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A. ÁBRAHÁM, J. BALOGH, I. BOROS, L. GOZMÁNY, Z. KASZAB,
G. SZELÉNYI, V. SZÉKESSY

REDIGIT

E. DUDICH

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1969

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THE SCIENTIFIC RESULTS OF THE HUNGARIAN SOIL ZOOLOGICAL EXPEDITIONS TO SOUTH AMERICA*

10. ACARI: ORIBATIDS, COLLECTED BY THE SECOND EXPEDITION. I.

By

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(Received August 30, 1968)

The second expedition to South America collected and extracted soil samples in Brazil, Bolivia, and Uruguay. We began the working up of the Oribatids from these materials. The results of investigations will be published in a series of papers, for the time being we do not lay any claim to completeness; and even the present paper contains but the description of new species.

The authors propose to establish one new family, 14 new genera, and 30 new species. The material derives from merely 5 different localities (8 habitats), hence, to obviate repetitions, the respective sites and the data of collecting conditions are given comprehensively below (*i.e.* the serial number listed hereunder agrees with that of the diary of collection to be published):

Brazil

No. 357. Manáos, Amazonas, 13 Nov., 1966. — BERLESE samples taken in the virgin forest, about 20 km from the city. — 1 = upper layer of litter (to a depth of 5 cm); 2 = lower layer in the same site (10 cm), decaying leaves interwoven with hyphae.

Bolivia

No. 380. Guayaramerin, Beni, 20 Nov., 1966. — BERLESE samples taken in the canopy forest near its edge, along the road to Riberalta, about 10 km from the town. — 1 = upper layer of litter; 2 = lower, mycelial layer; 3 = litter from the base of a large tree near the two former sites, upper and lower layers combined.

No. 396. Guayaramerin, Beni, 23 Nov., 1966. — BERLESE sample from the base of shrubs in a dense copse fluorishing after deforestation, at the outskirts of the village. — 1 = litter and decaying roots.

No. 406. Guayaramerin, Beni, 26 Nov., 1966. — BERLESE sample from the forest along the river Mamore. — 1 = litter and wooden debris from the shady base of a low tree

* The present paper treats the material of the Second Expedition: (1966—67). Leader: Prof. DR. J. BALOGH; other participants: DR. S. MAHUNKA and DR. A. ZICSI.

No. 416. Guayaramerin, Beni, 29 Nov., 1966. — BERLESE samples taken from the forest on a sandy substrate, 10 km from the town along the road to Riberalta. — 1 = upper layer of litter; 2 = lower mycelial layer from the same site.

The Holotypes and the greater part of the Paratypes are deposited in the Zoological Collection of the Hungarian Natural History Museum, Budapest; one Paratype each, whenever it has been possible to do so, forwarded to the collections of DR. J. AOKI, Tokyo; DR. E. PIFFL, Vienna; DR. A. RAJSKI, Poznan; and DR. T. A. WOOLLEY, Louisiana.

XENOLOHMANNIIDAE **fam. n.**

Genital and anal plates meeting, occupying entire length of ventral plate. Tibia and genu of about equal length and shape. Legs with one femur. Tarsi monodactyle. Body cylindrical, propodosoma and hysterosoma somewhat movably connected. Menton divided into two parts, not meeting medially. Genital plate with suture, preanal plate rather wide, triangular. Anal plates oval, each with 6 hairs.

Type-genus of family: *Xenolohmannia* gen. n.

R e m a r k s : The new family differs from the family Lohmanniidae in the characters of the ano-genital region and in the special evolvement of the menton. It might be regarded as an extremely specialized branch of the family Lohmanniidae.

Xenolohmannia gen. n.

Characters as for the family.

Type-species : *Xenolohmannia discrepans* sp. n.

Xenolohmannia discrepans sp. n. (Figs. 1—5)

663×428 μ. Sensillus pectinate, with lateral branches of uneven length. Prodorsal hairs strongly ciliate, except for hair *exa;* this latter also shorter.

N o t o g a s t e r : 3 pairs of transversal ribbons consisting of pori, and also some smaller fields of pori near lateral margins. Dorsal hairs short, thin, hardly discernibly ciliate. Their number deviating from the "*lohmannia*"-type, the distribution is shown on Fig. 5.

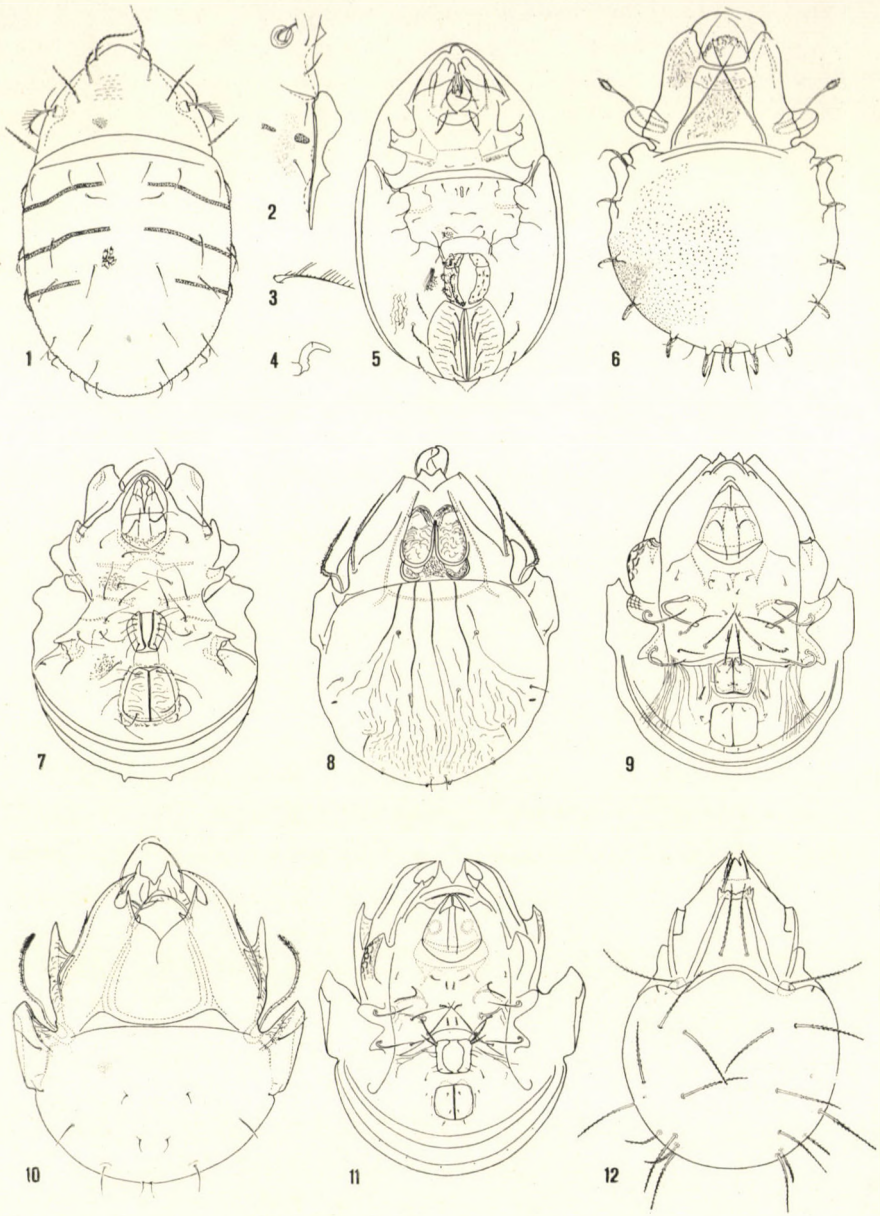
V e n t r a l : Epimeral setal formula: 3—1—3—4. All other essential features given in the description of the family. Shape of claw as shown on Fig. 4.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-508-68): No. 357-2.

CEPHEIDAE BERLESE, 1896

Hamotegeus gen. n.

Ten pairs of notogastral and 6 pairs of genital setae. Two pairs of humeral tubercles. Bothrydia tubiform, pro- and exclinate. Seven pairs of basally incrassate, coniform, marginally located notogastral setae.



Figs. 1—12. 1—5 = *Xenolohmannia discrepans* sp. n.; 6—7 = *Hamotegaeus granulatus* sp. n.; 8—9 = *Acaroceras nervosus* sp. n.; 10—11 = *Schalleria incurvata* sp. n.; 12 = *Ceratorchestes setosus* sp. n.

Type-species : *Hamotegeus granulatus* sp. n.

Remarks : The new genus takes an intermediate position between the genera *Cepheus* C. L. KOCH, 1836, *Compactozetes* HAMMER, 1966, and *Eutegaeus* BERLESE, 1917. Owing to the combination of characters given above, the new genus cannot be relegated to either one.

Hamotegeus granulatus sp. n. (Figs. 6—7)

714×510 μ. Lamellae wide, marginally situated, translamella present. Hair *la* arising on rounded apex of lamella. Hair *in* long, robust. Sensillus on a long stalk, apically small and pointedly clavate, apex finely ciliate.

Notogaster : Ten pairs of hairs, 7 of which arising on a projection and basally incrassate. Unpaired excrescence at posterior extremity of body with two pairs of setae longer than all other ones. Three pairs of setiform hairs.

Ventral : Epimeral setal formula: 3—1—3—3. Six pairs of long and thin genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Anal plate with transversal hollows.

Material examined : 1 ex. (Holotype: 0-509-68): No. 357-2.

MICROZETIDAE GRANDJEAN, 1936

Acaroceras nervosus sp. n. (Figs. 8—9)

343×245 μ. Sensillus setiform, proclinate, throughout densely ciliate Rostral apex deeply incised. Lamellae wide, hair *la* ramifying, similar to a cat-o'-nine-tails. Hair *in* long yet not reaching lamellar apices, throughout ciliate. Interlamellar apophysis pointed in a superior view, but its apex ramifying interiorly into several branches.

Notogaster : 4—5 strong, longitudinal lines decurrent posteriorad from anterior notogastral margin, posterior section of body with disjunct striation.

Ventral : Six pairs of genital hairs (1 pair very long and thick), 1 pair of robust aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Epimeral setal formula: 3—1—3—3. Ano-genital region with longitudinal striation.

Material examined : 1 ex. (Holotype: 0-510-68): No. 357-2; 4 ex. (Paratypes: 0-511-68): from the same locality.

Remarks: On the basis of the character-complex, the species widely differs all of its known congeners.

Schalleria BALOGH, 1962

The original description stated erroneously the absence of the interlamellar hair. It is present, and arises on the outer margin of the lamella, usually flattened against its side and thus hardly observable.

Schalleria incurvata sp. n. (Figs. 10—11)

338—362×294—318 μ. Sensillus sigmoid, throughout ciliate. Lamellae wide, cuspidally deeply and arcuately incised, the resultant outer apex longer than, and bending over, inner one.

Notogaster: finely and densely punctate.

Ventral: Epimeral setal formula: 3—1—3—3. Six pairs of genital hairs (two pairs considerably longer than all others), 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs.

Material examined: 1 ex. (Holotype: 0-512-68): No. 357-2; 2 ex. (Paratypes: 0-513-68): from the same locality.

Remarks: Among the known species of the genus *Schalleria*, the lamellar hair of *Sch. sexcornuta* Balogh, 1962, is simple; the lamellar cuspis of *Sch. monoceros* Balogh, 1962, is apically straightly truncate; and though the lamella of *Sch. bacillifera* Balogh, 1962, is, similarly to the new species, bicuspidate, the two apices are of equal length and the interlamellar region also carries 2 small, pointed apophyses.

EREMOBELBIDAE Balogh, 1961

Eremulus translamellatus sp. n. (Fig. 14)

275×180 μ. Sensillus sigmoid, with strong lateral cilia. Lamellae slightly convergent, also translamella well discernible. No costula, merely some larger areola, in interbothrydial area.

Notogaster: Hairs long, basally slightly incrassate, apically flagellately recurved.

Ventral: Epimeral setal formula: 3—1—3—3. Six pairs of trifurcate genital, 2 pairs of simple anal, and 3 pairs of simple adanal, hairs. Adanal setae, especially hair ad_1 extraordinarily long and apically flagelliform.

Material examined: 1 ex. (Holotype: 0-516-68): No. 357-1; 5 ex. (Paratypes: 0-517-68): from the same locality; 4 ex. (Paratypes: 0-507-68): No. 357-2.

Remarks: Of the small-sized *Eremulus* species, the new taxon stands nearest to *E. adami* Bal. et Mah., 1966, but the presence of the distinct translamella satisfactorily separates it from the latter.

METRIOPPIIDAE Balogh, 1943

Ceratorchestes gen. n.

Well developed lamellae with cuspis. Rostrum with a double, deep incision apically. Ten pairs of notogastral setae present, but hair *ta* completely reduced. Legs IV are jumping legs with special hairs. Mandible normal, not peloptoid.

Type-species : *Ceratorchestes setosus* sp. n.

Remarks : The new genus is clearly distinguished from all other generic taxa of the family by the configuration jumping legs IV.

Ceratorchestes setosus sp. n. (Figs. 12—13)

328—348×230—250 μ. Sensillus setiform, laterally proclinate, ciliate. Hairs *in* and *la* rather robust, hair *ro* arising on a small transversal protuberance immediately behind rostrum. Rostral apex intricate, with a double incision.

Notogaster : Dorsosejugal suture convex. Nine pairs of robust, ciliate notogastral setae present, merely insertion of hair *ta* present.

Ventral : Epimeral setal formula: 3—1—3—5. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Setae ad_1 and ad_2 in a paraanal, setae ad_3 in a preanal, position.

Material examined : 1 ex. (Holotype: 0-514-68): No. 357-1; 4 ex. (Paratypes: 0-515-68): from the same locality.

Amazoppia gen. n.

Mandible normal, not peloptoide. Lamellae situated near median line of body, lamellar cuspides not meeting. No translamella present. Sensillus long, filiform. Apodemata well developed.

Type-species : *Amazoppia tricuspidata* sp. n.

Remarks : Among the related genera, the new genus is distinguished from *Maquarioppia* Wallw., 1964 (= *Maquariella* Wallw., 1963), by the well developed apodemata and the absence of the translamella, from *Paenoppia* Woolley et Higgins, 1965, by the not peloptoide chelicera and the shape of the apodemata, from *Furcoppia* Bal. et Mah., 1967, by the shape and evolvement of the lamellae and the apodemata.

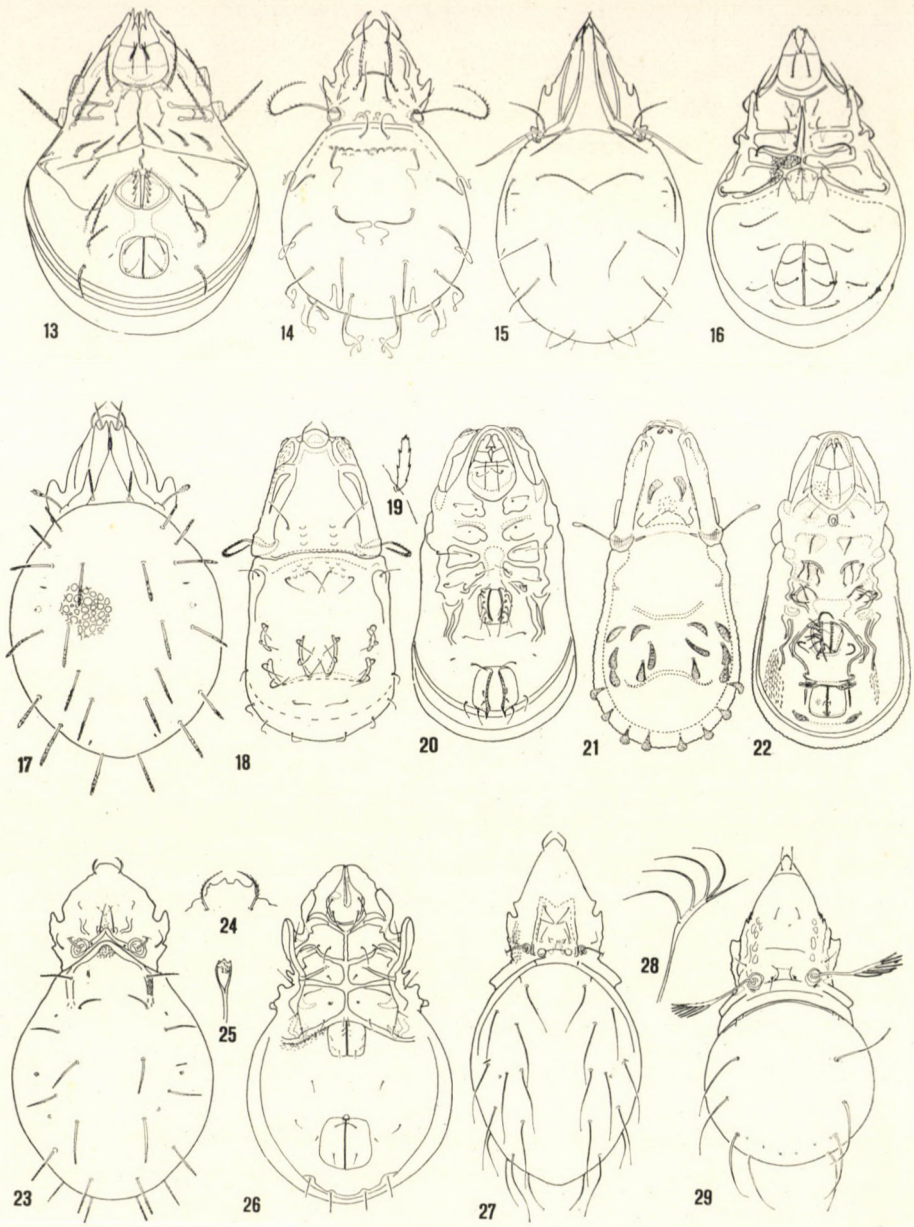
Amazoppia tricuspidata sp. n. (Figs. 15—16)

441—500×245—289 μ. Rostrum elongate, tricuspidate. Lamellae narrow, convergent then parallel, emitting hair *la* apically.

Notogaster : Ten pairs of subequal and ciliate notogastral hairs; hair *ta* minute.

Ventral : Apodemata strongly developed. Among epimeral setae, hairs *1b* and *3a* especially long. First one of 6 pairs of genital hairs extremely long; 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present. All ciliate.

Material examined : 1 ex. (Holotype: 0-518-68): No. 406; 14 ex. (Paratypes: 0-519-68): from the same locality.



Figs. 13—29. 13 = *Ceratorchestes setosus* sp. n.; 14 = *Eremulus translamellatus* sp. n.; 15—16 = *Amazoppia tricuspidata* sp. n.; 17 = *Xenillus brasilianus* sp. n.; 18—20 = *Neocarabodes sexpilosus* sp. n.; 21—22 = *Spathulocepheus amazonicus* sp. n.; 23—26 = *Cuneoppia laticeps* sp. n.; 27—28 = *Multioppia amazonica* sp. n.; 29 = *Octoppia irmayi* sp. n.

XENILLIDAE WOOLLEY et HIGGINS, 1966

Xenillus brasilianus sp. n. (Fig. 17)

663—877×408—632 μ. Sensillus clavate. Lamellae not coalescing, cuspidally excised: inner apex slightly longer than outer one.

N o t o g a s t e r : Ornamented with foveolae of divers size and irregular shapes. Notogastral hairs gradually incrassate apicad, hairs *ta* and *ti* shorter than all other setae.

V e n t r a l : Similar to dorsal side, but genital plate with considerably, anal plate with hardly, smaller foveolae. Hair ad_3 minute, smooth, hairs ad_1 and ad_2 robust, thick and ciliate.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-520-68): No. 357-1; 3 ex. (Paratypes: 0-521-68): from the same locality.

R e m a r k s: Of the known congeners, *X. lawrencei* BAL. et MAH., 1968, stands nearest to the new species, but the shape of the notogastral hairs, the sculpture of the genital and anal plates, as well as the form of the adanal hairs, amply separate it from the former one.

CARABODIDAE WILLMANN, 1931

Neocarabodes gen. n.

Fifteen pairs of notogastral setae, 6 pairs of genital setae. Among notogastral setae, 2 pairs (c_1, c_2) situated in anterior hollow of notogaster, 7 pairs in its elevated median portion, 1 pair in its posterior hollow, and 4 pairs in a postmarginal position.

Type-species: *Neocarabodes sexpilosus* sp. n.

R e m a r k s : The habit of the new genus resembles that of the *Machadocepheus—Congocepheus* group, but the genital, aggenital, and notogastral chaetotaxy separates it from all generic taxa of the family.

Neocarabodes sexpilosus sp. n. (Figs. 18—20)

542—714×285—336 μ. Sensillus exclinate, curving downward, then apically inclinate. Rostrum rounded, rostral hair (Fig. 19) dilated, marginally dentate.

N o t o g a s t e r : Epimeral setal formula: 3—1—2—3. Six pairs of long and thin genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Hairs ad_1 and ad_2 in a postanal, hair ad_3 in a preanal position.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-522-68): No. 357-1, 2 ex. (Paratypes: 0-875-68): from the same locality.

Spathulocepheus gen. n.

Ten pairs of notogastral and ten pairs of genital hairs.

Type-species: *Spathulocepheus amazonicus* sp. n.

R e m a r k s : By reason of the notogastral and genital setal formulae, the new species differs from all known generic taxa of the family. With regard to its general habit, it may be compared with the *Machadocepheus—Congocepheus* group, but these latter genera possess 4 pairs of genital and 14—15 pairs of notogastral hairs.* Also, *Trichocarabodes* BALOGH, 1961, with 8 genital, and *Apotomocepheus* AOKI, 1966, with 7 genital, hairs may yet be mentioned, but they are of a completely different character.

Spathulocepheus amazonicus sp. n. (Figs. 21—22)

540—714×265—377 μ. Sensillus long, apically hardly incrassate. Hair *in* large, spatulate, hairs *la* and *ro* inclinate, simple.

N o t o g a s t e r : Ten pairs of notogastral hairs, 6 of which relatively closely adjacent to each other and situated on a transversal ridge, while 4 other pairs in a posteromarginal position.

V e n t r a l : Epimeral setal formula: 1—1—3—3. Ten pairs of vermiform genital hairs, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs; of these latter ones, hairs ad_1 and ad_2 spatulate, hair ad_3 setiform.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-523-68): No. 357-1; 24 ex. (Paratypes: 0-524-68): from the same locality.

OPPIIDAE GRANDJEAN, 1954

Cuneoppia gen. n.

Dorsosejugal suture cuneiform, projecting between bothrydia; a costula, parallel with it and bearing hair *in*, connecting bothrydia; hair *la* arising immediately anteriorly to it, on a distinct tubercle. Ten pairs of notogastral and 6 pairs of genital hairs. Mandible peloptoide.

Type-species: *Cuneoppia laticeps* sp. n.

R e m a r k s : The new genus is distinguished from all known Oppiid genera by the peloptoide mandibles, the peculiar structure of the prodorsum and especially by hair *la* arising extraordinarily posteriorly.

* Following a comparison of the Carabodid species described hitherto, the species *Machadocepheus longus* BAL., 1962 (Madagascar), is to be excluded from this genus, and a new genus established for it, as follows:

Tuberocepheus gen. n.

Ten pairs of notogastral and 4 pairs of genital hairs. Six pairs of minute and simple hairs arising on 5 pairs of tubercles medially on notogaster.

R e m a r k s : The new genus rather resembles *Spathulocepheus* gen. n., described above, but the number of genital and adanal hairs as well as the epimeral setal formula clearly distinguish it.

Cuneoppia laticeps sp. n. (Figs. 23—26)

295—315 × 175—192 μ. Rostral apex proclinate in a superior view (Fig. 24), lacerated by divers kinds of incisions. Sensillus tricuspidate and spatulate (Fig. 25), laterally proclinate.

N o t o g a s t e r : Cuneiform dorsosejugal suture followed by a wide chitinous ridge, emitting a lath each also posteriorad. Enclosed area strongly punctate. Hairs robust, thick, weakly ciliate.

V e n t r a l : Epimeral setal formula: 3—1—3—3. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Hairs ad_1 and ad_2 in postanal, hair ad_3 in preanal, position; former two arising on an arcuate and chitinous ridge.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-525-68): No. 380-3; 5 ex. (Paratypes: 0-526-68): from the same locality.

Multioppia amazonica sp. n. (Figs. 27—28)

598 × 294 μ. Sensillus pentafid, slightly incrassate along lateral branches (Fig. 28). Prodorsal hairs extremely short, lamellae hardly discernible. A strong chitinous tubercle posteriorly to hair *in*.

N o t o g a s t e r : Only insertion point of hair *ta* present, 12 long and curved notogastral hairs.

V e n t r a l : Epimeral setal formula: 3—1—3—3. Five pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Setae ad_1 in postanal, ad_2 in paraanal, ad_3 in preanal, position; pori *iad* long, subtending an acute angle with longitudinal axis of anal aperture.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-556-68): No. 357-1; 8 ex. (Paratypes: 872-68): No. 357-2.

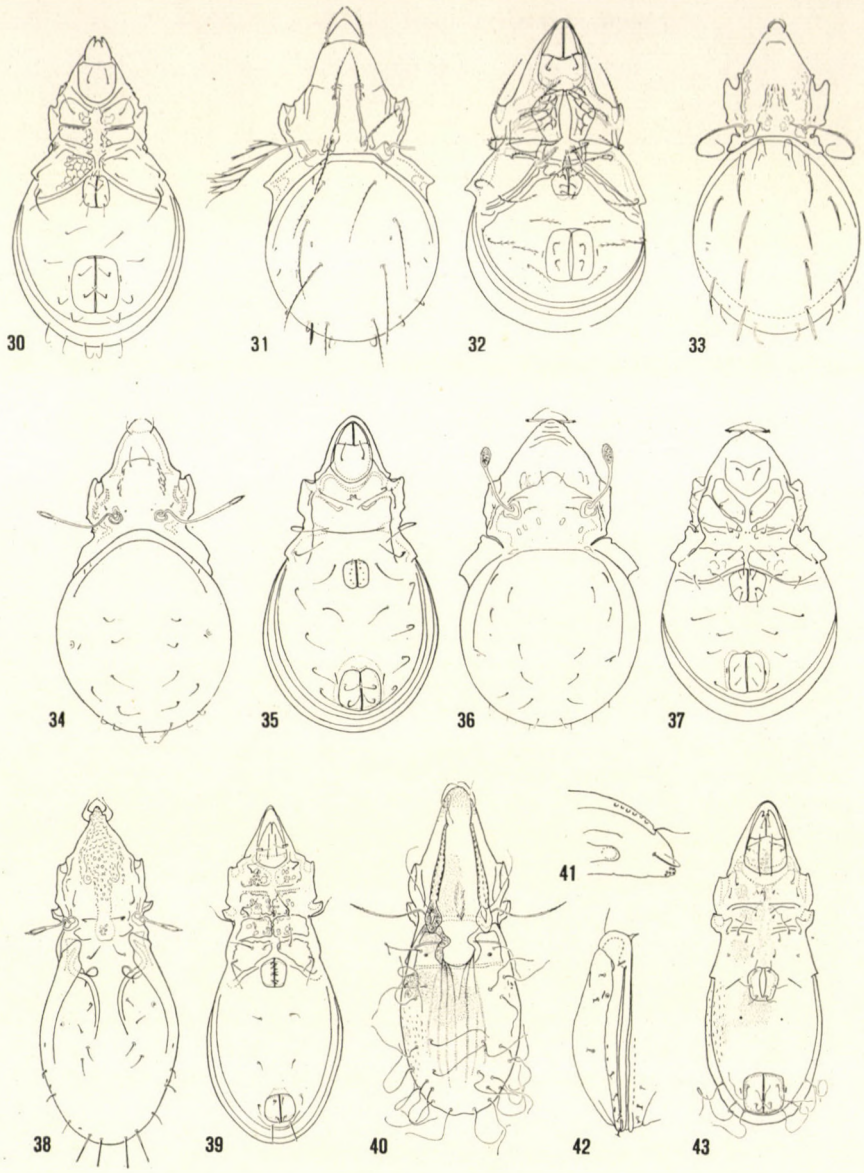
R e m a r k s : The new species stands nearest to *M. punctata* (HAMMER, 1961), and *M. pectinata* BAL. et MAH., 1967, but it differs from them by the shape of the sensillus and the length as well as the configuration of the epimeral setae.

Octoppia gen. n.

Four pairs of long and thick notogastral hairs, arranged in two longitudinal rows. All other notogastral hairs minute or absent. Sensillus pectiniform. Five pairs of genital hairs.

Type-species : *Octoppia irmayi* sp. n.

R e m a r k s : The peculiar notogastral chaetotaxy separates the new genus from all hitherto known genera of the family.



Figs. 30—43. 30 = *Octoppia irmayi* sp. n.; 31—32 = *Sternoppia reticulata* sp. n.; 33 = *Tecteremaeus cristatus* sp. n.; 34—35 = *Trematoppia reducta* sp. n.; 36—37 = *Neosuctobelba transitoria* sp. n.; 38—39 = *Beckiella foveolata* sp. n.; 40—43 = *Cavernocepheus monstruosus* sp. n.

Octoppia irmayi sp. n. (Figs. 29—30)

225—235×127—132 μ. Sensillus pectiniform, with 7 long lateral branches and some short cilia. Rostrum tricuspidate. Prodorsal hairs short.

N o t o g a s t e r : A minute, spiniform hair *ta*, and 4 pairs of long and thick, as well as 3 pairs of shorter and thin, hairs present, latter in postero-marginal position.

V e n t r a l : Epimeral setal formula: 3—1—3—3. Five pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-527-68): No. 357-1; 23 ex. (Paratypes: 0-526-68): from the same locality.

We dedicate the new species, in gratitude and esteem, to H. DE IRMAY, of immense help in the realization and collecting activities of the expedition.

Sternoppia reticulata sp. n. (Figs. 31—32)

267—317×165—172 μ. Sensillus long, multiply furcate or ramifying. Hairs *la* arising postapically on lamella, hairs *in* on dilating base of lamella.

N o t o g a s t e r : Hair *ta* reduced; 4 pairs of long and 5 pairs of short notogastral hairs present.

V e n t r a l : Highly similar to *S. mirabilis* BAL. et MAH., 1968, but chitinous plates (covering epimeral region) reticulate, hairs *3a* and *4c* only weakly incrassate.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-529-68): No. 357-1; 6 ex. (Paratypes: 0-530-68): from the same locality.

R e m a r k s : From the type-species, the new taxon is satisfactorily distinguished by the reduced hair *ta*, the reticulation of the epimeral region, and the configuration of the epimeral hairs.

Tecteremaeus cristatus sp. n. (Fig. 33)

456×269 μ. Sensillus exclinate then recurving, densely ciliate. A weak but distinctly recognizable costula present; lamellar hairs arising anteriorly to it and closely adjacent to each other.

N o t o g a s t e r : Ten pairs of slightly widened notogastral hairs, resembling willow-leaves. Hairs originating on posterior margin of body shorter than all other ones.

V e n t r a l : Epimeral setal formula: 3—1—3—3. Apodemata well developed, 6 pairs of genital, 1 pair of aggenital, 2 (2 + 3) pairs of anal, and 3 pairs of adanal hairs. Setae ad_1 in a postanal, setae ad_2 and ad_3 in a paraanal position. Anogenital region finely punctate.

L e g s : Chitinous crest of femora of legs 1—4 dentate.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-531-68): No. 380-2; 9 ex. (Paratypes 0-873-68): No. 357-2.

Remarks: The new species is easily distinguished from the single known species taxon (type-species) of the genus by the notogastral hairs and the dentate plates of the femora.

Teratoppia reducta sp. n. (Figs. 34—35)

250—312×142—177 μ. Sensillus long, pro- and exclinate, terminally slightly incrassate, weakly ciliate. Hairs *in* minute. Hairs *la* thin, situated posteriorly to a transversal chitinous line.

Notogaster: Anterior margin with a wide chitinous ribbon. Ten pairs of minute hairs.

Ventral: Apodemata almost completely reduced. Epimeral setal formula: 1—0—1—2. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Setae ad_1 and ad_2 in paraanal, ad_3 in preanal, position.

Material examined: 1 ex. (Holotype: 0-532-68): No. 357-1; 26 ex. (Paratypes: 0-533-68): from the same locality.

Remarks: The other species of the genus occur in Africa; the new species differs by the epimeral setal formula and the weaker legs.

SUCTOBELBIDAE GRANDJEAN, 1954

Neosuctobelba gen. n.

Rostrum and hair *ro* of a suctobelbid type. Prodorsum without the two fenestrate hollows and tubercles. Dorsosejugal suture without tubercles. Chelicera of a suctorial type.

Type-species: *Neosuctobelba transitoria* sp. n.

Remarks: The dissimilar evolvement of the prodorsum separates the new taxon from the genus *Suctobelba*.

Neosuctobelba transitoria sp. n. (Figs. 36—37)

200—220×120—133 μ. Sensillus proclinate, long-stalked, apically minutely clavate, bearing 3—4 minute cilia. Rostrum with two small lateral teeth. A stronger and two weaker transversal lines behind rostral apex. Bothrydia connected by a thin, medially projecting chitinous line, hairs *la* arising on this elevated portion. Only alveoli of hairs *in* discernible.

Notogaster: Ten pairs of thin notogastral hairs.

Ventral: Epimeral setal formula: 3—1—3—3. Body slightly concave anteriorly to genital aperture. Four pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Setae ad_2 and ad_3 in preanal position.

Material examined: 1 ex. (Holotype: 0-534-68): No. 380-2; 8 ex. (Paratype: 0-535-68): from the same locality.

DAMPFIELLIDAE BALOGH, 1961

Beckiella foveolata sp. n. (Figs. 38—39)

441—592×163—245 μ. Stalk of sensillus sigmoid, clavus fusiform, pointed, with 3—4 lateral cilia. Anterior third of rostrum and a median stripe, decurrent posteriorad, strongly foveolate. Hairs *exa* and *in* merely one-third shorter than hair *la*.

N o t o g a s t e r : Ten pairs of notogastral hairs of divers length; longest ones arising on posterior margin of notogastral hollow.

V e n t r a l : Epimeral setal formula: 2—1—2—2. Hairs *1a* and *2a* represented merely by their hardly recognizable insertion points. Four pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Hair ad_3 in preanal position.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-536-68): No. 357-2; 7 ex. (Paratypes: 0-537-68): from the same locality.

R e m a r k s : Of the known *Beckiella* species, the new taxon stands nearest to *B. cejanensis* (BECK, 1962). However, the prodorsum and the notogastral hairs distinguish it from both this and all other species of the genus.

OTOCEPHEIDAE BALOGH, 1961

Cavernocepheus gen. n.

A deep cave — occupying anterior portion of notogaster — in dorsosejugal region. 14 pairs of notogastral and 3 pairs of genital setae. Porus *iad* adjacent to anus.

Type-species: *Cavernocepheus monstruosus* sp. n.

R e m a r k s : By reason of the cave in the anterior portion of the notogaster, and the concurrent deformations, the genus is unique in the entire family.

Cavernocepheus monstruosus sp. n. (Figs. 40—43)

714×275 μ. Sensillus long, thin, exclinate, weakly ciliate. Lamellae long, basally incrassate; *spa. l* absent. Hair *ro* slightly more robust than filiform setae *la* and *in*.

N o t o g a s t e r : Hollow, with radial ribs decurrent posteriorad. Surface sparsely foveolate. All hairs filiform. Position of lateral pores as shown on Fig. 42.

V e n t r a l : Apodemata weakly developed. Epimeral setal formula: 3—1—3—2. Three pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-539-68): No. 357-1.

Dolycheremaeus amazonicus sp. n. (Figs. 44—45)

691×206 μ. Lamellae long, narrow, hairs *la* removed from them. *Spa. l* absent. Hairs *ro* and *la* setiform, hair *in* apically obtuse. Sensillus pointed, fusiform.

Notogaster: Hair *ta* short, obtuse, all other hairs long, flagelliform. Notogaster densely and heavily punctate.

Ventral: Epimeral setal formula: 3—1—3—3. Four pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs.

Material examined: 1 ex. (Holotype: 0-538-68): No. 357-1.

Remarks: No species of a similar notogastral chaetotaxy is known among the hitherto described taxa.

ORIBATELLIDAE JACOT, 1925

Oribatella serrata sp. n. (Figs. 46—47)

387×274 μ. Sensillus thick but setiform, ciliate. Exterior cuspis of lamellae slightly longer than interior one, outer margin with 3 teeth. Hair *in* long, extending to cuspides of lamellae.

Notogaster: Anterior margin of pteromorpha serrate, laterally reticulate. Notogaster heavily punctate. Four pairs of small areae porosae, 11 pairs of subequal notogastral setae.

Ventral: Epimeral region in fourth row with also some long hairs. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Merely insertion point of hair ad_3 visible.

Material examined: 1 ex. (Holotype: 0-540-68): No. 380-1; 18 ex. (Paratype: 0-541-68): from the same locality.

Remarks: The serrate anterior margin of the pteromorpha and the reticulated sculpture distinguish the new species from all of its known congeners.

EPACTOZETIDAE GRANDJEAN, 1936

Truncozetes gen. n.

Lamellae short, apically truncate. Legs tridactylous, lateral claws extremely thin, setiform. Epimeral region with longitudinal ribs. A large spur above, on base of tibia of leg IV. Six pairs of genital and ten pairs of notogastral hairs.

Type-species: *Truncozetes mucronatus* sp. n.

Remarks: The lamellae and the peculiar evolvement of the epimeral region amply distinguish the new genus from *Epactozetes* GRANDJEAN, 1936.

Truncozetes mucronatus sp. n. (Figs. 48—49)

228×168 μ. Sensillus proclinate, clavate, its surface heavily aciculate. Lamellae wide, obliquely truncate anteriorly, concavely excavated. Translamella present. Hair *la* a small spine, also hair *in* very short.

Notogaster: Roughly foveolated. Posterior margin with a bulbous tumescence. Ten pairs of well discernible hairs. Pteromorpha rounded, foveolate.

Ventral: Epimeral region with longitudinal rugulosity, hence apodemata and hairs hardly recognizable. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Hairs ad_1 and ad_2 in postanal, hair ad_3 in preanal, position.

Materia examined: 1 ex. (Holotype: 0-542-68): No. 406; 20 ex. (Paratypes: 0-874-68): from the same locality.

PARAKALUMMIDAE GRANDJEAN, 1936

Parakalumma foveolata sp. n. (Figs. 50—51)

314—345×166—191 μ. Prodorsum elongate, lamellae submarginal, rather wide. Hairs *in* and *la* minute. Sensillus fusiform, apically rounded, proclinate.

Notogaster: Anterior margin of notogaster parabolically arcuate anteriorad. Four pairs of sacculi present. *Sa* large, all other ones small and situated posteriorly. Ten pairs of notogastral alveoli. Surface irregularly foveolate. Antero-inferior margin of pteromorpha arcuately excised.

Ventral: Setae extremely small, usually only their alveoli discernible. Four pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs; all minute. Hair ad_3 in preanal position.

Material examined: 1 ex. (Holotype: 0-543-68): No. 357-1; 15 ex. (Paratypes: 0-544-68): No. 357-2.

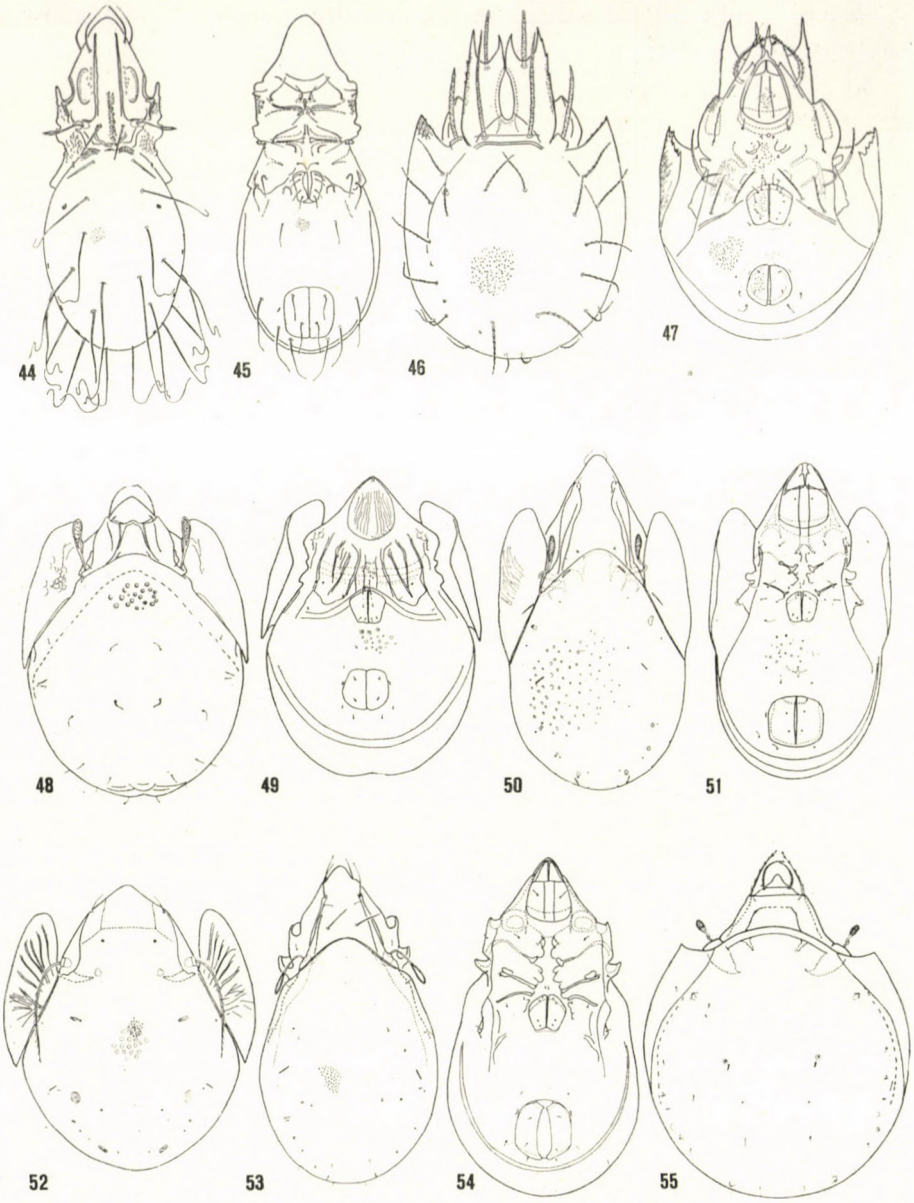
Remarks: A similar combination of features was as yet unknown in the genus.

GALUMNIDAE GRANDJEAN, 1936

Pergalumna passimpunctata sp. n. (Fig. 52)

275—285×260—280 μ. Sensillus filiform, reclinate, with long cilia. Dorsosejugal suture absent. Setae *in* represented only by alveoli behind an extremely thin transversal line. Hair *la* fine but discernible, hair *ro* indicated only by alveoli.

Notogaster: Pteromorpha relatively large, with scarce venation. Area porosa *Aa* removed from pteromorpha, small, transversal, areae porosae A_1—A_3 situated posteriorly, A_2 considerably smaller than the other two. Notogaster with double sculpture.



Figs. 44—55. 44—45 = *Dolicheremaeus amazonicus* sp. n.; 46—47 = *Oribatella serrata* sp. n.; 48—49 = *Epactozetes setosus* sp. n.; 50—51 = *Parakalumma foveolata* sp. n.; 52 = *Pergalumna passimpunctata* sp. n.; 53—54 = *Monoschelobates parvus* sp. n.; 55 = *Conozetes arcualis* sp. n.

V e n t r a l : All hairs represented only by alveoli. Ventral plate with large, obscure points.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-545-68): No. 357-1; 19 ex. (Paratypes: 0-546-68): from the same locality.

R e m a r k s : The filiform sensillus, the four pairs of areae porosae, the small dimensions of the body, and the foveolate notogaster distinguish the new species from all known congeners.

ORIBATULIDAE JACOT, 1929

Monoschelobates gen. n.

Pteromorpha absent, only humeral lobe present. Four pairs of extremely small sacculi. Ten pairs of minute notogastral hairs. Four pairs of genital setae. Legs monodactyle.

Type-species: *Monoschelobates parvus* sp. n.

R e m a r k s : On the basis of the above combination of characters, the new genus might be assigned to the small-sized, monodactyle *Scheloribates* species, but by its habit the new genus seems to be related rather to the genus *Tuberemaeus* SELLNICK, 1930.

Monoschelobates parvus sp. n. (Figs. 53—54)

254—279×147—162 μ. Sensillus ex- and reclinate, fusiform, with rounded and ciliate apex. Hairs *in*, *la* and *ro* of medium length. Lamellae long, an obliquely transversal line each beneath their cuspis, imitating translamella.

N o t o g a s t e r : Dorsosejugal suture arcuate. Small, short humeral lobe present. Four pairs of minute sacculi.

V e n t r a l : All hairs of epimeral and anogenital regions extremely short; hair ad_3 in preanal position.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: 0-547-68): No. 357-1; 13 ex. (Paratypes: 0-548-68): from the same locality.

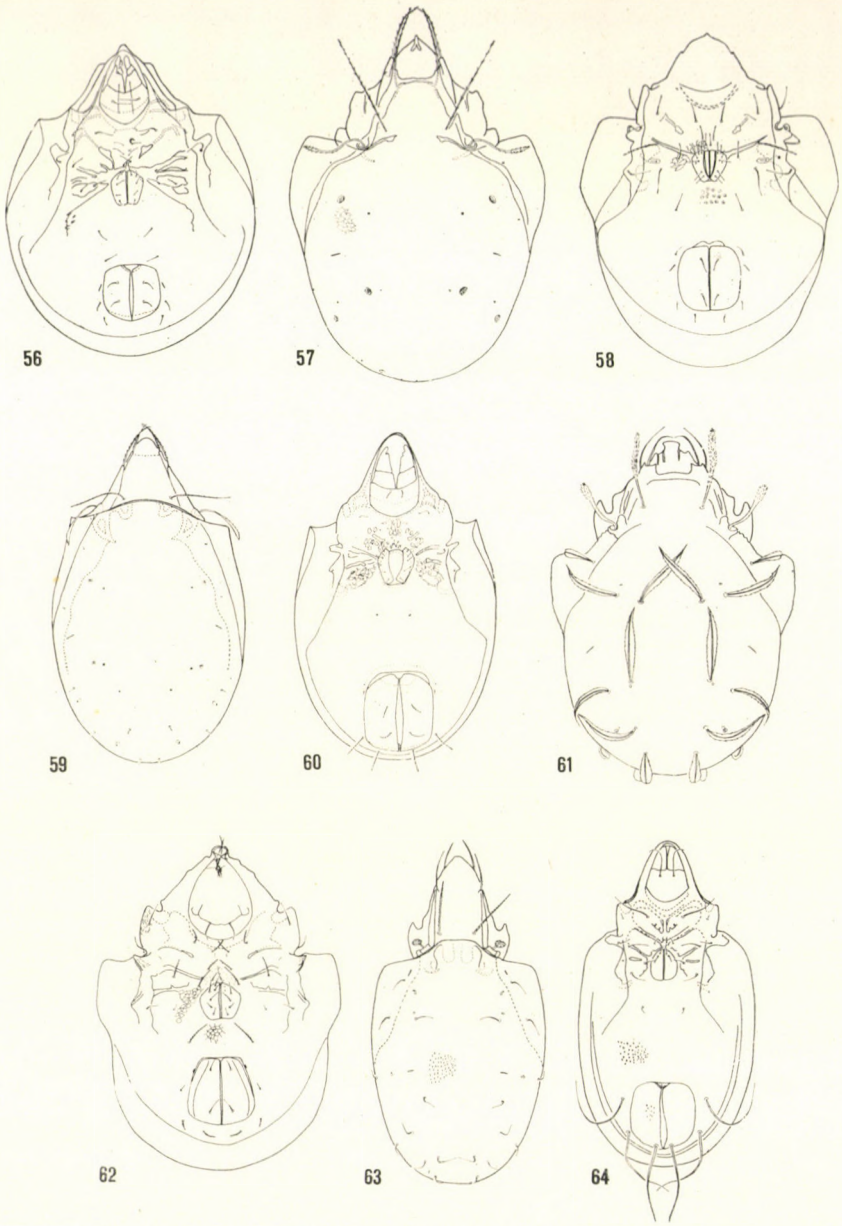
HAPLOZETIDAE GRANDJEAN, 1936

Conozetes gen. n.

Pteromorpha movable. Four pairs of characteristically projecting, coniform sacculi. Prodorsum with lamella and translamella. Five pairs of genital setae. Four pairs of apodemata, concurrent in almost one point at margin of genital aperture. Legs monodactyle.

Type-species : *Conozetes arcualis* sp. n.

R e m a r k s : The special structure of the sacculi and the configuration of the anogenital region distinguish the new genus from all poronotic Oribatids.



Figs. 56—64. 56 = *Conozetes arcualis* sp. n.; 57—58 = *Uracrobates incertus* sp. n.; 59—60 = *Paraxylobates imitans* sp. n.; 61—62 = *Nasobates mirabilis* sp. n.; 63—64 = *Benoibates bolivianus* sp. n.

Conozetes arcualis sp. n. (Figs. 55—56)

392×323 μ. Stalk of sensillus sigmoid, fusiform, weakly ciliate. Rostral cuspis elongate. Lamella and translamella very wide. Hairs *la* arising at outer margin of lamella.

Notogaster: Hairs reduced, merely 10 pairs of alveoli visible.

Ventral: Five pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Setae ad_3 in preanal position.

Material examined: 1 ex. (Holotype: 0-549-68): No. 357-2.

Uracrobates incertus sp. n. (Figs. 57—58)

539—676×431—534 μ. Sensillus exclinate, slightly fusiform, ciliate. Rostral apex pointed. Lamellae well developed, cuspides long, outer apex mucronate. Hair *in* longest among all prodorsal hairs.

Notogaster: Dorsosejugal suture medially interrupted. Surface weakly reticulate. Hairs represented only by alveoli.

Ventral: Apodemata underdeveloped. Epimeral hairs long. Anogenital region with large, punctate foveolae. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Setae ad_2 and ad_3 in preanal position. Pori *iad* subtending an angle with anal opening.

Material examined: 1 ex. (Holotype: 0-550-68): No. 416-1; 1 ex. (Paratype: 0-551-68): from the same locality.

Paraxylobates gen. n.

Ten pairs of extremely small notogastral setae, 6 pairs of genital hairs. Pteromorpha movable. Four pairs of sacculi. Legs tridactylous, heterodactylous.

Type-species: *Paraxylobates imitans* sp. n.*

Remarks: The above combination of features precludes the relegation of this species to any Haplozetid genus.

Paraxylobates imitans sp. n. (Figs. 59—60)

673×408 μ. Sensillus ex- and slightly reclinate, apically incrassate, ciliate. Hairs *in* heavily, hairs *la* and *ro* only slightly, ciliate. Hair *la* arising on lamellar cuspis.

Notogaster: Dorsosejugal suture hardly convex. Pteromorpha pointed. Notogastral hairs hardly discernible, sacculi minute.

* The species *Scheloribates madagascarensis* BAL., 1960, probably also belongs here.

Ventral: Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Setae ad_1 and ad_2 long, ciliate, in para- and postanal positions, respectively; hairs ad_3 and *ag* almost reduced.

Material examined: 1 ex. (Holotype: 0-552-68): No. 357-1.

Nasobates mirabilis sp. n. (Figs. 61—62)

494×392 μ. Pteromorpha movable. Sensillus ex- and proclinate, its clavate apex densely ciliate. Hairs *la* and *ro* setiform, hair *in* long, incrassate, penicillately ciliate. Lamellae wide, cuspis short but well discernible, with a distinct outer and inner apex.

Notogaster: Dorsosejugal suture absent. Nine (?) pairs of large notogastral setae, resembling willow-leaves, four pairs of minute sacculi. Notogaster covered with rough cerotegument.

Ventral: Epimeral hairs well discernible. Epimeral setal formula: 3—1—3—2. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs. Setae ad_2 and ad_3 in postanal position.

Material examined: 1 ex. (Holotype: 0-553-68): No. 406; 3 ex. (Paratypes: 0-554-68): No. 447-2.

Remarks: On the basis of the character-complex, the species widely differs from all its known congeners.

ORIPODIDAE JACOT, 1925

Benoibates bolivianus sp. n. (Figs. 63—64)

519×294 μ. Sensillus clavate, bothrydium only partially covered. Hairs *ro*, *la*, and *in* lengthening in order of above sequence. Hair *in* projecting even beyond cuspis of lamellae.

Notogaster: Median line with smaller, but marginally with gradually increasing, foveolae. Ten pairs of short notogastral hairs.

Ventral: Hair *1b* very long. Two pairs of genital, 1 pair of aggenital, 1 pair of anal, and 2 pairs of adanal, hairs; these latter very long.

Material examined: 1 ex. (Holotype: 0-555-68): No. 406.

Remarks: The ventral side of the new species is similar to that of *Benoibates flagelliger* BAL., 1958, but the proportion of the prodorsal hairs, the uncovered bothrydium, and the notogastral sculpture distinguish it satisfactorily.

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QUELQUES GEORISSUS LATREILLE NOUVEAUX DE L'INDONÉSIE, VIETNAM ET DE NOUVELLE GUINÉE (COLEOPTERA: GEORISSIDAE)

Par

J. DELÈVE

INSTITUT ROYAL DES SCIENCES NATURELLES DE BELGIQUE, BRUXELLES

(Reçu: le 4 janvier 1968)

Les insectes faisant l'objet de cette note appartiennent au Musée de Budapest. Je remercie très vivement M. le DR. Z. KASZAB d'avoir bien voulu m'en confier l'examen.

Georissus calculus n. sp. (Fig. 1)

Taille: 1,1 mm. Brièvement ovale, brun marron, assez luisant. Antennes d'un jaune pâle, à massue fusiforme.

Tête granuleuse sur l'épistome, ornée sur le milieu du front de deux reliefs longitudinaux disposés en V épaissis à leur extrémité antérieure devant le sillon transversal séparant l'épistome du front. De chaque côté, une crête longitudinale, courbée vers l'intérieur en arrière où elle a tendance à se fragmenter.

Pronotum nettement plus large (au niveau de la dilatation anguleuse) que long (0,55 mm : 0,4 mm). Bord antérieur faiblement arrondi. Bord latéral élargi en une dent assez large suivie de deux ou trois denticules. Partie antérieure coupée au milieu par un sillon médian longitudinal peu profond; garnie de chaque côté d'une faible callosité avec de très petits granules. Partie postérieure creusée de trois fossettes: une médiane en forme de losange et deux submédianes, ovales, en arrière de la précédente dont elles ne sont séparées que par une mince arête. De chaque côté, une callosité sublatérale, peu élevée, avec quelques granules, accolée à la fossette submédiane. Une ligne irrégulière de granules le long de la base.

Elytres moins de deux fois plus longs que le pronotum; plus grande largeur située vers le premier tiers de leur longueur; plus larges ensemble que longs (0,7 mm : 0,67 mm). Points des stries profonds, très larges, les interstries très étroits de même que les séparations des points dans chaque strie. Tous les interstries de même valeur, garnis de granules coniques peu élevés, disposés à peu près à raison d'un par point, plus visibles sur les inter-

stries latéraux. Calus huméral marqué. Neuvième intervalle élargi en saillie crénelée après le calus huméral mais à un niveau inférieur, semblant former, vu de dessus, le bord latéral de l'élytre. Angle basal avancé en lobe saillant dentelé. Repli épipleural offrant au niveau des hanches postérieures un pli transverse formant la limite antérieure d'un alvéole arrondi.

Métasternum court, en bourrelet granuleux de chaque côté de la ligne médiane.

Abdomen avec quelques granules.

Edéage (Fig. 1). Longueur totale: 300 μ. Lobe médian (160 μ) à apophyses longues et étroites. Paramères (140 μ) dépassant le sommet du lobe médian. Pièce basale: 160 μ.

Holotype: un ♂, Sumatra centr., Singkarak, 22-II-1929, Ufer des Sees (Deutsche Limnologische Expedition) Coll. E. Csiki.
Paratypes: trois ♂♂, trois ♀♀ de même provenance.

Tous les spécimens étaient couverts d'une croûte blanchâtre, masquant la sculpture. Diffèrent de *G. overbecki* van Emden (d'après la description) par leur taille encore plus petite, leur coloration brune, la ponctuation des élytres formée de larges points rapprochés, le 9e interstrie saillant latéralement.

Les deux espèces appartiennent au groupe, largement répandu, de *G. laesicollis* Gyll.

Georissus emdeni n. sp. (Fig. 5)

Taille: 1,4 mm. Brièvement ovale, rétréci en arrière, d'un brun marron luisant.

Tête granuleuse sur l'épistome; ornée, sur le milieu du front, de deux reliefs longitudinaux arqués en V, épaissis à leur extrémité antérieure, devant le sillon transversal séparant l'épistome du front. De chaque côté, une crête longitudinale courbée en arrière vers l'intérieur où elle a tendance à se fragmenter.

Pronotum très nettement plus large (au niveau de la dent latérale) que long (0,61 mm : 0,45 mm). Bord antérieur subtronqué garni de petits granules; longé de très près par le bord, granuleux lui aussi, du lobe antérieur. Celui-ci coupé au milieu par un sillon médian longitudinal peu profond; relevé de chaque côté en callosité granuleuse peu prononcée. Partie postérieure du disque creusé de trois fossettes: une médiane losangique, flanquée de chaque côté d'un fort bourrelet granuleux; deux submédianes postérieures, ovales, limitées en avant chacune par le bourrelet précité, subcontiguës sur la ligne médiane, leur contour marqué par de fines granulations. De chaque côté, une callosité granuleuse moins haute que les bourrelets limitant la fossette centrale. Immédiatement en arrière de cette callosité et de la fossette sub-

médiane, de chaque côté, une cavité transversale étroite, parallèle à la base. Dent latérale de la région explanée, dirigée en arrière, suivie de trois denticules.

Elytres un peu plus de deux fois plus longs que le pronotum; un peu moins larges ensemble que longs (0,86 mm : 0,96 mm), Points des stries larges, très étroitement séparés entre eux par de fins traits transversaux. Suture élevée, presque tranchante. Interstries 1 et 4 plus faibles que les interstries 3 et 5, le 3e élevé en forte côte, encore élargi et épaissi avant la déclivité apicale; le 5e moins élevé; les suivants, tant pairs qu'impairs, de force égale. Calus huméral granuleux, masquant presque complètement, vu de dessus, l'angle huméral externe crénelé. Repli épipleural coupé, au niveau des hanches postérieures, par un fort pli transverse formant du côté interne, avec le 9e interstrie, la limite antérieure d'un alvéole (Fig. 5).

Métasternum en bourrelet granuleux de chaque côté du sillon longitudinal médian.

Abdomen offrant des granules largement séparés.

Holotype: une ♀, Sumatra centr., Singkarak, 22-II-1929, Ufer des Sees (Deutsche Limnologische Expedition) Coll. E. Csiki.

Confondue avec les spécimens de l'espèce précédente, portant une étiquette «*Georyssus overbecki* v. Emden», pourtant très distincte par la sculpture des élytres offrant une côte épaisse sur le 3e intervalle.

Je dédie cette espèce à M. Van Emden qui fit connaître la première espèce du genre en provenance de Sumatra.

Georissus batavianus n. sp. (Figs. 2 et 7)

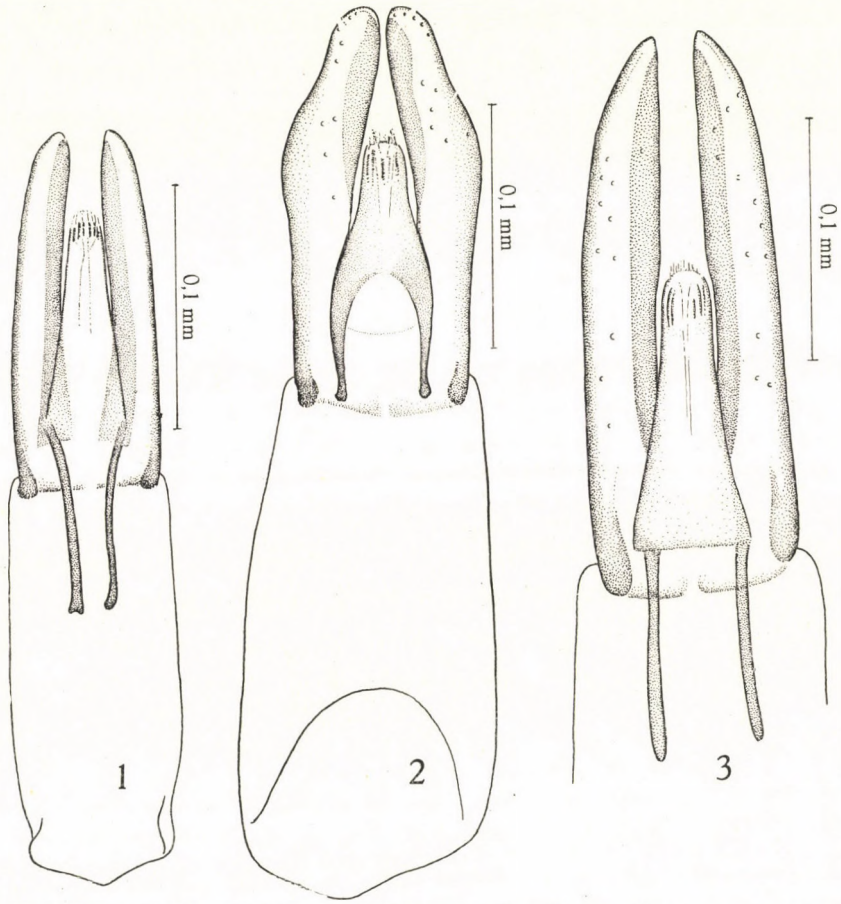
Taille: 1,5 mm. En ovale assez large; d'un brun foncé luisant.

Tête sculptée comme chez *G. calculus* n. sp.

Pronotum du type *laesicollis*, nettement plus large que long (0,7 mm : 0,5 mm) à bords antérieur et latéral crénelés; la dent latérale courbée vers l'arrière, suivie de deux petits denticules. Marge apicale du lobe antérieur garnie de petits granules disposés parallèlement au bord antérieur subtronqué; sillon longitudinal médian bordé de granules; des granules encore, de chaque côté du lobe, formant une faible callosité. Fossette médiane losangique; fossettes submédianes obliques, ovales; leurs arêtes granuleuses. En avant des fossettes submédianes de chaque côté contre la fossette médiane, un bourrelet granuleux. Callosité sublatérale moins élevée que la région centrale, plus ou moins arrondie, granuleuse. En arrière de celle-ci, le long de la base, une cavité transversale se rétrécissant vers la région médiane.

Elytres un peu plus de deux fois plus longs que le pronotum, plus longs que larges ensemble (1,1 mm : 0,93 mm) à stries profondes, les points séparés entre eux par de minces traits transversaux. Interstries plus étroits que les

points, tous semblables, élevés en côtes nettes, garnies de granules aplatis subcontigus. Calus huméral proéminent ne masquant toutefois pas le bord latéral. Angle huméral externe peu avancé, à peine crénelé. Repli épipleural creusé d'un alvéole arrondi, limité en avant par le pli transverse et vers



Figs. 1-3. Edéage de 1 = *Georissus calculus* n. sp., 2 = *G. batavianus* n. sp., 3 = *G. neoguineensis* n. sp.

l'intérieur par le 9e interstrie, celui-ci ne formant pas, vu de dessus, d'élargissement anguleux (Fig. 7).

Métasternum relevé, de chaque côté de la ligne médiane, en bourrelet granuleux.

Abdomen avec de larges granules mousses sur le premier segment.

Edéage (Fig. 2) d'une longueur totale de 345 μ. Lobe médian court (112 μ), apophyses basales ne pénétrant pas dans la pièce basale. Paramères

(150 μ) quelque peu élargis au niveau du sommet du lobe médian, qu'ils dépassent sensiblement. Pièce basale: 205 μ.

Holotype: un ♂, Batavia (Bíró, 1896).

Premier représentant du genre pour l'île de Java. Espèce très distincte de *G. calculus* n. sp. par la taille, les points des stries moins larges, les interstries en côtes plus nettes à granules aplatis, le 9e beaucoup moins saillant latéralement.

Georissus neoguineensis n. sp. (Figs. 3 et 8)

Taille: 1,35 mm. Brièvement ovale; brun marron assez luisant; tête plus sombre. Antennes d'un jaune pâle.

Tête sculptée comme chez *G. calculus* n. sp.

Pronotum nettement plus large (au niveau de la dilatation anguleuse latérale) que long (0,61 mm : 0,45 mm). Forme et sculpture du type *laesicollis*, très semblable à celui de *G. calculus* n. sp., le sillon médian de la partie antérieure mieux marqué, les fossettes submédianes moins profondes, la base longée par une cavité étroite mais profonde, surtout derrière la callosité latérale (Fig. 8).

Elytres un peu plus de deux fois plus longs que le pronotum, un peu plus longs que larges dans leur plus grande largeur (0,96 mm : 0,86 mm), celle-ci située avant le milieu au niveau de l'élargissement en saillie latérale du 8e intervalle. Angle huméral externe crénelé et avancé vers l'angle postérieur du pronotum. Calus huméral marqué, avec quelques granules peu élevés. Repli épipleural divisé par un pli transverse. Points des stries larges, étroitement séparés. Interstries étroits, tous semblables, à granules indistincts, sauf sur les 7e et 8e.

Métasternum coupé par un sillon longitudinal médian peu profond, garni de granules coniques bien séparés, sur fond lisse.

Abdomen à granules effacés.

Edéage (Fig. 3) mesurant: 400 μ. Lobe médian (200 μ) à apophyses étroites, pénétrant profondément dans la pièce basale. Paramères (220 μ) acuminés au sommet. Pièce basale: 205 μ.

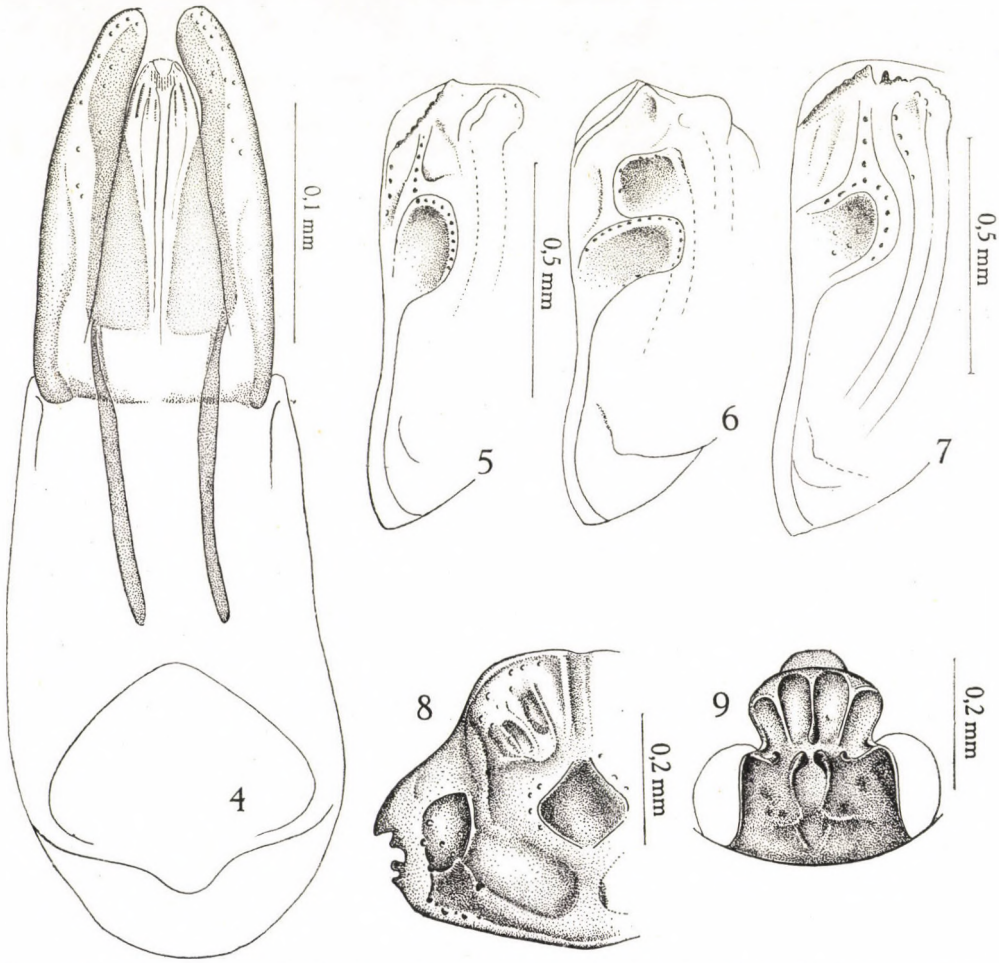
Holotype: un ♂. Nouvelle Guinée, Erima, Astrolabe Baie (Bíró, 1896).
Paratypes: un ♂, une ♀ de même origine; une ♀ Stephansort.

Georissus biroi n. sp. (Fig. 9)

Taille: 1,2 mm. Noir mat.

Tête finement alutacée, garnie, sur l'épistome, de trois lignes longitudinales en relief et, sur le milieu du front de deux courtes carènes en forme de virgules (Fig. 9).

Pronotum un peu plus large que long (0,47 mm : 0,41 mm), alutacé entre les larges granules subconfluents couvrant toute la surface. Bord antérieur largement subtronqué. Bord latéral sans dilatation anguleuse, arrondi au tiers antérieur, puis rectiligne jusqu'à la base.



Figs. 4-9 Edéage de 4 = *G. vietnamensis* n. sp.; 5-7 = Vue de profil de l'élytre (schématique) chez: 5 = *G. emdeni* n. sp., 6 = *G. pocsi* n. sp., 7 = *G. batavianus* n. sp.; 8 = *G. neoguineensis* n. sp.: aspect du pronotum; 9 = *G. biroi* n. sp.: tête

Elytres près de deux fois plus longs que le pronotum, plus longs que larges ensemble (0,8 mm : 0,7 mm). Suture et intervalles impairs un peu plus élevés que les intervalles pairs, en partie subgranuleux. Points des stries larges, profonds, entamant les interstries. Calus huméral à granulations plus petites que celles du pronotum; calus subhuméral effacé. Repli épipleural sans pli transverse.

Métasternum longitudinalement sillonné; alutacé et granuleux comme le pronotum.

Premier segment de l'abdomen à gros granules subconfluents; sur les segments 2 à 4, une rangée horizontale de granules écrasés; sur le 5e les granules sont disposés sur deux rangs plus ou moins réguliers.

Holotype: une ♀, Nouvelle Guinée, Erima, Astrolabe Baie (Biró, 1896).
Paratypes: deux ♀♀ de même origine.

Première espèce décrite de la Nouvelle Guinée, distincte entre toutes par la granulation du pronotum.

Georissus vietnamensis n. sp. (Fig. 4)

Taille: 1,4 mm. En ovale assez large; d'un brun jaunâtre avec la tête plus sombre et les appendices plus clairs.

Tête sculptée comme chez *G. calculus* n. sp.

Pronotum de beaucoup plus large (au niveau de la dent latérale) que long (0,68 mm : 0,45 mm). Bord antérieur largement subtronqué, bord latéral élargi en une dent courbée vers l'arrière suivie de deux denticules avant l'angle postérieur. Sculpture du type *laesicollis*. Partie antérieure garnie d'un sillon longitudinal médian assez large, peu profond et, de chaque côté, une faible callosité avec des granulations plus ou moins parallèles au bord antérieur. Fossette médiane de la partie postérieure profonde, en forme de losange, limitée à gauche et à droite, par un bourrelet granuleux; séparée, en arrière, de chaque côté de la fossette submédiane, par une fine arête granuleuse qui contourne cette fossette qui est de forme ovale, moins profonde que la médiane. De chaque côté, une callosité sublatérale, arrondie, granuleuse. Base bordée par quelques granules irréguliers; ce rebord précédé d'une cavité transversale creusée surtout derrière la callosité sublatérale.

Elytres un peu plus de deux fois plus longs que le pronotum, et à peine plus longs que larges ensemble dans leur plus grande largeur (0,95 mm : 0,91 mm), celle-ci située avant le milieu. Calus huméraux marqués, granuleux. Repli latéral divisé par un pli transverse. Points des stries larges, séparés entre eux par de petits traits transversaux, moins élevés toutefois que les interstries. Interstries élevés en côtes formées de granules juxtaposés tous semblables.

Métasternum coupé par un sillon longitudinal peu profond, finement pointillé avec quelques granules.

Premier segment de l'abdomen plus clair que les segments suivants, n'offrant que de petits granules isolés. Dernier segment garni de granules disposés sur deux rangs.

Edéage (Fig. 4) mesurant 380 μ. Lobe médian (230 μ) à apophyses basales pénétrant profondément dans la pièce basale. Paramères: 160 μ. Pièce basale: 230 μ.

Holotype: un ♂, Vietnam, Prov. Nghe-An, forestière Quy-chaù, 200 m, à la lumière, forêt tropicale pluvieuse semidecidue, 23-VIII-1963 (T. Pócs).
Paratypes: trois ♂♂, neuf ♀♀ de même origine.

Première espèce du genre signalée du Vietnam. Rentre dans le groupe *laesicollis*. Se caractérise par sa forme large, ses interstries élevés en côtes granuleuses.

Deux ♀♀ ont une coloration d'un beau brun luisant.

Deux ♂♂ (non paratypes) de même origine que les autres ont cette même coloration plus foncée avec les interstries plus accusés et une forme plus rétrécie en arrière. Leur édéage est un peu plus petit et moins large, avec le sommet du lobe médian dépassant le sommet des paramères. Mais ce caractère est sans doute sans signification, le lobe médian étant probablement mobile entre les paramères. Je considère, à titre provisoire, ces individus comme des variétés de *G. vietnamensis* n. sp.

Georissus pocsi n. sp. (Fig. 6)

Taille: 1,4 mm. Brièvement ovale, d'un brun foncé luisant.

Tête sculptée comme chez *G. emdeni* n. sp.

Pronotum très nettement plus large que long (0,66 mm : 0,46 mm); sculpture identique à celle de *G. emdeni* n. sp., avec le sillon médian du lobe antérieur un peu plus profond.

Elytres deux fois plus longs que le pronotum, un peu plus longs que larges ensemble (0,95 mm : 0,90 mm). Points des stries profonds, larges, séparés entre eux par de fins traits transversaux. Suture élevée et garnie de petits granules non contigus. Troisième interstrie élevé en côte granuleuse, plus haute et plus large encore avant la déclivité apicale au début de laquelle elle s'arrête. Cinquième interstrie en côte granuleuse de force égale sur toute sa longueur. Interstries 2 et 4 constitués par des granules alignés, bien séparés et de beaucoup moins hauts que la côte du 3e interstrie. Interstries latéraux subégaux, garnis de granules non contigus. Calus huméral marqué. Repli épipleural coupé par deux plis transverses déterminant deux alvéoles, les deux plis reliés par une courte branche longitudinale (Fig. 6).

Métasternum en bourrelet granuleux de chaque côté du sillon longitudinal médian.

Abdomen offrant des granules largement séparés.

Holotype: une ♀, Vietnam, Prov. Nghe-An, forestière Quy-chaù, 200 m, à la lumière forêt tropicale pluvieuse semidecidue, 23-VIII-1963 (T. Pócs).

Proche de *G. emdeni* par la sculpture des élytres, la côte du 3e intervalle plus forte, plus large, écourtée en arrière. Caractérisée, en outre, par la présence de deux plis transverses sur l'épipleure.

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EINIGE NEUE CYCLOCEPHALINI UND PENTODONTINI (COLEOPTERA: DYNASTINAE)

Von

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ZOOLOGISCHE ABTEILUNG DES UNGARISCHEN NATURWISSENSCHAFTLICHEN MUSEUMS, BUDAPEST
(DIREKTOR: DR. Z. KASZAB)

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In der letzten Zeit erhielt ich wieder eine größere Anzahl der beiden Triben der Dynastinae, Cyclocephalini und Pentodontini, besonders von Herrn P. FRANCISCO SILVERIO PEREIRA (Sao Paulo) und DR. SW. G. LARSSON (Kopenhagen). Dadurch konnte ich wieder einige neue Arten feststellen und auch unsere Kenntnisse bei einigen Arten bereichern. Die Diagnosen der neuen sowie die Ergänzungen zu bekannten Arten lauten wie folgt:

Cyclocephala pereirai n. sp.

Glänzend bräunlichgelb, Stirn und Scheitel schwarz, Halsschild bei stark ausgefärbten Exemplaren (z. B. bei der Allotype) wie bei Fig. 101 meiner Monographie, mit einem Seitenfleck (ähnlich wie bei Fig. 106); bei reduzierter Zeichnung sah ich auch solche, wie ca. 108 bzw. 80, letztere scheint die häufigste zu sein (auch die Holotype). Flügeldecken wie Fig. 185 und 187 gezeichnet, die vorderen Punkte, besonders der vorderste manchmal schwach oder fehlend. Oberseite und Pygidium beim ♀ kahl, letzteres bei ♂ lang, ziemlich dicht behaart.

Clipeus[1] an der Basis kaum doppelt so breit wie lang, Seiten sehr leicht gebogen, nach vorn erheblich konvergierend. Vorderecken abgerundet, die Spitze abgestutzt. Ränder fein, der Spitzenrand oft stärker aufgebogen als die Seitenränder. Oberseite beim ♂ bald feiner, bald stärker, stets dicht punktiert, bei dem einzigen ♀ gerunzelt-punktiert. Stirnnaht schwach, oft kaum sichtbar. Stirn reichlich doppelt so breit wie der Durchmesser eines Auges. Fühler 10gliedrig, die Fahne wenig länger als die Geißel ohne Basalglied.

Halsschild viel breiter als lang (etwa 6,5 : 4,5), Seiten gebogen, zur Spitze stärker als zur Basis konvergierend. Hinterecken breit abgerundet, Basis gerandet. Scheibe kaum stärker als die Stirn, ziemlich dicht punktiert,

[1] Clipeus ist richtig geschrieben, da das Wort latinisiert wurde, und in der lateinischen Sprache gibt es kein »y«. Die richtige griechische Schriftweise müßte clypeos lauten (der Verfasser).

die Punkte an den Seiten etwas größer und dichter (viele Zwischenräume größer als die Punkte). Schildchen wie die Scheibe des Halsschildes punktiert.

Flügeldecken länger als zusammen breit (9 : 7 bzw. 9 : 7,5), überall sehr dicht und viel stärker als die Seiten des Halsschildes punktiert. Doppelreihen vorhanden, aber nicht stark ausgeprägt.

Prosternalzapfen mäßig hoch, die abgestutzte Spitze gewölbt, glänzend, kahl, hinten breit abgesetzt. Hintertarsen viel länger als die Schienen.

♂: Vorderschienen mit 2 Zähnen, ein dritter als eine schwache Erweiterung angedeutet. Vordertarsen stark verdickt, Glieder 2—4 breiter als lang. Klauenglied sehr groß, die größere Klaue stark gebogen, an der Spitze nicht gespalten, innen mit der Spur einer kleinen Ecke. Pygidium an der Basis nicht ganz doppelt so breit wie lang, die Spitze halbkreisförmig gerundet, von der Seite gesehen, stark gewölbt, überall fein chagriniert, mit kleinen Haarpunkten. Kopulationsapparat Abb. 1—2. Parameren herzförmig.

♀: Vorderschienen mit 3 Zähnen. Seitenrand der Flügeldecken überall fein, weit hinter der Mitte leicht erweitert, mit starker Seitenbeule. Pygidium mehr dreieckig, weniger stark gewölbt, die Scheibe glänzend, die Seitenecken matt-chagriniert.

Länge: 16—18 mm. — Untersuchtes Material 7 Exemplare.

Type: Holotype, Allotype und Paratypen aus Brasilien, Utiariti, Rio Papagaio Mt. 1.—12. XI. 1966, leg. LENKO et PEREIRA, in der Sammlung von Herrn P. FRANCISCO SILVERIO PEREIRA in Sao Paulo, Paratypen auch in meiner Sammlung.

Meinem eminenten Kollegen P. F. S. PEREIRA gewidmet.

Die Bestimmungstabelle meiner Monographie für ♂♂ führt die Art zu Nr. 97/102, doch kommen die beiden hierher gehörenden Arten aus den Antillen schon wegen der geringen Größe (11—14 mm) nicht in Frage: die dritte, *C. discolor* HERBST, ist zwar größer, doch ist die Spitze des Clipeus gerundet, die Oberseite fein gerunzelt, die Parameren sind ganz anders gebildet, usw. Das ♀ der neuen Art gleicht stark der *C. discolor* und vielleicht noch mehr meiner *C. decorella*, ist aber größer als diese beiden, die Zeichnung ist beim ausgefärbten Exemplaren anders gebildet und der Seitenrand der Flügeldecken überall fein, bei beiden Vergleichsarten, besonders in der Nähe der Seitenbeule erheblich erweitert.

Cyclocephala bella n. sp.

Schwach glänzend, lebhaft rot, Kopf, Bauchseite mit Ausnahme der Vorderbrust, Spitze und Zähne der Schenkeln und der Schienen, sowie die Tarsen schwarz. Am Halsschild finden sich 6 starke und an den Flügeldecken je 2 schwächere Punkte (in der Mitte der Scheibe hintereinander). Oberseite fast kahl, an den Flügeldecken sind äußerst kleine und spärliche Härchen vorhanden, das Pygidium ist beim ♂ ziemlich lang und mäßig dicht, beim ♀ kürzer und spärlicher behaart. Behaarung der Bauchseite schwach.

Clipeus kaum doppelt so breit wie lang, die Ränder fast ganz regelmäßig halbkreisförmig gebogen, Spitzenrand etwas höher als die feinen Seitenränder aufgebogen. Oberseite dicht und ziemlich stark gerunzelt-punktiert. Stirnnaht leicht eingedrückt, doppelbuchtig, Stirn etwa doppelt so breit wie der Durch-

messer eines Auges von oben gesehen, ebenso stark, aber etwas lockerer als der Clipeus punktiert, die Punktierung des Scheitels viel feiner und spärlicher. Fühler 10gliedrig, die Fahne etwas länger als die übrigen Glieder ohne Basalglied.

Halsschild fast doppelt so breit wie lang (etwa wie 6 : 3,5), in der Nähe der Hinterecken am breitesten. Seiten gebogen, nach vorn stark konvergierend. Hinterecken breit abgerundet, Basis gerandet. Oberseite ähnlich wie die Stirn, vielleicht etwas spärlicher punktiert (auf der Scheibe viele Zwischenräume größer als die Punkte). Schildchen längs den Seiten fein gefurcht, wie der Halsschild punktiert.

Flügeldecken länger als zusammen breit (etwa wie 9 : 7), nach hinten leicht erweitert. Die ganze Oberseite sehr dicht gerunzelt-punktiert, die Punkte viel größer als die des Halsschildes, die Doppelreihen schwer zu entnehmen.

Prosternalzapfen hoch, die Spitze abgestutzt, leicht gewölbt, rundlich, kahl, hinten breit abgesetzt. Hintertarsen viel länger als die Schienen.

♂: Vorderschienen mit 3 Außenzähnen, der basale aber sehr klein und von den beiden apikalen etwas weiter abgerückt. Vordertarsen stark verdickt, Glieder 2—4 breiter als lang, die größere Klaue stark gebogen, an der Spitze fein gespalten. Pygidium mäßig stark gewölbt, ähnlich, aber feiner als die Spitze der Flügeldecken gerunzelt-punktiert. Kopulationsapparat Abb. 3—4. Parameren lang und schmal.

♀: Vorderschienen wie beim ♂, nur die Zähne stärker. Seitenrand der Flügeldecken in der Mitte kurz und undeutlich verdickt, daneben ohne deutliche Seitenbeule. Pygidium noch flacher, auf der Scheibe viel feiner und ebenso zerstreut punktiert wie der Halsschild, die Spitze fast glatt, die Seitenecken sehr fein gerunzelt.

Länge: 11,5—15 mm. — Untersuchtes Material 10 Exemplare.

Variation: manchmal sind die Punktflecke der Flügeldecken stark reduziert (auch die Holotype) oder auch fehlend.

Typen: Holotype, Allotype und 8 Paratypen aus Brasilien, Unai (Faz. Bolivia) MG-Brasil, 22.—24. X. 1964, Exp. Dep. Zoologia, in der Sammlung des Herrn P. F. S. PEREIRA in Sao Paulo, Paratypen auch in meiner Sammlung.

Meine Bestimmungstabelle für Männchen führt die Art bis 97/102. Von den 3 hierher gehörenden Arten (*discolor*, *tetrica* und *cubana*) kann die neue Art schon durch ihre lebhaft rote Färbung mit der angegebenen Punktzeichnung ohne Schwierigkeiten unterschieden werden; auch die Parameren usw. sind deutlich verschieden. In der Tabelle für Weibchen kommt man bis Nr. 170/177, von den hierher gehörenden Arten ähnelt die neue Art bloß der *C. 14-punctata*, bei der die 6 Punktflecke des Halsschildes ähnlich angeordnet sind (wie Fig. 73), diese ist aber gelb, die Flügeldecken mit je 4 Punktflecken, größer (15—17 mm), usw.

Cyclocephala guianae n. sp.

Mäßig glänzend, einfärbig rötlichgelb, auch die Stirn nicht angedunkelt. Oberseite kahl, Pygidium mit äußerst kurzen, spärlichen Härchen, Behaarung der Brust kurz, mäßig dicht.

Clipeus an der Basis wenig breiter als lang, parabolisch, Spitze und Seiten kontinuierlich verrundet, überall fein gerandet, die Spitze schwach aufgebogen. Oberseite mikroskopisch fein und spärlich (beim ♀ etwas stärker und dichter) punktiert. Stirnnaht sehr fein. Stirn etwa doppelt so breit wie der Durchmesser eines Auges von oben gesehen, ähnlich wie der Clipeus punktiert, Scheitel fast glatt. Fühler 10gliedrig, die Fahne länger als die sehr kurze Geißel ohne Basalglied, aber viel kürzer als mit Basalglied.

Halsschild viel breiter als lang (5,5 : 3,5), in der Mitte am breitesten, Seiten gebogen, zur Spitze stärker als zur Basis konvergierend. Seitenrand ziemlich stark gewulstet. Hinterecken kurz abgerundet, Basis ungerandet. Die Mitte ähnlich wie die Stirn punktiert, nach den Seiten zu werden die Punkte etwas größer und dichter, aber auch hier die meisten Zwischenräume größer als die Punkte. Schildchen dreieckig, nicht breiter als lang, wie die Mitte des Halsschildes skulptiert, die Spitze scharf.

Flügeldecken länger als zusammen breit (8,5 : 7), nach hinten kaum erweitert. Doppelreihen deutlich, mit oft leicht gewölbten Rippen (die 2. in der vorderen Hälfte nach innen gebogen). Zwischenräume bedeutend stärker (beim ♀ dichter als beim ♂) als die Seiten des Halsschildes punktiert.

Prosternalzapfen hoch, die abgestutzte Spitze klein, gewölbt, queroval, hinten schmal gerandet. Hinterschienen zur Spitze kaum erweitert; Hintertarsen sehr dünn, beim ♂ fast doppelt so lang wie die Schienen (3,5 : 6), beim ♀ etwas kürzer (3,5 : 5).

♂: Vorderschienen mit 2 Außenzähnen, der basale nicht angedeutet. Vordertarsen stark verdickt, Glieder 2—4 breiter als lang, Klauenglied etwa so lang wie die übrigen Glieder zusammen, die innere Klaue hakenförmig gekrümmt, schlank, an der Spitze nicht gespalten. Pygidium, von der Seite gesehen, an der Basis flach, nur an der Spitze stark gewölbt, matt, mit sehr feinen und spärlichen Haarpunkten. Kopulationsapparat Abb. 5—6. Parameren in der Basalhälfte breit, die Spitzen fingerartig ausgezogen.

♀: Vorderschienen mit 3 Zähnen, der basale klein, nicht nach hinten abgerückt. Seiten der Flügeldecken fast einfach, in der Mitte leicht erweitert, der Rand nicht verdickt, ohne Seitenbeule. Pygidium glänzend, in den Seitenecken fein gerunzelt, an der schmalen Basis fast glatt, auf der Scheibe fein chagriniert, mit sehr feinen und spärlichen Haarpunkten.

Länge: 12—15 mm. — Untersuchtes Material 7 Exemplare.

Typen: Holotype, Allotype und 5 Paratypen aus Fr. Guiana, St. Jean, Collection WM. SCHAUS. Die Typen sind im U. S. Nat. Mus. in Washington vorzufinden, 2 Paratypen in meiner Sammlung.

Meine Bestimmungstabelle für Männchen führt die neue Art in die Nähe der *C. seditiosa* CASEY und *longula* LECONTE (311/314), bei welchen die innere Klaue an der Spitze ebenfalls nicht gespalten ist. Die neue Art lebt aber in Südamerika, die Vorderschienen sind nicht 3-, sondern 2zähnig, Hintertarsen fast doppelt so lang wie die Schienen und die Parameren ganz anders geformt. Die Tabelle für Weibchen führt zu Nr. 350/353, die übrigen hierher gehörenden Arten haben keinen parabolischen, sondern einen fast halbkreisförmigen Clipeus, die Hintertarsen sind nur wenig länger als die Schienen.

Cyclocephala molesta n. sp.

Glänzend gelbrot, Kopf und fast die ganze Bauchseite mit den Beinen schwarz. Oberseite mit einer scharfen schwarzen »lunulataartigen« Zeichnung, Pygidium in der Mitte und an den Seiten hell. Oberseite kahl, Pygidium beim ♂ an der Basis mit spärlichen kurzen Haaren, beim ♀ kahl (stets?).

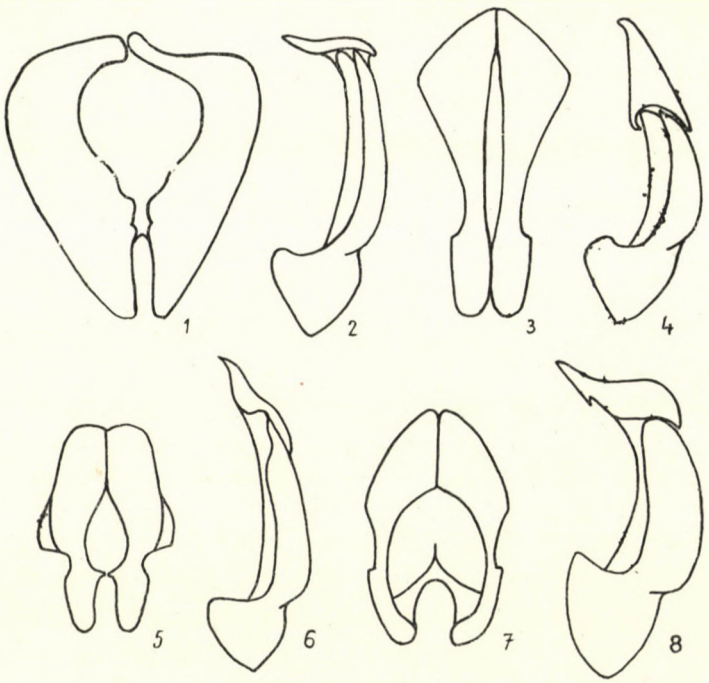

Abb. 1—8. Kopulationsapparate von *Cyclocephala* Arten: 1—2 = *C. pereirai* n. sp., 3—4 = *C. bella* n. sp., 5—6 = *C. guianae* n. sp., 7—8 = *C. molesta* n. sp.

Clipeus klein, annähernd halbkreisförmig, Seitenränder kaum, Spitzenrand deutlicher aufgebogen. Oberseite gleichmäßig dicht und fein gerunzeltpunktiert. Stirnnaht kaum angedeutet, Stirn etwa doppelt so breit wie der Durchmesser eines Auges von oben gesehen, ähnlich, aber weit lockerer punktiert als der Clipeus. Punktierung des Scheitels sehr fein und spärlich. Fühler 10gliedrig, die Fahne länger als die Geißel ohne Basalglied, aber beträchtlich kürzer als die übrigen Glieder zusammen.

Halsschild viel breiter als lang (7 : 4,5), vor den Hinterecken am breitesten, Seiten zur Spitze stark konvergierend, leicht gebogen. Hinterecken breit abgerundet, Basis ungerandet. Die Punktierung der Scheibe kaum stärker als jene der Stirn, aber spärlicher, auch an den Seiten nur wenig dichter, hier viele Zwischenräume kleiner als die Punkte. Schildchen dreieckig, wie die Mitte des Halsschildes punktiert.

Flügeldecken länger als zusammen breit (11 : 8,5), nach hinten kaum erweitert. Die Punktierung weit stärker als jene des Halsschildes, dicht, die Doppelreihen angedeutet, an den Seiten viel feiner, die Spitze nur chagriniert.

Prosternalzapfen hoch, die breit abgestutzte Spitze kahl, die hintere Hälfte abgesetzt. Hintertarsen etwas länger als die Schienen.

♂: Vorderschienen mit 3 starken Außenzähnen, der basale nicht, oder kaum weiter nach hinten abgerückt. Vordertarsen stark verdickt, Glieder 2—4 quer, das Klauenglied sehr groß, beträchtlich länger als die übrigen Glieder zusammen. Die größere Klaue ziemlich schmal, hakenförmig gekrümmt, an der Spitze fein gespalten. Pygidium, von der Seite gesehen, regelmäßig gewölbt, fein gerunzelt, nur die Spitze fein und dicht punktiert. Kopulationsapparat Abb. 7—8. Parameren oval, zur Spitze schwach verjüngt, der Spitzenteil außen mit einem Zahn.

♀: Vorderschienen ähnlich wie beim ♂. Seitenrand der Flügeldecken in der Mitte erheblich bogenförmig erweitert, mit einer länglichen Beule zwischen Schulterbeule und Erweiterung. Pygidium eher dreieckig, viel flacher, ähnlich skulptiert.

Länge: 17—19 mm. — Untersuchtes Material 3 Exemplare.

Typen: Holotype ♂ aus Brasilien, Para, Cachimbo, 1—956, PEDRO; Allotype und 1 Paratype (♀♀) Bolivien, Region Chapare, 400 m, 4. IX. 1956 bzw. 15. II. 1952, leg. ZISCHKA. Die Holotype in der Sammlung von Herrn P. PEREIRA in Sao Paulo; Allotype und Paratype in meiner Sammlung.

Der *C. lunulata* BURM. und Verwandten am nächsten stehend; sie fällt sowohl durch die scharfe schwarze Zeichnung ihres Halsschildes und der Flügeldecken als auch durch die schwarze Bauchseite und die schwarzen Beine auf. Da aber fast ähnlich gefärbte Exemplare vereinzelt auch bei anderen Arten vorkommen können, sind bei den Männchen die Parameren entscheidend, die die neue Art von allen Verwandten eindeutig unterscheiden. In meiner Bestimmungstabelle für ♂♂ käme die neue Art neben *C. fulgurata* BURM. (Nr. 294/295) zu stehen, von der sie in den erwähnten Eigenschaften abweicht. In der Tabelle für ♀♀ gelangt man zu *C. lunulata* BURM., von der sie durch die vorgeschobene Seutenbeule der Flügeldecken, durch die schwarze Brust und die schwarzen Beine sowie durch die scharfe Zeichnung abweicht.

Cyclocephala undata OLIV.

Ich erhielt 5 Exemplare dieser Art, die es erlauben, die Färbung der Oberseite konkreter zu charakterisieren. Das Exemplar von OLIVIER hatte laut Diagnose am Halsschild 2 angedunkelte Längsstreifen; bei den Exemplaren von BURMEISTER (*C. rubicunda*) waren diese in »2, 3, 4 schwarzbraune Punkte (die auch fehlen können)« aufgelöst. Anscheinend sind die Exemplare, bei denen der Halsschild fast oder ganz einfarbig gelb ist, viel häufiger als die reicher gezeichneten. Von den 5 Exemplaren ist der Halsschild bei dreien ganz ohne schwarze Zeichnung, bei den zwei übrigen finden sich wie auch bei der Neotype zwei braune Punktflecken hinter der Spitze.

Es ist daher zweckmäßig, in meiner Bestimmungstabelle für ♂♂ bei Nr. 285/286 die erste Zeile folgendermaßen zu ergänzen: Halsschild einfarbig gelb oder beiderseits der Mitte mit 2, 3, 4 Punktflecken, selten . . .

In der Tabelle für ♀♀ kann bei *C. lunulata* BURM. die folgende Anmerkung hinzugefügt werden: Exemplare der *C. undata* OLIV., bei denen die Zeichnung des Halsschildes fehlt oder stark reduziert ist, sind der *C. lunulata* sehr ähnlich, weil die Seitenerweiterung der Flügeldecken ebenfalls in der Mitte liegt. *C. undata* weicht von dieser Art dadurch ab, daß ihr basaler Zahn der Vorderschienen sehr stark nach hinten abgerückt ist, bei *lunulata* dagegen nur ganz wenig.

Die Zeichnung der Flügeldecken scheint mehr konstant zu sein, sie entspricht der ausführlichen Schilderung von BURMEISTER vollkommen und ist nur selten stärker reduziert.

Cyclocephala quattuordecimpunctata MANNH.

Ich sah 2 Männchen, bei denen das Pygidium dicht und kurz, aufstehend behaart ist. Solche unterscheiden sich von den Arten der Nr. 97/102, *discolor*, *tetrica* und *cubana* durch ihre Zeichnung (Halsschild mit 6, Flügeldecken mit 8 Punkten) auf den ersten Blick.

Cyclocephala literata BURM.

Auch bei dieser Art kommen — besonders beim Männchen — Exemplare vor, bei denen das Pygidium ziemlich dicht und kurz, aufstehend behaart ist. Es ist anzunehmen, daß eben bei den frischen, intakten Exemplaren diese Behaarung vorzufinden ist. Darum müßte die Art in meiner Bestimmungstabelle für ♂♂ (auch) neben *C. discolor* HERBST (Nr. 98/99) eingereiht werden, von der sie durch die 3zähnigen Vorderschienen, durch die Zeichnung der Oberseite, usw. sehr leicht zu unterscheiden ist.

Cyclocephala lurida BLAND.

Die Type dieser Art konnte nicht vorgefunden werden, und auf Grund der Diagnose wurde angenommen, daß sie mit *C. hirta* LEC. identisch ist. Herr DR. O. L. CARTRIGHT (U.S. Mus. Washington) war so freundlich, mir brieflich mitzuteilen, daß er die Type nun unter mehreren alten Typen entdeckt hat. Er hat die Type identifiziert und festgestellt, daß sie nicht mit *C. hirta* LEC., sondern mit *C. immaculata* OLIV., 1789, ("a very large specimen") identisch ist.

Cyclocephala brittoni ENDR.

Wie ich bereits in der Diagnose der Art bemerkt habe, ist der Clipeus manchmal an der Spitze nur sehr leicht ausgerandet. Ich sah jetzt 2 Männchen in der Sammlung des Universitätsmuseums Kopenhagen, bei denen die Ausrandung kaum angedeutet ist (es scheint, daß diese Eigenschaft bei mehreren Arten sehr veränderlich ist!). Es ist daher nützlich, in meiner Bestimmungs-

tabelle für ♂♂, Seite 78, bei Nr. 201/204 folgende Anmerkung aufzunehmen: »Exemplare der *C. brittoni*, bei denen der Clipeus nur undeutlich ausgerandet ist, sind viel größer als die beiden hierher gehörenden Arten, 17—22 mm, s. Nr. 218/219«.

Cyclocephala castanea Oliv.

Die Literatur beschreibt die Färbung dieser Art stets als kastanienbraun mit etwas helleren Flügeldecken. Auch ich sah bisher nur solche Exemplare. Um so mehr war ich überrascht, als ich im Material des Universitätsmuseums, Kopenhagen, zwei schwarze Exemplare vorfand. Bei dem einen ist nur die Bauchseite mit den Beinen etwas heller schwarzbraun, bei dem anderen sind die Bauchseite, das Pygidium, die Beine sowie die schmale Spitze der Flügeldecken dunkelrot. Sonst weichen diese Exemplare von der normalen Form nicht ab, auch die Parameren sind ganz ähnlich. Ich sehe keinen Grund anzunehmen, daß die schwarze Färbung künstlich hergestellt worden wäre. Beide Exemplare tragen die gleichen Fundortdaten: Essequibo, Smidt.

Ancognatha castanea Er., 1847 (= *Lissodon argodi* Paul. 1954)

Herrn R. Paulian wurde eine Dynastine aus Soudan Tombouctou vorgelegt, die er in Bull. Inst. fr. Afr. noire, XVI, 1954, p. 1154—1155 als eine neue Gattung und neue Art, namens *Lissodon argodi* beschrieb. Als ich die Type der Art untersucht habe, mußte ich feststellen, daß es sich um ein Exemplar der südamerikanischen *Ancognatha castanea* Erichson handelt. Das Exemplar wurde sicherlich mit Waren nach Westafrika eingeschleppt. Infolgedessen muß die Gattung *Lissodon* Paulian als ein Synonym der Gattung *Ancognatha* Erichson (1847) und die Art *L. argodi* als ein Synonym der Art *A. castanea* Er. betrachtet werden.

Stenocrates pereirai n. sp.

Glänzend schwarz, auch unten nur wenig heller. Oberseite und Pygidium kahl, Bauchseite sehr schwach behaart.

Clipeus an der Basis reichlich doppelt so breit wie lang, Seiten fast ganz gerade, nach vorn stark konvergierend. Vorderrand wenig höher als die Seitenränder, die breite Spitze deutlich ausgerandet. Oberseite in den Vertiefungen stärker, auf den Erhabenheiten mikroskopisch fein, spärlich punktiert. Stirnnaht stark vertieft, der sie vorn begrenzende Querwulst breit, auch hinten nicht gekielt, der größte Teil des Clipeus gewölbt. Stirn reichlich doppelt so breit wie der Durchmesser eines Auges von oben gesehen, etwa wie die Vertiefungen des Clipeus punktiert. Fühler 10gliedrig, die Fahne klein, kaum länger als die Geißel ohne Basalglied. Mandibeln unter dem Clipeus versteckt, breit, außen einfach gebogen.

Halsschild viel breiter als lang (6 : 3,8), vor den Hinterecken am breitesten, Seiten leicht gebogen, beim Weibchen stärker nach vorn konvergierend als beim Männchen. Hinterecken kurz abgerundet, Seitenrand dick, Basis ungerandet. Oberseite glatt, an den Seiten mit ziemlich zahlreichen groben Punkten vorwiegend in den Hinterecken. Auf der Scheibe sind bei beiden Geschlechtern nur äußerst feine und zerstreute Punkte zu finden (nur bei einem ♀ sind diese Punkte sehr deutlich).

Flügeldecken viel länger als zusammen breit (9,6 : 7,5), nach hinten zu schwach erweitert. Die Punktierung viel stärker als jene des Halsschildes, die Punkte der Doppelreihen und der äußeren Zwischenräume sehr dicht, die beiden inneren Zwischenräume vorn (der 2. bis zur Mitte) glatt. Die Rippen weit schmäler als die Zwischenräume.

Prosternalzapfen hoch, die abgestutzte Spitze rundlich gewölbt, glatt und kahl, hinten schmal gerandet. Propygidium ohne Stridulationsapparat. Seiten der Hinterbrust etwa so stark wie die Seiten der Flügeldecken, dicht punktiert, jene der Bauchsegmente mit feinen, sehr dichten Punkten. Hintertarsen dünn, wenig länger als die abgeflachten Schienen.

♂: Vorderschienen mit 3 Außenzähnen, der basale Zahn ein wenig weiter nach hinten abgerückt. Pygidium etwa doppelt so breit wie lang, regelmäßig, nicht stark gewölbt, die überall gedrängt gestellten Punkte kreisförmig, genabelt und etwa so groß oder etwas größer als jene der Flügeldeckenspitze. Kopulationsapparat Abb. 9—10. Parameren sehr einfach, nur außen in der Mitte dreieckig erweitert, auch die Spitze ohne Artikulation.

♀: Dem Männchen äußerlich sehr ähnlich, Pygidium flacher.

Länge: 15,5—16,5 mm. — Untersuchtes Material 7 Exemplare.

Typen: Holotype, Allotype und 2 Paratypen aus Brasilien, Porto Velho, Rio Tapirapé, Mt. 10.—12. XII. 1964, R. T. Lima col.; 3 Paratypen aus Barra do Tapirapé, Mato Grosso, Brasil, XI. 1964, B. Malkin col. Die Typen befinden sich in der Sammlung des Herrn P. F. S. Pereira in Sao Paulo, dem ich auch diese neue Art freundschaftlichst widme.

Die Bestimmungstabelle in meiner Monographie (p. 415.) führt in die Nähe der *S. clipeatus* m. und *difficilis* m. Von beiden unterscheidet sie sich sofort durch die Form der Parameren und durch die geringe Größe.

Oxyligyrus larssoni n. sp.

Sehr klein, oval, stark gewölbt, glänzend dunkel rotbraun bis schwarz. Oberseite und Pygidium kahl, Bauchseite mit ziemlich langen roten Haaren.

Clipeus dreieckig, Seiten fast gerade (♀) oder leicht konkav (♂), zur steil aufgebogenen scharfen Spitze stark konvergierend, die Seiten nicht aufgebogen, sehr fein gerandet. Wangenecken stumpf dreieckig. Oberseite sehr dicht und fein gerunzelt-punktiert. Stirnkiel in der Mitte unterbrochen, beiderseits ziemlich hoch, wie Querhöcker erscheinend, seitlich bedeutend schwächer. Stirn kaum vertieft, sehr breit, gröber als der Clipeus skulptiert. Augen sehr klein, bei allen 3 Exemplaren durch den Vorderecken des Halsschildes bedeckt.

Mandibeln außen ohne Zähne. Fühler 10gliedrig, die Fahne wenig länger als die Geißel ohne Basalglied.

Halsschild breiter als lang (5,8 : 4,2), weit hinter der Mitte am breitesten. Seiten leicht gebogen, nach vorn stärker als nach hinten konvergierend. Hinterecken sehr breit abgerundet, Basis gerandet. Hinter dem gerandeten Vor-

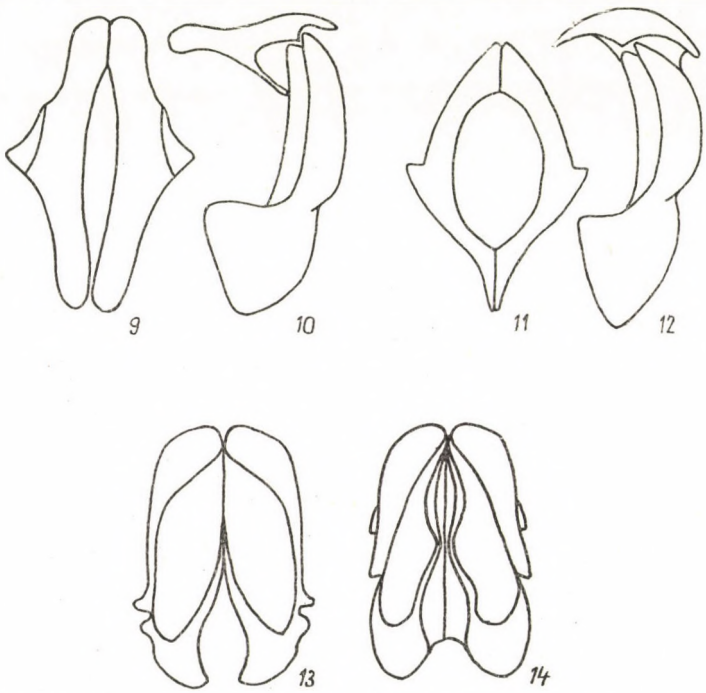

Abb. 9—14. 9—10 = Kopulationsapparat der *Stenocrates pereirai* n. sp., 11—12 = Kopulationsapparat der *Oxyligyrus larssoni* n. sp., 13 = Parameren von *Hylobothynus columbianus* OHAUS, 14 = Parameren von *Hylobothynus obesus* OHAUS

derrand ohne Tuberkel und ohne Grube, ganz einfach gewölbt. Oberseite überall ziemlich dicht, mäßig stark punktiert, die Punkte auf der Scheibe wesentlich feiner als an den Seiten, vor der Basis in der Mitte fast fehlend. Schildchen etwas breiter als lang, glatt.

Flügeldecken länger als zusammen breit, nach hinten sehr wenig erweitert. Die Punktstreifen tief gefurcht, nicht gepaart, die Streifenpunkte stark und dicht gestellt. Zwischenräume gewölbt, glatt. Die seitlichsten Streifen schwach vertieft, ihre Zwischenräume schwach gewölbt. Humeral- und Apikalbuckel glatt, die Spitze verworren punktiert.

Propygidium ohne Stridulationsapparat. Prosternalzapfen mäßig hoch, die Spitze gewölbt, ringsum lang rot behaart. Brust mäßig dicht mit seichten, aber ziemlich großen Punkten besetzt. Bauchplatten mit deutlichen Querreihen von starken Punkten, die Seiten dicht und fein gerunzelt-punktiert. Hinter-

schenkel viel stärker als die übrigen. Vorderschienen mit 3 starken Außenzähnen, der basale Zahn nicht weiter nach hinten abgerückt. Mittel- und Hinterschienen zur Spitze stark erweitert, die Spitze gerade abgestutzt, mit nicht sehr dichtgestellten (etwa 25—30) kurzen und dicken Randbörstchen. Beide Schrägkiele deutlich. Tarsen kürzer als die Schienen, das Basalglied der Hintertarsen dornartig nach außen ausgezogen, auch das zweite Glied noch leicht dreieckig.

♂: Vordertarsen nicht verdickt, alle Klauen einfach, gleichgeformt. Pygidium an der Basis etwa doppelt so breit wie lang, die Spitze abgerundet, von der Seite gesehen, leicht gewölbt, glatt, nur die schmale Basis dicht und fein gerunzelt-punktiert, in den Seitenecken sind auch vereinzelte Haare tragende Punkte zu finden. Kopulationsapparat Abb. 11—12. Parameren oval, mit schnabelartiger Spitze.

♀: Seitenrand der Flügeldecken einfach. Pygidium ähnlich, etwas reichlicher punktiert.

Länge: 13—14 mm. — Untersuchtes Material 3 Exemplare.

Typen: Holotype ♂ und 1 Paratype ♂ aus Argentinien: »Argentina«, Coll. JENSEN—HAARUP; Allotype ♀: Buenos Aires, Mus. Westerm. Holo- und Allotype im Universitätsmuseum in Kopenhagen, die Paratype in meiner Sammlung.

Kollegen Herrn DR. SW. G. LARSSON (Kopenhagen) freundlichst gewidmet.

Die neue Art kann schon wegen der außergewöhnlich geringen Größe mit keiner der bekannten Arten verwechselt werden.

Oxyligyrus rostratus BURM.

Im Material des Herrn P. PEREIRA fand ich 8 Exemplare (4 ♂♂ und 4 ♀♀), die zweifellos zu dieser Art gehören. Anhand dieser Exemplare konnte festgestellt werden, daß der Körper nicht immer so stark gewölbt ist wie bei der Type und bei einem Exemplar in meiner Sammlung, sondern fast so abgeflacht wie bei *O. politus* OHAUS. Auch die Bezahnung der Vorderschienen nähert sich sehr der Form der letzteren Art (»4zähnig«), so daß diese beiden Eigenschaften nicht geeignet sind, *rostratus* von *politus* sicher zu trennen. Obwohl die Parameren der beiden Arten ebenfalls ziemlich ähnlich gebaut sind, und auch deren Ventralzahn auch bei *rostratus* ähnlich, nur schwächer (von vorn nicht sichtbar) ist,halte ich auf Grund von anderen Merkmalen die beiden doch für eigene Arten.

Würde ich meine Bestimmungstabelle jetzt abfassen, dann würde ich die Eigenschaften

»Flügeldecken fast ganz glatt« (bei Nr. 2/3) bzw.

»Flügeldecken stark gestreift punktiert« (bei Nr. 3/2) in Vordergrund stellen und die beiden obenerwähnten Eigenschaften bei *rostratus* folgendermaßen formulieren: »Körper oft stark gewölbt« bzw. »Vorderschienen mit 3 Außenzähnen, zu denen oft ein kleines viertes Zähnchen hinzutritt«.

In dieser Weise stehen die beiden Arten schon so nahe zueinander, daß ich genötigt bin, auch *O. rostratus* BURM. in die Untergattung *Vulcanoia* MARTINEZ einzuteilen. Die wichtigsten Eigenschaften, die diese Untergattung von der Untergattung s. str. trennen, sind die folgenden: 1. Form der Parameren; 2. stark verdickte Vordertarsen beim Männchen; 3. ziemlich flache Körperform; 4. mehr oder weniger ausgeprägtes 4. Außenzähnchen an den Vorderschienen; 5. glatter Halsschild und Pygidium.

Hylobothynus columbianus n. sp.

OHAUS bezeichnete (ohne es zu beschreiben) ein zweites Männchen als »*obesus* subsp. *columbianus*«. Das Exemplar gehört ohne Zweifel in die Gattung *Hylobothynus*. Ich verglich es mit der Type von *H. obesus* OHAUS und fand, daß die äußerlichen Abweichungen tatsächlich sehr gering sind: der Halsschild ist an der Basis ungerandet, bei *obesus* deutlich gerandet; das Pygidium ist in den Seitenecken stärker und umfangreicher punktiert. Auch an den auspräparierten Mundteilen sind keine spezifischen Unterschiede zu finden. Dagegen weicht die Form der Parameren (Abb. 13) von jener der *H. obesus* (Abb. 14) erheblich ab.

Von beiden Formen ist einstweilen nur je 1 Exemplar bekannt, darum kann die systematische Stelle der neuen Form nicht mit Sicherheit festgestellt werden. Wegen der erheblich abweichenden Parameren halte ich sie für eine eigene Art.

♀: unbekannt.

Länge: 26 mm. — Untersuchtes Material 1 Exemplar.

Typen: Holotype ♂: Mocoa, 530 m, Putumayogebiet, Februar 1921, WERNER HOPP. Die Type befindet sich im Zool. Museum in Berlin.

Anschrift des Verfassers: Budapest, VIII., Baross u. 13, Ungarn.

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XV. 1—2. 1969 p. 43—48

SPECIES NOVAE HUNGARICAE GENERIS TETRASTICHUS HAL. (HYMENOPTERA: CHALCIDOIDEA)

Auctore

J. ERDŐS (Tompa)

(Manuscriptum traditum est 11. Aprilis 1968)

Regnum Hungariae habet terram, respectu geologiae, geographiae et florae, valde variabilem. Ideo inter alia insecta genus *Tetrastichus* HAL. est in speciebus raris ditissimum. Ex Hungaria descriptae sunt 34 species novae, quae post investigationes GRAHAMI *Oxoniensis*, necnon DOMENICHINII *Mediolanensis* remanserunt validae. Nunc sunt adhuc 9 species novae, quae ad publicationem maturae sunt. Praeter has species novas communicantur 2 varietates et 3 nomina nova.

Nonnullae species uno tantum loco provenerunt. Tales sunt: *Tetrastichus csokakoensis*, in Csókakő capturatus; *T. pannonicus*, in Küngös ex inflorescentia *Medicago sativa* L. educatus; item *T. domenichinii* in Tés Bakonyensi de floribus *Primulae veris* HUDS. captus, qui est certis condicionibus plantae hospitalis et temporis querendus; *T. helianthemellae* oritur ex Budaörs, hospes eius est *Nepticula helianthemella* H. S. in foliis *Helianthemi cani* L., debemus hospitem inquirere; *T. capreae* in montibus Bükk (Fodor-lápa, 850 m supra mare) de frondibus *Salix caprea* L. est lectus; demum *T. callunae* collectus est in Vendvidék de *Calluna vulgari* L., planta alpestris ibi virescit. Ceterae species sunt magis diffusae.

His perpensis licet transire ad descriptionem specierum novarum.

Tetrastichus pannonicus sp. n. (2 ♂♂ 1 ♀)

♀ — Color corporis niger, nitidus; antennae fuscae; alae hyalinae; coxae pedum et femora corpore concolora, genua, tibiae et tarsi sordide lutei, ultimi fusci.

Caput thorace parum angustius; thorax sesqui longior, quam latus, leniter convexus, fere laevis, linea media scuti mesonoti debilis, propodeum valde breve. Abdomen fere sessile, thorace multo brevius.

Longitudo corporis 1.3 mm.

♂ — Antennae valde extraneae! Scapus rotundato-quadrangulatus, fortiter dilatatus, niger, tam longus, quam partes ceterae antennarum simul sumptae, pedicellus et articuli funiculi laete flavi, fere albidi, clava fusca, setis

funiculi longis absentibus. Pedes in partibus flavis magis lucidi sunt, quam in femina. Abdomen eius thorace multo brevius.

Longitudo corporis 1.1 mm.

Educavit ERDÉLYI in Küngös 1 ♂ 1 ♀ die 15. Iulii 1958. et 1 ♂ die 21. Iulii 1958., cuncta ex inflorescentia plantae *Medicago sativa* L. Typus est ♂ die 15. prodiens, ceteri paratypi, in collectione mea conservati.

Mares huius speciei scapo dilatato pertinent in subgenus *Baryscapus* FÖRST., proximi ad speciem *T. fumatus* ERD., at distinguuntur antennis pulchre bicoloribus.

Tetrastichus aneurytus nom. n.

Tetrastichus eurytus auct. nec WALKER, 1839

Cum species WALKERI sit identica cum specie *T. elegans* ERD., species *T. eurytus* auctorum nomen novum postulat. Species benefica *T. aneurytus* est parasita in noxia *Eurytoma roddi* GUSS., seminivora in *Medicago sativa* L., necnon in *Eurytoma onobrychidis* NIK. in semine *Onobrychis viciaefolia* SC.

Tetrastichus pellucens sp. n. (2 ♂♂ 4 ♀♀)

♀ — Corpus testaceum, thorax et abdomen in nonnullis locis parum fuscescentes; antennae et pedes albido-flavescentes.

Corpus eius mediocriter deplanatum, breve, fere laeve; thorax latitudine sua vix longior; abdomen, quam thorax paullum longius. Antennae elongatae, articulo medio funiculi fere duplo longiore, quam lato.

Longitudo corporis 0.6—0.9 mm.

♂ — Similis feminae; setis longis funiculi absentibus.

Longitudo corporis 0.6—0.9 mm.

Legi in Fajsz 1 ♀ die 19. Iunii 1958. de fronde *Tiliae tomentosae* MNCH.; in Szeged, Emlékerdő, 1 ♂ die 6. Iunii 1963.; in Tompa, hortis decorosis 1 ♀ die 4. Iunii 1962., 2 ♀♀ die 25. Iunii 1962. et 1 ♂ die 28. Iunii 1962., cuncta de frondibus *Acer campestris* L. Typus est ♀ in Tompa die 4. Iunii inventa, ceteri paratypi, in collectione mea custoditi.

Species nova excellit corpore deplanato, cum sint species propinquae. *T. brevicornis* PZ. et socii eius, magna parte flavi coloris, magis convexae.

Tetrastichus callunae sp. n. (27 ♀♀)

Color corporis obscure viridis, abdomine basi fusco-testaceo maculato, macula non magna, lateraversus magis extensa; antennae luteo-adustae, scapo lucide flavo; pedes sordide testacei, coxis omnibus nigris.

Corpus robustum, oculis magnis; thorax lucens, vix observabiliter punctatus, latitudine sua paullo longior; abdomen vix elongatum, fere formam tri-

anguli monstrans. Antennae debiliter clavatae, articulis funiculi fere quadratis. Alae sat exiguae et angustae, pubescentia densa.

Longitudo corporis 0.7—0.9 mm.

Legi in Szakonyfalu, Vendvidék, 1 ♀ die 26. Iunii 1960., dein 26 ♀♀ diebus 10—27. Iulii 1961., cuncta exemplaria de *Calluna vulgari* L. Typus est ♀ die 13. Iulii reperta, ceteri paratypi, in collectione mea custoditi.

Species haec nova distinguitur a cunctis propinquis *T. ecus* WALK. et sociis eius: forma exigua, colore corporis viridi, forma triangulari abdominis, maculaque basali. Magni momenti est vita eius ignota in planta alpestri.

Tetrastichus populifoliellae nom. n.

Tetrastichus populi ERDŐS nec KURDJUMOV, 1913

Validitas huius speciei est incerta, prope stans ad *T. platanellum* MERC. At colore corporis obscure luteo, magis laevi, vitaeque modo uti speciem distinctam teneo. Est parasita in *Lithocollete populifoliella* TR. in foliis *Populi italicae* MNCH. Propter nomen eius originale praeoccupatum *Tetrastichus populifoliellae* vocabitur.

Tetrastichus helianthemellae sp. n. (1 ♂ 4 ♀♀)

♀ — Corpus obscure cyaneo-viride, basi abdominis macula magna et lateribus testaceis; antennae nigrescentes, scapo flavo; pedes testacei, coxis et dimidio basali femorum obscuris; alae fere hyalinae, nervis sordide testaceis.

Corpus sat angustum; thorax latitudine sua sesqui longior, splendidus, vix observabiliter punctatus, scutello parum elevato; abdomen elongatum, angustatum, thorace non longius. Antennae uniformiter latae, articulis funiculi vix longioribus, quam latis.

Longitudo corporis 0.9—1.1 mm.

♂ — Abdomen nigrum; scapus antennarum fuscus, articulis funiculi ad invicem laxe cohaerentibus, setis valde longis; pedes nigri, genubus tantum testaceis.

Longitudo corporis 0.8 mm.

Educavit Szőcs in Budaörs 1 ♀ die 12. Iulii 1959., 1 ♀ die 18. Iulii 1959. et 1 ♂ 2 ♀♀ die 28. Iulii 1959., cuncta ex *Nepticula helianthemella* H. S. in *Helianthemum canum* L. exclusa. Typus est ♀ die 18. apparens, ceteri paratypi, in collectione mea custoditi.

Species nova cognoscitur colore corporis, macula basali abdominis, a *T. budensis* ERD. dignoscitur praesertim articulis funiculi fere quadratis et vitae modo.

Tetrastichus domenichinii sp. n. (4 ♂♂ 3 ♀♀, var.: 2 ♂♂ 4 ♀♀)

Color corporis obscure fuscus, thorace parum ravi splendoris; 2 segmenta basalia abdominis praecise et complete ad marginem albido-flava; antennae

albido-flavae, scapo fusco; pedes flavo-albidi, coxis nigris; alae perfecte vitreae, nervis albidis.

Corpus breve et obesum; caput deplanatum; thorax latitudine sua parum longior, latus et depressus, pingui-nitens, fere laevis, linea media scuti mesonoti invisibili; abdomen ovale, longitudinem thoracis aequans. Articuli funiculi antennarum latitudine sua vix longiores, parum lati.

Longitudo corporis 1.3 mm.

♂ — Colore et forma corporis optime concordat cum femina. Articuli funiculi parum longiores, setis tenuibus, non longis, albidis, scapo vix dilatato.

Longitudo corporis 1.1 mm.

Varietas **obscurus** var. n. — Forma eius concordat cum stirpe, basis abdominis in utroque sexu est nigra. Invenitur cum stirpe.

Legi in Tés Bakonyensi 4 ♂♂ 3 ♀♀ stirpis, 2 ♂♂ 4 ♀♀ varietatis die 15. Maii 1963. de floribus *Primulae veris* HUDS. Flos ille in silva *Quercus cerris* L. dispersa est frequentissima, in inflorescentia multae parasitae volant cum una Cecidomyida indeterminata. Typus est ♀ tessera distinctus, ceteri paratypi, in collectione mea custoditi.

Species haec nova a propinqua specie *T. rosarum* FÖRST. dignoscitur antennis flavo-albidis, duobus segmentis basalibus abdominis in utroque sexu albidis.

Tetrastichus problematicus sp. n. (6 ♂♂ 10 ♀♀, var.: 10 ♀♀)

♀ — Color corporis niger, basi abdominis testacea; antennae parum ravescentes, fulvae, scapo nigro; pedes albido-flavi, coxis nigris; alae hyalinae, nervis testaceis.

Corpus breve et robustum, fere laeve; caput parum concisum; thorax latus, quadratus, vix visibiliter punctatus, linea media scuti mesonoti deficiente, scutello transversali, postice fortiter elevato; abdomen thorace sesqui longius, parum acuminatum. Antennae filiformes, articulis funiculi latitudine sua sesqui longioribus, scapo vix dilatato.

Longitudo corporis 1.1—1.5 mm.

♂ — In omnibus concordat cum femina; antennis angustioribus et longioribus, scapo parum dilatato, setis funiculi fortibus et longis, abdomine vix breviore.

Longitudo corporis 0.7—1.1 mm.

Varietas **unicolor** var. n. — Abdomen sine macula basali pallida. In omnibus cum stirpe conveniens.

Legi in Tompa 1 ♂ die 26. Martii 1960. ex *Chilaspis nitida* GIR. in foliis *Quercus cerris* L., 1 ♂ 1 ♀ diebus 25—28. Iunii 1962., 1 ♀ die 21. Maii 1966.; in Foktő 1 ♀ die 18. Maii 1943. et 1 ♀ die 21. Septembris 1943.; in Érd 2 ♀♀ die 14. Iulii 1955. ex *Lithocolletis* specie in *Ulmus* (Szőcs); in Berhida 1 ♂ die 30. Iulii 1952. de fronde *Quercus cerris* L., 1 ♀ die 4. Iunii 1953. de fronde *Quercus* speciei; in Csókakő 1 ♂ 19. Iunii 1962.; in Sashegy Budensi 1 ♀ die 22. Maii 1951.; in montibus Mátra, Kisbükk, 2 ♂♂ diebus 5—8. Augusti 1947. de fronde *Quercus*

roboris L. et in Bagolyirtás 1 ♀ die 4. Iulii 1962.; in montibus Bükk, Hármaskút, 1 ♀ die 27. Augusti 1957. — Varietas vero *unicolor* inveniebatur: in Tompa, Szabadföld, 2 ♀♀ die 26. Septembris 1961. de fronde *Quercus cerris* L.; in Kalocsa 2 ♀♀ die 7. Novembris 1945.; in Berhida 1 ♀ die 4. Iulii 1953. de fronde *Quercus cerris* L.; in montibus Kőszegensibus, Velem, 1 ♀ die 21. Maii 1944. de fronde *Alnus glutinosa* L.; in Vendvidék, Felsőszőlnök, 1 ♀ die 13. Iulii 1961. de fronde *Salix caprea* L. et in Szakonyfalu 2 ♀♀ die 16. Iulii 1961. de fronde *Salix alba* L.; in montibus Radnaensibus 1 ♀ die 21. Iulii 1943. — Typus est ♀ in Tompa die 25. Iunii 1962. capta, ceteri paratypi, in collectione mea conservati.

Species nova excellit colore corporis nigro, macula abdominis flava, corpore brevi et robusto, scutello postice elevato, quibus characteribus differt a specie *T. cerricola* ERD. Tenebam prius, uti *Tetrastichus ecus* WALK., sed GRAHAM stabilivit esse inaequalem et indescriptam.

Tetrastichus capreae sp. n. (3 ♀♀)

Corpus obscurissime cyaneo-viride; antennae nigrae, pedum coxae et femora corpore concolores, genubus, tibiis et tarsis sordide testaceis, tibiis in medio parum infuscatis, tarsis ultimis nigris; alae hyalinae, nervis luteis.

Caput latitudine thoracis, parum depressum; thorax latitudine sua sesqui longior, paullo brevior, splendens, vix visibiliter punctatus, linea media scuti mesonoti debili; abdomen longum et angustum, thorace ter longius, fortiter acuminatum, terebra fere in longitudine tarsi primi prodeunte. Antennae articulis funiculi vix longioribus, ac latis, clava brevi, longitudine articulorum 2 praecedentium.

Longitudo corporis 1.9—2 mm.

Legi in montibus Bükk (Fodor-lápa, in altitudine 850 m. supra mare), 3 ♀♀ die 28. Iulii 1954. de frondibus *Salicis capreae* L. Typus est ♀ exemplar maximum, ceteri paratypi, in collectione mea conservati.

Excellit colore corporis aeneo, abdomine, quam thorax, ter longiore, articulis funiculi brevibus, quibus characteribus dignoscitur a specie *T. strobilanae* RATZB.

Tetrastichus acuminatellus sp. n. (5 ♀♀)

Corpus laetius cyaneo-viride, in thorace parum aureo-micans; antennae fusco-luteae, scapi dimidio basali testaceo; coxae et femora postica nigra, femora 4 anteriora, tibiae et tarsi clare flavi, ultimi solum fusci; alae hyalinae, nervis flavis.

Caput latitudine thoracis, sat robustum, neque depressum; thorax angustus, latitudine sua plus, quam sesqui longior, splendens, vix observabiliter punctatus, vestigio lineae medianae in scuto mesonoti, scutello breviter ovato, propodeo medio brevi, fere laevi; abdomen angustum, elongatum, thorace duplo et dimidio longius, fortiter a basi fere incipiendo acuminatum, terebra

paullulum exserta. Antennae elongatae, articulo medio funiculi duplo et dimidio longiore, quam lato, cunctis valde angustis.

Longitudo corporis 1.9—2.1 mm.

Legi in Szeremle 4 ♀♀ die 14—15. Iulii 1960. de frondibus *Salix alba* L. et in montibus Bükk (Fodor-lápa), 1 ♀ die 28. Iulii 1954. de *Salix caprea* L. Typus est ♀ in Szeremle die 14. Iulii repertus, ceteri paratypi, in collectione mea custoditi.

Species haec nova est similis praecedenti, at habet antennas multo angustiores et elongatas.

Tetrastichus csokakoensis sp. n. (4 ♂♂ 7 ♀♀)

♀ — Color corporis niger, vix lucidus; antennae piceo-nigrae, apice lucidiores; pedes flavi, coxis nigris, dimidio basali femorum fusco, tarsis ultimis nigris; alae hyalinae, nervis testaceis.

Caput thorace parum angustius, depressum et coincisum; thorax latitudine sua semel et quadrante longior, dense punctulatus, pingui-nitens, linea media scuti mesonoti acuta, scutello transversali, apice elevato, propodeo brevi, fortiter declivi, fere laevi; abdomen longum, acuminatum, thorace duplo longius, basi vix angustius, terebra fere recondita. Antennae filiformes, articulo medio funiculi sesqui longiore, quam lato.

Longitudo corporis 2.2—2.4 mm.

♂ — Antennae scapo testaceo, articulo medio funiculi latitudine sua duplo et dimidio longiore, setis fortibus et elongatis; abdomen thorace brevius, elongato-ovatum.

Longitudo corporis 1.5—1.8 mm.

Legi in Csókakő 4 ♂♂ 7 ♀♀ die 22. Iunii 1962. Typus est ♀ longitudinis maximae, ceter paratypi, in collectione mea conservati.

Corpore robusto, nigro, prope stat speciei *T. grandii* Dom., at differt pedibus fere cunctis testaceis, terebra breviore.

Tetrastichus graminum nom. n.

Tetrastichus annulatus Kurdjumov nec Förster

Loco nominis praeoccupati nomen novum *Tetrastichus graminum* statuo. Est parasita in Cecidomyida *Asynapta thuraui* Rübs. vel *Thomasiella calamagrostidis* Rübs. sub vagina foliacea graminis *Calamagrostis epigeios* L., dein item ex Cecidomyida indeterminata in vagina graminum *Dactylis glomerata* L. et *Festuca valesiaca* Schleich.

Inscriptio auctoris: Tompa, Comitatus Bács-Kiskun, Hungaria.

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A SURVEY OF THE TAXA RELATED TO APAMEA MONOGLYPHA HUFN., WITH THE DESCRIPTION OF A NEW SPECIES (LEPIDOPTERA: NOCTUIDAE)

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In the first part of our century, a number of taxa had been described partly as a subspecies of *Apamea monoglypha* HUFN., partly as a species or subspecies in its alliance. They are as follows: *A. monoglypha sicula* TURATI, 1909, *A. corsica* TURATI, 1909 (= *corsa* SCHAWERDA, 1928), and *A. monoglypha sardoa* TURATI, 1909; *A. indiges* TURATI, 1926; *A. lithoxylea coerulescens* REISSER, 1926; *A. monoglypha syriaca* OSTHELDER, 1933, and *A. monoglypha maroccana* ZERNY, 1935. The common feature of the new taxa, except for the majority of specimens relegated to *sardoa* TUR., is a narrow, light stripe decurrent along the fold, from the obscure claviform spot to the postmedian line, in the middle of the fore wing. It is worthy of note that though the above taxa can be securely distinguished on the basis of the above cited common feature — discernible, incidentally, also in *A. lithoxylea* SCHIFF., and *sublustris* ESP. — from *A. monoglypha* which in its area hardly reveals any variation worthy of a taxonomic value; their distribution is considerably disconnected, in many cases insular in nature, occasionally of the order of thousands of kilometers; also, their range is almost entirely extraneous to the area of *monoglypha* HUFN.

With regard to the taxonomic assessment of the group in question, it seems now of extreme importance that the light trap at Sopronhorpács has since 1958 repeatedly captured, together with normal *monoglypha* specimens, exemplars of a Noctuid moth, also belonging to the genus *Apamea*, which though most similar to them as to color and form they still regularly differ in certain characteristics. Such are, for instance, a smaller alar expanse, or the lack of the whitish or greyish oval spot in the inner angle of the fore wing. They can, however, be unmistakably distinguished in every case by the presence of the light plical stripe bisecting the median field of the fore wing, characteristic of the taxa enumerated in the first paragraph, invariably absent in the nominate subspecies of *monoglypha* HUFN.

Since the new form is extraordinarily constant in contrast with the variability of the *monoglypha* specimens captured also simultaneously with it, the assumption of their different specificity seemed to be justified. Nor were any transitional individuals found, usually a decisive evidence for the specific distinctness of related forms coexistent in the same area. It remained an open question, however, whether the new form belonged to some other related species or represents a hitherto unknown species.

In order to decide the above problem and in spite of the traditional view that the reproductive organs of *monoglypha* and its related taxa are extremely similar to each other, we have painstakingly and thoroughly re-examined the genital organs of all taxa in question, in so far as we had suitable specimens available for this purpose.

The basic material of our investigations was represented by the Collection of Lepidoptera in the Hungarian Natural History Museum, Budapest, containing all respective taxa with the exception of TURATI's *sicula* and *indiges* and holding several paratype specimens of even OSTHELDER's *syriaca*. We had also recourse to the light-trap materials, established by L. KOVÁCS, comprising almost all captured exemplars of the new form, as well as the respective individuals preserved in the authors' private collections.

L. ISSEKUTZ, Vienna, forwarded for identification his *monoglypha* specimens collected in Burgenland, Austria; two individuals of the new form were discovered in his material. F. KASY, of the Natural History Museum, Vienna, has very kindly lent us a smaller series of *A. syriaca* as well as the types and several exemplars of ŻERNY's *maroccana*.

Unfortunately, however, TURATI's collection is still unavailable, hence we were unable to examine the type-specimens of *A. sicula* and *A. indiges*, or those of other taxa described by TURATI. Of these, we had specimens merely of *A. corsica* and *A. sardoa*, but they were not identified by that author. In our opinion, however, the illustrations and descriptions published by TURATI allow the drawing of correct conclusions with regard to all debatable points concerning his taxa.

Our investigations resulted, as set out in detail below, in the realization that the new form, discovered in the area of the Austro- Hungarian border, represents a hitherto undescribed species, to be diagnosed as follows.

Apamea tallosi sp. n.

Basic color of fore wing dull brown with an argillaceous suffusion: median field between and below the spots, as well as submarginal area from submarginal line towards termen, lustreless dark brown. The white or pruinose oval spot, frequently occurring in *monoglypha*, indeed, any whitish or pruinose design, is absent from the lower part of the marginal area.

Pattern elements (Fig. 1) are only moderately outlined, the most conspicuous being the reniform and the orbicular, but of a pallid tint and obscure outlines. The submarginal line is hardly lighter than the basic color, and rather defined by the blackish-brown apices of its internal projections. The lines bordering the median field are double, slightly sinuous, their margins darker below the costa. The external apices of the postmedian are ornamented, on

the veins, by fine and lanceolate dots. The median stripe is obscure, umbrose, distinct only below the costa. The base bears two more or less sharply defined aristiform and blackish-brown spots, one below the base of the cell, the other immediately above the dorsum.

The main character of the fore wing lies in the entirely lustreless brown shades and the light spot, resembling a sand-glass, situated in the lower third of the median field and by its constricted neck dividing the darker color of the median field.



Fig. 1. Right upper wing of *Apamea tallosi* sp. n. (male)

The hind wing is dark brownish-grey, with some yellowish sheen especially in the inner third of the wing. The discal spot is crescent-shaped, its upper portion wider, yet tapering downward. The cilia are brownish-yellow, with dark, lunulate spots in the middle.

The underside of the wings is rufous brown along the costa and the termen; more basad the fore wing is dark grey, the hind wing whitish-grey with a yellow suffusion. The discal spot is not sharp on the fore wing and comma-shaped on the hind wing.

The male reproductive organ displays the basic structure characteristic of the *Apamea monoglypha* and the *lithoxylea—sublustris* groups, respectively, with some well distinguishable differences in the details.

The corona is well developed, with 45—48 spines; the cucullus expands in both outer and inner directions at approximately identical rates, its exterior corner is not mucronate. The harpe is of uniform breadth, arching somewhat sinuously, about parallel with the inner margin of the cucullus and reaching its exterior corner. The ampulla is extremely fine, evenly arcuate, apically gradually and hardly expanding and rather obliquely truncate. Anteriorly to the dilated section of the cucullus, the costa bears a projecting excrescence, with another smaller one inside and a bud-shaped one directed downward.

The former projection is strongly setose, the latter two glabrous. The membraneous lobe on the outer margin of the valva is penicillately hairy. The sacculus is well developed, its inner margin with a blunt and two pointed projections. The peniculus is comparatively narrow and covered with a dense hairy brush. The uncus, vinculum, and saccus have no distinguishing characters. The aedoeagus is relatively short, squat, with two short spines. The coecum is slightly expanding.

Holotype male: Sopronhorpács, 16 June, 1959, deposited in L. KOVÁCS's collection captured by light traps. Paratypes: 25 June, 1965, 1 ♂; 21 June, 1967, 1 ♀, Sopronhorpács; 21 June, 1965, 1 ♂, Tanakajd; all deposited in the Collection of the Hungarian Natural History Museum. — 24 June, 1958, 1 ♂; 10 June, 2 ♂; 16 June, 1 ♂; 26 June, 1 ♂; 19 June, 1960, 1 ♂; all from Sopronhorpács, deposited in L. KOVÁCS's light trap collection. — 21 June, 1957, 1 ♂; 10 June, 1958, 1 ♂, Kohfidisch, Burgenland, Austria, deposited in L. ISSEKUTZ's collection, Vienna.

The authors dedicate the new species to the memory of the prematurely departed PÁL TALLÓS, of lasting merits in his untiring collecting activities and the organization of the forest light-trap system: both significantly contributing to the knowledge of the lepidopterous fauna of Hungary.

With respect to the external morphologic characters, the new species differs from *Apamea monoglypha* HUFN. mainly by the light dividing line bisecting the median field, replaced in the latter species by a more or less distinct, blackish line (Fig. 2). Another well discernible feature is the (in the average) smaller and more obscure reniform and orbicular of the new species as against those of *monoglypha*. The spots of this latter one are framed by a more or less sharp, fine black line, and thus conspicuously contrasting with the basic color. Furthermore, the specimens of the new taxon are in the average smaller than the *monoglypha* specimens collected in the same locality; they are less contrasting, and the pattern of the fore wings lacks any white or pruinose elements.

There is a characteristic difference also between the time of flight of the two species. *A. tallosi* sp. n. appears earlier and terminates its period of flight sooner (similarly to *sublustris*) than *monoglypha* which begins its flight later (for the whole country) and can be encountered for a much longer time. The phenological data, observed at Sopronhorpács, are: 9 June–5 July for *tallosi* sp. n., and 22 June – 16 August for *monoglypha*.

Of the hitherto known taxa with a median field bisected by a light stripe none resembles, as to color or the distribution of the color shades, the new species. By their dark coloration, *A. syriaca* and *maroccana* approach it to a degree, but their basic color lacks any dull brown and yellowish-brown tints, that is, they are replaced by rufous and rufous grey hues, or by hoary greyish in *maroccana*. Concerning the reniform and the orbicular, the differences are also constant. The spots of *tallosi* sp. n. are wider than those of the two other taxa, the outer margin of its reniform also less indented (Fig. 2). Still, it stands nearer to *syriaca* in that their spots lack any sharp contours. The reniform and

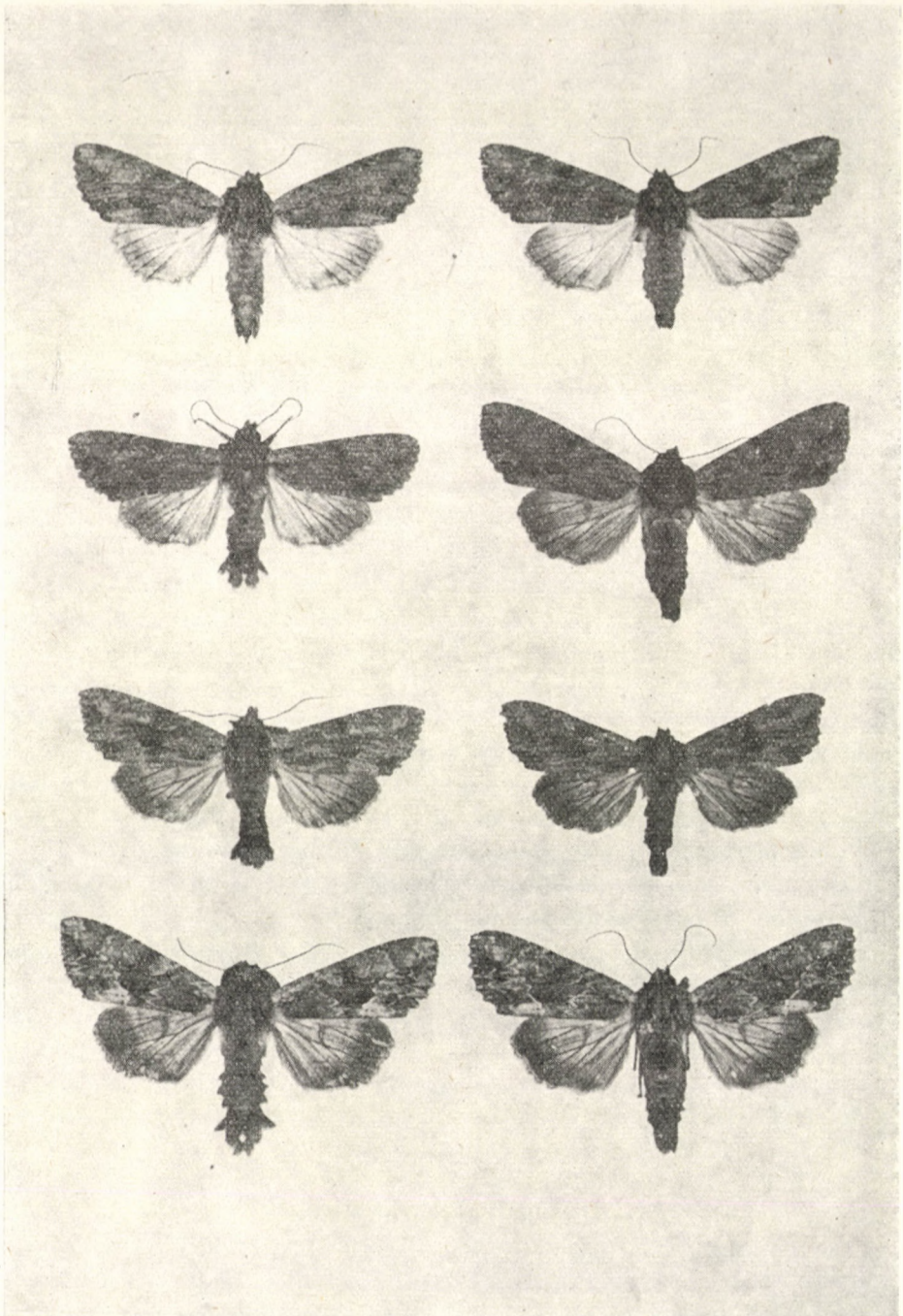

Fig. 2. Male and female of: 1st row: *Apamea maroccana* ZERNY, Tachdirt, Great Atlas; 2nd row: *Apamea syriaca* OSTH., Bcharré, North Lebanon; 3rd row: *Apamea tallosi* sp. n., Sopronhorpács, Hungary; 4th row: *Apamea monoglypha* HUFN., Isaszeg, Hungary

orbicular of *maroccana* are, on the other hand, framed by a fine, dark line, resembling *monoglypha* in this feature.

Of the taxa described by TURATI in 1909, *sicula* resembles, according to the illustration and the description, rather *lithoxylea* than *tallosi* sp. n. It also differs from this latter by a very indistinct reniform and a narrow orbicular, characteristics also resembling *lithoxylea*. Another simultaneously described subspecies, standing nearest to *sicula*, namely ssp. *corsica* deviates, according to a relatively great number of examined specimens, so much from *tallosi* sp. n., both as to color and shape, that their conspecificity is in our opinion highly improbable. Finally, ssp. *sardoa* belongs, also on the basis of the available specimens, rather to the immediate alliance of *monoglypha* — either as one of its subspecies or as a nearly related species — than to the new taxon.

In 1926, TURATI described from Cyrenaica a species, named *indiges*, belonging to the genus *Apamea*; he compared it to *sublustris*. The figure, though slightly obscure, seems to corroborate his opinion; indeed, it raises the question whether it be rather its subspecies than a distinct species. All these problems should, however, be solved by a knowledge of the reproductive organs.

The male organ of *Apamea tallosi* sp. n. essentially differs also from that of *A. monoglypha* (Fig. 3). In this latter, the corona bears 49—52 spines, the outer lobe of the cucullus is considerably more elongated than the inner one, and its outer corner is mucronate; the harpe fails to reach the outer corner of the cucullus and is not parallel with its outer curvature. The ampulla is strongly arcuate, especially in its basal third, its apex expands rapidly and assumes a claviform shape. The excrescence on the costa, below the cucullus, is relatively flat and densely haired. The aedoeagus is significantly longer, narrower, and the coecum narrower than in all related forms.

The male genital organs of the two examined Mediterranean taxa, *syriaca* and *maroccana*, stand considerably nearer to that of *A. tallosi* sp. n. (Fig. 4). The corona resembles that of *syriaca*, in which latter it bears 42—49 spines, whereas the cucullus of *maroccana* is more rounded and more dilating externally than internally, and the harpe is extremely narrow, especially in its distal portion. The ampullae differ essentially, in so far as it is almost straight and rather wide in *syriaca*, its apical end expanding only at its end, it is, however, still not claviform; its end is truncate. The sacculus of *syriaca* is narrower. There is no essential difference in the aedoeagi.

The corona of *maroccana* has slightly less, about 41—46, spines. The expansion of the cucullus is similar, but the lobes are relatively narrow, especially the external one. The harpe is very slender and still fails to reach the apex of the outer lobe (as it does in *tallosi* sp. n.), and often crosses its margin. Its ampulla rather resembles that of *syriaca*, being entirely straight and wide, while its apical portion resembles that of *monoglypha*, with its claviform end, however, obliquely truncate.

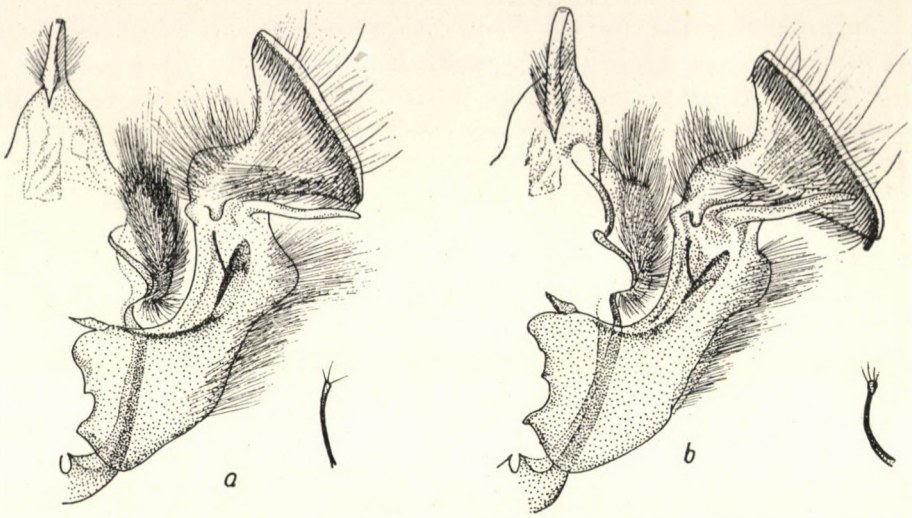

Fig. 3. Male genital organ and ampulla (disattached) of a = *Apamea tallosi* sp. n., b = *Apamea monoglypha* HUFN.

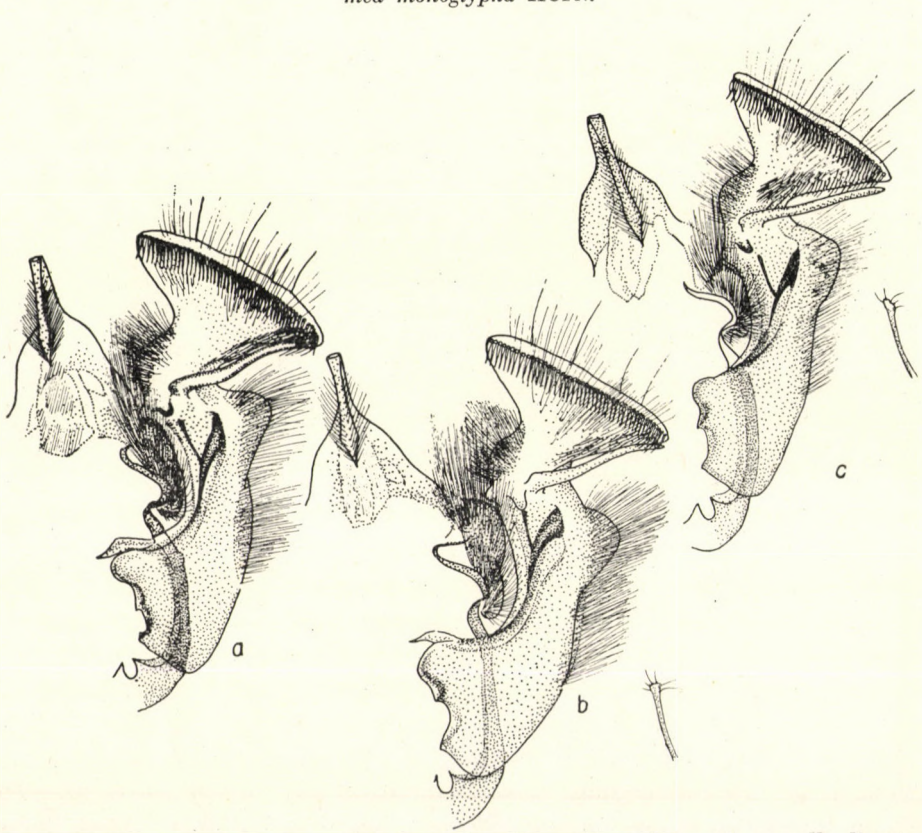

Fig. 4. Male genital organ of a = *Apamea syriaca* OSTH., b = idem, with ampulla disattached, c = *Apamea maroccana* ZERNY

In order to anticipate any doubts, we submit a short description of the reproductive organs of also the externally quite dissimilar *lithoxylea* and *sublustris*. The corona of the latter one consists of less than 40 spines, the cucullus is rounder, less dilating, with only a single, bud-shaped excrescence below its projecting corner on the costa. The strikingly narrow harpe is very long, extending beyond the outer angle of the cucullus, the sacculus is much smaller

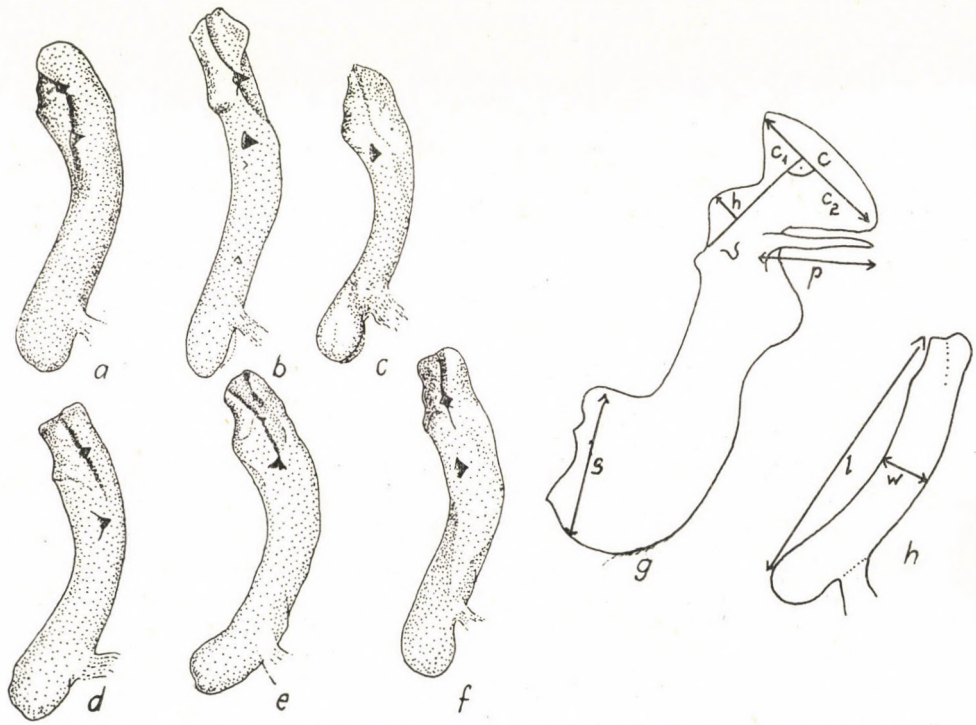

Fig. 5. Aedoeagus of a = *A. tallosi* sp. n., b = *A. monoglypha* HUFN., c = *A. sublustris* ESP., d = *A. maroccana* ZERNY, e—f = *A. syriaca* OSTH., g—h = Explanation of symbols used in measurements made on male genital organs of *Apamea* taxa. c = total width of corona; c_1 = width of interior lobe of corona; c_2 = width of exterior lobe of corona; h = excrescence on costa; p = length of harpe; s = sacculus; l = length of aedoeagus; w = width of aedoeagus

and the aedoeagus is constricted in the middle. The corona of *lithoxylea* bears 46—48 spines, the inner portion of the cucullus is less elongated, the proximal part of the harpe is widely flattened, but evenly wide and cylindrical at its distal section. The distal part of the aedoeagus is strikingly wide.

The differences extant in the male genital organs of the examined species might also be demonstrated by some numerical data, as shown in Table I. The values refer to distances read on the grading of the ocular micrometer, at magnification × 40 (explanation of symbols as used in Fig. 5).

Table I

Taxa	Locality	c	c_1	c_2	c_1/c_2	h	p	s	l	w
A. monoglypha	Buda-hills	58.5	19.5	39	0.50	4	36.5	46.5	80.5	10.5
	Debrecen	60.5	24	36.5	0.65	4	35.5	46	78.5	9.5
	Jósvafő	57.5	21	35.5	0.59	4	32.5	48	78	9.5
	Sárospatak	60.5	24.5	36	0.68	4.5	34	43.5	79.5	9.5
	Mts. Bükk	60.5	23	37.5	0.61	4.5	35	44	78.5	11.5
	Mts. Durmitor	58	22	36	0.61	3.5	36	43.5	79	11
	Julian Alps	53.5	19.5	33.5	0.58	3.5	32	42	79	9
	Julian Alps	59.5	23	36.5	0.63	3.5	35	44	82	10.5
	Mts. Rila	60	24.5	36.5	0.67	4	34.5	45.5	80.5	11
A. tallosi	Sopronhorpács	55.5	28	27.5	1.01	6	37.5	40.5	75	12
	Sopronhorpács	53.5	26	27.5	0.94	5.5	36.5	38.5	68.5	11
	Sopronhorpács	54	27.5	26.5	1.03	5.5	36.5	39	69.5	11
A. maroccana	Djebel Aurès	54.5	27.5	27	1.01	5	34.5	37	69	11
A. syriaca	Ankara	59.5	27	32	0.85	5.5	36	37.5	70.5	12.5
	Bcharré, Cedars, Lebanon	59	27	32	0.84	5	34.5	39	71.5	11.5
A. lithoxylea	Sárospatak	54	21	33	0.63	4	35	35.5	63.5	12
A. sublustris	Sárospatak	41.5	20.5	21.5	0.94	5.5	32.5	23	60.8	10.5

It seems now indubitable, therefore, that these forms cannot be considered conspecific with *monoglypha*, not even the externally so similar *tallosi* sp. n.

The differences between the male genital organs of *tallosi* sp. n., *maroccana*, and *syriaca*, are considerably smaller; and wherever they exist they are not uniform, there being namely details in which *maroccana* stands nearer to *tallosi* sp. n., and also other ones which bring *syriaca* nearer to the new species.

With respect to their taxonomical evaluation, we consider the differences existing in the shape of their ampullae as the most important. In his time, PIERCE referred to differences in the ampullae to decide the long debated question whether *sublustris* and *lithoxylea* are distinct species or not. The ampullae differ unequivocally in also the forms now under investigation and we might add that it is the ampulla of *tallosi* sp. n. which is most singular including also *monoglypha*. And if, in the case of *maroccana* and *syriaca*, due attention is paid, aside of other differences, also to their completely isolated position and the enormous geographical distance separating their localities,

it seems hardly contestable that their evolvement had passed the rank of subspecificity. We could hardly doubt this in the case of *tallosi* sp. n.

On the basis of the above considerations, our views concerning the *monoglypha*-group in a wider sense may be summarized as follows.

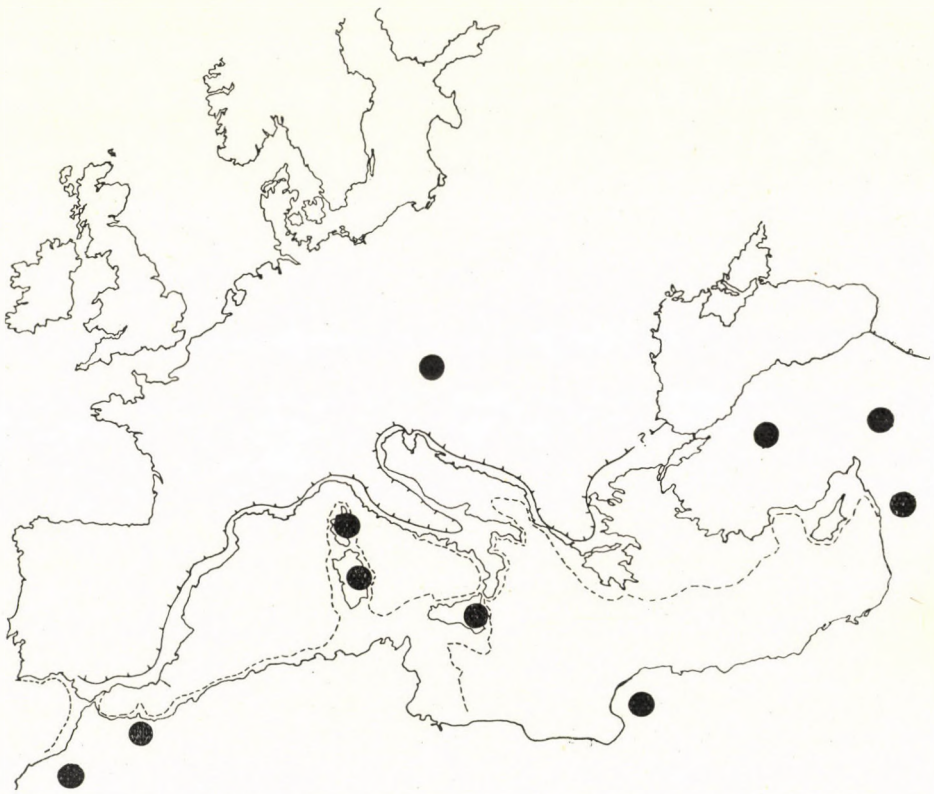

Fig. 6. Map of range of investigated *Apamea* taxa. ● = localities of isolated Mediterranean forms and site of new species; | | | | = approximate southern border of range of *A. monoglypha* HUFN., ——— = assumed coastline of maximum Pleistocene regression

With respect to habits and the reproductive organs, *A. lithoxylea* SCHIFF. and *A. sublustris* ESP. are the easiest to separate from the other related taxa. According to range, the former is European—Western Asiatic, with a single subspecies, *coerulescens* RSSR., assigned to it (cf. BOURSIN, 1964). The centre of the range of *A. sublustris* ESP. is in West and Central Europe, probably of an Atlanto-Mediterranean expansion, without any subspecies relegated to it.

The Mediterranean taxa, displaying similarities in the pattern of the median field (*A. maroccana* ZERNY, *A. corsica* TUR., and *A. syriaca* TUR.), might be considered members of an earlier Circummediterranean Formenkreis, isolated during the Quaternary and subsequently evolving in distinct directions (Fig. 6).

Since the continental connection between Corsica, Sardinia, Sicily, and North Africa had, to all intents and purposes, terminated owing to the transgression during the Riss-Würm interglacial (OMODEO, 1961), it is hardly dubitable that the spreading of the Mediterranean taxa cited above must have

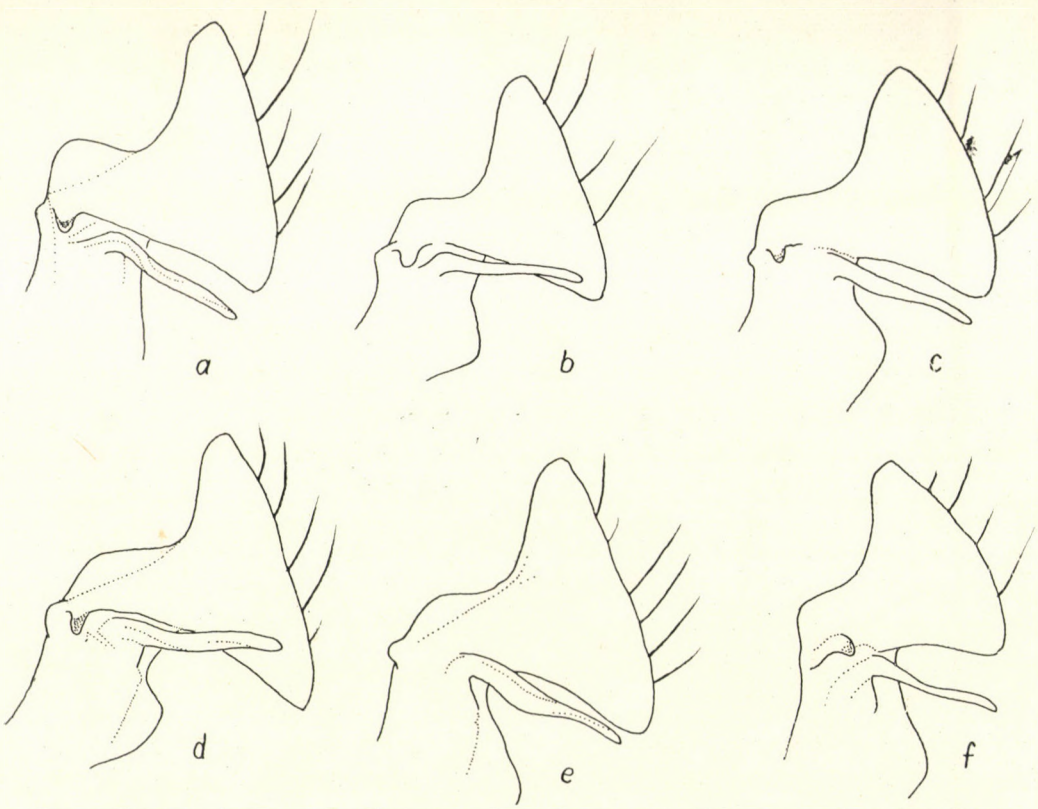

Fig. 7. Valval end of a = *A. tallosi* sp. n., b = *A. maroccana* ZERNY, c = *A. syriaca* OSTH. d = *A. monoglypha* HUFN., e = *A. lithoxylea* SCHIFF., f = *A. sublustris* ESP.

preceded the Riss glaciation and to have occurred preglacially or in some interglacial phase. It is also possible that their delimitation on the southern shores of the Mediterranean and its islands, respectively, might have taken place during the Riss glaciation and owing to its climatic effects. If so, *A. tallosi* sp. n. became separated, before and during the Riss glaciation, from the populations driven to the southern parts of the Mediterranean and there isolated in secondary refuges (cf. DE LATTIN, 1949, 1967). The fact, however, that the related Mediterranean forms are explicitly montane, indeed, alpine (*maroccana* occurs at elevations up to 2900 m, *syriaca* at 1900 m), the group seems to be definitely characterizable as having a high tolerance of cold. It is not precluded, there-

fore, that *tallosi* sp. n. will yet be discovered in the southeastern margin of the Alps or in the Dinarian range.

A. monoglypha HUFN. seems to have the greatest range and to be the most progressive form. As generally in the peripheric regions of large areas, there are also in this case local or more widely ranging forms, deviating mainly as to coloration, to be regarded as possible subspecies (e.g., *infuscata* BUCH.—WHITE in Nort Europe) or at least subspecies under evolution, as, for instance, the forms with a pale basic color in the South European mountainous ranges. The area of *A. monoglypha* is further characterizable by the fact that it fails to cover the Mediterranean subregion and, progressively southward along the peninsulas, the species becomes more and more a montane or even subalpine taxon. As an isolating factor, this is most important in the evolvement of local forms. And it also allows the assumption that the centre of dispersion of the species may have been in the eastern part of the present area. Following DE LATTIN (1964, 1967), it can be considered a Siberian species of great expansive ability, a perfect antipode, by its taxonomic unity and expansivity, of the group centered in the Mediterranean and exploded into several taxa.

Finally, a short key of identification of the investigated forms is submitted below.

1 (2) Lower third of median field not bisected by a light, narrow stripe or line; basic color consisting of various brownish and brownish-yellow hues; locally, especially in inner angle of fore wing, with a cinereous suffusion
Apamea monoglypha HUFNAGEL, 1766

2 (1) Lower third of median field bisected by a light, narrow stripe or line between veins cu_2 and *an.*

3 (4) Basic color dull brown, lighter sections ochreous yellowish or ochreous brownish. No cinereous spot in outer angle of fore wing
Apamea tallosi sp. n.

4 (3) Basic color not dull brown but rufous brown or grey or yellowish; in these latter two cases with a more or less extensive brownish pattern.

5 (8) Basic color rufous brown.

6 (7) Reniform and orbicular large, their outlines indistinct
Apamea syriaca OSTHELDER, 1933

7 (6) Reniform and orbicular conspicuous, well emerging from basic color (even small orbicular), owing to their fine, blackish frame
Apamea maroccana ZERNY, 1935

8 (5) Basic color grey or yellow, with a brown, more or less extensive pattern.

9 (10) Basic color grey, brownish pattern not or hardly rufous
Apamea lithoxylea SCHIFFERMILLER & DENIS, 1775, with its Formenkreis

10 (9) Basic color yellow, pattern ferrugineous red
Apamea sublustris ESPER, 1788, with its Formenkreis

Identification key based on the male sexual organs of species belonging to the *Apamea monoglypha*-group

1 (2) Proximal part of harpe flattened, widely expanding distal part cylindrical (Fig. 7e)
Apamea lithoxylea SCHIFFERMILLER & DENIS, 1775

2 (1) Harpe of even width throughout, more or less cylindrical, nowhere flattened or expanding (Fig. 7).

3 (4) Aedoeagus strongly arcuate, both extremities considerably expanding, coecum vesiculately swollen (Fig. 5c)
Apamea sublustris ESPER, 1788
4 (3) Aedoeagus much less arcuate (Fig. 5), hardly expanding distally; coecum eventually expanding but never vesiculate.
5 (6) Aedoeagus slender, long, at least 6.5 times as long as wide (Fig. 5b); outer lobe of corona nearly twice bigger than inner lobe, but at least 1.5 times bigger (see Table I)
Apamea monoglypha HUFNAGEL, 1766
6 (5) Aedoeagus relatively stouter, at most 6.2 times as long as wide (Fig. 5); proportion of outer and inner lobe of corona approximating 1 : 1 (see Table I).
7 (8) Ampulla evenly and slightly arcuate, throughout extremely narrow, hardly dilating even at its distal part (Fig. 3a)
Apamea tallosi sp. n.
8 (7) Ampulla nearly straight, strikingly dilating at its distal part (Fig. 4).
9 (10) Dilated part of ampulla straightly truncate at right angles to its longitudinal axis (Fig. 4a)
Apamea syriaca OSTHELDER, 1933
10 (9) Dilated part of ampulla obliquely truncate to its longitudinal axis (Fig. 4c)
Apamea maroccana ZERNY, 1935

The authors are indebted to DR. F. KASY, Vienna, for his permission to conduct investigations in the Natural History Museum, Vienna, and the loan of materials, as well as to DR. L. ISSEKUTZ, Vienna, for his valuable help in making available his respective material from Burgenland, Austria.

REFERENCES

1. BOURSIN, CH. (1962): Les Noctuidae — Trifinae de France et de Belgique (Contribution à l'étude des Noctuidae — Trifinae, 148). — Bull. Mensuel Soc. Linn. Lyon, p. 204—240.
2. DANNEHL, F. (1933): Neues aus meiner Sammlung. — Ent. Ztschr., **46,** p. 259—260.
3. DE LATTIN, G. (1949): Beiträge zur Zoogeographie des Mittelmeergebietes. — Verh. deutsch. Zool. Ges. Kiel, **1948,** p. 143—151.
4. DE LATTIN, G. (1964): Die Verbreitung der sibirischen Faunenelemente in der Westpalaearktis. — Natur und Museum, **94,** p. 505—514.
5. DE LATTIN, G. (1967): Grundriss der Zoogeographie. — Jena, pp. 602.
6. OMODEO, P. (1961): Le peuplement des îles méditerranées et le problème de l'insularité. — Colloques inter. du Centr. Nat. Res. Sci., **94,** p. 128—133.
7. OSTHELDER, L. (1933): Lepidopteren-Fauna von Marasch in türkisch Nordsyrien. — Mitt. Münch. Ent. Ges., **23,** p. 45—102.
8. PIERCE, F. N. (1909): The Genitalia of the Group Noctuidae of the Lepidoptera of the British Isles. — Liverpool, pp. XII + 88, T. XXXII.
9. REISSER, H. (1926): Hadena lithoxylea F. var. nova coerulescens. — Ztschr. Öst. Ent. Ver., **11,** p. 13—14.
10. SCHAWERDA, K. (1928): Meine dritte Lepidopteren-Ausbeute aus dem Hochgebirge Korsikas. — Ztschr. Öst. Ent. Ver., **13,** p. 41—49.
11. TURATI, E. (1909): Nuove Forme di Lepidotteri. — Il Naturalista Siciliano, **21,** p. 1—133.
12. TURATI, E. (1926): Novità di Lepidotterologia in Cirenaica. — Atti Soc. Ital. Sci. Nat., **65,** p. 25—83.
13. WARREN, W. (1914, 1938): Die Eulenartigen Nachtfalter. — in SEITZ: Die Gross-Schmetterlinge der Erde, **3,** Stuttgart, pp. III + 511 and Suppl. 3, Stuttgart, pp. VI + 332.
14. ZERNY, H. (1934): Neue Heteroceren aus dem Grossen Atlas in Marokko. — Ztschr. Öst. Ent. Ver., **19,** p. 43—48.

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THE SCIENTIFIC RESULTS OF THE HUNGARIAN SOIL ZOOLOGICAL EXPEDITIONS TO SOUTH AMERICA*

9. ACARI: PYEMOTIDAE AND SCUTACARIDAE FROM THE GUAYARAMERIN REGION IN BOLIVIA

By

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(Received July 27, 1968)

On the occasion of its second field trip, the Hungarian Soil Zoological Expedition continued its investigations (begun previously in Chile, Argentina, and Paraguay) now in Brazil, Bolivia and Uruguay. A comprehensive paper reports [2] on the course of the expedition, its investigations and collecting activities.

Nearly 120 soil samples have been collected and extracted; in working up the enormous material, many hundreds of mites referable to the families Pyemotidae and Scutacaridae were found. The present paper discusses the material collected merely in the Guayaramerin region (Alto Beni, Bolivia). Examination of the material resulted in the demonstration of 36 species, the greater part of which (25 species) proved to be new also for science, the other ones having already been known or described from South America. Owing to the still incomplete evaluation of the material, merely the description and listing, respectively, of the taxa discovered are herein given.

Since the detailed data of collecting conditions and localities are being given under serial numbers in the introductory paper mentioned above, I summarize here, for the sake of obviating a number of repetitions, only the more important data, and in the description of the species submit merely the number of identification of the respective materials. All of these have been collected within a radius of 30 km of the settlement indicated in the title. Three main centres of collecting can, however, be distinguished: 1: primordial forests around the settlement: Nos. 380-1 380-3 = closed forest, No. 406 = base of solitary tree on a clearing; Nos. 416-1, 416-2 = virgin forest; Nos. 431-1, 431-2 = banana plantation; Nos. 432-1, 432-2= galery forest along the Mamoré, No. 436 = closed forest. — 2: About 30 km from the settlement, along the road to Riberalte: No. 455-1 = transitional forest between savanna and closed forest. — 3: About 20 km north of the settlement, on the estate of Mr. HECTOR ESPOS, along the Mamoré: No. 421 = closed forest on wet soil; Nos. 447-1—447 -3 = under a solitary tree in a clearing; Nos. 448-1 — 448-4 = banana plantation; Nos.

* The present paper treats the material of the Second Expedition (1966—67). Leader: Prof. DR. J. BALOGH; other participants: DR. S. MAHUNKA and DR. A. ZICSI.

449-1 — 449-2 = cocoa plantation; No. 450 = bank of a stream in forest; No. 451 = plantation of leguminous plants; Nos. 452-1 — 452-2 = closed forest; Nos. 447-4 — 447-5 = narrow band of galery forest along the Mamoré.

The Holotype specimens and most of the Paratypes of the new species described herein are deposited in the Zoological Department of the Natural History Museum, Budapest; one Paratype specimen each in the collections of Dr. G. Rack, Hamburg and Dr. H. Regenfuss, Freiburg,

All materials have been jointly collected by Dr. J. Balogh, Dr. S. Mahunka, and Dr. A. Zicsi.

Microdispus flagellifer sp. n.

Length: 142—150 μ, width: 92—100 μ.

D o r s a l s i d e (Fig. 1: A): Clypeus relatively large, inner pair of hairs arising considerably beyond, and much shorter than, outer pair. Setae dorsales long, thin. All other hairs basally greatly incrassate, apically rapidly attenuating, flagelliform.

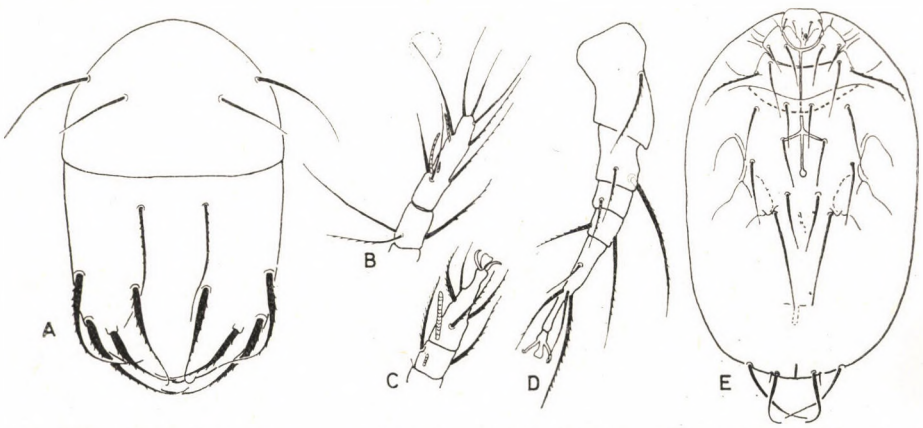

Fig. 1. *Microdispus flagellifer* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg IV; E = ventral side

V e n t r a l s i d e (Fig. 1: E): Setae coxales II internae longest hairs on anterior sternal plate. Setae coxales II externae ciliate. On posterior sternal plate, epimere III short, pre- and poststernal hairs also short, setae poststernales externae longest of all but still not extending beyond vulva. Three pairs of caudal hairs present, setae caudales internae shorter than externae 2, apically both pairs arcuate.

L e g s : Shape and chaetotaxy of tibiotarsus of leg I as shown on Fig. 1: B. Solenidium on tarsus of leg II long (Fig. 1: C). Joints of leg IV short, ciliation also simple (Fig. 1: D).

R e m a r k s : The unique chaetotaxy, for the most part resembling that of the recently described African *M. mirabilis* (Mah., 1967), distinguishes the new species from all known congeners.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-1005p-68): No. 447-2; 2 ex. (Paratypes: T-1006p-68): from the same locality.

Microdispus australis sp. n.

Length: 82—90 μ, width: 58—62 μ.

D o r s a l s i d e (Fig. 2: A): Clypeus narrow, inner pair of hairs arising considerably behind outer one, thin and considerably shorter than the latter. Setae dorsales longest of all dorsal hairs, reaching even between points of origin of setae sacrales. Setae sacrales internae strongly and fusiformly incrassate, laterally with merely a few cilia.

V e n t r a l s i d e (Fig. 2: F): Epimere I well developed on anterior sternal plate, setae coxales I externae shortest pair of all hairs. Epimere III of posterior sternal plate short, its end emitting setae presternales externae, these latter long, reaching points of origin of setae poststernales externae of strongly incrassate base. Inner pair of two caudal hairs arcuate, interior sides with some long cilia. Outer hairs straight and longer than preceding ones.

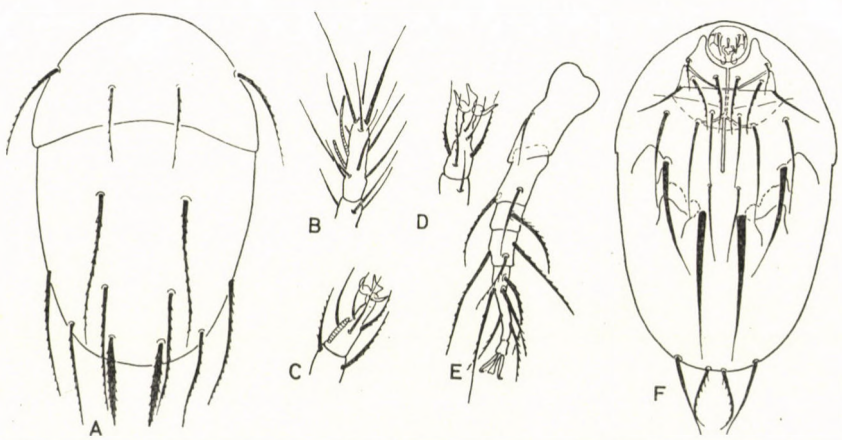

Fig. 2. *Microdispus australis* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

L e g s : Tibiotarsus of leg I without claw (Fig. 2: B), solenidium ω_3 curved and extending far beyond apex of tarsus. Suctorial plate of legs II and III (Fig. 2: C, D) asymmetrical. Shape and chaetotaxy of leg IV as shown on Fig. 2: E.

R e m a r k s : It is extremely difficult to distinguish the new species from the European *M. setosus* EVANS, 1952; the main difference is in its extraordinarily small size. However, some further differences appear in the chaetotaxy of the ventral side (incrassate setae poststernales externae, proportionate lengths of praesternal hairs).

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-1001p-68): No. 447-1; 1 ex. (Paratype: T-1002p-68): from the same locality; 2 ex. (Paratypes: T-1003p-68): No. 450; 1 ex. (Paratype: T-1004p-68): No. 380-1.

Neopygmephorus amazonicus sp. n.

Length: 165 μ, width: 120 μ.

D o r s a l s i d e (Fig. 3: A): Clypeus covering greater part of propodosoma, thus also bases of sensillus and setae scapulares externae. Of its two pairs of hairs, upper one thick, robust, whereas setae scapulares internae minute. Hysterosomatic hairs robust, thick, well discernibly ciliate. Setae humerales internae arising anteriorly to externae, setae lumbales externae merely half as long as setae sacrales externae.

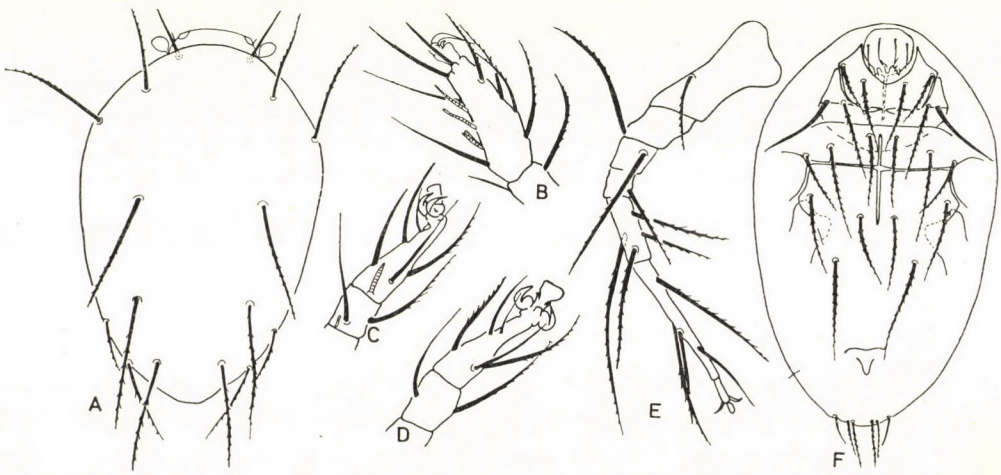

Fig. 3. *Neopygmephorus amazonicus* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

V e n t r a l s i d e (Fig. 3: F): Configuration of sternum, ventrum and epimeres on anterior and posterior sternal plates greatly resembling that of *N. interruptus* MAH., 1968. Setae coxales I externae short, whereas setae coxales II externae as long as other ones. Setae caudales internae longest of all caudal hairs, setae caudales externae 1 closely adjacent, slightly longer than rather removed externae 2.

L e g s: Tibiotarsus of leg I (Fig. 3: B) elongate, solenidia ω_1 and ω_2 of equal length but only half as long as also equally long ω_3 and ω_4. Tarsus of legs II and III also elongated (Fig. 3: C, D). Shape of leg IV (Fig. 3: E) also similar to that of *N. interruptus*, but its hairs, especially hairs *c*, *l* and *m*, much shorter.

R e m a r k s: The new species stands nearest to the above mentioned *N. interruptus* MAH., 1968, but the configuration of the propodosoma of this latter one is different, of the dorsal hairs it is especially the setae dorsales which are dissimilar. The solenidia of legs I and II are also different.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-999-68): No. 436.

Neopygmephorus tuberosus sp. n.

Length: 140—163 μ, width: 112—140 μ.

D o r s a l s i d e (Fig. 4: A): Clypeus entirely covering propodosoma. Setae humerales internae considerably shorter than externae. Setae dorsales failing to reach points of origin of setae lumbales. Setae sacrales and setae lumbales externae slightly and spinosely incrassate.

V e n t r a l s i d e (Fig. 4: E): Coxal laths weakly developed on both anterior and posterior sternal plates. Hairs long, setae presternales internae longer than externae, setae poststernales internae extending to vulva, setae poststernales externae to posterior margin of body. Three pairs of caudal hairs present, setae caudales internae and externae 1 arising closely adjacent to one another, setae caudales externae 2 characteristically curved.

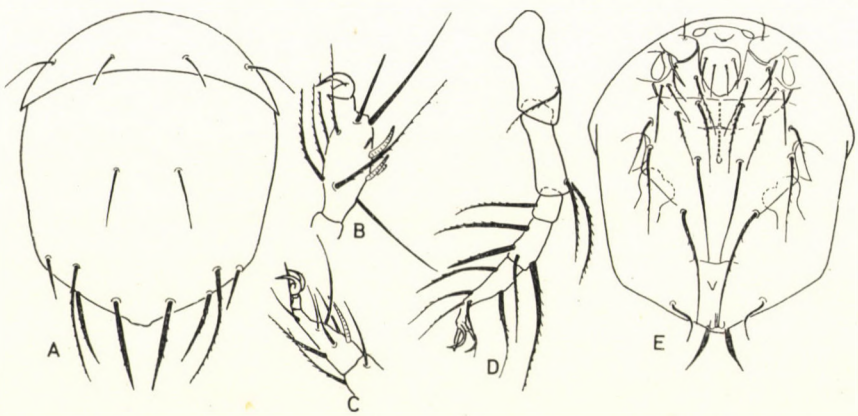

Fig. 4. *Neopygmephorus tuberosus* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg IV; E = ventral side

L e g s: Tibiotarsus of leg I fusiform (Fig. 4: B), solenidia ω_1 and ω_3 of equal length. Claw well developed. Solenidium on tarsus of leg II long (Fig. 4: C). Tibia of leg IV (Fig. 4: D) almost twice longer than genu, hair *n* of tibia spiniform.

R e m a r k s: No South American species of a similar type is hitherto known; with respect to the European species, *N. matthesi* (KRCZAL, 1959) stands nearest to the new taxon. This latter can, however, be separated from it by the incrassate dorsal hairs and the chaetotaxy of the legs.

M a t e r i a l e x a m i n e d: 1 ex. (Holotype: T-998-68): No. 406; 2 ex. (Paratypes: T-1007p-68): from the same locality.

Pygmodispus boliviensis sp. n.

Length: 136—168 μ, width: 92—110 μ.

D o r s a l s i d e (Fig. 5: A): On clypeus setae humerales internae arising anteriorly to externae. All hairs short and thin.

V e n t r a l s i d e (Fig. 5: D): Posterior sternal plate not widened, its lateral margins sinuous. Epimere III transverse, its apices bending uncinately toward posterior end of body. Setae poststernales internae originating between legs IV, considerably anteriorly to externae. These latter also short, not reaching vulva.

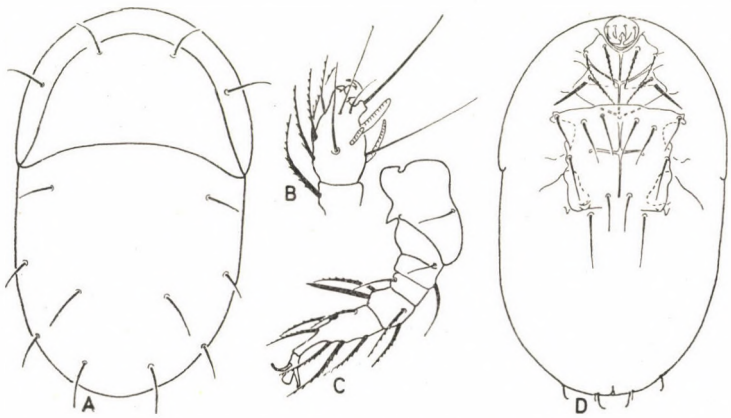

Fig. 5. *Pygmodispus boliviensis* sp. n. A = dorsal side; B = leg I; C = leg IV; D = ventral side

L e g s: Fusiform tibiotarsus of leg I (Fig. 5: B) with a relatively small claw. Trochanter of leg IV (Fig. 5: C) small, its lower margin terminating in a minute spur.

R e m a r k s: Among the South American species, the new taxon stands nearest to *P. appendiculatus* MAH., 1968, and *P. similis* MAH., 1968; however, it can be distinguished from both by the terminally characteristically recurved epimere III, and the shape of the inferio-interior spur on the trochanter of leg IV.

M a t e r i a l e x a m i n e d: 1 ex. (Holotype: T-1008p-68): No. 406; 5 ex. (Paratypes: T-1009p-68): from the same locality; 2 ex. (Paratypes: T-1010p-68): No. 416-2; 5 ex. (Paratypes: T-1011-68): No. 448-1; 1 ex. (Paratype: T-1012p-68): No. 447-1; 2 ex. (Paratypes: T-1013p-68): No. 68.

Imparipes setifer sp. n.

Length: 198—214 μ, width: 162—178 μ.

D o r s a l s i d e (Fig. 6: A): Clypeus small, with heterotrichy. Setae humerales internae minute and arising far anteriorly to externae. All other dorsal hairs extremely long, longest ones almost as long as body.

Ventral side (Fig. 6: D): Setae coxales II externae strongly incrassate on anterior sternal plate. Lateral margins of posterior sternal plate with deep incisions; setae presternales internae longer than externae. Epimere IV strongly developed, emitting setae poststernales externae which extend to posterior margin of body. Setae poststernales internae removed farther away from one another than externae, and arising before these latter. Caudal hairs extremely long, especially setae caudales externae 2.

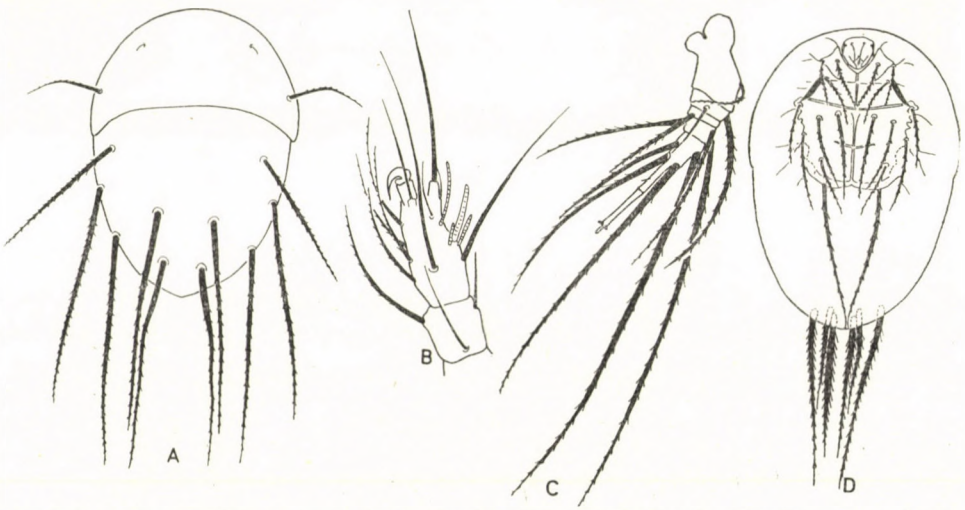

Fig. 6. *Imparipes setifer* sp. n. A = dorsal side; B = leg I; C = leg IV; D = ventral side

Legs: Tibiotarsus of leg I (Fig. 6: B) with claw, solenidium ω_3 longer than ω_1, but this latter one slightly thicker. Shape of leg IV as shown on Fig. 6: C.

Remarks: The heterotrichy of the clypeus resembles that of *I. heterotrichus* MAH., 1963, but the new species differs by reason of the chaetotaxy of the dorsal and ventral sides, and especially the evolvement of the caudal hairs.

Material examined: 1 ex. (Holotype: T-1014p-68): No. 380-1; 5 ex. (Paratypes: T-1015p-68): from the same locality; 1 ex. (Paratype: T-1016p-68): No. 421-1; 2 ex. (Paratypes: T-1017p-68): No. 436; 5 ex. (Paratypes: T-1018p-68): No. 447-2; 2 ex. (Paratypes: T-1019p-68): No. 448-2; 2 ex. (Paratypes: T-1020p-68): No. 450; 1 ex. (Paratype: T-1021p-68): No. 452-1.

Imparipes irmayi sp. n.

Length: 198 μ, width: 155 μ.

Dorsal side (Fig. 7: A): Clypeal hairs thin and short, setae dorsales also short. Other hairs longer, but in both setae lumbales and setae sacrales, outer pairs longer, gradually attenuating, setiform, while inner pairs thicker, bacilliform.

Ventral side (Fig. 7: D): Sternum, ventrum, and epimeres very robust, epimere III extending to base of leg III. Setae presternales internae as well as setae poststernales internae arising anteriorly to their outer mates.

Setae poststernales externae not reaching posterior margin of body. Setae caudales externae 2 longest of all caudal hairs, rather removed from the other two pairs, of which internae hardly shorter whereas externae 1 minute.

L e g s: Tibiotarsus of leg I (Fig. 7: B) without claw. Solenidia ω_1 and ω_2 stout, large, ω_3 and ω_4 much smaller. Tarsus of leg IV (Fig. 7: C) slightly shortened, hair *t* long. Besides tarsal setae, hairs *l* and *k* of tibia as well as hair *c* of femur strikingly long.

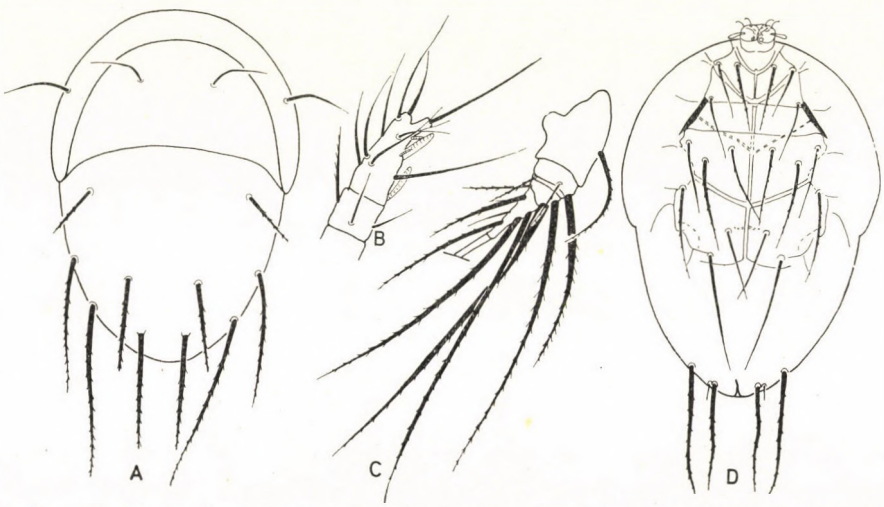

Fig. 7. *Imparipes irmayi* sp. n. A = dorsal side; B = leg I; C = leg IV; D = ventral side

R e m a r k s: No species lacking a claw on leg I was hitherto known from South America.

M a t e r i a l e x a m i n e d: 1 ex. (Holotype: T-1022p-68): No. 380-1.

I dedicate the new species, as a token of my gratitude and esteem, to the late H. DE IRMAY, forestry officer, without whose magnanimous help our expedition could not have been realized and who was our guide and fellow collector during its entire course.

Imparipes guayaramerinensis sp. n.

Length: 227 μ, width: 190 μ.

D o r s a l s i d e (Fig. 8: A): Clypeal hairs longer, more curved, but also thinner than all other dorsal hairs. Setae lumbales internae only slightly longer (105 μ) than setae sacrales internae (94 μ).

V e n t r a l s i d e (Fig. 8: F): Except for short but thick setae coxales II, hairs of anterior sternal plate long. Setae presternales also long, externae reaching base of poststernal hairs. These latter arising along an imaginary transversal line, externae one-third longer than internae, but not reaching posterior margin of body. Three pairs of caudal hairs present, setae caudales

internae and externae 2 of equal length and very densely ciliate. Setae caudales externae 1 minute.

L e g s: Tibiotarsus of leg I (Fig. 8: B) elongate, bearing two very small (ω_3 and ω_4) and two larger (ω_1 and ω_2) solenidia. Tarsus of legs II and III elongate, tibial solenidia situated on small chitinous thickenings. Tarsus of leg IV (Fig. 8: E) slightly shortened, but hair *t* well developed. Hairs *p* and *l* by far the longest ones of all setae on leg IV.

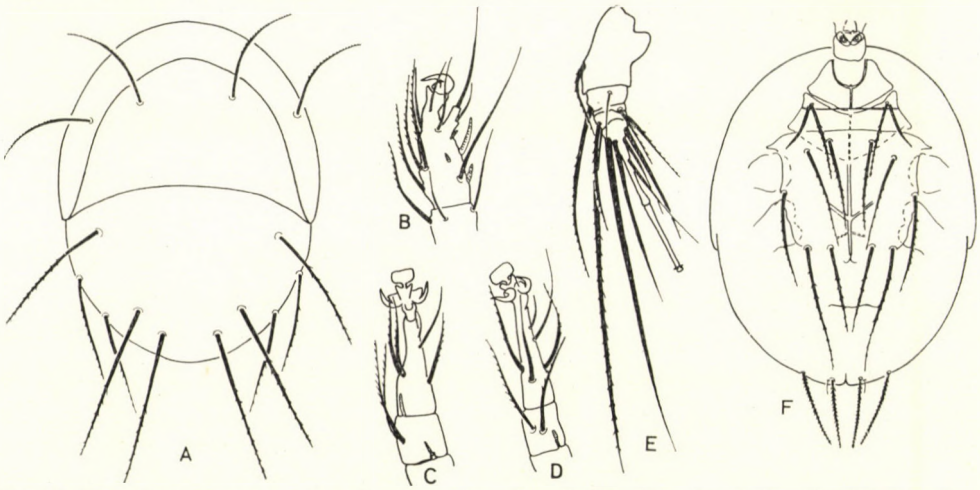

Fig. 8. *Imparipes guayaramerinensis* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

R e m a r k s: No South American species is as yet known on which the poststernal hairs are situated along a common transversal line. From similar species of other regions, the new species is easily distinguished by its dorsal chaetotaxy.

M a t e r i a l e x a m i n e d: 1 ex. (Holotype: T-1023p-68): No. 416-1.

Imparipes longiunguis sp. n.

Length: 162—175 μ, width: 145—167 μ.

D o r s a l s i d e (Fig. 9: A): Clypeus large, hairs short. Setae dorsales, setae lumbales internae (65 μ), and setae sacrales internae (60 μ) considerably longer than all other dorsal hairs. All dorsal hairs ciliate.

V e n t r a l s i d e (Fig. 9: F): All hairs of anterior and posterior sternal plates of about equal length, even setae poststernales externae only slightly longer than internae. Setae caudales externae 2 longest of all caudal hairs, externae 1 only half as long as setae caudales internae, arising closely adjacent to them.

L e g s: On tibiotarsus of leg I (Fig. 9: B), solenidium ω_1 considerably thicker and longer than ω_3. Solenidia on tibia of legs II and III (Fig. 9: C, D)

hardly longer than those on tarsal ones of leg II. Tarsus of leg IV (Fig. 9: E) shortened, claws very long and thin. Tibial solenidium also extremely long and thin.

R e m a r k s: The characteristical configuration and chaetotaxy of leg IV distinguish the new species from all heretofore known congeners. As for habit, it resembles *I. covarrubiasi* MAH., 1968, but, aside of the features of leg

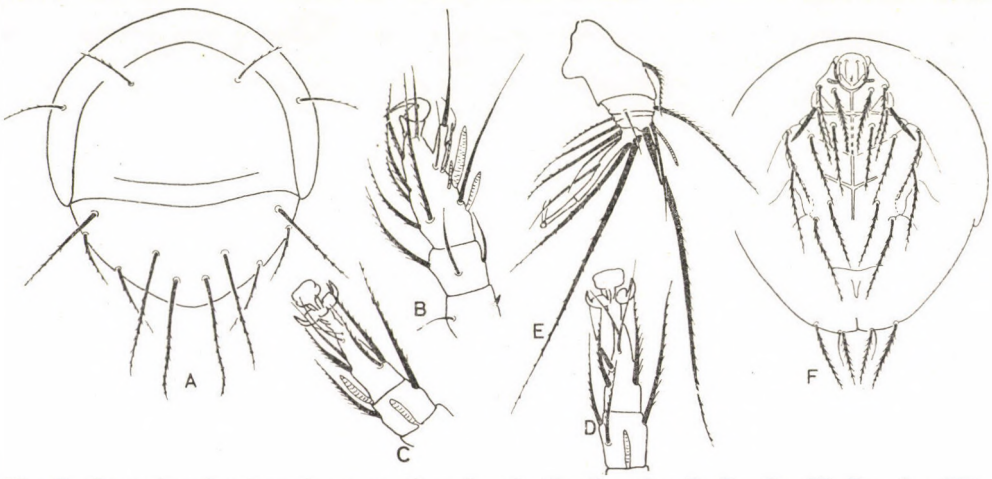

Fig. 9. *Imparipes longiunguis* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

IV, the ventral chaetotaxy and the evolvement of the epimeres are also different in the new species.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-1024p-68): No. 432-1; 1 ex. (Paratype: T-1025p-68): from the same locality; 2 ex. (Paratypes: T-1026p-68): No. 448-2.

Imparipes (T.) similis sp. n.

Length: 155 μ, width: 120 μ.

D o r s a l s i d e (Fig. 10: A): Clypeus large, hairs small. Setae lumbales internae (46 μ) slightly longer than setae dorsales (36 μ) and setae sacrales internae (33 μ), respectively.

V e n t r a l s i d e (Fig. 10: E): Setae presternales short, none extending beyond epimere III. Setae poststernales internae only slightly shorter, arising behind externae. Setae caudales internae and externae 2 of equal length, externae 1 merely half as long.

L e g s: Tibiotarsus of leg I (Fig. 10: B) large, its claw present, also its base excised. Solenidium ω_1 thicker but slightly shorter than ω_3. Tarsus of leg II (Fig. 10: C) with a short, fusiform solenidium. Leg IV agreeing with basic type of genus (Fig. 10: D), hairs *t* and *o* on tarsus of equal length, hair *p* longer and more robust than hair *l* of tibia.

Remarks: Until now, only one *Telodispus* species, namely *T. uniformis* MAH., 1968, was known from South America. On its leg IV, hair *o* is considerably longer than hair *t*, the presternal hairs are also longer and extend to the base of the poststernal setae, whereas the setae caudales *l* are minute. On the basis of these features, the two species are easily distinguishable.

Material examined: 1 ex. (Holotype: T-1027p-68): No. 447-5.

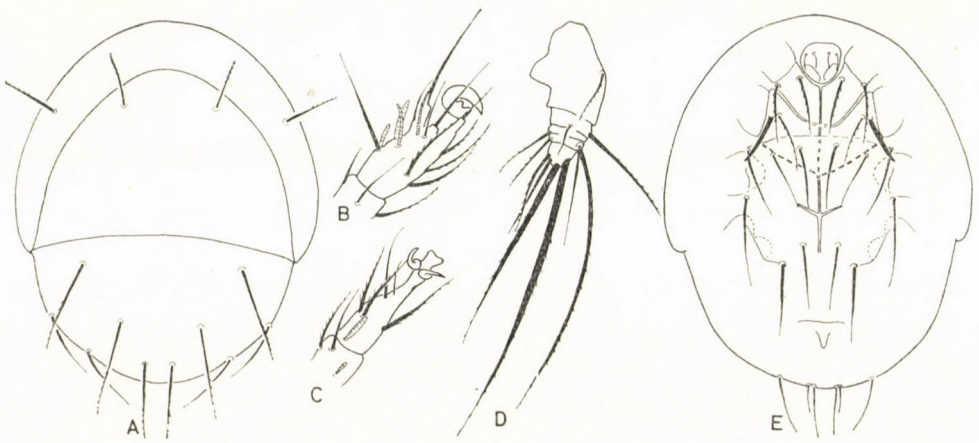

Fig. 10. *Imparipes (T). similis* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg IV; E = ventral side

Rhynchodispus gen. n.

Scutacaroid, clypeal margin well visible, with only one pair of hairs. Gnathosoma elongated, several times longer than wide, circumgnathosomatic foramen accordingly also elongately excavated. Lateral margin of posterior sternal plate dilated at height of legs IV, terminating in sharp apex above exterior margin of trochanter. Leg IV composed of 5 independent and distinct joints, pretarsus, ambulacrum, and claws absent.

Type-species: *Rhynchodispus punctipedis* sp. n.

Remarks: By the shape of leg IV, the new taxon resembles the subgenus *Telodispus* of the genus *Imparipes*. However, primarily the elongate gnathosoma and the appendage of the sternal plate, partially covering the trochanter of legs IV, distinguish it from both the former as well as all other groups of the genus *Imparipes*.

Rhynchodispus punctipedis sp. n.

Length: 225—235 μ, width: 185—192 μ.

Dorsal side (Fig. 11: A): Clypeal hairs short. Setae dorsales and setae sacrales internae slightly longer (54 and 52 μ, respectively) than these, while setae lumbales internae longest (61 μ) of all dorsal hairs.

V e n t r a l s i d e (Fig. 11: E): Gnathosoma (Fig. 11: C) strongly elongate. Hairs of both anterior and posterior sternal plates short and thin; setae poststernales externae hardly projecting beyond vulva. Setae caudales externae 2 only slightly longer than internae.

L e g s: Tibiotarsus of leg I (Fig. 11: B) with a well developed claw, solenidium ω_1 longer and thicker than ω_3. Tarsus of leg IV (Fig. 11: D) with 4 hairs, tarsal and tibial surface characteristically punctate.

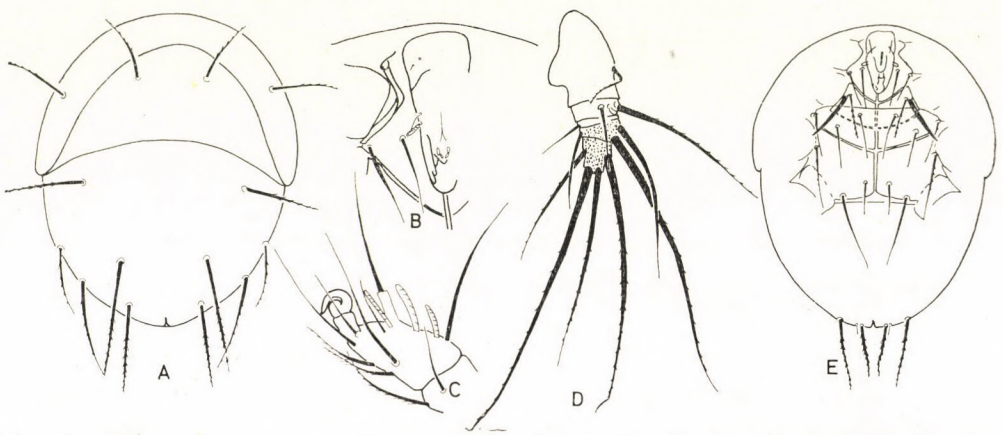

Fig. 11. *Rhynchodispus punctipedis* sp. n. A = dorsal side; B = gnathosoma; C = leg I; D = leg IV; E = ventral side

R e m a r k s: On the basis of the gnathosoma and the configuration and chaetotaxy of leg IV, the species is easily distinguished from its other congener described below.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-1028p-68): No. 380-3; 2 ex. (Paratypes: T-1029p-68): No. 416-2.

Rhynchodispus rostratus sp. n.

Length: 245 μ, width: 187 μ.

D o r s a l s i d e (Fig. 12: A): Clypeal hairs of equal length, setae humerales internae arising anteriorly to externae. Setae dorsales, setae lumbales, and setae sacrales internae of equal length, apically all gradually attenuating. Setae sacrales externae longer than setae lumbales externae, both pairs terminating in a blunt apex.

V e n t r a l s i d e (Fig. 12: F): Gnathosoma elongate, its distal portion gradually tapering, palpi terminating in a point. Coxal laths strongly developed on both anterior and posterior sternal plates; epimere III extending to base of legs. Also several arcuate incisions anteriorly to appendage on lateral margin of posterior sternal plate. Setae poststernales internae arising anteriorly to externae, these latter twice as long, but still failing to reach posterior end of body. Setae caudales internae incrassate (turnip-shaped), setae caudales

externae 1 immediately adjacent, minute, whereas setae caudales externae 2 removed and longest of all hairs.

L e g s: Tibiotarsus of leg I (Fig. 12: B) with a well developed claw, solenidium ω_1 strikingly thick, also much longer than all other ones. On tarsus of legs II and III (Fig. 12: C, D), hairs *p*, *q* and *r* modified into robust spines,

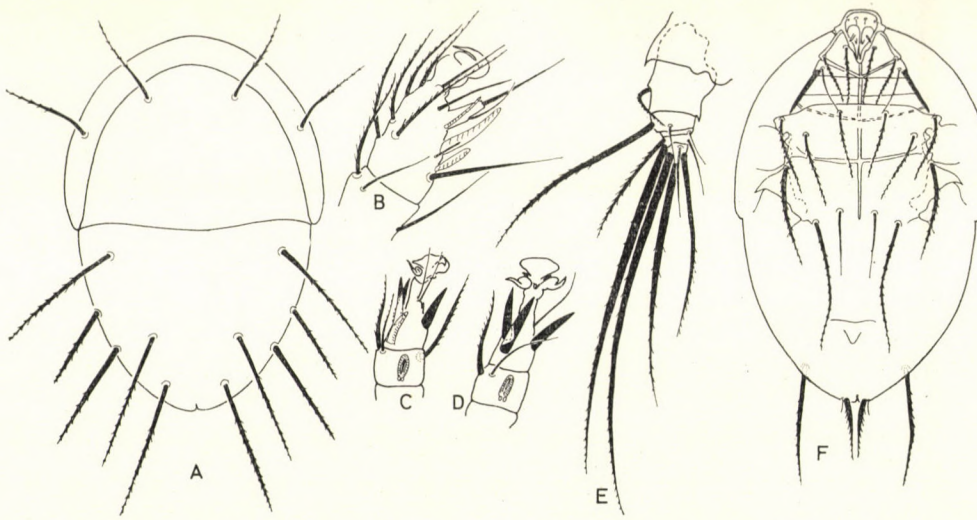

Fig. 12. *Rhynchodispus rostratus* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

tibial solenidia of peculiar configuration. Tarsus of leg IV (Fig. 12: E) strongly reduced, bearing only 4 hairs, also hairs *s* and *o* very short.

R e m a r k s: On the basis of the gnathosoma and the dissimilar configuration of leg IV, the new species is easily distinguishable from the type-species described above.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-1030p-68): No. 416-2.

Scutacarus gladifer sp. n.

Length: 285 μ, width: 254 μ.

D o r s a l s i d e (Fig. 13: A): Clypeal setae humerales internae shorter than externae, and arising behind these latter. Setae lumbales internae only slightly longer (63 μ) than setae sacrales internae (50 μ), both thin, arcuate. Setae lumbales externae and setae sacrales externae of equal length, both considerably shorter than their inner mates.

V e n t r a l s i d e (Fig. 13: D): Setae coxales II externae longest and thickest pair on anterior sternal plate. Hairs of posterior sternal plate long, all strongly ciliate. Setae poststernales internae originating considerably

anteriorly to, and along a common longitudinal line with, externae. These latter long, reaching posterior margin of body, basally incrassate. Setae caudales externae 2 longest of, and rather removed from, the other caudal hairs.

L e g s: Basis of tibiotarsus of leg I (Fig. 13: B) with a crest-shaped arcuate incrassation, deep red in color, apparently continuing also within inte-

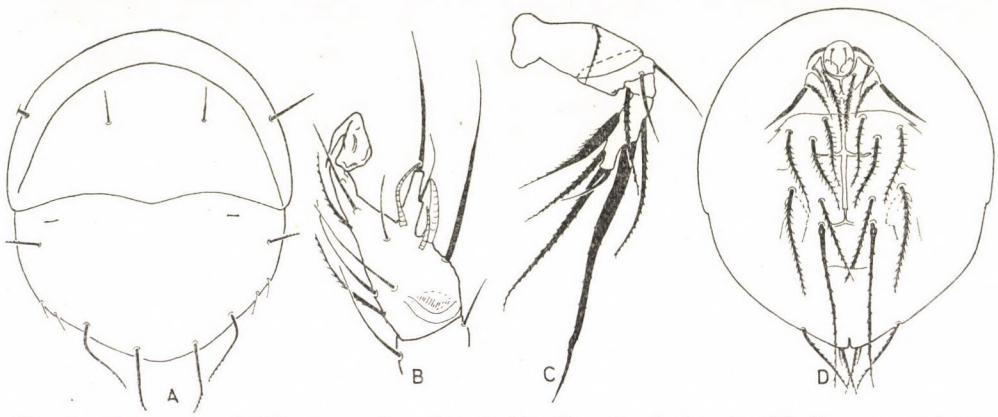

Fig. 13. *Scutacarus gladifer* sp. n. A = dorsal side; B = leg I; C = leg IV; D = ventral side

rior of leg. Claw of unusually angular shape, its configuration implying a special function. Solenidium ω_3 arising from projecting base of hair *l*, longer than considerably thicker solenidium ω_1. Leg IV (Fig. 13: C) also shaped peculiarly, femur with a ploughshare-shaped edge below, tarsus long, its hairs partly incrassate, partly reduced.

R e m a r k s: Primarily by its extraordinary legs and the shape of the claw on leg I, the new species differs from all known congeners. Its relegation to the genus *Scutacarus* is rather problematic, but the single Holotype specimen was insufficient for a more thorough examination or, rather, failed to submit characters sufficient for the establishment of a new genus.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-1031p-68): No. 380-3.

Scutacarus gyoergyi sp. n.

Length: 197—223 μ, width: 147—190 μ.

D o r s a l s i d e (Fig. 14: A): Clypeus relatively small, among its hairs setae humerales internae shorter than, and arising anteriorly to, externae. Setae dorsales of similar construction, setae lumbales internae shorter than setae sacrales internae. Setae lumbales externae shortest, whereas setae sacrales externae longest, of all other dorsal hairs.

V e n t r a l s i d e (Fig. 14: F): Setae coxales I internae much longer than all other hairs arising on anterior sternal plate. Setae presternales internae

originating considerably anteriorly to externae, and setae poststernales internae situated also anteriorly to their outer mates. Setae poststernales externae reaching posterior margin of body. All three pairs of caudal hairs arising closely adjacent to each other. Internae and externae 1 extremely long, externae 2 merely one-fourth as long as former ones.

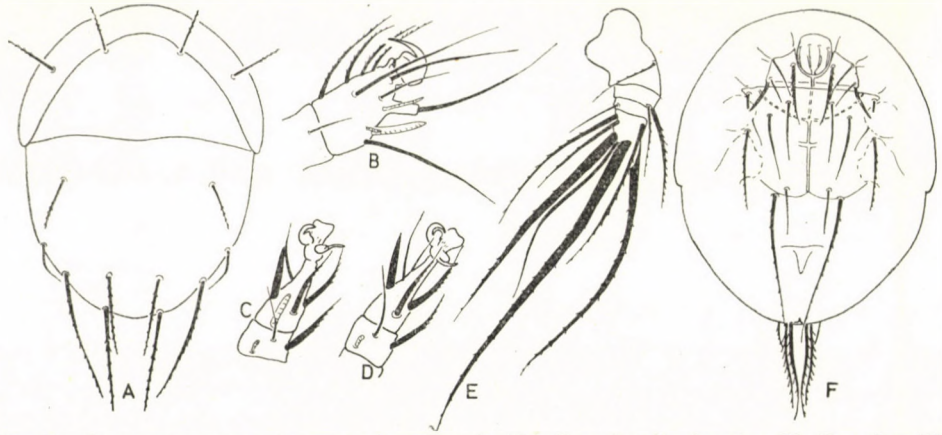

Fig. 14. *Scutacarus gyoergyi* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

L e g s: Tibiotarsus of leg I (Fig. 14: B) with a large claw, solenidium ω_1 much thicker and longer than ω_3. On tarsus of legs II and III (Fig. 14: C, D), hair *p* modified into a spine, solenidium large. On tibiotarsus of leg IV (Fig. 14: E), base of hairs *p* and *r* incrassate. Hairs *l* and *r* of equal length.

R e m a r k s: It is primarily the caudal hairs which are characteristical; those of *S. anisoclavus* MAH., 1968, and *S. marginatus* sp. n., are similar, but these latter species differ in all other features.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-1032p-68): No. 380-3; 1 ex. (Paratype: T-1033p-68): from the same locality.

I dedicate the new species, in gratitude and esteem, to J. GYÖRGY, of great help in the successful realization of the expedition.

Scutacarus koppanyi sp. n.

Length: 145—165 μ, width: 88—96 μ.

D o r s a l s i d e (Fig. 15: A): Clypeus narrow, setae humerales internae shorter than, and anteriorly to, externae. Setae dorsales, setae lumbales internae, and setae sacrales internae of increasing length in order of the above sequence, but without any essential difference in size. Setae lumbales externae and setae sacrales externae considerably shorter than their inner mates.

V e n t r a l s i d e (Fig. 15: E): All hairs very short. Setae coxales I internae strongly incrassate, turnip-shaped. Setae presternales internae aris-

ing far anteriorly to externae, failing to reach even epimere III. Poststernal hairs originating along a common imaginary transversal line. Caudal hairs small, setae caudales internae longest of them all.

L e g s: Tibiotarsus of leg I with a well developed claw, solenidium ω_3 considerably thicker and slightly longer than ω_1. On tarsus of legs II and

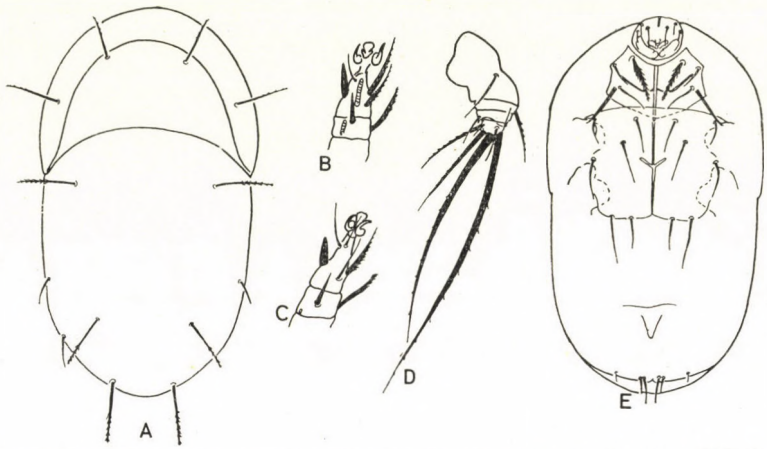

Fig. 15. *Scutacarus koppanyi* sp. n. A = dorsal side; B = leg II; C = leg III; D = leg IV; E = ventral side

III (Fig. 15: B, C), hair *p* slightly incrassate, hair *m* of tibia similarly constructed. Tibiotarsus of leg IV (Fig. 15: D) with merely 6 hairs, also hair *n* strongly reduced, hardly discernible.

R e m a r k s: A species with similarly strongly reduced leg IV from South America is the recently described *S. abatus* MAH., 1968. However, the new species can be satisfactorily distinguished from it by reason of the different configuration of the poststernal hairs and the shape of the caudal hairs.

M a t e r i a l e x a m i n e d: 1 ex. (Holotype: T-1034p-68): No. 380-3; 2 ex. (Paratypes: T-1035p-68): from the same locality.

I dedicate the new species, in gratitude, to V. KOPPÁNY, for his aid and support given to the expedition.

Scutacarus marginatus sp. n.

Length: 235—248 μ, width: 217—229 μ.

D o r s a l s i d e (Fig. 16: A): Clypeus large. Setae humerales externae longer than, and arising posteriorly to, internae. Posterior margin of posterior segments incrassate, bearing all hairs. Except for setae lumbales externae, all hairs robust, strongly ciliate.

V e n t r a l s i d e (Fig. 16: F): Hairs of anterior sternal plate short, setae coxales I internae longest of all. Anterior margin of posterior sternal plate

convexly arcuate, epimere III strong, distally expanding. Axillary hairs long. Setae poststernales externae reaching posterior margin of body, internae falling short of vulva. Setae caudales internae and externae 1 extremely long and, especially internae, incrassate. Closely adjacent externae 2 minute.

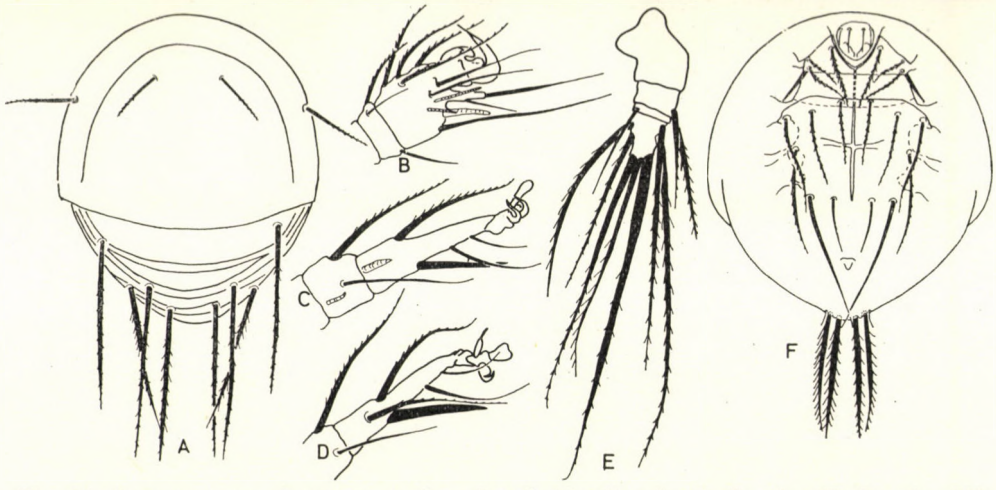

Fig. 16. *Scutacarus marginatus* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

L e g s: On tibiotarsus of leg I (Fig. 16: B), base of claw arcuately excised. Base of hair *l* long. Solenidia ω_1 and ω_3 of equal length, but former one much thicker. Tarsus of legs II and III (Fig. 16: C, D) long, solenidium of leg II arising at base of tarsus and quite small. Tibiotarsus of leg IV (Fig. 16: E) with 7 hairs, also hairs *k* and *l* very long; order of sequence in size: $p > l > r > k > s > n > o$.

R e m a r k s: The peculiarly incrassate margin of the dorsal segments, the form of the posterior sternal plate, and the characteristical caudal hairs separate the new species from all known congeners.

M a t e r i a l e x a m i n e d: 1 ex. (Holotype: T-1036p-68): No. 406; 1 ex. (Paratype: T-1037p-68): from the same locality; 2 ex. (Paratypes: T-1038p-68): No. 447-1.

Scutacarus bilobatus sp. n.

Length: 150—180 μ, width: 115—140 μ.

D o r s a l s i d e (Fig. 17: A): Two small chitinous thickenings or excrescences on posterior margin of clypeus. Setae humerales internae longer than (35 μ), and arising anteriorly to, externae. Setae lumbales externae and setae sacrales externae absent. Ratio of other dorsal hairs: setae dorsales (42 μ) > setae sacrales internae (38 μ) > setae lumbales internae (30 μ).

Ventral side (Fig. 17: E): All hairs short, setae poststernales originating on a common, imaginary transversal line, externae longer than internae. Also poststernal hairs short, even setae poststernales externae failing to reach vulva. Caudal hairs also short, setae caudales externae 2 slightly incrassate, spiniform.

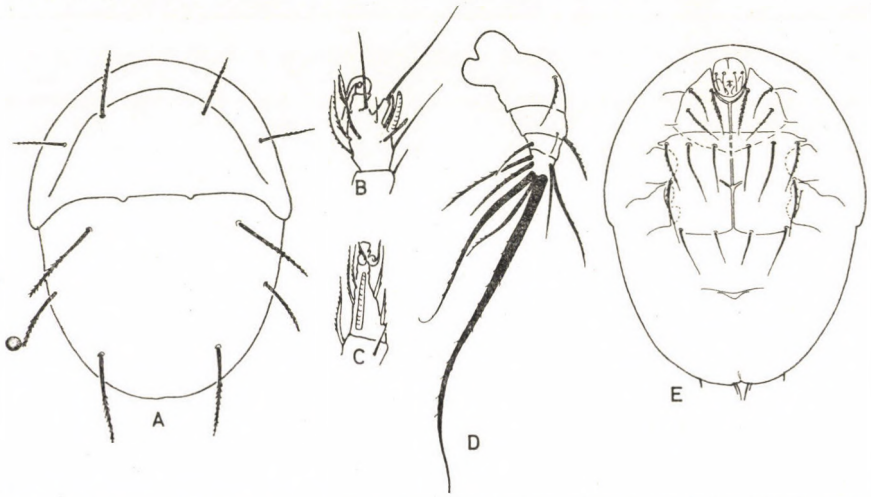

Fig. 17. *Scutacarus bilobatus* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg IV; E = ventral side

Legs: On tibiotarsus of leg I (Fig. 17: B), tip of claw long, recurved. Solenidium ω_1 considerably longer and thicker than ω_3. On tarsus of leg II (Fig. 17: C), solenidium strikingly elongate, extending nearly to claws. Leg IV (Fig. 17: D) with 7 hairs on tibiotarsus, hair *s* much shorter than hair *r*.

Remarks: Of the species with incomplete numbers of hairs, *S. ineptus* MAH., 1968, described from Paraguay, stands nearest to the new species. However, the ratio to each other of the dorsal hairs is completely different, the tarsus of leg II has no long solenidium similar to that of the new taxon, nor do its presternal hairs arise along a common transversal line.

Material examined: 1 ex. (Holotype: T-1039p-68): No. 406; 1 ex. (Paratype: T-1040p-68): No. 436; 2 ex. (Paratypes: T-1058p-68): No. 447-3; 1 ex. (Paratype: T-1041 p-68): No. 447-5.

Scutacarus propinquus sp. n.

Length: 155—180 μ, width: 112—125 μ.

Dorsal side (Fig. 18: A): Among clypeal hairs, setae humerales externae longer than, and arising posteriorly to, internae. Setae dorsales even longer than both preceding ones, but shorter than setae lumbales internae. Setae lumbales externae only one-fourth as long as setae sacrales externae.

V e n t r a l s i d e (Fig. 18: F): All hairs of both sternal plates thin and short. Setae poststernales closely adjacent to one another, but setae poststernales internae situated anteriorly to externae. Posterior extremity of body characteristically elongated, caudal hairs long, internae somewhat longer than slightly thicker externae 1. Setae caudales externae 2 removed, merely half as long as preceding ones.

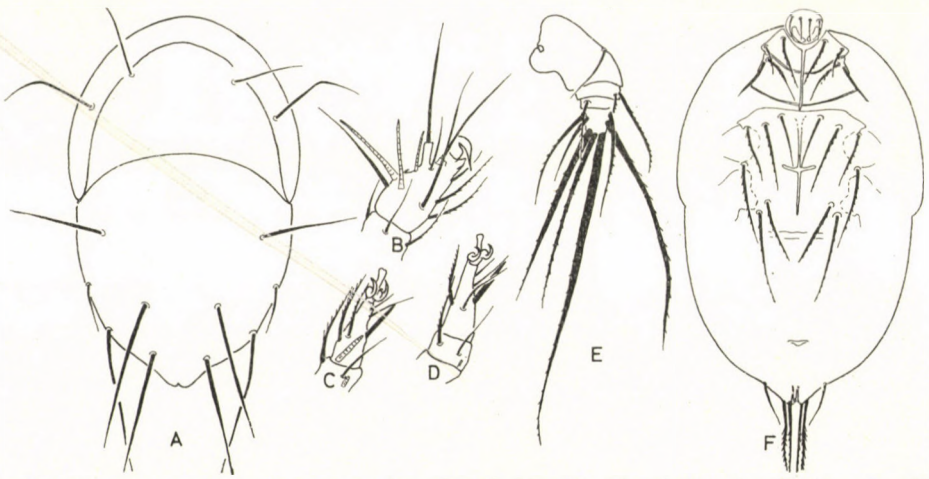

Fig. 18. *Scutacarus propinquus* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

L e g s: Tibiotarsus of leg I (Fig. 18: B) with unusually shaped and long solenidia; solenidium ω_1 almost as long as hair *j*, solenidium ω_2 is also nearly half as long. On tarsus of legs II and III (Fig. 18: C, D), hair *p* transformed into a thick spine. Tibiotarsus of leg IV (Fig. 18: E) with 7 hairs, hairs *r* and *s* of equal length, hair *p* longer than all other ones.

R e m a r k s: There was, until now, no species known with a solenidium as long as hair *j* on the tibiotarsus of leg I. The characteristical hind extremity of the body and the location of the poststernal hairs are also excellent distinguishing features.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-1042p-68): No. 416-1; 2 ex. (Paratypes: T-1043p-68): from the same locality.

Scutacarus esposi sp. n.

Length: 202 μ, width: 170 μ.

D o r s a l s i d e (Fig. 19: A): Clypeal hairs arising on a common imaginary transversal line, all of equal length. Setae dorsales similar to preceding ones, setae lumbales internae and setae sacrales internae longer, characteristically reclining toward each other. Setae lumbales externae and setae sacrales externae of equal length but shorter than their inner mates.

Ventral side (Fig. 19: E): Posterior margin of anterior sternal plate sinuous. Hairs short, setae coxales I internae being longest of all, incrassate, turnip-shaped, and strongly ciliate. Distal ends of epimere III on posterior sternal plate bifurcating. Presternal hairs short, setae presternales internae failing to reach even epimere III, nor even externae projecting far beyond it.

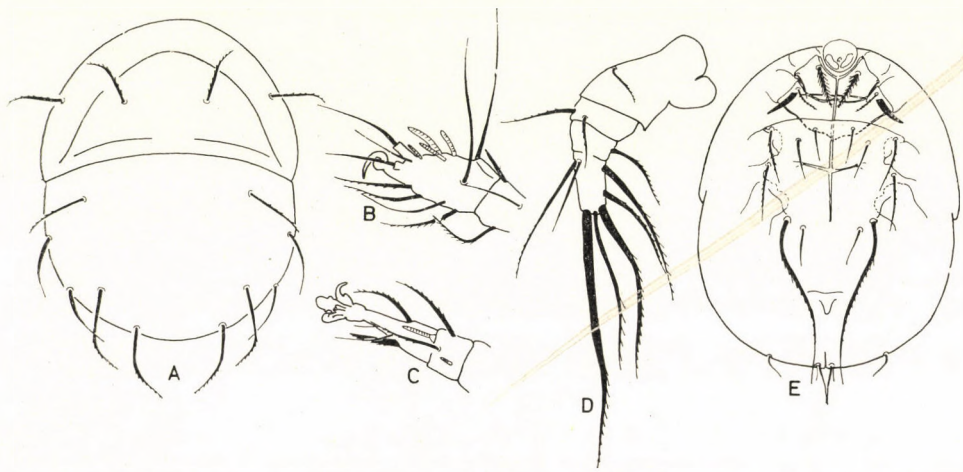

Fig. 19. *Scutacarus esposi* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

Setae poststernales externae long, arising anteriorly to internae, projecting beyond posterior margin of body. Three pairs of caudal hairs present, internae nearly thrice longer than closely adjacent externae 1.

Legs: On tibiotarsus of leg I (Fig. 19: B), hair *l* short, hair *j* considerably longer. Solenidium ω_3 shortest of all, solenidium ω_1 longest and thickest. Solenidium on tarsus of leg II (Fig. 19: C) minute. Tibiotarsus of leg IV (Fig. 19: D) slightly elongated, base of hairs *r* and especially that of *p* incrassate. Hair *s* shorter than hair *r*.

Remarks: The dorsal and ventral chaetotaxy of the new species is highly similar to that of *S. nutatius* MAH., 1968. However, the poststernal hairs of this latter species show a different location (setae poststernales externae arising posteriorly to internae), they fail to reach the posterior end of the body, and the ratio of their dimensions is also dissimilar. The chaetotaxy and form of the legs (tibiotarsus IV of the known species is not elongated) also show considerable differences.

Material examined: 1 ex. (Holotype: T-1044p-68): No. 421-1.

I dedicate the new species to H. ESPOS, Guayaramerin, an active participant in the collecting activities of the expedition.

Scutacarus subpectinatus sp. n.

Length: 205 μ, width: 162 μ.

D o r s a l s i d e (Fig. 20: A): Clypeus small, hairs short. Setae dorsales similarly construed. Setae lumbales internae and setae sacrales internae as well as externae robust, well ciliated, but setae lumbales externae minute.

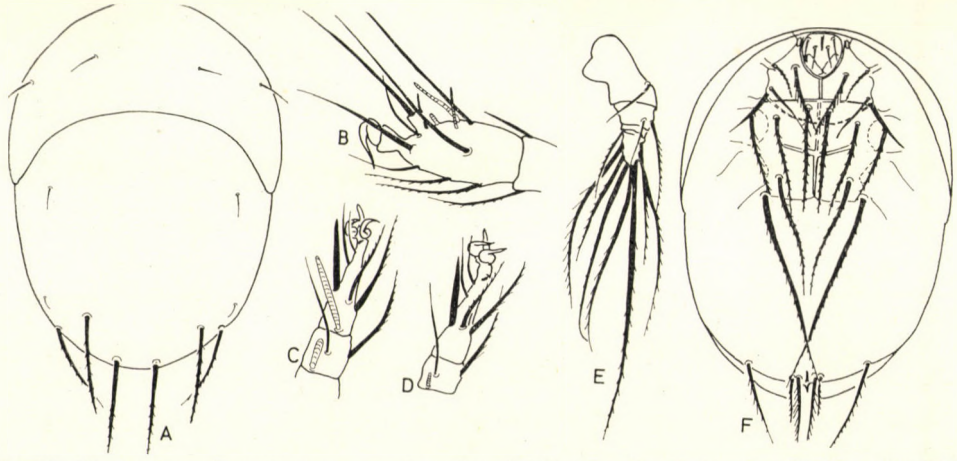

Fig. 20. *Scutacarus subpectinatus* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

V e n t r a l s i d e (Fig. 20: F): Highly similar to *S. pectinatus* MAH., 1968, and *S. benicus* sp. n., described hereunder. Setae coxales I internae very robust, unilaterally elongately ciliated. Setae pre- and poststernales long, also setae poststernales internae projecting beyond vulva. Setae caudales externae 2 longest among caudal hairs, but much more sparsely ciliated than setae caudales internae.

L e g s: On tibiotarsus of leg I (Fig. 20: B), base of hair *l* not strikingly long, solenidium ω_3 shorter and thinner than sigmoid solenidium ω_1. Tarsus of legs II and III (Fig. 20: C, D) with hair *p* modified into a spine, solenidium extremely long, not shorter than hair *p*. Suctorial plates pointed. On tibiotarsus of leg IV (Fig. 20: E), hair *l* longer than hair *k*, apically gradually attenuating, setiform.

R e m a r k s: Inferences as to the systematical position of the new species are given under *S. pectinatus* MAH., 1968, below.

M a t e r i a l e x a m i n e d: 1 ex. (Holotype: T-1045p-68): No. 432-1; 2 ex. (Paratypes: T-1046p-68): No. 447-5.

Scutacarus benicus sp. n.

Length: 267—298 μ, width: 204—242 μ.

D o r s a l s i d e (Fig. 21: A): Clypeus large, its hairs short. Dorsal plates with obscure, hardly discernible, fine longitudinal striation. Setae dorsa-

les and setae lumbales internae as short as preceding ones, setae sacrales internae somewhat longer. Setae lumbales externae and setae sacrales externae minute.

V e n t r a l s i d e (Fig. 21: F): Dorsal hairs of gnathosomatic base strikingly robust. Epimere I of anterior sternal plate very robust, setae coxales

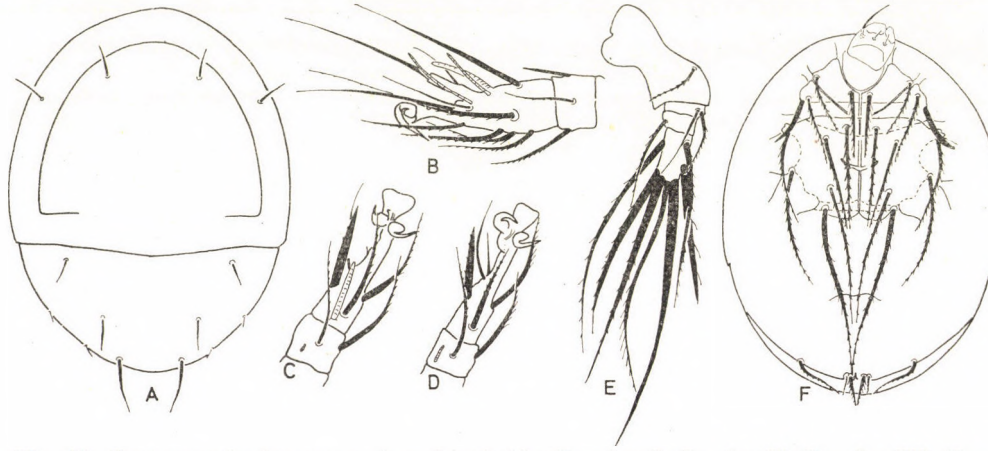

Fig. 21. *Scutacarus benicus* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

I internae thick, turnip-shaped. All hairs of posterior sternal plate very long and strongly ciliate. Setae presternales internae longer than externae, and also these latter projecting behind points of origin of poststernal hairs. Setae poststernales internae extending beyond vulva. Three pairs of caudal hairs present, setae caudales externae 2 longest of all, setae caudales internae basally slightly incrassate.

L e g s: Tibiotarsus of leg I (Fig. 21: B) elongate, all hairs and solenidia also very long. Also base of hair *l* large, emitting even hair *k*. Solenidium ω_3 longer but considerably thinner than solenidium ω_1. On tarsus of legs II and III (Fig. 21: C, D), hair *p* modified into a thick spine, but laterally with 2—3 cilia still visible; solenidium here essentially shorter. Tibiotarsus of leg IV (Fig. 21: E) slightly elongate, hair *l* spiniform and shorter than hair *k*.

R e m a r k s: Inferences as to the systematic status of the new species are given under *S. pectinatus* MAH., 1968, below.

M a t e r i a l e x a m i n e d: 1 ex. (Holotype: T-1047p-68): No. 432-2; 1 ex. (Paratype: T-1048p-68): from the same locality.

Scutacarus pauper boliviensis ssp. n.

Highly similar to the nominate form recently described from Paraguay. However, the specimens originating from Bolivia also exhibit characteristics which are constant and sufficiently justify a subspecific separation.

Length: 175—225 μ, width: 100—138 μ.

D o r s a l s i d e (Fig. 22: A): Dorsal hairs of divers length and, excepting clypeal ones, longer than those of the nominate subspecies (setae dorsales: 43 μ, setae lumbales internae: 51 μ, setae sacrales internae: 33 μ).

V e n t r a l s i d e (Fig. 22: C): Setae presternales internae considerably shorter than externae.

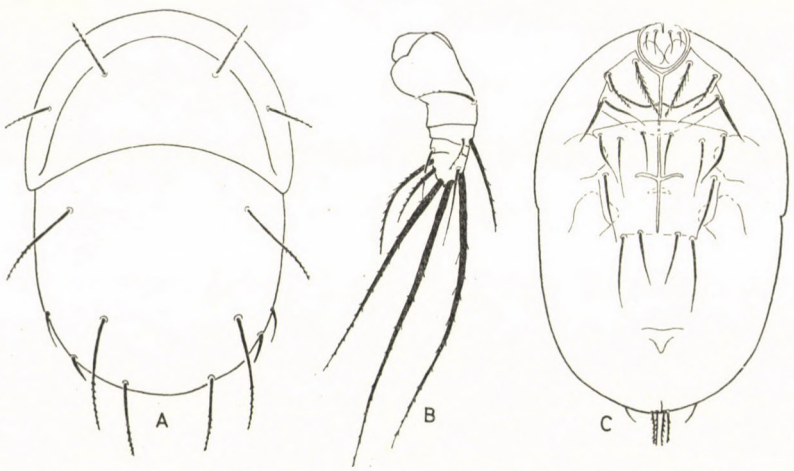

Fig. 22. *Scutacarus pauper boliviensis* ssp. n. A = dorsal side; B = leg IV; C = ventral side

L e g s: Tibiotarsus of leg IV (Fig. 22: B) emitting, similarly to nominate subspecies, 6 hairs, but hair *l* shorter than hair *p*.

R e m a r k s: The features given in the description separate the new subspecies from the nominate form.

M a t e r i a l e x a m i n e d: 1 ex. (Holotype: T-1049p-68): No. 421-1; 5 ex. (Paratypes: T-1050p-68): from the same locality; 8 ex. (Paratypes: T-1051p-68): No. 448-1; 3 ex. (Paratypes: T-1052p-68): No. 449-1; 6 ex. (Paratypes: T-1057p-68): No. 452-1.

Scutacarus loricatus sp. n.

Length: 135 μ, width: 120 μ.

D o r s a l s i d e (Fig. 23: A): Setae dorsales and clypeal hairs of equal length and somewhat longer than all other dorsal hairs; no essential difference in dimensions between these latter ones. All hairs thin and finely ciliate.

V e n t r a l s i d e (Fig. 23: D): Anterior sternal plate small, its hairs short. Posterior sternal plate widely expanding, partially covering basal joints of legs. Presternal hairs short, axillary hairs very robust, slightly incrassate. Setae poststernales internae short, half as long as externae, but not even these latter reaching posterior margin of body. Three pairs of closely adjacent caudal hairs, setae caudales externae 2 merely half as long as the two other pairs of caudal hairs.

L e g s: Tibiotarsus of leg I (Fig. 23: B) with an enormous, elongately pointed claw. Solenidium ω_3 long, arcuate, solenidium ω_1 shorter but thicker. Tarsus of legs II and III with hair *p* modified into a spine. Tibiotarsus of leg IV (Fig. 23: C) with 7 hairs, hairs *p* and *r* strongly incrassate basally. Hair *s* shorter than both former ones, and also much thinner.

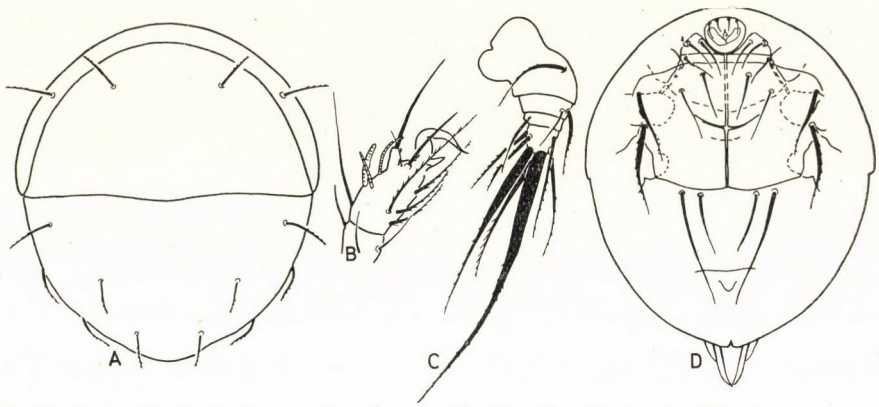

Fig. 23. *Scutacarus loricatus* sp. n. A = dorsal side; B = leg I; C = leg IV; D = ventral side

R e m a r k s: The extreme expansion of the posterior sternal plate was hitherto unknown among the South American species. The new species resembles the taxa relegated to the genus *Lamnacarus* BAL. et MAH., 1963, but its other features fail to show any nearer relationship with them, hence I provisionally assign it to the genus *Scutacarus*.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-1053p-68): No. 451.

Scutacarus mamoricus sp. n.

Length: 117—138 μ, width: 109—125 μ.

D o r s a l s i d e (Fig. 24: A): Clypeal hairs considerably shorter than all other dorsal ones. Setae lumbales externae and setae sacrales externae reduced, however, the other remaining 3 pairs of hairs strikingly long (setae dorsales: 69 μ, setae lumbales internae: 70 μ, setae sacrales internae: 51 μ).

V e n t r a l s i d e (Fig. 24: E): Hairs of anterior sternal plate longer than those arising on posterior sternal plate. Setae presternales externae originating anteriorly to internae. Setae poststernales externae approximately twice longer than setae poststernales internae, arising slightly posteriorly to them. Setae caudales internae and externae 1 subequal, ciliate. Externae 2 minute, arising slightly removed.

L e g s: Tibiotarsus of leg I (Fig. 24: B) with a well developed claw, solenidium ω_3 longer than ω_1, but also much thinner. Tarsus of leg II as shown

on Fig. 24: C. Tibiotarsus of leg IV (Fig. 24: D) with 7 hairs, hair *p* considerably more robust than all other ones, hair *s* shorter than hair *r*.

R e m a r k s: No species with such long dorsal hairs (about 70 μ) were hitherto known in the "*deficiens*"-group. The location of the setae presternales is also a good distinguishing character; these hairs arise, in the known con-

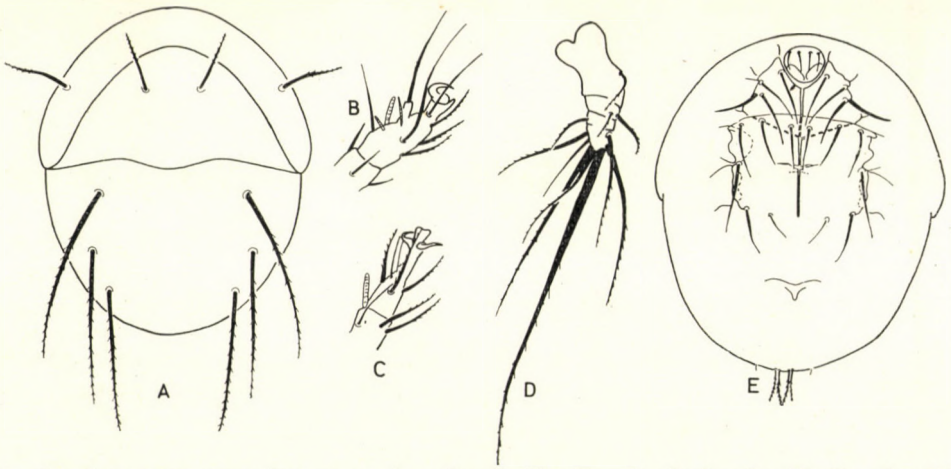

Fig. 24. *Scutacarus mamoricus* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg IV; E = ventral side

geners, either along a common transversal line or the setae presternales internae originate anteriorly to the externae.

M a t e r i a l e x a m i n e d: 1 ex. (Holotype: T-1054p-68): No. 452-1; 2 ex. (Paratypes: T-1055p-68): from the same locality.

Scutacarus orbiculatus sp. n.

Length: 127 μ, width: 132 μ.

D o r s a l s i d e (Fig. 25: A): Clypeal hairs as well as setae dorsales thin and short. Setae lumbales internae and setae sacrales internae considerably longer, yet also thin and setiform. Setae lumbales externae and setae sacrales externae short, but basally thickened, spiniform, carrying merely 3—4 lateral cilia on their external side.

V e n t r a l s i d e (Fig. 25: F): Setae presternales short. Setae poststernales externae extremely long, projecting far beyond posterior margin of body. Setae poststernales internae arising on a common line with former ones, but much shorter, not reaching even vulva. Setae caudales internae and externae 1 extraordinarily long, strongly ciliate; setae caudales externae 2 arising not far removed from them, considerably shorter, smooth.

L e g s: Solenidium ω_1 on tibiotarsus of leg I (Fig. 25: B) thicker and slightly longer than solenidium ω_3. On tarsus of legs II and III (Fig. 25: C, D),

hair *p* modified into a spine. Tibiotarsus of leg IV (Fig. 25: E) with 7 hairs, hairs *r* and *s* of equal length, hair *l* longer than pair *p*.

R e m a r k s: With regard to external habits and the chaetotaxy of the legs, the new species shows a certain similarity to *S. dudichi* MAH., 1968. However, the incrassate dorsal hairs, the poststernal hairs (essentially longer than in the preceding one), and the ratio of the dimensions of the dorsal hairs, are differences of such proportions that they satisfactorily justify the establishment of a distinct species.

M a t e r i a l e x a m i n e d : 1 ex. (Holotype: T-1056p-68): No. 447-2.

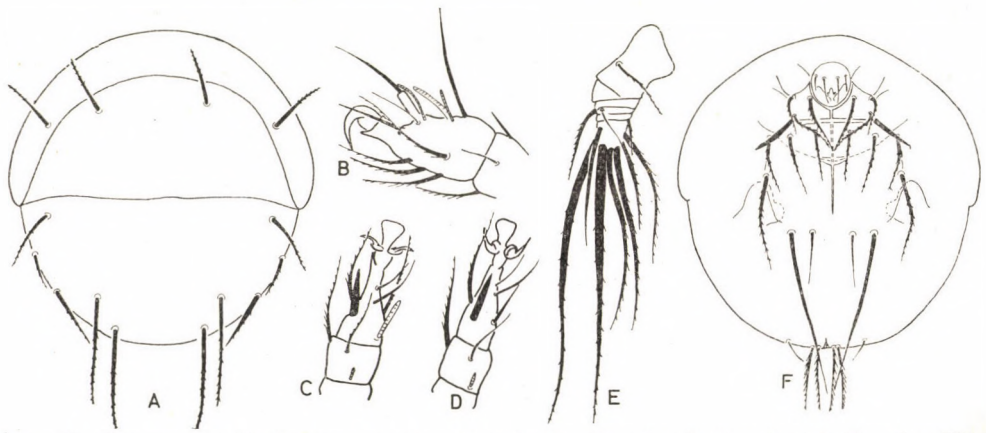

Fig. 25. *Scutacarus orbiculatus* sp. n. A = dorsal side; B = leg I; C = leg II; D = leg III; E = leg IV; F = ventral side

Scutacarus pectinatus MAHUNKA, 1968

The species, recently described from Paraguay, was found to occur in several samples deriving also from tropical Bolivia. In these materials, however, there were found also two further forms, in several respects similar to this species. In all three forms, there is a discernible striation on the posterior segments of the body, and the clypeal hairs as well as the setae dorsales are strikingly short. The ventral chaetotaxy is almost completely identical, and the lengths and locations of the points of origin of the setae pre- and poststernales are also remarkable. The evolvement of the caudal hairs also refers to a wellnigh identical type. There is a number of similarities in the chaetotaxy of the legs, especially with respect to legs IV. Despite the considerable similarities, however, there are also features which reveal differences of such significance that, according to our present informations, they have to be regarded as distinct specific taxa, and thus I introduce in the present paper the two new forms under the names *S. subpectinatus* sp. n., and *S. benicus* sp. n.

The main differences between the three species are as follows:

The very distinct structure of *S. pectinatus* is absent from the other two species, they are merely weakly striated. In *S. benicus* sp. n., the setae lumbales externae and the setae sacrales externae are of equal length, and both extremely short. In the other two species, the setae sacrales externae are essentially longer than the setae lumbales externae. On the leg of *S. benicus* sp. n., hair *l* is shorter than hair *k*, and modified into a spine. In *S. pectinatus* MAH., and *S. subpectinatus* sp. n., hair *l* is longer than hair *k*, nor is its shape modified. The main difference between these two latter species lies, aside of the dorsal structure, in the solenidia of leg I and especially leg II, insofar as the solenidia on the tarsus of the presently described new species are longer than hair *p*, whereas they are merely half as long in *S. pectinatus* MAH. The caudal hairs also reveal certain differences.

Species already known from recent investigations but new for the fauna of Bolivia are:

Pygmodispus adjacens MAHUNKA, 1968: No. 447-3
Imparipes zicsii MAHUNKA, 1968: Nos. 432-1 447-1 452-1
Telodispus uniformis MAHUNKA, 1968: No. 452-2
Scutacarus andrassyi MAHUNKA, 1968: Nos. 416-1, 431-1, 432-1, 447-2, 452-1, 352-2, 455-1
Scutacarus australis MAHUNKA, 1963: No. 406
Scutacarus exaratus MAHUNKA, 1968: No. 416-1
Scutacarus muscorum VITZTHUM, 1924: Nos. 447-1
Scutacarus perditus MAHUNKA, 1968: No. 455-1
Scutacarus pectinatus MAHUNKA, 1968: Nos. 447-2, 447-5, 450
Scutacarus subconfertus MAHUNKA, 1968: Nos. 406, 416-1, 416-2, 421-1, 432-1, 447-1, 447-2, 447-8, 447-8, 441-5, 451

REFERENCES

1. ANDRÁSSY, I., BALOGH, J., LOKSA, I., MAHUNKA, S. & ZICSI, A. (1967): Fauna Paraguayensis. 1. Report on the Collectings. — Folia Ent. Hung., **20**, p. 297—308.
2. BALOGH, J., MAHUNKA, S. & ZICSI, A. (1969): The Scientific Results of the Hungarian Soil Zoological Expeditions to South America. 14. Report on the Collectings of the Second Expedition. — Folia Ent. Hung., **22** (in print).
3. EVANS, G. O. (1952): Terrestrial Acari new to Britain II. — Ann. Mag. Nat. Hist., (12) **5**, p. 660—675.
4. JACOT, P. (1936): An undescribed Pediculoid mite from the Southern Appalachians. — Canad. Entomol., **68**, p. 82—85.
5. KRCZAL, H. (1959): Systematik und Ökologie der Pyemotiden. — In: STAMMER, H. J.: Beiträge zur Systematik und Ökologie mitteleuropäischer Acarina, **1** (2), p. 385—625.
6. MAHUNKA, S. (1963): The Zoological Results of Gy. Topál's Collectings in South Argentine. 8. Scutacaridae (Acarina). — Ann. Hist.-nat. Mus. Nat. Hung., **55**, p. 501—507.
7. MAHUNKA, S. (1965): Identification Key for the Species of the Family Scutacaridae (Acari: Tarsonemini). — Acta Zool. Hung., **11**, p. 353—401.

8. MAHUNKA, S. (1968): The Scientific Results of the Hungarian Soil Zoological Expedition to South America. 4. Acari: Scutacaridae I. A Survey of the Scutacarid Fauna of Chile. — Acta Zool. Hung., **14**, p. 139—166.
9. MAHUNKA, S. (1968): Fauna Paraguayensis. 3. Acari: Pyemotidae and Scutacaridae. — Acta Zool. Hung., **14**, p. 407—425.
10. MAHUNKA, S. (1968): The Scientific Results of the Hungarian Soil Zoological Expedition to South America. 3. Beiträge zur Kenntnis der Scutacariden-Fauna Argentiniens (Acarina: Tarsonemini) — Opusc. Zool. Budapest, **8**, p. 63—79.
11. PAOLI, G. (1911): Monografia dei Tarsonemini. — Redia, **7**, p. 217—281.

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NEUE MOLLUSKEN AUS BULGARIEN (GASTROPODA: HELICIDAE)

Von

L. PINTÉR (Budapest)

(Eingegangen am 15. August 1968)

Die Helicidenfauna Bulgariens ist zur Zeit noch sehr wenig erforscht. Die meisten Literaturangaben und Beschreibungen stützen sich auf Schalenmerkmale allein, die aber keine zureichende Vorstellung von den systematischen und verwandtschaftlichen Beziehungen der einzelnen Arten und Rassen geben können.

Bei meiner zweiten Sammelreise in Bulgarien — Sommer 1968, teils gemeinsam mit meinem Vater, dem ich für seine selbstlose Hilfe auch hier danken möchte — hatte ich vor möglichst lebende Exemplare zu sammeln und so Beiträge auch zur systematischen Anatomie zu liefern. Das außerordentlich trockene Wetter vereitelte diesen Plan zum Teil, weshalb in meinen Untersuchungen Unklarheiten und weitere Probleme bleiben.

Helicella obvia razlogi subsp. nov.

D i a g n o s e: Eine Unterart des Formenkreises von *Helicella obvia* (HARTMANN), die sich von allen bekannten Rassen durch ihre extreme Kleinheit und durch das sehr hohe Gewinde unterscheidet.

B e s c h r e i b u n g: Gehäuse klein, gedrückt kugelig mit konisch erhobenem Gewinde. Spitze meistens kaum abgestumpft. Auf den oberen Umgängen sehr fein, dicht und regelmäßig rippenstreifig, auf den unteren fast geglättet. Gelblich-weiß, glänzend mit braunen Bändern, die unteren oft in Fleckchen aufgelöst, die Zahl der Bänder veränderlich. Umgänge $5^1/_4$—$5^3/_4$, gut gerundet, der letzte vorn wenig herabsteigend. Mündung kreisförmig, schief gestellt, vom letzten Umgang kaum ausgeschnitten; Mundsaum scharf, nicht erweitert, innen, weit zurückliegend, mit einer schwachen Schwiele. Nabel weit, fast perspektivisch, alle Umgänge zeigend (Taf. I, Abb. 4—7).

Maße des Holotypus: H. 8,1 mm, Br. 12,3 mm.

G e n i t a l o r g a n e: wie bei der Nominatform (Abb. 1, Praep. 139).

M a t e r i a l: Holotypus (Schale) und 3 Paratypen in der Molluskensammlung des Ungarischen Naturwissenschaftlichen Museums zu Budapest, die Genitalorgane des Holotypus und 81 Paratypen (fast alle in Alkohol) in der Sammlung des Verfassers.

L o c u s t y p i c u s: Bulgarien, Pirin-Gebirge, ca. 850 m ü. d. M., etwa 2 km südwestlich von der Stadt Razlog, am 22. VII. 1968 gesammelt (L. PINTÉR).

Ökologie und Beziehungen: Die neue Unterart lebt ähnlich wie *Helicella obvia obvia* (HARTM.) auf einer sonnigen Wiese. Ihr Lebensraum ist eine Fläche von 16—20 Quadratmetern, wo sie in überraschend großer Anzahl — 100—150 Stück/m² — zu finden ist. Anderswo in der ganzen Gegend lebt übrigens *Helicella obvia obvia* (etwa 10—12 Exemplare auf jedem Quadratmeter), ausgenommen jene kleine Fläche, wo *Helicella obvia razlogi* subsp. nov. vorkommt; sie scheinen einander auszuschließen. Es ist wichtig zu erwähnen, daß ich *Helicella obvia razlogi* subsp. nov. auf dem Boden, an morschen Holzstücken, unter dem Gras fand, während *Helicella obvia obvia* meist an Pflanzen hochgeklettert lebt.

Die Genitalien der neuen Unterart stimmen mit jenen von *Helicella obvia obvia* überein. Die Schalenform, die Dimensionen (die durchschnittliche Größe der Gehäuse von *Helicella obvia obvia* vom selben Biotop beträgt 17,0 mm), die Bänderung (alle Stücke der neuen Unterart sind regelmäßig gebändert, während die gesammelten Exemplare der Nominatform vielfach ungebändert sind) sowie die Lebensweise weisen so große Unterschiede auf, daß sich die beiden auch systematisch trennen lassen. Es kann aber vorläufig nicht geklärt werden, wie sich diese neue Entwicklungsrichtung der vermutlichen Stammform anschließt (genetische Mutation?).

Helicella? depulsa spec. nov.

Diagnose: Eine Art aus der Unterfamilie Helicellinae (Gattung *Helicella?*), mit einem sehr weiten Nabel und schmalen Umgängen.

Beschreibung: Gehäuse mittelgroß (Taf. I, Abb. 1—3), scheibenförmig, mit wenig erhobenem Gewinde. Sehr fein, regelmäßig rippenstreifig. Gelblichweiß, verloschen gebändert, mit bräunlichem Anflug. Umgänge 5—$5^1/_4$, gut gerundet (nur bei jungen Exemplaren erscheint eine stumpfe Kante), verhältnismäßig schmal, der letzte gegen die Mündung etwas herabsteigend. Naht mäßig tief. Mündung fast kreisförmig, schief, wenig ausgeschnitten; Mundsaum scharf, nicht besonders erweitert, innen mit einer nach außen gelblich durchscheinenden Lippe belegt. Nabel sehr weit perspektivisch, alle Umgänge deutlich treppenförmig zeigend. Tier unbekannt.

Maße des Holotypus: H. 7,1 mm, Br. 15,0 mm.

Material: Holotypus und 1 Paratypus im Naturwissenschaftlichen Museum in Budapest, 10 Paratypen in der Sammlung des Verfassers. Es wurden nur leere Schalen gefunden.

Locus typicus: Bulgarien, Beloslav (westlich von Varna), in der Anschwemmung des Gebedžensko ezero (am östlichen Ufer), 19. VII. 1968 (leg. L. PINTÉR). Die Art lebt, allem Anschein nach, irgendwo am westlichen Ufer des Sees, das ich leider nicht aufsuchen konnte. Es ist auch nicht ausgeschlossen, daß sie durch Bäche aus größerer Entfernung herabgespült ist.

Beziehungen: Die neue Art weist eine gewisse Ähnlichkeit mit zwei Gruppen der Familie Helicidae auf. Von der siebenbürgischen *Helicopsis*

instabilis talmacensis (CLESSIN) kann sie durch den noch breiteren Nabel, den regelmäßig gerundeten letzten Umgang und durch ihre nicht gerippte Schale getrennt werden. Von *Helicella itala* (LINNÉ) unterscheidet sie sich vor allem durch ihre weniger schiefe und kaum erweiterte Mündung und den mehr perspektivischeren Nabel.

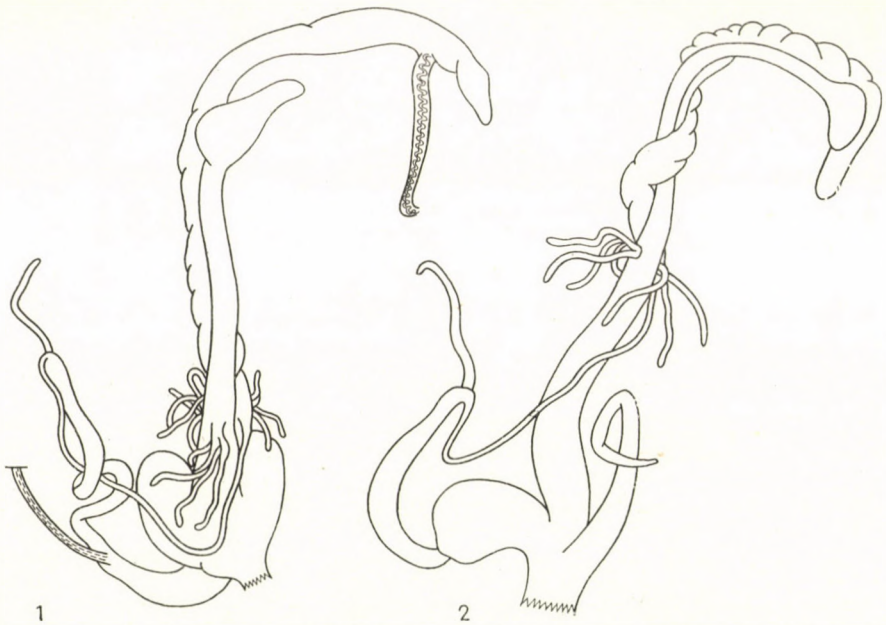

Abb. 1—2. 1 = Genitalorgane von *Helicella obvia razlogi* subsp. nov. (Holotypus), 2 = Genitalorgane von *Monacha venusta* spec. nov. (Holotypus)

Ob diese neue Art zur Gattung *Helicella* FÉRUSSAC gehört oder zu *Helicopsis* FITZINGER (in die Verwandtschaft von *Helicopsis instabilis talmacensis*) gestellt werden muß, kann ohne anatomische Untersuchungen nicht gesagt werden.

Monacha venusta spec. nov.

D i a g n o s e: Eine kleine Art der Gattung *Monacha* FITZINGER, die sich durch ihre ungewöhnlich lange Vagina auszeichnet.

B e s c h r e i b u n g: Gehäuse (Taf. I, Abb. 8—10) klein, dünnschalig, hornfarben; an eine halbwüchsige *Monacha cartusiana* (MÜLLER) erinnernd, von welcher sie sich aber durch die Schalenform und die Farbe unterscheidet. Umgänge 5—$5^1/_4$. Mundsaum scharf, nicht erweitert, die Mündung innen mit einer sehr schmalen und vielmals fast unmerklichen flachen Lippe versehen. Nabel eng, vom Spindelrand etwas verdeckt.

Maße des Holotypus: H. 6,6 mm, Br. 9,8 mm.

Genitalorgane: Charakteristisch für die Gattung *Monacha* (Penisretraktor fehlt, der rechte Ommatophorenretraktor liegt frei neben den Genitalien). Penis dick, etwas angeschwollen, von dem schlanken, 1,5mal längeren Epiphallus scharf abgegrenzt. Flagellum etwas kürzer als der Epiphallus. Vagina sehr lang, länger als Penis und Epiphallus zusammen. Die Appendicula, die in die Vagina an ihrem basalen Abschnitt mündet, ist schlank schlauchförmig, gleichmäßig verjüngt (also nicht aus zwei Teilen bestehend wie bei *Monacha cartusiana*), etwas länger als der Epiphallus. Glandulae mucosae: zwei Büschel vorhanden, mit verhältnismäßig schlanken Schläuchen, die am basalen Teil des Truncus receptaculi inserieren. Blasenstiel etwa gleich lang wie die Vagina, gleichmäßig schmal; Receptaculum seminis nicht groß, gerundet dreieckig (Abb. 2, Praep. 140).

Material: Holotypus (Schale) im Naturwissenschaftlichen Museum (Budapest), Genitalorgane des Holotypus und 16 Paratypen in der Sammlung des Verfassers.

Locus typicus: Bulgarien, am rechten Ufer des Flusses Ropotamo, etwa 1,5 km östlich von der unteren Brücke, unter Andesitsteinen auf einer Wiese. Gesammelt am 10. und 14. VII. 1968 von I. und L. PINTÉR.

Beziehungen: Die anatomischen Verhältnisse grenzen alle in der Schalenform ähnliche Arten ab. Außerdem kenne ich keine andere Art der Gattung, die unter Steinen lebte.

Monacha? pilosa spec. nov.

Diagnose: Eine kleine behaarte Art, die sich von ihren vermutlich nächsten Verwandten (*Monacha*-Arten) durch ihre Dimensionen und Schalenform unterscheidet.

Beschreibung: Gehäuse (Taf. I, Abb. 11—14) sehr klein, mit deutlich erhobenem spitzkuppelförmigem Gewinde; dicht gestreift und leicht gehämmert, mit äußerst kurzen und feinen hinfälligen Härchen bedeckt. Dunkel hornfarben, manchmal mit Andeutung eines hellen Peripheriebandes. Umgänge 5—5¼, der letzte anfangs etwas stumpfkantig, dann breit gerundet, seitlich nicht gedrückt, gegen die Mündung zu unter die Peripherie des vorletzten herabsteigend. Basis nicht abgeflacht. Mündung schief, wenig breiter als hoch. Mundsaum scharf, nicht erweitert, innen mit einer weißlichen Lippe belegt, die besonders bei der Ansatzstelle des Außenrandes vom Rande zurücktritt und nach außen gelblich durchscheint. Spindelrand stark umgeschlagen, so daß vom Nabel nur ein kleiner Ritz offen bleibt. Auf der Mündungswand ein breiter weißlicher Kallus vorhanden. Tier unbekannt.

Maße des Holotypus: H. 6,0 mm, Br. 8,0 mm.

Material: Holotypus und 1 Paratypus im Naturwissenschaftlichen Museum (Budapest), 30 Paratypen in der Sammlung des Verfassers.

Locus typicus: Bulgarien, Ropotamo-Gegend, am linken Ufer: zwischen dem Dorf Veselie und dem Fluß, entlang der Landstraße Veselie — Jasna Poljana; am rechten Ufer: von der Straßenbrücke Veselie — Jasna Poljana bis zur unteren Brücke (Landstraße Sozopol — Primorsko), im Gebüsch. Gesammelt am 10. und 12. VII. 1968 von I. und L. PINTÉR. Trotz eifrigen Suchens konnten wir kein lebendes Stück finden.

Tafel I

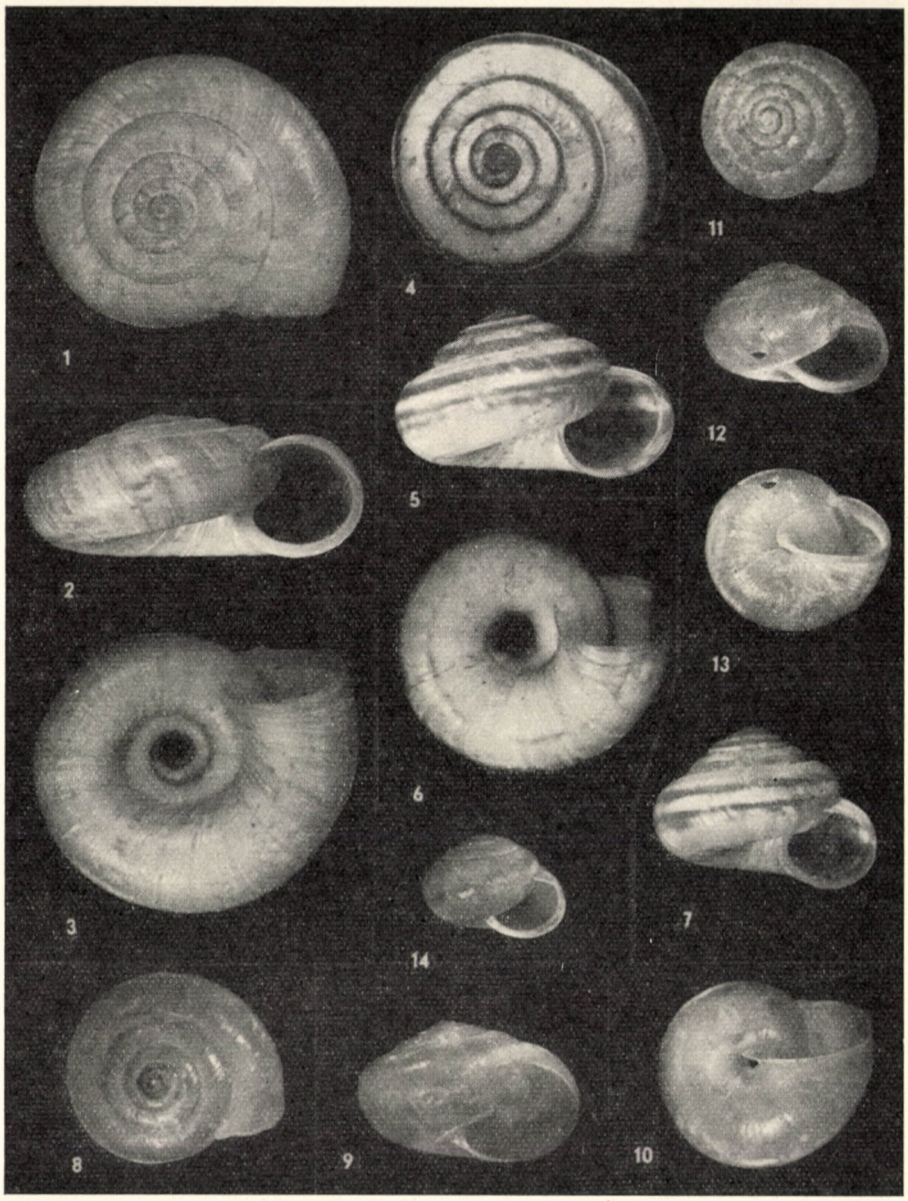

Abb. 1—3 = *Helicella? depulsa* spec. nov. Holotypus. — Abb. 4—7 = *Helicella obvia razlogi* subsp. nov. (4—6 = Holotypus, 7 = Paratypus). — Abb. 8—10 = *Monacha venusta* spec. nov. Holotypus. — Abb. 11—14 = *Monacha? pilosa* spec. nov. (11—13 = Holotypus, 14 = Paratypus)

B e z i e h u n g e n: Wegen Mangels an Alkoholmaterial bleibt die systematische Stellung dieser Art unsicher. Sie unterscheidet sich von der äußerlich ähnlichen *Perforatella rubiginosa* (A. SCHMIDT) durch ihre kürzere Behaarung, durch die Nabelform, Oberflächenskulptur und Lippe. Von *Monacha microtricha* JAECKEL (aus Mazedonien bekannt) kann sie vor allem durch die ganze Schalenform, durch die nicht abgeflachte Oberseite und durch den herabsteigenden letzten Umgang getrennt werden. Die anderen behaarten »*Monacha*«-Arten sind bedeutend größer.

SCHRIFTTUM

1. HESSE, P. (1921): Beiträge zur näheren Kenntnis der Subfamilie Fruticicolinae. — Arch. Moll., **53,** p. 55—83.
2. HESSE, P. (1931): Zur Anatomie und Systematik palaearktischer Stylommatophoren. — Zoologica, Stuttgart, **31,** p. 1—118.
3. HESSE, P. (1934): Zur Anatomie und Systematik palaearktischer Stylommatophoren. II. — Zoologica, Stuttgart, **33,** p. 1—59.
4. JAECKEL, S. (1954): Zur Systematik und Faunistik der Mollusken der nördlichen Balkanhalbinsel. — Mitt. Zool. Mus. Berlin, **30,** p. 54—95.
5. PINTÉR, L. (1968): Über bulgarische Mollusken. — Malak. Abh. Mus. Tierk. Dresden, **2,** p. 209—230.
6. POLINSKI, W. (1922): Recherches sur l'anatomie et la systématique des Xérophilinés de la Pologne et de la Transylvanie. — Ann. Zool. Mus. Polonici Hist. Nat., Warszawa, **1,** p. 166—184.
7. WAGNER, A. J. (1927): Studien zur Molluskenfauna der Balkanhalbinsel mit besonderer Berücksichtigung Bulgariens und Thraziens, nebst monographischer Bearbeitung einzelner Gruppen. — Ann. Zool. Mus. Polonici Hist. Nat., Warszawa, **6,** p. 263—399.

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A CONTRIBUTION TO THE SYSTEMATICS OF THE HIRUDINID LEECHES, WITH DESCRIPTION OF NEW FAMILIES, GENERA AND SPECIES

By

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(Received June 6, 1968)

INTRODUCTION

The hirudinid leeches have a world-wide distribution. They are noted for a compact morphology based on 27 preanal somites, and a complex external annulation. The latter varies only in the 8th. and 9th., and 24th. and 25th. somites in the majority of species which have 15 or 16 5-annulate somites, a few 14 or 17 such. There is accordingly little significant morphological variation in the constitution of the anterior sucker, in the location of the eyes, of the nephropores, the anus etc., and marked variation from the location of the genital pores between or on the last two annuli of the 11th. and 12th. somites is found only in a minority of the species.

The hirudinids are essentially monotonous in their external meristic morphology. For this reason detailed annulation is omitted from this paper. In our present knowledge, there is relative monotony also in the morphology of the muscular body-wall envelope, of the central nervous system, of the vascular and excretory systems; but not in the pharynx and associated structures nor in the reproductive systems.

The general external monotony enables the ready recognition of a leech as being hirudinid and has been responsible for the retention of these leeches essentially within a single family Hirudinidae (Hirudidae, etc.), formulated on the basis of the external morphology of the European hirudinids, and divided into two groups some 80 years ago on the nature of the dentition.

The conservative systematics of the hirudinids survives from descriptions based on a total count of annuli; annular location of external landmarks, eyes, anus, genital pores, etc.; jaws; teeth; occurrence of salivary gland papillae; and colour. In these terms only one family is required; but as shown in this paper, this is inadequate when our knowledge is extended to an understanding

of the variety of forms shown in the reproductive systems on the basis of an organogeny derived from comparative morphology, and a more complete comparative morphology of the pharynx and associated structures.

WHITMAN (1886) provided an analysis of somital annulation on the basis of zoonite morphology, drew attention to variation in the number of (complete) 5-annulate somites, and to the somital morphology of the reproductive system. This technique provided only an improved accuracy in the description of external morphology. It was based initially on the recognition of 26 preanal somites, latered altered to 27.

WHITMAN's technique in its original form continued in use by OKA, HARDING, WEBER, PINTO, CABALLERO and others well into this century, some few later using a preanal morphology of 27 somites. In particular it was used by R. BLANCHARD who provided genera for, and described species of hirudinid and other leeches from many parts of the world over a period of some thirty years. The use of WHITMAN's technique was probably the last survival of the zoonite morphology of French comparative morphology of the early decades of the XIXth. century.

In 1896, R. BLANCHARD gave systematic value to the presence of one row of teeth (monostichodont) and two rows of teeth (distichodont), and to the presence or absence of salivary gland papillae on the jaws. He did not utilise information from internal dissection. BRANDES (1901) probably best pictures the understanding of the hirudinid leeches at the turn of the century: a family Hirudinidae containing the genera *Hirudo*, *Limnatis*, *Hirudinaria*, *Limnobdella*, *Macrobdella* and *Whitmania*. To this would be added the genera *Haemopis*, *Philobdella*, and *Oxyptychus*, to give a total of some 25 species. There were other genera and species, many still of uncertain validity. MANN (1962) lists a family Hirudidae containing some 23 genera; and a family Semiscolecidae containing 4 genera — some hirudinid. Soós advises me there are now 25 genera containing about 100 recognisable species.

J. PERCY MOORE established the anatomical limits of the somite, a description of annulation in conformity with ontogeny, and developed and used from 1901 onwards an intimate description of external and internal anatomy in terms of regional somital morphology on the basis of 27 preanal somites. MOORE's high level of descriptive skill in dealing with hirudinids is without parallel. It can only be regretted that his methods were not earlier adopted by others. He developed important concepts of "haemopisine" and "hirudolike" as descriptive of the pharynx and associated structures and of the reproductive systems during his original studies on the North American leeches. These concepts were only broadly defined and in the progress of his work were employed in the descriptions of many species but without closer definition, becoming increasingly difficult to assess and even in some cases beyond understanding as employed in various combinations.

The wealth of information MOORE provided on the morphology of the reproductive systems gave promise of systematic value. My own repeated attempts over the past thirty years to arrange genera on this basis produced only groupings of genera otherwise systematically unacceptable. It was obvious to me finally that this material was unusable for this purpose until systematic principles could be established on the basis of an organogeny derived from comparative morphology.

The opportunity for this appeared during my studies on the Australasian hirudinids. These have provided a valuable variety of levels of organisation on the median regions of the reproductive systems. In two, the organisation is morphologically equivalent to *Philobdella*; in one, to *Macrobdella*; another to *Hirudo medicinalis* and *Haemopis sanguisuga*; others to species in *Limnatis*, etc. All are monostichodont. Excepting the first two, all show a relationship of epididymis and ejaculatory bulb not described in other hirudinids, a relationship as distinctive as that of the "haemopisine", the epididymis being essentially in XII and posterior to the ejaculatory bulb in XI.

There is here a distinct natural monostichodont group having an "hirudo-like" pharynx and associated structures, but exhibiting levels of organisation on the median regions of the reproductive systems which are morphologically equivalent to those seen in other hirudinids to which they could not be given any measure of close relationship.

The earlier failure to achieve systematically acceptable groups on only the basis of the levels of organisation of the median region of the reproductive systems can be now understood. The parallelisms of levels of organisation among unrelated hirudinid genera is an exhibition of a common organogenic process which brings about levels of growth and morphological differentiation in the period of development following the earlier embryonic period in which the somital morphology of other organ systems has been established. Accordingly the different levels are generic in value.

They are of further interest in that as yet it is impossible to give functional value to the different levels of organisation. Where in some genera there is a vaginal duct, this is lacking in another. A species of each living in the same body of water give no indication numerically or otherwise that reproduction is more successful in the one than in the other. Another is successful having a dwarfed muscular median region on the male system; another, with only a non-muscular male atrium; etc. Others exhibit giantism and other extravagance in the organs in this region. It would seem that although the levels of organisation are genetic, the levels of organisation do not express levels of function or functional efficiency and evolve along various lines being limited only by the need for successful function.

The anterior region of the male paired duct is the locus of another process of growth and differentiation, the latter being associated with muscularisa-

tion extending from the median region. This provides patterns and organisation which are familial in value. There is evidence to indicate that these are influenced by the organogeny of the pharynx, a structure of earlier embryonic establishment. Unfortunately it is not yet possible to derive the organogeny of the pharynx, and the forms of the pharynx and related structures can at this time be only interpreted in terms of function. These forms also have some measure of familial significance.

In order to seek clarification of MOORE's use of "haemopisine" and "hirudo-like", I undertook the dissection of *Hirudo medicinalis* and *Haemopis sanguisuga*; but it was not until I had dissected again the North American leeches MOORE had placed in the genus *Haemopis* and also *Macrobdella decora*, that I recognised that MOORE's concepts had been formed on his knowledge of the North American leeches. These dissections also showed the parallelisms in the levels of organisation of the median reproductive structures in the North American and Australasian leeches.

The need to establish the generic home for *Hirudo australis*, long accepted on only casual indications (RICHARDSON, 1968) as congeneric with *Limnobdella mexicana* BLANCHARD, 1893, led me to the dissection of the Mexican *Potamobdella olivacea* and *Pintobdella cajali*. These were found to possess a pharynx and associated structures similar to *Macrobdella decora*, and all three in common possess a similar pattern of organisation of the anterior region of the paired male duct, as also an acaecate vagina with a vaginal duct. The two latter are seen also in *Oxyptychus*. These form a further natural group of genera.

In brief, the comparative morphology of the pharynx and associated structures in the dissection of 17 species of hirudinids from Middle and North America, from Europe, Australia and New Zealand, enables me to extend MOORE's concept of "hirudo-like" from the single form he recognised, to two forms of monostichodont pharynx; of "haemopisine", to two forms of haemopisoid pharynx, and a third distinct essentially agnathous form of pharynx. The organisation of structures on the anterior region of the paired male duct can now be recognised as showing four distinct patterns. The levels of organisation of the median region of the male and female reproductive systems provide two major categories of which one has four distinct subdivisions which are shown as of no more than generic value. The forms of the pharynx and associated structures and the patterns of organisation of the anterior region of the male paired duct are shown to be of familial values. In these terms, I can now provide a division of the hirudinids into families, correct errors in the understanding of certain genera, leading to the need for the provision of new genera, and to descriptions for other genera, as will be seen in the following pages.

GENERIC DESCRIPTIONS

Excepting the genera *Asiaticobdella* and *Hirudobdella*, the following descriptions are all based on dissection. For the majority, two or more specimens have been dissected. The sequence of description is not one of relative systematic value; but the sequence of dissection, so that the descriptions are not in the form of final generic diagnoses. This practice, being the more convenient one, provides descriptions which are accordingly strongly traditional in the initial portion.

Detailed accounts of external annulation are not given here but will be provided in accounts of individual species elsewhere. This is because they have not shown systematic value other than specific, excepting for the number of somites having the complete 5-annulate condition. This is found only on somites having nephridia, i.e. VIII to XXIV, which will be all 5-annulate in the leech having 17 complete somites. In the 16 5-annulate leech, IX to XXIV are complete; IX to XXIII, in the 15 5-annulate leech. The annulation of XXV was regarded as confirmatory of the condition in XXIV, XXV having 4 annuli when XXIV was complete (i.e. in 16 and 17 5-annulate leeches), and 3 annuli when XXIV was incomplete. As can be seen in the following accounts of the different genera, the correlation is not sound.

In the course of this study, it has become obvious that some hirudinids have an anterior sucker which can be recognised as "sanguivorous"; "macrophagous", in others; but there is a third form seen in some sanguivores which can be termed "pseudomacrophagous" in that it resembles the form seen in the macrophagous hirudinids. I am not yet able to provide a distinction between these three forms of the anterior sucker.

The name "crop" is employed throughout, as also "testis" and "ovary", etc. as applying to structures which are anatomical entities. There is in the hirudinids no systematic value in a departure from the standard nomenclature of the descriptive anatomy of organs and organ-systems; but there are those other structures, *e.g.* the penis sheath, which are essentially a hirudinid novelty and without an appropriate name in general descriptive anatomy. Likewise, I do not recognise an "oesophagus". In a recent experience, *G. elegans* and *R. dawbini* killed in hot water showed a non-compartmented "oesophagus" extending in *elegans* from the pharynx to XII, and in *dawbini* from the pharynx to XIV. These are clearly artefact. Excepting the haemopisines, in well-prepared leeches I have found only compartments within the immediate post-pharyngeal somites.

The albumen glands are not dealt with below. I find these highly variable throughout the year in local species and cannot determine as yet any systematic value in them. The prostate glands are much more constant in the species throughout the year. I have recently had indications that in some cases, the

form of the gland and its application to the median muscular organ may be specific.

Hirudo LINNAEUS, 1758 s. str. (Figs. 1 A; 5 A)

Monostichodont; 15 5-annulate somites; XXV 3-annulate; somital sense organs small; jaws large, prominent, located in open grooves; some 65 spaced acute teeth; no salivary papillae; dorsal salivary glands in two compact masses with obvious columns of aggregated ducts; radial muscles, obvious; entrance to pharynx, narrow; lumen of pharynx narrow, tubular, tapering posteriorly; pharynx with 6 internal muscular ridges arranged in dorsomedian and ventrolateral pairs, each pair fusing to enter the base of the jaw; pharynx terminating in the middle of IX followed by a short acaecate compartment in IX; the crop in X to XIX with one large primary pair of lateral caeca extending from the middle third of each compartment, and a small secondary pair anterior to these in each; postcaeca of XIX extending into XXV; no obvious copulatory gland pores; genital pores, XI and XII b_5/b_6; testes normally 10 pairs paired male duct with two primary flexures essentially in XI of which the initial and middle regions form the epididymis and the terminal region the muscular ejaculatory bulb with anterior and posterior cornua; bulb dorsal to epididymis; ejaculatory duct short; male and female median organs myomeric, mesomorphic; male atrium in XI; penis sheath short, reflected on itself in XI or the contiguous portions of XI and XII; oviducts short; common oviduct long, tortuous but applied to the full length of the mature vagina; vagina cylindrical, reflected on itself, to erect fusiform when mature; vaginal caecum present, short; no vaginal duct. Size, moderate. Colour pattern, striped to longitudinally maculate. Aquatic. Sanguivorous.

Type-species: *Hirudo medicinalis* LINNAEUS, 1758. Europe.

Other species: ? *Hirudo hildebrandti* BLANCHARD, 1897. East Africa.

Prior to MOORE (1927) the genus *Hirudo* was defined on external features, the jaws and their dentition, and distinguished from the genus *Limnatis* by the lesser number of teeth and the absence of salivary papillae (HARDING, 1910, etc.). In extending the definition to include internal morphological detail, MOORE apparently relied on the account of the internal anatomy of *medicinalis* as given in MOQUIN-TANDON (1846) and as shown in plates VII to XI in the Atlas. From this he took as characteristic of the caecation of the crop, that there is "One pair of large, but little-lobed gastric caeca in each somite". This agrees with MOQUIN-TANDON's figure where the crop is shown as carrying lateral caeca which arise from the full length of the compartment, the intestine and postcaeca are widely tubular. No secondary caeca are shown.

In dissecting fresh, unpreserved specimens of differing Australian hirudinids under water in warm weather, I have found that the crop and intestine will rapidly swell and expand in all parts to the form as shown in MOQUIN-TANDON when no longer restrained by the dorsoventral muscles of the paramedian palisades which have been cut in the course of the dissection. Secondary small caeca are obliterated. Either there was repitition of this circumstance or else MOQUIN-TANDON's figure was used as the basis of the illustrations of the alimentary canal of *medicinalis* for it has appeared in this manner in many texts in Europe and North America over many years, and as recently as in MANN (1962). My dissections agree with SCRIBAN and AUTRUM (1934, Fig. 178).

MOORE had before him two species of Asian leeches. In both, the common oviduct connects terminally to the vagina which accordingly is acaecate. There is a vaginal duct. This is the condition which was known to him in *Macrobdella decora*, in *Diplobdella* (now *Oxyptychus*) of America, and in "*Hirudo*" *nipponia* of Japan. It was not unreasonable for him to interpret MOQUIN-TANDON's figure of the female mature vagina in *medicinalis* as showing this to be acaecate. He made this the characteristic of the genus *Hirudo* and admitted *asiatica* and *birmanica* and later African leeches to the genus.

BRANDES (1901, Figs. 335, 336) clearly shows the vagina as having a small caecum but no vaginal duct in both *medicinalis* and *Haemopis sanguisuga*. These figures are reproduced unaltered in SCRIBAN and AUTRUM (1934, Figs. 313, 314). On the same page, these authors give diagrammatic representations of the relationship of the common oviduct and vagina in several genera (Fig. 315) which show the connection as being terminal, acaecate in *medicinalis* and subterminal and caecate in *sanguisuga*.

My own dissections of *medicinalis* show the vagina to be definitely and characteristically caecate and without a duct. This agrees with BRANDES. In my specimens, the vagina is cylindrical, reflected upon itself; the common oviduct, coiled openly alongside the head of the vagina and obviously connecting subterminally. This is the form of the vagina and the relationship of the common oviduct which I find in a small number of Australian specimens having a caecate vagina without a duct. It seems to me that this is the form in the leech which has not yet reproduced, for in the majority of specimens the vagina is either elongate cylindrical without a flexure or grown to a fusiform shape. In both, the common oviduct extends along the length of the vagina and is adherent to the face of the vagina. This is seen in *Goddardobdella*, *Eunomobdella*, *Haemopis* s. str., and *Bdellarogatis*.

It will be clear in comparing this with the relationship and proportions of the common oviduct and vagina in those leeches having an acaecate vagina with a vaginal duct, that the two express completely different levels of organisation of the median female structures. This is supportable otherwise as being definitely generic in value. Accordingly many species until now included in the genus *Hirudo* can no longer be held congeneric with *medicinalis*.

Asiaticobdella gen. n. (Fig. 1 E)

(Derivation of generic name: Asia + βδέλλα = a leech) f.

Monostichodont; 15 5-annulate somites; XXV, 4-annulate; salivary papillae essentially absent; radial muscles obvious; jaws small, short, some 50 teeth; pharynx terminating at IX/X, nearly smooth internally; crop with two small pairs of caeca in XI and XII, and a small pair and a large pair of caeca in XIII to XVIII; postcaeca in XIX; no obvious copulatory gland pores; genital pores in XI and XII b_5/b_6; testes, 9 pairs; paired male duct with two primary flexures, the initial and middle limbs forming a globoid epididymis in the contiguous portions of XI and XII, the terminal limb forming the curved fusiform ejaculatory bulb which partially embraces the epididymis; ejaculatory ducts short; median reproductive structures myomeric, macromorphic; male atrium in XI; penis sheath enlarged, elongate, reflexed on itself in XIII; oviducts short; common oviduct long; no vaginal caecum; vaginal duct of the length of the vagina. Size, small. Colour pattern, longitudinally striped. Aquatic. Sanguivorous.

Type-species: *Haemopis birmanica* BLANCHARD, 1894. Ceylon, India, Burma.

Other species: ? *Hirudo asiatica* BLANCHARD, 1894. India,
? *Hirudo nipponia* WHITMAN, 1886. Japan.

I propose *birmanica* as the type for this genus, MOORE (1927) having given an intimately detailed account of the morphology of this, the common species. He recognised the divergence from *H. medicinalis* in annulation, XXV being 3-annulate in *medicinalis* and attached no significance to the occasional presence of a few salivary papillae in *birmanica*. The circumstances which enabled him to place *birmanica* in the same genus with *medicinalis* have been discussed above, and obviously must now be recognised as invalidating his action.

It can be noted that the Asian leeches, *birmanica*, *asiatica*, *Dinobdella ferox* and *D. notata* all have an acaecate vagina and, excepting possibly *D. notata*, a vaginal duct. A re-examination of these leeches could be anticipated to show them a distinct natural group, as has been found here for the New World group of *Macrobdella decora*, *Potamobdella*, *Pintobdella* and *Oxyptychus* which also have an acaecate vagina, the first three with a vaginal duct which is absent in *Oxyptychus*.

Macrobdella VERRILL, 1872 (Figs. 1 B; 5 D)

Monostichodont; 16 5-annulate somites; XXV, 4-annulate; somital sense organs, small; salivary glands sparse, no obvious dorsal masses of glands or columns of ducts; radial muscles, obvious; no salivary papillae; jaws prominent, small; teeth acute, about 50 to 60; pharynx with 6 internal muscular ridges, a dorsomedian and ventrolaterals being larger and entering directly into the base of the jaws, the intervening three being narrower and ending independently on the margin of the entrance to the pharynx between the bases of the jaws; entrance to pharynx and lumen of pharynx, reduced; pharynx ending in the middle of IX followed by an acaecate compartment in IX; two pairs of large caeca in X to XIX, the posterior in XIX forming the postcaeca; copulatory gland pores obvious on XIII b_6 and XIV b_1 (b_2); genital pores, XI/XII (XII b_1) and XII/XIII (XIII b_1); testes normally 10 pairs; paired male duct reflected at ganglion XI in a posteriorly directed simple loop essentially within XI; epididymis formed on the initial portion of the recurrent loop, a swollen non-muscular sperm duct continues on the recurrent and procurrent limbs; no ejaculatory bulb; male median organ, amyomeric, female myomeric, both mesomorphic; male atrium in contiguous portions of XI and XII; no penis sheath; oviducts short; common oviduct short; no vaginal caecum; vagina fusiform; vaginal duct short. Size, large. Colour pattern, metameric longitudinal maculations. Aquatic. Sanguivorous.

Type-species: *Hirudo decora* SAY, 1824. North & Middle America.
Other species: ? *Macrobdella sestertia* WHITMAN, 1884. N. America.
? *Macrobdella ditetra* MOORE, 1953. N. America.

The above data is largely based on specimens from Lac aux Rats Musquees, Frontenac Co., and from elsewhere in the Province of Quebec. These are fully typical of *decora*.

At the time MOORE (1901, 1912) prepared his accounts of this species, he did not make a distinction between vagina and vaginal duct. My specimens show short wide oviducts entering independently into a thin-walled atrium continuous with a more stoutly walled common oviduct which enters terminally and without any indication of an internal papilla extending into the end of the rather thin-walled vagina which has three large internal longi-

tudinal rugae. The vaginal duct opens subterminally from the vagina and is briefly tortuous before joining the bursa.

This differs strikingly from the description of the female median organs given by MOORE (1953) for *M. ditetra*, nor can I see that the two can be reconciled. The peculiar condition in this species is associated with the close approximation of the genital pores which are separated only by some two annuli, as also in *M. sestertia*. The relationship of these three species is encouraged by the common and unusual possession of enlarged copulatory glands; but there are indications that this relationship could well now be reviewed.

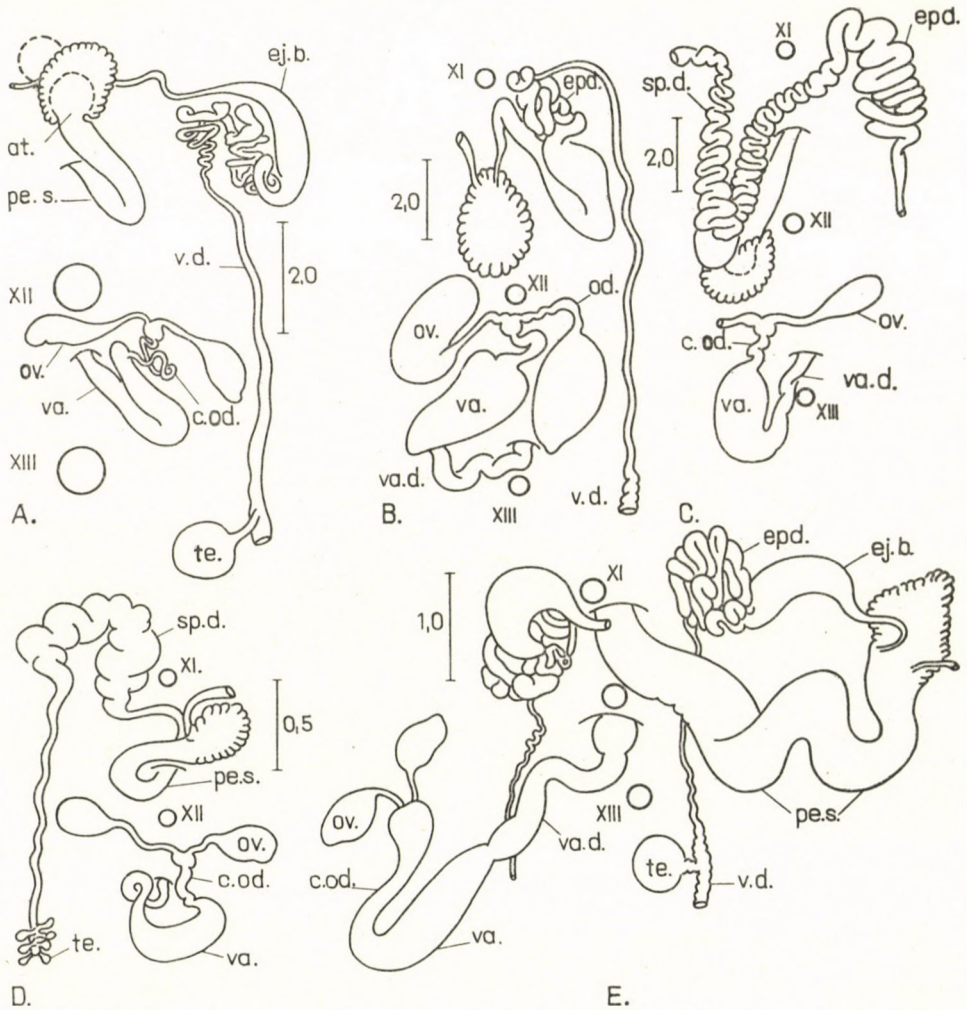

Fig. 1. Reproductive systems in monostichodont hirudinids. A = *Hirudo medicinalis;* B = *Macrobdella decora;* C = *Pintobdella cajali;* D = *Potamobdella olivacea;* E = *Asiaticobdella birmanica* (E, redrawn after MOORE). at. = atrium, ce. = vaginal caecum, c. od. = common oviduct, ej. b. = ejaculatory bulb, ej. d. = ejaculatory duct, epd. = epididymis, od. = oviduct, ov. = ovary, pe. s. = penis sheath, pr. = prostate, sp. d. = sperm duct, te. = testis, va. = vagina, va. d. = vaginal duct, v. d. = vas deferens — All scales in mm. (Note: In order to display the relationships of the structures on the anterior end of the paired male duct, the medial aspect is generally shown. The ventral nerve cord ganglia are represented at their relative size, and the somital level indicated by Roman numerals)

Potamobdella CABALLERO, 1932 (Figs. 1 D; 5 F)

Monostichodont; 16 5-annulate somites; XXV, 4-annulate; somital sense organs small, obscure; jaws, low rounded; teeth about 40 to 50; obvious small salivary papillae; radial muscles, sparse; dorsal salivary glands in poorly defined masses with only weakly developed columns of aggregated ducts; pharynx extending to VIII/IX; 6 internal ridges on pharynx, a median dorsal and two ventrolaterals entering into the base of the jaws, the intervening 3 narrower ridges terminating independently on the margin of the mouth of the pharynx between the bases of the jaws; crop in IX to XIX with two pairs of equal simple laterally directed essentially entire caeca, the posterior pair in XIX forming the postcaeca; dorsoventral musculature very sparse; no obvious copulatory gland pores; genital pores XI and XII b_5/b_6; multiple small testes from XIII/XIV to XX; paired male duct with an anteriorly directed open loop in XI; epididymis formed on the initial procurrent limb extending onto recurrent limb as a swollen thin-walled sperm duct, the whole in XI; no ejaculatory bulb; ejaculatory ducts short; median reproductive structures myomeric, micro- and mesomorphic; male atrium and penis sheath in the contiguous portions of XI and XII; oviducts and common oviduct, short and of about equal length; no vaginal caecum; vaginal duct of the length of the vagina. Size, medium. Colour, plain. Aquatic. Sanguivorous.

Type-species: *Batrachobdella oaxacensis* CABALLERO, 1931. Middle America.

Other species: *Limnobdella olivacea* CABALLERO, 1933. Middle America, *Pintobdella chiapasensis* CABALLERO, 1958. Middle America.

DR. EDUARDO CABALLERO kindly sent me a specimen of *P. olivacea* 37.0 mm long which was dissected to provide the above data confirming RINGUELET's account (1944) of this genus as based on his study of *P. oaxacensis*. A specimen of *P. chiapasensis* proved to have 16 5-annulate somites and is accordingly placed in *Potamobdella*.

Thanks to DR. CABALLERO's persistent exploration of the leech fauna of Mexico, it seems to me most highly probable that BLANCHARD's *Limnobdella mexicana* will prove to be one or other of the species in *Potamobdella*, *mexicana* having 16 5-annulate somites. BLANCHARD (1893) describes the jaw in *mexicana* as lacking salivary papillae. These are very small in *olivacea* and could be readily overlooked.

RINGUELET (1944) on the basis of MOORE's account (1939) of *Limnatis nilotica* and other species in the genus concluded that there was an element of relationship between this Afroasian genus and *Potamobdella*, both being monostichodont, with salivary papillae, with paired crop caeca, etc.

The matter is confused by the diversity of species which MOORE placed in the genus *Limnatis*. These fall into three groups. One group lacks ejaculatory bulbs and has the epididymis formed on both limbs of the simple loop formed on the male primary duct. This includes *L. nilotica*, shown in MOQUIN-TANDON (1846) as having a relationship of common oviduct and vagina typical of a caecate vagina without a vaginal duct, but by MOORE (1939) as having an acaecate vagina with a vaginal duct; and *L. paluda* for which MOORE (1927) does not describe a vaginal duct. In a second group, ejaculatory bulbs are present embracing the epididymis in an hirudoid manner but MOORE shows that the paired male duct forms only a simple loop with the epididymis formed on the initial recurrent limb and the bulb formed

on the terminal procurrent limb. This group includes *L. obscura* and *L. oligodonta* which have an acaecate vagina and lack a vaginal duct; and *L. fenestrata* which has an acaecate vagina with a vaginal duct. The third group contains *L. africana* in which the paired male duct forms a typical hirudoid "S"-loop with the epididymis formed from the initial procurrent and median recurrent limbs and the ejaculatory bulb on the terminal procurrent limb. *L. africana* has an acaecate vagina with a vaginal duct.

It seems most unlikely now that all these species can be contained within the one genus. The relationship of common oviduct and vagina in *L. obscura* would indicate that this has a caecate vagina.

If there is any relationship with *Potamobdella* it is seen only in the species in the first group in this *Limnatis*-complex and here only with *L. nilotica* as described by MOORE (1939).

In contrast, the relationship of *Potamobdella* to *Macrobdella* and *Oxyptychus* is shown in the morphology of the jaws and pharynx, the caecation of the crop, the pattern of elaboration on the paired male ducts, and in the level of organisation of the median female structures. *Potamobdella* stands apart in the possession of salivary gland papillae and a myomeric male median organ.

As shown under the genus *Richardsonianus* it is most probable that *Potamobdella* will become only a synonym of *Limnobdella* BLANCHARD, 1893.

Pintobdella CABALLERO, 1937 (Figs. 1 C; 5 E)

Monostichodont; 15 5-annulate somites; XXV, 3-annulate; somital sensillae small, obscure; salivary glands sparse, diffuse, no obvious aggregations of ducts forming columns; radial muscles sparse, diffuse; pharynx closely approximated to body wall, terminates at VIII/IX; jaws small, ventrolaterals in short crypts; teeth, about 36, minute, acute, spaced; numerous small salivary papillae; pharynx with about 6 internal ridges, dorsomedian and ventrolaterals enter jaws, the narrower intervening 3 or 4 ridges terminate independently on margin of opening into pharynx between the bases of the jaws; crop caecate in IX to XIX with one primary pair of simple undivided lateral caeca extending from the middle portion of each compartment and forming postcaeca in XIX; no obvious copulatory gland pores; genital pores, XI and XII b_5/b_6; testes, some 5 pairs of sacs per somite; XIII/XIV to XXII/XXIII; male paired duct with a simple primary loop in XI, the initial procurrent limb forming the coiled tubular epididymis, the recurrent terminal limb a thin-walled non-muscular tortuous sperm duct extending to the male atrium; no ejaculatory bulb; male and female median structures myomeric, mesomorphic; male atrium in the posterior half of XII; penis sheath of moderate length; oviducts short, common oviduct, short; vagina acaecate; vaginal duct short. Size, moderate. Colour plain. Aquatic. Sanguivorous.

Type-species: not originally nominated.

DR. CABALLERO described several species of Mexican leeches assigning them to the genus *Limnobdella* BLANCHARD, transferring them later (1937) to a new genus *Pintobdella*. The species placed in *Pintobdella* were *tehuacanea* CABALLERO, 1931, *olivacea* CABALLERO, 1933, and *cajali* CABALLERO, 1934. He had earlier provided (1932) a new genus *Potamobdella* based on *Batrachobdella oaxacensis* CABALLERO.

RINGUELET (1944) gives a full account of *oaxacensis* and recognised this and *olivacea* as species of *Potamobdella*. DR. CABALLERO kindly sent me a specimen of *P. cajali* 83.0 mm long. I find this to be similar to *Potamobdella* in the nature of the jaws, possession of salivary papillae, the nature of the pharynx, the pattern of the male paired duct, the level of organisation of the male and female median structures; but differing in being 15 5-annulate, as can be seen in CABALLERO (1934), not 16 complete somites as in *oaxacensis* and *olivacea*. It has only one pair, not two pairs of caeca on the compartments of the crop; and the very unusual tortuous sperm duct which is in complete contrast to the short ejaculatory ducts in *Potamobdella*. There is nothing in the morphology of *olivacea* which could form or would require a structure of this nature.

Accordingly, it seems proper now to retain the genus *Pintobdella* to contain *cajali*. In broader relationships, *Pintobdella* belongs to the *Macrobdella—Potamobdella—Oxyptychus* group.

Richardsonianus Soós, 1968 (Figs. 2 A; 5 B)

Monostichodont; 16 5-annulate somites; XXV, 4-annulate; somital sense organs obvious; jaws large, prominent, located in open recesses; about 50 sharp teeth; no salivary papillae; dorsal salivary glands in two compact masses, obvious columns of aggregated ducts; radial muscles obvious; entrance to pharynx and lumen of pharynx, narrow, tubular; pharynx with 6 internal ridges, alternating wide and narrow, one of each joining close to and entering the base of each jaw; pharynx ends in IX, followed by a short acaecate compartment in IX; the crop in X to XIX with a single pair of narrow based laterally directed simple caeca extending from the middle third of each compartment, those in XIX forming postcaeca; no obvious copulatory gland pores; genital pores, XI b_5/b_6 (XI b_5) and XII b_5/b_6; testes normally 10 pairs; no flexures on the paired male duct, the epididymis elaborating as a tortuous linear canal in XII essentially posterior to the ejaculatory bulb in XI; bulb with cornua; ejaculatory duct, short; male and female median organs myomeric, mesomorphic; male atrium in XI; penis sheath short and briefly coiled in the posterior half of XI; oviducts short; common oviduct short; vaginal caecum present; vagina fusiform; vaginal duct present, only briefly longer than the vagina. Size, moderate. Colour pattern, longitudinally striped. Aquatic. Sanguivorous.

Type-species: *Hirudo australis* BOSISTO, 1859. Victoria, Australia.

Other species: *Richardsonianus dawbini* n. sp., N. S. W. Australia.

Richardsonianus dawbini n. sp.

With the above features. It differs from *R. australis* in that the first few teeth at the median end of the row are not markedly higher than the teeth in the first half of the row; the coiling oviducts are longer than the common oviduct, twice and more the length of the ovaries. *R. australis* is coarsely striped; *dawbini*, finely and delicately striped. In *australis* the intermediate dark stripe is wide and includes both the intermediate and supramarginal somital sensillae and the venter is plain, while in *dawbini* the intermediate sensillae are situated in a narrow dark stripe separated by a narrow light stripe

from a broader dark supramarginal stripe which includes both the marginal and supramarginal sensillae. The venter is sparsely maculate with irregular black patches, to almost black. Length 30.0 mm contracted to 80.0 mm extended. Near Bathurst, and at Grafton, N. S. W.

Type: Australian Museum, Sydney, N. S. W. L. 38.0 mm. Coll. L. R. RICHARDSON, Grafton, N. S. W., Australia, Coll. No. W 4183.

This is a peculiarly agressive leech, attacking, feeding from the body fluids of, and killing *Goddardobdella elegans*. Such a habit has been reported before only for *Oxyptychus brasiliensis* (PINTO, 1923).

I have reviewed briefly (RICHARDSON, 1968) the history of *Hirudo australis*, the situations arising from the transfer of the description of *H. quinquestriata* SCHMARDA to *australis*, and finally the transfer of *australis* to the genus *Limnobdella* BLANCHARD.

It seemed to me most highly improbable in view of the knowledge which demonstrated the distinctiveness of the hirudinids of North, Middle and South America, that a leech in Australia would be kindred to a hirudinid of that region. There was certainly nothing in the leeches which I considered to be *australis* which could support such a relationship. I had reached this conclusion some fifteen years ago when it was obvious that there could be no relationship to *L. mexicana* as described by CABALLERO (1930), for this leech clearly had haemopisine features.

More recently, having become confident in my recognition of BOSISTO's *australis* I could be equally confident that the Australian leech was distinct from *Potamobdella* and *Pintobdella*, and reached the conclusion that it was only possible for *mexicana* to be a species of one or other of those genera. I proposed this to DR. SOÓS last year. He has now examined BLANCHARD's type material and found my indication is correct and provided the necessary new genus.

If *R. australis* had been the only intimately known Australian hirudinid, it would have been placed in the genus *Hirudo* s.l. even in most recent years. The general form, location of the eyes and genital pores, the large and prominent jaws, the absence of salivary papillae, the form of the pharynx and the presence of 6 internal muscular ridges, the termination of the pharynx in IX, the acaecate compartment in IX followed by compartments each bearing a single pair of laterally directed simple caeca, the general morphology of the paired and median reproductive structures, even the presence of 16 5-annulate somites — all fall within MOORE's definition (1927) of the genus *Hirudo*.

I have been fortunate in handling a diversity of Australian hirudinids which have shown uniformity in possessing a linear relationship of the organs on the paired male ducts so forming a group which otherwise displays a range of levels of organisation of the median reproductive structures having parallelisms in hirudinids in other regions. These other hirudinids in turn form groups on the basis of other patterns in the organisation of the structures on the male paired ducts.

It is clearly no longer possible to place even a leech such as *australis* within the genus *Hirudo*.

The specific name for the new species is given in appreciation of the assistance from DR. W. H. DAWBIN, Sydney University, who has supplied me with valuable critical material from the vicinity of Sydney, N.S.W.

Quantenobdella gen. n. (Fig. 2 B)

(Derivation of generic name: quantenus = how far + $\beta\delta\varepsilon\lambda\lambda\alpha$ = a leech) f.

Monostichodont; 16 5-annulate somites; XXV, 4-annulate; somital sense organs small; jaws, small, profile low convex, resting in shallow open recesses; teeth about 40, minute, acute, spaced; no salivary papillae; dorsal salivary glands diffuse, weakly developed columns of aggregated ducts; radial muscles obvious, sparse; entrance to pharynx and lumen of pharynx, narrow; pharynx

small, terminating at VIII/IX; crop XII to XIX with small secondary simple paired anterior and posterior caeca and paired lobed large median primary caeca; median caeca form the lobed postcaeca extending from XIX; no obvious copulatory gland pores; genital pores XI and XII b_5/b_6; number of testes, ?; paired male duct without a primary flexure; epididymis coiling essentially linear in XII and posterior to ejaculatory bulb in XI which lacks cornua; ejaculatory ducts very short; median reproductive structures myomeric, mesomorphic; male atrium and short reflected penis sheath in the posterior half of XI; oviducts very short; common oviduct long, about twice as long as vagina and not attached to the face of the vagina; vagina caecate; vaginal duct twice the length of the vagina. Size, moderate. Colour pattern, longitudinally striped. Aquatic. Sanguivorous.

Type-species: *Quantenobdella howensis* sp. n.

Quantenobdella howensis sp. n.

Known from the single type specimen, reasonably extended, 38.0 mm long, with the clitellum fully developed.

The dorsum with a very narrow median line of black; a narrow light line of the same width as the median on either side of it; lateral to this a very wide black band more or less divided lengthwise by an irregular light stripe so as to appear as two black bands of equal width; a light stripe and then a dark band on either side. The margin light, continuous onto the immaculate venter of the same colour. The dorsal black stripes commence as a median stripe behind the first pair of eyes with a stripe on either side. The latter divides to two black bands on somite VII and these fuse again on XXV. No stripes or patches on the posterior sucker.

The clitellar glands compress the crop in X to XII where no caeca can be seen in this specimen. The crop behind this is well-filled with blood and the number of testes could not be determined without destroying the crop.

Having the epididymis posterior to the ejaculatory bulb, etc., this species is referable only to the Australian hirudinids having 16 5-annulate somites. The relationship to *Richardsonianus* and *Euranophila* has been discussed under the latter genus.

Type: Lord Howe Island, 1st. Jan. 1903. W. Baldwin Spencer Collection. National Museum of Victoria, Coll. No. G. 850.

The only described hirudinid from the islands adjacent to Eastern Australia is *Hirudo catenulata* Johansson, 1918, from the New Hebrides and known only in his account.

Johansson describes only the externals and the jaws. *H. catenulata* is monostichodont with 45 small teeth. The eyes and genital pores are as in *H. medicinalis*. He describes XXII as 5-annulate; XXIII, 4-annulate; XXIV, 2-annulate, and XXV as uniannulate and bordering the anus. This indicates that his description is based on 25 preanal somites which is confirmed in his reference to the 4th pair of eyes as on III which is 2-annulate above and uni-

annulate below. He refers to the annulation otherwise as being as in *H. medicinalis.* It is clear then that this species has 16 5-annu ate somites, IX to XXIV inclusive.

The colour pattern is very distinctive. The venter is maculate to nearly dark; margins light with some maculations; a narrow black median stripe on the dorsum, widening over the three central annuli of each somite so that it includes a light patch which is the length of 3 annuli; the paramedian area, light with black maculae even fusing into elongate patches; lateral to this, another dark band also expanding to enclose a light patch on the three central annuli in each somite. In brief, a leech showing three rows of obvious metameric light patches with black borders forming three narrow longitudinal stripes, and a maculate venter. There is no indication of anything of this pattern in *Quantenobdella.*

So far I have not seen a hirudinid conforming to *H. catenulata.*

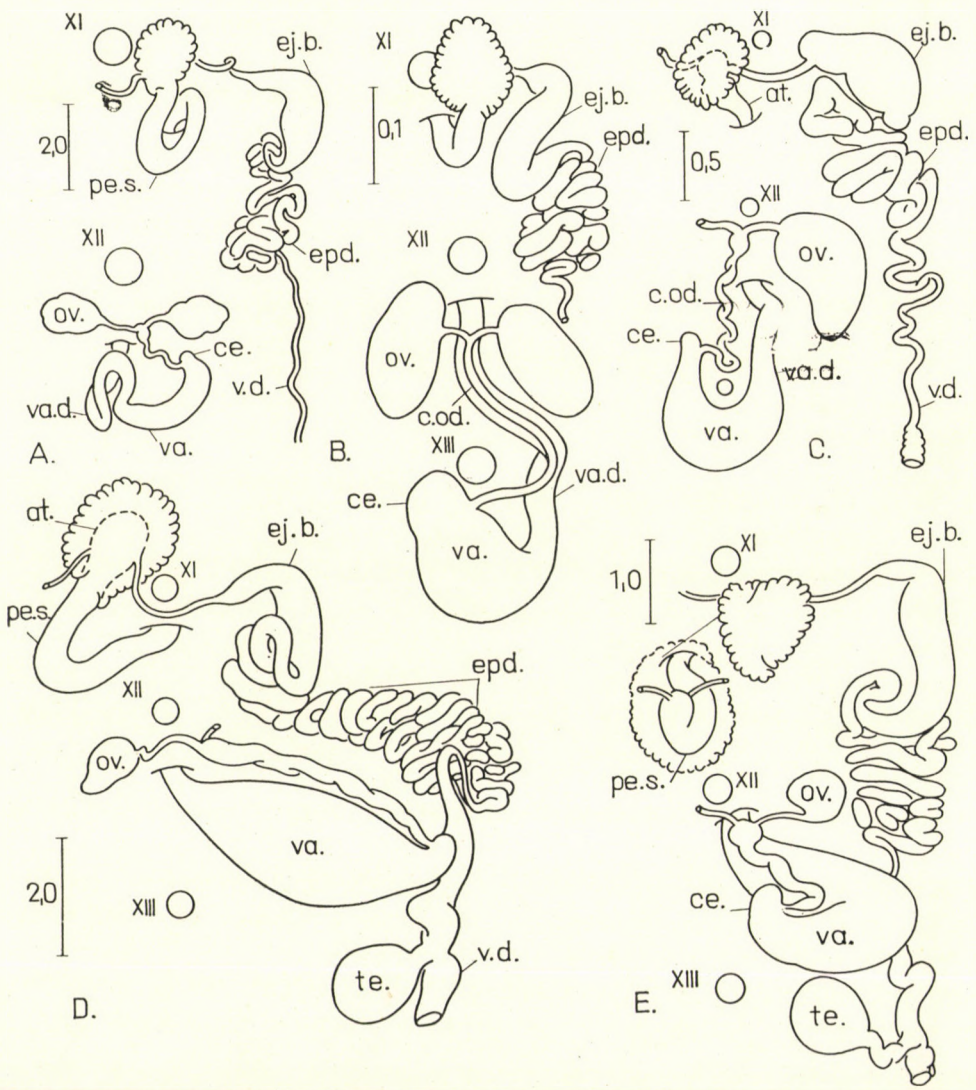

Fig. 2. Reproductive systems in Australasian monostichodont hirudinids. A = *Richardsonianus australis;* B = *Quantenobdella howensis;* C = *Euranophila centrale;* D = *Goddardobdella elegans;* E = *Eunomobdella yaldwyni.* Abbreviations as in Fig. 1. All scales in mm

Euranophila gen. n. (Fig. 2 C)

(Derivation of generic name: $\varepsilon\upsilon$ = good + rana = a frog + $\varphi\iota\lambda o\varsigma$ = loving) f.

Monostichodont (a single chitinous cutting edge along the jaw); 16 5-annulate somites; XXV, 4-annulate; somital sense organs small, somewhat obscure; jaws, small, low, rounded, located in shallow open grooves; no salivary papillae; dorsal salivary glands sparse, diffuse, no compact masses or aggregation of ducts into columns; radial muscles obvious; entrance to pharynx and lumen of pharynx, narrow; pharynx with 6 internal ridges joining into 3 entering the jaws; pharynx small, terminating at middle of IX followed by a simple short acaecate compartment in IX; the crop in X to XIX with small secondary anterior and large primary posterior pairs of caeca, the posterior pairs increasingly large, extending laterally and posteriorly, and increasingly lobed; postcaeca of XIX with lateral lobulation; no obvious copulatory gland pores; genital pores, XI and XII b_5/b_6; testes, 10 pairs; paired male duct without primary flexure; epididymis coiling tubular in XII essentially linear posterior to ejaculatory bulb in XI; no cornua on bulb; ejaculatory duct short; male median structures amyomeric, micromorphic; female median structures, myomeric, mesomorphic; male atrium in XI; oviducts, very short; common oviduct long, longer than vagina and not applied to the face of the vagina; vagina, caecate; vaginal duct of the length of the vagina. Size, moderate. Colour pattern, striped. Aquatic. Sanguivorous.

Type-species: *Euranophila centrale* sp. n.

Euranophila centrale sp. n.

With the above characters. Preserved, reasonably extended, 44.0 mm. The field note records the colour in life as mainly dark brown with a narrow orange red median stripe and another stripe between this and the orange-red bordered margin. Venter immaculate. Known from a single specimen taken October 1964 by Mr. H. Cogger of the Australian Museum attached to *Hyla gilleni*, Central Australia. This, the type specimen is Coll. No. W 3837, Australian Museum.

The absence of a loop on the paired male duct, and the essentially linear relationship of the epididymis posterior to the ejaculatory bulb, indicates relationship only to the Australian hirudinids.

The female median structures are small, thin-walled but muscularisation is evident in the vaginal duct and to a lesser degree in the vagina. These organs are crowded beneath the ventral nerve cord, and the specimen is obviously maturing for the first time, which may be indicated also in the absence of a fully formed testis on the terminal portion of the vas deferens. The other testes are well-formed, the vas deferens glandular, and the indications are of approaching male maturity. Accordingly, the amyomeric condition of the male median structure is characteristic and secondary since the ejaculatory duct and bulb are both already strongly muscled.

Having 16 5-annulate somites and a vaginal duct, *Euranophila* is comparable with *Quantenobdella* and *Richardsonianus*. It differs from the latter in the shortness of the pharynx,

the small size of the jaws, poorly represented salivary glands, and caecation of the crop. It resembles *Quantenobdella* in these features, differing from it in the presence of a cutting edge and not teeth on the jaw and the absence of a distinct posterior pair of secondary caeca. The amyomeric condition of the male median structures in *Euranophila* is a major distinction.

Recognising that the secondarily amyomeric condition of the median male structure is an expression of failure in a post-embryonic mechanism such as is commonly a departure point for further novelty, *Euranophila* can be held only as generically distinct from *Quantenobdella*.

Goddardobdella gen. n. (Figs. 2 D; 5 C)

(Derivation of generic name: Goddard = personal name + βδελλα = a leech) f.

Monostichodont; 15 5-annulate somites; XXV, 3-annulate; somital sense organs obvious; jaws small, low, rounded, situated in open recesses, the dorsomedian in an open groove; teeth about 48, spaced, sharp, conical; salivary papillae, present; dorsal salivary glands in two compact masses, strongly developed columns of aggregated ducts; radial muscles, obvious; entrance to pharynx and lumen of pharynx, narrow, the latter tubular; pharynx with 6 internal ridges, alternating narrow and wide, a pair of each fusing remote from the base of the jaw forming a single broad ridge entering the jaw; pharynx terminates at VIII/IX; a single pair of laterally directed caeca extend from the middle third of each compartment in IX to XIX with a pair of small secondary caeca anterior to the primary caeca in XII to XIX; primary caeca of XIX form postcaeca; no obvious copulatory gland pores; genital pores, XI b_5/b_6 and XII b_5/b_6; testes normally 10 pairs; no flexure on the primary male duct; epididymis a tortuous essentially linear tube in XII posterior to the ejaculatory bulb in the contiguous portions of XI and XII; ejaculatory duct short; male and female median structures myomeric, mesomorphic; male atrium in XI; penis sheath short, in the contiguous portions of XI and XII; oviduct short; common oviduct of the length of the vagina and applied to the face of the mature vagina; vaginal caecum small; no vaginal duct. Size, small. Colour pattern, striped. Aquatic. Sanguivorous.

Type-species: *Hirudo elegans* GRUBE, 1867. Rockhampton, Queensland.

I have in press (RICHARDSON: Mem. Queensland Mus.) a description of *H. elegans* based on specimens from Rockhampton collected and sent to me by the Rockhampton Naturalists Club which enabled me to recognise this species in the area of Grafton, N.S.W.

As a monostichodont with 15 5-annulate somites and salivary papillae on the jaws, this species would have been placed formerly in the genus *Limnatis*, or in the genus *Pintobdella* to which there is resemblance in the shortness of the pharynx, the caecation of the crop, the small size of the salivary papillae, etc.; but the linear relationship of epididymis and ejaculatory bulb provide relationship only with the Australian hirudinids among which to date this is the only species other than *Hirudobdella antipodum* having 15 5-annulate somites. *G. elegans* resembles the 16 5-annulate *Eunomobdella* in having a short pharynx (but this is followed by 10 caecate compartments, a single pair of caeca on each compartment) and a simple fusiform vagina with a small caecum.

The generic name recognises the pioneer studies on the Australian leeches by the late Professor E. J. GODDARD in the early part of this century.

Specimens of "*Hirudo*" *elegans* have been deposited in the Australian Museum, Sydney, N.S.W., Coll. Nos. W. 4172 and W. 4173, and in the Queensland Museum, Coll. Nos. G 5116 and G 5117.

Eunomobdella gen. n. (Fig. 2 E)

(Derivation of generic name: $\varepsilon\upsilon$ = good + nomen = a name + $\beta\delta\varepsilon\lambda\lambda\alpha$ = a leech) f.

Monostichodont; 16 5-annulate somites; XXV, 3-annulate above, 2-annulate below; somital sense organs obscure; jaws small, located in open recesses; some (?) 40 sharp, small, spaced teeth; no salivary papillae; salivary glands sparse, no obvious columns of aggregated ducts; radial muscles obvious; entrance to pharynx and lumen of pharynx both narrow; pharynx small, terminating in IX followed by an acaecate compartment in IX; the crop in X to XIX with a single pair of large unlobed narrow based lateral caeca, those of XIX forming postcaeca; no obvious copulatory gland pores; genital pores XI b_5 and XII b_5/b_6; testes, 10 pairs; no primary flexure on paired male duct; the epididymis essentially coiling linear in XII posterior to the ejaculatory bulb in XI; indefinite cornua; ejaculatory duct short; male and female median structures myomeric, the male micromorphic, the female mesomorphic; male atrium and penis sheath in posterior half of XI; oviducts short; common oviduct of the length of and applied to the face of the vagina; vagina fusiform; vaginal caecum present; no vaginal duct. Size, moderate. Colour pattern, striped. Aquatic (? Amphibious). Sanguivorous.

Type-species: *Eunomobdella yaldwyni* sp. n.

Eunomobdella yaldwyni sp. n.

With the above features. Contracted, 45.0 mm, extended 70.0 mm. A very narrow median black line interrupted posteriorly, narrower than the fawn lines which include the paramedian sense organs and complete the median field; paramedian field a wide dark slate-grey band and a narrower fawn band; intermediate and supramarginal sense organs each in a dark slate grey band, the two separated by a narrow fawn band; margin, faintly pale rose continuous onto the margin of the venter which otherwise is immaculate pale slate grey. Stripes incomplete and interrupted variously on the pregenital region. A post-anal triangular slate-grey patch on dorsum of sucker which is otherwise fawn.

Known from a single specimen taken 10/9/1967 by Mr. and Mrs. VALE LANE near Cowan Creek, Grafton, N. S. W. Australian Museum, Collection No. W 4175.

The single specimen was fully male mature and accordingly there is no reason to consider that the micromorphic form of the atrium and penis sheath is other than characteristic of this leech. The number of teeth given above is an estimate, based on a rapid count of a little more than half of the dental ridge of one jaw. The dental ridges must be very delicately attached for they fell away from each jaw and disintegrated.

Having the essentially linear relationship of the epididymis and ejaculatory bulb, this leech is referable only to the other leeches in the Australian group. Of these, only *God-*

dardobdella lacks a vaginal duct, but this has 15 5-annulate somites and has salivary papillae on the jaws.

The specific name recognises the valuable help I have had from DR. J. C. YALDWYN of the Australian Museum in the matter of literature and in other ways in the course of this and other research.

Aetheobdella MOORE, 1935 (Fig. 3 A)

Monostichodont; 17 5-annulate somites; XXV, 4-annulate; somital sense organs small; jaws small, low, rounded, situated in shallow open recesses; about 25 low, wide-based, spaced teeth; no salivary gland papillae; dorsal salivary glands sparse, diffuse, no obvious columns of aggregated ducts; radial musculature obvious; entrance to pharynx and lumen of pharynx, narrow; pharynx with three main ridges, formed each by the fusion of 2 or 3 posterior ridges, all entering the jaws; pharynx terminating in the middle of VIII followed by a narrow acaecate compartment in VIII and IX; the crop in X to XIX with three pairs of narrow based caeca on each compartment, anterior and posterior lobed small secondary pairs and a median laterally and posteriorly directed lobed primary pair which extend into the following somite in XIII to XVIII and form lobed postcaeca extending posteriorly from XIX; no obvious copulatory gland pores; genital pores XI b_5/b_6 (b_5 or b_6) and XIII b_1/b_2; testes, 11 pairs; paired male duct with a primary loop reflected posteriorly from XI/XII; epididymis a tortuous coiling tube recurrent on the initial limb, extending onto the procurrent terminal limb continuous with a thin-walled enlarged sperm duct; short muscular ejaculatory ducts; male and female median structures amyomeric, micromorphic; male atrium dwarfed, concealed in body-wall in XI b_5 and b_6; penis minute, conical; oviducts elongate, coiled as a globular mass in the contiguous parts of XII and XIII; dwarfed female atrium concealed in body-wall in contiguous annuli of XII and XIII; no common oviduct; no vagina. Size, medium. Colour, plain. Aquatic (? Amphibious). Sanguivorous.

Type-species: *Aetheobdella hirudoides* MOORE, 1935. New South Wales; Victoria. Australia.

Monotypic. MOORE had only the single type specimen in the collections of the British Museum. This was taken free-living. I have now many specimens found as (?) temporary parasites in subcutaneous pockets lateral to the eye in various bush-birds taken by Mr. P. STRONG and Mr. H. BATTAM South of Sydney. None show developed vasa deferentia or testes. A large specimen, 70.0 mm, taken free-living near Mansfield, Victoria is in the collections of the National Museum of Victoria. It is gorged with blood and I cannot at this time dissect it to confirm the number of testes.

A. hirudoides is exceptional in the Australian hirudinid fauna in having a loop on the paired male duct conforming to the haemopisoid condition; but in jaws, pharynx, crop, this leech is hirudoid.

MOORE (1935) saw resemblance to the N. American *Philobdella gracilis* in the level of organisation of the median reproductive structures. With only MOORE's figures (1901, Figs. 17, 21) to guide me, it appears that in *P. gracilis* the male paired duct turns posteriorly in the middle of XI forming a globular coiled epididymis in the contiguous parts of XI and XII connecting by an ejaculatory duct to the male atrium which opens at XII a_2. There is only a recurrent and no procurrent limb. The ovaries are short, in the posterior half of XII

with short oviducts connecting to the atrium which opens at XIII b_1. The alimentary canal is "haemopisine", a tubular crop, acaecate excepting for the postcaeca. There are 15 5-annulate somites.

At best, *A. hirudoides* and *P. gracilis* exhibit parallelism in the level of organisation of the median structures of the reproductive system. Other 17 5-annulate hirudinids are in the Asian genus *Whitmania* and the South American genus *Semiscolex*. Both have a macrophagous haemopisoid form; *Whitmania*, distichodont; *Semiscolex*, agnathous. *Whitmania* has the epididymis formed on the initial recurrent limb, continuing onto the procurrent limb on which the ejaculatory bulb is also formed; the ejaculatory duct, short. *Semiscolex* has the epididymis formed on the initial recurrent limb followed by the ejaculatory duct on the procurrent limb so that the ejaculatory duct is long. Both have myomeric median reproductive structures, the female organs mesomorphic in both — the vagina lacking a caecum and duct; the male median organs mesomorphic to macromorphic in *Whitmania* and macromorphic in *Semiscolex*.

The 17 5-annulate condition in *A. hirudoides* is a parallelism and not indicative of relationship to other hirudinids exhibiting this somital annulation.

There remains the interesting possibility that the amyomeric condition may be an established consequence from temporary parasitism during early life in the high temperature of the environment within a warm-blooded host. In the infested birds I have examined, the point of entry is situated at the upper outer corner of the eye at the limit of sweep of the nictitating membrane. The aperture to the subcutaneous pocket is firm-rimmed and small. The indications are that infestation is achieved by a small leech, for it is difficult to believe that a large leech would not be dislodged by the bird; but a small leech could well be sheltered at this position while achieving entry.

The dwarfed condition of the male and female median structures and the undeveloped state of the paired structures are in conformity with our knowledge of the inhibitory effects of higher than normal sustained temperature on the elaboration of post-embryonic structures, and on maturation. The excessive length of the oviduct in the free-living leech is fully abnormal within the hirudinids and similar to the elongate paired structures in the erpobdellids but without the morphological relationships normal to the erpobdellids. This indicates the high probability of an implanted secondary condition which is now permanent through the loss of a post-embryonic developmental agency, a consequence from a partial parasitic existence. There are no indications at this time that the condition is still plastic.

A basis for reversion to a lower level of organisation of the reproductive system can be given on reasonable grounds as above. The 17 5-annulate condition can be assumed on theoretical grounds to be a lower level of somital organisation than 16 or 15 such somites; but at this time there is no apparent evidence from *A. hirudoides* to even support such an assumption.

Ornithobdella Benham, 1909 (Fig. 3 B)

Monostichodont; 15 5-annulate somites; XXV, 3-annulate; somital sense organs obscure; jaws moderate, low, slightly compressed, dorsomedian in an open groove, ventrolaterals in widely open chambers; no salivary papillae; no teeth, dorsomedian jaw with a high sharp cutting ridge; salivary glands numerous, arranged on longitudinal thick cords, no right or left columns of aggregated ducts; radial muscles sparse, obscure; entrance to pharynx very narrow, and lumen of pharynx narrow; 8 internal ridges on pharynx, 3 fusing to enter each ventrolateral jaw, 2 fusing to enter dorsomedian; no ridges terminating on margin of entrance to pharynx; pharynx terminating in the middle of IX followed by a short compartment in IX with a primary pair of lateral caeca; X to XIX each with a small simple secondary posterior pair, a larger lobed secondary anterior pair, and an extensive lobed laterally directed median primary pair passing into the following somite from XII to XIX and forming strongly lobed postcaeca on XIX; no obvious copulatory gland pores;

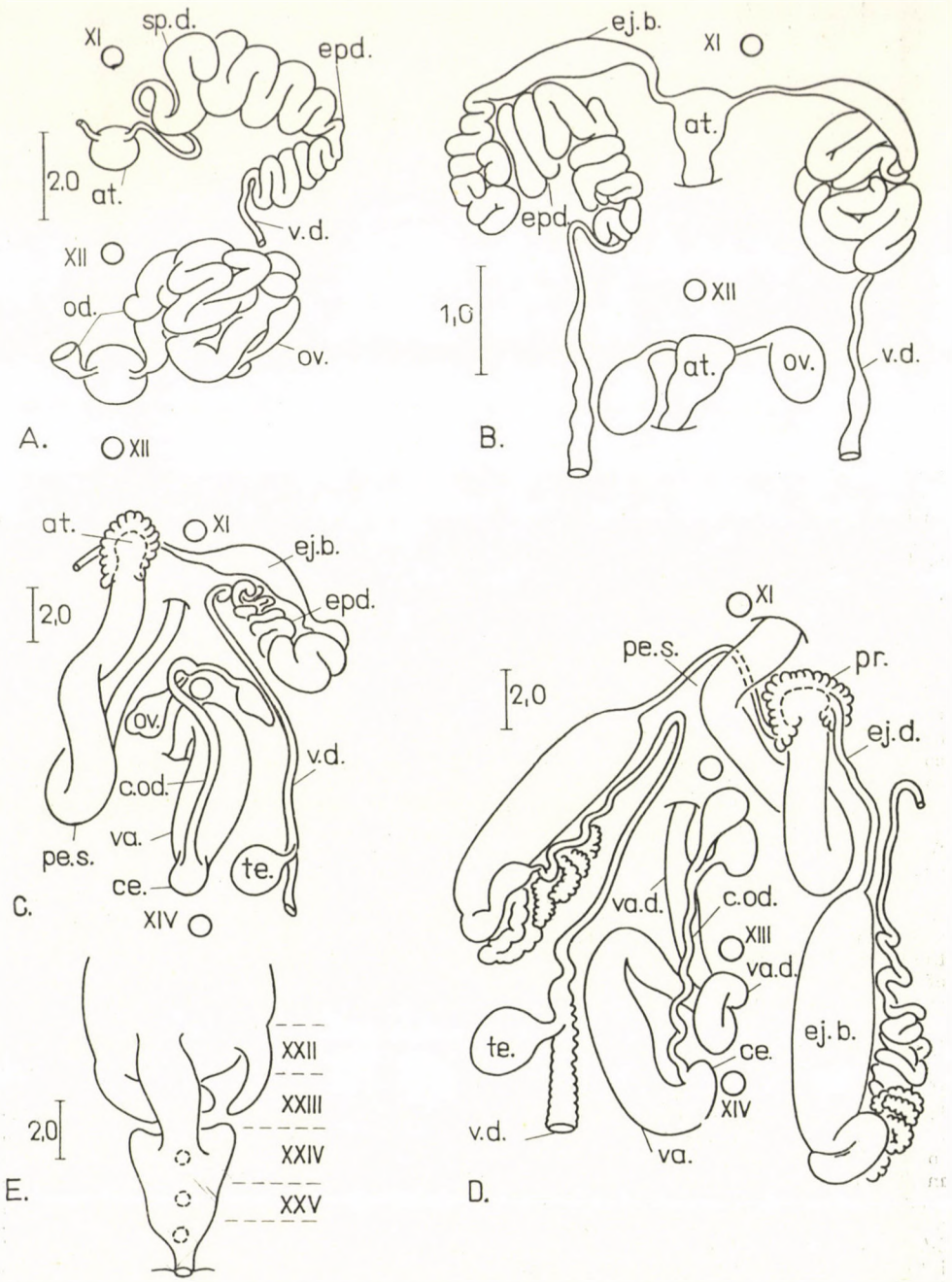

Fig. 3. Reproductive systems of monostichodont and distichodont leeches. A = *Aetheobdella hirudoides;* B = *Ornithobdella edentula;* C = *Haemopis sanguisuga;* D = *Mollibdella grandis;* E = Posterior region of alimentary canal in *Bdellarogatis plumbeus.* Abbreviations as in Fig. 1. All scales in mm

genital pores XI b_5/b_6 and XII/XIII; testes 10 pairs, simple saccular; paired male duct with a double flexure at XI/XII, epididymis formed on initial procurrent, median recurrent and terminal procurrent limbs, ejaculatory bulb on anterior vertical descendent limb, the whole a globoid mass in the contiguous portions of XI and XII; ejaculatory ducts short; male and female median reproductive structures amyomeric, micromorphic; male atrium thin-walled, in last part XI/XII; female atrium, thin-walled at XII/XIII; oviducts short. Size, moderate. Colour pattern, reticulate above and below. Terrestrial. Sanguivorous.

Type-species: *Ornithobdella edentula* BENHAM, 1909. New Zealand.

Two specimens, 53.0 and 68.0 mm long from the Snare's Islands, the location of the original collections, agree with BENHAM's description. They are hirudinid in general facies, in annulation, the disposition of the eyes, etc. and unusual externally only in the genital apertures, which resemble those in *Aetheobdella*, and in XXIV a_1 being the last complete annulus on the venter.

The pattern of organisation on the anterior end of the paired male duct is not linear as in the other Australasian hirudinids, but conforms to the hirudoid pattern. They otherwise exhibit much novelty. The salivary glands are unusual in being arranged as a dorsal and a ventral layer of longitudinal thick cords between the wall of the pharynx and the body-wall. The internal longitudinal muscle layer of the body-wall includes some 25 wide independent longitudinal elements varying in width from 0.5 to 1.0 mm in the vicinity of XIX, extending from behind this anteriorly to diminish in number anteriorly to XI. These are restricted to the ventral body-wall. They are similar in form and nature to those seen in *Aetheobdella hirudoides* but in that species they are present on all aspects of the body-wall. The caecation of the crop is similar to that of *hirudoides* excepting that the primary caeca extend through the dorsoventral muscles of the intermediate palisade into the lateral longitudinal chamber of the body-cavity, passing between the nephric vesicles and below the lateral longitudinal contractile vessel. The ventral nerve cord is detached from and in no way closely fastened to the body-wall.

Professor KNOX informs me this leech is terrestrial which may explain in some measure the presence of the very powerful longitudinal muscles on the floor of the body-cavity. Anteriorly these break into many small strands which become intimate with the muscular envelope of the body-wall which is heavily developed anterior to the genital region.

The distribution, the known sanguivorous association with birds, the level of organisation of the median reproductive structures, etc. would in the first instance give promise of affinities between *Ornithobdella*, *Aetheobdella*, and *Hirudobdella*. Until more completely known, the unusually long pharynx in the latter sets it apart from the other two, although the pattern of organisation on the paired male duct indicates that *Hirudobdella* may well be placed in with the Australian leeches among which it is unique so far in having an (?) acaecate vagina.

Ornithobdella and *Aetheobdella* agree in having heavy bands of internal longitudinal muscles on the body-wall. This may be a correlate of a terrestrial habit which I have not yet succeded in establishing for *Aetheobdella* in which the pregenital body-wall is not obviously thickened or strengthe ed. The salivary gland arrangement is fully different in the two leeches; but, other than size of the pharynx, the pharynx and caecation of the crop are similar in both excepting that the primary caeca in *Aetheobdella* are contained within the paramedian longitudinal chamber of the body-cavity. They agree in the amyomeric condition of the median reproductive structures; but not in the pattern of elaboration on the paired male duct, nor in the female paired structures which are normal for hirudinids in *Ornithobdella*, and an hirudinid abnormality in *Aetheobdella*. They differ also in that the atria in *Aetheobdella* are imbedded in the body-wall; but in *Ornithobdella* although minute, they are extended into the body-cavity standing above the longitudinal layer of the body-wall muscles. There is accordingly no basis for considering that the level of organisation shown on the median region of the reproductive system in *Ornithobdella* is fully equivalent to that in *Aetheobdella*.

There is no relationship to the terrestrial and amphibious leeches of South America. These are surveyed by SOÓS (1966) and have been well described by RINGUELET in several papers (*e.g.* 1944). *Americobdella* and *Semiscolex* are agnathous and with a macrophagous

pharynx. *Diestecostoma* has only 16 pairs of nephridia and has erpobdellid characteristics.

Ornithobdella edentula is clearly an hirudinid with unusual morphological features setting it apart from other hirudinids excepting only, so far as I am aware, *Aetheobdella hirudoides*. The two are generically distinct, but share other features indicating a level of relationship higher than generic and of familial status. This is shown in the level of organisation on the paired and median regions of the reproductive system, in the unusual degree of detachment of the ventral nerve cord from the body-wall; etc. as discussed above. Accordingly at this time it seems most proper to place them in a separate family giving recognition to morphological characteristics which are a departure from the general monotony seen in other hirudinids.

Hirudobdella GODDARD, 1910

Monostichodont (a single low chitinous cutting edge on each jaw); 15 5-annulate somites; XXV, 3-annulate; obvious somital sense organs; 3 small tall jaws; no salivary papillae; pharynx extending to XII/XIII; (?) 5 pairs of caeca; genital pores XI and XII b_5/b_6; testes, 7 pairs; paired male ducts elaborating without a primary flexure into a globular coiled epididymis in the contiguous halves of XI and XII; no ejaculatory bulbs; male median structures, amyomeric, female myomeric, both mesomorphic; muscular long ejaculatory ducts enter atrium independently; oviducts, short; common oviduct moderate entering (?) terminally into vagina; (?) no vaginal caecum; no vaginal duct. Size, moderate. Colour pattern, longitudinally striped. (?) Terrestrial. Sanguivorous.

Type-species: *Hirudo antipodum* BENHAM, 1904. New Zealand.

Monotypic. Not known other than in BENHAM's accounts (1904, 1907) based on specimens from bird burrows, Open Bay Island, West Coast of the South Island. No specimens survive (W. H. B. pers. corr.).

GODDARD followed BENHAM's clear opinion that this leech required a new genus, which he provided but did not define.

The generic diagnosis is based on BENHAM's excellent account. BENHAM enumerated the annuli carrying somital sense organs which enables the determination of the somital annulation. He describes the pharynx as extending so far as to cover the median reproductive organs which I interpret as reaching to XII/XIII, but it might reach further. His reference to there being only ten caeca which he could detect can only be read that there were 5 pairs of crop caeca which if the crop terminates at XIX/XX as is most usual, would suggest that the pharynx ends well behind XII/XIII. He does not mention postcaeca. BENHAM was most definite that the small filiform penis was contained entirely within the atrium and that there was no penis sheath. The absence of a vaginal caecum is my own interpretation from his Fig. 12 which shows the median structures in side view; but this is a most unusual condition in a leech where there is no vaginal duct. MOORE (1939) shows such a condition in *Limnatis obscura* and *L. oligodonta*.

The male and female median structures show a level of organisation similar, excepting in the lack of a duct, to that in the American leeches of the genera *Macrobdella* and *Oxyptychus;* but the elaboration of the epididymis on the male paired duct in XII without the formation of a primary loop separates *H. antipodum* from the American leeches and associates it with the Australian group from which it differs only in the absence of an ejaculatory bulb in this respect. Otherwise it is unique in the length of the pharynx which suggests it may be a sac-like rather than bulbous structure. This form of pharynx has not been seen otherwise in the Australasian leeches. So far as I have seen, a pharynx terminating at XII/XIII is known otherwise only in the Asian *Whitmania gracilis* (MOORE, 1930).

Haemopis SAVIGNY, 1822 (s. str.) (Figs. 3 C; 6 A)

Distichodont; 15 5-annulate somites; XXV, 3-annulate; jaws small, dorsomedian located in a shallow open recess, ventrolaterals in shallow crypts; two rows, each of a few (11—19) large heavy teeth; no salivary papillae; salivary glands, diffuse; radial muscles not obvious; wall of pharynx intimately associated with muscular layer of body-wall; entrance to and lumen of pharynx, moderate, not strongly reduced; internal ridges of pharynx in groups of 3 each fusing to enter base of jaw, three ending independently on margin of entrance to pharynx between bases of jaws; pharynx ends in X; crop essentially tubular, acaecate excepting for simple postcaeca of XIX reaching nearly to XXV; no obvious copulatory gland pores; genital pores, XI b_6 (b_5/b_6) and XII b_5/b_6 (b_6); testes, normally 10 pairs; paired male duct reflected posteriorly in last half of XI a loop essentially in XII; the recurrent initial limb forming the epididymis and thin-walled sperm duct, the terminal procurrent limb forming the ejaculatory bulb; ejaculatory ducts short; median reproductive structures myomeric, mesomorphic; atria in XI and XII; penis sheath reflected on itself in XII and XIII; penis elongate, cylindrical, sturdy; oviducts short; common oviduct long, of the length of and applied to the face of the vagina; vaginal caecum present, small; vagina simple fusiform; no vaginal duct. Size, moderate. Colour pattern, maculate. Aquatic. Macrophagous.

Type-species: *Hirudo sanguisuga* LINNAEUS, 1758. Europe, and eastward.

I am at this time unable to associate any other species with this genus; but as an intimate account of *sanguisuga* was not available until MANN (1954) and even this is not complete on all systematic data, it is highly probable that a second or more species of this genus exist in Europe since the earlier synonymies were determined only on external morphology. MATHERS' demonstration of two new haemopisine species in North America supports this suggestion.

Percymoorensis gen. n. (Figs. 4 B; 6 B)

(Derivation of generic name: personal name) m.

Distichodont; 15 5-annulate somites (if 16, VIII also complete); XXV, 3-annulate; jaws, very small, retractable into deep narrow-mouthed tubular pits; teeth a double row, broad-based, coarse, few in number; no salivary papillae; salivary glands, diffuse; radial muscles not obvious; wall of pharynx intimately associated with muscular layer of body-wall; entrance to and lumen of pharynx reduced; internal muscular ridges of pharynx grouped in three, each group fusing to enter jaw, dorsolaterals absent and none ending on margin of entrance to pharynx; pharynx ends at X/XI; crop essentially tubular with minor indications of compartmentation and acaecate excepting XIX from which large postcaeca reach to XXIV; no obvious copulatory gland pores; genital pores, XI and XII b_6; testes normally 10 pairs; paired male duct reflected posteriorly in XI into XII and XIII; epididymis formed on the

initial recurrent limb expanding into a sperm duct; ejaculatory bulb formed on the procurrent terminal limb; ejaculatory duct short in the paramedian chamber, long to very long in the median longitudinal chamber; median organs myomeric, macromorphic; male atrium in XI, XII or even XV; penis sheath reflected, moderate to very long; penis long, sturdy, cylindrical; oviducts short, common oviduct long to very long, not applied to face of vagina; small vaginal caecum; fusiform vagina; vaginal duct long to very long. Size, moderate to large. Colour pattern, maculate to linear maculate. Aquatic. Microphagous to macrophagous.

Type-species: *Hirudo marmorata* SAY, 1824. North America.
Other species: *Hirudo lateralis* SAY, 1824. North America,
(?) *Haemopis kingi* MATHERS, 1954. North America,
(?) *Haemopis lateromaculatum* MATHERS, 1963. North America.

It is clear that MOORE formulated his concept of the "haemopisine" reproductive system from his knowledge of *marmoratis* and *lateralis*. This can be seen in his reference to "haemopisine proportions" in discussing the reproductive system in various hirudinid leeches (*e.g. Asiaticobdella birmanica* and *A. asiatica*). He was fully aware of the systematic value of the haemopisine pattern shown at the anterior end of the paired male duct, which he recognised in the North American species known to him.

Although the median reproductive structures in *sanguisuga* are essentially mesomorphic but enlarged, my two dissections show that these structures are contained within the median longitudinal chamber of the body-cavity. So far as I can judge from MATHERS (1954, 1963), this is also the case in *kingi* and *lateromaculatum*. In *marmoratis*, my dissections show that the male and female median structures depart the median longitudinal chamber, enter the paramedian chambers, and continually posteriorly in these chambers, the female in one chamber, the male in the opposite. The departure is made in the contiguous parts of XI and XII for the male structures, the contiguous parts of XII and XIII for the female structures. It is clear in MOORE (1901) that the male structures extend posteriorly in the paramedian chamber in *lateralis*, but it would appear from his remarks about the positioning of the ovary and from the location shown for the ovary in his figure, that the female system remains in the median chamber in this species.

The two differ totally from *sanguisuga* in this important and unusual manner sufficiently to suggest the provision of a separate genus for these two species. This action is supported by the absence of internal ridges of the pharynx ending independently between the bases of the jaws on the margin of the opening into the pharynx. This indicates the opening is morphologically smaller, more restricted than in *sanguisuga*. It is supported further by the presence of firm-rimmed, narrow-mouthed, deep tubular pits into which the three jaws are fully retractable. These pits extend from VII a_1/a_2 to VIII a_1/a_2, the equivalent of the length of a full somite at this level. In *sanguisuga* such pits are present only for the ventrolaterals. The margin is mostly a loose non-muscular fold; the depth, not that of half a somite; and the jaws do not retract fully into the pit, the medial aspect of the jaw forming half of the margin when the jaw is retracted.

MATHERS' two species have deep pits fully housing the jaws, as in *marmoratis;* but the dorsolaterals and ventromedian are paired, so that there are six ridges ending independently between the bases of the jaws in *kingi*. Otherwise the presence of developed vaginal ducts, etc. fully separate these two species from the genus *Haemopis*. A closer examination might show that they should be excluded also from *Percymoorensis* in which the extent of development and morphological relationships of the median reproductive structures warrants the recognition of a level of organisation which can be termed megamorphic; but *kingi* and *lateromaculatum* are essentially macromorphic and not remarkable in this respect. The genus *Whitmania* as currently accepted contains megamorphic species (*acranulata*, *gracilis*) and mesomorphic species (*pigra*, *laevis*, *edentula*) and so parallels *Percymoorensis* as given above.

The name proposed for the new genus is a very small recognition of the meticulous, intimate, detailed, accurate account of the hirudinid leeches devised, developed, and practised by the late Professor J. PERCY MOORE as an unparalleled contribution to the knowledge of leeches over a period of more than 50 years.

Bdellarogatis gen. n. (Figs. 3 E; 4 A; 6 C)

(Derivation of generic name: $\beta\delta\varepsilon\lambda\lambda\alpha$ = a leech + rogare = to question) m.

No teeth; 15 5-annulate somites; XXV, 3-annulate; somital sense organs small; lower surface of velum finely and closely papillate; small ventrolateral fleshy pads, but no true jaws; no crypts or formed recesses; no salivary papillae; salivary glands sparse, diffuse; radial muscles obscure; wall of pharynx intimately associated with muscular body-wall; entrance to, and lumen of pharynx, broad, unrestricted; pharynx with some 15 internal ridges, ventrolateral pairs joining to enter the fleshy pads on the margin of the entrance to the pharynx, 4 joining to end broadly on the dorsomedian position, 3 joining on the ventromedial position, and 3 ending independently on the margin of the entrance to the pharynx; pharynx terminating at X/XI; crop tubular with intersomital sphincters, extending to XXII/XXIII, acaecate excepting for reduced postcaeca on XXII terminating in XXIII; no obvious copulatory gland pores; genital pores anterior in XI b_6 and XII b_6; testes, 10 pairs; paired male duct reflects from XI/XII in a simple primary flexure; epididymis formed on initial recurrent limb expanding into a thin-walled convoluted sperm tube; ejaculatory bulb on procurrent terminal limb; ejaculatory duct very long; male and female median structures myomeric, macromorphic; male atrium at XII/XIII; penis sheath reflected at XIII/XIV; penis elongate, cylindrical, sturdy; oviducts short; common oviduct of length of vagina and applied to face of vagina; vagina caecate, simple fusiform; no vaginal duct. Size, large. Colour pattern, sparsely maculate. Aquatic. Macrophagous.

Type-species: *Haemopis plumbeus* MOORE, 1912. North America.

I am not able at this time to associate another species with this genus.

The original account by MOORE (1912) was not complete. He indicated that in general *plumbeus* resembled *grandis* in the nature of the alimentary canal, etc. He made the point that "Unlike any other species described in this paper, the vagina is very much shorter than the atrium". At that time he did not distinguish between vagina and vaginal duct. He did not figure the reproductive system.

The data above is taken from the dissection of two specimens which I collected at Lac aux Rats Musquees, Frontenac Co., Province of Quebec, in August 1934. In both the crop is filled with erpobdellid leeches but from the attachment and relationships of the intestine, it seems that the crop definitely extends into XXII.

The absence of functional jaws; the great width of the entrance to the pharynx; the number of internal ridges and the manner of their termination on the margin of the entrance to the pharynx; the long ejaculatory ducts; these characteristics all set this species apart from the genus *Haemopis* s. str. and further in the absence of a vaginal duct, serve to set the species apart from the genus *Percymoorensis;* but the characters of the pharynx would indicate some degree of relationship to *Mollibdella.*

Strong difference is shown in the form of the anterior sucker in *plumbeus* and *grandis.* In the latter, the sucker is closely similar to the form shown in *P. marmoratis.* The aperture in

these two species is elongate, the margin thin, the lower margin sharply concave, the lower surface of the velum is smooth. In *plumbeus*, the margin of the velum and of the sucker is thick, rounded, the aperture is transverse, the lower margin is anteriorly convex, the lower surface of the velum is closely and finely papillate.

These differences along with the absence of a vaginal duct, the form of the male median structures, the elongate ejaculatory ducts, all support the proposal of a separate genus to accomodate *plumbeus*.

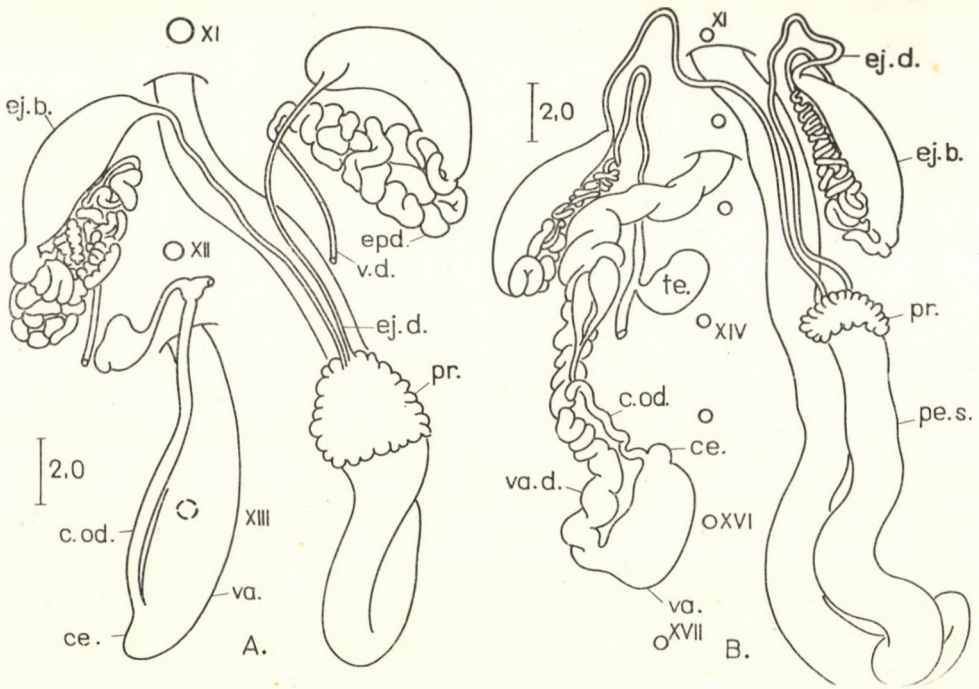

Fig. 4. Reproductive systems in distichodont and agnathous leeches. A = *Bdellarogatis plumbeus;* B = *Percymoorensis marmoratis.* Abbreviations as in Fig. 1. All scales in mm

Bdellarogatis differs from the South American agnathous genus *Semiscolex* which lacks ejaculatory bulbs, has an acaecate vagina, and a straight penis sheath with the male atrium back as far as in XIV to XVII.

With only the facilities of hand-dissection, I am unable to satisfy myself that the structures which I refer to above as salivary glands in this leech, as also in *M. grandis* are in fact structures of this nature.

Mollibdella gen. n. (Figs. 3 D; 6 D)

(Derivation of generic name: mollis = soft + $\beta\delta\varepsilon\lambda\lambda\alpha$ = a leech) f.

No teeth; 15 5-annulate somites; XXV, 3-annulate; somital sense organs small; lower surface of velum smooth; agnathous; no jaw recesses; no salivary papillae; salivary gland sparse, diffuse; radial muscles, obscure; wall of pharynx intimately associated with muscles of body-wall; entrance to, and lumen of

pharynx broad, unrestricted; pharynx with some 12 internal ridges, a wide single dorsomedian, fusing ventrolateral and ventral pairs, and 4 single ridges all terminating on the margin of the entrance to the pharynx; pharynx terminates at X/XI; crop simple tubular, terminating at XIX/XX, acaecate excepting for reduced postcaeca on XIX terminating in XXI; no obvious copulatory gland pores; genital pores XI b_5/b_6 and XII b_6; testes, (?) 10 pairs; paired male duct reflects in the anterior portion of XII as a single loop; epididymis formed on the initial recurrent limb continuous with a thin-walled convoluted sperm duct; ejaculatory bulb on terminal procurrent limb; ejaculatory ducts short; median reproductive structures myomeric, macromorphic; male atrium in contiguous portions of XI and XII; penis sheath reflected at XII/XIII; penis long, cylindrical, sturdy; oviducts short; common oviduct longer than and not applied to the face of the vagina; vaginal caecum, small; vagina fusiform; vaginal duct long, about twice the length of the vagina. Size, large. Colour pattern, sparsely to liberally maculate. Aquatic. Macrophagous.

Type-species: *Semiscolex grandis* VERRILL, 1874. North America.

MOORE (1912) did not fully describe this species. The above data is based on specimens I collected in August, 1934 at Lac aux Rats Musquees, Frontenac Co., P. Q., and from others taken elsewhere in South-Eastern Quebec.

This leech resembles *P. marmoratis* in general form, appearance, the nature of the anterior sucker, etc. and *P. kingi* and *P. lateromaculatum* in the level of organisation of the median reproductive structures; but departs so markedly in the absence of jaws, the nature of the pharynx, the reduced postcaeca, that it cannot be housed in a genus with those other species.

The new genus differs from the genus *Semiscolex* in the same manner as does *Bdellarogatis*.

MORPHOLOGY OF THE SECONDARY BODY-CAVITY

In the absence of septa and of an extensive primary perivisceral coelom, the secondary body-cavity of hirudinids filled more or less with a diffuse poorly differentiated connective tissue resembling a packing tissue such as parenchyme traversed by dorsoventral strands of muscle, has not been recognised as other than a generalised cavity essentially lacking a morphologically disciplined post-embryonic development. The somital divisions of the crop and of the intestine, the metamerism of the testes, nephridia, transverse vessels of the vascular system etc., all indicate a disciplined regional splanchnology; but these indications have been viewed more as a survival from embryonic segmentation than as an expression of a regional morphology associated with persisting morphological determinant factors in the post-embryonic secondary body-cavity

There has been little more than occasional brief comment (SCRIBAN and AUTRUM, 1932/34) that the dorsoventral muscles are not random, and there has been no full recognition that these muscles are arranged in longitudinal

rows or palisades. This came to my attention first in the dissection of *Aetheobdella hirudoides* in which the internal longitudinal layer of muscle in the body-wall consists of strands which are wider than usual and individual strands can be readily traced through many somites. It was then seen that the strands of dorsoventral muscles ascending between the compartments of the crop on each side, are all rooted between the same two strands of longitudinal muscle on the body-wall. Posteriorly from XIX/XX to XXVI, there are continuous palisades of dorsoventral muscles separating the intestine and rectum from the postcaeca. This then provides two palisades on either side of the axial structures of the alimentary canal, extending from VIII/IX to XXVI, enclosing a median longitudinal division of the secondary body-cavity. These two palisades are in the paramedian position.

A longitudinal lateral palisade of dorsoventral muscles continuous from VII/VIII to XXVI is present on each side internal to the lateral longitudinal contractile vessels, the nephridial vesicles and their main ducts. These palisades divide off a lateral longitudinal chamber of the secondary body-cavity, providing a chamber in which the contractile vessels and nephric vesicles are at least partially, if not more fully, protected from functional interference by other organs. As this palisade extends along the intermediate line, it can be referred to as the intermediate palisade.

Accordingly the four palisades, paired paramedian and paired intermediate, define five longitudinal chambers in the secondary body-cavity: a median chamber; paired paramedian chambers; paired lateral chambers. The passage of structures transversely, vascular vessels, nephric ducts, lateral caeca of the crop, ducts of the reproductive system, etc. from one longitudinal chamber to another, involves passage between strands of dorsoventral muscles of the palisades. This provides anchoring or morphological fixed points on such structures.

This has been confirmed in the dissection of *H. medicinalis*, various monostichodont Australian hirudinids, etc. In *H. sanguisuga* where the crop is tubular and lacks lateral caeca, the paramedian palisades are well-formed and obvious along their entire length. They are somewhat less obvious in the region of the crop in *M. decora*, *B. plumbeus*, *M. grandis* and *P. marmoratis*, leeches in which the connective tissue in the body-cavity is heavily developed; but in all so far dissected, the longitudinal chambers can be determined, a regional splanchnology can be described in relation to them, and it can be clearly seen that the palisades determine morphological limitations and morphological fixed points of significance in the post-embryonic development and elaboration of the alimentary canal and especially the reproductive system.

If an exception is to be made, it is in the case of *P. olivacea*. The specimen I dissected was remarkably deficient in packing tissues and exhibited relatively few dorsoventral muscle strands. I could not recognise a distinctive inter-

mediate palisade. The longitudinal lateral contractile vessels and nephric vesicles were fully exposed when the cavity was opened. The seeming absence or very incomplete nature of this palisade may be related to the unusual manner in which the nephric vesicles appear to be wrapped around the contractile vessels and to anchor them to the body-wall. This can be seen in CABALLERO (1933, Fig. 4).

GENERAL REGIONAL SPLANCHNOLOGY

The median longitudinal chamber of the body-cavity contains the axial structures of the alimentary canal (crop, intestine and rectum); the median structures of the male and female reproductive systems (atrium and penis sheath; atrium, vagina and vaginal duct); the testes and ovaries; the oviducts and common oviduct; dorsal and ventral vascular sinuses; the ventral nerve cord.

The paramedian longitudinal chambers contain the primary paired lateral caeca of the crop and the postcaeca; the male paired ducts (vasa deferentia and associated elaborated structures, epididymis and sperm sac or duct, or ejaculatory bulb).

The acaecate tubular crop is contained entirely within the median chamber excepting for the postcaeca which pass through the paramedian palisade to enter the paramedian chamber in the middle of XIX. This secures the posterior end of the crop in XIX, and otherwise it is secured only at the anterior end where it is attached to the pharynx. In the caecate crop, strands of dorsoventral muscles stand in the intersomital constrictions between the compartments, so securing these within their somites. Other strands of the paramedian palisade pass up over the face of the compartments. Primary laterally directed caeca pass through the paramedian palisade into the paramedian chamber where they may extend posteriorly even beyond the limit of their proper somite. The root of the caecum is secured between strands of dorsoventral muscles in the paramedian palisade. The small secondary caeca are retained essentially in the median chamber being medial to strands of dorsoventral muscles in the paramedian palisade. *Ornithobdella* is an exception, the primary caeca entering the lateral longitudinal chamber.

In engorgement, there is relaxation of the dorsoventral muscles of the paramedian palisade so that the root of the primary caeca may become swollen and the secondary caeca enlarged.

With only one exception, *P. marmoratis*, the whole of the female reproductive system is contained within the median longitudinal chamber of the body-cavity. It may remain entirely ventral to the crop, or in the female mature state the ovaries and vagina may stand lateral to the crop. In this way the median chamber provides a limited space within which the female system

elaborates post-embryonically between two points: the site of the passage of one oviduct beneath the ventral nerve cord, nearly always just posterior to ganglion XII or otherwise in the posterior half of XII; and the terminal attachment of the female median structures to the body-wall and genital pore, in the last two annuli of XII or exceptionally in the first two annuli of XIII. These are embryonically established morphological anchors, fixed points between which the median structures of the female system are elaborated in the late embryo. The morphological distance between these two fixed points is less than one half somite.

The same circumstances apply to the median structures of the male reproductive system where the atrium, or muscular atrium and penis sheath are contained entirely within the median longitudinal chamber of the body-cavity, and ventral to the crop as the rule, but in some the penis sheath stands lateral to the crop in the male mature animal. Morphological anchors are provided in the passage of one ejaculatory duct or sperm duct beneath the ventral nerve cord nearly always immediately posterior to ganglion XI, and the terminal attachment to the body wall at the genital pore which is characteristically on or between the last two annuli of XI, very rarely on either the first or second in XII. Again the morphological distance between these fixed points is less than one half somite.

It can now be recognised that the post-embryonic elaboration and functional differentiation of the median portions of the male and female reproductive systems take place between two closely approximated fixed points and within the limits of the median longitudinal chamber of the body-cavity.

The testes are situated within the median longitudinal chamber of the body-cavity. The vasa efferentia pass laterally between strands of the dorsoventral muscles of the paramedian palisade to enter the paramedian chamber where they join the vas deferens. This provides a series of embryonically established anchor points, the most anterior at or in the vicinity of XIII/XIV.

Anteriorly, the terminal end of the male paired duct passes through the paramedian palisade to enter the median chamber as the sperm duct or ejaculatory duct. This is in the middle of or just postmedian in XI.

The post-embryonic elaboration and functional differentiation of the organs on the paired male ducts, epididymis, sperm-sac or ejaculatory bulb and duct, takes place between morphologically fixed points and within the paramedian longitudinal chamber of the body-cavity.

The above regional splanchnology applies widely. The major exception is found in *P. marmoratis* in which the median organs of the male and female systems pass from the median chamber in XI and in XII to enter and extend posteriorly in the paramedian chambers.

COMPARATIVE MORPHOLOGY OF THE REPRODUCTIVE SYSTEMS (Figs. 1—4)

In the following account it will be shown that the levels of organisation achieved through the post-embryonic growth and differentiation of the median structures of the reproductive system are paralleled in unrelated genera and can have no more than generic value; but relationship above the generic level is expressed in the form and level of organisation established on the anterior end of the male paired duct.

The hirudinid leeches are hermaphrodite with separate complete male and female systems. The genital pores are median, the male always anterior to the female and characteristically on or between the last two annuli of XI, rarely in the first third of XII; the female pore, on or between the last two annuli of XII, very rarely anterior to this or in the first portion of XIII.

The male and female systems show a common basic pattern. Internal to the genital pore, there is a median region receiving the ends of the paired genital ducts which come from the paired gonads, a single pair in the female located typically in the posterior half of XII or XII/XIII, and 7 to 12 serial pairs in the male located approximately intersomitically at XIII/XIV posteriorly.

The terminology applied to the organs formed on the median region has been developed in part on a comparative basis with reference to other groups, particularly the erpobdellids and glossiphonids, and at various hands, so that there are now some confusions. In this account, "atrium" is given as a name to the portion of the median region recognisable as a structure receiving the paired ducts; "bursa", a pouch formed in relation to the body-wall and opening at the genital pore; "penis" a protrusible male organ; "muscular organ", an organ showing thickly developed regular muscular layers, recognisable in dissection as being shiny, opalescent; "penis sheath", a strongly muscular organ containing the penis and formed between the atrium and bursa; "vagina", a strongly muscular organ, between the common oviduct and bursa, which is inflated in maturity; "vaginal duct", a strongly muscular cylindrical organ situated between the vagina and bursa and remaining simply cylindrical in maturity; "long and short", are proportions relative within the reproductive system.

The leeches dealt with in this account show a diversity of organisation always conforming to the basic pattern common in both male and female systems, established in late embryonic development. At that time, the atrium opens essentially directly into the bursa. Postembryonic growth, morphological differentiation and functional elaboration are recognisable as organised and operating under morphological controls.

The level of organisation typical of the group is in the form of an elongate region developed in the late embryo between atrium and bursa: the penis

sheath in the male, entirely muscular as also the atrium; but in the female only the bursal portion of this elongate region, the vagina (and duct if present) is muscular; the atrial portion (atrium and common oviduct) remain thin-walled and is non-muscular.

Two processes are apparent. Postembryonic growth takes place at a locus morphologically between the embryonic atrium and bursa. This is associated with or followed by muscularisation resulting in morphological differentiation. The latter process in the female system never reaches the level of the atrium. In the male, it reaches the atrium, and may extend beyond the atrium along the paired male ducts to produce muscular ejaculatory ducts and also muscular ejaculatory bulbs; but it does not go beyond this level on the paired male duct. As shown below, growth activity and muscularisation are greatest near the bursa and diminish with distance from the bursa. This can be seen in the failure in some to produce ejaculatory bulbs, etc.

The anterior end of the paired male ducts exhibit a second locus of post-embryonic growth which is apparent during functional differentiation. This activity is distinct from the above. It results in tortuousity and dilatation of the primary duct producing the thin-walled epididymis and sperm duct or sperm-sac. The latter, sperm duct and sperm-sac form when this portion of the primary duct does not come under the influence of muscularisation from the median region.

This interpretation of the organogeny of the male and female systems is supportable in comparative morphology, in embryology, and in phylogeny. It provides a basis for determining morphological levels of organisation of the median region of the reproductive systems exhibited among the hirudinid leeches.

Aetheobdella and *Philobdella* in which there are no muscular median organs on both systems, *Macrobdella* and *Hirudobdella* lacking male median muscular structures, can be recognised as though neotenic in this respect. In the three, other than *Aetheobdella*, post-embryonic growth has produced relatively large atria with unorganised weakly developed muscularity and no development of other median structures, in both male and female systems in *Philobdella* and in the male system in the other two. This is a primary morphological condition. It is here termed "Amyomeric", indicating the lack of median muscular organs. *Aetheobdella* is amyomeric, but the atria remain dwarfed. This condition is termed "micromorphic", *i.e.* the median structure has not undergone the ordinary level of growth during morphological and functional differentiation.

The median male region is amyomeric and micromorphic in *Eurano-phila*; myomeric and micromorphic in *Eunomobdella*; myomeric and simply reflected on itself in *Quantenobdella* and *Goddardobdella*; myomeric and partially coiling on the bursal portion in *Richardsonianus*. If this series is continued

with *Mollibdella*, *Haemopis* s. str., *Bdellarogatis*, and *Percymoorensis*, it can be recognised that the organs are defined on the median structures by the end of morphological differentiation and that the final characteristic morphological relationships are determined through the growth activity during functional differentiation. Evidence of this two-phase differentiation is seen in MOORE's account (1927) of the micromorphic myomeric condition of the median structures in *Dinobdella ferox* removed from the respiratory passages of mammals in India. It is fully within our knowledge of the influence of sustained high temperature on the morphogenesis of reproductive systems in cold-blooded animals, to recognise that such is an agent preventing functional differentiation in these leeches.

It is seen in the evidence of the series given above that the degree of disturbance of the morphological relationships established at the end of the first phase is not simply an expression of growth in the second stage but of greater growth activity in the bursal portions than in the atrial portions of the median structures. In consequence, the male atrium may be shifted from the posterior half of XI or XI/XII into the posterior half of XII, and even further posteriorly. Growth of the vaginal duct may shift the body of the vagina into the posterior half of XIII, the atrium being still in XII, or even further posteriorly when the body of the vagina may be shifted into XVI and the atrium into the posterior portion of XIV. Even with maximum growth of the duct, the body of the vagina changes little in size indicating it does not come under the influence of this higher level of growth activity.

In *H. medicinalis*, *G. elegans*, and some others lacking vaginal ducts, the original morphological relationships of the atria and muscular structures are insignificantly disturbed by growth during functional differentiation. The atria remain close to the ganglia of XI and XII, the penis sheath and vagina are retained in the contiguous parts of XI/XII, XII/XIII. This is here termed the mesomorphic condition. In others having the atria placed as above, the penis sheath somewhat more elongate, and a vaginal duct present, the body of the vagina may be in the posterior half of XIII. This is also considered to be mesomorphic in contrast to the conditions described below. In this sense, in spite of the "haemopisine proportions", it appears that *H. sanguisuga* should be retained in the mesomorphic group.

During functional differentiation, even possibly in part in earlier differentiation, the atria in *P. marmoratis* shift to rest finally in the middle of XIV; the penis sheath reflects in XVII; the body of the vagina shifts to XVI. There is accordingly a complete disturbance of the original morphological relationships and a full contrast to the mesomorphic condition. This is recognised as a megamorphic condition, an expression of an extravagant level of growth during functional differentiation. *Whitmania acranulata* (v. WHITMAN, 1886) and *W. gracilis* (MOORE, 1930) also exhibit the megamorphic condition with

as a remarkable feature, the ovaries in XVI posterior to the acaecate vagina. This is in contrast to *P. marmoratis* in which it is quite clear that the ovaries have been trailed into the posterior position by the growing vaginal duct. This could not be the case in the above two species of *Whitmania* and it appears possible that these possess an entirely distinctive morphogenesis of the female median region, unlike the other species of this genus (*edentula*, *pigra*, *laevis*) which are typically mesomorphic.

Between the mesomorphic and macromorphic conditions, there is a variety of levels of organization in one way, or more, differing from both. In *B. plumbeus*, the proportions are "haemopisine", the female region is as in *H. sanguisuga;* but the male atrium is at XII/XIII, the penis sheath reflects at XIII/XIV, and the ejaculatory ducts are long. In *M. grandis*, the male median structures are much as in *sanguisuga*, but the ejaculatory ducts are long since the bulbs are essentially posterior to XI; a vaginal duct is present and the body of the vagina is in the posterior part of XIII and mainly in XIV. This is essentially the condition in *P. kingi* and *P. lateromaculatum*; but in *P. lateralis* the male atrium is at XII/XIII; the ejaculatory ducts, long; the penis sheath reflected at XIII/XIV; and the body of the vagina is in XIV.

There are here various exhibitions of a growth activity during functional differentiation, affecting either the male or female median regions, or one more so than the other, a level of activity less than megamorphic, but leading to marked disturbance of the original morphological relationship, and so a level of activity greater than mesomorphic. It is proposed that this be recognised as a macromorphic condition.

(1) Genera grouped in terms of level of organisation of the median reproductive structures

A. AMYOMERIC. No median muscular organs. Vesicular thin-walled atria connect directly to the bursa in both male and female systems.

Genera:

Aetheobdella, *Ornithobdella* (Austr.); Monostichodont. Micromorphic.

Philobdella (N. Am.); Distichodont. Mesomorphic.

B. MYOMERIC. Strongly muscular median organs are formed between the atrium and the bursa.

B_1. **Hemimyomeric.** Female median region myomeric; male region, amyomeric; no ejaculatory bulbs.

Genera:

Hirudobdella (N. Z.) vagina acaecate, no duct;

Oxyptychus (S. Am.) vagina acaecate, no duct;

Macrobdella (N. & M. Am.) vagina acaecate; duct present.

All monostichodont; no salivary papillae.

B_2. **Bimyomeric.** Muscular organs on both male and female median regions.

(a) M i c r o m o r p h i c. Median organs thinly to fully muscular but dwarfed consequential from failure of growth activity during functional differentiation; no ejaculatory bulbs.
Genera:
Potamobdella (e.g. *olivacea*) (M. Am.); vagina acaecate; duct present;
Limnatis (e.g. *paluda*). (Afroasian, v. MOORE, 1927) vagina acaecate, no duct.
Both monostichodont with salivary papillae.

(b) M e s o m o r p h i c. Well developed muscular median regions contained essentially in the posterior portions of XI and XII, or contiguous portions of XI and XII, XII and XIII; atria in posterior portions of XI and XII, or at XI/XII, XII/XIII; ejaculatory bulbs, when present, in contiguous halves of XI and XII; ejaculatory ducts short.

(b_1) Ejaculatory bulbs present.
Genera:
Hirudo s. str. (Eur.); *Limnatis* (Afroasian);
Richardsonianus, *Goddardobdella*, *Quantenobdella*, *Eunomobdella*, *Euranophila* (Aust.);
Haemopis s. str. (Eur.); *Whitmania* in part (Asia).
Monostichodont, excepting *Haemopis* and *Whitmania*; salivary papillae in only *Limnatis* and *Goddardobdella*; all excepting *Whitmania*, with caecate vagina; vaginal duct present in only *Richardsonianus*, *Quantenobdella*, and *Euranophila*. Male region secondarily micromorphic in *Eunomobdella*, secondarily amyomeric micromorphic in *Euranophila*.

(b_2) Ejaculatory bulbs absent.
Genus:
Myxobdella (Asia), vagina caecate; no duct; distichodont.

(c) M a c r o m o r p h i c. Median structures elongated in functional differentiation, the penis sheath extending to XII/XIII or further posteriorly; the vagina at XIII/XIV or in XIV; the male atrium from the middle of XI to XII/XIII; the female atrium in the posterior half of XII or at XII/XIII; ejaculatory bulbs posterior to XI; ejaculatory ducts, long.
Genera:
Bdellarogatis, *Mollibdella* (N. Am.);
Percymoorensis in part (N. Am.). The first two agnathous; the third, distichodont.

(d) M e g a m o r p h i c. Median structures grossly elongated in functional differentiation; the penis sheath extending into XVI or XVII; the vagina behind XIV; atria posterior to XIII; ejaculatory bulbs posterior to XI; ejaculatory ducts, long.

Genera:

Percymoorensis in part. (N. Am.);

Whitmania in part. (Asia). Both distichodont.

The groups of genera formed on the above basis, as also groups derived in terms of the presence or absence of a vaginal duct, etc. result in some groups which are partially acceptable systematically, some unacceptable, and some few which are acceptable. Obviously there is no generally usable systematic principle other than clear evidence from the parallelism in levels of organisation in unrelated genera that the levels of organisation of the median reproductive regions are no more than generic in value.

This is in contrast to the results from the formation of groups on the basis of the post-embryonic growth and elaboration exhibited on the anterior end of the male paired ducts. This provides groups which are sound systematically in our other knowledge.

In some genera, the epididymis forms in XII by the dilation and tortuous elongation of the primary male paired duct, posterior to the ejaculatory bulb in XI. In the rest, there is post-embryonic elongation of the anterior portion of the primary male paired duct in XI so forming an anteriorly directed loop in XI; or a posteriorly directed simple loop which extends from XI or XI/XII, into XII; or it may form a double, "S"-shaped loop retained essentially in XI. The limbs of the loop may be termed initial, terminal, and described as procurrent and recurrent. The epididymis is always formed on the initial limb but extends also onto the median limb in the double loop. The sperm duct and sac, or the ejaculatory bulb is formed on the terminal limb.

The existence of patterns on the anterior end of the paired male duct, patterns having systematic value was recognised by MOORE who referred to the haemopisine and hirudo-like organisation on this structure in various leeches; but he did not carry this into his systematic definitions in any detail. It has remained a small feature within his specific descriptions.

(2) Generic groups based on pattern and organisation of the anterior end of the male paired ducts

A. **Richardsonianoid group.** No formed primary loop or flexure. Epididymis differentiates in XII posterior to ejaculatory bulb in XI, the two in a linear relationship.

Genera:
Richardsonianus, *Goddardobdella*, *Euranophila*, *Eunomobdella*, *Quantenobdella* (Aust.).
All with caecate vagina, monostichodont.
Aetheobdella (Aust.) and *Hirudobdella* (N. Z.) show no looping on the paired duct in XI, have the epididymis in XII; are monostichodont; but lack ejaculatory bulbs.

B. A primary loop or flexure formed. The epididymis and sperm duct or ejaculatory bulb, subparallel, not linear.

B_1. Loop essentially in XI.

(a) **Macrobdelloid group.** A simple "U"-shape in XI; no ejaculatory bulb; epididymis formed on initial procurrent limb, thin-walled sperm duct on terminal recurrent limb.
Genera:
Macrobdella (N. & M. Am.); *Potamobdella*, *Pintobdella* (M. Am.); *Oxyptychus* (S. Am.).
All monostichodont, with acaecate vagina and vaginal duct; male myomeric, excepting *Macrobdella* and *Oxyptychus* which are male amyomeric.

(b) **Hirudoid group.** Loop "S"-shaped in XI; epididymis formed on initial procurrent and median recurrent limbs, ejaculatory bulb on terminal procurrent limb.
Genera:
Hirudo s. str. (Eur.); *Limnatis* (Afroasian);
(?) *Asiaticobdella* (Asia); *Ornithobdella* (Aust.).
All monostichodont, with caecate vagina and no duct in *Hirudo*, duct in some species of *Limnatis*; but *Asiaticobdella* has an acaecate vagina with a duct. *Ornithobdella* is amyomeric.

B_2. **Haemopisoid group.** Primary simple loop reflected into XII; epididymis formed on initial recurrent loop, ejaculatory bulb on terminal procurrent loop.
Genera:
Haemopis s. str. (Eur.); *Percymoorensis* (N. Am.);
(?) *Whitmania* (Asia); *Bdellarogatis* and *Mollibdella* (N. Am.); *Semiscolex* (S. Am.).
The first three distichodont; the three latter, agnathous. Excepting *Semiscolex*, these possess a caecate vagina. There is some doubt on this for *W. laevis* which MOORE (1927, Fig. 47) shows as, in my

experience, typically caecate; but he described it as acaecate. However, WHITMAN (1886) clearly shows *W. pigra* as caecate (Fig. 67).

In all the genera in the haemopisoid group above, the morphology of the pharynx and associated structures is haemopisoid. The elongate pharynx is intimately associated with the body-wall back into the middle of X or to X/XI. In consequence, the median and paramedian longitudinal chambers of the body-cavity terminate at the end of the pharynx and are reduced in X and XI, which is to be correlated with the posterior position of the organs on the paired male ducts. This is in contrast to the other groups in which the median and paramedian chambers extend throughout X and commonly well into IX.

COMPARATIVE MORPHOLOGY OF THE PHARYNX AND ASSOCIATED STRUCTURES

(Figs. 5—6)

The value of the morphology of the pharynx in distinguishing between erpobdellid and hirudinid leeches, and for the recognition of major groups in the erpobdellids, early encouraged an anticipation that the pharynx and associated structures should also prove systematically useful in the hirudinids. BLANCHARD's groups, Monostichodonta and Distichodonta based on dentition, were expanded with the recognition by MOORE of "hirudo-like" and "haemopisine" types of pharynx. These were broadly defined. MOORE carefully described the pharynx and associated structures in many hirudinid leeches, using the two categories in a wide sense and applied to a diversity of anatomical detail. It can now be recognised that his concepts of the two categories were initially formulated during his early studies on North American leeches.

In MOORE's practice, the two categories are to be recognised as follows:

(a) Haemopisine: a wide-mouthed pharynx with the muscular layers intimately associated with the muscular body-wall along the length of the pharynx; elongate, terminating at X/XI; sac-like having an open wide, long lumen; 6, 9 to 15 longitudinal internal muscular ridges posteriorly; associated with distichodonty, a tubular crop acaecate excepting for postcaeca on XIX, and the macrophagous habit.

(b) Hirudo-like: a bulbous muscular pharynx remote from the muscular layers of the body-wall, supported by obvious radial strands of muscle; short,

ending at VIII/IX, in IX, or at IX/X; the entrance to the pharynx narrow, restricted, the lumen, narrow, tubular; with 6 or 9 longitudinal internal muscular ridges; associated with monostichodonty, a crop caecate from X to XIX, and the sanguivorous habit.

The relationship to habit remains essentially valid; but the application of only the two categories to many leeches exhibiting among them such combinations as an "haemopisine" pharynx with a caecate crop, distichodonty, with a small muscular bulbous pharynx and caecate crop (*e.g. Myxobdella*) has led to confusion and loss of value for these categories. Undue emphasis on the nature of the pharynx, contrary to other clear systematic indications, has resulted in some leeches which are obviously and typically hirudinid in the morphology of the reproductive system, being recognised as having dominantly erpobdellid affinities (v. Soós, 1966).

The application of these two terms progressed to the point where "hirudolike" is applied to toothed and toothless leeches showing two quite dissimilar distinct patterns of internal ridges, and "haemopisine" is applied to jawed and jaw-less leeches showing at least three patterns of internal ridges and two levels in the degree of association of the wall of the pharynx with the muscular body-wall. As definitive categories, the terms have become reduced in practice to little more systematic value than is understood by "distichodont" and "monostichodont".

In the present study it has been found necessary to increase the number of defined categories for the kinds of pharynx and associated structures in the hirudinid leeches. In order to avoid confusion with the earlier categories, these are named as "hirudoid", "haemopisoid", etc. They appear to form compact groups with the exception of the haemopisoid group. Further study of leeches assignable to the latter group can be expected to lead to its further division.

In general the illustrations are restricted to approximately the anterior half of the pharynx where the ridge patterns are more definite than posteriorly. In the caudal half of the pharynx as the lumen reduces, the ridges diminish in height and subdivide in conformity with the reduction in lumen of the pharynx in this region. In the anterior half, the fusions are related to the supply of muscles into the jaws and onto the margin of the entrance to the pharynx showing correlation with the size of the jaw and the width of the entrance into the pharynx. The illustrations, with the exception of Fig. 5 C, *Goddardobdella elegans*, are all to the same scale and even though taken from leeches of different lengths, they give value to the meaning of small (v. *M. decora*, L. 92.0 mm) and large (*R. australis*, L. 62.0 mm) etc. as applied to the jaws, as also tall-compressed, low-rounded, etc.; the width of the entrance to the pharynx, and its lumen, and the consequences from the termination of ridges on the margin of the entrance. The appreciation of the latter is assisted by the

recognition that all the preparations were made by an incision along the mid-ventral line of the pharynx, the figures centred on the dorsomedian jaw, or where this is lacking the mid-dorsal point is indicated by an arrow. Unfortunately it has been beyond my ability so far to prepare the pharynx in some of the other Australian leeches in which the pharynx is barely 2.0 mm in length, and accordingly these are not figured at this time.

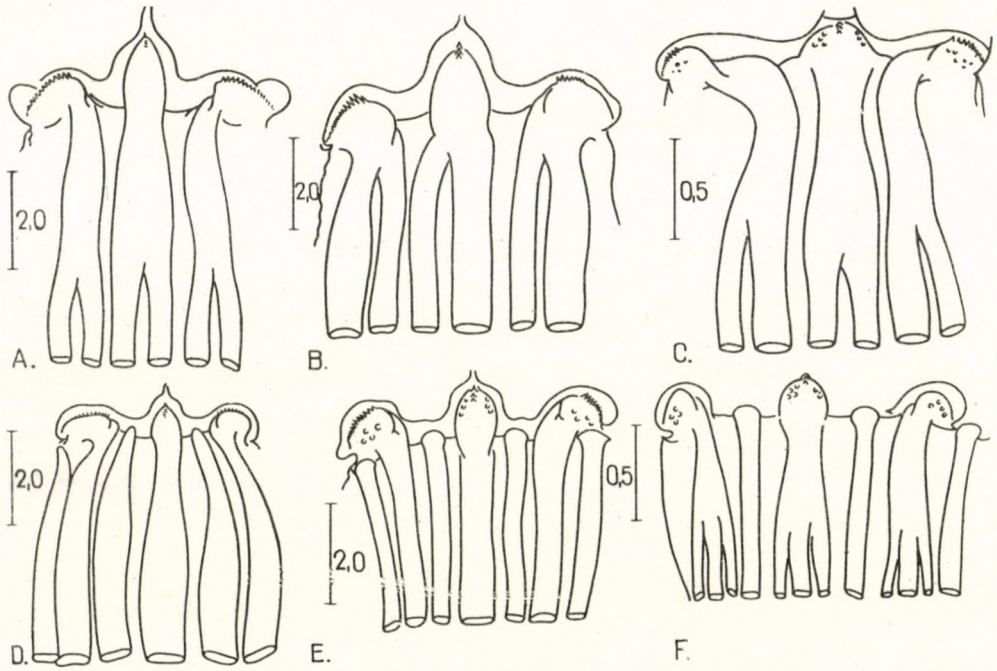

Fig. 5. Pharynx and associated structures in hirudinid leeches. A = *Hirudo medicinalis* (L. 83.0 mm); B = *Richardsonianus australis* (L. 63.0 mm); C = *Goddardobdella elegans* (L. 38.0 mm); D = *Macrobdella decora* (L. 92.0 mm); E = *Pintobdella cajali* (L. 83.0 mm); F = *Potamobdella olivacea* (L. 38.0 mm). The pharynx is shown as opened along the mid-ventral line, centred on the mid-dorsal line. All scales in mm

A. The **Hirudoid Form** (Figs. 5 A, B, C). Pharynx bulbous, muscular, attached by obvious long radial strands of muscle to the body-wall and accordingly remote from the muscular layers of the body-wall; short to moderate in length, terminating at VIII/IX, in IX, or at IX/X, followed by a caecate or non-caecate compartment in IX or X, and the crop caecate behind this with the postcaeca extending from XIX; dorsal salivary glands commonly forming recognisable right and left compact masses continuing to the dorsomedian jaw as right and left columns of aggregated ducts; jaws prominent, moderate to large, accommodated in open grooves; monostichodont; with or without salivary papillae; internal muscular ridges 6, dorsomedian and ventro-

lateral pairs fusing to single ridges entering the bases of the jaws; no ridges ending independently on margin of entrance to pharynx; entrance to pharynx narrow, restricted, essentially little wider than the base of the dorsomedian jaw; lumen of pharynx narrow, tapering posteriorly. Sanguivorous.

Genera: *Hirudo* s. str., *Richardsonianus*, *Goddardobdella*, (*Poecilobdella javanica*, v. MOORE, 1927); etc.

B. The **Macrobdelloid Form** (Figs. 5 D, E, F). Pharynx moderate, muscular, attached by radial strands of muscle so that it is distinctly separated from the muscular body-wall; short to moderate in length, terminating at VIII/IX or in IX followed by an acaecate or caecate compartment in IX, and crop caecate in X to XIX, the latter providing postcaeca; dorsal salivary glands diffuse, not as compact masses, and at best poorly indicated columns of aggregated ducts; jaws small to moderate in size, not strongly compressed; dorsomedian accommodated in an open groove, ventrolaterals in shallow open recesses; monostichodont; with or without salivary papillary; internal muscular ridges 6 to 12 posteriorly, 6 anteriorly, of which the dorsomedian and ventrolaterals may be formed by the fusion of 3 and the other three, dorsolaterals and median ventral, end independently between the bases of the jaws on the margin of the entrance into the pharynx; entrance to pharynx restricted but distinctly wider than the base of the dorsomedian jaw; lumen restricted but not strongly tapering posteriorly. Sanguivorous.

Genera: *Macrobdella*, *Potamobdella*, *Pintobdella*, (*Whitmania*, *Dinobdella*, *Poecilobdella viridis*, v. MOORE, 1927); etc.

C. The **Haemopisoid Form** (Figs. 6 A, B). Pharynx broad, muscular, attached intimately along its length to the muscles of the body-wall so that the sparse short strands of radial muscles are concealed; pharynx moderate to long, terminating in IX or in X, or at IX/X or X/XI, followed by a crop acaecate excepting for postcaeca on XIX; salivary glands sparse, diffuse, no well-formed compact masses of dorsal glands and no dorsal columns of aggregated ducts; jaws small, low, rounded; ventrolaterals housed in formed pits; distichodont; no salivary papillae; internal muscular ridges 9 (to 15 posteriorly) joining anteriorly in groups of three close to and entering the base of the jaws; with or without dorsolateral and median ventral ridges ending on the margin of the entrance to the pharynx; entrance to pharynx distinctly wider than base of dorsomedian jaw; lumen of pharynx wide, not strongly tapering. Macrophagous, scavengers.

C_1. Dorsolaterals and ventromedian each a single ridge ending independently on margin of entrance; dorsomedian jaw in shallow

groove, ventrolaterals in shallow crypts; pharynx terminates in X.

Genus: *Haemopis* s. str.

C_2. Paired ventromedian and paired dorsolaterals ending on margin of entrance; all jaws housed in deep pits; pharynx ends in X.
Percymoorensis kingi and (?) *P. lateromaculatum.*

C_3. Lacking dorsolateral and median ventral ridges; all jaws housed in deep pits; pharynx ends at X/XI.
Percymoorensis marmoratis.

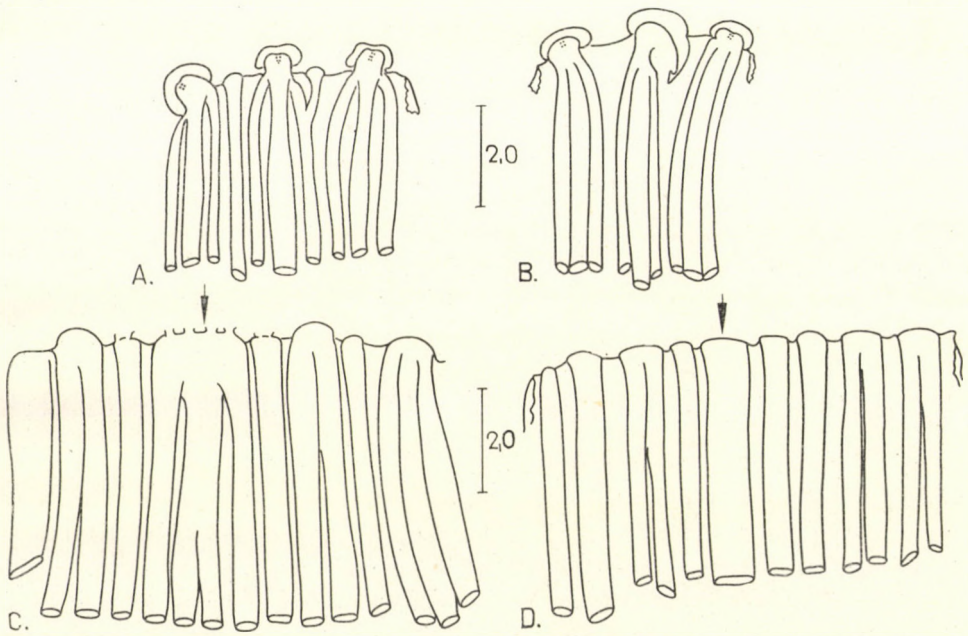

Fig. 6. Pharynx and associated structures in hirudinid leeches. A = *Haemopis sanguisuga* (L. 70.0 mm); B = *Percymoorensis marmoratis* (L. 82.0 mm), the median dorsal crypt is shown open to its full length; C = *Bdellarogatis plumbeus* (L. 110.0 mm); D = *Mollibdella grandis* (L. 110.0 mm, contracted). The pharynx is shown as opened along the mid-ventral line, centred on the mid-dorsal line. All scales in mm

D. The **Bdellarogatoid Form** (Figs. 6 C, D). Sac-like, weakly muscular pharynx, the wall intimately associated along its full length with the muscles of the body-wall; radial muscles, short, sparse, diffuse, concealed, not forming an obvious system; pharynx long, terminating at X/XI, followed by an acaecate crop excepting for reduced postcaeca on XIX or XXI; salivary glands sparse, diffuse, obscure, no indications of dorsal columns of ducts; agnathous or with low pad-like (? vestigial) ventrolateral "jaws"; no formed recesses or crypts no grooves; edentulous; no salivary papillae; internal muscular ridges 12 to 15 posteriorly, variously 8 or 9 anteriorly, usually dorsomedian and

ventrolaterals and narrower dorsolaterals and ventromedian, all terminating on the margin of the entrance to the pharynx; entrance to pharynx very wide, unrestricted, continuous with sac-like unrestricted lumen of pharynx. Macrophagous.

Genera: *Bdellarogatis*, *Mollibdella*.

PROPOSAL OF FAMILY GROUPS FOR THE HIRUDINID LEECHES

The awareness of the need for a widened systematics of the hirudinids is fully apparent in CABALLERO (1956, 1959) where in particular the impact of the precise studies of RINGUELET on South American leeches is seen in brief review as seriously disturbing the traditional systematics based essentially on the limited European fauna. RINGUELET (1944, et. seq.) was concerned with hirudinids showing novelty in the location of genital pores etc. externally, and distinctive novelty in the levels of organisation of the reproductive system. Among these, the essentially agnathous *Semiscolex* KINGBERG had become the type of a family Semiscolecidae SCRIBAN and AUTRUM 1934 carrying with it *Orchibdella* and *Potamobdella* to be placed among the erpobdellid leeches. RINGUELET made this untenable by showing *Potamobdella* to be hirudinid. The family Semiscolecidae survives (v. SOÓS, 1966) containing *Semiscolex*, *Orchibdella*, and *Cyclobdella*, still placed among the erpobdellid leeches.

In these examples, as in others which can be readily found, it is clear that there has been systematisation of the hirudinids without an understanding and application of fundamental systematic principles derived soundly from the comparative morphology of these leeches. The principles which have been established in this study may not yet be in a final form, but even at this time they provide a basis for a new approach to a natural systematics of the group.

Some genera in the following pages are prefaced (?). I use this to indicate that so far as I find guidance in the literature, there are reasonable grounds to expect the genus to fall within the proposed family. Other genera are indicated as (? Genus A), indicating that although in the literature there are grounds for the inclusion of the genus in the proposed family, there is doubt otherwise. I endeavour to describe the basis for the uncertainties in each case.

Hirudinidae (WHITMAN 1886, emended) s. str.

Monostichodont; 15 or 16 5-annulate somites; male paired duct anteriorly forms two loops essentially within XI, epididymis forms on initial procurrent and median recurrent limbs, ejaculatory bulb (when present) on terminal procurrent limb; median reproductive structures myomeric, mesomorphic or micromorphic; vagina caecate (? or also non-caecate); vaginal duct present or absent; pharynx and associated structures hirudoid, entrance and lumen

of pharynx restricted, no ridges ending independently on margin of entrance to pharynx; salivary papillae present or absent; crop caecate.

Freshwater. Sanguivorous. — Europe, Asia, Africa.

Type-genus: *Hirudo* LINNÉ, 1758 s. str.

Other genera: (? *Asiaticobdella*), (?) *Limnatis*.

It seems probable that a re-examination of the species at present included in *Limnatis* will provide a genus *Limnatis* s. str. which will be contained within the family Hirudinidae as above, and show the need for the provision of a second genus for those having an acaecate vagina. This might possibly be expected to associate with *Asiaticobdella* and require a separate and new family. This will reduce the family Hirudinidae to leeches having only a caecate vagina.

Richardsonianidae fam. n.

Monostichodont; 15 or 16 5-annulate somites; paired male duct anteriorly linear, without loop formation, epididymis in XII posterior to the ejaculatory bulb in XI; median reproductive structures bimyomeric (secondarily hemimyomeric), male organs micromorphic or mesomorphic; female mesomorphic; vagina caecate, vaginal duct present or absent; pharynx hirudoid, no ridges terminating on the margin of the entrance to the pharynx between the jaws; salivary papillae present or absent; crop caecate.

Freshwater. Sanguivorous. — Australia. New Zealand.

Type-genus: *Richardsonianus* SOÓS, 1968. Australia. New Zealand.

Other genera: *Goddardobdella*, *Euranophila*, *Eunomobdella*, *Quantenobdella*. — Australia.

Although *Hirudobdella* has the epididymis essentially in XII as above, the presumed acaecate condition of the vagina and the very long form of the pharynx make it improbable at this time that it can be included here. It is an undoubtedly distinct genus, at present of unknown affinity among the hirudinids.

Ornithobdellidae fam. n.

Essentially monostichodont; 15 or 17 5-annulate somites; male paired duct elaborating anteriorly in a simple or duplicated loop in the contiguous parts of XI and XII, the epididymis on the initial (and median) limb followed by a sperm duct or small ejaculatory bulb on the terminal limb; median reproductive structures amyomeric, micromorphic; pharynx and associated structures hirudoid, the entrance and lumen of the pharynx restricted, no ridges terminating independently on the margin of the entrance to the pharynx; no salivary papillae; crop caecate; internal muscular layer of body-wall includes many long wide compact strong bands.

Terrestrial. ? Amphibious. Sanguivorous. — Australia and New Zealand.

Type-genus: *Ornithobdella* BENHAM, 1909. New Zealand.

Other genus: *Aetheobdella* MOORE, 1935. Australia.

The separation of these two genera from the leeches in Richardsonianidae has been fully discussed under the two genera above. The nature of the pharynx excludes them from the family below.

Macrobdellidae fam. n.

Monostichodont; 15 or 16 5-annulate somites; paired male duct anteriorly forming a simple loop essentially in XI, the epididymis forming on the initial limb with a thin-walled sperm duct on the terminal limb; median reproductive structures hemimyomeric or bimyomeric, mesomorphic; vagina acaecate; vaginal duct present; pharynx and associated structures macrobdelloid, internal ridges alternately terminating in the jaws and on the margin of the entrance to the pharynx; salivary papillae present or absent; crop caecate.

Freshwater. Sanguivorous. — North, Middle and South America. ? Asia.

Type-genus: *Macrobdella* VERRILL, 1872. N. & M. America.

Other genera: *Potamobdella*, *Pintobdella*, M. America; (?) *Oxyptychus*, S. America; (? *Dinobdella*, Asia).

The doubt on *Oxyptychus* is in the lack of information on the presence of dorsolateral and ventromedian ridges terminating independently on the margin of the entrance to the pharynx. Otherwise it is fully a member of this family.

The multiple testes of *Potamobdella* and *Pintobdella* contrast with the simple saccular testes in the other two genera. It is a novelty in the hirudinids, an indication of the close relationship of the two genera of the one region, can be given no higher systematic value than subfamilial, and recognised only as a regional evolutionary novelty. This would seem to be the case also for the enlarged copulatory glands in both *Macrobdella* and *Philobdella* in which it is a parallelism without other indications of close relationship and so not indicative of close affinity. I have only MOORE's account (1901) of *Philobdella* to guide me. From this it is quite clear that *Philobdella* cannot be recognised as a member of this family. Judging from MOORE's account (1953) of *Macrobdella ditetra* it seems possible that this species has closer affinities to *Philobdella* than to *M. decora* from the nature of the pharynx, jaws and median reproductive structures in both.

The genus *Dinobdella* is placed here since MOORE (1927) clearly describes an epididymis of two limbs bent in XI without an ejaculatory bulb; the pharynx with two dorsolateral and one ventromedian internal ridges terminating independently on the margin between the bases of the jaws which are small and housed in recesses. The vagina is acaecate with a vaginal duct. It would appear that the myomeric median stuctures are macromorphic.

Haemopidae fam. n.

Distichodont or edentulous; 15 or 16 (? 17) 5-annulate somites; paired male duct reflects posteriorly from XI or XI/XII as a single loop, the epididymis forming on the recurrent limb, the ejaculatory bulb (when present) on the procurrent limb; median reproductive structures amyomeric or myomeric, mesomorphic or macromorphic; vagina caecate (? or non-caecate); vaginal duct present or absent; pharynx haemopisoid, entrance and lumen partially restricted or unrestricted; internal ridges of pharynx usually some ending independently on margin of entrance to pharynx; no salivary papillae; crop tubular acaecate excepting for postcaeca in XIX.

Freshwater. Amphibious. Macrophagous, scavengers, some potential sanguivores. — Europe, Afroasia, North, Middle and South America.

Type-genus: *Haemopis* SAVIGNY, 1822. Europe.

Other genera: *Percymoorensis*, *Bdellarogatis*, *Mollibdella*, (? *Philobdella*), North America; (?) *Semiscolex*, South America; (?) *Whitmania*, Asia.

The haemopisoid pattern of organisation of structures on the anterior portion of the paired male duct is common in the above genera with the exception of the genus *Philobdella* which finds its place here on the haemopisoid form of the pharynx and associated structures as described by MOORE (1901).

The range of form shown in the pharynx and associated structures is considerable, reflecting the wider range of utilisation open to the macrophage in contrast to the high specialisation of the sanguivorous pharynx and habit.

Percymoorensis marmoratis is a scavenger, more microphagous than an essential macrophage, and a potential sanguivore. *H. sanguisuga* is described essentially as a predator on small animals in contrast to *Bdellarogatis plumbeus* and *Mollibdella grandis* which can fairly be termed grossly macrophagous. It would seem that *Semiscolex* may also be grossly macrophagous, and the reduction of postcaeca seen in *plumbeus* taken one step further in the acaecate *Semiscolex* and *Whitmania gracilis* (MOORE, 1930).

The family divides readily on the above terms into "Gnathifera" [*Haemopis*, *Percymoorensis*, *Whitmania*, and (? *Philobdella*)] having the haemopisoid type of pharynx and associated structures, and the "Agnatha" (*Bdellarogatis*, *Mollibdella*, and *Semiscolex*) having a pharynx of the bdellarogatoid type. These would seem to constitute two natural groupings for the time being at the subfamily level which might in time be found to warrant higher systematic status; but the vagina in *Semiscolex* is acaecate.

It is now recognised (SOÓS, 1966) that the family Semiscolecidae SCRIBAN and AUTRUM 1934 based on *Semiscolex*, *Orchibdella*, and *Potamobdella* (v. MANN, 1962; HARRANT & GRASSÉ, 1964) cannot be sustained least of all among the erpobdellid leeches. Of the three, only *Orchibdella* is essentially erpobdellid in the organisation and morphological relationships of the female reproductive system. The male system in *Orchibdella*, if hirudinid does not conform to any pattern of organisation of the paired male duct known in any undoubted hirudinid. Nor can a family Semiscolecidae based on *Semiscolex*, *Orchibdella* and *Cyclobdella* be sustained (SOÓS, 1966). Guided by RINGUELET's account (1944) *Semiscolex* is fully hirudinid in the morphology and relationships of the reproductive systems, haemopisoid in the pattern of the anterior end of the paired male duct, and bdellarogatoid in the nature of the pharynx and associated structures. I am not able to assess *Cyclobdella* on the information available to me.

RETROSPECT, EVOLUTION AND PROSPECT

Retrospect. The exploration of the Australasian hirudinids has been made with advantages not earlier available in the study of other regional faunas. The problems presented in the diversity of the reproductive systems, provided a comparative morphology, and can now be interpreted in terms of the present general knowledge of organogeny and organogenic processes operating in the

phases of early and late embryonic development and in later growth and morphological and functional differentiation.

The Australasian hirudinids in general exhibit a monotony of external meristic detail and general internal morphology such as is seen in the hirudinids of other faunas. Without colour and colour pattern, only the ornithobdellids with the female genital pore posterior in position, can be confidently recognised as distinct from the others on simple external detail. The recognition of *Hirudobdella* and *Goddardobdella* from the others requires the determination of XXIV as being 4-annulate, so establishing these as having only 15 5-annulate somites, in contrast to the four genera in which XXIV is 5-annulate. No further progress can be made without reference to the jaws. These give the recognition of *Goddardobdella* in the presence of salivary gland papillae, and separate out *Euranophila* having a cutting edge, from *Richardsonianus*, *Eunomobdella*, *Quantenobdella* which have the jaws armed with teeth. Adding colour and pattern to the above would in early systematic practice provide recognition of these leeches as including 6 species to be placed in two genera: the one with 15 complete somites and salivary gland papillae, as a species of *Limnatis*; the others with 15 or 16 such somites as species of *Hirudo*, or later *Limnobdella*. *Euranophila* if not placed in *Hirudobdella*, both having a cutting edge on the jaw, might have been given separate generic status.

Such generic assignments would not be disturbed by reference to the pharynx and crop, all being sanguivorous, nor by reference to the reproductive systems as used in more recent practice.

The two matters of initial concern to me in the study of the Australasian hirudinids were the recognition of *Hirudo australis* and the preparation of a detailed account of *Aetheobdella hirudoides*. The former led me to the other genera. The latter in its unusual morphology showed me the importance of the regional morphology of the secondary body-cavity in relation to the differentiation of the reproductive systems, as well as the simple level of organisation of the reproductive system which emphasized the value in recognising the division of these systems into paired and median regions. It provided the basis for the understanding of the organogeny of these systems.

The diversity of the organisation shown in the median region in the other leeches, especially in the male system, demonstrated the characteristics of the levels of organisation, ranging from the simple amyomeric micromorphic male atrium in *Euranophila*, a morphological equivalent to the condition in *Aetheobdella*; to the definitely muscular but dwarfed organ in *Eunomobdella*; and the myomeric mesomorphic organs in *Richardsonianus*, *Goddardobdella*, etc. Here is full evidence of two separate processes of growth and muscularisation. *Euranophila* has a vaginal duct and simple ejaculatory bulbs. *Eunomobdella* lacks a duct and has well-formed ejaculatory bulbs. *Euranophila* has a cutting edge on the jaw; *Eunomobdella* has teeth. Such evidence confirms that the

levels of organisation achieved by growth and morphological differentiation are higher than specific in value which is to be anticipated from processes operative in late embryonic and early morphological differentiation.

This is supported also in the levels of organisation shown on the median region of the female reproductive system. The dissection of some fifty *G. elegans* taken at Grafton in early spring showed the greater number to have a simple suberect fusiform vagina with the common oviduct of the length of the vagina and applied to its face. A small number had a small weakly muscular simple cylindrical "U"-shaped vagina, reflexed on itself, and the common oviduct in open coils close to the caecate end of the vagina. The whole was rather loosely but firmly bound down to the ventral body-wall.

Size, position, form, degree of muscularisation, all indicate that this is the condition of the vagina at the end of morphological differentiation and before the functional differentiation of initial maturity has taken place. Other dissections indicate that the median region does not revert to this simple condition between breeding seasons. Accordingly, seasonal change does not interfere with or diminish the value of the median regions of the reproductive systems for systematic purposes (In fact, the dissection of a collection of specimens taken at the right season permits the determination of the number of leeches approaching first maturity and so can give a measure of annual recruitment to the population).

The establishment of the myomeric Australasian hirudinids as a distinct natural sanguivorous group on the basis of the linear relationship of the epididymis and ejaculatory bulb, provided the essentials for the recognition of familial characteristics which apply successfully when used on other groups.

The finding of a second species of the genus *Richardsonianus* completed the assessment of systematic characterisations. The two species, *australis* and *dawbini*, are most closely similar in their annulation, in the level of organisation of the reproductive systems, and in the nature of the pharynx and crop, etc. They differ in that the oviducts are longer than the ovary in *dawbini*. They differ in the form of the dental arch and in colour pattern, and so are fully separate species and not subspecies or varieties.

Evolution. In the sanguivorous Australasian hirudinids we have a group of monostichodont leeches having an essentially hirudoid pharynx and related structures, an external meristic morphology associated with a general morphology of the central nervous system, of the locomotor, vascular and excretory systems. In all of these they are closely similar to the sanguivorous hirudinids of the Old World. The similarity has its origin in the common compact somital morphology established in the earlier embryonic development which also provides the basic morphology of the alimentary canal and reproductive systems.

Such evidence of relationship is maintained during later embryonic growth and differentiation within the morphological discipline required by the

sanguivorous habit, so that in general the pharynx and associated structures conform to the hirudoid form of the Old World sanguivores.

Departure is seen in the relationship of the organs formed in later embryological development and elaborated in functional differentiation on the anterior end of the paired male ducts. The reason for this departure and the morphological conditions which maintain this departure in a diversity of species, are not known. It is a departure not disciplined by nor essential to the sanguivorous habit. It can be recognised as based on the same organogenic processes which produce other patterns and relationship of organs on these ducts in other groups of hirudinids elsewhere. For the time being it can be recognised in the Australasian hirudinids as an established evolutionary departure which cannot be given functional significance nor seen as a functional or morphological necessity.

The parallelisms in the levels of organisation on the median regions of the reproductive systems shown in the Australasian hirudinids and in sanguivorous and also macrophagous hirudinids elsewhere, come from an organogeny of late embryonic development, of morphological and functional differentiation, common throughout the hirudinid group. It is operative outside of the disciplines of early embryonic development, and outside of the disciplines of the sanguivorous and macrophagous habits. The process is common throughout the group. The levels of organisation as achieved in a genus are genetically stable, but these cannot be measured in terms of functional necessity or success.

When the range of levels of organisation of the median region of the reproductive systems is examined, it would seem at first sight that the amyomeric level is precursor to the levels of myomeric organisation within the Australasian group. It would be difficult to reach any other opinion on phylogenetic and ontogenetic grounds for the hirudinids as a whole. However, it is more difficult to sustain a claim that the amyomeric condition was the precursor condition within the Australasian group alone. Such would require the evolutionary development of two distinct processes, growth and morphological differentiation by muscularisation, in the Australasian hirudinids as well also in the other groups of hirudinids in order to produce the parallelisms shown in the leeches within the different groups.

Probability, as well as our general knowledge of organogenic processes agree in supporting the view that both the growth and myomeric processes were established in the leeches which were ancestral to the Australasian group. The bimyomeric level is fully acceptable as ancestral for this group. *Eunomobdella* exhibits a low level of growth activity with muscularisation in the median male region; *Euranophila*, a low level of growth activity and a loss of the muscularisation process on the median region; *Ornithobdella*, a low level of growth activity without muscularisation on the male and female median

regions; *Aetheobdella*, essentially complete failure of both processes on the median region in both male and female systems.

Such stages in the progressive breakdown through various levels in cooperating organogenic processes are known in other groups, as for example in the organogeny of the eye in cavernicolous freshwater fishes, and as occasional events producing sporadic teratoma, etc. Failure at various levels of a process responsible for the organogeny of a single structure is not directly responsible for failure or modification of structures organised otherwise. Such change as does occur in other structures is either compensatory or separately adaptive to the habitat.

In the cases of *Euranophila* and *Eunomobdella*, the diminished levels of growth activity and muscularisation are effected on an organ system in no way related to the disciplined morphology of the sanguivorous habit, and on a system with a function distinct from the cooperative functions of the systems disciplined by the sanguivorous habit.

There can accordingly be no demand on the leech for compensatory evolutionary change. There is no requirement for change adaptive to the environment, for this continues to be the environment of the bimyomeric leech. There can be no occasion for change consequent from a change in nutrition, for the leech continues to be sanguivorous.

Variations in the level of operation of only these two mechanisms of growth and muscularisation cannot on these grounds be seen as leading to the evolution of groups of higher than generic category.

Prospect. The Australasian hirudinids have already provided a firm basis for the assessment of familial, generic and specific characterisation. When applied, as has been done here to some other hirudinids, we can anticipate a widening of the systematics of this group far beyond previously accepted levels. There is obviously a greater richness than has been recognised previously at the generic level and I anticipate also at the specific level.

I have no doubt at all that the close study of the European hirudinids will reveal that the reduction of this fauna to but three species on the basis of only external morphology will prove to have been incorrect. RINGUELET's careful work on the hirudinids of South America supports this view. The need for review of the Afroasian hirudinids is most obvious. In particular, the value in the study of the hirudinids of Oceania, the East Indies, and the more remote islands should now prove zoologically rewarding.

It is necessary to emphasise that we are not yet arrived at the level of knowledge of the systematics of the hirudinids sufficient for zoogeographical considerations and the approach to the problems of distribution and dispersion of the leeches of this group which in the relatively small numbers of species and morphological compactness are as important zoogeographically as the Primates.

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REFERENCES

1. Benham, W. B. (1904): On a new species of leech (Hirudo antipodum) recently discovered in New Zealand. — Trans. N. Z. Inst., **36** (21), p. 185—192.
2. Benham, W. B. (1907): Two new species of leech in New Zealand. — Trans. N. Z. Inst., **39** (16), p. 181—193.
3. Benham, W. B. (1909): Preliminary report on two Hirudinea from the Subantarctic Islands of New Zealand. "Subantarctic Islands of New Zealand". — Wellington, Art. **16**, p. 372—376.
4. Blanchard, R. (1893): Révision de Hirudinées du Musée de Turin. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **8**, No. 145, p. 1—32.
5. Brandes, G. (1886—1901): Hirudineen. — in Leuckart: Die Parasiten des Menschen und die von ihnen herrührenden Krankheiten. Leipzig, p. 535—897.
6. Caballero, Ed. (1930): Contribución al conocimento de los Hirudineos de México. Limnobdella mexicana R. Blanchard. — Anal. Inst. Biol. México, **1** (3), p. 247—251.
7. Caballero, Ed. (1933): Sanguijuelas del Estado de Guanajunto. — Anal. Inst. Biol. México, **4**, p. 179—185.
8. Caballero, Ed. (1934): Limnobdella cajali n. sp. (Hirudinea). — Anal. Inst. Biol. México, **5** (3), p. 237—241.
9. Caballero, Ed. (1937): Hirudineos del Valle del Mezquital, Hgo. XII. — Anal. Inst. Biol. México, **8** (1 & 2), p. 181—188.
10. Caballero, Ed. (1956): Hirudineos de México. XX. Taxa y nomenclatura de la Clase Hirudinea. — Anal. Inst. Biol. México, **27** (1), p. 179—302.
11. Caballero, Ed. (1959): Hirudineos de México. XXII. Taxa y nomenclatura de la Clase Hirudinea hasta generos (n. ed.). — Anal. Inst. Biol. México, **30** (1—2), p. 227—242.
12. Harant, H. & Grassé, P. (1959): Traité de Zoologie. V. Annelides achetes ou hirudinées ou sangsues. — Paris, pp. 471—593.
13. Harding, W. A. (1910): A revision of the British leeches. — Parasitology, **3**, p. 130—201.
14. Johansson, L. (1918): Hirudineen von Neu-Caledonien und den Neu-Hebriden. — in Sarasin and Roux: Nova Caledonia. Zool., **2**, p. 373—396.
15. Mann, K. H. (1954): The anatomy of the horse-leech, Haemopis sanguisuga L., with particular reference to the excretory system. — Proc. Zool. Soc. Lond., **124** (1), p. 69—88.
16. Mann, K. H. (1962): Leeches (Hirudinea). — in: "Intl. Ser. Monogr. Pure Appl. Biol. Oxford, Zool., **11**, p. 1—201.
17. Mathers, C. K. (1954): Haemopis kingi, new species (Annelida, Hirudinea). — Am. Midl. Nat., **52** (2), p. 460—468.
18. Mathers, C. K. (1963): Haemopis lateromaculatum, new species (Annelida, Hirudinea). — Am. Midl. Nat., **70** (1), p. 168—174.
19. Moore, J. P. (1901): Hirudinea of Illinois. — Bull. Illin. State Lab. Nat. Hist., **5**, p. 479—547.

20. MOORE, J. P. (1912): The leeches of Minnesota. — Geol. & Nat. Hist. Survey Minn., Zool. Ser. No. **5** (3), p. 65—150.
21. MOORE, J. P. (1927): Arhynchobdellae. — in "Hirudinea". Fauna of British India. — London, pp. 96—302.
22. MOORE, J. P. (1930): Leeches (Hirudinea) from China with descriptions of new species. — Proc. Acad. Nat. Sci. Phil., **82,** p. 169—192.
23. MOORE, J. P. (1935): A description of Aetheobdella hirudoides gen. et sp. n. from New South Wales, with notes on the leeches collected by the Oxford University Sarawak Expedition. — Ann. Mag. Nat. Hist., (10) **16,** p. 296—304.
24. MOORE, J. P. (1939): Additions to our knowledge of African leeches (Hirudinea). — Proc. Acad. Nat. Sci. Phil., **90,** p. 297—360.
25. MOORE, J. P. (1953): Three undescribed North American leeches (Hirudinea). — Not. Nat. Acad. Nat. Sci. Phil., No. **250,** p. 1—13.
26. MOQUIN-TANDON, A. (1846): Monographie de la famille Hirudinées. — Paris, Ed. 2, pp. 448 + Atlas.
27. PINTO, C. (1923): Ensaio monographico dos Hirudineas. — Rev. Mus. Paulista, **13,** p. 5—266.
28. RICHARDSON, L. R. (1968): An annotated list of Australian leeches. — Proc. Linn. Soc. N. S. W., **92** (3), p. 227—245.
29. RINGUELET, R. (1944): Revisión de los Hirudineos Argentinos de los generos Helobdella R. Bl., Batrachobdella Vig., y Semiscolex Kingb. — Rev. Mus. La Plata (N. S.) Zool., **4,** p. 5—94.
30. RINGUELET, R. (1944): Notas sobre Hirudinéos neotropicales. 1. Caracteres y posición sistematica del genero Potamobdella Cab. — Notas Mus. La Plata, **9** (73), p. 39—52.
31. SCRIBAN, I. A. & AUTRUM, H. (1932—1934): Hirudinea. — in KÜKENTHAL: Handbuch der Zoologie, **2** (2), p. 119—352.
32. SOÓS, Á. (1966): Identification key to the leech (Hirudinoidea) genera of the world, with a catalogue of species. II. Families: Semiscolecidae, Trematobdellidae, Americobdellidae, Diestecostomatidae. — Acta Zool. Hung., **12** (1—2), p. 145—160.
33. SOÓS, Á. (1966): Ibid. III. Family: Erpobdellidae. — Acta Zool. Hung., **12** (3—4), p. 371—407.
34. SOÓS, Á. (1968): A new leech genus: Richardsonianus gen. nov. (Hirudinoidea: Hirudinidae). — Acta Zool. Hung., **14** (3—4), p. 455—459.
35. WHITMAN, C. O. (1886): The leeches of Japan. — Quart. Journ. Micr. Sci. (N. S.), **26,** p. 317—416.

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IDENTIFICATION KEY TO THE LEECH (HIRUDINOIDEA) GENERA OF THE WORLD, WITH A CATALOGUE OF THE SPECIES. V. FAMILY: HIRUDINIDAE

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I. Introduction

In the present part of this series of communications, begun in preceding volumes of this periodical (**11,** p. 417—463; **12,** p. 145—160 and 371—407; **13,** p. 417—432), I propose to deal with the family Hirudinidae. In compiling this section, I adhered to the same concept and presentation of the material, with the difference, however, that I omit now in the introductory part my remarks concerning the 25 genera to be discussed below. This is owing to the fact that the introduction became rather lengthy and thus I am forced to publish much of it separately, even though it would be more proper here to clarify and justify my interpretation of the taxa treated in the key and the catalogue. Another reason is that this very nu tber of our journal contains a detailed paper by Prof. L. R. RICHARDSON, onmhe classification of the hirudinid leeches, with the description of new families, genera, and species. A study of the manuscript of this excellent work made it possible to recast, by a thorough inquiry of the results, my original manuscript including also the generic key and the catalogue, and also to include the new taxa.

RICHARDSON's extensive work, based on comparative anatomical researches, solves not only a number of classificatory problems, but contains also the description of several new families, genera, and species, as well as the redescription of some old taxa. And even more than that, it presents many new statements of essential theoretical importance entailing a number of new approaches to a new and sound phylogeny within the family Hirudinidae, to replace the present untenable and obsolete system.

Despite the fact that RICHARDSON's work, as I pointed out above, was of immense help in rewriting and completing my generic key and in moulding it in an up-to-date shape, it also caused some difficulties by increasing in certain

cases the complexities in the diagnoses of divers genera. Another problem emerged in the case of non-monotypic, new or redescribed genera, owing to the fact that RICHARDSON based his descriptions of genera on merely the type-species. In this way, it has become obvious that certain long-standing genera are strongly heterogeneous in content and cannot any longer be separated one from the other entirely by single factors, or contained within single divisions in the key. Although it will be a more comprehensive and comparative morphology of the externally monotonous hirudinids which will in the future provide real characteristics for the establishment and maintenance of taxa of various ranks, RICHARDSON's proposals cannot be fully utilized at this time because many taxa rest at present only on external features. For this reason, it is necessary here to provide dichotomies at many points, and even at high levels, at least in part on external characters; but it has been possible in many places to bring much additional information into the key. The difficulties which have accumulated within the old system cannot yet be avoided. They are obvious in this key. Equally obvious is the need for a widened and more detailed knowledge of the morphology of the hirudinids, especially in the case of single type-specimens whose dissection may, even in the future, not be feasible beyond the study of the pharyngeal structure by recourse to a ventromedian incision.

Finally, since I use in the key below, as far as possible, RICHARDSON's terms, or classification of types, in the characterization of the several parts of the reproductive system and its assignment as to type, I deem it necessary to present their short definition from RICHARDSON's as follows.

1. Levels of organization of median reproductive structures

"A. AMYOMERIC. No median muscular organs. Vesicular thin-walled atria connect directly to the bursa in both male and female systems.

B. MYOMERIC. Strongly muscular median organs are formed between the atrium and bursa.

B_1. **Hemimyomeric.** Female median region myomeric; male region, amyomeric; no ejaculatory bulbs.

B_2. **Bimyomeric.** Muscular median organs on both male and female median regions.

(a) M i c r o m o r p h i c. Median organs thinly to fully muscular but dwarfed consequential from failure of growth activity during functional differentiation; no ejaculatory bulbs.

(b) M e s o m o r p h i c. Well-developed muscular median regions contained essentially in the posterior portions of XI and XII or contiguous portions of XI and XII, and XII and XIII; atria in posterior portions of XI and XII, or at XI/XII, XII/XIII; ejaculatory bulbs, when present, in contiguous halves of XI and XII; ejaculatory ducts short.

(c) M a c r o m o r p h i c. Median structures elongated in functional differentiation, the penis sheath extending to XII/XIII or further posteriorly; the vagina at XIII/XIV or in XIV; the male atrium from the middle of XI to XII/XIII; the female atrium in the posterior half of XII or at XII/XIII; ejaculatory bulbs posterior to XI; ejaculatory ducts long.

(d) M e g a m o r p h i c. Median structures grossly elongated in functional differentiation; the penis sheath extending into XVI or XVII; the vagina behind XIV; atria posterior to XIII; ejaculatory bulbs posterior to XI; ejaculatory ducts long."

2. Patterns and organization of the anterior end of the male paired ducts

"A. **Richardsonianoid group.** No formed primary loop or flexure. Epididymis differentiates in XII posterior to ejaculatory bulb in XI, the two in a linear relationship.

B. A primary loop or flexure formed. The epididymis and sperm duct or ejaculatory bulb, subparallel, not linear.

B_1. Loop essentially in XI.

(a) **Macrobdelloid group.** A simple 'U'-shape in XI; no ejaculatory bulb; epididymis formed on initial procurrent limb, thin-walled sperm duct on terminal recurrent limb.

(b) **Hirudoid group.** Loop 'S'-shape in XI; epididymis formed on initial procurrent and median recurrent limbs, ejaculatory bulb on terminal procurrent limb.

B_2. **Haemopisoid group.** Primary simple loop reflected into XII; epididymis formed on initial recurrent loop, ejaculatory bulb on terminal procurrent loop."

II. Identification Key to the Genera of the World

1 (4) Always multiple testes and not a single pair of testes in each somite. Their ducts (vasa efferentia) opening either as a common duct into the vas deferens that is the testiculi seem to be clustered, or (rarely) each of them separately, arranged uniformly along the vas deferens. Monostichodont; jaws with small salivary papillae and about 35—50 teeth. Pharynx with 6 internal ridges, a dorsomedian and two ventrolaterals entering into base of jaws, the intervening 3 narrower ridges terminating independently on anterior margin of pharynx between bases of jaws. Crop in IX to XIX with one or two pairs of caeca. Median reproductive structures myomeric, micro- or mesomorphic. Anterior end of the male paired ducts Macrobdelloid-Type. Gonopores separated by 5 annuli: $♂—♀ = \text{XI } b_5/b_6 - \text{XII } b_5/b_6$. Epididymis continued by a thin-walled, non-muscular sperm duct; no ejaculatory bulb, vagina acaecate, vaginal duct present. Mexican species.

2 (3) Number of complete, 5-annulate somites 16; XXV 4-annulate. Crop with two pairs of equal, simple, laterally directed caeca. Sperm duct conspicuously swollen, relatively short. Monocolorous or indiscernibly striped. Size medium. Length: 20—90 mm. Aquatic; sanguivorous. — Type-species: *Limnobdella mexicana* BLANCHARD, 1893. 5 species known. Mexico 12. **Limnobdella** BLANCHARD, 1893

3 (2) Number of complete somites 15; XXV 3-annulate. Crop with one primary pair of simple undivided lateral caeca. Sperm duct tortuous, relatively long. Monocolorous. Size moderate. Length: 60—80 mm. Aquatic; sanguivorous. — Type-species: *Limnobdella cajali* CABALLERO, 1934 (type-species not originally designated). Only a single species known. Mexico

20. **Pintobdella** (CABALLERO, 1937) RICHARDSON, 1969

4 (1) Only a single pair of testes on each somite.

5 (8) Either distinct copulatory glands present behind gonopores or gonopores in glandular area. No salivary papillae, nor ejaculatory bulbs or vaginal caecum. North and Central American species.

6 (7) 4, 8 or 24 copulatory gland pores behind gonopores either in furrows XIII/XIV and XIV b_1/b_2, or on annuli XIII b_6, XIV b_1 and b_2. Gonopores not in glandular area, separated by 2, 2 $^1/_2$ or 5 annuli. Number of complete somites 16. Monostichodont; jaws with 40—65 acute teeth. Crop in X to XIX with two pairs of approximately equally large and similarly lobed caeca. 10 pairs of testes. Median reproductive structures hemimyomeric, mesomorphic. Pattern: longitudinally metameric maculations. Size large. Length: 40—120 mm. Aquatic (? amphibious); sanguivorous. — Type-species: *Hirudo decora* SAY, 1824. 3 species known. North and Central America

13. **Macrobdella** VERRILL, 1872

7 (6) Copulatory gland pores in two nearly similar groups, related respectively to the male and female gonopores. Gonopores in glandular area and separated by 3 or 4 annuli but obscured in mature leeches by surrounding systems of copulatory pits and prominences. Number of complete somites 15. Distichodont; jaws with 20—45 teeth. Crop essentially tubular (*gracilis* MOORE, 1901), or (?) in XI to XIX with two pairs of unequal caeca (*floridana* VERRILL, 1874). 7 pairs of testes. Median reproductive structures amyomeric, micromorphic. Pattern: median dorsal stripe, spotted dorsolateral. Size moderate. Length: 40—85 mm. Aquatic; macrophagous and ?sanguivorous. — Type-species: *Macrobdella* (*Philobdella*) *floridana* VERRILL, 1874. 2 species known. North America 19. **Philobdella** VERRILL, 1874

8 (5) Copulatory gland pores absent, gonopores not in a glandular area.

9 (10) Gonopores separated only by 1—4 annuli; male pore at XI/XII or in XII. Number of complete somites 15, exceptionally 17 (*antellarum* MOORE, 1901). Monostichodont; jaws with 35—50 teeth; no salivary papillae. Crop in IX to XII with a pair of large primary and a pair of small posterior secondary caeca, in XII to XIX two pairs of approximately equal-sized caeca. Median reproductive structures hemimyomeric, i. e. female median region myomeric, male region amyomeric. Anterior end of the male paired ducts Macrobdelloid-Type. 6—10 pairs of testes. No ejaculatory bulb, vagina acaecate, vaginal duct absent. Pattern: striped. Size moderate. Length: 30—90 mm. Aquatic; sanguivorous. — Type-species: *Oxyptychus striatus* GRUBE, 1851. 7 species known. South America, West Indies

17. **Oxyptychus** GRUBE, 1851

10 (9) Gonopores usually separated by 5 annuli, rarely by more than 5; male pore in posterior position of XI.

11 (24) Jaws smooth, edentulous, rarely very weak, or even entirely absent No salivary papillae.

12 (15) Jaws completely absent, or very weak, quite reduced, no true jaws. Wall of pharynx intimately associated with muscles of body-wall; postcaeca reduced. Median reproductive structures myomeric, macromorphic; anterior end of the male paired ducts Haemopisoid-Type. 10 pairs of testes, vaginal caecum present, small.

13 (14) Lower surface of velum smooth. Vaginal duct long, about twice as long as vagina. Male genital pore usually in XI b_5/b_6, female pore in XII b_6; ♂—♀ = 5 $^1/_2$. Jaws entirely absent ("agnathous"), no jaw recesses. Pharynx with some 12 internal ridges; a wide single dorsomedian (fusing ventrolateral and ventral pairs) and 4 single ridges, all terminating on the margin of pharyngeal entrance. Crop simple, tubular, acaecate, except for reduced postcaeca on XIX terminating in XXI. Pattern: sparsely to liberally maculate. Size large. Length: 120—200 mm. Aquatic; macrophagous. — Type-species: *Semiscolex grandis* VERRILL, 1874. Only a single species known. North America
14. **Mollibdella** RICHARDSON, 1969

14 (13) Lower surface of velum finely and closely papillate. No vaginal duct. Male genital pore usually anterior in XI b_6, female pore in XII b_6; ♂—♀ = 5. Small ventrolateral fleshy pads, but no true jaws, no crypts or formed recesses. Pharynx with some 15 internal ridges, ventrolateral pairs joining to enter fleshy pads on margin of pharyngeal entrance; 4 joining to end broadly in dorsomedian position, 3 joining in ventromedian position, and 3 ending independently on margin of the pharyngeal entrance. Crop tubular, with intersomital sphincters, extending to XXII/XXIII, acaecate except for reduced postcaeca on XXII terminating in XXIII. Pattern: sparsely maculate. Size large. Length: 50—150 mm. Aquatic; macrophagous. — Type-species: *Haemopis plumbea* MOORE, 1912. Only a single species known. North America
3. **Bdellarogatis** RICHARDSON, 1969

15 (12) Jaws present, distinct, but always smooth, edentulous.

16 (17) Gonopores separated by 6 annuli: ♂—♀ = XI b_5/b_6 — XII/XIII. Number of complete somites 15. Jaws moderate, low, with cutting ridge, pharynx with 8 internal ridges, 3 fusing to enter each ventrolateral jaw, 2 fusing to enter dorsomedian; no ridges terminating on margin of pharyngeal entrance. Crop in X to XIX, each with a small simple secondary posterior pair, a larger lobed secondary anterior pair, and an extensive lobed median primary pair passing into the following somite from XII to XIX and forming strongly lobed postcaeca on XIX. Male and female median reproductive structures amyomeric, micromorphic. Anterior end of the male paired ducts not actually a fully

typical Hirudoid-Type. 10 pairs of testes; ejaculatory bulbs present. Pattern: reticulate dorsally and ventrally. Size moderate. Length: 30—95 mm. Terrestrial; sanguivorous. — Type-species: *Ornithobdella edentula* BENHAM, 1909. Only a single species known. New Zealand (Snare's Islands) 16. **Ornithobdella** BENHAM, 1909

17 (16) Gonopores separated by 5 annuli, quite exceptionally 5 $^1/_2$ annuli; female pore within XII.

18 (19) Pharynx very long, extending to XII/XIII; only 7 pairs of testes and (?) 5 pairs of crop caeca. Number of complete somites 15; XXV 3-annulate. 3 small, tall jaws, with cutting ridge. Median reproductive structures hemimyomeric: male amyomeric, female myomeric, both mesomorphic. Anterior end of the male paired ducts Richardsonianoid-Type; no ejaculatory bulbs. Neither vaginal caecum, nor vaginal duct present. Pattern: longitudinally striped. Size moderate. Length: 20—50 mm. (?)Terrestrial; sanguivorous. — Type-species: *Hirudo antipodum* BENHAM, 1904. Only a single species known. New Zealand (Open Bay Island) 10. **Hirudobdella** GODDARD, 1910

19 (18) Pharynx not very long, extending no more than to middle of IX; 9—11 pairs of testes, crop either acaecate or 9—11 pairs of caeca. Jaws small or very small.

20 (21) Number of complete somites 17. Crop tubular, acaecate, except for reduced postcaeca on XIX terminating in XXII. Female median reproductive structures myomeric, mesomorphic. Jaws very small, only a little higher than the ridges to which they belong. Body tapering gradually anteriorad. Caudal sucker of medium size, its diameter not exceeding one-half of maximum body-width. Pattern: longitudinally striped. Size moderate. Length: 40—60 mm. Aquatic; ? microphagous. — Japan (*edentula* WHITMAN, 1886) (See No. 30)
25. **Whitmania** BLANCHARD, 1888, p. p.

21 (20) Number of complete somites 16. Crop in X to XIX with small secondary anterior and large primary posterior pairs of caeca, posterior pairs increasingly large, extending laterally and posteriorly. Vaginal duct present.

22 (23) Monocolorous or exceptionally finely linear maculate but never with definitive stripes, bands or spots. Vagina acaecate, oviduct as long as common oviduct. Median reproductive structures myomeric, meso- or (?) macromorphic. Anterior end of the male paired ducts ?-Type. No ejaculatory bulbs. 11 pairs of testes. Jaws small; pharynx with 6 internal ridges, 3 larger ones terminating at bases of jaws and 3 smaller ones alternating with the formers. The type-species includes two forms: One of them known as free-living, aquatic, the other from the air-passages of mammals, as facultative parasites. The latter are always immature. Although both possess nearly all characters in common, the two forms

also present two essential differences in the shape of the body and the development of the caudal sucker. In the aquatic form the maximum body-width is near the middle, tapering gradually anteriorad, in the parasitic form the greatest width lies very far back, close to the caudal sucker, it tapers regularly forewards but becomes abruptly attenuate in the cephalic region. Caudal sucker of parasites very large, even exceeding maximum body-width, in contrast with that of the free-living form (invariably much less than maximum body-width). The difference is not a question of size, age or season. Size large. Length: 40—170 mm. Aquatic; sanguivorous. — Type-species: *Whitmania ferox* BLANCHARD, 1896. 2 species known. Ceylon, India, Burma (See No. 53).

4. **Dinobdella** MOORE, 1927, p. p

23 (22) Pattern: striped, never plain. Vagina caecate, common oviduct at least four times as long as oviduct. Median reproductive structures secondarily hemimyomeric: the male amyomeric, micromorphic, the female myomeric, mesomorphic. Anterior end of the male paired ducts Richardsonianoid-Type. 10 pairs of testes. Jaws with cutting ridge, small, low, rounded, located in shallow open grooves; pharynx with 6 internal ridges joining into 3 entering jaws. Size moderate. Length: 44 mm. Aquatic; sanguivorous. — Type-species: *Euranophila centrale* RICHARDSON, 1969. Only a single species known. Central Australia

6. **Euranophila** RICHARDSON, 1969

24 (11) Jaws with always discernible and more or less well-developed teeth in one or two rows.

25 (34) Teeth of jaws, sometimes irregularly spaced and of varying size, arranged always in two rows (Distichodont). Jaws small, teeth broad-based, blunt, coarse and few in number (3 to 25 pairs). No salivary papillae.

26 (29) Crop with caeca, namely in X to XII one, and in XIII to XIX two pairs, in the latter case with a large primary laterally extended and lobed pair, and a small secondary posterior pair. Body texture soft, flabby and oedomatous. Complete somites delimited very distinctly and with annuli all approximately equal, but grouped 2—3 or 2—1—2; the deeply folded annuli indicate a capability of great extension and contraction. Caudal sucker very large. Jaws with 3—9 pairs of teeth. Median reproductive structures myomeric, mesomorphic. No ejaculatory bulbs, vagina caecate or acaecate, no vaginal duct. Pattern: metameric spots.

27 (28) Gonopores separated by 5 annuli: δ—φ = XI b_5/b_6 — XII b_5/b_6. Number of complete somites 15, exceptionally 12—14. Jaws with 3—6 pairs of teeth. Vagina caecate. Size moderate. Length: 20—70 mm. Aquatic; ? microphagous. — Type-species: *Myxobdella annandalei*

OKA, 1917; 4 species known. Caucasus, Afghanistan, India, Burma, Malay Peninsula, South China, Japan, Central and South Africa

15. **Myxobdella** OKA, 1917

28 (27) Gonopores separated by 7 annuli (♂—♀ = XI a_2/b_5 — XII/XIII), and 8 (♂—♀ = XI a_2/b_5 — XIII b_1/b_2) or 9 (♂—♀ = XI b_2/a_2 — XIII b_1/b_2) annuli, respectively. Number of complete somites 16. Jaws with 8—9 pairs of teeth. Vagina caecate. Size moderate. Length: 30—55 mm. Aquatic; ? microphagous. — Type-species: *Praobdella buettneri* BLANCHARD, 1896. 3 species known. West and Central Africa

22. **Praobdella** BLANCHARD, 1896

29 (26) Crop tubular, at most sacculated and acaecate except for more or less well-developed postcaeca (lacking in *Whitmania gracilis* MOORE, 1930). Body-wall not soft, or oedomatous. Complete somites generally not distinctly delimited, without a 2—3 or 2—1—2 grouping, furrows between annuli not conspicuously deep, but sometimes, mainly in badly conserved specimens, a similar grouping may occur! Caudal sucker small, its diameter no more than about one-half of maximum body-width. Jaws with 9—25 pairs of teeth. Median reproductive structures myomeric, meso- or macromorphic. Anterior end of the male paired ducts Haemopisoid-Type. Usually 10 pairs of testes, except *Whitmania gracilis* MOORE, 1930 (with 7 pairs). Vaginal caecum present. Gonopores separated by 5 annuli.

30 (31) Number of complete somites 17, exceptionally 16 (*gracilis* MOORE, 1930). Abruptly and conspicuously attenuated cephalic region most characteristic. Pattern: longitudinally striped. Median reproductive structures myomeric, meso- to megamorphic. Size moderate to large. Length: 40—150 mm. Aquatic; micro- to macrophagous. — Type-species: *Microstomum pigrum* WHITMAN, 1884. 5 species known. Amur region, Japan, Taiwan, China, India (See No. 20)

25. **Whitmania** BLANCHARD, 1888, p. p.

31 (30) Number of complete somites 15 (when exceptionally 16, VIII also 5-annulate). Cephalic region not abruptly attenuated. Pattern: maculate to lineo-maculate, never definite longitudinal stripes. Median reproductive structures myomeric.

32 (33) Vaginal duct absent, ejaculatory ducts short, shorter than length of ejaculatory bulbs. Entrance to and lumen of pharynx moderate, not strongly reduced; internal ridges of pharynx in groups of 3 each fusing to enter base of jaw, 3 others ending independently on margin of entrance to pharynx between bases of jaws. Jaws small, dorsomedian located in a shallow open recess, ventrolaterals in shallow crypts; with 11—19 pairs of large teeth. Median reproductive structures myomeric, mesomorphic. Pattern: maculate, or without pattern. Size moderate.

Length: 30—110 mm. Aquatic; macrophagous. — Type-species: *Hirudo sanguisuga* LINNAEUS, 1758. Only a single species known. Western Palearctic Region

8. **Haemopis** (LINNAEUS, 1758) RICHARDSON, 1969

33 (32) Vaginal duct present, long to very long; ejaculatory ducts also long, at least as long as length of ejaculatory bulbs, but usually twice or even longer. Entrance to and lumen of pharynx reduced; internal ridges of pharynx grouped in 3, each group fusing to enter jaw, dorsolaterals absent and none ending on margin of pharyngeal entrance. Jaws very small, retractable into deep narrow-mouthed tubular pits, with 9—25 coarse teeth. Median reproductive structures myomeric, macromorphic. Pattern: maculate to linear maculate. Size moderate to large. Length: 40—180 mm. Aquatic; micro- to macrophagous. — Type-species: *Hirudo marmoratis* SAY, 1824. 4 species known. North America 18. **Percymoorensis** RICHARDSON, 1969

34 (25) Teeth of jaws arranged in a single row (Monostichodont). Teeth, most acute, always well discernible. With or without salivary papillae. Crop always caecate with postcaeca, never simple tubular.

35 (38) Gonopores separated by 6 $^1/_2$—7 $^1/_2$ annuli. Number of complete somites 17 or 15. 11 or 12 pairs of testes.

36 (37) Number of complete somites 17; XXV 4-annulate. Gonopores separated by 6 $^1/_2$—7 $^1/_2$ annuli; ♂—♀ = XI b_5/b_6 (b_5 or b_6) — XIII b_1/b_2. Somital sense organs small. 11 pairs of testes. Jaws small, low, rounded, with about 25 wide-based teeth. No salivary papillae. Entrance to pharynx and its lumen narrow; pharynx with 3 main ridges, formed each by the fusion of 2 or 3 posterior ridges, all entering jaws. Crop in X to XIX with 3 pairs of caeca: anterior and posterior secondary pairs lobed and a primary median pair in a lateral position and directed posteriorad. Lobed primary pairs extending into following somites in XII to XVII, and forming lobed postcaeca extending posteriorly from XIX. Median reproductive structures amyomeric, micromorphic. Anterior end of the male paired ducts Richardsonianoid-Type. Epididymis a tortuous coiling tube continued in a thin-walled, enlarged sperm duct; atria dwarfed, penis minute. No common oviduct, no vagina. Monocolorous. Size medium. Length: 50—110 mm. Aquatic (? amphibious); sanguivorous. — Type-species: *Aetheobdella hirudoides* MOORE, 1935. Only a single species known. Australia

1. **Aetheobdella** MOORE, 1935

37 (36) Number of complete somites 15; XXV 3-annulate. Gonopores separated by 7 annuli; ♂—♀ = XI b_5/b_6 — XIII b_1/b_2. Somital sense organs unusually large and prominent, elongated and oblique, or transverse to body-axis. 12 pairs of testes. Jaws very large, high, with about

140 (115 to 154) teeth. Salivary papillae large, arranged in about 3 or 4 longitudinal rows of four or six each. Pharynx with 6 low, rather broad and flat internal ridges meeting in pairs anteriorly to form 3 which pass into the base of each jaw. Crop in X to XIX with 2 pairs of unequal caeca. Median reproductive structures myomeric, micromorphic. Anterior end of the male paired ducts Hirudoid-Type. Ejaculatory bulbs present, atrium small. Common oviduct opening directly into bursa (and not into the vagina which has the nature of a caecum and connects to the bursa by a vaginal duct). Pattern: linear maculate to striped. Size moderate to very large. Length: 40—170 mm. Aquatic; sanguivorous. — Java, Borneo, Sumatra, Burma, Assam (*javanica* WAHLBERG, 1855) (See No. 48)

21. **Poecilobdella** BLANCHARD, 1893, p. p.

38 (35) Gonopores separated by 5, exceptionally 5 $^1/_2$, annuli. Number of complete somites 15 or 16.

39 (44) Number of complete somites 16. Jaws in general with 40—50 teeth; no salivary papillae. Anterior end of the male paired ducts Richardsonianoid-Type. Vagina caecate. 10 pairs of testes. These species occur only in the Notogea.

40 (41) Gonopores separated by 5 $^1/_2$ annuli: ♂—♀ = XI b_5 — XII b_5/b_6. XXV 3-annulate above, 2-annulate below. Vaginal duct absent. Jaws small, with about 40 sharp, small, teeth. Entrance to pharynx and lumen of pharynx both narrow; pharynx small. Median reproductive structures myomeric, the male micromorphic, the female mesomorphic. Pattern: striped. Size moderate. Length: about 60 mm. Aquatic (? amphibious); sanguivorous. — Type-species: *Eunomobdella yaldwyni* RICHARDSON, 1969. Only a single species known. Australia

5. **Eunomobdella** RICHARDSON, 1969

41 (40) Gonopores separated by 5 annuli (♂—♀ = XI b_5/b_6 — XII b_5/b_6), exceptionally 5 $^1/_2$ as in preceding genus, but if the latter then: XXV 4-annulate above and below, vaginal duct present. Median reproductive structures myomeric, mesomorphic.

42 (43) Crop in X to XIX with a single pair of laterally directed simple caeca of narrow base; they extend from middle third of each somite. Jaws large, prominent, with about 50 sharp teeth. Dorsal salivary glands in two compact masses, obvious columns of aggregated ducts. Pharynx with 6 internal ridges, alternating wide and narrow, one of each joining close to and entering base of each jaw. Ejaculatory bulbs with cornua. Vaginal duct only briefly longer than vagina. Pattern: longitudinally striped. Size moderate. Length: 30—90 mm. Aquatic; sanguivorous. — Type-species: *Hirudo australis* BOSISTO, 1859. 4 species known. Australia, New Zealand, Tasmania 24. **Richardsonianus** SOÓS, 1968

43 (42) Crop in XII to XIX with small secondary simple paired anterior and posterior caeca and paired lobed large median primary caeca. Jaws small, with about 40 minute, acute, teeth. Dorsal salivary glands diffuse, weakly developed columns of aggregated ducts. Ejaculatory bulbs without cornua. Vaginal duct twice as long as vagina. Pattern: longitudinally striped. Size moderate. Length: about 35 mm. ? Aquatic; sanguivorous. — Type-species: *Quantenobdella howensis* RICHARDSON, 1969. Only a single species known. Australia (Lord Howe Island)
23. **Quantenobdella** RICHARDSON, 1969

44 (39) Number of complete somites 15. Jaws usually with more than 50 teeth (less than 50 in a few *Limnatis* and *Hirudo* species as well as *Goddardobdella elegans* GRUBE, 1867). Salivary papillae present or absent. Anterior end of male paired ducts Hirudoid-Type (except *Goddardobdella* RICHARDSON).

45 (50) Jaws with salivary papillae.

46 (47) Anterior end of male paired ducts Richardsonianoid-Type. Vaginal duct absent. Median reproductive structures myomeric, mesomorphic. Jaws small, with about 48 sharp, conical teeth. Pharynx with 6 internal ridges, alternating narrow and wide, a pair of each fusing remotely from base of jaw (forming a single broad ridge entering each jaw). Crop a single pair of laterally directed primary caeca extending from middle third of each somite in IX to XIX, with a pair of small secondary caeca anterior to primary caeca in XII to XIX. 10 pairs of testes. Pattern: striped. Size small. Length: about 30 mm. Aquatic; sanguivorous. — Type-species: *Hirudo elegans* GRUBE, 1867. One single species known. Australia 7. **Goddardobdella** RICHARDSON, 1969

47 (46) Anterior end of the male paired ducts Hirudoid-Type. Vaginal duct present.

48 (49) Female organs very distinctive, unique in the family. Common oviduct not connected in vagina, but either vaginal duct and common oviduct opening separately and directly into bursa or common oviduct opening into vaginal duct remote from bursa. Jaws with many acute teeth (86 to 166) usually more than 100. Crop in X to XIX with two pairs of unequal caeca. Somital sense organs unusually large, elongated on elliptical papillae and transverse or oblique to body-axis. Pattern: striped or metameric spotted. Size medium to very large. Length: 40—210 mm. Aquatic; sanguivorous. — Type-species: *Sanguisuga granulosa* SAVIGNY, 1822. 5 species known. Oriental Region and Porto Rico (See No. 37) 21. **Poecilobdella** BLANCHARD, 1893, p. p.

49 (48) Common oviduct opening into vagina. Vagina caecate or acaecate. Jaws with a varying amount of (30 to 120), but usually 70—90, acute teeth. At present an unacceptably heterogeneous genus. Median repro-

ductive structures myomeric, micro- to macromorphic. Pattern: mostly striped. Size moderate. Length: 20—120 mm. Aquatic; sanguivorous. — Type-species: *Bdella nilotica* SAVIGNY, 1822. 17 species known. Circum-Mediterranean, Caucasus, Iran, Afghanistan, Arabia, Ceylon, Malay Peninsula, Africa

11. **Limnatis** MOQUIN-TANDON, 1826 s. l.

50 (45) Jaws without salivary papillae; exceptionally some specimens of *Asiaticobdella birmanica* (BLANCHARD, 1896) with some small, inconspicuous ones.

51 (52) Vaginal duct present, vagina acaecate, female median reproductive structures myomeric, macromorphic. XXV 4-, rarely 3-annulate. Jaws small, with about 50 teeth. Crop with two small pairs of caeca in XI and XII, and a small and a large pair in XIII to XIX. Pattern: longitudinally striped. Size small. Length: 20—40 mm. Aquatic; sanguivorous. — Type-species: *Haemopis birmanica* BLANCHARD, 1894. 4 species known. Afghanistan, Iran, Ceylon, India, Burma, Japan, Timor 2. **Asiaticobdella** RICHARDSON, 1969

52 (51) Vaginal duct absent, vagina caecate or acaecate, female median reproductive structures myomeric, mesomorphic. XXV 3-annulate.

53 (54) Vagina acaecate. Monocolorous, dark, without pattern, but conspicuous somital sense organs surrounded with elongated white dots. Jaws small, with about 60 teeth. Size small. Length: about 40 mm. Amphibious; sanguivorous. — India (*notata* MOORE, 1927) (See No. 22)

4. **Dinobdella** MOORE, 1927, p. p.

54 (53) Vagina caecate; if acaecate, color never plain. At present a very heterogeneous genus. Jaws large, with 35—100 acute teeth. Pharynx with 6 internal ridges, arranged into dorsomedian and ventrolateral pairs, each pair fusing to enter bases of jaws. Crop in X to XIX with one large primary pair of lateral caeca and a small secondary pair anterior to these each. Pattern: striped to longitudinally maculate. Length: 30—150 mm. Aquatic; sanguivorous. — Type-species: *Hirudo medicinalis* LINNAEUS, 1758. 15 species known. Europe, Africa

9. **Hirudo** LINNAEUS, 1758, s. l.

III. Catalogue of the Specis

Familia: HIRUDINIDAE

1. Genus: **Aetheobdella** MOORE, 1935

MOORE (1935): Ann. Mag. Nat. Hist., (10) **16,** p. 296—297. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 115—116.

Type-species: *Aetheobdella hirudoides* MOORE, 1935

1. **hirudoides** MOORE (1935): Ann. Mag. Nat. Hist., (10) **16,** p. 297—303, Figs. 1—3, Pl. X, Figs. 1—2. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 115—116, Fig. 3 A.

Distribution: Australia (N. S. Wales, Victoria).

2. Genus: **Asiaticobdella** RICHARDSON, 1969

RICHARDSON (1969): Acta Zool. Hung., **15,** p. 103.

Type-species: *Haemopis birmanica* BLANCHARD, 1894

1. **asiatica** (BLANCHARD, 1896): Mém. Soc. Zool. France, **9,** p. 320—322, Figs. 4 A—B (*Hirudo*). — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 190—192, Pl. VIII, Fig. 25 (*Hirudo*). — SCIACCHITANO (1960): Libro homenaje al Doctor Eduardo Caballero y Caballero 1930—1960, México, No. **24,** p. 534—535 (*Hirudo*).

Distribution: Iran, Afghanistan, India.

2. **birmancia** (BLANCHARD, 1894): Ann. Mus. Civ. Storia Nat. Genova, (2) **14,** p. 115—117 (*Haemopis*). — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 192—199, 297, Fig. 49, Pl. VIII, Fig. 26 (*Hirudo*). — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 103—104, Fig. 1 E.

= *nipponia* var. *fuscolineata* MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 373—374, Pl. XIX, Figs. 8—9, Pl. XXI, Figs. 27—28 (*Hirudo*).

Distribution: Burma, India, Ceylon.

3. **nipponia** (WHITMAN, 1886): Quart. Journ. Microsc. Sci. (N. S.) **26,** p. 349—357, Pl. XVIII, Figs. 10—20, Pl. XXI, Figs. 65, 70 (*Hirudo*). — PLOTNIKOV (1907): Ann. Mus. Zool. Acad. Imp. St.-Pétersbourg, **10,** p. 140—141 (*Hirudo*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 373 (*Hirudo*). — MOORE (1930): Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 185 (*Hirudo*).

= *nipponia* var. *jaejamana* OKA (1910): Annot. Zool. Jap., **7,** p. 181—182 (*Hirudo*).

Distribution: Japan, China, Mandchuria, Mongolia.

4. **timorensis** (BLANCHARD, 1897): Not. Leyden Mus., **19,** p. 82—83, Pl. 5, Figs. 4—6. — AUGENER (1936): SB. Ges. naturf. Fr. Berlin, Jahrg. **1935,** p. 384 (footnote).

= *amorensis* BLANCHARD (1897) (error): HARANT (1929): Arch. Soc. Sci. Méd. Biol., **10,** p. 639 (*Hirudo*). — HARANT & VERNIÈRES (1936): Mém. Mus. Nat. Hist. Nat. (N. S.), **4,** p. 221 (*Hirudo*).

Distribution: Timor Island.

3. Genus: **Bdellarogatis** RICHARDSON, 1969

RICHARDSON (1969): Acta Zool. Hung., **15,** p. 122—123.

Type-species: *Haemopis plumbea* MOORE, 1912

1. **plumbea** (MOORE, 1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. No. **5,** p. 115—117, Pl. IV, Figs. 29—31 (*Haemopis*). — MATHERS (1948): Proc. Iowa Acad. Sci., **55,** p. 412, Pl. 3 (*Haemopis*). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed. p. 555 (*Haemopis*). — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 122—123, Figs. 3 E, 4 A, 6 C.

Distribution: U. S. A.

4. Genus: **Dinobdella** MOORE, 1927

MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 175. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 332—333.

Type-species: *Whitmania ferox* BLANCHARD, 1896

1. **ferox** (BLANCHARD, 1896): Mém. Soc. Zool. France, **9,** p. 322—326, Figs. 5 A—C (*Whitmania*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 377—380, Pl. XX, Figs. 12—14 (*Whitmania*). — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 175—185, Fig. 48, Pl. IV, Fig. 4, Pl. VII, Figs. 23—24. — OKA (1929): Proc. Imp. Acad. Tokyo, **5,** p. 210—212, Figs. A—B.

= *birmanica* KABURAKI (1921) (nec BLANCHARD, 1894): Rec. Ind. Mus., **22,** p. 712—713 (*Haemopis*).
= *subviridis* MURIE (1865) (nec DUTROCHET, 1817): Proc. Zool. Soc. London, **1865,** p. 659—662 (*Trocheta*).

Distribution: Ceylon, India, Thailand, Burma, Taiwan, Japan, ? China.

2. **notata** MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 185—189, 296, Pl. VIII, Figs. 34—35.

= sp.? MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 382—383, Pl. XX, Figs. 15—18 (*Whitmania*).

Distribution: South India.

5. Genus: **Eunomobdella** Richardson, 1969

Richardson (1969): Acta Zool. Hung., **15,** p. 114.

Type-species: *Eunomobdella yaldwyni* Richardson, 1969

1. **yaldwyni** Richardson (1969): Acta Zool. Hung., **15,** p. 114—115, Fig. 2 E.

Distribution: Australia (N. S. Wales).

6. Genus: **Euranophila** Richardson, 1969

Richardson (1969): Acta Zool. Hung., **15,** p. 112.

Type-species: *Euranophila centrale* Richardson, 1969

1. **centrale** Richardson (1969): Acta Zool. Hung., **15,** p. 112—113, Fig. 2 C.

Distribution: Central Australia.

7. Genus: **Goddardobdella** Richardson, 1969

Richardson (1969): Acta Zool. Hung., **15,** p. 113.

Type-species: *Hirudo elegans* Grube, 1867

1. **elegans** (Grube, 1867): Jahresb. Schles. Ges. vaterl. Cultur, **44,** p. 61 (*Hirudo*). — Grube (1871): Arch. f. Naturg., **37,** p. 91—92, Pl. III, Fig. 2 (*Hirudo*). — Augener (1930): Zool. Anz., **90,** p. 307—308 (*Hirudo*). — Richardson (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 236—237 (*Hirudo*). — Richardson (1968): Mem. Queensl. Mus., **15,** (in print). — Richardson (1969): Acta Zool. Hung., **15,** p. 113, Figs. 2 D, 5 C.

Distribution: Australia (Queensland).

8. Genus: **Haemopis** (Savigny, 1822) Richardson, 1969

Savigny (1822): Système des Annelides, Paris, **1** (3), p. 107, 115. — Blanchard (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 48. — Harding (1910): Parasitology, **3,** p. 165. — Moore (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. No. **5,** p. 110. — Rousseau (1912): Ann. Biol. Lacustre, **5,** p. 282. — Gedroyć (1915): Rozpr. Wiad. Muz. Im. Dzied., **2,** p. 75—76. — Pawlowski (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 142. — Hoffmann (1955): Arch. Inst. Grand-Ducal Luxemb., Sect. Sci. Nat. (N. S.) **22,** p. 202. — Autrum (1958): Hirudinea. in Brohmer: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 12. — Moore (1959): Hirudinea. in Ward & Whipple: Fresh-water Biology, New York, 2nd Ed., p. 554. — Mann (1961): Leeches (Hirudinea). in: Intern. Ser. Monogr. Pure Appl. Biol., Ser. Zool., **11,** p. 163. — Lukin (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 145. — Richardson (1969): Acta Zool. Hung., **15,** p. 120.

SYNONYMY:

Aulastoma MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 124.
Aulacostomum GRUBE (1850): Arch. f. Naturg., **16,** p. 358.
Aulostoma JOHNSTON (1865): A Catalogue of the British Non-parasitical Worms in the Collection of the British Museum, London, p. 46.
Aulostomum DIESING (1850): Systema Helminthum, Vindobonae, **1,** p. 461.
Haemopsis (error) JOHNSTON (1846): Ann. Mag. Nat. Hist., **16,** Suppl., p. 442.
Hippobdella DE BLAINVILLE (1827): Dict. Sci. Nat., **47,** p. 251—252.
Pseudobdella DE BLAINVILLE (1827): Dict. Sci. Nat., **47,** p. 246—249.
Typhlobdella DIESING (1850): Systema Helminthum, Vindobonae, **1,** p. 458—459.

Type-species: *Hirudo sanguisuga* LINNAEUS, 1758

1. **sanguisuga** (LINNAEUS, 1758): Syst. Nat., Edit., X, p. 649 (*Hirudo*). — MÜLLER, O. F. (1774): Vermium terrestrium et fluviatilum, Havniae et Lipsiae, **1** (2), p. 38—39 (*Hirudo*). — CARENA (1820): Mem. Real. Accad. Sci. Torino, **25,** p. 286—287, Pl. IX, Figs. 7—8, 12, 23, 25—26 (*Hirudo*). — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 25—27, Figs. 10—11. — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 161, p. 3. — BLANCHARD (1893): Anal. Soc. Españ. Hist. Nat., **22,** p. 253. — BLANCHARD (1894): Abh. Ber. Zool. Mus. Dresden 1892/93, No. **4,** p. 3—4, Figs. 1—2. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 48—51, Figs. 13 A—C. — BLANCHARD (1896): Bull. Soc. Zool. France, **21,** p. 138—140. — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13,** p. 79, Figs. 137—138. — HARDING (1910): Parasitology, **3,** p. 165—170, Figs. 11—12, Pl. XV, Figs. 39—41. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 282—283. — GEDROYĆ (1915): Rozpr. Wiad. Mus. Im. Dzied., **2,** p. 76—80, Fig. 15. — JOHANSSON (1929): Hirudinea. in DAHL: Die Tierwelt Deutschlands, T. **15,** p. 149, Figs. 39—41. — PAWLOWSKI (1936): Ann. Mus. Zool. Polon., **11,** p. 161—169, Figs. 1—2, Pl. XXVI, Figs. A—F. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 142—149, Figs. 103—110. — BENNIKE (1943): Fol. Limnol. Scand., No. **2,** p. 84—85. — PAWLOWSKI (1948): Fragm. Faun. Mus. Zool. Polon., **5,** p. 333—336, Fig. 4a. — MANN (1954): Proc. Zool. Soc. London, **124,** p. 69—88, Figs. 1—9. — HOFFMANN (1955): Arch. Inst. Grand-Ducal Luxemb., Sect. Sci. Nat. (N. S.), **22,** p. 203—204, Figs. 11 A—D. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 12—13, Figs. 6c, 34a, 35b, 37, 38b, 39. — PAWLOWSKI (1959): Soc. Sci. Lodz, Sect. III, No. **57,** p. 61—62. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 145—148, Figs. 88 (colored), 89—91. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 120, Figs. 3 C, 6 A.

= *carnivora* BROSSAT (1822): Journ. Pharm., **8**, p. 34 (*Hirudo*).
= *gulo* BRAUN (1805): Systematische Beschreibung einiger Egelarten. Berlin, p. 12—23, Pl. I, Figs. 1—7 (colored) (*Hirudo*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, 2nd Ed., p. 313, Pl. V, Figs. 1—6 (colored) (*Aulastoma*). — DIESING (1850): Systema Helminthum, Vindobonae, **1**, p. 461—462 (*Aulostomum*). — GRUBE (1851): Die Familie der Anneliden. Berlin, p. 110, 148 (*Aulacostomum*). — DIESING (1859): SB. mathem.-naturw. Cl. Akad. Wiss. Wien, **33**, p. 499 (*Aulastomum*). — POLONIO (1861): Atti Soc. Ital. Sci. Nat., **3**, p. 41 (*Aulostomum*). — JOHNSTON (1865): A Catalogue of the British Non-parasitical Worms in the Collection of the British Museum, London, p. 46 (*Aulostoma*). — GRUBE (1871): Arch. f. Naturg., **37**, p. 97—101, Pl. III, Fig. 7 (*Aulacostomum*). — CHWOROSTANSKY (1886): Zool. Anz., **9**, p. 446 (*Aulastoma*). — ÖRLEY (1886): Mathem. term.-tud. Közlem., **22** (2), p. 86—88 (*Aulastoma*). — APÁTHY (1888): Zool. Jahrb. Syst., **3**, p. 746—749, 793 (*Aulastoma*).
= *italicum* POLONIO (1861): Atti Soc. Ital. Sci. Nat., **3**, p. 41 (*Aulostomum*).
= *kovatsi* DIESING (1850): Systema Helminthum, Vindobonae, **1**, p. 459 (*Typhlobdella*). — DIESING (1858): Denkschr. mathem.-naturw. Cl. Akad. Wiss. Wien, **14**, p. 77, Pl. III, Figs. 25—31 (*Typhlobdella*). — APÁTHY (1888): Zool. Jahrb. Syst., **3**, p. 749—750 (*Typhlobdella*).
= *lacertina* SAVIGNY (1822): Système des Annelides, Paris, **1** (3), p. 117. — DE BLAINVILLE (1827): Dict. Sci. Nat., **47**, p. 253 (*Hippobdella*).
= *luctuosa* SAVIGNY (1822): Système des Annelides, Paris, **1** (3), p. 116. — DE BLAINVILLE (1827): Dict. Sci. Nat., **47**, p. 253 (*Hippobdella*).
= *nigra* SAVIGNY (1822): Système des Annelides, Paris, **1** (3), p. 116. — DE BLAINVILLE (1827): Dict. Sci. Nat., **47**, p. 249—250, Pl. II, Fig. 1 (*Pseudobdella*). — DE BLAINVILLE (1828): Dict. Sci. Nat., **57**, p. 560, Pl. XXXV, Fig. 1 (*Pseudobdella*). — JOHNSTON (1846): Ann. Mag. Nat. Hist., **16**, Suppl. p. 442 (*Haemopsis*). — JOHNSTON (1865): A Catalogue of the British Non-parasitical Worms in the Collection of the British Museum, London, p. 46 (*Aulostoma*).
= *nigrescens* MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 124, Pl. VI, Fig. 3 (*Aulastoma*).
= *ornata* DE FILIPPI (1837): Memoria sugli Anellidi della famiglia delle Sanguisughe, Milano, p. 25, Fig. 14. — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, 2nd Ed., p. 315, Pl. V, Fig. 6 (*Aulastoma*). — ÖRLEY (1886): Mathem. term.-tud. Közlem., **22** (2), p. 89 (*Aulastoma*). — APÁTHY (1888): Zool. Jahrb. Syst., **3**, p. 748 (*Aulastoma*).
= *sanguisorba* DE BLAINVILLE (1818): in LAMARCK: Histoire naturelle des animaux sans Vertèbres, Paris, **5**, p. 291 (*Hirudo*). — SAVIGNY (1822): Système des Annalides, Paris, **1** (3), p. 115—116. — DE BLAINVILLE (1827): Dict. Sci. Nat., **47**, p. 252—253 (*Hippobdella*). — DE BLAINVILLE (1828): Dict. Sci. Nat., **57**, p. 561, Pl. XXXV, Fig. 2 (*Hippobdella*). — DIESING (1850): Systema Helminthum, Vindobonae, **1**, p. 462—464.
= *schmidli* DIESING (1862): SB. mathem.-naturw. Cl. Akad. Wiss. Wien, **45**, p. 483—484 (*Aulastomum*). — ÖRLEY (1886): Mathem. term.-tud. Közlem., **22** (2), p. 89 (*Aulastoma*). — APÁTHY (1888): Zool. Jahrb. Syst., **3**, p. 747—748 (*Aulastoma*).
= *vorax* JOHNSON (1816): A Treatise on the medicinal Leech. London, p. 62 (*Hirudo*). — GERVAIS (1836): Hirudinée. in GUÉRIN: Dict. Hist. Nat., **3**, p. 628. Pl. CCXI, Figs. 6, 6a—b (*Pseudobdella*). — JOHNSTON (1846): Ann. Mag. Nat. Hist., **16**, Suppl. p. 442 (*Haemopsis*).
= *wedli* DIESING (1862): SB. mathem.-naturw. Cl. Akad. Wiss. Wien, **45**, p. 484 (*Aulastomum*). — ÖRLEY (1886): Mathem. term.-tud. Közlem., **22** (2), p. 89 (*Aulastoma*). — APÁTHY (1888): Zool. Jahrb. Syst., **3**, p. 748—749 (*Aulastoma*).

Distribution: Western Palearctic Region.

9. Genus: **Hirudo** LINNAEUS, 1758 s. l.

LINNAEUS (1758): Syst. nat., X. Edit., p. 649. — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, 2nd Ed., p. 326—327. —

DIESING (1850): Systema Helminthum, Vindobonae, **1,** p. 465. — WHITMAN (1886): Quart. Journ. Miscrosc. Sci. (N. S.) **26,** p. 364—365. — APÁTHY (1888): Zool. Jahrb. Syst., **3,** p. 743—746, 793—794. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 39. — HARDING (1910): Parasitology, **3,** p. 171. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 280. — GEDROYĆ (1915): Rozpr. Wiad. Mus. Im. Dzied., **2,** p. 71. — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 189. — HARANT (1929): Arch. Soc. Sci. Méd. Biol., **10,** p. 639—641. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 134. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 13. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 102—103.

SYNONYMY:

Iatrobdella DE BLAINVILLE (1827): Dict. Sci. Nat., **47,** p. 252.
Sanguisuga SAVIGNY (1822): Système des Annelides, Paris, **1** (3), p. 107, 113—114.

Type-species: *Hirudo medicinalis* LINNAEUS, 1758

1. **capensis** GRUBE (1868): Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859. Zool. Theil, **2,** III. Abt. 2, p. 38—39, Pl. IV, Fig. 4. — GODDARD & MALAN (1912): Ann. S. Afr. Mus., **11,** p. 318—319. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178. — SCIACCHITANO (1963): Ann. Transvaal. Mus., **24,** p. 259.

Distribution: South Africa (Capland).

2. **chavesei** BLANCHARD (1896): Bull. Soc. Zool. France, **21,** p. 197. — BLANCHARD (1936 !): Res. camp. Sci. Monaco, **96,** p. 77 (a complete posthumous reprint of the author's paper cited above).

Distribution: The Azores.

3. **granviki** HARANT & VERNIÈRES (1936): Mém. Mus. Nat. Hist. Nat. (N. S.) **4,** p. 220—221.

Distribution: Kenya.

4. **grisea** SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61,** p. 292—294, Figs. 1—3. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178.

Distribution: Belgian Congo (Katanga).

5. **hildebrandti** BLANCHARD (1898): Hirudinea. in MÖBIUS: Die Thierwelt Ost-Afrikas und der Nachbargebiete, Berlin, **4,** Lief. 2, No. 13, p. 5—6, Pl. Figs. 4—9. — JOHANSSON (1913): Hirudineen aus dem Sudan. in: Res.

Swedish Zool. Exp. Egypt and the White Nile 1901, Pt. 5, No. **24,** p. 29—30. — JOHANSSON (1914): SB. mathem.-naturw. Kl. Akad. Wiss. Wien, **123,** p. 847. — MOORE (1933): Journ. Linn. Soc. London, **38,** p. 299. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 333—334, Pl. 26, Fig. 25, Pl. 27, Fig. 44, Pl. 28, Fig. 60. — MEYER (1951): Hirudinea. in: Explor. Parc Nat. Albert, Mission G. F. de Witte (1933—1935), Fasc. **76,** p. 18—19. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool. **16,** p. 21—22, 46, 62. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178.

= *hildebranti* (!) var. *carossii* DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32,** No. 724, p. 7—8.
= *pawensis* SCIACCHITANO (1937): Rev. Zool. Bot. Afr., **29,** p. 427.

Distribution: East Africa.

6. **intermedia** GODDARD & MALAN (1912): Ann. S. Afr. Mus., **11,** p. 316—317. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 259.

Distribution: South Africa (Capland).

7. **lefevrei** SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool. **16,** p. 24—26, 46, 65, Figs. 8—9. — SCIACCHITANO (1954): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 4, Miscell. Zool. **1,** p. 280. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178.

Distribution: Belgian Congo, Ruanda.

8. **medicinalis** LINNAEUS (1758): Syst. nat., X. Edit., p. 649. — MÜLLER, O. F. (1774): Vermium terrestrium et fluviatilum. Havniae et Lipsiae, **1** (2), p. 37—38. — CARENA (1820): Mem. Real. Accad. Sci. Torino, **25,** p. 279, Pl. XI, Figs. 1—2 (colored). — SAVIGNY (1822): Système des Annelides, Paris, **1** (3), p. 114 (*Sanguisuga*). — DE BLAINVILLE (1827): Dict. Sci. Nat., **47,** p. 254, Pl. II, Fig. 4, 4 a—b (*Iatrobdella*). — DE BLAINVILLE (1828): Dict. Sci. Nat., **57,** p. 561, Pl. XXXV, Figs. 4, 4 a—d, Pl. XXXVI, Figs. 1—3 (*Iatrobdella*). — BRANDT & RATZEBURG (1833): Medizinische Zoologie, Berlin, **2,** p. 238—297, Pl. XXVIII, Figs. 3—17 and A—M (colored, except figs. 10—17), Pl. XXIX. A, Figs. 1—58, Pl. XXIX. B, Figs. 1—11, Pl. XXX, Figs. 5—23 (*Sanguisuga*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, 2nd Ed., p. 327—355, Pl. VII, Figs. 1—19 (colored), Pl. VIII, Figs. 1—15 (colored), Pl. IX, Figs. 1—20, Pl. X, Figs. 1—16, Pl. XI, Figs. 1—18. — DIESING (1850): Systema Helminthum, Vindobonae, **1,** p. 465—468. — DIESING (1859): SB. mathem.-naturw. Cl. Akad. Wiss. Wien, **33,** p. 501—507. — WHITMAN (1886): Quart. Journ. Miscrosc. Sci. (N. S.), **26,** p. 369—371.

— APÁTHY (1888): Zool. Jahrb. Syst., **3,** p. 743—746. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 39—41, Figs. 12 A—B. — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13,** p. 78, Figs. 134—136. — HARDING (1910): Parasitology, **3,** p. 171—175, Figs. 12—13, Pl. XV, Figs. 36—38. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 281—282, Figs. 23—25. — GEDROYĆ (1915): Rozpr. Wiad. Mus. Im. Dzied., **2,** p. 71—75, Fig. 15. — JOHANSSON (1929): Hirudinea. in DAHL: Die Tierwelt Deutschlands, T. **15,** p. 148, Figs. 33—38. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 134—142, Figs. 94—102. — BENNIKE (1943): Fol. Limnol. Scand., No. **2,** p. 85—87, Fig. 19. — HOFFMANN (1955): Arch. Inst. Grand-Ducal Luxemb., Sect. Sci. Nat. (N. S.), **22,** p. 200—202, Figs. 10 A—B. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 13, Figs. 6b, 10, 34b, 36, 38a, 40—41. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 127—143, Figs. 80—86. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 102—103, Figs. 1 A, 5 A.

= *carena* RISSO (1826): Hist. nat. de l'Europe méridion., Paris, **4,** p. 429 (*Sanguisuga*).
= *chlorogaster* BRANDT (1833): in BRANDT & RATZEBURG: Medizinische Zoologie, Berlin, **2,** p. 238, Pl. XXVIII, Figs. 1—2 (colored) (*Sanguisuga*).
= *meridionalis* RISSO (1826): Hist. nat. de l'Europe méridion., Paris, **4,** p. 428 (*Sanguisuga*).
= *obscura* MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 116, Pl. V, Figs. 3a—e. — BRANDT & RATZEBURG (1833): Medizinische Zoologie, Berlin, **2,** p. 236—237, Pl. XXX, Fig. 3, and D, E, F (colored) (*Sanguisuga*).
= *officinalis* SAVIGNY (1822): Système des Annelides, Paris, **1** (3), p. 114—115 (*Sanguisuga*). — MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 112, Pl. V, Figs. 1a—s (*Sanguisuga*). — BRANDT & RATZEBURG (1833): Medizinische Zoologie, Berlin, **2,** p. 237—238, Pl. XXX, Fig. 1, and A, B, C (colored) (*Sanguisuga*).
= *provincialis* CARENA (1820): Mem. Real. Accad. Sci. Torino, **25,** p. 282, Pl. XI, Figs. 4—5. — BRANDT & RATZEBURG (1833): Medizinische Zoologie, Berlin, **2,** p. 237, Pl. XXX, Figs. 1* and M (colored) (*Sanguisuga*).
= *venaesector* BRAUN (1805): Systematische Beschreibung einiger Egelarten, Berlin, p. 24—34, Pl. 2, Figs. 1—9 (colored).
= *verbana* CARENA (1820): Mem. Real. Accad. Sci. Torino, **25,** p. 285, 316, Pl. XI, Fig. 6. — MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 117, Pl. VI, Fig. 1 (*Sanguisuga*). — BRANDT & RATZEBURG (1833): Medizinische Zoologie, Berlin, **2,** p. 235, Pl. XXX, Fig. 2 (colored) (*Sanguisuga*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, 2nd Ed., p. 337—339. — DIESING (1850): Systema Helminthum, Vindobonae, **1,** p. 469.

Distribution: Europe, West Asia.

9. **michaelseni** AUGENER (1936): SB. Ges. naturf. Fr. Berlin, Jahrg. **1935,** p. 382—385, Figs. 1 a—b. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 334, Pl. 27, Fig. 28. — JARRY (1959): Bull. Soc. Zool. France, **84,** p. 380—382, Fig. 3. — PAWLOWSKI & JARRY (1961): Mission épidémiologique au Nord-Tchad. in RIOUX: Comm. coord. Sci. Sahara,

P.R.O.H.U.Z.A., p. 115—116. — SCIACCHITANO (1962): Monit. Zool. Ital. Firenze, **69,** p. 145—146. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 254, 259.

= sp. MOORE (1933): Journ. Linn. Soc. London, **38,** p. 299 (*Hirudo*).

Distribution: South Africa, Kenya, Tshad.

10. **morrisii** GODDARD & MALAN (1912): Ann. S. Afr. Mus., **11,** p. 315. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178. — SCIACCHITANO (1963): Ann. Transvaal. Mus., **24,** p. 259.

Distribution: South Africa (Capland).

11. **notabilis** GODDARD & MALAN (1912): Ann. S. Afr. Mus., **11,** p. 315—316. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 259.

Distribution: South Africa (Capland).

12. **septemstriata** GRUBE (1868): Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859, Zool. Theil, **2,** III. Abt. 2, p. 37—38, Pl. IV, Fig. 5. — GODDARD & MALAN (1912): Ann. S. Afr. Mus., **11,** p. 314.

Distribution: South Africa.

13. **sjoestedti** JOHANSSON (1910): Wiss. Erg. Schwed. Zool. Exp. Kilimandjaro-Meru 1905—1906, **3,** Abt. 22 (5), p. 29—31, Figs. 1—3. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 335, Pl. 27, Figs. 29, 45, Pl. 28, Fig. 53. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 22—24, 46, 62—63, Figs. 6—7. — SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61,** p. 292. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178.

Distribution: East Africa, Northern Rhodesia, Congo, Urundi.

14. **taivana** OKA (1928): Proc. Imp. Acad. Tokyo, **4,** p. 122—124, Figs. A—B.

Distribution: Taiwan.

15. **troctina** JOHNSON (1816): A Treatise on the medicinal Leech. London, p. 31—32. — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, 2nd Ed., p. 335—337, Pl. XI, Figs. 19—22 (colored). — DIESING (1850): Systema Helminthum, Vindobonae, **1,** p. 468—469. — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 24—25. — BLANCHARD (1893): Anal. Soc. Españ. Hist. Nat..

22, p. 252, Fig. 5. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp, Univ. Torino, **9,** No. 192, p. 41—42. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 282. — JOHANSSON (1914): SB. mathem.-naturw. Kl. Akad. Wiss. Wien, **123,** p. 837—840. — HARANT (1929): Arch. Soc. Sci. Méd. Biol., **10,** p. 640—641. — AUGENER (1930): Zool. Anz., **90,** p. 306. — MOORE (1939): Ann. Mag. Nat. Hist., (11) **3,** p. 82—83.

= *interrupta* MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 118, Pl. VI, Figs. 2a—h (*Sanguisuga*). — BRANDT & RATZEBURG (1833): Medizinische Zoologie, Berlin, **2,** p. 235—236, Pl. XXX, Figs. 4, and G, H, I, K, L (colored) (*Sanguisuga*).
= *medicinalis* var. *tessellata* DE BLAINVILLE (1827): Dict. Sci. Nat., **47,** p. 255, Pl. III, Fig. 1a [*Hirudo* (*Iatrobdella*)].

Distribution: Western Mediterranean.

SPECIES INQUIRENDAE:

1. *brunellii* SCIACCHITANO (1939): Boll. pesca, piscicult. idrobiol., **15,** p. 8—9, Fig. 5. — SCIACCHITANO (1941): Riv. Biol. Coloniale, **4,** p. 164.
Distribution: Ethiopia.
2. *dubia* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 455. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 46, 65.
Distribution: Tanganyika.
3. *inconspicua* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 455. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 46, 65—66.
Distribution: Tanganyika.
4. *lumbricoides* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 456. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 46, 66.
Distribution: Belgian Congo.
5. *margaritensis* SCIACCHITANO (1939): Boll. pesca, piscicult. idrobiol., **15,** p. 9, Fig. 6. — SCIACCHITANO (1941): Riv. Biol. Coloniale, **4,** p. 164.
Distribution: Ethiopia.
6. *oligodonta* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 452—453. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 46, 63.
var. *schoutedeni* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 453. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 63.
Distribution: Belgian Congo.
7. *orlandinii* SCIACCHITANO (1941): Riv. Biol. Coloniale, **4,** p. 165—166, Fig. 1.
Distribution: Ethiopia.
8. *parenzani* SCIACCHITANO (1939): Boll. pesca, piscicult. idrobiol., **15,** p. 8, Fig. 4. — SCIACCHITANO (1941): Riv. Biol. Coloniale, **4,** p. 164.
Distribution: Ethiopia.
9. *protoclepsoides* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 454—455, Fig. 5. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 46, 64.
Distribution: Tanganyika.
10. *schoutedeni* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 455. — SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 360. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 46, 64.
= *sexstriata* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 455, Fig. 2. — SCIACCHITANO (1936): Rev. Zool. Bot. Afr., **28,** p. 162. — SCIACCHITANO (1939): Boll. pesca, piscicult. idrobiol., **15,** p. 6—7, Fig. 2. — SCIACCHITANO (1941): Riv. Biol. Coloniale, **4,** p. 164.
var. *cinerea* SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 64
= *sexstriata* var. *cinerea* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 456.
Distribution: Tanganyika, Ruanda, Ethiopia.
11. *speciosa* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 453. — SCIACCHITANO (1952):

Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 46, 63.
Distribution: Tanganyika.

12. spec.? SCIACCHITANO (1961): Publ. Cult. Co. Diam. Angola, Lisboa, No. **52**, p. 111—112 (*Hirudo*).

13. *stappersi* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26**, p. 454. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 46, 64.
Distribution: Tanganyika.

14. *tanganykensis* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26**, p. 453—454. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 46, 63.
var. *aequalis* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26**, p. 454. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 64.
Distribution: Tanganyika.

15. *urundensis* SCIACCHITANO (1937): Rev. Zool. Bot. Afr., **29**, p. 428. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 46, 65.
Distribution: Urundi.

16. *vatovae* SCIACCHITANO (1939): Boll. pesca, piscicult. idrobiol., **15**, p. 7, Fig. 3. — SCIACCHITANO (1941): Riv. Biol. Coloniale, **4**, p. 164.
Distribution: Ethiopia.

10. Genus: **Hirudobdella** GODDARD, 1910

GODDARD (1910): Proc. Linn. Soc. N. S. Wales, **35**, p. 69—71. — RICHARDSON (1968): Proc. Linn. Soc. N. S. Wales, **92**, p. 238. — RICHARDSON (1969): Acta Zool. Hung., **15**, p. 119

Type-species: *Hirudo antipodum* BENHAM, 1904

1. **antipodum** (BENHAM, 1904): Trans. Proc. New Zealand Inst., **36**, p. 187—192, Pl. VIII, Figs. 1—7 (*Hirudo*). — BENHAM (1907): Trans. Proc. New Zealand Inst., **39**, p. 189—191, Pl. VIIIa, Figs. 11—12 (*Hirudo*). — RICHARDSON (1969): Acta Zool. Hung., **15**, p. 119

Distribution: New Zealand.

11. Genus: **Limnatis** MOQUIN-TANDON, 1826 s. l.

MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 122. — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, 2nd Ed., p. 349—350. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9**, No. 192, p. 42. — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 199—200. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 66. — RICHARDSON (1969): Acta Zool. Hung., **15**, p. 106—107.

SYNONYMY:

Bdella SAVIGNY (1822) (nec LATREILLE, 1795): Système des Annelides, Paris, **1** (3), p. 107, 112—113. — DIESING (1850): Systema Helminthum, Vindobonae, **1**, p. 460.

Type-species: *Bdella nilotica* SAVIGNY, 1822

1. **africana** BLANCHARD (1897): Not. Leyden Mus., **19**, p. 108—112, Fig. 23. — DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32**, No. 724, p. 8—9. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90**, p.

340—341, Pl. 27, Figs. 33, 46—47, Pl. 28, Figs. 57, 61. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 29—31, 47, 66, Figs. 14—15. — SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61,** p. 294. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178. — SCIACCHITANO (1967): Journ. nat. Hist., **1,** p. 191. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 107.

= *bokumensis* SCIACCHITANO (1937): Rev. Zool. Bot. Afr., **29,** p. 427—428 (*Hirudo*).
= *buluvensis* SCIACCHITANO (1936): Rev. Zool. Bot. Afr., **28,** p. 162 (*Hirudo*).
= *iturensis* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 361—362, Figs. 14, 15a—d (*Hirudo*).

Distribution: Senegal, Liberia, Gold Coast, Congo, Angola, Uganda, Ruanda, Ethiopia.

2. **butonensis** MEYER (1951): Hirudinea. in: Explor. Parc Nat. Albert, Mission G. F. de Witte (1933—1935), Fasc. **76,** p. 14—18, Figs. 1—2. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 47, 70. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Congo.

3. **damasi** SCIACCHITANO (1957): Rev. Zool. Bot. Afr., **56,** p. 375—378, Figs. 1—2. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Ruanda.

4. **dissimulata** MOORE (1938): Bull. Raffles Mus., **14,** p. 65—70, Pl. IV, Figs. 1—4.

Distribution: Malay Peninsula.

5. **dundensis** SCIACCHITANO (1961): Publ. Cult. Co. Diam. Angola, Lisboa, No. **52,** p. 114—115, Figs. 8—12. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Angola.

6. **ealensis** SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 34—38, 47, 69, Figs. 21—23. — SCIACCHITANO (1954): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 4, Miscell. Zool., **1,** p. 281—282, Figs. 1—2. — SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61,** p. 295—300, Figs. 4—10. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Congo.

7. **faini** SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61,** p. 300—303, Figs. 11—13. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Congo.

8. fenestrata MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 343—347, Pl. 27, Figs. 35—36, 43, 48, Pl. 28, Fig. 56. — MEYER (1951): Hirudinea. in: Explor. Parc Nat. Albert, Mission G. F. de Witte (1933—1935), Fasc. **76,** p. 12—13. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 31—34, 47, 67—68, Figs. 16—20. — SCIACCHITANO (1954): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 4, Miscell. Zool., **1,** p. 280—281. — MOORE (1958): Ann. Natal. Mus., **14,** p. 333—334. — SCIACCHITANO (1962): Monit. Zool. Ital. Firenze, **69,** p. 146. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 258. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 107.

Distribution: Bechuanaland, Northern Rhodesia, Zululand, Congo.

9. karambensis SCIACCHITANO (1957): Rev. Zool. Bot., Afr., **56,** p. 378—379, Figs. 3—5. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Ruanda.

10. lukumensis SCIACCHITANO (1957): Rev. Zool. Bot. Afr., **56,** p. 379—380, Figs. 6—7. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Ruanda.

11. lundensis SCIACCHITANO (1961): Publ. Cult. Co. Diam. Angola, Lisboa, No. **52,** p. 112—114, Figs. 3—7. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Angola.

12. nilotica (SAVIGNY, 1822): Système des Annelides, Paris, **1** (3), p. 113, Pl. V, Fig. 4 (*Bdella*). — MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 122. — DE BLAINVILLE (1827): Dict. Sci. Nat., **47,** p. 257, Pl. II, Figs. 3, 3a—b (*Bdella*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, 2nd Ed., p. 350—351. — BLANCHARD (1891): Bull. Soc. Zool. France, **16,** p. 218—221. — BLANCHARD (1893): Anal. Soc. Espan. Hist. Nat., **22,** p. 253—257, Figs. 6 A—B. — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 27. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 43—48. — PLOTNIKOV (1907): Ann. Mus. Zool. Acad. Imp. Sci. St.-Pétersbourg, **10,** p. 141—142. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 279—280. — JOHANSSON (1914): SB. mathem.-naturw. Kl. Akad. Wiss. Wien, **123,** p. 840—845, Figs. 1—2. — WEBER (1915): Monographie des Hirudinées Sud-Américaines.

Neuchâtel, p. 82—84. — ANNANDALE (1920): Rec. Ind. Mus., **18,** p. 135—136. — KABURAKI (1921): Rec. Ind. Mus., **18,** p. 213—214. — KABURAKI (1921): Rec. Ind. Mus., **22,** p. 711. — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 374—375. — JOHANSSON (1926): Mitt. Zool. Mus. Berlin, **12,** p. 231—232. — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 200—201. — JOHANSSON (1927): Abh. Senckenb. Naturf. Ges., **39,** p. 220—223, Fig. 1. — HARANT (1929): Arch. Soc. Sci. Méd. Biol., **10,** p. 642. — OKA (1932): Ann. Mus. Zool. Polon., **9,** p. 314—315. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 335—336, Pl. 27, Figs. 30, 49, Pl. 28, Fig. 58. — MOORE (1939): Ann. Mag. Nat. Hist., (11) **3,** p. 83—84. — SCIACCHITANO (1941): Riv. Biol. Coloniale, **4,** p. 166. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 13, Figs. 42—43. — JARRY (1959): Bull. Soc. Zool. France, **84,** p. 73—74. — SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61,** p. 295. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 143—145, Fig. 87 (colored). — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 178. — SCIACCHITANO (1967): Journ. nat. Hist., **1,** p. 191. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 106.

= *aegyptica* MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 120 (*Sanguisuga*).
= *sanguisuga* MOQUIN-TANDON, 1846 (nec LINNAEUS, 1758): Monographie de la famille des Hirudinées, Paris, 2nd Ed., p. 318—323, Pl. VI, Figs. 1—21 (*Haemopis*).
= *turkestanica* PLOTNIKOV (1907): Ann. Mus. Zool. Acad. Imp. Sci. St.-Pétersbourg, **10,** p. 142—144.

Distribution: Circum-Mediterranean, Caucasus, Turkestan, Iran, ? Afghanistan, ? Baluchistan, Sudan, East Africa.

13. **obscura** MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 341—343, Pl. 27, Fig. 34, Pl. 28, Figs. 54—55. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 258. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 107.

Distribution: South Africa.

14. **oligodonta** JOHANSSON (1913): Hirudineen aus dem Sudan. in: Res. Swedish Zool. Exp. Egypt and the White Nile 1901, No. **24,** p. 23—31, Figs. 7—9, Pl. I, Fig. 9. — JOHANSSON (1914): SB. mathem.-naturw. Kl. Akad. Wiss. Wien, **123,** p. 845—847. — HARDING (1932): Proc. Zool. Soc. London, **1932,** p. 84—86, Figs. 3—4. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 337—340, Pl. 27, Figs. 31—32, 41—42, Pl. 28, Fig. 59. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 26—29, 47, 67, Figs. 10—13. — SCIACCHITANO

(1954): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 4, Miscell. Zool., **1,** p. 280. — MOORE (1958): Ann. Natal. Mus., **14,** p. 331—333, Pl. IX, Figs. 22—23. — SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61,** p. 294—295. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 259. — SCIACCHITANO (1967): Journ. nat. Hist., **1,** p. 191—192. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 107.

= *ghesquierei* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 362—363, Fig. 16 (*Hirudo*).
= *medicinalis* LINNAEUS (apud SCIACCHITANO, 1935): Rev. Zool. Bot. Afr., **26,** p. 451—452 (*Hirudo*). — SCIACCHITANO (1936): Rev. Zool. Bot. Afr., **28,** p. 162 (*Hirudo*).
= *nilotica* (SAVIGNY) var. AUGENER (1930): Zool. Anz., **90,** p. 308—309.
= *reticulata* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 363—364 (*Hirudo*).
= *vignarellii* SCIACCHITANO (1937): Rev. Zool. Bot. Afr., **29,** p. 428 (*Hirudo*).

Distribution: East, Central and South Africa.

15. **paluda** (TENNENT, 1861): Leeches. in: Sketches of the Natural History of Ceylon. London, p. 484 (*Haemopis*). — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 201—206, Pl. VIII, Figs. 27—28. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 336—337. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 106.

Distribution: Ceylon, Arabia.

16. **sp.?** MOORE (1958): Ann. Natal. Mus., **14,** p. 334—336, Figs. 8—9, Pl. IX, Fig. 24.

Distribution: South Africa: Zululand.

17. **yokambensis** SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61,** p. 303—305, Figs. 14—16. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Congo.

SPECIES INQUIRENDAE:

1. *cornuta* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 456—457, Figs. 4a—b (*Hirudo*). — SCIACCHITANO (1936): Rev. Zool. Bot. Afr., **28,** p. 162 (*Hirudo*). — SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 360—361 (*Hirudo*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 47, 68.
Distribution: Congo.
2. *haasi* JOHANSSON (1927): Abh. Senckenb. Naturf. Ges., **39,** p. 223—224, Figs. 2—3.
Distribution: Spain.
3. *parodi* SCIACCHITANO (1936): Boll. Mus. Zool. Anat. comp. Univ. Genova, **16,** p. 3—6, Figs. a—b, e (*Hirudo*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 47, 68—69.

Distribution: Congo.

12. Genus: **Limnobdella** BLANCHARD, 1893

BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 28—29. — BLANCHARD (1894): Abh. Ber. Zool. Mus. Dresden 1892/93, No. **4,** p. 7. — Soós (1968): Acta Zool. Hung., **14,** p. 457—458. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 109—110.

SYNONYMY:

Batrachobdella CABALLERO (1931) (nec VIGUIER, 1879): An. Inst. Biol. México, **2,** p. 223.
Pintobdella CABALLERO (1937): An. Inst. Biol. México, **8,** p. 182—183, p. p.
Potamobdella CABALLERO (1932): An. Inst. Biol. México, **3,** p. 283. — RINGUELET (1944): Not. Mus. La Plata, **9,** Zool., No. 73, p. 39—40, 47—52. — Soós (1966): Acta Zool. Hung., **12,** p. 146. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 109—110.

Type-species: *Limnobdella mexicana* BLANCHARD, 1893

1. **chiapasensis** (CABALLERO, 1958): An. Inst. Biol. México, **8,** p. 241—245, Figs. 1—3 (*Pintobdella*).

Distribution: Mexico.

2. **mexicana** BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 29—30, Figs. 12 A—D. — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchâtel, p. 81—82, Pl. IV, Figs. 31 a—d. — Soós (1968): Acta Zool. Hung., **14,** p. 455—458. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 106 (*Potamobdella*).

= *oaxacensis* (CABALLERO, 1931): An. Inst. Biol. México, **2,** p. 223—229, Figs. 1—7 (*Batrachobdella*). — RINGUELET (1944): Not. Mus. La Plata, **9,** Zool., No. 73, p. 40—47, Figs. 1—2 (*Potamobdella*).

Distribution: Mexico.

3. **olivacea** CABALLERO (1933): An. Inst. Biol. México, **4,** p. 179—182, Figs. 1—4. — CABALLERO (1937): An. Inst. Biol. México, **8,** p. 184, Figs. 2—3 (*Pintobdella*, in text-figure *Limnobdella*). — CABALLERO (1941): An. Inst. Biol. México, **12,** p. 754 (*Pintobdella*). — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 106, Figs. 1 D, 5 F.

Distribution: Mexico.

4. **profundisulcata** (CABALLERO, 1933): An. Inst. Biol. México, **4,** p. 23—26, Figs. 1—3 (*Haemopis*). — CABALLERO (1941): An. Inst. Biol. México, **12,** p. 754 (*Haemopis*).

Distribution: Mexico.

5. **techuacanea** CABALLERO (1932): An. Inst. Biol. México, **3,** p. 43—47, Figs. 1—3. — CABALLERO (1937): An. Inst. Biol. México, **8,** p. 183 (*Pintobdella*).

Distribution: Mexico.

13. Genus: **Macrobdella** VERRILL, 1872

VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 137—138. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. No. **5,** p. 106. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed., p. 552—553. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 104.

Type-species: *Hirudo decora* SAY, 1824

1. **decora** (SAY, 1824): Narrative of Expedition to the Source of the St. Peter's River, **2,** Appendix, p. 268 (*Hirudo*). — DIESING (1850): Systema Helminthum, Vindobonae, **1,** p. 474—475 (*Hirudo*). — LEIDY (1868): Proc. Acad. Nat. Sci. Philadelphia, **1868,** p. 2305 (*Hirudo*). — VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 138—139, Fig. 4. — VERRILL (1874): Rep. Com. Fish and Fisheries 1872/73, p. 668—669. — MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5,** No. 12, p. 508—511, Pl. XLIV, Figs. 22—23. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. No. **5,** p. 106—110, Pl. IV, Figs. 24—25, Pl. V, Fig. 38. — MOORE (1924): Publ. Ontario Fisheries Res. Labor., No. **23,** p. 28. — MOORE (1936): Canad. Field-Nat., **50,** p. 114. — PAWLOWSKI (1948): Fragm. Faun. Mus. Zool. Polon., **5,** p. 332—333, Figs. 2—3. — MATHERS (1948): Proc. Iowa Acad. Sci., **55,** p. 409—410, Pl. 3. — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245,** p. 4. — CABALLERO (1952): An. Inst. Biol. México, **23,** p. 203—207, Figs. 1—5. — MEYER & MOORE (1954): Wasmann Journ. Biol., **12,** p. 91. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed., p. 553—554, Figs. 23,8 a—b. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 104—105, Figs. 1 B, 5 D.

Distribution: North America, Mexico.

2. **ditetra** MOORE (1953): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **250,** p. 5—9, Figs. 1 a—c, Pl. I, Figs. 2—3 (on the plate named as *Macrobdella decora*!). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed., p. 553, Fig. 23,8 b. — MEYER (1959): Journ. Parasit., **45,** No. 4, Sect. 2, p. 39. — SAWYER (1967): Proc. Louisiana Acad. Sci., **30,** p. 32—33.

Distribution: Southern States of U.S.A.

3. **sestertia** WHITMAN (1886): Quart. Journ. Microsc. Sci. (N. S.), **26,** p. 378—382, Pl. XX, Figs. 57—59. — MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5,** No. 12, p. 509—510. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd. Ed., p. 553, Fig. 23,8 b.

Distribution: U.S.A. (Cambridge).

14. Genus: **Mollibdella** RICHARDSON, 1969

RICHARDSON (1969): Acta Zool. Hung., **15,** p. 123—124.
Type-species: *Semiscolex grandis* VERRILL, 1874

1. **grandis** (VERRILL, 1874): Rep. Com. Fish and Fisheries 1872/73, p. 672 (*Semiscolex*). — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. No. **5,** p. 117—120, Pl. IV, Figs. 26—28, Pl. V, Fig. 37 and on colored plate E (*Haemopis*). — MOORE (1924): Publ. Ontario Fisheries Res. Labor., Toronto, No. **23,** p. 29 (*Haemopis*). — BERE (1929): Contr. Canad. Biol. Fish. Toronto (N. S.), 4 (14), p. 177—178 (*Haemopis*). — MOORE (1936): Canad. Field-Nat., **50,** p. 114 (*Haemopis*). — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245,** p. 5 (*Semiscolex*). — MEYER & MOORE (1954): Wasmann Journ. Biol., **12,** p. 91 (*Haemopis*). — OLIVER (1958): Canad. Field-Nat., **72,** p. 163—164 (*Haemopis*). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Freshwater Biology, New York, 2nd Ed., p. 555 (*Haemopis*). — MOORE, J. E. (1964): Nat. Mus. Canada, Nat. Hist. Papers, No. **27,** p. 9 (*Haemopis*). — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 124, Figs. 3 D, 6 D.

Distribution: North America.

15. Genus: **Myxobdella** OKA, 1917

OKA (1917): Mem. Asiat. Soc. Bengal., **6,** p. 165. — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 161. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 332—333. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 60. — MOORE (1958): Ann. Natal Mus., **14,** p. 330. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 258.
Type-species: *Myxobdella annandalei* OKA, 1917

1. **africana** MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 326—328, Pl. 26, Fig. 24, Pl. 28, Fig. 51. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 19—20, 61. — MOORE (1958): Ann. Natal Mus., **14,** p. 327—328, Pl. IX, Figs. 17, 21. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179. — SCIACCHITANO (1963): Ann. Transvaal. Mus., **24,** p. 258. — SCIACCHITANO (1965): Rev. Zool. Bot. Afr., **71,** p. 30. — SCIACCHITANO (1967): Journ. nat. Hist., **1,** p. 192.

Distribution: Kenya, Ruanda, Katanga, Congo, Natal, Ethiopia.

2. **annandalei** OKA (1917): Mem. Asiat. Soc. Bengal, **6,** p. 161—165, Figs. a—d, Pl. VII, Figs. 1—5. — KABURAKI (1921): Rec. Ind. Mus., **22,** p. 714—715. — OKA (1925): Annot. Zool. Jap., **10,** p. 319—320. — MOORE

(1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 161—168, 296, Fig. 46, Pl. VII, Figs. 19—20. — OKA (1932): Ann. Mus. Zool. Polon., **9,** p. 315—316. — MOORE (1935): Bull. Raffles Mus., **10,** p. 68—69, Pl. VI, Fig. 5, Pl. VII, Fig. 9. — SCIACCHITANO (1960): Libro homenaje al Doctor Eduardo Caballero y Caballero, 1930—1960, México, No. **24,** p. 535.

= *concolor* KABURAKI (1921): Rec. Ind. Mus., **22,** p. 713—714, Fig. 7 (*Haemopis*).

Distribution: Honkong, South China, Burma, Malay Peninsula, India, Afghanistan, Caucasus.

3. **radiata** (MOORE, 1958): Ann. Natal Mus., **14,** p. 328—331, Pl. IX, Figs. 18—21 (*Praobdella*). — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179 (*Praobdella*). — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 258 (*Praobdella*).

Distribution: Natal, Portuguese East Africa.

4. **sinanensis** OKA (1925): Annot. Zool. Jap., **10,** p. 316—320, Figs. 3—4.

Distribution: Japan.

16. Genus: **Ornithobdella** BENHAM, 1909

BENHAM (1909): Hirudinea. in CHILTON: The Subantarctic Islands of New Zealand, **1,** Art. XVI, p. 374. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 116—119.

Type-species: *Ornithobdella edentula* BENHAM, 1909

1. **edentula** BENHAM (1909): Hirudinea. in CHILTON: The Subantarctic Islands of New Zealand, **1,** Art. XVI, p. 374—376. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 118—119, Fig. 3 B.

Distribution: New Zealand (Snare's Islands).

17. Genus: **Oxyptychus** GRUBE, 1851

GRUBE (1851): Die Familien der Anneliden, mit Angaben ihrer Gattungen und Arten, Berlin, p. 110, 148. — DIESING (1859): SB. mathem.-naturw. Cl. Akad. Wiss. Wien, **33,** p. 509—510. — GRUBE (1871): Arch. f. Naturg., **37,** p. 95. — BLANCHARD (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11,** No. 263, p. 3. — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchâtel, p. 84—85. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 1046. — CORDERO (1941): Bol. Acad. Nac. Cienc. Córdoba, **35,** p. 207. — RINGUELET (1943): Not. Mus. La Plata, **8,** Zool. No. 65, p. 104—105. — RINGUELET (1944): Rev. Mus. La Plata, (N. S.) **3,** Zool. No. 22, p. 203. — RINGUELET (1945): Rev. Mus. La Plata, (N. S.) **4,** Zool. No. 26, p. 120. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 236—238. — RINGUELET (1968): Physis, **27,** No. 75, p. 380.

SYNONYMY:

Argyrobdella CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 50. — CORDERO (1941): Bol. Acad. Nac. Cienc. Córdoba, **35,** p. 208.
Diplobdella MOORE (1901): Bull. U. S. Comm. Fish and Fisheries, **2,** p. 219. — DEQUAL (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31,** No. 717, p. 5.
Hybobdella WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 243 (partim). — WEYENBERGH (1879): Period. Zool., **3,** p. 123 (partim).
Hylobdella WEYENBERGH, 1879, apud BLANCHARD (1888): Hirudinea. in: Dict. enc. Sci. Méd. (4) **14,** p. 159 (error).
Nephelis SAVIGNY, 1822, apud WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 236 (partim). — WEYENBERGH (1879): Period. Zool., **3,** p. 116 (partim).
Schlegelia WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 240. — WEYENBERGH (1879): Period. Zool., **3,** p. 120.

Type-species: *Oxyptychus striatus* GRUBE, 1851

1. **antellarum** (MOORE, 1901): Bull. U. S. Comm. Fish and Fisheries, **2,** p. 219—221, Pl. 13, Figs. 10—17 (*Diplobdella*). — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 237—238.

Distribution: Porto Rico, Panama, Columbia.

2. **brasiliensis** (PINTO, 1920): Brasil Médico, **34,** No. 43, p. 708—709, Figs. 1—4 a—b (*Limnobdella*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 1043—1045, Figs. 69 A—F (*Limnobdella*). — CORDERO (1936): Ann. Acad. Brasil. Sci., **8,** p. 227—231 (*Diplobdella*). — CORDERO (1937): Ann. Acad. Brasil. Sci., **9,** p. 23 (*Diplobdella*). — CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 40—44 (*Diplobdella*). — RINGUELET (1943): Not. Mus. La Plata, **8,** Zool. No. 65, p. 115—116. — RINGUELET (1944): Rev. Mus. La Plata (N. S.), **3,** Zool. No. 22, p. 204—205. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 237—238. — RINGUELET (1968): Physis, **27,** No. 75, p. 380.

Distribution: Brasil, Argentina.

3. **festae** (DEQUAL, 1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31,** No. 717, p. 5—7 (*Diplobdella*). — RINGUELET (1948): Not. Mus. La Plata. **13,** Zool. No. 113, p. 237—238.

Distribution: Ecuador.

4. **inexpectatus** RINGUELET (1945): Rev. Mus. La Plata (N. S.), **4,** Zool. No. 26, p. 116—120, Figs. 11—14. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 237—238. — RINGUELET (1968): Physis, **27,** No. 75, p. 380.

Distribution: Argentina, Uruguay.

5. **ornatus** (WEYENBERGH, 1883): An. Ateneo Uruguay, **5,** p. 429—430 (*Nephelis*). — CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 51—57 (*Argyrobdella*). — CORDERO (1941): Bol. Acad. Nac. Cienc. Córdoba, **35,** p.

208—209 (*Argyrobdella*). — RGINUELET (1943): Not. Mus. La Plata, **8,** Zool. No. 65, p. 116—125, Pl. Figs. 3—6. — RINGUELET (1944): Rev. Mus. La Plata (N. S.), **3,** Zool. No. 22, p. 205. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 237—238. — RINGUELET (1968): Physis, **27,** No. 75, p. 380.

Distribution: Argentina, Uruguay.

6. **strenuus** RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 231—238, Figs. 6—9.

Distribution: Paraguay.

7. **striatus** GRUBE (1851): Die Familie der Anneliden, Berlin, p. 110, 148. — GRUBE (1871): Arch. f. Naturg., **37,** p. 95—97, Pl. III, Figs. 5, 5a [*Hirudo* (*Oxyptychus*)]. — VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 139. — BLANCHARD (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11,** No. 263, p. 3. — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchâtel, p. 85—86, Pl. IV, Fig. 32. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 1046—1047, Fig. 70. — CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 44—50. — CORDERO (1941): Bol. Acad. Nac. Cienc. Córdoba, **35,** p. 207—208. — RINGUELET (1943): Not. Mus. La Plata, **8,** Zool. No. 65, p. 105—114, Pl. Figs. 1—2. — RINGUELET (1944): Rev. Mus. La Plata (N. S.), **3,** Zool. No. 22, p. 204. — RINGUELET (1945): Rev. Mus. La Plata (N. S.), **4,** Zool. No. 26, p. 115—116, 120. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 236—238. — RINGUELET (1968): Physis, **27,** No. 75, p. 380.

= *argentina* WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 236 (*Nephelis*). — WEYENBERGH (1879): Period. Zool., **3,** p. 116—117 (*Nephelis*).
= *argentina* WEYENBERGH var. *marginata* WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 236 (*Nephelis*).
= *billberghi* KINBERG (1866): Öfv. Kongl. Vetensk.-Akad. Förhand., **23,** p. 356 (*Hirudo*). — VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 139 (*Hirudo*).
= *corduensis* WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 238—239 (*Nephelis*). — WEYENBERGH (1879): Period. Zool., **3,** p. 119 (*Nephelis*).
= *flavolineata* WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 244 (*Hybobdella*). — WEYENBERGH (1879): Period. Zool., **3,** p. 124 (*Hybobdella*). — BLANCHARD (1888): Hirudinea. in: Dict. enc. Sci. Méd., p. 159 (*Hylobdella*).
= *nepheloides* WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 240—242 (*Schlegelia*). — WEYENBERGH (1879): Period. Zool., **3,** p. 121—122 (*Schlegelia*).
= *picta* WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 237—238 (*Nephelis*). — WEYENBERGH (1879): Period. Zool., **3,** p. 118—119 (*Nephelis*).
= *subolivea* WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 239 (*Nephelis*). — WEYENBERGH (1879): Period. Zool., **3,** p. 119—120 (*Nephelis*).

Distribution: Argentina, Uruguay.

18. Genus: **Percymoorensis** RICHARDSON, 1969

RICHARDSON (1969): Acta Zool. Hung., **15,** p. 120—122.
Type-species: *Hirudo marmorata* SAY, 1824

1. **kingi** (MATHERS, 1954): Amer. Midl. Natur., **52,** p. 460—468, Figs. 1—10 (*Haemopis*). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed., p. 555 (*Haemopis*).

Distribution: U.S.A.

2. **lateralis** (SAY, 1824) (MOORE, 1901): Narrative of Expedition to the Source of the St. Peter's River, **2,** Appendix, p. 266—268 (*Hirudo*). — MOORE (1898): Proc. U. S. Nat. Mus. Washington, **21,** p. 560 (*Haemopis*). — MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5,** No. 12, p. 528—532, Pl. XLV, Figs. 25, 27, Pl. XLVI, Figs. 28—32 (*Haemopis*). — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. No. **5,** p. 113—115, Pl. III, Fig. 23 (*Haemopis*). — MATHERS (1948): Proc. Iowa Acad. Sci., **55,** p. 441, Pl. 3 (*Haemopis*). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed., p. 554—555 (*Haemopis*).

= *terrestris* FORBES (1890): Bull. Illinois State Labor., Nat. Hist., **3,** p. 119—122 (*Semiscolex*).

Distribution: U.S.A.

3. **lateromaculata** (MATHERS, 1963): Amer. Midl. Natur., **70,** p. 168—174, Figs. 1—3 (*Haemopis*).

Distribution: U.S.A. (Iowa, Minnesota).

4. **marmoratis** (SAY, 1824) (MOORE, 1901): Narrative of Expedition to the Source of the St. Peter's River, **2,** Appendix, p. 266—268 (*Hirudo*). — MOORE (1898): Proc. U. S. Nat. Mus. Washington, **21,** p. 560 (*Haemopis*). — MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5,** No. 12, p. 519—527, Pl. XLV, Figs. 24, 26, Pl. XLVI, Figs. 33—34 (*Haemopis*). — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. No. **5,** p. 110—113, Pl. IV, Fig., 32, on colored plate G (*Haemopis*). — MOORE (1924): Publ. Ontario Fisheries Res. Labor., Toronto, No. **23,** p. 28—29 (*Haemopis*). — MOORE (1936): Canad. Field-Nat., **50,** p. 114 (*Haemopis*). — PAWLOWSKI (1948): Fragm. Faun. Mus. Zool. Polon., **5,** p. 333—336, Fig. 4 (*Haemopis*). — MATHERS (1948): Proc. Iowa Acad. Sci., **55,** p. 410—411, Pl. 3 (*Haemopis*). — MOORE & MEYER (1951):Wasmann Journ. Biol., **9,** p. 68—69 (*Haemopis*). — MEYER & MOORE (1954): Wasmann Journ. Biol., **12,** p. 91 (*Haemopis*). — BECK (1954): Proc. Utah Acad. Sci. Arts Letters, **31,** p. 75—76 (*Haemopis*). — OLIVER (1958): Canad. Field-Nat., **72,** p. 163—164 (*Haemopis*). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed., p. 554 (*Haemopis*). — MOORE, J. E. (1964): Nat. Mus. Canada, Nat.

Hist. Papers, No. **27,** p. 10 (*Haemopis*). — MOORE, J. E. (1966): Nat. Mus. Canada, Nat. Hist. Papers, No. **32,** p. 6 (*Haemopis*). — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 121—122, Figs. 4 B, 6 B.

= *lacustre* LEIDY (1868): Proc. Acad. Nat. Sci. Philadelphia, **1868,** p. 229—230 (*Aulastomum*). — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245,** p. 5 (*Aulastomum*).

= ? *maculatus* KINBERG (1866): Öfv. Kongl. Vetensk.-Akad. Förhand., **23,** p. 356 (*Democedes*). — VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 137 (*Aulastomum*). — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245,** p. 5 (*Democedes*).

Distribution: North America.

19. Genus: **Philobdella** VERRILL, 1874

VERRILL (1874): Rep. Comm. Fish and Fisheries 1872/73, p. 669 (as subgenus of *Macrobdella* VERRILL). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed., p. 554.

Type-species: *Macrobdella* (*Philobdella*) *floridana* VERRILL, 1874

1. **floridana** (VERRILL, 1874): Rep. Comm. Fish and Fisheries 1872/73, p. 669—670 (*Macrobdella*). — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245,** p. 4—5. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed., p. 554.

Distribution: U.S.A. (Florida)

2. **gracilis** MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5,** No. 12, p. 511—518, Pl. XLIV, Figs. 12—21. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed., p. 554, Figs. 23,9 a—b. — VIOSCA (1962): Tulane Stud. Zool., **9,** p. 243—244. — SAWYER (1967): Proc. Louisiana Acad. Sci., **30,** p. 33.

= *floridana* MOORE (1898) (nec VERRILL, 1874): Proc. U. S. Nat. Mus. Washington, **21,** p. 561—562.

Distribution: U.S.A. (Illinois).

20. Genus: **Pintobdella** (CABALLERO, 1937) RICHARDSON, 1969

CABALLERO (1937): An. Inst. Biol. México, **8,** p. 182—183. — RINGUELET (1944): Not. Mus. La Plata, **9,** Zool. No. 73, p. 49—50. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 107—108.

Type-species: *Limnobdella cajali* CABALLERO, 1934 (not originally designated)

1. **cajali** (CABALLERO, 1934): An. Inst. Biol. México, **5,** p. 237—241, Figs. 1—4 (*Limnobdella*). — CABALLERO (1941): An. Inst. Biol. México, **12,** p. 754. — RICHARDSON (1969): Acta Zool. Hung., **15,** p. 108, Fig. 5 E.

Distribution: Mexico.

21. Genus: **Poecilobdella** BLANCHARD, 1893

BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 28 (as subgenus of *Limnatis*). — BLANCHARD (1897): Hirudineen. in WEBER: Zool. Ergebn. Niederl. Ostindien, **4,** p. 337—338 (as subgenus of *Limnatis*). — MOORE (1901): Bull. U. S. Fish Comm., **2,** p. 213. — CABALLERO (1956): An. Inst. Biol. México, **27,** p. 282—283.

SYNONYMY:

Hirudinaria WHITMAN (1886) (nec SCACCHI, 1883, Mollusca: Lamellibranchiata): Quart Journ. Microsc. Sci. (N. S.) **26,** p. 373. — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 207—210.

Type-species: *Sanguisuga granulosa* SAVIGNY, 1822

1. **blanchardi** (MOORE, 1901): Bull. U. S. Comm. Fish and Fisheries, **2,** p. 214—219, Pl. 12, Figs. 1—9 (*Hirudinaria*).

Distribution: Porto Rico.

2. **granulosa** (SAVIGNY, 1822): Système des Annelides, Paris, **1** (3), p. 115 (*Sanguisuga*). — MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 119 (*Sanguisuga*). — DE BLAINVILLE (1827): Dict. Sci. Nat., **47,** p. 256 (*Hirudo*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, 2nd Ed., p. 341 (*Hirudo*). — DIESING (1850): Systema Helminthum, Vindobonae, **1,** p. 469 (*Hirudo*). — BLANCHARD (1897): Not. Leyden Mus., **19,** p. 83—84 [*Limnatis* (*Poecilobdella*)]. — BLANCHARD (1897): Hirudinea. in WEBER: Zool. Ergebn. Niederl. Ostindien, **4,** p. 338—349, Figs. 3—6 [*Limnatis* (*Poecilobdella*)]. — PLOTNIKOV (1907): Ann. Mus. Zool. Acad. Imp. Sci. St.-Pétersbourg, **10,** p. 144—145 [*Limnatis* (*Poecilobdella*)]. — KHAN (1912): Rec. Ind. Mus., **7,** p. 206—207 (*Limnatis*). — MATTHAI (1921): Journ. Asiat. Soc. Bengal, (N. S.) **16,** p. 341—346, Fig. 1, Pl. XVII (*Limnatis*). — KABURAKI (1921): Rec. Ind. Mus., **22,** p. 711 [*Limnatis* (*Poecilobdella*)]. — KABURAKI (1921): Mem. Ind. Mus., **5,** p. 673—675 [*Limnatis* (*Poecilobdella*)]. — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 375—377 [*Limnatis* (*Poecilobdella*)]. — OKA (1925): Annot. Zool. Jap., **10,** p. 325—326 (*Limnatis*). — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 226—238, 297, Figs. 54—56, Pl. IV, Fig. 5 [*Hirudinaria* (*Poecilobdella*)].

Distribution: In the upperland (up to about 500 m) of the entire Oriental Region.

3. **javanica** (WAHLBERG, 1855): Öfv. Kongl. Vetensk.-Akad. Förhand., **12,** p. 233 (*Sanguisaga*). — WAHLBERG (1856): Zeitschr. ges. Naturw., **8,** p. 271 (*Sanguisuga*). — WHITMAN (1886): Quart. Journ. Microsc. Sci. (N. S.)

26, p. 373—376, Pl. XX, Fig. 56, Pl. XXI, Fig. 60 (*Hirudinaria*). — BLANCHARD (1894): Ann. Mus. Civ. Storia Nat. Genova (2) **14,** p. 117—118 (*Hirudinaria*). — BLANCHARD (1897): Hirudinea. in WEBER: Zool. Ergebn. Niederl. Ostindien, **4,** p. 349—352, Fig. 7 [*Limnatis* (*Poecilobdella*)]. — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 377, Pl. XIX, Figs. 10—11 (*Hirudinaria*). — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 210—218, Figs. 50—52, Pl. III, Fig. 1, Pl. VIII, Fig. 29—30 (*Hirudinaria*).

Distribution: Java, Borneo, Sumatra, Bengal, Burma, Assam.

3a. **javanica** subsp. **similis** MOORE (1945): Journ. Washington Acad. Sci., **35,** p. 265, Fig. 4.

Distribution: South China, North Burma.

4. **manillensis** (LESSON, 1842): Rev. Zool. Soc. Cuvierième, **5,** p. 8 (*Hirudo*). — BLANCHARD (1897): Not. Leyden Mus., **19,** p. 83—84 [*Limnatis* (*Poecilobdella*)]. — BLANCHARD (1897): Hirudinea. in WEBER: Zool. Ergebn. in Niederl. Ostindien, **4,** p. 338—349 [*Limnatis* (*Poecilobdella*)]. — KABURAKI (1921): Rec. Ind. Mus., **22,** p. 711 (*Limnatis*). — KABURAKI (1921): Mem. Ind. Mus., **5,** p. 673—675 [*Limnatis* (*Poecilobdella*)]. — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 376 [*Limnatis* (*Poecilobdella*)]. — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 218—226, 297, Fig. 53, Pl. III, Fig. 2 (*Hirudinaria*). — MOORE (1929): Proc. Acad. Nat. Sci. Philadelphia, **81,** p. 293—294 (*Hirudinaria*). — MOORE (1930): Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 185 (*Hirudinaria*). — MOORE (1930): Bull. Dept. Biol., Yenching Univ., **1,** No. 2, p. 40—41 (*Hirudinaria*). — MOORE (1935): Bull. Raffles Mus., **10,** p. 69 (*Hirudinaria*). — MOORE (1938): Bull. Raffles Mus., **14,** p. 65 (*Hirudinaria*). — SMYTHIES (1959): Sarawak Mus. Journ., (N. S.) **9,** p. 282—284, Figs. 3—4 (*Hirudinaria*).

= *assimilis* BAIRD (1869): Proc. Zool. Soc. London, **1869,** p. 315—316 (*Hirudo*).
= *belcheri* BAIRD (1869): Proc. Zool. Soc. London, **1869,** p. 315 (*Hirudo*).
= *boyntoni* WHARTON (1913): Philippine Journ. Sci., (D) **8,** p. 369—371 (*Hirudo*).
= *chinensis* KINBERG (1866): Öfv. Kongl. Vetensk.-Akad. Förhand., **22,** p. 356 (*Hirudo*).
= *loewi* BAIRD (1869): Proc. Zool. Soc. London, **1869,** p. 314—315 (*Hirudo*).
= *luzoniae* KINBERG (1866): Öfv. Kongl. Vetensk.-Akad. Förhand., **22,** p. 356 (*Hirudo*).
= *maculata* BAIRD (1869): Proc. Zool. Soc. London, **1869,** p. 315 (*Hirudo*).
= *maculosa* GRUBE (1868): Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859, Wien, Zool. Theil, **2,** III. Abt. 2, p. 39—40, Pl. IV, Figs. 6, 6a (*Hirudo*). — DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32,** No. 724, p. 9 (*Limnatis*).
= *multistriata* SCHMARDA (1861): Neue Turbellarien, Rotatorien und Anneliden, Leipzig, **1** (2), p. 3, Text-fig. Pl. XVI, Fig. 141 (colored) (*Hirudo*).

= *saigonensis* WHITMAN (1886): Quart. Journ. Microsc. Sci. (N. S.) **26,** p. 394—395, Fig. 1 (*Hirudo*).
= *sanguisorba* TENNENT (1861): Leeches. in: Sketches of the Natural History of Ceylon, London, p. 483—484, Figs. 1—2 (*Hirudo*).

Distribution: In the lowland (about until 500 m) of the entire Oriental Region.

5. **viridis** (MOORE, 1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 239—243, Figs. 57—58, Pl. VIII, Figs. 31—33 [*Hirudinaria* (*Poecilobdella*)].

Distribution: Southern India.

22. Genus: **Praobdella** BLANCHARD, 1896

BLANCHARD (1896): Arch. f. Naturg., **62,** p. 50. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 332—333. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 60. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 258.

Type-species: *Praobdella buettneri* BLANCHARD, 1896

1. **buettneri** BLANCHARD (1896): Arch. f. Naturg., **62,** p. 50—52, Pl. III, Figs. 1—7. — AUGENER (1936): SB. Ges. naturf. Fr. Berlin, Jahrg. **1935,** p. 384 (footnote). — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 332—333. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Togoland, Kenya.

2. **guineensis** BLANCHARD (1896): Arch. f. Naturg., **62,** p. 52—53, Pl. III, Figs. 8—10. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 329—333, Pl. 26, Fig. 26, Pl. 28, Fig. 52. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 20—21, 60. — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179.

Distribution: Togoland, Liberia.

3. **maculata** (MOORE, 1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 328—329, Pl. 27, Fig. 27, Pl. 28, Fig. 50 (*Myxobdella*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 60—61 (*Myxobdella*). — SCIACCHITANO (1963): Monit. Zool. Ital. Firenze, **70—71,** p. 179 (*Myxobdella*).

Distribution: Congo.

23. Genus: **Quantenobdella** RICHARDSON, 1969

RICHARDSON (1969): Acta Zool. Hung., **15,** p. 109—110.

Type-species: *Quantenobdella howensis* RICHARDSON, 1969

1. **howensis** RICHARDSON (1969): Acta Zool. Hung., **15,** p. 110—111, Fig. 2 B.

Distribution: Australia (Lord Howe Island).

24. Genus: **Richardsonianus** Soós, 1968

Soós (1968): Acta Zool. Hung., **14,** p. 455—459. — Richardson (1969): Acta Zool. Hung., **15,** p. 108—109.

Type-species: *Hirudo australis* Bosisto, 1859

1. **australis** (Bosisto, 1859): Trans. Philos. Inst. Victoria, **3,** p. 18—22 (*Hirudo*). — Goddard (1909): Proc. Linn. Soc. N. S. Wales, **34,** p. 476—484, Pl. XLV, Figs. 3—5, Pl. XLVI, Figs. 7, 10, 12 (*Limnobdella*). — Johansson (1911): Hirudinea. in: Die Fauna Südwest-Australiens, **3,** Lief. 12, p. 423—430, Figs. 9—10 (*Hirudo*). — Ingram (1957): Pap. Proc. Roy. Soc. Tasmania, **91,** p. 196—198, Figs. 12—14 (*Limnobdella*). — Richardson (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 239—240 ("*Limnobdella*"). — Richardson (1969): Acta Zool. Hung., **15,** p. 111—111, Figs. 2 A, 5 B.

= *quinquestriatus* (Schmarda, 1861): Neue Turbellarien, Rotatorien und Anneliden beobachtet und gesammelt auf einer Reise um die Erde 1853 bis 1857. Leipzig **1** (2), p. 2, Text-Fig. Pl. XVI, Fig. 140 (*Hirudo*). — Kershaw (1904): Victorian Naturalist, **20,** 9, Zoology, p. 125 (*Limnobdella*). — Richardson (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 237—238 (*Hirudo*).

Distribution: Australia, New Zealand, Tasmania.

2. **dawbini** Richardson (1969): Acta Zool. Hung., **15,** p. 108—109.

Distribution: Australia (N. S. Wales).

3. **mauianus** (Benham, 1907): Trans. Proc. New Zealand Inst., **39,** p. 185—189, Text-Fig. A, Pl. VIII a, Figs. 6—10 (*Hirudo*).

Distribution: New Zealand.

4. **novemstriatus** (Grube, 1867): Jahresb. Schles. Ges. vaterl. Cultur, **44,** p. 61 (*Hirudo*). — Grube (1871): Arch. f. Naturg., **37,** p. 92—93, Pl. III, Fig. 3 (*Hirudo*). — Richardson (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 237 (*Hirudo*).

Distribution: Australia (Queensland).

SPECIES INQUIRENDA:

1. *grandis* (Blanchard, 1894): Abh. Ber. Zool. Mus. Dresden 1892/93, No. **4,** p. 7—8, Figs. 14—17 (*Limnobdella*).
Distribution: Timor, ? Sumatra.

25. Genus: **Whitmania** Blanchard, 1888

Blanchard (1888): Hirudinées. Dict. enc. Sci. Méd. (4) **14,** p. 139, 155. — Blanchard (1896): Mém. Soc. Zool. France, **9,** p. 322. — Oka (1925): Annot. Zool. Jap., **10,** p. 320—325. — Moore (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 168—169. — Oka (1931): Proc. Imp. Acad. Tokyo, **7,** p. 387—389.

SYNONYMY:

Leptostoma WHITMAN (1886) (nec SWAINSON, 1837, Aves): Quart. Journ. Microsc. Sci. (N. S.) **26,** p. 376.

Microstoma WHITMAN (1884) (nec CUVIER, 1817, Pisces): Proc. Amer. Acad. Arts Sci., **20,** p. 84.

Type-species: *Microstomum pigrum* WHITMAN, 1884

1. **acramulata** (WHITMAN, 1886): Quart. Journ. Microsc. Sci. (N. S.) **26,** p. 389—392, Pl. XIX, Figs. 40—46, Pl. XX, Fig. 53, Pl. XXI, Fig. 64 (*Leptostoma*). — BLANCHARD (1888): Hirudinées. Dict. enc. Sci. Méd., p. 155.

Distribution: Japan.

2. **edentula** (WHITMAN, 1886): Quart. Journ. Microsc. Sci. (N. S.) **26,** p. 386—389, Pl. XIX, Figs. 28—39, Pl. XXI, Figs. 63, 66 (*Leptostoma*). — BLANCHARD (1888): Hirudinées. Dict. enc. Sci. Méd. (4) **14,** p. 155. — BLANCHARD (1896): Mém. Soc. Zool. France, **9,** p. 328—330, Figs. 7 A—B. — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 381—382. — OKA (1931): Proc. Imp. Acad. Tokyo, **7,** p. 387—389.

Distribution: Japan.

3. **gracilis** (MOORE, 1930): Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 186—191. Pl. 8, Figs. 16—19 (*Haemopis*). — MOORE (1930): Bull. Dept. Biol. Yenching Univ., **1,** No. 2, p. 40 (*Haemopis*).

Distribution: China (Nanking, Soochow).

4. **laevis** (BAIRD, 1869): Proc. Zool. Soc. London, **1869,** p. 316 (*Hirudo*). — BLANCHARD (1896): Mém. Soc. Zool. France, **9,** p. 326—328, Figs. 6 A—D. — BLANCHARD (1897): Not. Leyden Mus., **19,** p. 85—86, Figs. 7 A—B, 8. — PLOTNIKOV (1907): Ann. Mus. Zool. Acad. Imp. Sci. St.-Pétersbourg, **10,** p. 145—146. — STSHEGOLEV (1916): Rev. Zool. Russe, **1,** p. 251. — OKA (1917): Mem. Asiat. Soc. Bengal, **6,** p. 160—161. — KABURAKI (1921): Rec. Ind. Mus., **22,** p. 710—711. — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 380—381. — MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 169—175, Fig. 47, Pl. VI, Fig. 18, Pl. VII, Figs. 21—22. — OKA (1931): Proc. Imp. Acad. Tokyo, **7,** p. 387—389, Figs. C—D. — TING (1938): Peking Nat. Hist. Bull., **13,** p. 29—33, Pl. Figs. 1—4. — LUKIN (1960): Zool. Journ. Moscow, **39,** p. 42—43.

= *interrupta* OKA (1928): Proc. Imp. Acad. Tokyo, **4,** p. 170—171, Figs. 2A—B. — OKA (1931): Proc. Imp. Acad. Tokyo, **7,** p. 387—389.
= *quinquelineata* GRUBE (1871): Arch. f. Naturg., **37,** p. 88—90, Pl. III, Fig. 1 (*Hirudo*). **syn. nov.**
= *quinquelineata* OKA (1928) (nec GRUBE, 1871): Proc. Imp. Acad. Tokyo, **4,** p. 169—170, Fig. 1A—B. — OKA (1931): Proc. Imp. Acad. Tokyo, **7,** p. 387—389.
= *pigra* var. *formosana* OKA (1910): Annot. Zool. Jap., **7,** p. 181.

Distribution: Amur region, China, Taiwan, India.

5. **pigra** (WHITMAN, 1884): Proc. Amer. Acad. Arts Sci., **20,** p. 84 (*Microstoma*). — WHITMAN (1886): Quart. Journ. Microsc. Sci. (N. S.) **26,** p. 382—386, Pl. XVIII, Figs. 21—27, Pl. XX, Figs. 54—55, Pl. XXI, Figs. 61—62, 67 (*Leptostoma*). — BLANCHARD (1888): Hirudinées. in: Dict. enc. Sci. Méd. (4) **14,** p. 155. — OKA (1931): Proc. Imp. Acad. Tokyo, **7,** p. 387—389, Figs. A—B.

Distribution: Japan, China.

GENERA INQUIRENDAE

1. **Democedes** KINBERG (1866): Öfv. Kongl. Vetensk.-Akad. Förhand., **23,** p. 356. — VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 137.
Type-species: *Democedes decemstriatus* KINBERG, 1866
decemstriatus KINBERG (1866): Öfv. Kongl. Vetensk.-Akad. Förhand., **23,** p. 356.
Distribution: Natal.
natalensis KINBERG (1866): Öfv. Kongl. Vetensk.-Akad. Förhand., **23,** p. 356.
Distribution: Natal.
2. **Hararbdella** SCIACCHITANO (1941): Riv. Biol. Coloniale, **4,** p. 166.
Type-species: *Hararbdella caccavellai* SCIACCHITANO, 1941
caccavellai SCIACCHITANO (1941): Riv. Biol. Coloniale, **4,** p. 166, Figs. 2b—c.
Distribution: Ethiopia.
trigonostoma SCIACCHITANO (1941): Riv. Biol. Coloniale, **4,** p. 166—168, Fig. 2a.
Distribution: Ethiopia.
3. **Hexabdella** VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 136. — VERRILL (1874): Rep. Comm. Fish and Fisheries 1872/73, p. 672—673. — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245,** p. 6.
Type-species: *Hexabdella depressa* VERRILL, 1872
depressa VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 136—137. — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245,** p. 5—6.
Distribution: U.S.A.
4. **Mongbwalubdella** SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 364. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 70.
Type-species: *Mongbwalubdella scheitzae* SCIACCHITANO, 1939
scheitzae SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 364—365, Fig. 17. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 70—71.
Distribution: Belgian Congo.

GENERIC STATUS UNCERTAIN

1. **Haemopis weberi** BLANCHARD (1897): Hirudinea. in WEBER: Zool. Ergebn. in Niederl. Ostindien, **4,** p. 352—353, Figs. 8A—D, 9A—B.
Distribution: Sumatra.
2. **Hirudo catenulata** JOHANSSON (1918): Hirudineen von Neu-Caledonien und den Neuen Hebriden. in SARASIN & ROUX: Nova Caledonia, A. Zoologie, **2,** Lief. 4, p. 391—393, Fig. 6, Pl. XII, Figs. 5—6.
Distribution: New Hebrides.
3. **Limnobdella mexicana** CABALLERO 1930 (nec BLANCHARD, 1893): An. Inst. Biol. México, **1,** p. 247—251, Figs. 1—8.
Distribution: Mexico.

REFERENCES

1. ANNANDALE, N. (1920): Note on the occurrence of the Leech Limnatis nilotica in Seistan and the Afghan-Baluch Desert. — Rec. Ind. Mus., **18,** p. 135—136.
2. APÁTHY, ST. (1888): Süsswasser-Hirudineen. Ein systematischer Essay. — Zool. Jahrb. Syst., **3,** p. 725—794.
3. AUGENER, H. (1930): Mitteilung über einige Polychaeten und Hirudineen aus den Zoologischen Museen von Basel, Berlin und Hamburg. — Zool. Anz., **90,** p. 303—316.

4. AUGENER, H. (1936): Hirudineen aus Deutsch-Südwestafrika. — SB. Ges. naturf. Fr. Berlin, Jahrg. **1935,** p. 381—397.
5. AUTRUM, H. (1958): Hirudinea. — in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, pp. 30.
6. BAIRD, W. (1869): Description of some new Suctorial Annelides in the Collection of the British Museum. — Proc. Zool. Soc. London, **1869,** p. 310—318.
7. BECK, D. E. (1954): Ecological and distributional notes on some Utah Hirudinea. — Proc. Utah Acad. Sci. Arts Letters, **31,** p. 73—78.
8. BENHAM, W. B. (1904): On a New Species of Leech (Hirudo antipodum) recently discovered in New Zealand. — Trans. Proc. New Zealand Inst., **36,** p. 185—192.
9. BENHAM, W. B. (1907): Two New Species of Leech in New Zealand. — Trans. Proc. New Zealand Inst., **39,** p. 180—192.
10. BENHAM, W. B. (1909): Preliminary Report on two Hirudinea from the Subantarctic Islands of New Zealand. — in CHILTON: The Subantarctic Islands of New Zealand, Wellington, **1,** Art. XVI, p. 372—376.
11. BENNIKE, S. A. B. (1943): Contribution to the ecology and biology of the Danish freshwater leeches (Hirudinea). — Fol. Limnol. Scand., No. **2,** p. 1—109.
12. BERE, R. (1929): Reports of the Jasper Park Lakes Investigations, 1925—26. III. The leeches. — Contr. Canad. Biol. Fish. Toronto (N. S.), **4** (14), p. 175—183.
13. DE BLAINVILLE, H. (1818): Hirudinea. — in LAMARCK: Histoire naturelle des animaux sans Vertèbres, Paris, **5,** p. 291—292.
14. DE BLAINVILLE, H. (1827): Essai d'une monographie de la famille des Hirudinées. — in: Dict. Sci. Nat., **47,** p. 205—273.
15. DE BLAINVILLE, H. (1828): Sangsues. — in: Dict. Sci. Nat., **57,** p. 365—625.
16. BLANCHARD, R. (1888): Hirudinées. — in: Dict. enc. Sci. Méd., (4) **14,** p. 129—162.
17. BLANCHARD, R. (1891): Courtes notices sur les Hirudinées. I. Sur la Sangsue du Cheval du nord de l'Afrique (Limnatis nilotica Savigny, 1820). — Bull. Soc. Zool. France, **16,** p. 218—221.
18. BLANCHARD, R. (1893): Révision de Hirudinées du Musée de Turin. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 1—32.
19. BLANCHARD, R. (1893): Viaggio del Dr. E. Festa in Palestina, nel Libano e regioni vicine. III. Hirudinées. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 161, p. 1—3.
20. BLANCHARD, R. (1893): Sanguijuelas de la península ibérica. — Anal. Soc. Españ. Hist. Nat., **22,** p. 243—258.
21. BLANCHARD, R. (1894): Viaggio di Leonardo Fea in Birmania e regioni vicine. LVII. Hirudinées. — Ann. Mus. Civ. Storia Nat. Genova (2) **14,** p. 113—118.
22. BLANCHARD, R. (1894): Hirudinées de l'Italie continentale et insulaire. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 1—79.
23. BLANCHARD, R. (1894): Révision des Hirudinées du Musée de Dresde. — Abh. Ber. Zool. Mus. Dresden 1892/93, No. **4,** p. 1—8.
24. BLANCHARD, R. (1896): Description de quelques Hirudinées asiatiques. — Mém. Soc. Zool. France, **9,** p. 316—330.
25. BLANCHARD, R. (1896): Courtes notices sur les Hirudinées. XXIII. Hirudinées de Terre-Neuve et des îles adjacentes. — Bull. Soc. Zool. France, **21,** p. 138—140.
26. BLANCHARD, R. (1896): Campagnes de l'Hirondella et de la Princesse Alice Hirudinées. — Bull. Soc. Zool. France, **21,** p. 196—198.
27. BLANCHARD, R. (1896): Viaggio del dott. A. Borelli nella Republica Argentina e nel Paraguay. XXI. Hirudinées. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **11,** No. 263, p. 1—24.
28. BLANCHARD, R. (1896): Hirudineen aus dem Togoland. — Arch. f. Naturg., **62, I,** p. 49—53.
29. BLANCHARD, R. (1897): Hirudinées des Indes néerlandaises. — in WEBER: Zool. Ergebn. in Niederl. Ostindien, **4,** p. 332—356.
30. BLANCHARD, R. (1897): Hirudinées du Musée de Leyde. — Not. Leyden Mus., **19,** p. 79—113.
31. BLANCHARD, R. (1898): Hirudineen Ost-Afrikas und der Nachbargebiete. — in: Die Thierwelt Ost-Afrikas, **4,** Lief. 2, No. 13, p. 1—8.
32. BLANCHARD, R. (1936 !): Campagnes de l'Hirondella et de la Princesse Alice Hirudinées. — Res. camp. Sci. Monaco, **96,** p. 76—78.
33. BOSISTO, J. (1859): On the Hirudo Australis. — Trans. Philos. Inst. Victoria, **3,** p. 18—22.
34. BRANDES, G. (1886—1901): Hirundineen. — in LEUCKART & BRANDES: Die Parasiten des Menschen und die von ihnen herrührenden Krankheiten. Ein Hand- und Lehrbuch für Naturforscher und Ärzte. Leipzig, **1** (2), 2. Ed., p. 535—897.

35. Brandt, J. F. & Ratzeburg, J. T. C. (1833): Medizinische Zoologie oder getreue Darstellung und Beschreibung der Thiere, die in der Arzneimittellehre in Betracht kommen. — Berlin, **2**, p. 230—297.
36. Braun, J. F. Ph. (1805): Systematische Beschreibung einiger Egelarten, sowohl nach ihren äusseren Kennzeichen als nach ihrem innern Bau. — Berlin, p. 1—74.
37. Brossat, A. (1822): Extrait d'un Mémoire sur diverses Sangsues et sur leur maladies. — Journ. Pharmacie, **8**, p. 34.
38. Caballero, E. (1930): Contribución al conocimiento de los Hirudineos de México. — An. Inst. Biol. México, **1**, p. 247—251.
39. Caballero, E. (1932): Batrachobdellinae, Subfam. Nov. — An. Inst. Biol. México, **2**, p. 223—229.
40. Caballero, E. (1932): Limnobdella tehuacanea Jiménez 1865 Caballero 1931, Sin: Hirudo tehuacanea Jiménez 1865. — An. Inst. Biol. México, **3**, p. 43—47.
41. Caballero, E. (1932): Notas. — An. Inst. Biol. México, **3**, p. 283.
42. Caballero, E. (1933): Haemopis profundisulcata n. sp. Caballero, 1932 (Hirudinea). — An. Inst. Biol. México, **4**, p. 23—26.
43. Caballero, E. (1933): Sanguijuelas del estado de Guanajuato (Hirudinea). — An. Inst. Biol. México, **4**, p. 179—185.
44. Caballero, E. (1934): Limnobdella cajali n. sp. (Hirudinea). — An. Inst. Biol. México, **5**, p. 237—241.
45. Caballero, E. (1937): Hirudíneos del valle del Mezquital, HGO. XII. — An. Inst. Biol. México, **8**, p. 181—188.
46. Caballero, E. (1941): Hirudíneos de México. XVI. Nuevos huespedes y localidades para algunas sanguijuelas ya conocidas y descripción de una nueva especie. — An. Inst. Biol. México, **12**, p. 747—757.
47. Caballero, E. (1952): Sanguijuelas de México. XVIII. Presencia de Macrobdella decora (Say, 1824) Verrill, 1872, en el norte del pais, y nueva desinencia para los ordenes de Hirudinea. — An. Inst. Biol. México, **23**, p. 203—209.
48. Caballero, E. (1956): Hirudíneos de México. XX. Taxa y nomenclatura de la clase Hirudinea hasta generos. — An. Inst. Biol. México, **27**, p. 279—302.
49. Caballero, E. (1958): Hirudíneos de México. XXI. Descripción de una nueva especie de sanguijuela procedente de las selvas del Estado de Chiapas. — An. Inst. Biol. México, **28**, p. 241—245.
50. Caballero, E. (1960): Hirudíneos de México. XXII. Taxa y nomenclature de la clase Hirudinea hasta generos (Nueva edición). — An. Inst. Biol. México, **30**, p. 227—242.
51. Carena, H. (1820): Monographie du genre Hirudo, ou description des espèces de Sangsues qui se trouvent ou qui sont en usage en Piemont. — Mem. Real. Accad. Sci. Torino, **25**, p. 273—316.
52. Chworostansky, C. (1886): Organes génitaux de l'Hirudo et de l'Aulastoma. — Zool. Anz., **9**, p. 446—448.
53. Cordero, E. H. (1936): Revisión de los tipos de Hirudíneos brasileros. — Ann. Acad. Brasil. Sci., **8**, p. 221—231.
54. Cordero, E. H. (1937): Los Hirudíneos del nordeste del Brasil. I. Especies recogidas por Clemente Pereira en 1933 y por el autor en 1935. — Ann. Acad. Brasil. Sci., **9**, p. 13—26.
55. Cordero, E. H. (1937): Hirudíneos neotropicales y subantárticos nuevos, críticos o ya conocidos del Museo Argentino de Ciencias Naturales. — An. Mus. Arg. Cienc. Nat., **39**, p. 1—78.
56. Cordero, E. H. (1941): Revisión de las especies de Hirudíneos de la Republica Argentina, descriptos por Weyenbergh an 1879 y 1883. — Bol. Acad. Nac. Cienc. Córdoba, **35**, p. 182—214.
57. Dequal, L. (1916): Viaggio del Dott. E. Festa nel Darien, nell'Ecuador e regioni vicine. XXV. Irudinei. — Boll. Mus. Zool. Anat. comp. Torino, **31**, No. 717, p. 1—20.
58. Dequal, L. (1917): Nuovi Irudinei esotici del Museo Zoologico di Torino. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **32**, No. 724, p. 1—20.
59. Diesing, K. M. (1850): Systema Helminthum.— Vindobonae, **1**, p. 435—471.
60. Diesing, K. M. (1858): Vierzehn Arten von Bdellideen. — Denkschr. mathem.-naturw. Cl. Akad. Wiss. Wien, **14**, p. 63—80.
61. Diesing, K. M. (1859): Revision der Myzhelminthen. Abt. Bdellideen. — SB. mathem.-naturw. Cl. Akad. Wiss. Wien, **33**, p. 480—513.
62. Diesing, K. M. (1862): Beschreibung von zwei neuen Arten der Gattung Aulastomum aus warmen Quellen Ungarns. — SB. mathem.-naturw. Cl. Akad. Wiss. Wien, **45**, p. 481—484.

63. DE FILIPPI, F. (1837): Memoria sugli Annelidi della famiglia delle Sanguisughe coll'Indicazione di alcune specie indigene della Lombardia. — Milano, p. 1—32.
64. FORBES, S. A. (1890): An American Terrestrial Leech. — Bull. Illinois State Labor., Nat. Hist., **3,** p. 118—119.
65. GEDROYĆ, M. (1915): Pijawki (Hirudinea) Polski. Studyum monograficzne. — Rozpr. Wiad. Muz. Im. Dzied., Lwów, **2,** p. 15—115.
66. GERVAIS, P. (1836): Hirudinée. — in GUÉRIN: Dict. Hist. Nat., **3,** p. 626.
67. GODDARD, E. J. (1909): Contribution to our knowledge of Australian Hirudinea. Part III. — Proc. Linn. Soc. N. S. Wales, **34,** p. 467—486.
68. GODDARD, E. J. (1910): Contribution to a knowledge of Australian Hirudinea. Part VI. The distribution of Hirudinea, with special reference to Australian forms, and remarks on their affinities, together with reflections on zoogeography. — Proc. Linn. Soc. N. S. Wales, **35,** p. 69—76.
69. GODDARD, E. J. & MALAN, D. E. (1912): The South African Hirudinea. Part I. — Ann. S. Afr. Mus., **11,** p. 307—319.
70. GRUBE, A. E. (1850): Die Familie der Anneliden. — Arch. f. Naturg., **16,** p. 249—364, spec. p. 354—362.
71. GRUBE, A. E. (1851): Die Familie der Anneliden, mit Angabe ihrer Gattungen und Arten. Ein systematischer Versuch. — Berlin, pp. 164.
72. GRUBE, A. E. (1867): Über Landblutegel. — Jahresb. Schles. Ges. vaterl. Cultur, **44,** p. 59—61.
73. GRUBE, A. E. (1868): Anneliden, Discophora. — in: Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859. Wien, Zool. Theil. **2,** III. Abt. 2, p. 37—44.
74. GRUBE, A. E. (1871): Beschreibungen einiger Egelarten. — Arch. f. Naturg., **37,** p. 87—121.
75. HARANT, H. (1929): Essai sur les Hirudinées. — Arch. Soc. Sci. Méd. Biol. Montpellier, **10,** p. 613—682.
76. HARANT, H. & VERNIÈRES, P. (1936): Mission scientifique de l'Omo. Hirudinea. III. Fasc. 27 (Zoologie). — Mém. Mus. Nat. hist. Nat. (N. S.), **4,** p. 219—226.
77. HARDING, W. A. (1910): A Revision of the British Leeches. — Parasitology, **3,** p. 130—201.
78. HARDING, W. A. (1932): Report on the Hirudinea: Mr. Omer-Cooper's Investigation of the Abyssinian Fresh Waters (Hugh Scott Expedition). — Proc. Zool. Soc. London, **1932,** p. 81—86.
79. HOFFMANN, J. (1955): Faune hirudinéenne du Grand-Duché de Luxembourg. — Arch. Inst. Grand-Ducal Luxemb., Sect. Sci. Nat. (N. S.), **22,** p. 175—211.
80. INGRAM, D. M. (1957): Some Tasmanian Hirudinea. — Pap. Proc. Roy. Soc. Tasmania, **91,** p. 191—232.
81. JARRY, D. (1959): Observations écologiques sur les Hirudinées. III. Sur la présence de Limnatis nilotica (Savigny, 1820) dans un oued méditerranéen: La Baillaurie à Banyuls-sur-Mer. — Bull. Soc. Zool. France, **84,** p. 73—76.
82. JARRY, D. (1959): Notes sur les Hirudinées (suite). II. Sur la présence d'Hirudo michaelseni Augener 1936 au Borkou. — Bull. Soc. Zool. France, **84,** p. 380—382.
83. JOHANSSON, L. (1909): Hirudinea. — in BRAUER: Die Süsswasserfauna Deutschlands, H. **13,** II, p. 67—81.
84. JOHANSSON, L. (1910): Hirudinea. — in SJÖSTEDT: Wiss. Erg. Schwed. Zool. Exp. Kilimandjaro-Meru 1905—1906, **3,** Abt. 22 (5), p. 29—31.
85. JOHANSSON, L. (1911): Hirudinea. — in: Die Fauna Südwest-Australiens, **3,** Lief. 12, p. 407—431.
86. JOHANSSON, L. (1913): Hirudineen aus dem Sudan. — in JÄGERSKIÖLD: Res. Swedish Zool. Exp. Egypt and the White Nile 1901, Pt. 5, No. **24,** p. 1—42.
87. JOHANSSON, L. (1914): Ergebnisse einer von Prof. Franz Werner im Sommer 1910 mit Unterstützung aus dem Legate Wedl ausgeführten zoologischen Forschungsreise nach Algerien. VIII. Hirudineen. — SB. mathem.-naturw. Kl. Akad. Wiss. Wien, Abt. 1, **123,** p. 837—852.
88. JOHANSSON, L. (1918): Hirudineen von Neu-Caledonien und den Neuen Hebriden. — in SARASIN & ROUX: Nova Caledonia, A. Zoologie, **2,** Lief. 4, p. 373—396.
89. JOHANSSON, L. (1926): 4. Hirudinea. — in ARNDT: Beiträge zur Kenntnis der Land- und Süsswasserfauna Korsikas. I. — Mitt. Zool. Mus. Berlin, **12,** p. 228—233.
90. JOHANSSON, L. (1927): Hirudineen aus dem nördlichen und östlichen Spanien, gesammelt von Dr. F. Haas in den Jahren 1914—1919. — Abh. Senckenb. Naturf. Ges., **39,** p. 217—231.

91. JOHANSSON, L. (1929): Hirudinea (Egel). — in DAHL: Die Tierwelt Deutschlands, T. **15,** p. 133—155.
92. JOHNSON, J. R. (1816): A Treatise on the medicinal Leech; including its medical and natural history, with a description of its anatomical structure; also remarks upon the diseases, preservation and management of leeches. — London, XII + 147.
93. JOHNSTON, G. (1846): An Index to the British Annelides. — Ann. Mag. Nat. Hist., **16** (Suppl.), p. 433—462, spec. p. 439—442.
94. JOHNSTON, G. (1865): A Catalogue of the British Non-parasitical Worms in the Collection of the British Museum. — London, pp. 366, spec. p. 36—54.
95. KABURAKI, T. (1921): Note on the Leech Limnatis nilotica. — Rec. Ind. Mus., **18,** p. 213—214.
96. KABURAKI, T. (1921): Notes on some Leeches in the collection of the Indian Museum. — Rec. Ind. Mus., **22,** p. 689—719.
97. KABURAKI, T. (1921): On some Leeches from the Chilka Lake. — Mem. Ind. Mus., **5,** p. 661—675.
98. KERSHAW, J. A. (1904): Excursion to Launching Place. — Victorian Naturalist, **20** (9), Zoology, p. 122—125.
99. KHAN, M. M. (1912): Notes on Rearing of Leeches in Mavai, Bara Banki District, United Provinces. — Rec. Ind. Mus., **7,** p. 206—207.
100. KINBERG, J. G. H. (1866): Annulata nova. — Öfv. Kongl. Vetensk.-Akad. Förhand., **23,** p. 337—357.
101. LEIDY, J. (1868): Notice of some American leeches. — Proc. Acad. Nat. Sci. Philadelphia, **1868,** p. 229—230.
102. LESSON, J. P. (1842): Description d'une nouvelle espèce de Sangsue. — Rev. Zool. Soc. Cuvierième, Paris, **5,** p. 1—8.
103. LINNÉ, C. (1758): Systema naturae. Lipsiae, Ed. 10, p. 648—651.
104. LUKIN, E. I. (1960): Elements of the leech fauna of China and Japon in the fauna of the Amur Basin within the ranges of the USSR. — Journ. Zool. Moscow, **39,** p. 40—44.
105. LUKIN, E. I. (1962): Hirudinea. — in: The Fauna of Ukraine, Kiew, **30,** pp. 196.
106. MANN, K. H. (1954): The anatomy of the Horse Leech, Haemopis sanguisuga (L.) with particular references to the excretory system. — Proc. Zool. Soc. London, **124,** p. 69—88.
107. MANN, K. H. (1961): The systematics of freshwater and terrestrial leeches. — in MANN: Leeches (Hirudinea). Intern. Ser. Monogr. Pure Appl. Biol. Div. Zool. **11,** p. 147—168.
108. MATTHAI, G. (1921): Preliminary observations on cocoon-formation by the common Lahore leech, Limnatis (Poecilobdella) granulosa (Sav.). — Journ. Asiat. Soc. Bengal, (N. S.) **16,** p. 341—346.
109. MATHERS, C. K. (1948): The leeches of the Okoboji region. — Proc. Iowa Acad. Sci., **55,** p. 397—425.
110. MATHERS, C. K. (1954): Haemopis kingi, New Species (Annelida, Hirudinea). — Amer. Midl. Nat., **52,** p. 460—468.
111. MATHERS, C. K. (1963): Haemopis latero-maculatum, New Species (Annelida, Hirudinea). — Amer. Midl. Nat., **70,** p. 168—174.
112. MEYER, M. C. (1951): Hirudinea. — in: Explor. Parc Nat. Albert, Mission G. F. de Witte (1933—1935), Fasc. **76,** p. 1—29.
113. MEYER, M. C. (1959): Another unusual case of erratic hirudinasis. — Journ. Parasit., **45,** No. 4, Sect. 2, p. 39 (abstract).
114. MEYER, M. C. & MOORE, J. P. (1954): Notes on Canadian Leeches (Hirudinea), with the Description of a New Species. — Wasmann Journ. Biol., **12,** p. 63—96.
115. MOORE, J. E. (1964): Notes on the Leeches (Hirudinea) of Alberta. — Nat. Mus. Canada, Nat. Hist. Papers, No. **27,** p. 1—15.
116. MOORE, J. E. (1966): Further Notes on Alberta Leeches (Hirudinea). — Nat. Mus. Canada, Nat. Hist. Papers, No. **32,** p. 1—11.
117. MOORE, J. P. (1898): The leeches of the U. S. National Museum. — Proc. U. S. Nat. Mus. Washington, **21,** p. 543—563.
118. MOORE, J. P. (1901): The Hirudinea of Illinois. — Bull. Illinois State Labor., Nat. Hist., **5,** No. 12, p. 479—547.
119. MOORE, J. P. (1901): Descriptions of two new leeches from Porto Rico. — Bull. U. S. Comm. Fish and Fisheries, **2,** p. 211—222.
120. MOORE, J. P. (1912): The Leeches of Minnesota. — Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. No. **5,** p. 1—143.
121. MOORE, J. P. (1924): Notes on some Asiatic leeches (Hirudinea), principally from China, Kashmir, and British India. — Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 343—388.

122. MOORE, J. P. (1924): The leeches (Hirudinea) of Lake Nipigon. — Publ. Ontario Fisheries Res. Labor., No. **23,** p. 17—31.
123. MOORE, J. P. (1927): Hirudidae. — in HARDING & MOORE: The Fauna of British India, including Ceylon and Burma. London, pp. XXXVIII + 302, spec. p. 154—243, 296—297.
124. MOORE, J. P. (1929): Leeches from Borneo with descriptions of new species. — Proc. Acad. Nat. Sci. Philadelphia, **81,** p. 267—295.
125. MOORE, J. P. (1930): Leeches (Hirudinea) from China with descriptions of new species. — Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 169—192.
126. MOORE, J. P. (1930): The Leeches (Hirudinea) of China. — Bull. Dept. Biol. Yenching Univ., **1,** No. 2, p. 39—43.
127. MOORE, J. P. (1933): Scientific Results of the Cambridge Expedition to the East Africa Lakes, 1931. Leeches. — Journ. Linn. Soc. London, **38,** Zool., p. 297—299.
128. MOORE, J. P. (1935): A Description of Aetheobdella hirudoides gen. et sp. n., from New South Wales, with Notes on Leeches collected by the Oxford University Sarawak Expedition. — Ann. Mag. Nat. Hist., (10) **16,** p. 296—304.
129. MOORE, J. P. (1935): Leeches from Borneo and the Malay Peninsula. — Bull. Raffles Mus., **10,** p. 67—79.
130. MOORE, J. P. (1936): The Leeches of Lake Nipissing. — Canad. Field-Nat., **50,** p. 112—114.
131. MOORE, J. P. (1938): Leeches (Hirudinea) principally from the Malay Peninsula, with descriptions of new species. — Bull. Raffles Mus., **14,** p. 64—80.
132. MOORE, J. P. (1939): Additions to our knowledge of African Leeches (Hirudinea). — Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 297—360.
133. MOORE, J. P. (1939): Leeches (Hirudinea) from the Atlas Mountains of Morocco. — Ann. Mag. Nat. Hist., (11) **3,** p. 80—87.
134. MOORE, J. P. (1945): Two new leeches (Hirudinea) in the collection of the United States National Museum. — Journ. Washington Acad. Sci., **35,** p. 261—265.
135. MOORE, J. P. (1952): Professor A. E. Verrill's fresh-water leeches. A tribute and a critique. — Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245,** p. 1—15.
136. MOORE, J. P. (1953): Three undescribed North American Leeches (Hirudinea). — Not. Nat. Acad. Nat. Sci. Philadelphia, No. **250,** p. 1—13.
137. MOORE, J. P. (1958): The Leeches (Hirudinea) in the Collection of the Natal Museum. — Ann. Natal Mus., **14,** p. 303—340.
138. MOORE, J. P. (1959): Hirudinea. — in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd Ed., Chap. 23, p. 542—557.
139. MOORE, J. P. & MEYER, M. C. (1951): Leeches (Hirudinea) from Alaskan and adjacent waters. — Wasmann Journ. Biol., **9,** p. 11—77.
140. MOQUIN-TANDON, A. (1826): Monographie de la famille des Hirudinées. — Montpellier, p. 1—152.
141. MOQUIN-TANDON, A. (1846): Monographie de la famille des Hirudinées. — Paris, 2nd Ed., p. 1—448.
142. MURIE, J. (1865): On a Leech (Trocheta subviridis Dutrochet) found in the Viscera of a Moluccan Deer (Cervus moluccensis Müller). — Proc. Zool. Soc. London, **1865,** p. 659—662.
143. MÜLLER, O. F. (1774): Vermium terrestrium et fluviatilum, seu animalium infusoriorum, helminthicorum, et testaceorum, non marinorum succincta historia. — Havniae et Lipsiae, **1,** Pars 2, Helminthica, pp. 72.
144. OKA, A. (1910): Synopsis der japanischen Hirudineen, mit Diagnosen der neuen Species. — Annot. Zool. Jap., **7,** p. 165—183.
145. OKA, A. (1917): Zoological Results of a Tour in the Far East. Hirudinea. — Mem. Asiat. Soc. Bengal, **6,** p. 157—176.
146. OKA, A. (1925): Notices sur les Hirudinées d'Extrême Orient. I—IV. — Annot. Zool. Jap., **10,** p. 311—326.
147. OKA, A. (1928): Sur deux espèces nouvelles de Whitmania. — Proc. Imp. Acad. Tokyo, **4,** p. 169—171.
148. OKA, A. (1928): Sur les Hirudinides de la Formose méridionale. — Proc. Imp. Acad. Tokyo, **4,** p. 122—124.
149. OKA, A. (1929): Sur la présence de la Dinobdella ferox en Formose. — Proc. Imp. Acad. Tokyo, **5,** p. 210—212.
150. OKA, A. (1931): Révision du genre Whitmania d'Extrême Orient. — Proc. Imp. Acad. Tokyo, **7,** p. 387—389.
151. OKA, A. (1932): Hirudinées extraeuropéennes du Musée Zoologique Polonais. — Ann. Mus. Zool. Polon., **9,** p. 313—328.

152. OLIVER, D. R. (1958): The leeches (Hirudinea) of Saskatchewan. — Canad. Field-Nat., **72**, p. 161—165.
153. ÖRLEY, L. (1886): A magyarországi piócák faunája. — Mathem. term.-tud. Közlem., **22** (2), p. 63—115.
154. PAWLOWSKI, L. K. (1936): Hirudinea. — in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 1—134.
155. PAWLOWSKI, L. K. (1936): Über die sogenannten Varietäten des Egels Haemopis sanguisuga (Linn.). — Ann. Mus. Zool. Polon., **11**, p. 161—169.
156. PAWLOWSKI, L. K. (1948): Contribution à la connaissance des sangsues (Hirudinea) de la Nouvelle-Écosse, de Terre-Neuve et des îles françaises Saint-Pierre et Miquelon. — Fragm. Faun. Mus. Zool. Polon., **5**, p. 317—353.
157. PAWLOWSKI, L. K. (1959): Remarques sur la repartition de la faune torrenticole des Carpathes. — Soc. Sci. Lodz., Sect. III, No. **57**, p. 1—90.
158. PAWLOWSKI, L. K. & JARRY, D.-M. (1961): Présence d'Hirudo michaelseni Augener, 1935 au Borkou (Nord-Tchad). Mission épidémiologique au Nord-Tchad. — in RIOUX: Comm. coord. Sci. Sahara, P.R.O.H.U.Z.A., p. 115—116.
159. PINTO, C. (1920): Contribuição ao estudo dos hirudineos do Brazil. III. Limnobdella brasiliensis nov. sp. — Brazil Médico, **34**, No. 43, p. 707—709.
160. PINTO, C. (1923): Ensaio Monographico dos Hirudineos. — Rev. Mus. Paulista, **13**, p. 857—1118.
161. PLOTNIKOV, V. (1907): Glossosiphoniidae, Hirudinidae et Herpobdellidae du Musée Zoologique de l'Académie Impériale des Sciences. — Ann. Mus. Zool. Acad. Imp. Sci. St.-Pétersbourg, **10**, p. 133—158.
162. POLONIO, A. F. (1861): Monografia del génere Aulostomum. — Atti Soc. Ital. Sci. Nat., **3**, p. 39—43.
163. RICHARDSON, L. R. (1968): An annotated list of Australian leeches. — Proc. Linn. Soc. N. S. Wales, **92**, p. 227—245.
164. RICHARDSON, L. R. (1968): Mem. Queensl. Mus., **15**, (in print).
165. RICHARDSON, L. R. (1969): A Contribution to the Systematics of the Hirudinid Leeches, with description of new families, genera and species. — Acta Zool. Hung., **15**, p. 97—149.
166. RINGUELET, R. (1943): Refundición de los generos Oxyptychus Grube, Diplobdella Moore y Argyrobdella Cordero (Hirudinea) con una pequeña monografía de las especies Argentinas. — Not. Mus. La Plata, **8**, Zool. No. 65, p. 101—126.
167. RINGUELET, R. (1944): Sinopsis sistemática y zoogeográfica de los Hirudíneos de la Argentina, Brasil, Chile, Paraguay y Uruguay. — Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 163—232
168. RINGUELET, R. (1944): Notas sobre Hirudíneos neotropicales. I. Caracteres y posición sistemática del género Potamobdella Cab. — Not. Mus. La Plata, **9**, Zool. No. 73, p. 39—52.
169. RINGUELET, R. (1945): Hirudíneos del Museo de La Plata. — Rev. Mus. La Plata (N. S.) **4**, Zool. No. 26, p. 95—137.
170. RINGUELET, R. (1948): Notas sobre Hirudíneos neotropicales. V. Especies de la Republica del Paraguay. — Not. Mus. La Plata, **13**, Zool. No. 113, p. 213—244.
171. RINGUELET, R. A. (1968): Llave o clave para el reconocimiento de las sanguijuelas conocidas de la Republica Argentina (Hirudinea) y apuntamientos sobre la hirudofauna neotropica y transicional mexicana. — Physis, **27**, No. 75, p. 367—390.
172. RISSO, A. (1826): Sangsues. — in: Histoire naturelle des principales production de l'Europe méridionale. Paris, **4**, p. 427—432.
173. ROUSSEAU, E. (1912): Les Hirudinées d'eau douce d'Europe. — Ann. Biol. Lacustre, **5**, p. 259—295.
174. SAVIGNY, J. C. (1822): Système des Annelides. — in: Système de diverses classes d'animaux sans Vertèbres, Paris, **1** (3), p. 105—120.
175. SAWYER, R. T. (1967): The Leeches of Louisiana, with notes on some North American species (Hirudinea, Annelida). — Proc. Louisiana Acad. Sci., **30**, p. 32—38.
176. SAY, TH. (1824): Sur les Hirudo parasitica, lateralis, marmorata et decora, dans le voyage du major Long (Narrative of Expedition to the Source of St. Peter's River, Lake Winnipeek, Lake of the Woods, 1823). — Philadelphia, **2**, Appendix, p. 266—269.
177. SCHMARDA, L. K. (1861): Neue Turbellarien, Rotatorien und Anneliden beobachtet und gesammelt auf einer Reise um die Erde 1853 bis 1857. — Leipzig **1** (2), p. 1—161, spec. p. 2—7.
178. SCIACCHITANO, I. (1936): Sanguisughe del Congo Belga. — Rev. Zool. Bot. Afr., **26**, p. 448—460.

179. SCIACCHITANO, I. (1936): Una nuova sanguisuga del Congo Belga. — Boll. Mus. Zool. Anat. comp. Genova, **16**, p. 3—6.
180. SCIACCHITANO, I. (1936): Altre Sanguisughe del Congo Belga. — Rev. Zool. Bot. Afr., **28**, p. 161—163.
181. SCIACCHITANO, I. (1937): Irudinei del Congo Belga. — Rev. Zool. Bot. Afr., **29**, p. 426—429.
182. SCIACCHITANO, I. (1939): Nuovi Irudinei del Congo Belga. — Rev. Zool. Bot. Afr., **32**, p. 348—367.
183. SCIACCHITANO, I. (1939): Irudinei dell'Africa Orientale Italiana. — Boll. pesca, piscicult. idrobiol., Roma, **15**, p. 5—11.
184. SCIACCHITANO, I. (1941): Le attuali conoscenze sugli Irudinei dell'Africa Italiana. — Riv. Biol. Coloniale, Roma, **4**, p. 161—170.
185. SCIACCHITANO, I. (1952): Irudinei del Congo Belga. — Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool. **16**, p. 1—87.
186. SCIACCHITANO, I. (1954): Contributo alla conoscenza degli Irudinei del Congo Belga. — Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 4, Miscell. Zool. **1**, p. 278—283.
187. SCIACCHITANO, I. (1957): Contributo alla conoscenza degli Irudinei del Congo Belga (Nota seconda). — Rev. Zool. Bot. Afr., **56**, p. 373—381.
188. SCIACCHITANO, I. (1960): Sangsues de l'Afghanistan. Contribution à l'étude de la fauna d'Afghanistan. — Libro homenaje al Doctor Eduardo Caballero y Caballero, 1930—1960. México, No. **24**, p. 533—541.
189. SCIACCHITANO, I. (1960): Contributo alla conoscenza degli Irudinei del Congo Belga (Nota terza). — Rev. Zool. Bot. Afr., **61**, p. 287—309.
190. SCIACCHITANO, I. (1961): Irudinei dell'Angola. — Publ. Cult. Co. Diam. Angola, Lisboa, No. **52**, p. 109—118.
191. SCIACCHITANO, I. (1962): Su alcune sanguisughe del Parco Nazionale Kruger (Sud Africa). — Monit. Zool. Ital. Firenze, **69**, p. 144—148.
192. SCIACCHITANO, I. (1963): A collection of Hirudinea submitted by F. M. Chutter (National Institute for Water Research, Pretoria), and the geographical distribution of Hirudinea in South Africa. — Ann. Transvaal Mus., **24**, p. 249—260.
193. SCIACCHITANO, I. (1963): La attuali conoscenza sulla distribuzione geografica degli Irudinei nella Regione Etiopica. — Monit. Zool. Ital. Firenze, **70—71**, p. 175—184.
194. SCIACCHITANO, I. (1965): Nuovo contributo alla conoscenza degli Irudinei dell'Africa. — Rev. Zool. Bot. Afr., **71**, p. 29—33.
195. SCIACCHITANO, I. (1967): Leeches (Hirudinea) from Ethiopia. — Journ. nat. Hist., **1**, p. 189—194.
196. SMYTHIES, B. E. (1959): Leeches of Borneo. — Sarawak Mus. Journ. (N. S.) **9**, p. 279—294.
197. SOÓS, Á. (1966): Identification Key to the Leech (Hirudinoidea) Genera of the World, with a Catalogue of the Species. II. Families: Semiscolecidae, Trematobdellidae, Americobdellidae, Diestecostomatidae. — Acta Zool. Hung., **12**, p. 145—160.
198. SOÓS, Á. (1966): Identification Key to the Leech (Hirudinoidea) Genera of the World, with a Catalogue of the Species. III. Family: Erpobdellidae. — Acta Zool. Hung., **12**, p. 371—407.
199. SOÓS, Á. (1968): A new Leech Genus: Richardsonianus gen. nov. (Hirudinoidea: Hirudinidae). — Acta Zool. Hung., **14**, p. 455—459.
200. STCHEGOLEV, G. (1916): About the fauna of the leeches in the Amur Region. — Rev. Zool. Russe, **1**, p. 250—252.
201. TENNENT, J. E. (1859): Leeches. — in: Sketches of the Natural History of Ceylon. London, pp. 500.
202. TING, J. (1938): Morphology and anatomy of the Gigant Fresh-water Leech, Whitmania laevis (Baird). — Peking Nat. Hist. Bull., **13**, p. 29—33.
203. VERRILL, A. E. (1872): Descriptions of North American fresh-water leeches. — Amer. Journ. Sci. Arts, **3**, p. 126—139.
204. VERRILL, A. E. (1874): Synopsis of the North American fresh-water leeches. — Rep. Comm. Fish and Fisheries 1872/73, p. 666—689.
205. VIOSCA, P. (1962): Observations on the biology of the leech Philobdella gracile Moore in southeastern Louisiana. — Tulane Stud. Zool., **9**, p. 243—244.
206. WAHLBERG, P. (1855): Nya Blodiglar. — Öfv. Kongl. Vetensk.-Akad. Förhand., **12**, p. 233—234.
207. WAHLBERG, P. (1856): Neue Blutegel. — Zeitschr. ges. Naturw., **7**, p. 271—272.
208. WEBER, M. (1915): Monographie des Hirudinées Sud-Américaines. — Neuchâtel, pp. 134.
209. WEYENBERGH, D. H. (1879): Algunas nuevas sanguijuelas o chancacas de la familia Gnathobdellia y revista de esta familia. — Bol. Acad. Nac. Cienc. Arg., **3**, p. 231—244; Period. Zool. Argent., **3**, p. 112—125.

210. WEYENBERGH, D. H. (1883): Tres nuevas especies de sanguijuelas. — An. Ateneo Uruguay, **5**, p. 427—430.
211. WHARTON, L. D. (1913): Hirudo boyntoni, a new Philippine leech. — Philippine Journ. Sci., (D) **8**, p. 369—371.
212. WHITMAN, C. O. (1884): The external morphology of the leech. — Proc. Amer. Acad. Arts Sci., **20**, p. 76—87.
213. WHITMAN, C. O. (1886): The Leeches of Japan. — Quart. Journ. Microsc. Sci., (N. S.), **26**, p. 317—416.

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FÄCHERFLÜGLER — ZIKADEN — PFLANZENVIROSEN

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(OBERDIREKTOR: DR. V. SZÉKESSY)

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Die Fächerflügler (Strepsiptera) sind holometabole Insekten mit auffallendem Geschlechtsdimorphismus aus der engeren Verwandtschaft der Coleopteren und leben als Entoparasiten in Thysanuren, Orthopteren, Hymenopteren, Hemipteren und Homopteren. Sie sind vivipar und verpuppen sich innerhalb ihrer letzten Larvenhaut. Die Larven des ersten Stadiums (L_1) sowie die vollentwickelten Männchen sind freilebend, die Weibchen dagegen bleiben zeitlebens im Wirtstiere. Eine Ausnahme bilden die Weibchen der sich in Thysanuren entwickelnden Arten der Unterordnung Mengeidea, welche als flügellose, wanzenähnliche, außerordentlich primitive Insekten ebenfalls frei leben. Die Männchen der Strepsipteren sind 1—4 mm lang, mit fächerartig verzweigten Fühlern, stark vorspringenden Komplexaugen, großen, relativ schwach geäderten Hinterflügeln und mit zu Halteren umgewandelten Vorderflügeln. Die zeitlebens parasitierenden Weibchen sind 5—40 mm lang. Ihr Körper ist madenförmig; Augen, Fühler, Beine und Flügel sind vollständig reduziert, Kopf und Thorakalsegmente zu einem einheitlichen Cephalothorax verschmolzen, der aus dem Körper des Wirtstieres frei vorragt. Zum Entlassen der sich in der Leibeshöhle der Weibchen entwickelnden L_1 ist es zur Ausbildung eines, unter den Insekten alleinstehenden »Gebärorganes« gekommen. Die den Körper des Muttertieres verlassenden und das neue Wirtstier aufsuchenden L_1 sind ungef. 0,2 mm lang, von campodeoider Gestalt, mit stark reduzierten Fühlern, Augen, Mundwerkzeugen und Beinen. Die Ordnung der Strepsipteren ist eine der an Arten ärmsten Insektengruppen, die bis heute nicht viel mehr als 300 Arten enthält. Neben ihrer großen Anpassungsfähigkeit und Spezialisationsbereitschaft besitzen die Fächerflügler noch eine weitere charakteristische Eigenschaft. Es handelt sich dabei um die als Folgeerscheinung der Stylopisation (Befall durch Strepsipteren) an den Wirtstieren relativ häufig auftretenden, sehr stark ins Auge fallenden Veränderungen an den sekundären Geschlechtsmerkmalen der Wirtstiere. In manchen Fällen, so vor allem an Zikaden, wurde aber auch Verzögerung der Entwicklung, sowie weitgehende, in erster Linie wahrscheinlich mechanische Beeinflussung der Geschlechtsorgane der Wirtstiere festgestellt, welche letzten Endes sogar bis

zur sekundären Kastration führen kann. Trotz alledem müssen aber die Strepsipteren wohl als außerordentlich »rücksichtsvolle« Parasiten bezeichnet werden, da es ja in ihrem eigenen »Interesse« liegt, ihre Wirtstiere so lang wie möglich zu schonen. Nicht nur der ganze Entwicklungszyklus der weiblichen Strepsipteren hat sich nämlich in einunddemselben Wirtstiere abzuspielen, sondern auch noch dazu die Ausbildung der L_1 der nächsten Generation.

Die Arten der beiden Strepsipteren-Familien Halictophagidae und Elenchidae leben ausschließlich in Kleinzikaden. Viele der regelmäßig von solchen Strepsipteren befallenen, also stylopisierten Zikadenarten sind nun berüchtigte und gefährliche Schädlinge so mancher Nutzpflanzen. Der Grad der Stylopisation ist aber im Gegensatz zu der bis heute allgemein gewußten »Seltenheit« der Strepsipteren oft ganz bedeutend und kann bis zu 60—70 Prozent der befallenen Zikadenpopulation betragen. So gibt MEIXNER (1935) auf Grund älterer Literaturangaben Befallsstärken von bis zu 70 Prozent bekannt. Neuere Angaben — ohne Anspruch auf Vollständigkeit — sind folgende. LINDBERG (1939 und 1949) berichtet über einen 64,3%-igen Befall an *Chloriona unicolor* H. S., einen 59,5%-igen an *Dicranotropis hamata* BOH., einen 58,5%-igen an *Calligypona straminea* STÅL und einen 65,9%-igen an *Calligypona pellucida* (F.). Nach PIERCE (1961) war die von ihm aus Mexiko untersuchte Population von *Sogata cubana* (CRAWFORD) bis zu 60 Prozent von *Elenchus* (*Sogatelenchus*) *mexicanus* (PIERCE) befallen, während RAATIKAINEN (1967) mitteilt, daß die in Finnland an Wein und Hafer schädliche *Calligypona* (*Javesella*) *pellucida* (F.) Population bis zu 50 Prozent ihres Bestandes stylopisiert war, d. h. von ungef. 5200 Exemplaren waren mehr als 2600 mit *Elenchus tenuicornis* (KIRBY) infiziert. In Ungarn wurden derartige Untersuchungen über die Häufigkeit der Stylopisation noch nicht durchgeführt. Doch sind die Strepsipteren auch im Karpatenbecken bei weitem nicht so selten, wie bisher angenommen wurde. Wir kennen nämlich aus diesem Gebiete heute schon mehr als 25 stylopisierte Zikadenarten und auch die Zahl der Fundstellen von an Zikaden lebenden Strepsipteren beläuft sich über 150.

Es erscheint nun wohl als selbstverständlich, wenn schon vor Jahren daran gedacht wurde, die Strepsipteren im biologischen Pflanzenschutz zu verwenden. Die diesbezüglich durchgeführten Untersuchungen und Beobachtungen ergaben aber vorläufig negative Ergebnisse, so die Versuche von MUIR (1906), welcher für die biologische Bekämpfung der am Zuckerrohr schädlichen Zikade *Perkinsiella saccharicida* KIRK. die Strepsiptere *Elenchus perkinsi* (PIERCE) einsetzen wollte. Auch AHLBERG (1925) und KIRKPATRIK (1937) konnten an außerordentlich stark mit Strepsipteren infizierten Populationen von an Gramineen und Kaffeesträuchern schädlichen Zikadenarten keinerlei, mit der hochgradigen Stylopisation in kausalen Zusammenhang zu bringende zahlenmäßige Schwankungen, bzw. eine Abnahme der Wirtstiere feststellen. Im Gegenteil dazu berichtet ULRICH (1956) sogar über eine, trotz ihrer starken

Stylopisation mehr als 3 Jahrzehnte blühende *Andrena*-Population in der Umgebung Berlins. Schließlich mag auch noch darauf hingewiesen werden, daß ein in größerer Anzahl zu beobachtendes Auftreten stylopisierter Individuen innerhalb einer Wirtspopulation nicht unbedingt auch auf eine hochgradige Infektion hinzuweisen hat. So muß nach ULRICH (1956) z. B. ein zahlenmäßig erhöhtes Auftreten stylopisierter Andrenen im Vorfrühling, oder in späteren Jahreszeiten in den Mittagsstunden noch kein Beweis für einen stärkeren Befall sein, sondern kann event. durch die abweichende Verhaltungsnorm der stylopisierten Exemplare erklärt werden.

Die zahlreichen Untersuchungen und Erfahrungen der letzten Jahrzehnte über die Pflanzenvirosen und ihre Vektoren werfen nun von neuem das Problem einer allfälligen Anwendbarkeit des Einsetzens von Strepsipteren im Pflanzenschutz auf. Die im folgenden zur Klärung dieser Frage angelegte Zusammenstellung zeigt die außerordentlich interessanten Verhältnisse des in dieser Beziehung anzunehmenden Komplexes: Pflanze-Virose-Vektor-Parasit.

BISHER BEKANNT GEWORDENE BEISPIELE DES PFLANZE-VIROSE-VEKTOR-PARASIT KOMPLEXES*

Prunus persica

I. Täuschungsvirose des Pfirsichs.
   V^d: *Oncometopia orbona* (F.) (*undata* F.) in USA. P: *Halictophagus oncometopiae* (PIERCE).
   V^d: *Draeculacephala* (?) *portola* BALL in Westindien, Golfstaaten der USA, Hawaii, Puerto Rico. P: *Halictophagus acutus* BOHART.

Medicago sativa

I. Viröse Verzwergung der Luzerne.
   V^d: *Oncometopia orbona* (F.) (*undata* F.) in USA. P: *Halictophagus oncometopiae* (PIERCE).
   V^d: *Draeculacephala minerva* BALL (vermutlich) in West- und Südwest-USA, Mittelamerika, Guatemala. P: *Halictophagus acutus* BOHART.
   V^d: *Draeculacephala portola* BALL (vermutlich) in Westindien, Golfstaaten der USA, Hawaii, Puerto Rico. P: *Halictophagus acutus* BOHART.

Trifolium pratense

I. Kleeblattnervenverdickungs-Virus.
   V^e: *Agallia constricta* VAN DUZEE in USA, Argentinien. P: *Halictophagus serratus* BOHART.
   V^e: *Agallia quadripunctata* PROVANCHER in Nordost-USA. P: *Halictophagus americanus* PERKINS.

* Zusammengestellt in erster Linie auf Grund der eingehenden Arbeiten von KLINKOWSKI (1958) und HEINZE (1959) sowie meines bisher noch nicht veröffentlichten Kataloges der Strepsipteren.

In der Zusammenstellung angewendete Abkürzungen: V = Vektor, V^d = Dauerüberträger, V^e = Überträger über das Ei, P = Parasit.

Vitis vinifera

I. Pierce'sche Viruskrankheit der Weinrebe.
   V^d: *Oncometopia orbona* (F.) (*undata* F.) in USA. P: *Halictophagus oncometopiae* (PIERCE).
   V^d: *Draeculacephala minerva* BALL (vermutlich) in West- und Südwest-USA, Mittelamerika, Guatemala. P: *Halictophagus acutus* BOHART.
   V^d: *Draeculacephala portola* BALL (vermutlich) in Westindien, Golfstaaten der USA, Hawaii, Puerto Rico. P: *Halictophagus acutus* BOHART.

Beta vulgaris

I. Kalifornische Blattrollkrankheit der Zuckerrübe.
   V^d: *Circulifer tenellus* (BAKER) in West-USA, Brit. Columbien, Mexiko, Südeuropa, Kleinasien. P: *Halictophagus americanus* PERKINS.
   V^d: *Nephotettix cincticeps* (UHLER) (fraglich) in Japan, Philippinen. P: *Halictophagus bipunctatus* YANG und *Halictophagus orientalis* (ESAKI & HASHIMOTO).

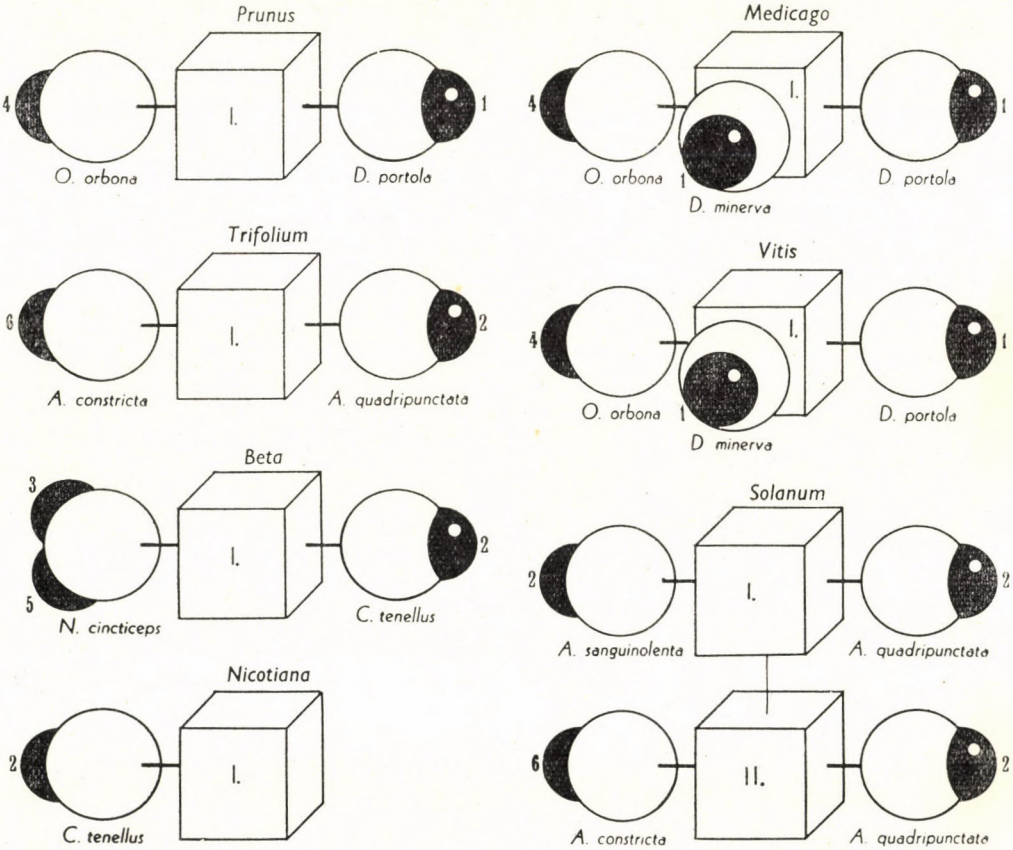

Abb. 1. Graphische Darstellung des Pflanze-Virose-Vektor-Parasit Komplexes. — Die unter dem Gattungsnamen der Pflanze stehenden Würfel vertreten je eine Virose. Ihre Bezeichnung mit I.—III. verweist auf die Zusammenstellung auf Seite 205. Die großen weißen Kugeln (mit Namen) stellen die in Frage kommenden Zikadenvektoren dar, die kleinen schwarzen, ihnen aufsitzenden Kugeln die Strepsipteren-Arten. Die neben ihnen stehenden Zahlen bedeuten: 1 = *Halictophagus acutus*, 2 = *H. americanus*, 3 = *H. bipunctatus*, 4 = *H. oncometopiae*, 5 = *H. orientalis*, 6 = *H. serratus*, 7 = *Stenocranophilus anomalocerus*, 8 = *S. perkinsiellae*, 9 = *Elenchus mexicanus*, 10 = *E. perkinsi*, 11 = *E. tenuicornis*

Solanum tuberosum

I. Viröse gelbe Verzwergung der Kartoffel.
V^{d}: *Aceratagallia sanguinolenta* PROVANCHER in USA, Südkanada, Mexiko. P: *Halictophagus americanus* PERKINS.
V^{d}: *Agallia quadripunctata* PROVANCHER in Nordost-USA. P: *Halictophagus americanus* PERKINS.

II. Solanum Virus 16 var.
V^{e}: *Agallia constricta* VAN DUZEE in USA, Argentinien. P: *Halictophagus serratus* BOHART.
V^{d}: *Agallia quadripunctata* PROVANCHER in Nordost-USA. P: *Halictophagus americanus* PERKINS.

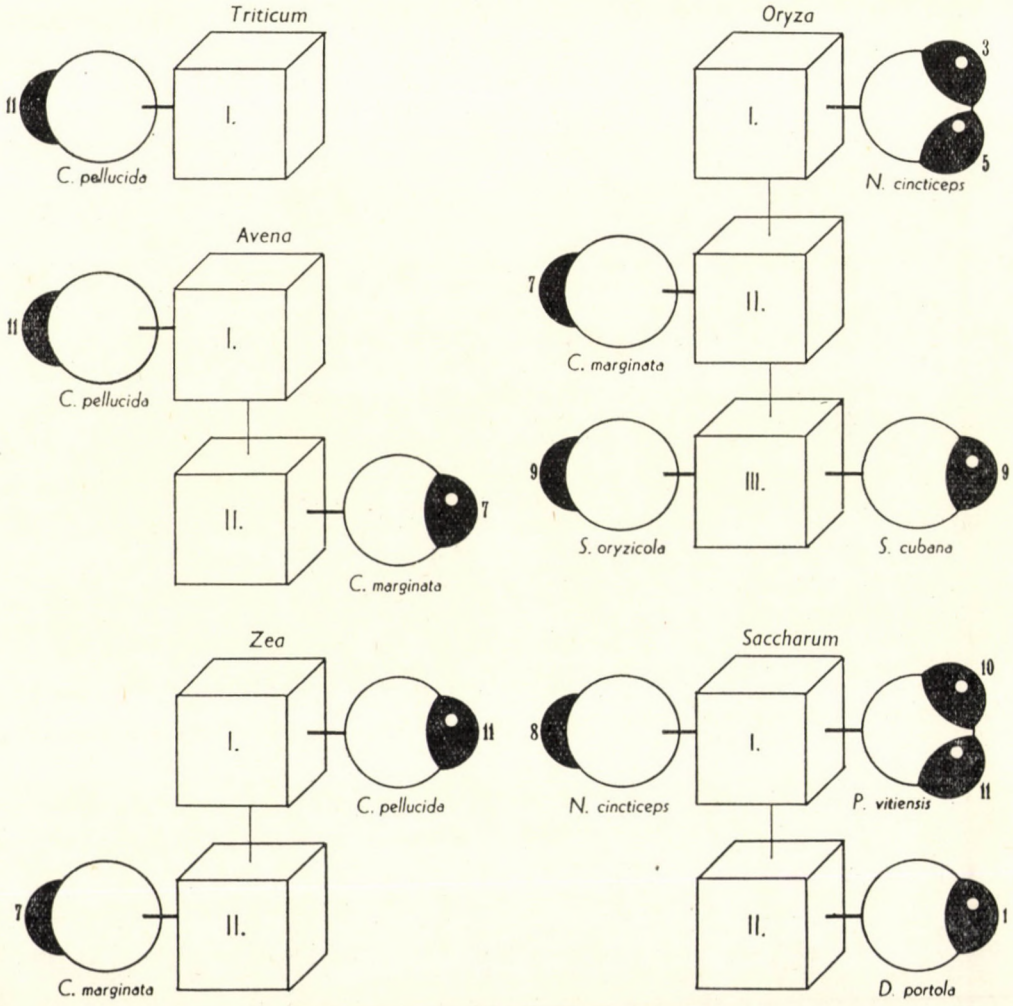

Abb. 2. Graphische Darstellung des Pflanze-Virose-Vektor-Parasit Komplexes (Fortsetzung der Abb. 1). Erklärung siehe in Abb. 1

Nicotiana tabacum

I. Gelbnerven-Virus des Tabaks.
V^{d}: *Circulifer tenellus* (BAKER) in West-USA. Brit. Columbien. Mexiko. P: *Halictophagus americanus* PERKINS.

Triticum monococcum

I. Europäische Form des Streifenmosaiks des Winterweizens (EWSMV).
V^{e}: *Calligypona pellucida* (F.) im paläarktischen Gebiet. P: *Elenchus tenuicornis* (KIRBY).

Avena sativa

I. Sterile Verzwergung des Hafers (OSDV).
V^{d}: *Calligypona pellucida* (F.) im paläarktischen Gebiet. P: *Elenchus tenuicornis* (KIRBY).

II. Pseudorosettenkrankheit des Hafers.
V^{d}: *Calligypona marginata* (F.) im Süden der Sowjetunion, asiatische Teile des paläarktischen Gebietes, Japan und auch Deutschland. P: *Stenocranophilus anomalocerus* (PIERCE).

Oryza sativa

I. Viröse Verzwergung der Reispflanze.
V^{e}: *Nephotettix cincticeps* (UHLER) in Japan, ? Korea, ? Formosa, Philippinen. P: *Halictophagus bipunctatus* YANG und *Halictophagus orientalis* (ESAKI & HASHIMOTO).

II. Streifenkrankheit der Reispflanze.
V^{e}: *Calligypona marginata* (F.) im Süden der Sowjetunion, asiatische Teile des paläarktischen Gebietes, Japan und auch Deutschland. P: *Stenocranophilus anomalocerus* (PIERCE).

III. Viröse Weißblättrigkeit der Reispflanze (Hoja blanca).
V: *Sogata cubana* (CRAWFORD) in Mexiko. P: *Elenchus mexicanus* (PIERCE).
V: *Sogata oryzicola* MUIR in Mexiko. P: *Elenchus mexicanus* (PIERCE).

Zea Mays

I. Mais-Streifenmosaik-Virus.
V: *Calligypona pellucida* (F.) im paläarktischen Gebiet (Tschechoslowakei). P: *Elenchus tenuicornis* (KIRBY).

II. Rauhverzwergung des Maises.
V: *Calligypona marginata* (F.) im Süden der Sowjetunion, asiatische Teile des paläarktischen Gebietes (Israel), Japan und auch Deutschland. P: *Stenocranophilus anomalocerus* (PIERCE).

Saccharum officinarum

I. Fidschi-Krankheit des Zuckerrohres.
V^{d}: *Perkinsiella saccharicida* KIRK. in Australien, Java, Formosa, Hawaii, Madagaskar. P: *Stenocranophilus perkinsiellae* (PIERCE).
V^{d}: *Perkinsiella vitiensis* KIRK. (noch fraglich) in Polynesien. P: *Elenchus perkinsi* (PIERCE) und *Elenchus tenuicornis* (KIRBY).

II. Chlorotische Streifenkrankheit des Zuckerrohres (bestritten).
V^{d}: *Draeculacephala portola* BALL (?) in Westindien, Golfstaaten der Süd-USA. P: *Halictophagus acutus* BOHART.

Diese Zusammenstellung sowie die beiden sie ergänzenden Abbildungen erscheinen nun vor allem dann von besonderer Bedeutung, wenn wir in Betracht ziehen, daß die bis jetzt bekannt gewordenen Pflanzenvirosen hauptsächlich an Nutzpflanzen nachgewiesen wurden und daß ferner die Systematik und tiergeographische Verbreitung der Kleinzikaden, insbesondere aber die der Strepsipteren heute bei weitem noch nicht als hinreichend erforscht bezeichnet werden kann. Trotz aller dieser Schwierigkeiten enthält aber die Zusammenstellung nicht weniger als 12 Pflanzenarten (alles Nutzpflanzen: Pfirsich, Luzerne, Klee, Weinrebe, Zuckerrübe, Kartoffel, Tabakpflanze, Weizen, Hafer, Reis, Mais und Zuckerrohr) und 18 an ihnen bisher nachgewiesene Viruserkrankungen (1—3 Virosen pro Pflanzenart). Als Überträger dieser Krankheiten finden wir 14, auch als stylopisiert bekannte Zikadenarten u. zw. die Vertreter zweier verschiedener Familien: Jassidae, vornehmlich an Nicht-Gramineen, sowie Delphacidae, ausschließlich an Gramineen. Als Parasiten dieser Zikadenarten kennen wir insgesamt 11 verschiedene Strepsipteren-Arten, welche 3 Gattungen angehören (*Halictophagus* CURTIS, *Stenocranophilus* PIERCE und *Elenchus* CURTIS), u. zw. erscheinen pro Virose 1—3 Vektoren-Arten als nachgewiesen und pro Vektoren-Art 1—2 Strepsipteren-Arten. Unter den in der Zusammenstellung angeführten Viruserkrankungen sind heute aus Europa bekannt die Kalifornische Blattrollkrankheit der Zuckerrübe (Beta Virus 1), die Europäische Form des Streifenmosaiks des Winterweizens (EWSMV), die Sterile Verzwergung des Hafers (OSDV), die Pseudorosettenkrankheit des Hafers (Avena Virus 1), die Streifenkrankheit der Reispflanze (Oryza Virus 2), das Mais-Streifenmosaik (Zea Virus 1 var.) und schließlich die Rauhverzwergung des Maises (Nanismo ruvido).

Die Zusammenstellung, aber noch viel deutlicher die beiden Abbildungen lassen weiter erkennen, daß der aus 4 Komponenten bestehende Pflanze-Virose-Vektor-Parasit Komplex verschiedene Variationsmöglichkeiten zeigen kann. So können wir z. B. feststellen, daß der Parasit *Stenocranophilus perkinsiellae* nur über eine einzige Vektoren-Art und die von ihr übertragene Virose mit einer einzigen Pflanzenart (Zuckerrohr) in Verbindung gebracht werden kann. Die Strepsipteren-Art *Elenchus tenuicornis* steht in Europa ebenfalls nur über eine einzige Vektoren-Art (*Calligypona pellucida*), aber durch 3 verschiedene, von ihr übertragene Virosen mit 3 Pflanzenarten in Zusammenhang (Weizen, Hafer und Mais). Der Parasit *Halictophagus americanus* kann dagegen an 3 verschiedenen Vektoren-Arten gefunden werden, welche für insgesamt 5, an 4 verschiedenen Pflanzenarten (Luzerne, Zuckerrübe, Kartoffel und Tabak) auftretende Pflanzenvirosen verantwortlich gemacht werden können. Weiter zeigt es sich, daß einerseits an gewissen, verschiedene Virosen übertragenden Vektoren-Arten, so z. B. an *Nephotettix cincticeps* bis zu 3 Strepsipteren-Arten nachgewiesen sind, daß an einer, eine bestimmte Pflanzenvirose übertragende Zikadenart (z. B. *Perkinsiella vitiensis*) 2 verschiedene Strepsi-

pteren-Arten leben und daß andererseits einunddieselbe Strepsipteren-Art mitunter auch als Parasit mehrerer Vektoren-Arten auftreten kann (s. oben *Halictophagus americanus* und *Elenchus tenuicornis*).

Interessant ist ferner die Tatsache, daß der Pflanze-Virose-Vektor-Parasit Komplex in der Zusammensetzung seiner Komponenten auch andere Variationsmöglichkeiten erkennen läßt, d. h. es kommt in gewissen Fällen bei einunddersel-ben Pflanzenart — allerdings immer nur in Verbindung mit unterschiedlichen Virosen — zu einer Substitution des Vektors und seines Parasiten durch andere Arten, welche Form der Substitution jedoch geographisch bedingt zu sein scheint. So sehen wir z. B., daß die vornehmlich in Europa auftretende Virose des Hafers an den Vektor *Calligypona pellucida* (Parasit: *Elenchus tenuicornis*) gebunden ist, die eher in Asien auftretende Virose des Hafers dagegen an *Calligypona marginata* (Parasit: *Stenocranophilus anomalocerus*). Genau dieselben Verhältnisse liegen auch bei den beiden Virosen des Maises vor, wo es zur Substitution derselben Vektoren- und Parasiten-Arten kommt (siehe Abb. 2). Bedenken wir nun weiter, daß bei der europäischen Form des Streifenmosaiks des Winterweizens ebenfalls *Calligypona pellucida* (Parasit: *Elenchus tenuicornis*) als Vektor zu finden ist, bei der Streifenkrankheit der Reispflanze dagegen, vornehmlich in Asien, *Calligypona marginata* (Parasit: *Stenocranophilus anomalocerus*), so kommen wir zu folgenden Feststellungen. Gewisse Vektor-Parasit Kombinationen können auch an verschiedenen viruskranken Pflanzenarten auftreten. Die Virosen der betreffenden Pflanzenarten sind aber immer andere. Die Substitutionen in den Vektor-Parasit Kombinationen scheinen außerdem geographisch bedingt zu sein. Die aus diesen Tatsachen abzuleitenden Schlüsse sind nun. 1. Die Vektor-Parasit Kombinationen sind nicht spezifisch, d. h. sie treten an verschiedenen Pflanzenarten immer in Verbindung mit anderen Virosen auf. 2. Die Einwirkung dieser Kombinationen muß in allen Fällen dieselbe sein, da sie ja z. B. im Falle der beiden oben erwähnten Strepsipteren-Arten an je 3 verschiedenen Virosen und 3 verschiedenen Pflanzenarten gleicherweise manifest wird. 3. Die geographische Substitution des Vektors und seines Parasiten kann wahrscheinlich nicht in kausale Beziehung zur Pflanzenkrankheit gebracht werden, sondern dürfte ganz einfach durch die geographische Verbreitung des Vektors zu erklären sein.

Als wichtig erscheint weiter die Tatsache, daß 9 von den bisher auch als stylopisiert nachgewiesenen Zikadenvektoren von HEINZE (1959) als (perisistente) Dauerüberträger (V^d in der Zusammenstellung) angegeben werden, also als Vektoren-Arten, in deren Leibeshöhle der Virus zeitlebens anwesend bleibt und dort auch seine Entwicklung durchmacht, sowie 5 Arten (*Agallia constricta*, *A. quadripunctata*, *Calligypona pellucida*, *C. marginata* und *Nephotettix cincticeps*) sogar als Überträger über das Ei (V^e in der Zusammenstellung), d. h. bei diesen Arten kommt es nicht nur zur Entwicklung des Virus im Vektor, sondern der Virus kann sogar über das Ei des Vektors auf die nächste Genera-

tion übertragen werden u. zw. bis zu 5 Jahre. In allen diesen Fällen handelt es sich also darum, daß die besprochenen Strepsipteren als Parasiten mit Vorliebe an solchen Zikadenarten aufzutreten scheinen, deren Verbindung mit den entsprechenden Viruserkrankungen der Pflanzen als sehr straff zu betrachten ist.

Die oben besprochenen Variationsmöglichkeiten des Pflanze-Virose-Vektor-Parasit Komplexes sowie die später erwähnten Umstände scheinen nun offensichtlich darauf hinzuweisen, daß zwischen bestimmten Strepsipteren-Arten und gewissen Pflanzenvirosen irgendein, bisher nicht geklärter kausaler Zusammenhang angenommen werden dürfte. Selbstverständlich können wir dabei kaum an die Möglichkeit denken, daß die betreffende Strepsipteren-Art irgendeine direkte Rolle spielt bei der Übertragung des Virus selbst, oder daß sie vielleicht zu einer Abänderung der Virus-Art oder ihres Wirkungsmodus führt. Doch darf vielleicht angenommen werden, daß die Anwesenheit des Parasiten irgendwie — keinesfalls aber artspezifisch — auf das Wirtstier, also auf den Vektor einwirkt, vor allem wahrscheinlich auf seinen Stoffwechsel u. zw. in der Richtung auf die Herabsetzung der Widerstandsfähigkeit des Vektors gegen den Virus. Ein derartiges Umstimmen des Stoffwechselzustandes des Vektors kann dann unter Umständen außerordentlich vorteilhafte Bedingungen schaffen, sei es für die Infektion selbst, sei es für die Weiterentwicklung und Vermehrung des Virus im Vektor.

Die hier aufgeworfene Frage, welche vorläufig wohl nur als eine Arbeitshypothese betrachtet werden kann, muß erst durch weitere Beobachtungen und Feldversuche Bestätigung finden, welche den Beweis dafür zu erbringen haben, ob die Ausbreitung einer gewissen Pflanzenvirose oder ihr verstärktes Aufflammen tatsächlich in kausalen Zusammenhang gestellt werden kann mit einer gesteigerten Stylopisierung der Population des für die Übertragung der Virose verantwortlichen Zikadenvektors oder nicht. Die eventuelle Bestätigung eines solchen Zusammenhanges zwischen den einzelnen Faktoren des Pflanze-Virose-Vektor-Parasit Komplexes würde dann unter Umständen vielleicht auch die Möglichkeit der Ausarbeitung von Prognosen gewisser Pflanzenvirosen bieten.

Abschließend kann also festgestellt werden. Die Zahl der durch Zikadenüberträger mit gewissen Pflanzenvirosen in kausale Verbindung zu stellenden Strepsipteren-Arten ist im Vergleich zu allen anderen, bisher bekannten Pflanzenvirosen und deren heute schon kaum mehr zu übersehenden Vektoren noch verschwindend klein. Dennoch erscheint es aber als wichtig, auch diese Möglichkeit vor Augen zu halten und weiter zu verfolgen, wenn auch vielleicht nicht in erster Linie vom Standpunkte des Pflanzenschutzes, so doch als eine bisher noch nicht erkannte biologische Erscheinung.

SCHRIFTTUM

1. AHLBERG, O. (1925): Zikaden-Parasiten unter den Strepsipteren und Hymenopteren. Beilage II zu A. Tullgren, Om Dvärgstriten (Cicadula sexnotata Fall.). — Medd. Nr. 287 Centralanst. försöksväsendet på jordbruksomradet. Ent. Avdel. Nr. **46,** Stockholm, p. 79—82.
2. BAUMERT, D. (1958, 1959): Mehrjährige Zuchten einheimischer Strepsipteren an Homopteren. 1. Hälfte. Larven und Puppen von Elenchus tenuicornis Kirby. 2. Hälfte. Imagines, Lebenszyklus und Artbestimmung von Elenchus tenuicornis Kirby. — Zool. Beitr. (N. F.) **3,** p. 365—421 und **4,** p. 343—409.
3. BLATTNY, C., POZDENA, J. & PROCHÁZKOVÁ, Z. (1965): Virusbedingte Rauhverzwergung und Streifenkrankheit bei Zea mays L. — Phytopath. Z., **52,** p. 105—130.
4. DLABOLA, J. (1957): Calligypona pellucida Fabr. — ein Haferschädling und eventueller Vektor einer Getreidevirose. — Nachrichtenbl. Dt. Pflanzenschutzdienst (Berlin) NF **12,** p. 36—38.
5. DLABOLA, J. (1961): Zur Schädlichkeit der Zikaden in Getreidefeldern. — Nachrichtenbl. Dt. Pflanzenschutzdienst (Berlin) NF **15,** p. 120—122.
6. HEINZE, K. (1959): Phytopathogene Viren und ihre Überträger. — Berlin, pp. 290.
7. HOFENEDER, K. (FULMEK, L.) (1952): Verzeichnis der Strepsiptera und ihrer Wirte. — Beitr. Ent. Berlin, **2,** p. 473—521.
8. HOFENEDER, K. & FULMEK, L. (1942, 1943): Verzeichnis der Strepsiptera und ihrer Wirte. — Arb. physiol. angew. Ent., **9,** p. 179—185, 249—383 und **10,** p. 32—58, 139—169, 196—230.
9. KIRKPATRICK, T. W. (1937): Studies on the Ecology of Coffee Plantations in East Africa II. The Autecology of Antestia spp. (Pentatomidae) with a Particular Account of a Strepsipterous Parasite (Part II. The Bionomics of Corioxenos antestiae). — Trans. ent. Soc. London, **86,** p. 247—343 (p. 281—341).
10. KLINKOWSKI, M. (1958): Pflanzliche Virologie. I. Einführung in die allgemeinen Probleme. II. Die Virosen des europäischen Raumes. — Berlin, pp. X + 279 und VI + 393.
11. LINDBERG, H. (1939): Der Parasitismus der auf Chloriona-Arten (Homoptera, Cicadina) lebenden Strepsiptere Elenchinus chlorionae n. sp. sowie die Einwirkung derselben auf ihren Wirt. — Acta Zool. Fenn., **22,** pp. 179.
12. LINDBERG, H. (1949): On Stylopisation of Araeopids. — Acta Zool. Fenn., **57,** pp. 40.
13. MEIXNER, J. (1935): Strepsiptera Kirby (1813). Fächerflügler oder Kolbenflügler. — in KÜKENTHAL—KRUMBACH: Handbuch der Zoologie, **4** (2), p. 1349—1382.
14. MUIR, F. (1906): Notes on some Fijian Insects. — Rep. Work Exp. Stat. Haw. Sugar Plant. Ass. Div. Ent. Bull., **2,** p. 1—11.
15. PIERCE, W. D. (1961): A New Genus and Species of Strepsiptera Parasitic on a Leafhopper Vector of a Virus Disease of Rice and Other Gramineae. — Ann. Entomol. Soc. America, **54,** p. 467—474.
16. RAATIKAINEN, M. (1967): Bionomics, Enemies and Population Dynamics of Javesella pellucida (F.) (Hom., Delphacidae). — Ann. Agricult. Fenniae, **6,** pp. 149.
17. SZÉKESSY, V. (1959): Die Strepsipteren-Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest. — Ann. hist.-nat. Mus. Nat. Hung., **51,** p. 301—337.
18. ULRICH, W. (1956): Unsere Strepsipteren-Arbeiten. — Zool. Beitr., (N. F.) **2,** p. 177—255.

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ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
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ACROLEPIA KAROLYII SP. N. (LEPIDOPTERA: ACROLEPIIDAE)

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In August, 1966, I received a dispatch of lepidopterous mines from ÁRPÁD KÁROLYI, Nagykanizsa, S. W. Hungary. In the material I found some leaves of *Tamus communis*, gathered at Mt. Badacsony in the N. W. Balaton area. There were numerous mines in the leaves, some with small larvae; unfortunately, all were crushed. After the perusal of the relevant literature, I concluded that they belong to an *Acrolepia* species, but are not identical with *Acrolepia tami* HERING, described from the Canary Islands. Since I had no opportunity to visit the locality in that year, I have asked KÁROLYI to revisit the site, and, if possible, gather and send me living caterpillars. He was able to go to Badacsony only on 25 September; by that time, however, most of the *Tamus* plants were already dry. Notwithstanding, he still succeeded to collect, from some still green plants, four larvae. These were not in their mines but feeding freely on the leaves. Of the four larvae, two perished but the other two had soon pupated, yielding the imagos in April, 1967. In order to collect further material and study the life history of the species, I visited Badacsony on several occasions in 1967 and 1968 (12 July, 11 August, 14 September, 1967; and 9 May, 6 June, 15 July, 1968).

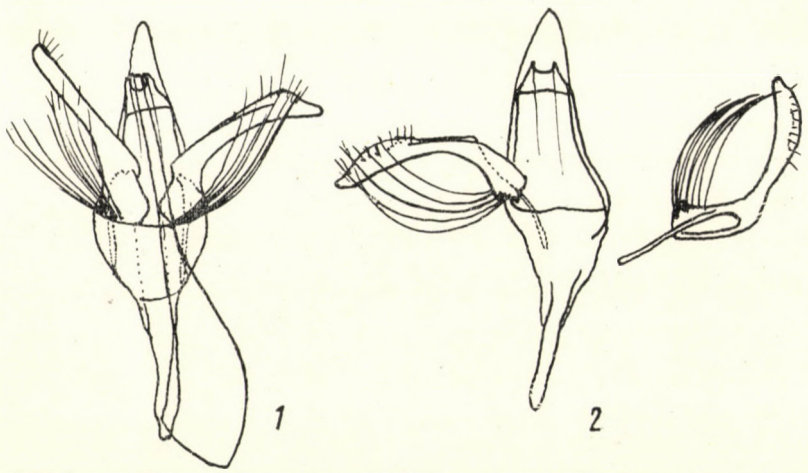
The identification of the species proved to be rather difficult, since only 14 of the 31 Palearctic *Acrolepia* species known to me are represented in the Collection of Lepidoptera of the Hungarian Natural History Museum. Accordingly, I had to fall back mainly on literature and thence attempted to obtain the original descriptions of the species wanting in our collection; I succeeded in this, with the exception of two species: *A. alliella* SEM.-KUZN., and *A. exsuccella* ERSCH. *A. alliella* is a Siberian species which, judging by its name, lives on *Allium* and thus cannot have anything to do with my specimen; with respect to *exsuccella*, I was unable to get any nearer data. After the thorough study of available literature, I arrived at the conclusion that the species found at Badacsony belongs to the *betulella* CURT.-group and stands nearest to *A. similella* MÜLL.-RUTZ. The known foodplants of all species comprising this group have bulbs or tubercles, and the species are extremely similar to one another, both as to external habits and the structure of the

reproductive organs. Unfortunately, there is no specimen representing *A. similella* in the collection of our museum, nor was I able to obtain one for comparison, indispensable for the exact identification of my species. Finally, DR. W. SAUTER, Zurich, Switzerland, came to my help and very kindly sent me a detailed drawing of the male genital organ of the lectotype specimen of *A. similella*, together with a sketch of the pattern of the fore wing of another specimen. I was now in the position to ascertain that my species is not identical with *similella* and that its description as a new taxon is satisfactorily justified. To honor its discoverer, I dedicate the new species to Á. KÁROLYI, and describe it (based on 12 male and 14 female exemplars) as follows:

Acrolepia karolyii sp. n.

Imago. Alar expanse: 10—11 mm, length of fore wing: 4.5—5 mm, greatest width: 1.5—2 mm. Basic color of fore wing blackish-brown, ornamented with light spots and striae. On the costa, there is one light-colored wedge-shaped spot at the apex, and two further ones behind it. Starting from these latter two, lines consisting of light dots run toward the dorsum: these lines either converge in the middle and are then decurrent parallel to one another, or they coalesce to form a Y-shaped pattern, or, again, cross one another in an X; in other cases the lines remain far removed from one another and thus reach the dorsum. At their termination here, their last dot increases into a smaller spot. In the middle of the dorsum, or slightly basad, there is a light, triangular spot, whose apex, however, rarely extends to the middle of the wing. Usually some dark scales or, exceptionally, a few dark lines, appear in this spot, but their location within the spot differs from specimen to specimen. There is a further light spot at the tornus, slightly bigger than those ending the transverse lines. Again on the costa, and somewhat nearer to the apex of the wing than the triangular spot on the dorsum, there appears a bigger, largely quadrangular and ochreous brown spot; it is, however, not conspicuous and even hardly discernible on some specimens. In certain cases, one or two darker striae, perpendicularly to the costa, are situated in this spot. Between the quadrangular spot and the base, four or five, usually hardly perceptible but comparatively wide, striae emerge from the costa and extend toward the fold; the external ones reach only the fold, the innermost ones (near the base) reach also the dorsum. There may also be one or two striae between the quadrangular spot and the inner wedge-shaped spot, and some minute dots below them, in the middle of the wing. The wedge-shaped spots and the lines emerging from them, the tornal spot, and the large spot of the dorsum are light ochreous, all other spots ochreous brown and more obscure than the lighter ones. The cilia are dark, with a wide and black subbasal line, terminating at the tornus where the cilia turns light. Below the apex,

the cilia are bisected by a light ochreous stripe, but it extends merely to the dark subbasal line. The constituting elements of the pattern generally vary in the extreme: there are hardly two animals equal in pattern, indeed, there are usually differences between right and left wings. The hind wings are grey, darker towards the apex; the base of the cilia is light ochreous, tending to grey apicad. The underside of both fore and hind wings is a uniform shining grey, with some ochreous suffusion on the fore wing; the single element of the pattern is the light interruption of the cilia below the apex. — The antennae are dentate, their length slightly exceeding two-thirds of that of the costa,



Figs. 1—2. Male genital organ of *Acrolepia karolyii* sp. n., ventrally. 1 = valvae and aedoeagus in situ, Holotype, slide 3727, Mt. Badacsony, W. Hungary; 2 = right valva bent outwards, left valva disattached, aedoeagus removed, Paratype, slide 3698, same locality

light ochreous, teeth blackish. The head is ochreous brown, the thorax brown, the abdomen shiny, silvery. The labial palpi curve upwards, the second and third joints are about equal in length, ochreous yellow inside, brownish outside, only the apex and the border of the second and third joints appearing ochreous yellow.

In the male genital organ (Figs. 1—2), the uncus is high and slender, the vinculum very narrow, the valva slender and narrow, wide from base to one-third of its length, there constricted and turning outward at an agle of about 70°, its apical section again slightly wider and boot-shaped; the saccus is wide at the base of the valvae, scutiform, then it narrows and is much elongated; the bundle of bristles, originating at the base of the valvae, is as long as one valva; the aedoeagus is long, reaching from the end of the saccus to the anal opening, its basal two-fifths widening, bulbous, its apical three-fifths thin and tubiform; the basal appendage of the valva is comparatively very long.

With regard to the other nearly related species, the new species stands nearest to *tauricella* STAUD., *similella* MÜLL.-RUTZ, and *betulella* CURT. As to external features, *karolyii* sp. n. differs insofar from *tauricella* and *similella* that the spot of the dorsum is not pure white but yellowish, with also — in most cases — some dark scales or striae within it. According to the original description of *tauricella*, there are some light striae behind the apex on the underside of the fore wing, — the new species lacks them. The main difference between *betulella* and the new species lies in the absence of the black frame of the large light spot on the dorsum in *karolyii* sp. n., nor has it a dark line, at most a very obscure one, within this spot.

The reproductive organ of the new species is most similar to that of *similella*. In this latter one, the entire organ is more robust, wider, its valva more finely arcuate, with the basal appendage merely half as long, the basal portion of the saccus triangular, the aedoeagus tapering gradually and its base not bulbous. The genital organ of *betulella* is even more different: the uncus is high and pointed, the valva wide, elongately spatulate, the saccus long but evenly tapering from base to apex, the aedoeagus longer, the base of the valvae without bundles of bristles. I do not know the male reproductive organ of *tauricella* STAUD.

Holotype male: "Badacsony, 1968. április 7, e.l. leg. Szőcs J. + gen. prep. 3727 DR. GOZMÁNY". Paratypes: Badacsony, 17 April, 1967, 1 ♂; 24 April, 1967, 1 ♂, e.l. leg. Á. KÁROLYI; 28 July, 1967, 1 ♀, 30 July, 1967, 1 ♂, e.l. leg. J. Szőcs; 1968: 7 April, 1 ♂ 1 ♀; 8 April, 1 ♂, gen. prep. 3698, DR. GOZMÁNY; 8 April, 1 ♂, 3 ♀; 9 April, 1 ♀; 13 April, 1 ♂; 17 April, 1 ♂; 22 April, 1 ♀; 31 May, 2 ♂ 1 ♀; 1 June, 1 ♂, 3 ♀; 2 June, 2 ♀; 3 June, 1 ♀; all specimens ex larva, leg. J. Szőcs. All type-specimens deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest.

Larva. In the mature state a pale yellowish-green, the green color being preponderant on the first three segments; the green gut of the feeding larva is very conspicuous. Its head is concolorous with the body, and merely the mandibles are yellowish-brown. All segments are ornamented with 10—12 blackish dots, the first thoracic segment is more densely punctate. The thoracic legs are greyish-brown, the abdominal legs concolorous with the body, and there is one black dot each at the base of both thoracic and abdominal legs. The head and the body bear sparsely spaced hairs. The body is nearly uniformly wide, and only the last segment tapers somewhat.

Pupa. The pupa is 5 mm long, at its widest point 1.2 mm wide. It is light brownish but blackish above on the two sides of the thorax as well as on those of the third abdominal segment; the blackish tint extends onto the entire dorsal surface of the fourth and fifth segments, but the sixth carries again only the black spots on its two sides. The abdominal sides also bear some spinose excrescences, with two similar ones anteriorly on the thorax.

The head, antennae, legs, and wings are well discernible. The end of the last segment is truncate. The larva pupates in a reticulate, brownish cocoon.

Mine. The mine is hyaline and transparent. Initially, the young larva gnaws a quite small, usually rounded or irregularly shaped blotch which may, on occasion, be also elongated or serpentine. There is usually no frass in the rounded or not elongated mines, whereas the excrement appears in the form of fine and dispersed granules in the long or sinuous mines. The minute larva leaves the mine after a time and makes, in another place of the leaf, a larger and irregular mine. There is no excrement in this latter one; the larva removes the frass through an opening at one corner of the mine; a part of it sometimes sticks to the filaments of webbing at the bottom of the mine, and it also occurs that some scattered excremental granules remain within the mine. When the larva is 5 mm, it leaves the mine and entirely eats up the leaf around the mine except for the thicker veins; for one or two days, however, it still returns into the mine during intervals in feeding. It also occurs, and especially with regard to thicker and older leaves, that the caterpillar does not consume the entire texture of the leaf but only skeletonizes its underside. When leaving the mine, the larva stays invariably on the underside of the leaf. There are usually several mines — frequently very many mines — in a given leaf, so that it looks like a sieve.

As for the life history of the new species, I could establish the followings; the imagos hatch from the hibernating pupae during April; the first larvae appear in the beginning of May at the time of the blossoming of *Tamus* and they can be found as long as the leaves are green. However, the vegetational period of *Tamus* varies greatly, in accordance with the dry or rainy state of the season. Thus, while KÁROLYI found living larvae still on 25 September, 1966, there were hardly any green plants on 11 August, 1967, and I found but a single larva only; there were no green plants on 14 September, and not a single green *Tamus* as early as 15 July in 1968! It seems that the species has merely one complete brood a year, all others are partial ones, at least as inferable from the results of rearing experiments up to now: of the 18 pupae deriving from the collection made on 12 July, 1967, only 2 imagos hatched in that year, the others in April, 1968; of those collected on 9 May, 1968, I received 53 pupae, yielding merely 10 imagos between 31 May—3 June, 1968, so that the other imagos will hatch probably in the spring of 1969; none of the 9 pupae collected on 6 June, 1968, has until now hatched, although I kept 2 pupae, as an experiment, in especially moist condition, acting on the assumption that I might have kept the previous pupae in a much too dry state and thus failed to receive more imagos. I should like to remark that the year 1966 was rather rainy in Hungary, while there was not much precipitation on the summer of 1967, and 1968 was especially dry from early spring

to the middle of July (at the writing of this paper). There is some justification to infer therefore that the hatching of the imagos is influenced by the moisture content of the foodstuff, because if the leaves are fresh their water-content is high and the imagos hatch soon, whereas if the leaves lose a certain amount of water the hatching of the imagos will shift to the spring of the subsequent year. This can, of course, be decided only by laboratory experiments, the means of which are not at my disposal.

There is only one known locality of the new species, namely the edge of the forest or the wooded slope on the southern side of Mt. Badacsony; however, the plant is not rare there so that a great number of *Tamus* leaves are full with the holes gnawed by the larvae. I succeeded to rear merely one parasitic wasp, a species belonging to the Chalcididae, whose identification is still pending.

I wish to thank, in this place, Dr. W. Sauter, Dr. J. Klimesch, and Dr. L. Gozmány, for their kind and extensive help rendered in the course of my investigations.

REFERENCES

1. Curtis, G. (1838): Acrolepia betulella. — Brit. Ent., **15,** p. 679.
2. Gozmány, L. & Szőcs, J. (1965): Microlepidoptera I.; Molylepkék I. — in Székessy: Fauna Hungariae, **16** (2), p. 1—214.
3. Hering, E. M. (1927): Die Minenfauna der Canarischen Inseln. — Zool. Jahrb. Syst., **53,** p. 405—486.
4. Hering, E. M. (1957): Bestimmungstabellen der Blattminen von Europa. — s'Gravenhage, pp. 1185.
5. Hering, E. M. (1963): Die Acrolepia der Inuleen (Lep.). — D. Ent. Ztschr. (N. F.), **10** (3—5), p. 223—226.
6. Klimesch, J. (1956): Die Arten der Acrolepia granitella Tr.-Gruppe. — Z. Wr. Ent. Ges., **41,** p. 129—144.
7. Mann, J. (1855): Die Lepidopteren, gesammelt auf einer entomologischen Reise in Corsica im Jahre 1855. — Verh. zool.-bot. Ver. Wien, **5,** p. 529—572.
8. Meyrick, E. (1914): Fam. Plutellidae. — in Wagner, H.: Lepidopterorum Catalogus, p. 47—63.
9. Rebel, H. (1916): Die Lepidopterenfauna Kretas. — Ann. Naturhist. Hofmus. Wien, **30,** p. 66—172.
10. Spuler, A. (1910): Die Groß-Schmetterlinge Europas. — Stuttgart, 2, pp. 523.
11. Staudinger, O. (1870): Beschreibung neuer Lepidopteren des europäischen Faunengebietes. — Berl. Ent. Ztschr., **14,** p. 273—330.
12. Toll, S. (1958): Neue Acrolepiidae. — Z. Wr. Ent. Ges., **43,** p. 84—89.
13. Weber, P. (1945): Die Schmetterlinge der Schweiz. 7. Nachtrag. Mikrolepidopteren. — Mitt. Schweiz. Ent. Ges., **19** (9), p. 347—406.

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ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
XV. 1—2. 1969 p. 219—227

EINE NEUE UNTERART VON MELLICTA BRITOMARTIS ASSM. (LEPIDOPTERA: NYMPHALIDAE)*

Von

Z. VARGA

ZOOLOGISCHES INSTITUT DER L. KOSSUTH UNIVERSITÄT, DEBRECEN
(DIREKTOR: PROF. DR. E. WOYNÁROVICH)

(Eingegangen am 23. April 1968)

Die Art *Mellicta britomartis* ASSM. zerfällt in charakteristische Lokalgruppen von Populationen. Entsprechend ist ihr Areal — obwohl sie als eine weit verbreitete eurosibirische Art kontinentalen Charakters gelten soll (vgl. VERITY, 1940; HIGGINS, 1955) — als lockeres Aggregat einer Vielzahl voneinander mehr oder weniger weit entfernter Verbreitungsflecken zu betrachten. Die Arten von solcher Verbreitung sind zur Untersuchung der Wirkung der geographischen Isolation in der infraspezifischen Evolution besonders geeignet.

Die erwähnten Lokalgruppen von *Mellicta britomartis* ASSM. sind daher als geographisch und zumeist auch morphologisch wohl getrennte Populationsgruppen der Art aufzufassen, denen selbständige faunogenetische Bedeutung zukommt und die den Forderungen einer taxonomischen Bezeichnung subspezifischen Ranges entsprechen.

Zur Kenntnis der südosteuropäischen Formen der Art *Mellicta britomartis* ASSM. sind die Arbeiten von VERITY (1940, 1953) sowie ISSEKUTZ und KOVÁCS (1954) von grundsätzlicher Bedeutung. Vorliegende Beschreibung einer bisher in der Literatur unbekannten Rasse der *M. britomartis* ASSM. schließt sich am engsten diesen Aufsätzen an.

Im Jahre 1965 machte mich während meines Aufenthaltes in Jugoslawien Herr Universitätsprofessor Š. MICHIELI (Ljubljana) darauf aufmerksam, daß auf dem Kalkstein-Hochplateau des Nanos-Berges (1289 m, Notranjsko, slowenisches Karstgebiet) eine verdunkelte Lokalform von *Mellicta britomartis* ASSM. vorkommt. Auf diese freundliche Anregung hin habe ich eine kleine Serie (10 ♂, 4 ♀) dieser Form erbeutet (3—5. VII. 1965).

Diese Form soll hier zu Ehren von Prof. Š. MICHIELI als

* Vorliegende Studie ist zu Ehren des leider sehr früh verstorbenen hervorragenden Entomologen: Universitätsprofessor Š. MICHIELI (Ljubljana) gewidmet.

Mellicta britomartis michielii ssp. nov.

in die Literatur eingeführt werden. Holotypus: ♂, Jugoslawien, Slowenien: Notranjsko, Nanos-Berg; 800—1100 m. 3—5. VII. 1965. Allotypus: ♀ mit denselben Angaben. Paratypen 8 ♂ 3 ♀ mit gleichen Angaben, alle befinden

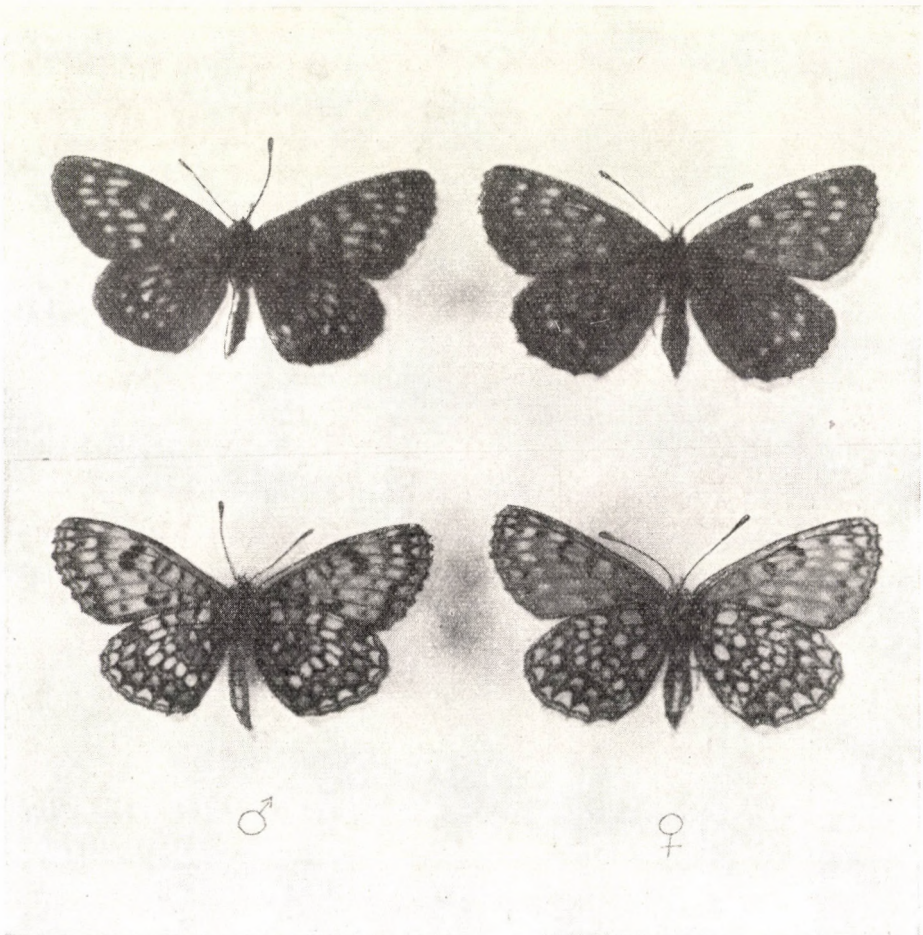


Abb. 1. *Mellicta britomartis michielii* ssp. nov.; ♂, Holotypus; ♀, Allotypus. 1. Reihe: Oberseite, 2. Reihe: Unterseite

sich in der Sammlung des Verfassers, 1♂, 1 ♀ in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest. Weitere Paratypen vom selben Fundort sind in der Sammlung von Prof. Š. MICHIELI (Ljubljana) zu finden.

Beschreibung der neuen Rasse. Eine der größten Rassen von *M. britomartis* ASSM.: Vorderflügellänge beim ♂: 16,5—19,5, bei ♀: 18—20,5 mm. Vorderflügel in Apikalrichtung verlängert und auch relativ schmal (fast alle

Rassen von *M. britomartis* Assm. haben wesentlich breitere Flügel). Die Grundfarbe der Flügel ist satt-rotbraun (wie z. B. bei *Melitaea diamina* Lang.), die Weibchen sind etwas gelblicher. Die Grundfarbe ist von dunklen Zeichnungen völlig unterdrückt; die Zeichnungen sind bei beiden Geschlechtern tief schwarzbraun. Beide Geschlechter sind gleichmäßig verdunkelt, daher gilt die neue Rasse als die bisher bekannte dunkelste europäische Form von *Mellicta britomartis* Assm., so daß sie völlig den Eindruck einer sehr dunklen

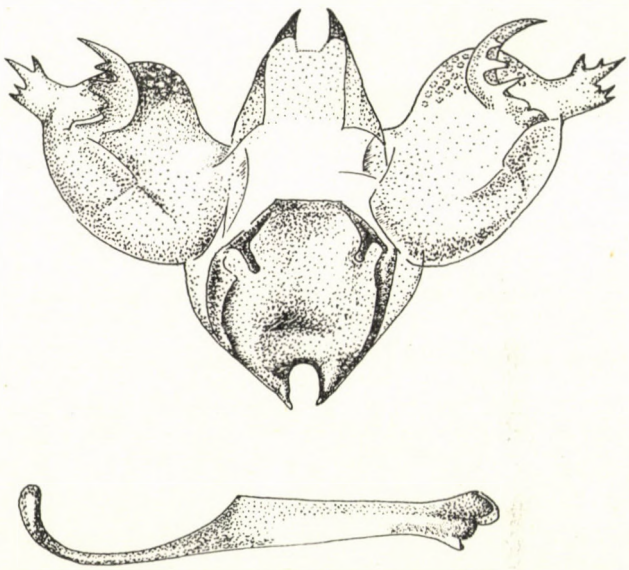


Abb. 2. ♂ Kopulationsapparat von *M. britomartis michielii* ssp. nov., Paratypus

diamina-Form macht. Die sonst ähnlich aussehenden osteuropäischen Rassen der *Mellicta britomartis* Assm.: z. B. *M. britomartis dictynnoides* Horm., *M. britomartis marussia* Fruhst. sind viel kleiner (15—18 mm) als die hier zu beschreibende neue Rasse. Die Expansion der dunklen Zeichnung ist auf den Hinterflügeln am ausgeprägtesten, ja manche ♀♀ besitzen fast ganz geschwärzte Hinterflügel (Abb. 1).

Die Unterseite der Flügel besitzt eine lebhaft satt gelblichbraune Grundfarbe, worin sie von allen *britomartis*-Rassen abweicht (nur einige Einzelstücke von *M. britomartis confulgens* Iss. et Kov. und *M. britomartis barthae* Iss. et Kov. können an der Unterseite ähnlich gefärbt sein).

Die männlichen Kopulationsorgane zeigen alle für die *Mellicta britomartis* Assm. charakteristischen Merkmale. Der Uncus ist ziemlich plump, seine Innenkanten haben oft feine Sägezähne (vgl. auch Abb. bei Beuret, 1954). Die Processi posteriores sind relative verlängert (das Verhältnis von Länge: Breite des Processus posterior schwankt zwischen 1,48—1,75; Mittelwert:

1,62). Olekranon des Aedoeagus ist stärker gekrümmt, als bei allen anderen Rassen der *Mellicta britomartis* ASSM. (Abb. 2).

Das Areal der neuen Subspezies ist noch nicht ganz aufgeklärt. Es ist wahrscheinlich, daß sie außer auf dem typischen Fundort auch auf anderen entsprechenden Plateaus des slowenischen Karstgebietes vorkommt. In der Sammlung von Prof. MICHIELI habe ich auch einige Stücke von Pokojisce (15 km südlich von Ljubljana) gesehen (Belegstücke von diesem Fundort lagen auch BEURET — 1954 — vor). Die Genitalienform dieser Exemplare stimmt mit derjenigen der Nanos-Exemplare völlig überein, sonst sind sie durchschnittlich etwas kleiner und weniger extrem verdunkelt als die Nanos-Exemplare. Bis weiteres sollen auch diese Stücke unter die neue Unterart eingereiht werden.

Das Gebiet, in welchem die neue Rasse von *Mellicta britomartis* ASSM. vorkommt, verdient unsere Aufmerksamkeit aus mehreren Gründen. Die Verdunkelungstendenz, die bei *M. britomartis michielii* so ausgeprägt ist, ist in diesem Gebiet auch bei mehreren Lepidopteren-Arten zu beobachten, so z. B.: bei *Agapetes galathea tenebrosa* FRUHST., *Melitaea didyma lesora* FRUHST., *Mellicta athalia scardona* FRUHST., *Coscinia striata slovenica* DANIEL usw.

Das Kalksteinplateau des Nanos-Berges ist sonst ein sehr bekannter Treffpunkt der Gebirgsvegetation und der Fauna mit alpinen und balkanisch-illyrischen Charakter. Die äußerst steil emporragende felsige Südseite des Berges ist mit einer sehr artenreichen Karstbusch- und Felsenvegetation ausgeprägt balkanischen Charakters (»Shiblyak«) bedeckt (vgl. JAKUCS, 1961, p. 251). Hier haben wir als Brutvogel das Steinhuhn *Alectoris graeca* beobachtet. Auf den Karstwiesen und in den Felsenwäldern des Berges herrscht schon eine subalpine Vegetation mit vielen »alpin-petrophilen« Lepidopteren-Arten (vgl. CARNELUTTI, 1957, p. 509—510). Daneben kommen auch Kennarten der balkanischen Hochgebirge vor: *Erebia melas nanos* FRUHST., *Aricia artaxerxes macedonica* VRTY., *Triphosa sabaudiata* TR. usw.

In dieser Hinsicht erscheinen uns auch die verwandschaftlichen Beziehungen der neubeschriebenen Subspezies von *M. britomartis* ASSM. interessant. ISSEKUTZ und KOVÁCS haben die im Karpatenbecken heimischen Formen der *Mellicta britomartis* ASSM. auf Grund ihrer Genitalienstruktur gruppiert. Der Grundgedanke dieser Gruppierung soll zweifellos als richtig gelten, denn alle mir bekannten Rassen von *M. britomartis* lassen sich in irgendeine Gruppe von ISSEKUTZ und KOVÁCS einreihen.

Die slowenische Karstrasse der *Mellicta britomartis* zeigt auf Grund ihrer Genitalienform sehr enge Beziehungen zu den Rassen *Mellicta britomartis confulgens* Iss. et KOV., *M. britomartis dioszeghyi* Iss. et KOV. und *M. britomartis barthae* Iss. et KOV., besonders zur ersten, die gleichfalls als eine Karsthochplateau-Rasse, d. h. als die geographische Form des Bükk-Gebirges und des nordungarischen Karstgebietes (vgl. VARGA, 1961) gilt. Da das slo-

wenische Karstgebiet als Refugialmassiv der südöstlichen Kalkalpen aufzufassen ist und auch die beiden Karstgebirge Nordostungarns Refugialmassiv-Charakter haben (VARGA, 1961, 1964), ergibt sich zwanglos eine auffallende faunogenetische Parallelität zwischen den beiden Rassen *Mellicta britomartis confulgens* Iss. et KOV. und *M. britomartis michielii* ssp. nov. Beide sind also als Vertreter einer reliktartigen Montanfauna balkanischen Gepräges zu betrachten wie auch die Rassen von *Aricia artaxerxes*-Rassengruppe *macedonica* (vgl. VARGA, 1968).

Der Verfasser ist Herrn Universitätsprofessor Š. MICHIELI (Biol. Inst. der Univ. Ljubljana) und Herrn DR. L. KOVÁCS (Ung. Naturwiss. Museum, Budapest) für die vielseitige Unterstützung und Förderung seiner Untersuchungen zu besonderem Dank verpflichtet.

SCHRIFTTUM

1. BEURET, H. (1954): Einiges über den männlichen Genitalienapparat von Melitaea britomartis Assm. u. M. menetriesi Car. (bona sp.). — Mitt. Ent. Ges., Basel, (N. F.) **4**, p. 73—88.
2. CARNELUTTI, J. (1957): Alpine petrophile Lepidopteren des Karst-Gebietes. — Verh. Dtsch. Zool. Ges., Zool. Anz. Suppl., **21**, p. 506—511.
3. HIGGINS, L. G. (1955): A descriptive catalogue of the Genus Mellicta Billb. — Trans. Roy. Ent. Soc. London, **106** (1), p. 1—131.
4. ISSEKUTZ, L. und KOVÁCS, L. (1954): Melitaea britomartis Assm. with Special Regard to its Occurrence in Hungary. — Ann. Hist.-nat. Mus. Nat. Hung., (Nov. Ser.) **5**, p. 289—303.
5. JAKUCS, P. (1961): Die phytozönologischen Verhältnisse der Flaumeichen-Buschwälder Südostmitteleuropas. — Budapest, pp. 313.
6. VARGA, Z. (1961): Zoogeographische Untersuchungen über die Makrolepidopteren-Fauna des Nordungarischen Karstgebietes. — Fol. Ent. Hung., **14**, p. 345—386.
7. VARGA, Z. (1963—64): Zoogeographische Analyse der Makrolepidopteren-Fauna Ungarns. I—II. — Acta Biologica Debr., **2—3**, p. 141—154 bzw. 147—180.
8. VARGA, Z. (1968): Bemerkungen und Ergänzungen zur taxonomischen Beurteilung der im Karpatenbecken vorkommenden Populationen von Aricia artaxerxes F. — Acta Biol. Debrecen, **6**, (im Druck).
9. VERITY, R. (1940): Revision of the Athalia Group of the Genus Melitaea F. — Trans. Roy. Ent. Soc. London, **89**, p. 591—702.
10. VERITY, R. (1953): Le Farfalle diurne d'Italia. Nymphalidae. — Firenze, **4**, pp. XIX + 354.

Anschrift des Verfassers: Debrecen, 10. Ungarn.

ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
XV. 1—2. 1969 p. 225—230

THE SCIENTIFIC RESULTS OF THE HUNGARIAN SOIL ZOOLOGICAL EXPEDITION TO THE BRAZZAVILLE-CONGO*

38. COLEOPTERA: LANGURIIDAE

Par

A. VILLIERS

MUSEUM NATIONAL D'HISTOIRE NATURELLE, ENTOMOLOGIE, PARIS

(Reçu 1. avril, 1968)

La faune de la République du Congo (Brazzaville) était, jusqu'à ces dernières années particulièrement mal connue, notamment en ce qui concerne les Languriidae. Ayant pu étudier dernièrement les récoltes de la mission française, effectuées exclusivement dans la grande forêt,[1] c'est avec grand plaisir que j'ai examiné la petite collection réunie par la mission hongroise (BALOGH, ENDRŐDY-YOUNGA et ZICSI); celle-ci, ayant prospectée diverses localités de savane, a pu capturer un bon nombre d'espèce particulières à ce milieu et qui viennent donc compléter très heureusement nos propres récoltes.

Subfam. CLADOXENINAE

Microlanguria angulosa VILLIERS

Microlanguria angulosa VILLIERS (1940): Rev. fr. Ent., **7** (3), p. 121—123, fig. 8 et 13; type: Congo ex-belge (Muséum de Paris).

Répartition géographique: De la Côte-d'Ivoire au Congo ex-belge.
République du Congo: Chutes de la Bouenza, 30. XI. 1963.

Penolanguria bechynei VILLIERS

Penolanguria bechynei VILLIERS (1962): Bull. Inst. fr. Afr. noire, A, **24** (2), p. 362, fig. 1; type: Cameroun (Muséum G. Frey).

Répartition géographique: Connu seulement du Cameroun.
République du Congo: Sibiti, 26. XI. 1963.

* Leader of the expedition: Prof. DR. J. BALOGH; other participants: DR. S. ENDRŐDY-YOUNGA and DR. A. ZICSI.

[1] A. VILLIERS (1966): Contribution à la faune du Congo (Brazzaville). Mission A. Villiers et A. Descarpentries. XXIV, Coléoptères Languriidae et Helotidae. — Bull. Inst. fond. Afr. noire, A, **28** (2), p. 815—826, 15 fig.

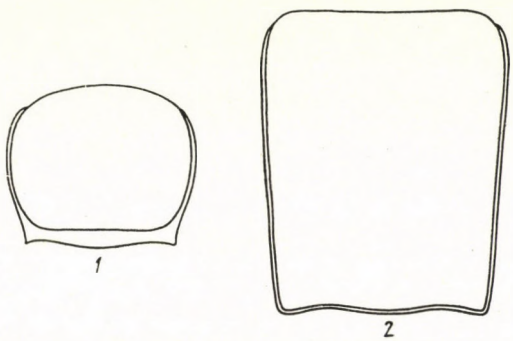
Paracladoxena infima n. sp. (Fig. 1)

Longueur: 1,7 mm.

Brun, luisant, la moitié basale des antennes testacée.

Tête à ponctuation assez fine et très éparse. Front très convexe, six fois plus large qu'un oeil vu de dessus.

Pronotum nettement transverse, très fortement convexe en avant, à côtés arrondis, convergents vers l'arrière, sinués devant les angles postérieurs, ceux-ci subdroits. Disque assez finement et éparsement ponctué.



Figs. 1—2. 1 = *Paracladoxena infima* n. sp., pronotum; 2 = *Promecolanguria kaszabi* n. sp. pronotum d'une femelle

Elytres ovalaires, un peu plus de deux fois plus longs que le pronotum, assez fortement sériés-ponctués, les interstries avec une ligne de très petits points superficiels.

République du Congo: Réserve de la Léfini, près de Mpo, en savane, 13. I. 1964. Holotype au Musée de Budapest.

Observations: dans le tableau des formes africaines de ce genre [A. VILLIERS (1962): Bull. Inst. fr. Afr. noire, A, **24** (2), p. 368] cette espèce vient se ranger avec *P. lata* VILLIERS. Ces deux expèces se distingueront à l'aide des caractères suivants:

P. lata VILLIERS	*P. infima* n. sp.
1. Longueur: 3,75 mm	1. Longueur: 1,7 mm
2. Coloration brun rouge	2. Coloration brun jaunâtre
3. Massue des antennes noire	3. Massue des antennes brun-jaune
4. Ponctuation de l'avant-corps assez forte et dense	4. Ponctuation de l'avant-corps assez fine, éparse.

Subfam. LANGURIINAE

Promecolanguria decorsei VILLIERS

Promecolanguria decorsei VILLIERS (1945): L'Abeille, **37**, p. 7 et 26, fig. 43 et 46; holotype: Brazzaville (Muséum de Paris).

Répartition géographique: Connu seulement de la République du Congo.

République du Congo: Brazzaville, 23. X. 1963.

Promecolanguria dollmanni (ARROW)

Anadastus dollmanni ARROW (1929): Proc. zool. Soc. Lond., **1**, p. 6, pl. I, fig. 4; holotype: Rhodesia (British Museum).

Répartition géographique: Afrique orientale et australe, Congo ex-belge.

République du Congo: Brazzaville, 23. X. 1963, 1. I. 1964; Kindamba-Meya, en savane, 2. et 3. XI. 1963.

Promecolanguria brazzai VILLIERS

Promecolanguria brazzai VILLIERS (1966): Bull. Inst. fond. Afr. noire, A, **28** (2), p. 817, fig. 1 à 4; type: République du Congo (Muséum de Paris).

Répartition géographique: Décrit de Brazzaville.

République du Congo: Brazzaville, 23. X. 1963.

Promecolanguria kaszabi n. sp. (Fig. 2)

Longueur: 6—6,5 mm.

Bleu sombre à vert sombre avec la base des antennes, le pronotum, les pattes, le prosternum rouges. Massue des antennes noire; méso et métasternum brun de poix; abdomen rouge avec l'apex brun de poix.

Tête assez grosse, fortement et densément ponctuée. Yeux petits, l'espace interoculaire convexe, grand, 8 fois plus large qu'un oeil vu de dessus. Antennes comme chez *P. pulchella* PASCOE, l'article VII légèrement épaissi, VIII à peu près aussi long que large, légèrement dilaté à l'angle apical-rostral.

Pronotum de la ♀ 1,25 fois plus long que large, à côtés subrectilignes nettement convergents vers l'arrière, le bord antérieur légèrement concave. Disque un peu plus densément ponctué que la tête, avec un sillon longitudinal médian s'étendant jusqu'au quart antérieur.

Elytres étroits, trois fois plus longs que le pronotum, 3,8 fois plus longs que larges ensemble, très fortement sériés-ponctués. Apex arrondis en commun.

République du Congo: Plateau Batéké, Mbé, 14. I. 1964; holotype ♀ au Musée de Budapest; Réserve de la Léfini, près de Mpo, 13. I. 1964.

Observations: Dans le tableau des formes de ce genre [VILLIERS (1961): Ann. Mus. roy. Afr. centr., Sc. zool., **98**, p. 53—55] cette espèce vient se ranger avec *P. pulchella* (PASCOE). La nouvelle espèce se distinguera par son pronotum proportionnellement plus allongé, à côtés droits et plus fortement convergents en arrière.

Promecolanguria cylindrica VILLIERS

Promecolanguria cylindrica VILLIERS (1961): Explor. Parc nat. Garamba, **22**, p. 31, fig. 26—31; holotype: République Centre-Africaine (Muséum de Paris).

Répartition géographique: République Centre-Africaine, Congo ex-belge, République du Congo.

République du Congo: Réserve de la Léfini, près de Mpo, 6—8. I. 1964; Plateau Batéké, Mbé, 14. I. 1964.

Observations: presque tous les exemplaires appartiennent à la forme «major» à pronotum relativement court et large.

Promecolanguria carvalhoi VILLIERS

Promecolanguria carvalhoi VILLIERS (1951): Publ. cult. Comp. Diam. Angola, No. **45**, p. 126, fig. 1—3; holotype: Angola (Muséum de Paris).

Répartition géographique: Angola, Sud du Congo ex-belge.

République du Congo: Réserve de la Léfini, Mpo, 9—13. I. 1964.

Clerolanguria tricolor (FABRICIUS)

Clerus tricolor FABRICIUS (1787): Mant. Ins., **1**, p. 126; type: ? (British Museum).

Répartition géographique: Du Sénégal au Sudan et au Ruanda.

République du Congo: Loudima, 6. XII. 1963; Brazzaville, 30. XII. 1963; Sibiti, 26. XI., 2. XII. 1963.

Clerolanguria pallidisternum (ARROW)

Anadastus pallidisternum ARROW (1939): Proc. Roy. ent. Soc. London, B, **3**, p. 202; holotype: Tanganyika (British Museum).

Répartition géographique: du Sénégal au Tanganyika.

République du Congo: Brazzaville, 23. X. 1963; chutes de la Bouenza, 30. XI. 1963; Sibiti 25—26. XI. 1963.

Stenolanguria gorhami FOWLER

Stenolanguria gorhami FOWLER (1885): Trans. ent. Soc. London, p. 388; holotype: Cameroun (British Museum).

Répartition géographique: Du Libéria au Kenya.

République du Congo: Sibiti, en forêt, 25. XI. 1963; Kindamba, Meya, rivière Louolo, 11. XI. 1963.

Stenolanguria tricolor FOWLER

Stenolanguria tricolor FOWLER (1885): Trans. ent. Soc. London, p. 388; holotype: Sud Nigeria (British Museum).

Répartition géographique: Du Togo à l'Uganda.

République du Congo: Sibiti, en forêt, 25. XI. 1963.

Barbaropus cupreus (ARROW)

Promecolanguria cuprea ARROW, in JOHNSTON (1902): Uganda Protectorate, **1**, p. 460; holotype: Uganda (British Museum).

Répartition géographique: Du Sénégal au Nyassa.

République du Congo: Kindamba, Meya, en savane, 3, 11. XI. 1963; Kindamba, Meya, forêt de Bangou, 12. XI. 1963; Kindamba, Meya, rivière Louolo, 12. XI. 1963; Sibiti, 26. XI., 2. XII. 1963; Plateau Batéké, Mbé, en savane, 14. I. 1964.

Barbaropus dubius (FOWLER)

Languria dubia FOWLER (1885): Trans. ent. Soc. London, p. 385; holotype: Cameroun (British Museum).

Répartition géographique: De la Guinée à l'Uganda.

République du Congo: Kindamba, Meya, rivière Louolo, 2—12. XI. 1963; Kindamba, Meya, en savane, 12. XI. 1963; Sibiti, en forêt, 25—27. XI. 1963.

Barbaropus leleupi VILLIERS

Barbaropus leleupsi VILLIERS (1958): Rev. zool. Bot. afr., **58** (1—2), p. 36, fig. 1—5; holotype: Congo ex-belge (Musée Afrique centrale).

Répartition géographique: Bas-Congo.

République du Congo: Plateau Batéké, Mbé, en savane, 14. I. 1964.

Barbaropus similis VILLIERS

Barbaropus similis VILLIERS (1961): Explor. Parc nat. Garamba, **22**, p. 45, fig. 42 à 46; holotype: Congo ex-belge (Musée Afrique centrale).

Répartition géographique: Congo ex-belge.

République du Congo: Réserve du Mont Fouari, en savane, 14. XII. 1963; Loudima, à la lumière, 7. XII. 1963.

Anadastus tropicus VILLIERS

Anadastus tropicus VILLIERS (1945): L'Abeille, **37**, p. 61, 70, fig. 130, 132; holotype: Cameroun (Muséum de Paris).

Répartition géographique: De la Guinée au Congo ex-belge.

République du Congo: Sibiti, 26—27. XI. 1963; forêt classée à 30 km à l'Ouest de Brazzaville, 26. XII. 1963.

Anadastus kassaicus VILLIERS

Anadastus kassaicus VILLIERS (1958): Bull. Inst. fr. Afr. noire, A, **20** (4), p. 1186, fig. 20—21; holotype: Congo ex-belge (Muséum de Paris).

Répartition géographique: Connu seulement du Kassaï.

République du Congo: Plateau Batéké, Mbé, en savane, 14. I. 1964.

Anadastus beaumontae VILLIERS

Anadastus beaumontae VILLIERS (1966): Bull. Inst. fond. Afr. noire, A, **28** (2), p. 824, fig. 11—15; holotype: Congo-Brazzaville (Muséum de Paris).

Répartition géographique: Connu seulement au Congo-Brazzaville (Sibiti et Mbila).

République du Congo: Sibiti, 12. XI., 2. XII. 1963.

Anadastus promontorii (CROTCH)

Languria promontorii CROTCH (1876): Cist. Ent., **1**, p. 383; holotype: Cap de Bonne Espérance (?) (Manchester Museum).

Répartition géographique: De la Guinée au Congo ex-belge.

République du Congo: Loudima, 6. XII. 1963.

Anadastus ellenbergeri VILLIERS

Anadastus ellenbergeri VILLIERS (1961): Ann. Mus. roy. Afr. Centr., Sc. zool., **98**, p. 323, fig. 715—717; holotype: Gabon (Muséum de Paris).

Répartition géographique: Gabon, Congo ex-belge.

République du Congo: Sibiti, ruisseau près de Zanzi, 28. XI. 1963.

Anadastus subspinosus ARROW

Anadastus subspinosus ARROW (1929): Proc. zool. Soc. London, **1**, p. 11 et 15; holotype: Congo ex-belge (Musée Afrique centrale).

Répartition géographique: Cameroun, Gabon, Congo ex-belge.

République du Congo: Sibiti, en forêt, 23. XI., 2. XII. 1963.

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ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
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A NEW GEOMETRID SPECIES: EUPITHECIA CATHARINAE SP. NOV. (LEPIDOPTERA: GEOMETRIDAE)

By

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In the volume of Geometridae of the great SEITZ'work, PROUT (1915) enumerates the following species as consituting the *absinthiata*-subgroup: *Eupithecia absinthiata* CL., *E. goossensiata* MAB., *E. lunata* DTZ., and *E. mandschuriaca* STGR. (I do not consider *E. expallidata* DBL. belonging strictly to this subgroup). Our author mentions yet *knautiata*, described by GREGSON from Lancashire, England. He considered it a subspecies of *goossensiata*, while DIETZE (1913) relegated it to *absinthiata*.

E. lunata DTZ. and *E. mandschuriaca* STGR. inhabit in Asia the Ili and the Amur regions, respectively. In Central Europe, we have only *E. absinthiata* CL. and *E. goossensiata* MAB. indigenous. Since the separation of the two species is not easy, the opinion, with respect to the specific state of the two taxa, of systematists has been long divided. Noted *Eupithecia* specialists, e.g. DIETZE (1913) and PETERSEN (1909), have not acknowledged the distinctness of *goossensiata*. They based their statement partly on similarities in the structure of the reproductive organs, partly on the experimental facts that the larvae of both species had accepted the foodplant of each other.

Against their deductions made from the results of laboratory experiments on the rearing of larvae, there are the following considerations to discuss:

1. It is questionable whether they have identified the animals correctly and indisputably when the breeding experiments had been undertaken;

2. In view of the fact that we are dealing with more or less polyphagous insects, changes from one foodplant to the other cannot unequivocally determine the taxonomic evaluation of these forms. And especially not when the breeding happens in artificial conditions (According to available literature data, *absinthiata* is rather polyphagous, and its foodplants include *Solidago*, *Senecio*, *Eupatorium cannabinum*, *Artemisia*, *Achillea*, *Erigeron canadense*, *Scabiosa*, and so on. *Goossensiata* larvae have been found on *Calluna* and *Erica* in the field).

3. As far as I know, no investigation has been made whether there occur hybrid populations in areas inhabited by both taxa.

In the course of my studies, the first steps to be taken were to discover characteristics by which *absinthiata* and *goossensiata* can be securely distinguished. Work was made easier by having recourse, in the collection of the Hungarian Natural History Museum, to a number of precisely labelled specimens originating from breedings conducted by several reliable lepidopterist. I succeeded to find, both in the external morphological characters and the structure of the male and female genital organs, constant differences by which the above taxa can be distinguished from one another, indeed, they substantiate the view that we are dealing with two distinct species.

In examining the rather bulky Hungarian material, I found two forms separable without any undue difficulties also on the basis of the external features. Of these, none could be identified with *goossensiata*. This was only to be expected, since *goossensiata* inhibits cold and humid habitats, the like of which may occur at most in the western confines of the country (The species may even breed there and systematic collecting in the area may yet produce it from that region).

A part of our home material agreed with our authentic *absinthiata* specimens originating from abroad. The rest, however, rather strongly differed, both as to morphologic and phenological characters, and habitat requirements as well, from *absinthiata* and *goossensiata*. The examination of the reproductive organs gave the same result. And since a thorough study of the relevant literature left no doubt that the form in question cannot be but a still underscribed member of the subgroup, I propose to introduce it as

Eupithecia catharinae sp. nov.

In the following, I submit all particulars distinguishing the new species from its two nearest allies, *E. absinthiata* CL., and *E. goossensiata* MAB.

D i m e n s i o n s . Both sexes of *E. catharinae* sp. nov. are bigger than *absinthiata*.

Alar expanse:

	E. catharinae sp. nov.	*E. absinthiata* CL.
♂♂ (mean of 15 specimens)	18.67 mm	17.97 mm
extreme values	18.0—20.0 mm	16.9—19.5 mm
♀♀ (mean of 30 specimens)	20.62 mm	18.08 mm
extreme values	16.0—23.5 mm	16.5—20.0 mm

According to available specimens and literature data, *goossensiata* is even smaller than *absinthiata*.

S h a p e o f w i n g s. The wings of *absinthiata* are more elongated than those of *catharinae* sp. nov. The rate of the costa, the termen, and the dorsum

of the latter species is 22 : 14 : 15, whereas in the former one this rate is 20 : 14 : 13. Hence the apex of the wing of *absinthiata* is more pointed.

The wings of *goossensiata* are even more elongated than those of *absinthiata*.

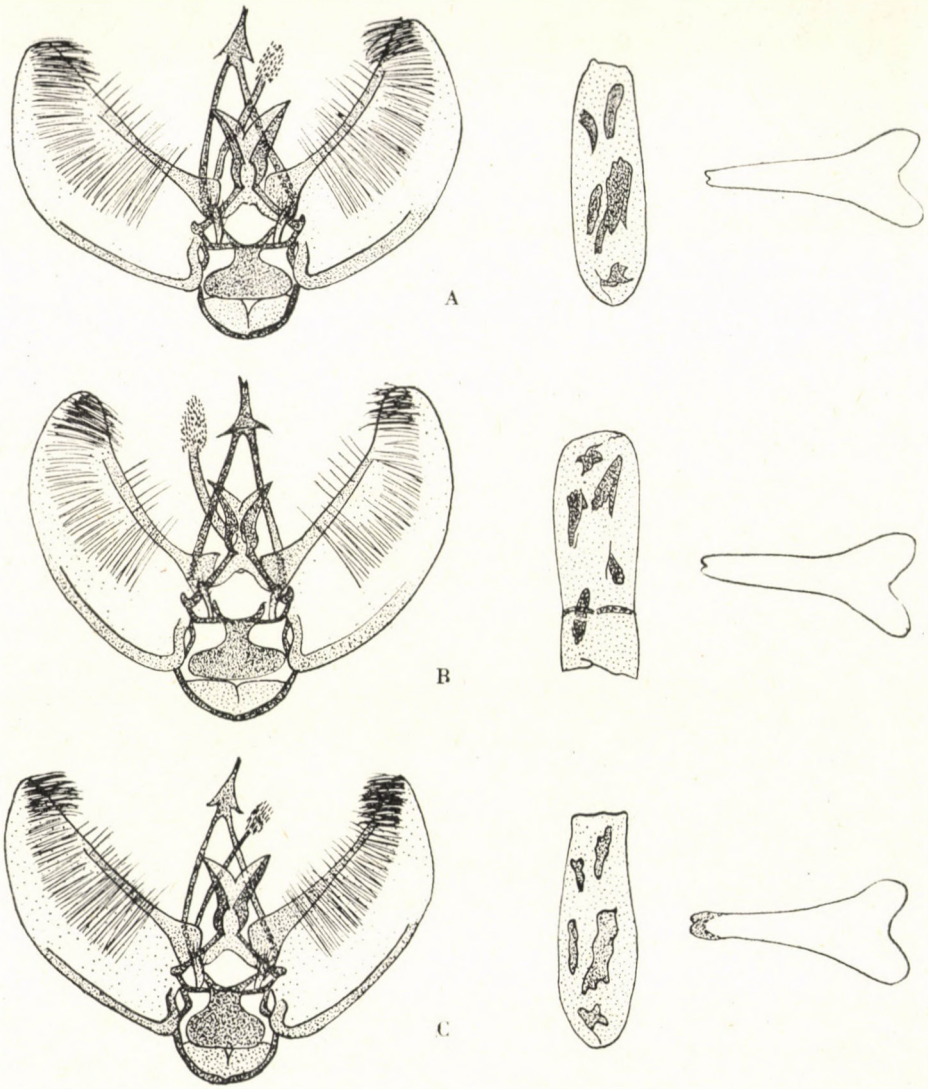

Fig. 1. Male sexual organ and eighth sternite of A = *Eupithecia catharinae* sp. nov., B = *E. absinthiata* CL., C = *E. goossensiata* MAB. (slides No. 370, 379, 339, respectively, prep. VOJNITS)

Color and pattern. The main elements of the pattern of *catharinae* sp. nov. and *absinthiata* agree. The discal spot of *catharinae* sp. nov. is slightly sharper, but the pattern is less distinct on the underside of the wings.

There is a marked difference in the basic color of the wings. While *absinthiata* is "chocolate brown" (DIETZE, 1913), with a rufous shine, the brown basic color of *catharinae* sp. nov. displays an iron grey shade. The difference is rather marked in contrasting larger series of the two species. *Goossensiata* is less rufous than *absinthiata*, tending rather to a light grey; its discal spot is small.

Reproductive organs. The differences apparent in the structure of the sexual organs are not considerable, but constant and unequivocal.

Male (Fig. 1). The basic structure is similar in all three species. It is the shape of the valvae which shows marked deviations, as follows: the costa of *catharinae* sp. nov. is straight, the dorsum medially more strongly curving, the apex pointed; the costa of *absinthiata* is slightly arcuate, especially apicad, the dorsum evenly curving, the apex obtuse, its valvae narrower than those of the new species; the costa of *goossensiata* is straight, the dorsum strongly curving in its last third, otherwise almost straight, the apex pointed, the valvae narrower in general than those of *catharinae* sp. nov. I found no basic differences in the structure of the aedoeagi.

Female (Fig. 2). The essential differences lie in the shape and size of the bursa, and the size and arrangement of the signa. The bursa of *catharinae* sp. nov. is the biggest of all three, its shape is more elongated than that of *absinthiata*; the main axis slightly exceeding that of the latter species. The greatest width at right angles to the main axis is about the same as in *absinthiata*. The bursa is full with very many, robust, long, and densely arranged signa. The bursa of *absinthiata* is rather spherical, the signa smaller than in *catharinae* sp. nov., and also less densely spaced. The bursa of *goossensiata* is essentially smaller and more elongated than in the two preceding species, and though the signa are robust and long, they are still less densely spaced.

The rate of the two main axes (the longitudinal and the longest one at right angles to it) in the three species of the subgroup is as follows:

catharinae	17 : 11
absinthiata	16 : 11
goossensiata	15 : 9

The shape of the eighth male sternite is largely identical in *absinthiata* and *catharinae* sp. nov., while that of *goossensiata* bears at its attenuating section a strongly chitinized, incrassate zone.

Phenological differences. In Hungary, *absinthiata* begins to fly at the end of June, ending the flight in the first days of August. The flying period in colder areas (Germany, etc.) is July—August. On the other hand, *catharinae* sp. nov. takes to wings about 30 days later, at the end of July, and specimens can be collected even at the beginning of September.

Habitat. The requirements of *catharinae* sp., nov. and *absinthiata* are in this respect wholly different. The new species breeds in dry and warm localities and thus frequents the Great Plain and the strongly insolated, rocky,

shrubby, karst slopes of the central range. *Absinthiata* is characteristic of colder and more humid areas.

In recording the localities of the two species, it is most important to indicate also the vernacular name of the habitat itself and not only the name of the village or an equivalent administrative unit. For example, the two species can be found near one another, in different habitats, but within the confines of the same village in the Great Plains. But whereas *catharinae*

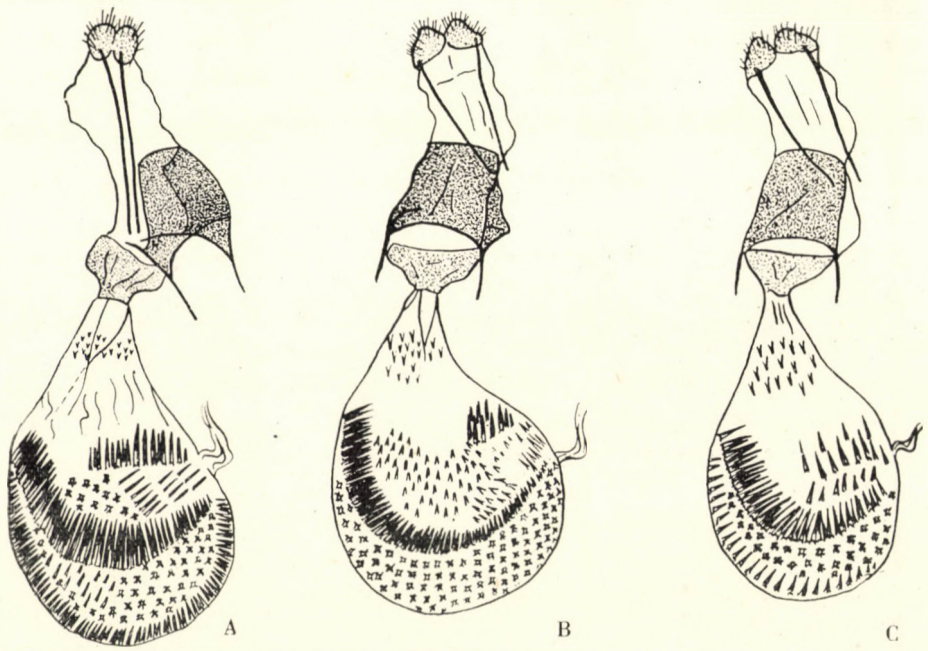

Fig. 2. Female sexual organ of A = *Eupithecia catharinae* sp. nov., B = *E. absinthiata* CL., C = *E goossensiata* MAB. (slides No. 377, 148, and 340, respectively, prep. VOJNITS)

sp. nov. flies in the summer in hot, dry, sandy sites, *absinthiata* inhabits the marshy habitats forming in the backwater areas of rivers insuring a colder microclimate.

F o o d p l a n t . DR. L. KOVÁCS, DR. GY. LENGYEL, J. SZŐCS and others collected and bred a great number of caterpillars. *Catharinae* sp. nov. was found on *Solidago virgaurae*, and it fed on this plant also in captivity. *Absinthiata* larvae were collected and bred on *Eupatorium cannabinum*.

D i s t r i b u t i o n . *Absinthiata* occurs in North and Central Europe, the Soviet Union, in the Altai area and in North Tibet. *Goossensiata* is the commonest in the western parts of Central Europe, but it was found also in Finland and the Soviet Union. *Catharinae* sp. nov. is not rare in Hungary. However, I found only a single specimen, in our available material, deriving from beyond our frontiers (Trebevic, Czechoslovakia).

Among the three nearly related species, *absinthiata* and *goossensiata* may have occurred in the colder climatological periods also further away to the south, having subsequently retired during the last warmer period to also colder regions. *Absinthiata* is getting restricted even today in the Plains, concurrently with the decreasing areas of the swampy and marshy sites. *Catharinae* sp. nov. inhabits warmer and drier localities, and will probably be found, outside the Carpathian Basin, also in the neighbouring countries, inhabitats of similar character.

The material I examined contained no specimens which might refer to hybridization. Any such possibility is rather meagre from the very outset, with respect to the considerable phenological and ecological isolation. And isolation as well as the stable differences apparent in the external morphological characters and the structure of the reproductive organs unequivocally attest that the new form shown from Hungary represents a distinct species.

Holotype male: "Kunfehértó, 1966, VII. 22, fénycsapda" (light trap); in the collection of the Hungarian Natural History Museum, Budapest. Paratypes: 1 ♀, Hárshokorhegy, Budakeszi, 15 Aug., 1952, leg. J. Szőcs; 1 ♀ the Buda hills, Budapest, 14 Aug., 1950, leg. Gy. Lengyel; 1 ♀, Mátraszentlászló, 830 m, 13—16 Aug., 1958, leg. Z. Kaszab; 1 ♀, Piliscsaba, 14 June, 1959, e larva, leg. Gy. Lengyel; 1 ♀, Kunfehértó, 6 Aug., 1966, light trap; 1 ♂, Kunfehértó, 8 Aug., 1966, light trap; 1 ♀, Kunfehértó, 13 Aug., 1966, light trap; 1 ♀, Kunfehértó, 27 July, 1967, light trap; 1 ♂, Várgesztes, 17 July, 1967, light trap. All deposited in the collection of the Hungarian Natural History Museum, Budapest.

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REFERENCES

1. Abafi-Aigner, L. (1907): Magyarország lepkéi. — Budapest, pp. VI+XXXII+137.
2. Bergmann, A. (1955): Die Schmetterlinge Mitteldeutschlands, — Leipzig—Jena, **5** (2), p. 561—1267.
3. Bleszynski, S. (1965): Geometridae. — in: Klucze do oznaczania owadów Polski, Lepidoptera, XXVII, **46** b, Warszawa, pp. 305.
4. Culot, J. (1917): Noctuelles et Géomètres d'Europe, III—IV. — Genève, pp. 167.
5. Dietze, K. (1900): Beiträge zur Kenntnis der Eupithecien. — Dtsch. Ent. Ztschr. Iris, **13,** p. 306—327.
6. Dietze, K. (1913): Biologie der Eupithecien. — Berlin, pp. 172.
7. Heuser, R., Jöst, H. & Roesler, R. (1964): Die Lepidopteren-Fauna der Pfalz, IV. Die Spanner. — Mitt. d. Pollichia, **3** (11), p. 5—140.
8. Kovács, L. (1953, 1956): A magyarországi nagylepkék és elterjedésük I. és II. (Die Gross-Schmetterlinge Ungarns und ihre Verbreitung. I und II). — Fol. Ent Hung., Ser. Nov., **6,** p. 77—164 and **9,** p. 89—140.
9. Kovács, L. (1958): Die Veränderungen in der Gross-Schmetterlingfauna von Ungarn seit dem Erscheinen der Fauna Regni Hungariae bzw. des Schmetterlingsbuches von Abafi-Aigner. — Fol. Ent. Hung., Ser. Nov., **11,** p. 133—188.
10. Petersen, W. (1909): Ein Beitrag zur Kenntnis der Gattung Eupithecia Curt. — Dtsch. Ent. Ztschr. Iris, **22,** p. 203—314.
11. Prout, B. L. (1915): Die Spannerartigen Nachtfalter. — in Seitz: Die Gross-Schmetterlinge der Erde IV, Stuttgart, pp. 579.
12. Prout, B. L. (1939): Die Spannerartigen Nachtfalter. — in Seitz: Die Gross-Schmetterlinge der Erde, Supplement ad IV, Stuttgart, pp. 766.
13. Spuler, A. (1918): Die Schmetterlinge Europas II. — Stuttgart, pp. 523.
14. Urbahn, E. (1967): Das neue Geometridensystem von C. Herbulot und Anmerkungen dazu (Lep. Geometridae). — Entomol. Berichte, p. 33—52.

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XV. 1—2. 1969 p. 237—242

EINE NEUE COLLINARIA-ART UND DIE BESCHREIBUNG DES WEIBCHENS VON C. NIGROMACULATA V. ROSER (DIPTERA: EMPIDIDAE)

Von

M. WÉBER

PÄDAGOGISCHE HOCHSCHULE, LEHRSTUHL FÜR ZOOLOGIE, PÉCS
(DIREKTOR: PROF. DR. M. WÉBER)

(Eingegangen am 31. Mai 1968)

Während der Bearbeitung der Empididae-Sammlung des Ungarischen Naturhistorischen Museums wurde eine neue *Collinaria*-Art und das bisher unbekannte Weibchen von *C. nigromaculata* V. ROSER angetroffen. Die beiden Tiere werden wie folgt beschrieben.

Collinaria hungarica sp. n.

♂: Die Augen berühren sich oberhalb der Fühler. Obere Facette größer als die untere. Stirn aschgrau, die dreieckige Verbreitung neben den Fühlern ist jedoch samtig schwarz. Fühler schwarz, so lang wie der Kopf breit. Mundrand glänzend schwarz. Rüssel so lang wie der Kopf hoch, glänzend schwarz bzw. braunschwarz. Hinterer Teil des Kopfes glänzend schwarz, aber fein grau bestäubt. Haare, Borsten des Kopfes schwarz.

Thorax glänzend schwarz, Mesonotum etwas schwächer, Pleuren etwas dunkler grau bestäubt. Spitze des Episternums unbedeckt, an der Seite 6—10 schwarze Borsten. Auf dem Mesonotum sind drei schmale, nicht scharf begrenzte Streifen dunkelbraun. Die akrostichal Borsten stehen unregelmäßig in zwei Reihen. Die Dorsozentralborsten bilden mit den an der Seite befindlichen Mesonotumborsten ein gemeinsames Feld. Neben der praescutellaren Vertiefung stehen die Dorsozentralborsten in einer Reihe, die letzte unter ihnen ist die längste. Die Zahl der humeralen Borsten ist groß. 1—2 von ihnen sind kräftig. Die Zahl der Notopleuralborsten beträgt 3. Auf dem Scutellum befinden sich 4 Randborsten, die mittleren sind länger und kreuzen sich. Die Metapleuralborsten sind schwarz.

Beine schwarz, braunschwarz, glänzend, mit Ausnahme der Coxen, die aschgrau sind. Erster Femur unbedeckt, auf der Tibia befinden sich dorsolateral lange Haare, sie sind länger als der Durchmesser der Tibia. Auf der Tibia stehen einige apikale Borsten (Abb. 1 A). Auf dem zweiten Femur

ventral zwei kurze, spärliche Dornreihen, im oberen Drittel sind die Dorne etwas länger. Auf der Tibia stehen dorsal 5—6 lange, kräftige Borsten, die nahezu so lang sind wie das zweite-dritte Glied des Tarsus (Abb. 1 B). Femur des dritten Beines stark verdickt, ventral mit einer Reihe von Dornenpaaren besetzt, die aus kurzen Dornen besteht. Im Spitzendrittel des Femurs sind die Dorne dichter, sie bilden hier eine unregelmäßige Reihe. Tibia ist knieförmig mit dem Femur verbunden, dorsal auf ihr 3—5 nahezu so lange Borstenpaare wie der Durchmesser der Tibia. Die dritte Tibia ist anderthalbmal so

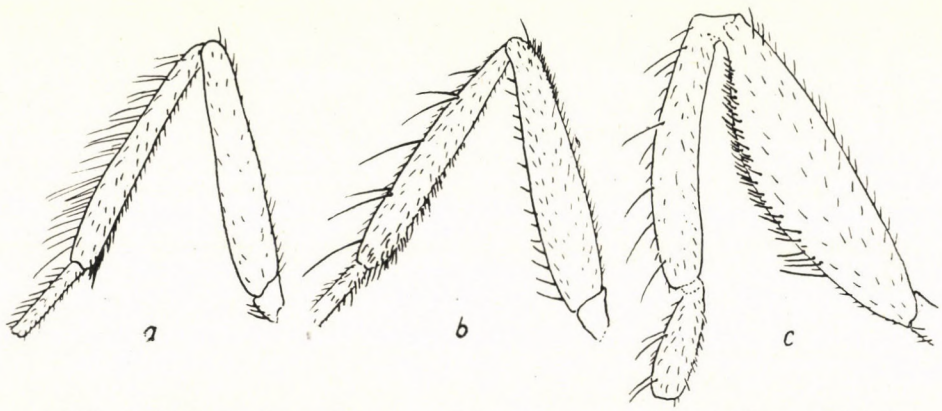

Abb. 1. *Collinaria hungarica* sp. n. Beine ♂: A = p_1, B = p_2, C = p_3 (Orig.)

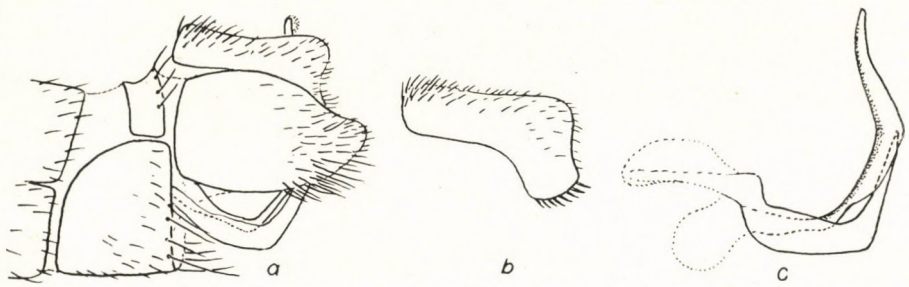

Abb. 2. *Collinaria hungarica* sp. n. Geschlechtsorgan ♂: A = Genitalsegment, B = obere Platte, C = Penis (Orig.)

dick wie die erste oder zweite. Metatarsus etwas dicker als die übrigen Oberfußglieder, dorsal darauf in der Mitte und an der Spitze je ein Paar längere Borsten (Abb. 1 C).

Flügel bräunlich, Flügelfleck etwas dunkler braun. Flügelschuppen von derselben Farbe wie Flügel, am Rand braunschwarze Borsten vorhanden. Stiele der Halteren am Ansatz braun, im übrigen gelblich.

Abdomen glänzend schwarz, im auffallenden Licht, von hinten betrachtet, flaumig silbergrau, besonders die Rückenplatten und der hintere Rand

der Bauchplatten und dessen Kanten. Behaarung des Abdomens schwarz. An der Seite der ersten drei Segmente sind die Haare länger.

Geschlechtssegment glänzend schwarz bzw. braunschwarz. Obere Platte des Geschlechtsorgans L-förmig (Abb. 2 B), an ihrem unteren Rand gleichlange Haare. Seitenplatte nach hinten zu zugespitzt, auf dem ventralen Rand der Spitze stehen längere Haare (Abb. 2 A). Penis gebogen, in der Mitte in stumpfem Winkel gebrochen (Abb. 2 C). Ansatz des Penis etwas dicker. Geschlechtsorgan geschlossen.

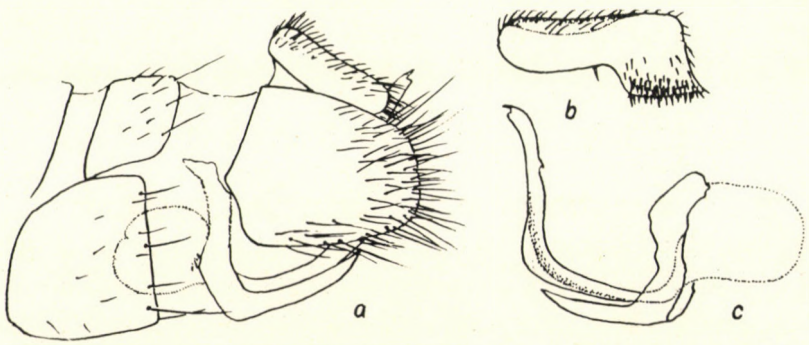

Abb. 3. *Collinaria argentata* v. Röd. Geschlechtsorgan ♂: A = Genitalsegment, B = innere Seite der oberen Platte, C = Penis (Orig.)

♀: Dem Männchen ähnlich, nur sind die Haare und Borsten kürzer, die Bestäubung ist intensiver. Abdomenanhänge zweimal so lang wie die Länge des letzten Segmentes.

Körperlänge: 4,5—5 mm, Flügellänge: 4—4,5 mm.

Holotypus: 1 ♂, Csákvár, Hajdúvágás, 25. IV. 1961. leg. F. Mihályi. Paratypus: 1 ♂, 1 ♀ Fót, Somlyóberg, 4. V. 1960. leg. F. Mihályi; 1 ♂ Csákvár, Hajdúvágás, 26. IV. 1961. leg. F. Mihályi. Die bisher angeführten Holotypen bzw. Paratypen befinden sich in der Sammlung der Zoologischen Abteilung des Naturwissenschaftlichen Museums Budapest. — 1 ♂ Tard, Sugaró-Wald, 12. V. 1958. leg. S. Tóth. Dieses Exemplar in der Sammlung der Pädagogischen Hochschule, Pécs.

Die neue Art ist mit Sicherheit in die Untergattung *Collinaria* Frey (1949) einzureihen, was auch die Struktur des Geschlechtsorgans und die unbedeckte Spitze des Episternum begründet. Von den ihr nahe stehenden Arten (*C. argentata* v. Röd., *C. nigromaculata* v. Ros., und *C. ignobilis* Zett.) unterscheidet sie sich hauptsächlich in folgenden Merkmalen:

Im Genitalsegment von *C. argentata* ist das Ende der Seitenplatte abgerundet (Abb. 3 A), die auf ihr befindlichen Haare sind kräftiger. Das Ende der L-förmigen oberen Platte ist gerade, die auf dieser dicht stehenden Borsten sind kurz. In der ventralen Neigung steht ein selbständiger Dorn (Abb. 3 C). Der Penis ist auch hier gebrochen, doch ist der Bruchwinkel größer, und dorsal in Richtung der Spitze befindet sich ein kleines hackenförmiges Gebilde (Abb. 3 C).

Im Genitalsegment von *C. nigromaculata* v. Ros. ist die Seitenplatte gestreckt, ventral ausgebuchtet, dreieckförmig, auf der Spitze und am Rand sind nur wenige Borsten vorhanden (Abb. 4 A). Ende der oberen Platte oval, Ansatz stielförmig. An der Spitze der inneren Seite stehen dicht kurze Borsten (Abb. 4 B). Penis einfach, gebogen (Abb. 4 C). In der Literatur finden sich keine Abbildungen der Geschlechtsorgane dieser Art.

Das Geschlechtsorgan von *C. siebecki* Strobl, *C. oldenbergi* Frey und *C. ignobilis* Zett. unterscheidet sich auch im äußeren Habitus von dem der neuen Art (Abb. 5).

Weitere erhebliche und gegenüber den anderen Arten kennzeichnende Unterschiede sind die folgenden: Auf der Tibia des ersten Beines befinden sich lange Haare. Tibia des dritten Beines ist knieförmig mit dem Femur verbunden, der mindestens 2,5mal so dick ist wie die Tibia. Das Geschlechtsorgan besitzt eine andere Form. Flügel von *C. ignobilis* mit Sicherheit milchweiß, Ansatz des dritten Femurs schlank. Flügel der neuen Art bräunlich, der dritte Femur dick. An den Beinen des Weibchens fehlen die Federn, ein Kennzeichen, welches sie — außer der Form der Tibia und des Femurs — mit Sicherheit von der Art *C. argentata* v. Ros. unterscheidet.

Collinaria nigromaculata v. Roser

Prof. Dr. R. Frey schreibt in seiner Arbeit »Die Fliegen der palaearktischen Region 28. Empididae« auf Seite 552 über die Art *Collinaria nigromaculata* v. Ros. folgendes:

»In Coll. v. Roser im Stuttgarter Museum fand sich nach Oldenberg 1 ♂ Ex. mit defekten Fühlern und Beinen. Thorax eingedrückt. Zum Glück Nr. 45 ‚*Rhamph.* sp.' ein besser erhaltenes ♂ derselben Art. Jetzt sind diese Exx. laut Mitteilung von Prof. E. Lindner im Museum nicht mehr vorhanden. Fundorte und Fundzeiten sind in der Sammlung v. Rosers nicht angegeben, doch ist wohl anzunehmen, daß die Tiere, entsprechend der Überschrift in Rosers Verzeichnis, alle oder fast alle aus Württemberg stammen«.

Mit Lichtfallen wurden 1966 in einem Tal neben der Siedlung Vasas II. im Mecsekgebirge 3 ♂ und 4 ♀ von dieser Art erbeutet. 21. IV. 3 ♂ und 1 ♀, 19. IV. 1 ♀, 16. IV. 1 ♀ und 8. IV. 1 ♀ 1966. Weibchen waren bisher nicht bekannt.

Die Männchen konnten auf Grund der Beschreibung von Frey bestimmt werden (Abb. 4).

Beschreibung des Weibchens: Kopf schwarz, aschgrau bestäubt. Stirn so breit wie die beiden ersten Fühlerglieder lang. Auf der Stirn neben dem Rand der Augen je 5 kurze Borsten. Ozellarborsten so lang wie die beiden ersten Fühlerglieder zusammen. Borsten des Kopfes schwarz. Fühler schwarz, erstes Fühlerglied länger als das zweite. Rüssel so lang wie der Kopf hoch.

Thorax schwarz, dunkelgrau bestäubt. Bestäubung des Mesonotums etwas braun, aber auch etwas glänzend. Die Borstenreihen des Mesonotums stehen auf wenig aschfarbigen dunklen Streifen, so daß auf dem Mesonotum

drei schmale Streifen erscheinen. Akrostichale Borsten kurz, bilden 2 Reihen. Dorsozentralborsten sitzen unregelmäßig in zwei Reihen, aber auch die Fläche hinter den Schultern ist von Borsten besetzt. Auf der Schulter mehrere Borsten, von denen eine kräftiger und länger ist als die übrigen. Die

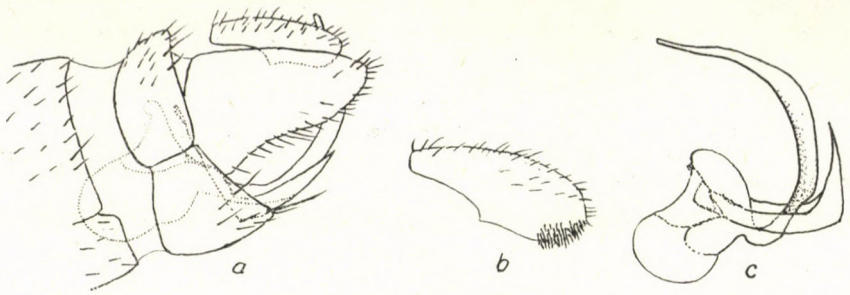

Abb. 4. *Collinaria nigromaculata* v. Ros. Geschlechtsorgan ♂: A = Genitalsegment, B = innere Seite der oberen Platte, C = Penis (Orig.)

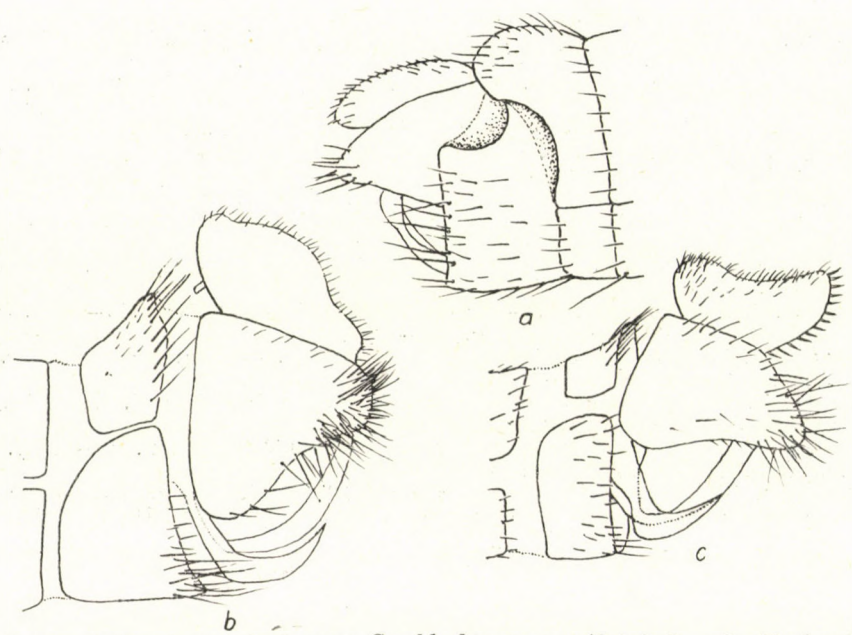

Abb. 5. A = *Collinaria siebecki* Strobl, Geschlechtsorgan ♂ (Orig.), B = *C. oldenbergi* Frey Geschlechtsorgan ♂ (Orig.), C = *C. ignobilis* Zett. Geschlechtsorgan ♂ (nach Collin)

seitlich auf dem Mesonotum stehenden Borsten sind lang. Scutellum bräunlichgrau bestäubt, mit vier Borsten am Rand, von denen die beiden mittleren länger sind.

Abdomen grau bestäubt, im auffallenden Licht silbern glänzend. Borsten schwarz. Rand der Tergite heller, etwas gelblich gefärbt.

Beine braunschwarz. Hüfte grau bestäubt. Die Borsten an den Beinen sind kürzer und schwächer als beim ♂. Auf dem dritten Femur sowohl dorsal wie ventral durch eine Borstenreihe gefiedert, die sich an die Beine schmiegt. Unter den dorsalen Borsten der dritten Tibia sind einige (4—5) länger als die übrigen.

Farbe der Flügel und die Aderung wie beim Männchen. Stiel der Halteren braun, Kopf gelb.

Neotypus: 2 ♂ und 1 ♀ Mecsekgebirge, Vasas II. 21. IV. 1966. leg. M. WÉBER. Die angeführten Exemplare befinden sich in der Sammlung der Zoologischen Abteilung des Ungarischen Naturwissenschaftlichen Museums, Budapest.

SCHRIFTTUM

1. BEQUAERT, M. (1962): Empididae (Diptera) inédits de Yugoslavie. — Bull. Ann. Soc. Roy. Belg., **98**, p. 75—93.
2. BEZZI, M. (1904): Empididae novae Palaearcticae ex Museo Nationali Hungarico. — Ann. Hist.-nat. Mus. Nat. Hung., **2**, p. 198—202.
3. COLLIN, J. E. (1926): Notes on the Empididae (Diptera) with Additions and Corrections to the British List. — Ent. Mont. Mag., **62**, p. 215—219.
4. COLLIN, J. E. (1933): Empididae. — in: Diptera of Patagonia and South Chile. Part **4**, p. 209—220.
5. COLLIN, J. E. (1961): Empididae. — in: British Flies, **6** (2), p. 382—415.
6. ENGEL, E. O. und FREY, R. (1956): Empididae. — in LINDNER: Die Fliegen der palaearktischen Region, **4** (4), p. 546—554.
7. FREY, R. (1934): Entomologische Ergebnisse der schwedischen Kamtschatka-Expedition 1920—1922. 36. Diptera, Brachycera 5. Empididae. — Ark. f. Zool., **28**, A. Nr. 10, p. 1—7.
8. FREY, R. (1950): Dipterafauna vid Tana älv i. Utsjaki sommaren 1949.—Not. Entomol., **30**, Nr. 1—2, p. 5—18.
9. MALLOCH, J. R. (1919): Diptera. — in: Canadian Arctic Expedition 1913—18. 3. Insects Southern Party 1913—16, Part **C**, p. 440—490.
10. OLDENBERG, L. (1910): Einige europäische Empididen. — Ann. Hist.-nat. Mus. Nat. Hung., **8**, p. 344—349.
11. SAIGUSA, T. (1966): The genus Rhamphomyia Meigen from Fukien, China (Diptera: Empididae). — Pacific Insect, **8** (4), p. 906—913.
12. SMITH, K. G. V. (1962): Studies on the Brazilian Empididae (Diptera). — Roy. Ent. Soc. London, **114**, p. 195—266.
13. SYUSIRO, I. (1961): Neue Empididen aus Japan (I), mit der Beschreibungen der unbeschriebenen Weibchen. — Pub. Ent. Lab. Univ. Osaka Pref., Nr. **6**, p. 123—128.

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ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
XV. 1—2. 1969 p. 243—246

REGENWÜRMER (LUMBRICIDAE) AUS MADEIRA UND VON DEN KANARISCHEN INSELN

Von

A. ZICSI

INSTITUT FÜR TIERSYSTEMATIK DER L.-EÖTVÖS-UNIVERSITÄT, BUDAPEST
(DIREKTOR: PROF. DR. J. BALOGH)

(Eingegangen am 15. Januar 1968)

Von Herrn DR. H. FRANZ, Professor an der Hochschule für Bodenkultur Wien, erhielt ich im vergangenen Jahr eine kleine Ausbeute von Regenwürmern, die z. T. in Madeira, z. T. auf den Kanarischen Inseln gesammelt wurden. Für die Freundlichkeit, mir das Material zur Bestimmung überlassen zu haben, spreche ich Herrn Prof. DR. H. FRANZ auch an dieser Stelle meinen besten Dank aus.

Unter den zur Bestimmung vorliegenden Tieren bin ich zwei Arten begegnet, mit denen ich mich hier eingehender befassen möchte. Es handelt sich einerseits um *Dendrobaena madeirensis* (MICHAELSEN) 1891, die meines Erachtens zur Gattung *Allolobophora* eingereiht werden muß, andererseits um *Allolobophora molleri* ROSA 1889, deren Beschreibung durch einige Angaben ergänzt werden soll.

Dendrobaena madeirensis wurde von MICHAELSEN 1891 in der Originalbeschreibung als *Allolobophora*-Art beschrieben. Etwas später betrachtet sie ROSA (1893) als eine fragliche *Dendrobaena* Form. Bei RIBAUCOURT (1896) wird sie wieder als der Gattung *Allolobophora* angehörend vermerkt. Auf Grund einer ergänzenden Beschreibung wird *A. madeirensis* von MICHAELSEN (1900, p. 493) endgültig in die Gattung *Dendrobaena* gestellt: »Borsten weit bis sehr weit gepaart; am Vorderkörper Borstendistanz *ab* gleich *cd* gleich 1/3 *aa* und gleich 1/2 *bc*; am Mittelkörper und Hinterkörper *ab* und *cd* nur weniger kleiner als *aa* und *bc*«.

Soweit die einschlägige Literatur eingesehen werden konnte, liegen keine weiteren ergänzenden Beschreibungen vor, in den neueren Bestimmungsbüchern, bzw. Revisionsarbeiten (COGNETTI, 1931; OMODEO, 1956) sowie in den Originalarbeiten, in denen ein Wiederfund erwähnt wurde (HEITOR, 1960) wird sie als *Dendrobaena*-Art verzeichnet.

In der Aufsammlung von Herrn Prof. DR. H. FRANZ liegen zwei vollkommen geschlechtsreife Exemplare vor, die auf Grund der Gesamtmerkmale einwandfrei mit der von MICHAELSEN beschriebenen Art übereinstimmen. Da

ich dieser Art jetzt zuerst begegnet bin und da die Originalbeschreibung auf Grund zweier erweichter Tiere erfolgte, gebe ich nachstehend eine kurze Beschreibung der in meinem Besitz befindlichen Tiere.

Allolobophora madeirensis MICH., 1891 (Abb. 1)

Länge: 92 mm, Breite 5 mm, Segmentzahl 173 (MICHAELSEN, 1900: Länge 42—47 mm, Breite 4—5 mm, Segmentzahl 129—135).

Farbe: Graubraun. Kopf epilobisch, offen. Erster Rückenporus auf Intersegmentalfurche 3/4. Borsten gepaart *aa* : *ab* : *bc* : *cd* : *dd* = 6 : 1 : 4 : 1 :

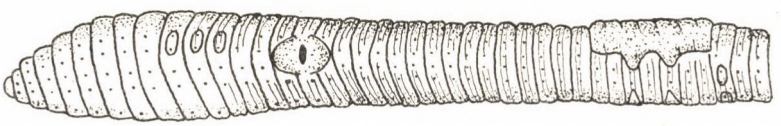

Abb. 1. *Allolobophora madeirensis* MICHAELSEN, 1891

12. Borsten *cd* des 9., 10. und 11. Segmentes auf Drüsenpapillen, ebenso die Borsten *ab* des 38. Segmentes. Männliche Poren mit großen, erhabenen Drüsenhöfen, die auf das 14. und 16. Segment hinüberreichen. Gürtel sattelförmig vom 31.—37. Segment (Originalbeschreibung: $^1/_3$ 31.—$^1/_3$ 37. Segment). Pubertätstuberkel quere Polster, 2 Paar am 33. und 35. Segment.

Innere Merkmale: Verdickte Dissepimente fehlen. Kalkdrüsen mit großen Ausbuchtungen im 10. Segment. Vier Paar Samensäcke im 9.—12. Segment. Hoden und Samentrichter frei. Zwei Paar Samentaschen im 9. und 10. Segment, die in die Intersegmentalfurchen 9/10 und 10/11, in den Borstenlinien *cd* münden.

Fundort: A. 32. Madeira, Umgebung Pico de Ariein. Grasmatten in ungefähr 1800 m Höhe. 4. IV. 1967. leg. H. FRANZ. 5879. Madeira, Queimadas, 800 m. Lorbeerwald. 13. 4. 1967. leg. H. FRANZ.

Wie auch aus der Beschreibung hervorgeht, bestehen Unterschiede bloß in der Größe und Segmentzahl sowie in der Borstenanordnung. Völlig übereinstimmend und sehr kennzeichnend ist die Ausbildung der Pubertätstuberkel, die Lage des Gürtels, die Zahl der Samensäcke und Samentaschen und die der Borstenpapillen tragenden Segmente. Ohne den Typus gesehen zu haben, bin ich fest überzeugt davon, derselben Form wie MICHAELSEN gegenüberzustehen, und da außer der verschieden angegebenen Borstenanordnung (erweichte Exemplare bei MICHAELSEN) alle übrigen wichtigen Merkmale (vgl. POP, 1941) auf eine Zugehörigkeit zur Gattung *Allolobophora* hinweisen, betrachte ich sie als dieser Gattung angehörend.

Allolobophora molleri Rosa, 1889 (Abb. 2)

Wie aus der Originalbekanntmachung hervorgeht, erfolgte die Beschreibung der Art auf Grund von nicht geschlechtsreifen Tieren, so daß selbst die Gürtelausdehnung — eines der wichtigsten Bestimmungsmerkmale — nicht angegeben werden konnte; Rosa 1889, p. 3—4: »Il clitello non era visibile si nostri esemplari, ma deve comprendere in sè questi stessi segmenti«. Soweit mir bekannt, liegt, obwohl neuere faunistische Fundorte gemeldet wurden (Heitor, 1960; Alvarez, 1967) keine Wiederbeschreibung dieser Art vor. Da in der mir zur Verfügung stehenden Ausbeute 3 vollkommen adulte und 2 weniger ge-

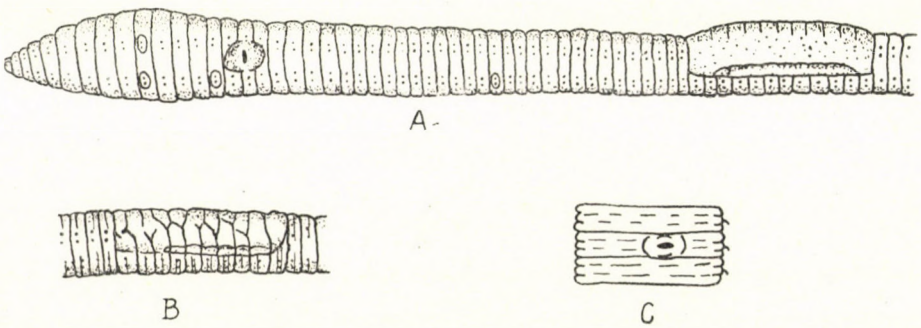

Abb. 2. A = *Allolobophora molleri* Rosa, 1889; B = Gürtelausbildung eines unvollkommen geschlechtsreifen Exemplares; C = Ausbildung der männlichen Poren bei einem nicht vollkommen geschlechtsreifen Tier

schlechtsreife Tiere vorliegen und da mit Sicherheit anzunehmen ist, daß sie mit *A. molleri* identisch sind, soll nachstehend eine Neubeschreibung erfolgen.

Einleitend sei jedoch bemerkt, daß in der Entwicklungsweise bei *A. molleri* eine gewisse Ähnlichkeit mit *A. dubiosa* (Örley), 1880 besteht (Zicsi, 1963). Obwohl bei den 2 von mir als unvollkommen geschlechtsreif bezeichneten Exemplaren der Gürtel deutlich zu erkennen, die Pubertätsstreifen entwickelt sind, können sie ähnlich wie bei *A. dubiosa* dennoch nicht als geschlechtsreif gelten, da die männlichen Poren kaum sichtbar sind (Abb. 2C). Während bei den adulten Tieren die männlichen Poren groß sind und auf die benachbarten Segmente (14.—16. Segment) übergehen, entwickeln sich die Gürtelorgane zu wulstigen, sattelförmigen Gebilden. Meistens kommt dies auch in der größeren Ausdehnung der Gürtelorgane zum Ausdruck. Eben solche Exemplare führen unbewußt zu falschen Diagnosen.

L ä n g e: 60—70 mm, Breite 3,5—4 mm. Segmentzahl 144—171.

F a r b e: Grün. Kopf epilobisch 1/2 geschlossen. Erster Rückenporus auf Intersegmentalfurche 3/4. Borsten eng gepaart. Borsten *ab* und *cd* des 9. Segmentes, sowie *ab* des 13. und 32. Segmentes auf großen Drüsenpapillen angeordnet. Männliche Poren groß, auf die benachbarten Segmente 14.—16. über-

gehend. Gürtel sattelförmig vom 47., 48., 49.—57., 58. Segment. Pubertätsstreifen vom 49., 50.—56., 57. Segment.

Innere Merkmale: Etwas verdickte Dissepimente vom 6/7. bis 10/11. Segment. Große Ausbuchtungen der Kalkdrüsen im 10. Segment. Hoden und Samentrichter im 10. und 11. Segment frei. Vier Paar Samensäcke im 9—12. Segment. Vier Paar Samentaschen im 7., 8., 9., und 10. Segment, die sich in die Intersegmentalfurchen 7/8, 8/9, 9/10 und 10/11 öffnen (In der Originalbeschreibung ist die Zahl der Samensäcke nicht angegeben, Samentaschen nur zwei Paar, die des 7. und 8. Segmentes). Muskelmagen im 17—18. Segment.

Fundort: 5874. La Palma, Umgebung der Fuente de la Zarza. 17. VIII. 1966. leg. H. FRANZ.

Aus der Ausbeute von Herrn Prof. DR. H. FRANZ wurden noch folgende Regenwürmer bestimmt (die Zahlen von den Fundortangaben beziehen sich auf die Inventarnummer der Institutssammlung):

Lumbricus terrestris L. — 5864. Madeira, Ribeiro Grande, Lorbeerwald, ca. 800—900 m. 7. IV. 1967. 1 Expl.

Lumbricus rubellus HOFFM. — 5978. La Gomera. 2 Expl.

Dendrobeana rubida (SAVIGNY). — 5865. Madeira, Ribeiro Grande, Lorbeerwald, ca. 800—900 m. 7. IV. 1967. 1 Expl.

Dendrobaena octaedra (SAVIGNY). — 5876. Madeira, Queimadas, 800 m. Lorbeerwald, 13. IV. 1967. 1 Expl.

Allolobophora caliginosa (SAVIGNY). — 5872. Madeira, Ribeiro Grande, Lorbeerwald, ca. 800—900 m. 7. IV. 1967. 3 Expl. — 5872. La Palma, Umgebung der Fuente de la Zarza. 17. VIII. 1966. 2 Expl. — 5873. Gran Canaria, Tamadaba, *Pinus canariensis* ca. 1600 m. 26. III. 1967. 1 Expl. — 5877. La Gomera. 2 Expl.

Octolasium complanatum (ANT. DUGES). — 5868. Tenerife. 5 Expl.

Eiseniella tetraedra (SAVIGNY) f. *typica*. — 5870. Lanzarote, Fuente de Chafari. 19. III. 1967. 1 Expl. — 5871. Gran Canaria, Umgebung Artenara. 13. VIII. 1966. 1 Expl. — 5874. Madeira, Queimadas, 800 m. Lorbeerwald. 13. VI. 1967. 1 Expl.

SCHRIFTTUM

1. ALVAREZ, J. (1967): Über die Verbreitung der Regenwürmer (Oligochaeta: Lumbricidae) in verschiedenen Böden und Landschaften Spaniens. — Progress in Soil Biology, Braunschweig-Amsterdam, p. 525—532.
2. COGNETTI DE MARTIIS, L. (1931): Catalogo dei Lumbricidi. — Arch. Zool. Ital., **15**, p. 371—443.
3. HEITOR, F. P. C. (1960): Lumbricidae de Portugal. — Agronomia Lusitana, **22**, p. 231—244.
4. MICHAELSEN, W. (1891): Terricolen der Berliner Zoologischen Sammlung. I. Afrika. — Arch. f. Naturg., **57**, p. 205—228.
5. MICHAELSEN, W. (1900): Oligochaeta. — In: Das Tierreich, Lief. **10**, pp. 575.
6. OMODEO, P. (1956): Contributo alla revisione dei Lumbricidae. — Arch. Zool. Ital., **41**, p. 129—212.
7. POP, V. (1941): Zur Phylogenie und Systematik der Lumbriciden. — Zool. Jahrb. Syst., **74**, p. 487—522.
8. RIBAUCOURT, E. (1896): Étude sur la fauna Lombricide de la Suisse. — Rev. Suisse Zool., **4**, p. 1—110.
9. ROSA, D. (1889): Note sui Lombrichi iberici. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **4**, Nr. 63, p. 1—5.
10. ROSA, D. (1893): Revisione dei Lumbricidi. — Mem. R. Acc. sc. Torino, 43 (Ser. 2), p. 399—476.
11. ZICSI, A. (1963): Beobachtungen über die Lebensweise des Regenwurmes Allolobophora dubiosa (Örley) 1880. — Acta Zool. Hung. **9**, p. 219—236.

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THE DESCRIPTION OF A NEW KONOWIA BRAUNS, 1884 SPECIES FROM HUNGARY AND SOME REMARKS ON KONOWIA BIFURCATA MAA, 1949 (HYMENOPTERA: SYMPHYTA, XIPHYDRIIDAE)

By

L. ZOMBORI (Budapest)

(Received November 14, 1967)

The family Xiphydriidae (BENSON, 1954) includes an obscure genus described by BRAUNS in 1884. The genus is easily separable from other Xiphydriidae, for the fore wing has only two enclosed cubital cells, distinguishing it from *Pseudoxiphydria* ENSLIN, 1917, which has three. The genus *Konowia* BRAUNS has had two species until now, one described by BRAUNS when erecting the genus, named *Konowia megapolitana*, the other by MAA in 1949, known as *Konowia bifurcata*.

MAA's species, however, does not seem to be a *Konowia* species after a scrutiny of the characters given in his description (MAA, 1949). Before writing this brief paper I had a careful study of BRAUN's original description of *Konowia*. Meanwhile, I sought advice from Mr. R. B. BENSON of British Museum (Natural History), London and we exchanged a number of letters on the topic. Herewith, I wish to present two short extracts from Mr. BENSON's letters closely relating to the discussion and subscribing to my assumption, in connection with MAA's *bifurcata*, expounded below. In a letter written on the 30th December, 1966 he says: "In regard to the species of *Konowia*, there is a 2nd European 'species' which was described by MAA, 1949 ..... I should warn you that I do not find MAA's work very reliable as I have indicated in my own paper". Some months later, on the 1st May, 1967 he goes even further: " ... the description of the species of *Konowia* that I referred to. I doubt very much whether this really represents a new species but you will of course have to consider it. Even the type locality is so vague 'Europe'." For the sake of clarity I herewith quote the respective lines from MAA's study: " 'Europe', 1 ♂ (Taiwan Agric. Inst.). This unique specimen is derived from T. SHIRAKI's collection and was brought back by him from a European museum" (p. 69). Another interesting thing, what one learns while studying MAA's description, is that this "unique" male specimen has been "pinned together" with a female individual of *Xiphydria picta* KONOW, 1897. To this effect MAA states: "It was originally pinned together with a ♀-*Xiphydria*, bear-

ing two common labels 'Europe, Col. T. SHIRAKI' and '*Xiphydria camelus* LINN., compared with type, det. T. SHIRAKI'. On examining the female specimen concerned, however, it proved to be *X. picta* KNW., instead of *camelus*" (p. 69). In Europe, it is a usual practice that specimens caught in copulation are mounted on a common pin. Of course, my assumption can be argued that it is also likely that the two animals (a female and a male) were not caught in copulation and were only pinned together by chance! But there are further points to be considered in connection with the validity of MAA's species.

MAA's description of *Konowia bifurcata* seems very detailed at first glance, however, at close inspection it is revealed that the characters used do not follow the features enumerated by BRAUNS when describing his *Konowia megapolitana*, and thus the two species do not contrast clearly. In other words, MAA brings forth characters which neither conform nor contrast with *Konowia megapolitana* BRAUNS, leaving systematists at a loss, to decide for themselves. However, with patience and deliberation MAA's *bifurcata* can be reconstructed to a fairly recognizable form and character, thus obtaining a more or less satisfactory picture what the animal would look like in reality. From this point of view, the 'reconstructed' animal appears to be more like a male specimen of *Xiphydria picta* KONOW than anything else, which seems to subscribe to the assumption expressed above. For another problem, MAA states: "antennae 15 segmented", then twenty-eight lines later he says: "It is rather poorly preserved, with the antennae and legs partly mutitated" (probably reading mutilated). It is interesting to note that he uses plural when referring to the antenna, so that the question immediately arises: how can he count the number of joints if the antennae are partly mutilated? Furthermore, he only gives the ratio of the first five joints: "relative lengths of segments I—V about 11 : 5 : 11 : 8 : 7." Could it be possible that the longest antenna in part comprised merely five joints? Or that the least number of still intact segments was 15? The coloration of the head: "Golden yellow on following portions: clypeus, paragenae (anteriorly black), frons anterior to about the level of posterior margins of antennal insertions, malar spaces, anterior halves and posterio-lateral margins of temples, short submedian bands on vertex." (p. 68), but more especially the 'golden yellow' abdominal lateral spots on tergites 2—5 are deciding characters, for these are present in all *Xiphydria* LATREILLE species but not in *Konowia* BRAUNS. As regards the tarsal claws: "apically bifurcate, the preapical tooth exceptionally long and slender" (p. 68); *Konowia* BRAUNS has a simple claw. Only the body length of MAA's species ("length about 11.5 mm.") is the character which seemingly conforms to that of *Konowia megapolitana* BRAUNS. However, it must be borne in mind that body length in Siricoidea may vary greatly. It is quite common among the individual animals in Siricoidea that body length may vary between 10 and

40 mm. Consequently, it could very well be assumed that MAA's specimen is but an underfed, dwarf male of *Xiphydria picta* KONOW (Its body length is generally given in keys of identification as being between 12 and 22 mm). In concluding this topic, final conclusions might naturally only be drawn after a close inspection of the type-specimen of *Konowia bifurcata* MAA.[1]

After the survey of MAA's dubious *Konowia* species, I wish to turn to a comparatively less important question, namely, the number of antennal segments in *Konowia* BRAUNS. In describing his *Konowia megapolitana*, BRAUNS states that the antenna is 13-segmented. The scape is curved and as long as the third segment. In *Xiphydria*, this joint has a stumpy base, above this a short 'neck', and this usually dilates into the characteristic form of the scape (Fig.1). The base of the scape is called the 'radicle' (BENSON, 1951). Admittedly, this short base resembles a separate joint in itself, however, generally, it is not regarded as such, for it had fused with the rest of the segment. Thus it could well be that when counting the number of segments BRAUNS started with this short stump as segment No. 1, following it up with the rest of the scape as No. 2 arriving at number 13 at the end. I feel justified to make mention of this fact for I refer, in my description of a new species, to the number of antennal segments as being 12.

Konowia guntionensis sp. nov.

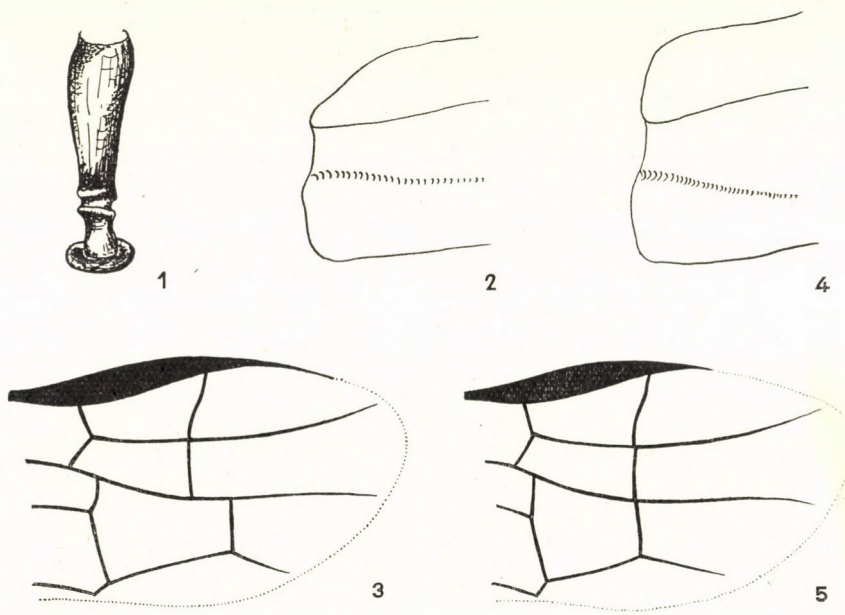
♀. — Black. Head globular with relatively small compound eyes. Face strongly rugose, supraclypeal area raised into a small crest, outer orbit shining between numerous longitudinally running striae, vertex shining with sparse, large but shallow punctures. Relative distance between lateral ocelli as compared to median ocellus 12 : 7. Mandible strong, 4-toothed, greater part dark yellow, black only at base, while teeth brown, all covered with long white hairs. Mandibular and maxillar palpi dark yellow. Occipital carina sharp, complete all round. Antenna black, very short, 12-segmented, only extreme tip of scape and pedicle dark brown, covered with very short white pubescence. Ratio of antennal segments: 20 : 11 : 22 : 9 : 9 : 9 : 8 : 8 : 8 : 7 : 7 : 6, giving a string of beads-like appearance. From the fourth to the tenth, segments only 1.2—1.5 times longer than wide, segments eleven and twelve about 1.8—2.0 times longer than wide.

Thorax dull with dense punctures; anterior margin of pronotum shining; mesoscutum in lateral view smoothly rounded off (Fig. 2), in the middle with an unpunctured area dull black; medial scutal line and prescutal sutures well developed; scutellum roughly coriaceous with a medial suture; cenchri small,

[1] While preparing this paper I have written a letter to Prof. TSING-CHAO MAA of Taipeh, Taiwan, Formosa, requesting the type for examination, but, unfortunately, my letter was left unanswered.

set widely apart. Tegulae conspicuous yellow. Mesopleura alveolate, lower quarter smooth with small dimples and some adhering white hairs.

Wings uniformly infuscate, base of costa yellow, otherwise venation and stigma brown. Intercostal area with an erect *Sc* vein, about 1.5 times of the length of *Sc* away from *M*, vein *R*1 rather long extending to $^3/_4$ on margin of cell 3*R*1, 3*rm* absent, 2*mcu* farther away from 2*rm* than half of latter (Fig. 3), anal cell with oblique cross vein. Along radial and vanal fold brown, infuscate.



Figs. 1—5. 1 = Xiphydriid scape to show radicle, 2 = Mesoscutum of *Konowia guntionensis* sp. nov. in lateral view, 3 = Part of right fore wing showing relative position of 2*mcu* to 2*rm* and the length of *R*1 on margin of cell 3*R*1 in *Konowia guntionensis* sp. nov., 4 = Mesoscutum of *Konowia megapolitana* BRAUNS in lateral view, 5 = Part of right fore wing showing relative position of 2*mcu* to 2*rm* and length of *R*1 on margin of cell 3*R*1 in *Konowia megapolitana* BRAUNS

Left hind wing without enclosed cells: 1 + 2*Rs* and 1*M* (RICHARDS 1956), a short vein springing from *Cu*1 is present as if continuation of *mcu*, parallel with *cua*. (Right hind wing missing).

Legs: coxa, trochanter, trochantellus, femur dark brown. Femora with a very regular fine sculpture. Tibiae, tarsi of all legs with dense, short, white hairs. Fore tibia yellow with one laminate apical spur longer than apical breadth of tibia, basitarsus also yellow, rest of tarsus infuscate. Median tibia with two apical spurs of length equal to apical breadth of tibia, more or less infuscate, only basitarsus somewhat lighter. Hind tibia brown with two apical spurs short-

er than apical breadth of tibia, first tarsal segment yellowish-brown. Ratio of hind tarsal segments: 44 : 16 : 14 : 10 : 22, claws simple.

Abdomen cylindrical, about as long as head and thorax together. First tergite with a wide median split, margins bordering split smooth and shining with very sparse large punctures, rest of tergite strongly coriaceous, basal part of second tergite heavily sculptured, passing into a fine undulous striation extending over tergites 3—8; 9th hardly sculptured. Only lateral parts of tergites 6—9 with short white hairs, posterior margin of tergite 8 with a zone of hairs, leaving a smooth hairless patch in the middle of about $^1/_4$ of the whole. Apex of 9th tergite brown with bristle-like yellow hairs, pygostyle black, short hardly extending beyond apex of 9th tergite. Sternites uniformly black with a very fine, irregular sculpture covered with short white hairs. Basal plate with its apical part yellowish, slightly longer than sawsheath, latter coriaceous with longer white hairs. Sawsheath about as long as hind tibia, projecting only 0.5 mm beyond last tergite. Length 8.5 mm.

Male unknown.

In contrasting the new species with the type-species of *Konowia megapolitana* BRAUNS, 1884, the following characters are worth of mention: scape clearly shorter than 3rd antennal segment (type-species: scape longer than 3rd antennal segment), antennal segments stouter, generally only 1.2—1.5 times longer than wide (type-species: 2.0—3.0 times longer than wide), 2*mcu* farther away from 2*rm* than half of the latter (type-species: 2*mcu* almost interstitial with 2*rm*), anal cell with oblique cross vein (type-species: anal cell with suberect cross vein), scutellum roughly coriaceous and a median line present (type-species: scutellum only slightly coriaceous, no median line present), basitarsus not equal to the three following segments (type-species: basitarsus equals the three following segments).

Holotype (♀): "Kőszegi hegyek, 1936 V. 19—23. Exc. Inst. syst. zool. Univ. Budapest". Label of determination: "*Konowia megapolitana* BRAUNS, det. MÓCZÁR" (published in MÓCZÁR, 1938). The holotype is deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 105.

The name is derived from records of the historic Castellum Guntionis frist appearing in 9th century charters. The area has earlier been occupied by the Avars, later by Charlemagne, the name possibly originates from the former.

The geographical distribution of *Konowia megapolitana* BRAUNS, according to available literature, is as follows: Austria, Croatia, Finland, Germany, Hungary and the USSR.

The two female specimens, found in the Hungarian Natural History Museum, Budapest, come from the following localities (in Table I, one is marked with 1, the other with 2, I refer to them accordingly): 1. Beszt. (erce) Bánya, Coll. FEKETE, 1918. V. 15, and 2. Bükk hg. (Mountains), Nagyvisnyó, Nagyvölgy, 1957. V. 29.—VI. 4., leg. MÓCZÁR L.

For an easy survey of differences, I present a comparative table (Table I) showing the characters in four columns. The first gives the characters of the

Table I

characters	*K. guntionensis* sp. nov.	*K. megapolitana* BRAUNS, 1	*K. megapolitana* BRAUNS, 2	*K. megapolitana* BRAUNS (type)
length	8.5 mm	7.5 mm	8.5 mm	8.0 mm
colour	black	dark brown	black	black
mandible	4-toothed	2-toothed	3-toothed	2-toothed
behind eyes	slightly contracted	contracted	contracted	slightly contracted
occipital carina	complete	incomplete	incomplete	—
antennal ratio (first four joints)	20:11:22:9	22:10:20:14	22:13:21:16	22:11:22:11 (relative ratio)
antennal joints from 5th to 10th	1.2—1.5 times longer than wide	2.0—3.0 times longer than wide	2.0—3.0 times longer than wide	"gradually becoming shorter and thinner"
tegula	yellowish	brown	dark brown	—
mesoscutum in lateral view	rounded (Fig. 2)	obtuse (Fig. 4)	obtuse (Fig. 4)	—
scutellum	rough, divided longitudinally	not rough, complete	not rough, complete	not rough, —
hind tarsal segments (4)	1 ≠ 2+3+4, ratio 44:16:14:10	missing	1 = 2+3+4, ratio 35:16:11:8	1 = 2+3+4 (no ratio given)
wing	light brown, infuscate	brown, infuscate	brown, infuscate	smoky grey (infuscate)
intercostal area with *Sc*	1.5 times of *Sc* from vein *M*	0.5 times of *Sc* from vein *M*	vein *M* absent in both wings	—
vein *R*1	3/4 of cell 3*R*1 (Fig. 3)	1/3 of cell 3*R*1 (Fig. 5)	1/3 of cell 3*R*1 (Fig. 5)	—
vein 2*mcu*	farther away from 2*rm* than half of latter (Fig. 3)	interstitial with 2*rm* (Fig. 5)	almost interstitial with 2*rm*	almost interstitial with 2*rm*
along vanal and radial folds	infuscate	hyaline	hyaline	hyaline
anal cell	with oblique cross vein	with suberect cross vein	with suberect cross vein	—

new species, the second and third those of the two specimens found in the Hungarian Natural History Museum, Budapest, and the fourth column contains the characters taken from BRAUN's original description of *Konowia megapolitana*. It is hoped that this table will be of some use to systematists, for until now no extensive description, other than BRAUN's has been available. Furthermore, as it will be seen, I have included characters other than what BRAUNS had mentioned in his paper, thus endeavouring to give a better picture of the genus *Konowia* BRAUNS.

Acknowledgement. I am greatly indebted to the late R. B. BENSON of the British Museum (Natural History), London, for his altruistic help and useful advice he had given me while writing the present paper.

REFERENCES

1. BENSON, R. B. (1951): Symphyta. — Hndk. Ident. Brit. Ins., **6,** (2a), p. 12.
2. BENSON, R. B. (1954): Classification of the Xiphydriidae (Hymenoptera). — Trans. R. ent. Soc. Lond., **105,** (9), p. 151—162.
3. BRAUNS, S. (1884): Eine neue Xiphydrinengattung. — Wien. Ent. Zeit., **3,** p. 220—222.
4. ENSLIN, E. (1918): Die Tenthredinoidea Mitteleuropas. — Beiheft d. Entom. Zeitschr. 1912—1917, **7,** p. 708.
5. GUSSAKOVSKIJ, V. V. (1935): Chalastogastra. — in: Faune de l'USSR, Insectes, Hymenoptères, Moscou—Leningrad, **2** (1), p. 45—46, 337.
6. MAA, T. (1949): Asiatic Siricoidea (Hymenoptera). — Not. d'Ent. Chinoise, **13** (2), p. 11—189.
7. MÓCZÁR, L. (1938): Adatok a Kőszegi-hegység hártyásszárnyú faunájához (Beiträge zur Kenntnis der Hymenopteren-Fauna des Kőszeger Gebirges). — Vasi Szemle, ser. I, **5,** p. 74, 77.
8. RICHARDS, W. O. (1956): Hymenoptera. Introduction and keys to families. — Hndk. Ident. Brit. Ins., **6** (1), p. 26.

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ACTA ZOOLOGICA

ТОМ XV. — ВЫП. 1—2

РЕЗЮМЕ

РЕЗУЛЬТАТЫ ВЕНГЕРСКИХ НАУЧНЫХ ЭКСПЕДИЦИЙ ПО ИЗУЧЕНИЮ ПОЧВЕННОЙ ЗООЛОГИИ В ЮЖНУЮ АМЕРИКУ 10. ACARI: ORIBATIDAE ИЗ ВТОРОЙ ЭКСПЕДИЦИИ, I

Й. БАЛОГ (Будапешт) и Ш. МАХУНКА (Будапешт)

Из коллекции **Oribatidae**, собранной при венгерской научной экспедиции по изучению почвенной зоологии, совершенной в Южную Америку, сообщается описание 1 нового семейства, 16 новых родов и 30 новых видов. Статья иллюстрирована превосходными рисунками.

НЕСКОЛЬКО НОВЫХ ВИДОВ GEORYSSUS LATR. ИЗ ИНДОНЕЗИИ, ВЬЕТНАМА И НОВОЙ ГВИНЕЙ (COLEOPTERA: GEORISSIDAE)

Й. ДЕЛЕВ (Брюссель)

Дается описание 7 новых видов *Georissus* из индо-малайско-папуасской территории. Вьетнамские виды были собраны ботаником Тамаш Почь, ново-гвинейские и яванские виды — Лайош Биро, а суматранские виды исследователями германской научной экспедиции по лимнологии. Типы всех описанных видов храняются в коллекции Зоологического отделения Будапештского музея естествознания.

НЕСКОЛЬКО НОВЫХ ВИДОВ ИЗ ТРИБ CYCLOCEPHALINI И PENTODONTINI (COLEOPTERA: DYNASTINAE)

Ш. ЭНДРЁДИ (Будапешт)

Дается описание нескольких новых видов из триб **Cyclocephalini** и **Pentodontini**. Преобладающая часть их была обнаружена в коллекциях П. Ф. С. Переира (Сао Паоло), собранных в Бразилии, Перу и Боливии, а также в материале музея Копенгагенского университета.

НОВЫЕ ВИДЫ TETRASTICHUS HAL. ИЗ ВЕНГРИИ (HYMENOPTERA: CHALCIDOIDEA)

Й. ЭРДЁШ (Томпа)

Автор дает описание 9 новых видов и 2 видоизменений, причисляемых к богатому видами роду *Tetrastichus* **Hal.** и внедряет 3 новых названий. Статья содержит кроме описания видов ценные экологические, фенологические данные и указания для разведения этих перепончатокрылых.

ОБЗОР ТАКСОНОВ, ОТНОСЯЩИХСЯ К КРУГУ ФОРМ APAMEA MONOGLYPHA HUFN. И ОПИСАНИЕ НОВОГО ВИДА (LEPIDOPTERA: NOCTUIDAE)

Л. КОВАЧ (Будапешт) и З. ВАРГА (Дебрецен)

На основе очень основательных сравнительно-морфологических исследований, изучения половых органов и проведения зоогеографического и фауногенетического анализа обсуждается круг форм *A. monoglypha* HUFN. Авторы выясняют с одной стороны, какие из описанныхся до сих пор таксонов этого круга форм следует рассматривать как подвиды вида *A. monoglypha* HUFN. а с другой стороны, что *A. syriaca* OSTH. и *maroccana* ZERNY представляют собой самостоятельные виды. Под названием **Apamea tallosi** sp. n. описывается также новый вид из западной пограничной области Венгрии.

РЕЗУЛЬТАТЫ ВЕНГЕРСКИХ НАУЧНЫХ ЭКСПЕДИЦИЙ ПО ИЗУЧЕНИЮ ПОЧВЕННОЙ ЗООЛОГИИ В ЮЖНУЮ АМЕРИКУ
9. ACARI: PYEMOTIDAE И SCUTACARIDAE ИЗ ОКРЕСТНОСТИ ГВИАЯРАМЕРИНА (БОЛИВИЯ)

Ш. МАХУНКА (Будапешт)

Из материала Венгерской научной экспедиции по изучению почвенной зоологии, собранного в окрестности Гвиаярамерина, дается описание видов Pyemotidae и Scutacaridae. Из 36 видов, обнаруженных в указанном материале, 25 видов оказались новыми для науки.

НОВЫЕ ВИДЫ УЛИТОК ИЗ БОЛГАРИИ (GASTROPODA: HELICIDAE)

Л. ПИНТЕР (Будапешт)

Сообщается описание 3 новых видов (**Helicella? depulsa** sp. n., **Monacha venusta** sp. n., **M. pilosa** sp. n.) и 1 нового подвида (**Helicella obvia razlogi** ssp. n.), обнаруженных в материале, собранном автором в Болгарии. В связи с описанием нового подвида обсуждаются также интересные систематические и экологические проблемы.

ДАННЫЕ К СИСТЕМАТИКЕ СЕМЕЙСТВА HIRUDINIDAE (HIRUDINOIDEA), С ОПИСАНИЕМ НОВЫХ СЕМЕЙСТВ, РОДОВ И ВИДОВ

Л. Р. РИЧАРДСОН (Графтон, Австралия)

На основе результата главным образом сравнительно-анатомических исследований (в первую очередь глотки и ее окружности, а также половых органов) автор сообщает свои систематические и генетические выводы: 1. точное разграничение родов *Hirudo* L. s. str. и *Haemopis* L. s. str.; 2. в связи с азиатскими видами *Hirudo* описание нового рода **Asiaticobdella,** а для североамериканских видов *Haemopis* описание новых родов **Bdellarogatis, Mollibdella** и **Percymoorensis**; 3. При ревизии австралийских видов выдвигаются новые роды **Quantenobdella, Goddardobdella, Eunomobdella** и **Euranophila**; 4. точное, основывающееся на анатомических признаках описание австралийских родов *Richardsonianus*, *Aetheobdella*, *Ornithobdella* и *Hirudobdella*, и американских родов *Potamobdella*, *Pintobdella* и *Macrobdella*; 5. в заключение автор предлагает выдвижение новых семейств Hirudinidae s. str., Macrobdellidae, Richardsonianidae, Ornithobdellidae и Haemopidae и сообщает также диагнозы последних.

КЛЮЧ ДЛЯ ОПРЕДЕЛЕНИЯ РОДОВ ПИЯВОК ВСЕГО МИРА (HIRUDINOIDEA) И КАТАЛОГ ВИДОВ V. СЕМЕЙСТВО: HIRUDINIDAE

А. ШООШ (Будапешт)

В пятой части своей серии статьей автор занимается с семейством Hirudinidae. После краткого введения и в этой части дается ключ для идентификации родов, а затем каталог видов, содержащий 25 родов и 93 видов. В заключении приводится богатый список литературы и дается указатель.

КОМПЛЕКС STREPSIPTERAE — ЦИКАДОВЫЕ — ВИРУСНЫЕ ЗАБОЛЕВАНИЯ РАСТЕНИЙ

В. СЕКЕШШИ (Будапешт)

На основе исследования комплекса вирусные заболевания растений — цикадовые — **Strepsipterae** автор приходит к заключению, что причинная связь между вирусными заболеваниями, перенесенными **Strepsipterae** и их животными хозяевами предположительно кроется в том, что паразиты, присутствующие в животных хозяевах, влияют на обмен веществ последних и тем самым снижают сопротивляемость против заражения, а также против дальнейшего развития вирусов. Поскольку дальнейшие исследования и эксперименты предоставят доказательства этой гипотезы, то зараженность и, главным образом, для степень зараженности цикадовых паразитами **Strepsipterae** можно будет использовать при постановлении прогноза отдельных вирусных заболеваний растений.

ACROLEPIA KAROLYII SP. NOV. (LEPIDOPTERA: ACROLEPIIDAE)

Й. СЁЧ (Будапешт)

Под названием **A. karolyii** sp. n. дается описание нового вида из рода *Acrolepiidae* относящегося к группе *betulella* Curt., близкого виду *similella* Müll.-Rutz. Кроме описания вида дается также описание гусениц, личинок и мин. Хозяином нового вида *Tamus communis* является растением.

НОВЫЙ ПОДВИД ВИДА MELLICTA BRITOMARTIS ASSM. (LEPIDOPTERA: NYMPHALIDAE)

З. ВАРГА (Дебрецен)

Под названием **M. b. michielii** ssp. n. дается описание очень темного нового подвида с сравнительно большим ростом из Словении, относящегося к виду *Mellicta britomartis* Assm., который в европейской части своего ареала раздробляется на множество подвидов. Обнаружение нового подвида является дальнейшим, существенным доказательством сходства фауны чешуекрылых и фауногенеза словенских и северовенгерских карстовых гор.

РЕЗУЛЬТАТЫ ВЕНГЕРСКОЙ НАУЧНОЙ ЭКСПЕДИЦИИ ПО ИЗУЧЕНИЮ ПОЧВЕННОЙ ЗООЛОГИИ В БРАЗЗАВИЛЬ-КОНГО 38. COLEOPTERA: LANGURIDAE

А. ВИЛЛИЕ (Париж)

В коллекции Венгерской научной экспедиции по изучению почвенной зоологии автор идентифицировал 23 вида Languriidae, среди которых 2 вида (**Paracladoxena infima** sp. n. и **Promecolanguria kaszabi** sp. n.) оказались новыми для науки. Много видов автором впервые были выявлены на территории Браззавиль-Конго.

НОВЫЙ ВИД ИЗ РОДА EUPITHECIA (LEPIDOPTERA: GEOMETRIDAE)

А. ВОЙНИЧ (Будапешт)

Автор в своей работе излагает виды группы *absinthiata* рода *Eupithecia*, встречающиеся в средней Европе. Он выявляет, что виды *E. absinthiata* Cl. и *E. goossensiata* Mab. представляют два хорошо определенных самостоятельных вида. В Венгрии встречается лишь первый из них. С другой стороны, в ходе исследования значительного венгерского материала выяснилось, что в Венгрии, наряду с видом *E. absinthiata* Cl. живет еще и другой, до сих пор неизвестный, родственный вид. Этот новый вид описывается автором под названием **Eupithecia catharinae** sp. nov.

ОПИСАНИЕ НОВОГО ВИДА COLLINARIA И САМКИ ВИДА C. NIGROMACULATA V. ROSER (DIPTERA: EMPIDIDAE)

М. ВЕБЕР (Печ)

Описание нового вида **Collinaria hungarica** sp. n., и до сих пор неизвестной самки вида *Collinaria nigromaculatus* v. Roger на основе 5, а относительно последного 4 экземпляров, собранных в Венгрии.

ДОЖДЕВЫЕ ЧЕРВИ (LUMBRICIDAE) ИЗ О. МАДЕИРЫ И ИЗ КАНАРСКИХ ОСТРОВОВ

А. ЗИЧИ (Будапешт)

В коллекции профессора др-а Х. Франц из Мадеиры и из Канарских островов автор обнаружил два вида дождевых червей, систематическое положение и описание которых нуждались в дополнении. На основе половозрелых экземпляров он переместил вид *D. madeirensis* Mich. отнесенный до сих пор к роду *Dendrobaena* к видам, описавшимся уже первоначально в род *Allolobophora*, а для вида *A. molleri* Rosa который до сих пор был известным лишь по молодым экземплярам, автор дает новое описание.

[НОВЫЙ ВИД KONOWIA ИЗ ВЕНГРИИ И ПРИМЕЧАНИЯ К ВИДУ KONOWIA BIFURCATA MAA, 1949 (HYMENOPTERA: XIPHYDRIDAE)

Л. ЗОМБОРИ (Будапешт)

В начале статьи подробно обсуждаются систематические проблемы, связанные, с видом *Konowia bifurcata* Maa, 1949. Затем дается описание нового вида из Венгрии, под названием **Konowia guntionensis** sp. nov. В заключении статьи результаты автора подытоживаются в сравнительной таблице.

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XV. 3—4. 1969 p. 255—275

THE SCIENTIFIC RESULTS OF THE HUNGARIAN SOIL ZOOLOGICAL EXPEDITIONS TO SOUTH AMERICA*

12. ACARI: ORIBATIDS FROM THE MATERIALS OF THE SECOND EXPEDITION. III.

By

J. BALOGH and S. MAHUNKA

ZOOSYSTEMATICAL INSTITUTE, L. EÖTVÖS UNIVERSITY OF SCIENCES, BUDAPEST (DIRECTOR: PROF. DR. J. BALOGH), AND ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST (DIRECTOR: DR. Z. KASZAB)

(Received January 15, 1969)

The publication of the Oribatid material, deriving from the collectings of the second expedition, is herein continued in accordance with the method of treatment followed in the preceding two papers of the series. The present paper contains the description of 3 new genera and 27 new species.

The species originated from the following localities:

No. 357-1 Brazil, Manaus, 13 November, 1966
No. 357-2 Brazil, Manaus, 13 November, 1966
No. 380-1 Bolivia, Guayaramerin, 20 November, 1966
No. 380-2 Bolivia, Guayaramerin, 20 November, 1966
No. 380-3 Bolivia, Guayaramerin, 20 November, 1966
No. 396 Bolivia, Guayaramerin, 20 November, 1966
No. 406 Bolivia, Guayaramerin, 23 November, 1966
No. 416-1 Bolivia, Guayaramerin, 29 November, 1966
No. 416-2 Bolivia, Guayaramerin, 29 November, 1966
No. 463-1 Bolivia, Puerto Linares, 17 December, 1966
No. 463-2 Bolivia, Puerto Linares, 17 December, 1966
No. 508** Bolivia, Coroico (La Paz), 15 km S of town, 1800 m, 20 Dec., 1966. — BERLESE sample taken from moss cushion along road.
No. 510-2 Bolivia, between Coroico and Unduavi (La Paz), 40 km from Coroico, about 2200 m, 20 Dec., 1966. — BERLESE samples taken from vegetation of steep cliff wall: 2. living and dead moss.
No. 512 Bolivia, Unduavi (La Paz), 5 km N of settlement, 3200 m, 20 Dec., 1966. — BERLESE sample taken from *Sphagnum* thriving on steep cliff wall.
No. 520 Bolivia, between Unduavi and La Paz (La Paz), on the pass, 4850 m, 21 Dec., 1966. — BERLESE sample from plant crust covering cliff.

* The present paper refers to the material collected during the Second Expedition (1966—67). Leader: Prof. Dr. J. BALOGH, other participants: Dr. S. MAHUNKA, and Dr. A. ZICSI.

** Only those localities and habitats are listed in details here which have not yet been discussed in our previous two papers. The data of the other localities are given there.

No. 522-2 Bolivia, valley of Rio Abaho (La Paz), 15 km from La Paz, about 3200 m, 23 Dec., 1966. — BERLESE samples taken below *Mimosa* shrubs. 2. wet litter at base of shrubs.

Allonothrus neotropicus sp. n. (Figs. 1—2)

617—658×316—349 μ. Sensillus long and thin, weakly incrassate merely in its apical portion; here also ciliate. Interlamellar hairs short, characteristically hemispherical. Lamellar hairs long, gradually widening apicad. Rostral hairs simple. Lamellae convergent but not touching medially. Interlamellar region with a margined, semicircular hollow.

N o t o g a s t e r: Surface covered with irregular foveolae. Hairs spatulate, beginning with hair c_1 gradually lengthening posteriorad (except for hairs *h* and *ps*). Hairs h_1, h_2, and ps_1 longest notogastral hairs (in this order of sequence).

V e n t r a l: Epimeral setal formula: 3—1—3—3. All setae slightly incrassate and ciliate. Hairs *3c* and *4c* longer than others. Eleven pairs of genital hairs arising in a longitudinal row on inner margin of genital plate, anterior nine long and ciliate, last two essentially shorter. Aggenital hairs reduced. Two anal and three adanal pairs of hairs present.

L e g s: All legs tridactylous.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1205-1969): No. 396; — 12 ex. (Paratypes: 0-1206-69): data as for holotype.

R e m a r k s: Among the species of the genus *Allonothrus*, only *A. russeolus* WALLW., 1960, and *A. ghanensis* WALLW., 1961 (both from West Africa), possess 11—14 genital hairs and tridactylous legs. By the extraordinary length of hair e_1 and those arising behind it, *A. ghanensis* differs from both *A. russeolus* and the new species. These two latter can be distinguished according to the following features:

russeolus WALLW., 1960	*neotropicus* sp. n.
1. Hair h_1 about as long as hair ps_1.	1. Hair h_1 about half as long as hair ps_1.
2. Hair e_1 considerably shorter than half distance between hairs e_1—h_1.	2. Hair e_1 as long as half distance between hairs e_1—h_1.
3. Hairs ad_1 and ad_2 smooth.	3. Hairs ad_1 and ad_2 ciliate.

Malaconothrus neoplumosus sp. n. (Fig. 3)

300—315×127—136 μ. Exobothrydial and interlamellar hairs arising near one another, at base of lamella. Hair *exa* plumose, similarly to notogastral hairs; hair *in* simple. Lamellar and rostral hairs basally heavily incrassate, both extremely long, ornamented with densely spaced cilia. Lamellae curved, sigmoid. Interlamellar region with some irregular foveolae and a fine but dense striation.

N o t o g a s t e r: Surface with two robust, longitudinal and parallel laths, decurrent to insertional points of hairs h_1, there rectangularly bifurcating and partly reaching points of origin of hairs h_2 partly extending towards median line, thereafter uniting and obsolescent towards posterior end of body. Hairs ps_1 connected by an arcuate chitinous lath. Area between longitudinal laths with some irregularly scattered foveolae. Notogastral hairs plumose, shaped like fir-trees.

V e n t r a l: Epimeral setal formula: 2—1—2—2. Hairs *1a*, *2a*, *3a* minute and smooth, outer ones as well as hairs *4a* longer and heavily ciliate. Four genital pairs of hairs present, anterior ones shorter but more heavily ciliate, posterior ones longer but less heavily ciliate. Three anal pairs of hairs strongly ciliate.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1207-69): No. 380-3; — 2 ex. (Paratypes: 0-1208-69): data as for holotype.

R e m a r k s: By its characteristic notogastral hairs, the new species can be compared merely with *Malaconothrus plumosus* WILLM., 1931. Aside of certain other differences, the new species can, however, be distinguished from it by the extraordinarily heavily incrassate lamellar hairs.

Malaconothrus pilosellus sp. n. (Fig. 4)

396—404 × 174—189 μ. Interlamellar hair long and thin, apically flagellate. Exobothrydial hairs short and simple. Lamellar and rostral hairs also long and thin. Some irregular foveolae behind interlamellar hairs; surface of prodorsum finely punctate.

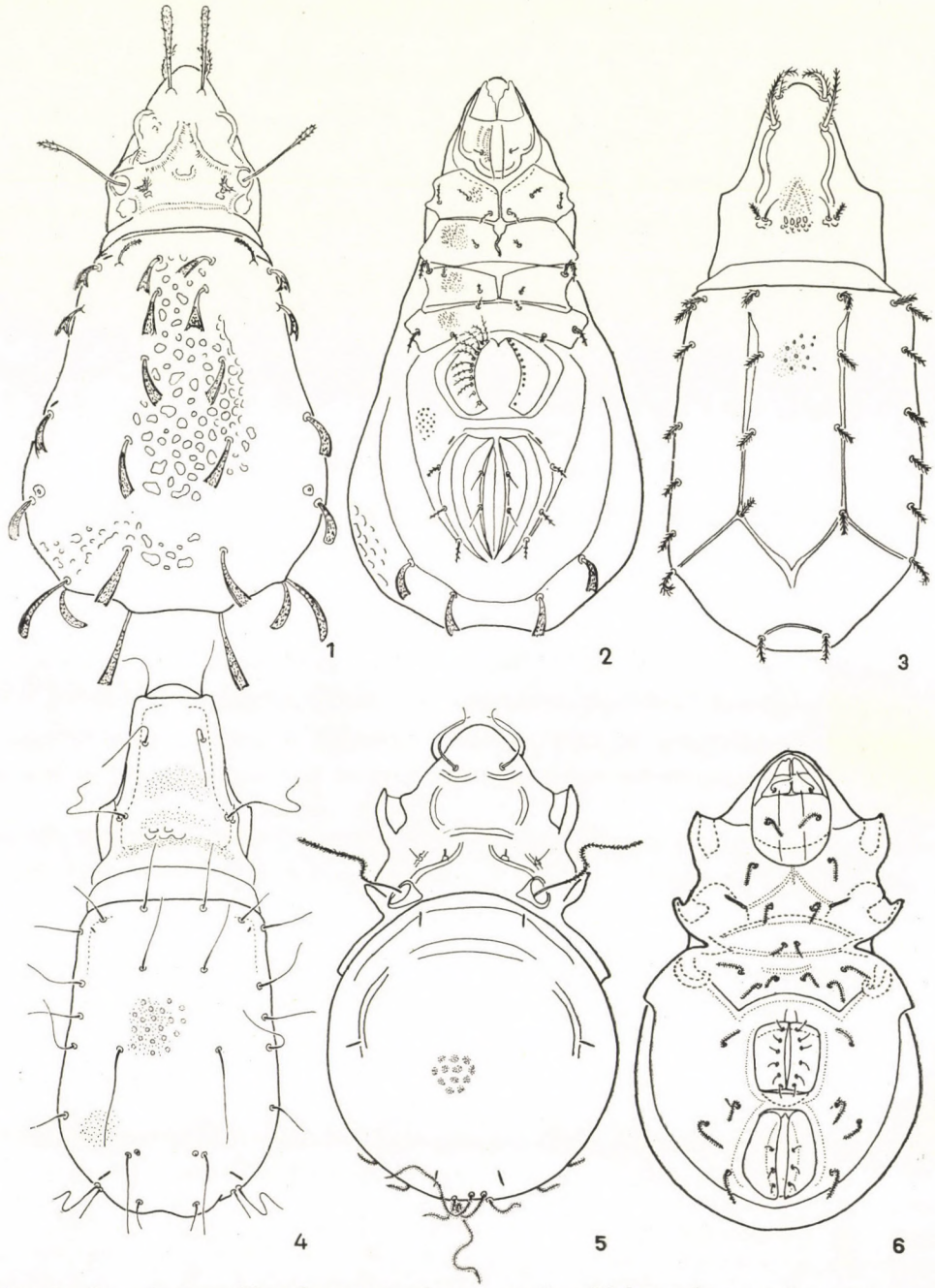
N o t o g a s t e r: Surface ornamented with a densely arranged but extraordinarily fine punctation and round foveolae. Notogastral hairs extremely thin and filiform, hairs c_1, d_1, h_1, and especially hair e_1 long, considerably longer than all other hairs. All hairs extremely fragile.

V e n t r a l: Epimeral setal formula: 3—1—3—2. Inner hairs short, outer ones long and thin. Five pairs of genital and 3 pairs of anal, hairs present. Surface of anogenital region with a longitudinal, punctate rugulosity.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1209-69): No. 357-1; — 2 ex. (Paratypes: 0-1210-69): No. 357-2.

R e m a r k s: Similarly and conspicuously long and thin notogastral hairs are known only in the species *M. pseudolamellatus* WILLM., 1931, and **M. machadoi*** nom. nov. However, the difference as to length between the hairs c_1, d_1, e_1, and the other notogastral hairs is by far not as great in these latter species.

* *Malaconothrus machadoi* nom. nov., to replace *Malaconothrus punctulatus* BALOGH, 1958, a junior homonym of *Malaconothrus punctulatus* HAMMER, 1952.



Figs. 1—6. — 1—2 = *Allonothrus neotropicus* sp. n.; 3 = *Malaconothrus neoplumosus* sp. n.; 4 = *Malaconothrus pilosellus* sp. n.; 5—6 = *Allodamaeus trisetosus* sp. n.

Allodamaeus trisetosus sp. n. (Figs. 5—6)

546×317 μ. Sensillus filiform with a secretional coating. Interlamellar hairs appearing as small but heavy spines situated on chitinous tubercles emerging from the lamellae. Exobothrydial hairs filiform. Lamellar and rostral hairs considerably more robust, longer, former ones slightly flagelliform. Prodorsal surface with a sculpture consisting of laths.

Notogaster: Slightly elongated. Surface ornamented with a secretional coating arranged into stelliform groups. Four notogastral pairs of hairs arising on posterior margin of body, inner pair considerably longer than all others, flagellate; others simple.

Ventral: Epimeral setal formula: 3—1—4—3. Seven pairs of genital, 1 pair of aggenital, 3 pairs of anal, and 3 pairs of adanal, hairs.

Type-material: 1 ex. (Holotype: 0-1211-69): No. 406.

Remarks: By reason of its dorsal habit, the new species resembles *Allodamaeus elegantulus* (Ham., 1958) (Argentina), but also differs from it by the following features: 1. The hairs *in* are spiniform and arise on chitinous excrescences; 2. There is no arcuate transversal ridge anteriorly on the notogaster; 3. The inner pair of the posteromarginal hairs is filiform and flagellate.

In her description of the species, M. Hammer makes no mention of the number of anal hairs. The new species possesses three pairs of anal hairs, a unique feature in the genus *Allodamaeus*, occurring otherwise only in the *Plateremaeus* group. On the basis of the single available specimen, however, it were inadvisable to draw any further inferences.

Acaroceras pseudofurcatus sp. n. (Fig. 7)

278—301×189—198 μ. Sensillus proclinate, setiform, finely ciliate. Interlamellar hairs robust, arising on exterior portion of lamellae, not reaching cuspis. Lamellar and rostral hairs simple and arcuate, hair *la* originating below lamella, long and recurving. Interlamellar apophyses bifurcate, Y-shaped, subtending a very wide angle. Lamellar cuspis concavely excised, inner and outer apices equally acute.

Notogaster: All hairs well discernible yet thin. Surface punctate.

Ventral: Epimeral region with some wrinkles, converging towards median line then decurrent longitudinally. Six genital pairs of hairs (first pair considerably longer than others and also heavily ciliate), 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present. Hair *ag* robust, all others minute. Anogenital region with thin wrinkles.

Type-material: 1 ex. (Holotype: 0-1212-69): No. 522-2; — 1 ex. (Paratype: 0-1213-69): data as for holotype.

Remarks: The new species stands nearest to *Acaroceras furcatus* BAL., 1962, but in this latter one the cuspis of the lamellae is convex and bears three minute apices; in the new species the cuspis is concave and the excision smooth. In *A. furcatus* BAL., the interlamellar apophysis subtends a rather acute angle and the branches are directed towards the points of origin of the lamellar hairs, whereas in the new species the angle subtended is very wide and the branches look towards the middle of the lamellae. In the former species the hair *in* is long and projects beyond the lamellar cuspis, but essentially shorter and not even approaching the lamellar cuspis in the new taxon.

Anakingia reticulata sp. n. (Figs. 8—9)

141×90 μ. Sensillus proclinate, basally slightly widening, apically gradually attenuating, its exterior margin densely ciliate. Interlamellar hairs minute, originating in interlamellar region. Lamellar hairs arising on lamellae, reclinate, short, ciliate. Also rostral hairs very minute and simple. Lamellae narrow, convergent, cuspidally obliquely truncate. Interlamellar region trapezoidal.

Notogaster: Oval, pteromorpha reduced. Surface ornamented with irregular reticulation. Anterior third of body with a single punctate field in middle, posterior half with 3 pairs of similarly constructed areas. Hairs minute, only their insertional points discernible.

Ventral: Epimeral region with two large longitudinal wrinkles anteriorly, followed by an irregular reticulation. Also epimeral hairs minute. Six pairs of genital, 2 pairs of anal, and 3 pairs of adanal, hairs present; aggenital hairs reduced. Anogenital region with some irregular, longitudinal rugulosity.

Type-material: 1 ex. (Holotype: 0-1214-69): No. 380-1.

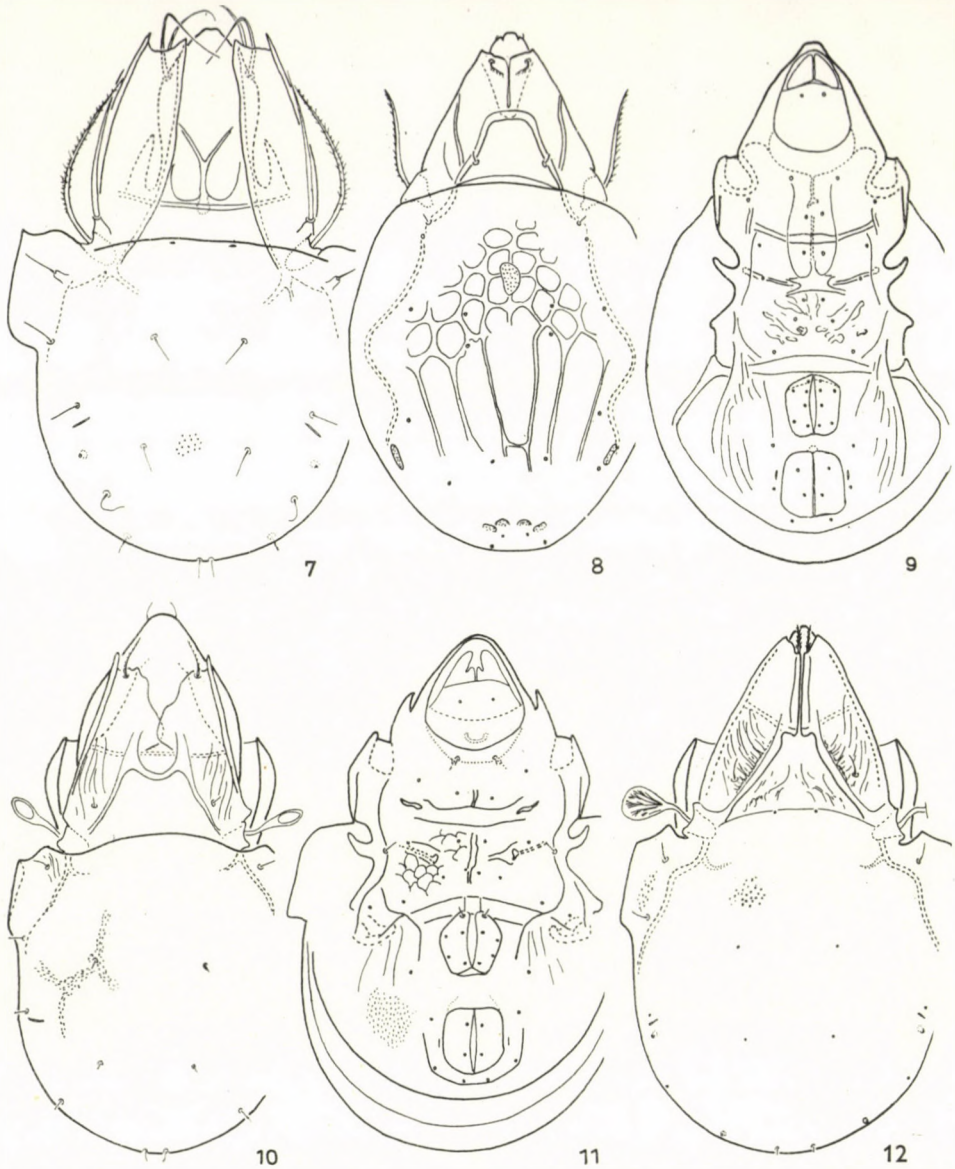
Remarks: By the characteristical sculpture of the notogastral surface, the new species is easily separable from the single known species of the genus. In *Anakingia williamsae* HAM., 1961, the notogaster is completely smooth.

Calozetes gen. n.

Sensillus exclinate, fusiform, apically ciliate. Interlamellar hairs minute, arising on lamellar surface. Lamellar hairs originating posteriorly to lamellar cuspis, on surface of lamellae, simple. Rostral hairs minute. Lamellae only slightly convergent, with an elongate external apex, inner section truncate. Interlamellar region high, trapezoidal, no interlamellar apophysis or tuberculum. Notogastral hairs well discernible.

Type-species: *Calozetes monticola* sp. n.

Remarks: The nearest ally of the new genus is *Fusozetes* BAL. et MAH., 1969, but in this latter the sensillus is very minute, shorter than pedo-



Figs. 7—12. — 7 = *Acaroceras pseudofurcatus* sp. n.; 8—9 = *Anakingia reticulata* sp. n.; 10—11 = *Calozetes monticola* sp. n.; 12 = *Licnozetes flabellatus* sp. n.

tecta 2, and also the notogastral hairs are extremely small and hardly discernible.

Calozetes monticola sp. n. (Figs. 10—11)

214—236×121—132 μ. Sensillus proclinate and slightly exclinate, fusiform, its stalk below clavus bulbosely incrassate. Surface with fine aciculi. Interlamellar hairs very minute, arising on surface of lamellae. Lamellar hairs also originating on lamellae, weakly ciliate; rostral hairs short and simple. Lamellae short, outer cuspis acute, inner side sinuously rounded, their surface with a longitudinal rugulosity. Interlamellar region trapezoidal.

N o t o g a s t e r: Surface ornamented with a pattern formed by groups of secretion. Hairs short and thin, yet well recognizable.

V e n t r a l: Hairs of epimeral region minute, but their insertional points very large. Surface hardly discernibly reticulated. Six genital pairs of hairs (first pair longer and more robust than other ones), 1 aggenital, 2 anal, and 3 adanal pairs of setae present. Surface of anogenital region punctate.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1215-69): No. 522-2; — 3 ex. (Paratypes: 0-1216-69): data as for holotype.

Licnozetes gen. n.

Sensillus licheniform, pro- and exclinate. Interlamellar hairs minute, arising on lamellar surface. Lamellae weakly convergent, widely meeting in middle, long, extending nearly to apex of rostrum, their outer cuspis acute, inner side obliquely truncate, emitting short and simple lamellar hairs. Interlamellar region smooth. Notogastral hairs very minute.

Type-species: *Licnozetes flabellatus* sp. n.

R e m a r k s: The peculiarly licheniform shape of the sensillus, the short hair *in* originating on the surface of the lamella, the convergent, narrowing, but medially widely meeting lamellae (bearing the simple lamellar hairs) are features which, as a combination of characters, satisfactorily delimits the new genus from all other known genera.

Licnozetes flabellatus sp. n. (Fig. 12)

166—175×109—117 μ. Sensillus licheniform, pro- and exclinate, its surface with a radial venation. Lamellar hairs thin and short, originating on lamellar surface. Rostral hairs short and simple; lamellar hairs also short but heavily ciliate. Lamellae convergent, outer cuspis acute, inner side obliquely truncate, hair *la* arising at inner margin. Lamellar surface longitudinally finely rugulose.

N o t o g a s t e r: Surface with a secretional granulosity; anterior margin of pteromorpha with some wrinkles. Hairs minute.

Ventral: Epimeral region with a weak reticulation. All hairs minute. Six pairs of genital, 2 pairs of anal, and 3 pairs of adanal, hairs present. Aggenital hairs reduced. Some longitudinal wrinkles along genital plate.

Type-material: 1 ex. (Holotype: 0-1217-69): No. 380-2; — 4 ex. (Paratypes: 0-1218-69): data as for holotype.

Schalleria ramosa sp. n. (Fig. 13)

333—348 × 269—293 μ. Sensillus proclinate, sigmoid, apically slightly incrassate, surface ciliate. Interlamellar hairs long, but not reaching lamellar cuspis, bearing aciculi. Lamellar hairs long, strongly furcating, originating below inner margin of lamellae. Lamellae typical for genus, their outer cuspis essentially longer than inner one. Interlamellar region with a membranous appendage. Rostral apex deeply excised.

Notogaster: Pteromorpha large, surface rugulose. Hairs arising marginally long, robust; those originating more inside, in median line, considerably smaller.

Type-material: 1 ex. (Holotype: 0-1219-69): No. 396.

Remarks: Of all the known species of the genus, *Schalleria bacillifera* Bal., 1962, stands nearest to the new species. However, in that species the lamellar hairs are short, the outer and inner cuspides of the lamellae equally long, and the lamellar hairs smooth. The notogastral hairs are also simple. There is no membranous plate, originating from the lamellae, in the interlamellar region.

Eremobelba esposi sp. n. (Fig. 16)

697—736 × 372—404 μ. Sensillus exclinate, apically recurving, marginally very finely ciliate. Interlamellar hairs incrassate, their shape and especially their ciliation differing from those of all other notogastral hairs; exobothrydial hairs similarly construed but slightly longer. Lamellar and rostral hairs smooth and considerably longer.

Notogaster: Surface without any regular polygonal sculpture, merely densely spaced and irregular secretional granules. Hairs elongately spoon-shaped, very finely and densely ciliate.

Ventral: In epimeral region, base of certain hairs stellately ramifying. Six pairs of simple genital and 2 pairs of anal hairs; anogenital region with neotrichy.

Type-material: 1 ex. (Holotype: 0-1220-69): No. 512; — 8 ex. (Paratypes: 0-1221-69): data as for holotype.

Remarks: Species known without a polygonal sculpture in the genus *Eremobelba* have heretofore been *E. zicsii* Bal. et Mah., 1969, *E. foliata* Ham., 1958, and *E. hamata* Ham., 1960. There is a considerable difference in size

between the anterior and posterior notogastral hairs in *E. zicsii*, and the hairs of *E. hamata* are not dilated, hence the new species is comparable only with *E. foliata*. In that species, however, the secretional granules are arranged in sinuous longitudinal lines, and the form and ciliation of its hairs are also dissimilar.

Eremulus rigidisetus sp. n. (Figs. 14—15)

381—405×201—216 μ. Sensillus exclinate, apically circularly recurving, marginally finely ciliate. Prodorsal hairs thin, their proportions as to length: *exa* > *in* > *ro* > *la*; all very finely ciliated. Lamellae sinuous, inner and outer margins ornamented with foveoli. A well recognizable translamella present immediately in front of interlamellar hairs. Some foveoli present also in interlamellar region.

N o t o g a s t e r: Foveolate series convexedly arcuate in anterior section. Hairs rigid and straight, length of hairs gradually increasing towards posterior margin of body. All very finely ciliate.

V e n t r a l: All hairs arising in epimeral region, excepting hair 1*c*, basally stellately ramifying. Six genital pairs of hairs of similar configuration, but two anal and adanal pairs of hairs simple. Adanal neotrichy present.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1222-69): No. 416-1; — 2 ex. (Paratypes: 0-1223-69): data as for holotype.

R e m a r k s: Four species of the genus have hitherto been known to occur in South America, all published by M. HAMMER. The notogastral hairs of these species are invariably gradually attenuating apically, there to become arcuate and flagellate. Nor is a definite translamella observable on the prodorsum of any one of them. Thus the above two features preclude the specific identity of our exemplars with the above taxa.

Xenillus longisetosus sp. n. (Fig. 17)

538—633×364—443 μ. Sensillus extraordinarily long, thin, its stalk repeatedly arcuate, apically hardly incrassate but weakly ciliate. Interlamellar hairs short, lamellar and rostral hairs considerably longer. All ciliate. Lamellae thin, convergent, terminating far behind rostrum, their inner cuspis very long, wide, outer cuspis hardly discernible owing to lamellar hair arising in that place.

N o t o g a s t e r: Surface with scattered round foveoli. Hairs straight and short, apically ciliate.

V e n t r a l: Epimeral setal formula: 3—1—3—3. Five pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present. Surface of ventral side weakly foveolate and densely and finely punctate.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1224-69): No. 463-1; — 3 ex. (Paratypes: 0-1225-69): data as for holotype.



Figs. 13—18. — 13 = *Schalleria ramosa* sp. n.; 14—15 = *Eremulus rigidisetosus* sp. n.; 16 = *Eremobelba esposi* sp. n.; 17 = *Xenillus longisetosus* sp. n.; 18 = *Charassobates ornatus* sp. n.

R e m a r k s: None of the hitherto described species of the genus possess a similarly long and hardly incrassate sensillus.

Charassobates ornatus sp. n. (Fig. 18)

275—281×157—166 μ. Stalk of sensillus short, its clavus long, extending even beyond anterior margin of pedotecta 1, its surface densely ciliate. Interlamellar, lamellar, and rostral hairs minute, often hardly discernible. Lamellae narrow, gradually attenuating apicad, their surface punctate and with several longitudinal wrinkles.

N o t o g a s t e r: Cavernae large, adjoining chitinous laths robust. Hairs minute and spiniform.

V e n t r a l: All hairs of ventral side minute; five pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1226-69): No. 357-2; — 14 ex. (Paratypes: 0-1227-69): data as for holotype.

R e m a r k s: The notogastral structure resembles that of the type-species; the main differences are as follows:

ornatus sp. n.	*cavernosus* GRANDJ., 1929
1. Sensillus long, reaching anterior margin of pedotecta 1.	1. Sensillus short, apex of clavus falling far behind anterior margin of pedotecta 1.
2. Notogastral caverna extending also to posterior half of notogaster.	2. Notogastral caverna restricted to anterior half of notogaster.
3. Notogastral hairs basally slightly incrassate, spiniform.	3. Notogastral hairs thin, simple.

Charassobates simplex sp. n. (Fig. 19)

246—259×140—151 μ. Stalk of sensillus short, its clavus long, ciliate, extending far beyond anterior margin of pedotecta 1. Interlamellar and rostral hairs minute. Lamellae wider and somewhat shorter than in preceding species, their surface densely punctate.

N o t o g a s t e r: Surface concave, with 2 slight hollows. Neither cavernae nor thick chitinous laths present, but ornamented with sparsely spaced irregular foveolae. Notogastral hairs minute and hardly recognizable, their alveoli better discernible.

V e n t r a l: Hairs of ventral side minute. Five pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1228-69): No. 357-2; — 8 ex. (Paratypes: 0-1229-69): data as for holotype.

R e m a r k s: Owing to the lack of the notogastral caverna, the new species differs from all of its known congeners.

Tectocepheus cervus sp. n. (Fig. 20)

275×153 μ. Sensillus long, its stalk geniculate, clavus long, heavily ciliate. Interlamellar and lamellar hairs minute, rostral hairs longer, with robust cilia. Lamellae enlarged, cuspides wide, covering rostrum also laterally.

Notogaster: Surface with 3 pairs of round hollows; cerotegument covering notogastral surface heavily granulated and dorsal hairs indiscernible.

Ventral: Epimeres weakly developed. Epimeral region margined by a distinct rim at height of legs III and IV. Hairs minute. Also pedotecta strongly developed. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present. Pori *iad* situated slightly obliquely in front of anal aperture.

Type-material: 1 ex. (Holotype: 0-1230-69): No. 508.

Remarks: A similar peculiarly shaped lamella was as yet unknown among the hitherto described congeners of the new species.

Oppia euramosa sp. n. (Fig. 21)

270×169 μ. Sensillus exclinate, apically slightly fusiform, there ramifying into a short apical and four long lateral branches. Exobothrydial, interlamellar, lamellar, and rostral hairs thin, comparatively short, and, excepting exobothrydial hairs, of about equal length. Lamellar hairs arising between lamellae. Lamellae weakly developed, not meeting, and with a similar translamella between them. A chitinous tubercle behind each interlamellar hairs.

Notogaster: Ten pairs of notogastral hairs present; hair *ta* considerably shorter than all others.

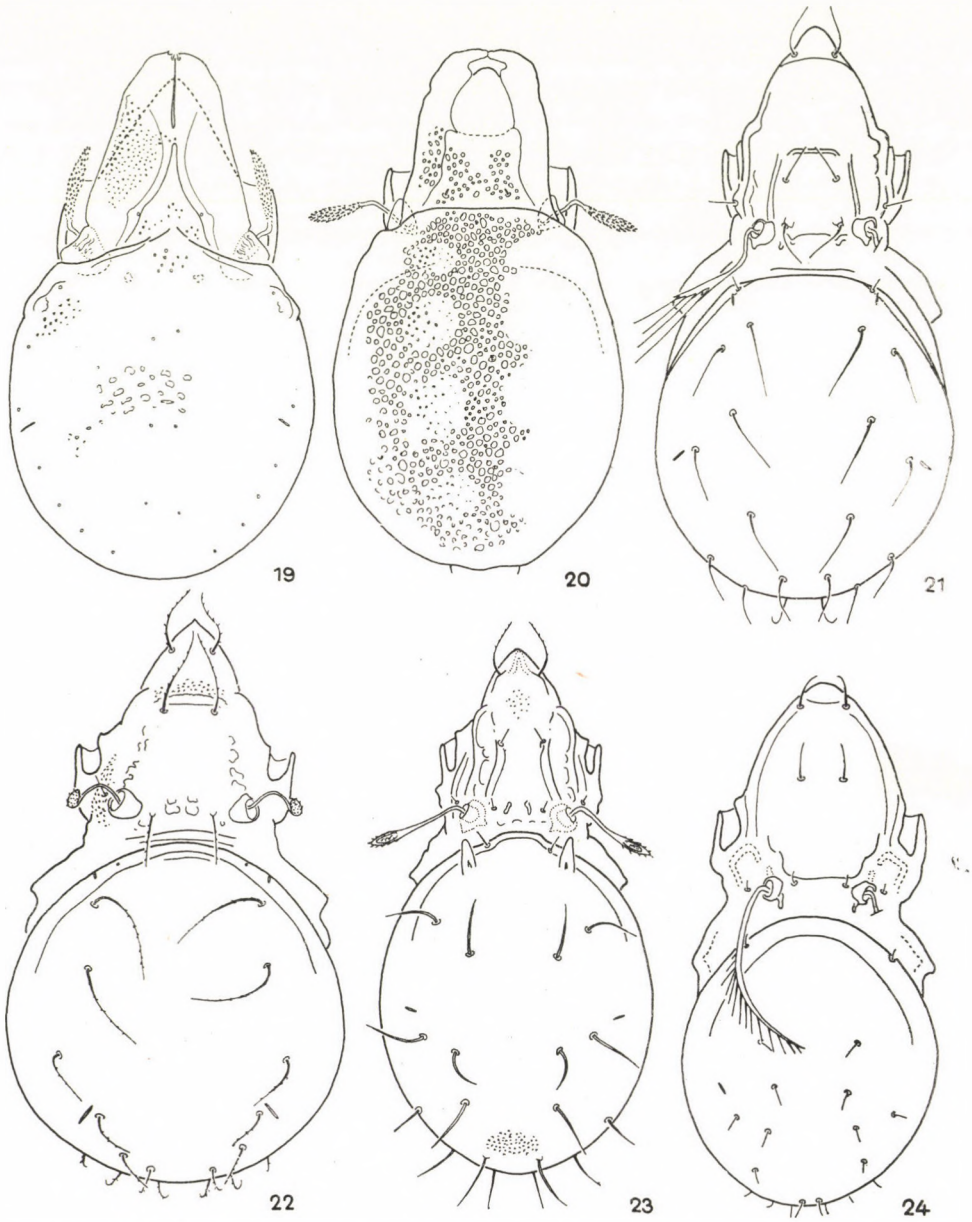
Ventral: Epimeral region with some larger foveolae, median line of sternum with a characteristic double chitinous lath. Hairs minute. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present. Hair ad_2 originating behind pori *iad* situated in an oblique position with reference to longitudinal axis of body; ad_1 adjacent, in a para-anal position, ad_3 removed from anal aperture, in a marginal position.

Type-material: 1 ex. (Holotype: 0-1231-69): No. 357-2.

Remarks: The configuration of the epimeral and anogenital regions as well as the characteristic laths of the prodorsum were, as a combination of features, as yet unknown in the species hitherto described.

Oppia heterotricha sp. n. (Fig. 22)

491×317 μ. Sensillus short, its stalk thin, apical clavus widening abruptly into a crescentiform shape, recurving and ciliate. Proportion as to length of



Figs. 19—24. — 19 = *Charassobates simplex* sp. n.; 20 = *Tectocepheus cervus* sp. n.; 21 = *Oppia euramosa* sp. n.; 22 = *Oppia heterotricha* sp. n.; 23 = *Oxyoppia spinosa* HAMMER, 1958; 24 = *Teratoppia pectinata* sp. n.

prodorsal hairs: *exa* < *in* < *ro* < *la*. All thin and very finely ciliate. Lamellae absent, but a well developed translamella present anteriorly to lamellar hairs; area between rostrum and translamella and region around exobothrydial hairs heavily granulated.

Notogaster: Hair *ta* reduced, with merely its insertional point visible. Hairs *te* and *ti* essentially longer than others, these latter gradually shortening posteriorad.

Ventral: Epimeral setal formula: 3—1—3—3; all hairs long, thin, and ciliate. Hairs 1*a*, 2*a*, and 3*a* somewhat shorter than others. Six pairs of thin and long genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present. Pori *iad* situated obliquely with reference to longitudinal axis of body, almost in a para-anal position.

Type-material: 1 ex. (Holotype: 0-1232-69): No. 380-2; — 2 ex. (Paratypes: 0-1233-69): data as for holotype.

Remarks: The reduction of hair *ta*, the considerable difference in length of hairs *te* and *ti* as compared to the other notogastral hairs, and the gradual shortening of these latter ones, characterize the new species rather distinctly. Although similar features appear also in *Oppia rotunda* (HAM., 1958), the hairs of its prodorsum show an entirely different evolvement, and the interlamellar hairs are reduced.

Oxyoppia gen. n.

An Oppioid habit. Prodorsal surface with robust costulae. Sensillus fusiform, with aciculi. Anterior margin of notogaster with a robust notogastral tubercle on each side marginally. Hair *ta* adjacent, well developed, all notogastral hairs short, stout, with aciculi.

Type-species: *Oppia spinosa* HAMMER, 1958.

Remarks: The type-species is characterized by the features given in the above diagnosis and accordingly removed from the genus *Oppia*, for the time being still regarded as an aggregate group. The following species also belong to the new genus: *Oppia saskai* BAL., 1961, and *Oppia scalifera* HAM., 1958. We also submit a complementary description of HAMMER's species and a figure based on our specimen.

Oxyoppia spinosa (HAMMER, 1958) (Fig. 23)

338×174 μ. Sensillus ex- to reclinate, fusiform, with aciculi. Prodorsal hairs short, lamellar hairs arising on inner side of lamella. Anterior portion of prodorsum punctate, laterally with a robust costula and some large areolae.

Notogaster: Hairs *ta* essentially shorter than all other notogastral hairs.

Ventral: Epimeres weakly developed, also hairs of epimeral region short. Epimeral setal formula: 3—1—3—3. Genital opening situated far anteriorly to anal aperture, epimeres 4 extending beyond it on both sides. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present. Pori *iad* situated near anal aperture.

Material examined: 2 ex. (0-1234-69): No. 396.

Teratoppia pectinata sp. n. (Fig. 24)

143—155×134—141 μ. Sensillus extraordinarily large, its stalk thickened, cilia elongate, shape pectiniform. Exobothrydial and interlamellar hairs extremely short, lamellar and rostral hairs essentially longer. A transversal line decurrent anteriorly to interlamellar hairs.

Notogaster: Together with hairs *ta*, ten pairs of short and straight hairs present.

Ventral: Similarly to basic type of genus, epimeral region not developed, depressed. Five pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present.

Type-material: 1 ex. (Holotype: 0-1235-69): No. 357-2; — 12 ex. (Paratypes: 0-1236-69): data as for holotype.

Remarks: The peculiar, thick, and pectiniform sensillus distinguishes the new species from all of its known congeners.

Suctobelba carinata sp. n. (Fig. 25)

285×163 μ. Sensillus long, fusiform, entirely smooth. Hairs *in* and *la* long, rostral hairs typically arcuate. Lateral margins of prodorsum and sides of pedotecta 1 with some striae. Rostrum proboscidately elongated, with a long adjacent tooth.

Notogaster: Two pairs of notogastral tubercles, outer one narrow and pointed, inner one widely rounded. A round, well discernible punctate area in median line of notogaster. Hairs long, apically flagellately curving.

Type-material: 1 ex. (Holotype: 0-1237-69): No. 406.

Remarks: The round, punctate spot in the median line of the notogaster was hitherto known only in some African species exhibiting extremely long notogastral tubercles. Similar structures are known also in a New Guinean (*S. woomersleyi* Bal., 1968) and a Vietnamese (*S. semiplumosa* Bal. et Mah., 1967) species. However, the sensillus of all these species is heavily ciliate.

Suctobelbila ornata sp. n. (Fig. 26)

185—196×102—108 μ. Apical half of sensillus heavily incrassate, fusiform, its surface with aciculi, stalk thin and arcuate. Interlamellar hairs repre-

sented only by their alveoli, also lamellar hairs short. Rostral hairs of *Suctobelba*-type. Prodorsal surface with chitinous processes characteristic of the genus *Suctobelba*. Rostral apex excised in a U-shape, laterally with 3—4 teeth.

N o t o g a s t e r: Two pairs of lateral and a single pair of median notogastral tubercles; the two outer ones emitting a chitinous lath each posteriorad, median unpaired one semicircular. Surface with 6 pairs of strong excrescences emitting some of the small notogastral hairs. A total of ten notogastral pairs of hairs present.

V e n t r a l: Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present. All very short.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1238-69): No. 380-2; — 2 ex. (Paratypes: 0-1239-69): data as for holotype.

R e m a r k s: The known species of the genus *Suctobelbila* have no processes resembling fenestrate spots on the prodorsum. The five notogastral tubercles situated on the dorsosejugal suture also represent a unique feature.

Suctoribates neotropicus sp. n. (Figs. 27—28)

347—396 × 191—238 μ. Sensillus thin, long, and arcuate; apical section slightly fusiform and ciliate. Interlamellar hairs short, lamellar hairs completely reduced. Rostral hairs thin, long, and arcuate. Bothrydia situated strikingly near one another, emitting a weak and short lath towards median line. Some irregular spots appearing anteriorly to bothrydia.

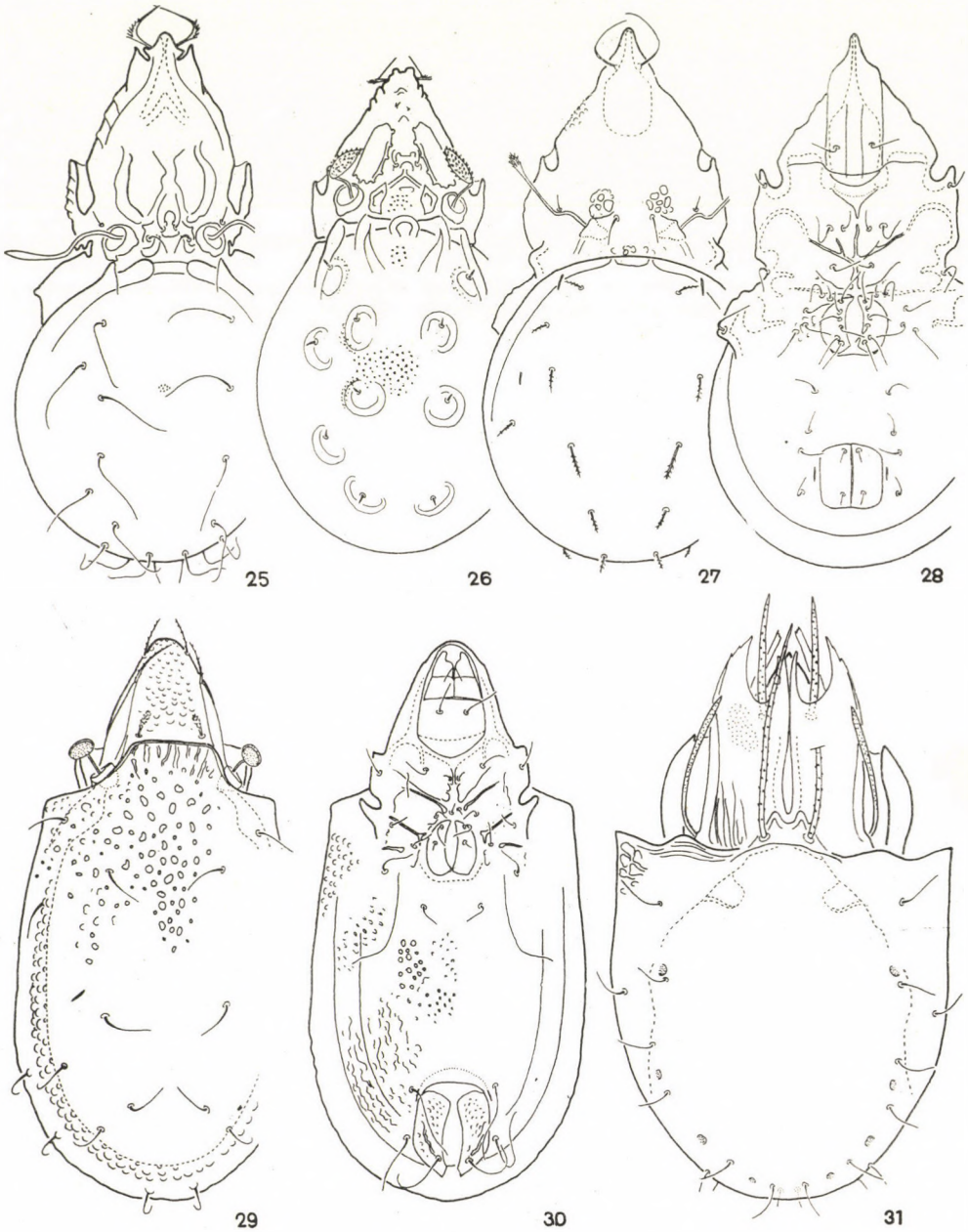
N o t o g a s t e r: Epimeral setal formula: 3—1—3—4. Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present. Aggenital and adanal hairs standing behind each other in a characteristic longitudinal row.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1240-69): No. 380-3; — 6 ex. (Paratypes: 0-1241-69): data as for holotype.

R e m a r k s: From the sole known species of the genus, described from Angola, West Africa, the new species can be distinguished by the configuration of the prodorsal chaetotaxy and the evolvement of the chitinous laths, the weakly incrassate and ciliate sensillus, and the completely reduced lamellar hairs. The notogastral hairs are also shaped otherwise.

Oribatella incurvata sp. n. (Fig. 31)

515—551 × 324—340 μ. Sensillus long, weakly fusiform, apically acute, throughout covered with aciculi. Interlamellar hairs long, projecting beyond cuspis of lamellae. Rostral hairs more robust. All hairs bearing aciculi. Lamellae wide, their outer cuspis considerably wider and longer than inner one, bearing



Figs. 25—31. — 25 = *Suctobelba carinata* sp. n.; 26 = *Suctobelbila ornata* sp. n.; 27—28 = *Suctoribates neotropicus* sp. n.; 29—30 = *Benoibates amazonicus* sp. n.; 31 = *Oribatell incurvata* sp. n.

2—3 lateral teeth. Lamellar surface punctate and with some longitudinal rugulosity.

Notogaster: Surface very finely punctate. Some transversal wrinkles near anterior margin of pteromorpha, and a weak reticulation along their lateral margins. Ten pairs of short and thin notogastral hairs present.

Ventral: Six pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present.

Type-material: 1 ex. (Holotype: 0-1242-69): No. 510-2; — 3 ex. (Paratypes: 0-1243-69): data as for holotype.

Remarks: There is no known South American species having a longer outer and a shorter inner lamellar cuspis and an elongate, fusiform sensillus.

Benoibates amazonicus sp. n. (Figs. 29—30)

475×221 μ. Sensillus clavate, its stalk thin and short. Surface of clavus with aciculi. Interlamellar hairs short, slightly incrassate, heavily ciliate. Lamellar and rostral hairs longer but thinner. Prodorsal surface foveolate.

Notogaster: Surface exhibiting irregular foveolae of diverse size. Ten pairs of arcuate notogastral hairs present.

Ventral: Surface also foveolate. Two pairs of short genital, 1 pair of aggenital, 1 pair of long anal, and 2 pairs of adanal, hairs present. Also anal plate foveolate.

Type-material: 1 ex. (Holotype: 0-1244-69): No. 406.

Remarks: The new species is somewhat similar to the African *Benoibates flagelliger* BAL., 1958, but the pteromorphic appendage, the shape of the sensillus, and the sculpture are different. The uncovered bothrydium safely separates it from the possibly confusable *Oripoda australis* BERL., 1916.

Truncopes anguinus sp. n. (Fig. 32)

326×125 μ. Sensillus elongated, clavate, largely covered. Lamellar hairs shorter than interlamellar ones, rostral hairs longer than both. Anterior margin of prodorsum entirely straight.

Notogaster: Extremely narrow, long. Dorsosejugal suture also straight. Four pairs of small sacculi and ten pairs of notogastral hairs present.

Ventral: Two pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present. Hairs of anal region essentially longer than those of genital region.

Type-material: 1 ex. (Holotype: 0-1245-69): No. 522-2.

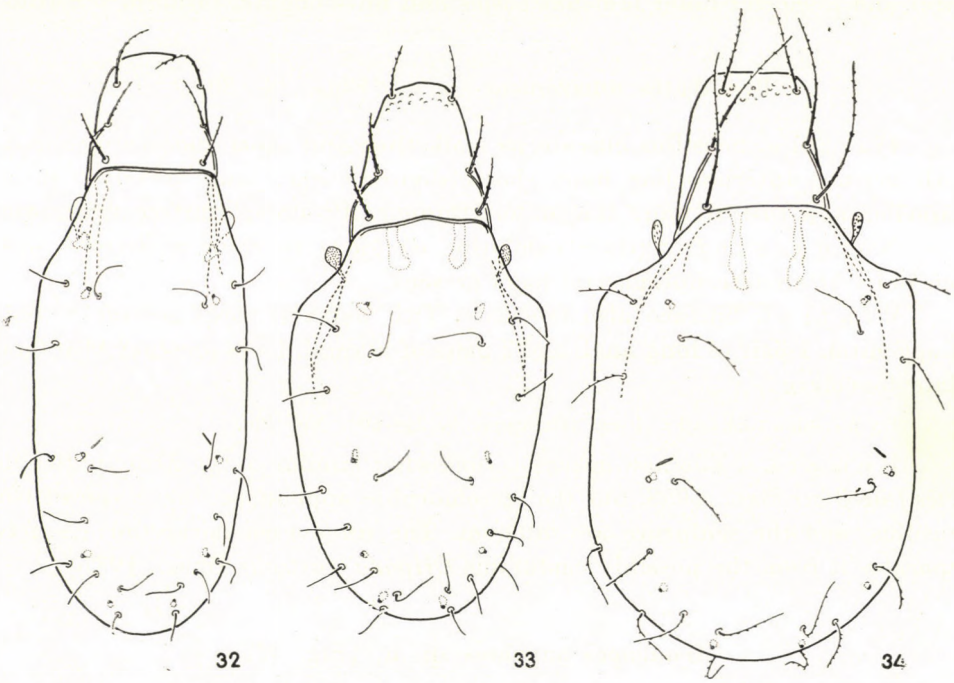
Remarks: The comparisons of the new *Truncopes* taxa will be discussed subsequently to the descriptions.

Truncopes divergens sp. n. (Fig. 33)

364—384×158—182 μ. Sensillus fusiform and partly covered. Interlamellar and lamellar hairs rigid, bacilliform, latter ones slightly longer than former ones. Rostral hairs thinner, less heavily ciliate, setiform. Anterior portion of prodorsum granulate.

N o t o g a s t e r: Body gradually attenuating posteriorad. Four pairs of sacculi and ten pairs of thin and long notogastral hairs present.

V e n t r a l: Two pairs of genital, 1 pair of aggenital, 2 pairs of anal, and 3 pairs of adanal, hairs present.



Figs. 32—34. — 32 = *Truncopes anguinus* sp. n.; 33 = *Truncopes divergens* sp. n.; 34 = *Truncopes magnus* sp. n.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1246-69): No. 522-2; — 1 ex. (Paratype: 0-1247-69): data as for holotype.

R e m a r k s: Comparisons between the three new species will be given subsequently to their description.

Truncopes magnus sp. n. (Fig. 34)

522—641×263—380 μ. Sensillus uncovered, narrow, fusiform. Interlamellar, lamellar, and rostral hairs gradually shortening in above order of

sequence, but all thin, long, and ciliate. Anterior portion of notogaster with some irregular foveolae.

N o t o g a s t e r: Wide, margins parallel. Four pairs of minute sacculi and ten pairs of thin, long, finely ciliate notogastral hairs present.

T y p e - m a t e r i a l: 1 ex. (Holotype: 0-1248-69): No. 522-2; — 2 ex. (Paratypes: 0-1249-69): data as for holotype.

R e m a r k s: Of the hitherto known three species of the genus, only the recently described *Truncopes australis* BAL. et MAH., 1968, derives from South America. Among the four species, interlamellar hairs longer than the prodorsum occur only in *T. magnus*. In *T. australis*, hair *in* is about one and a half times longer than hair *la*, while these hairs are of about the same length in the other two new species. These two latter can be easily separated by the shape of the body, the dimensions, and the granulated prodorsum (*T. divergens*).

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ÜBER DIE CHIRONOMIDEN IM BENTHAL DES UNGARISCHEN DONAUABSCHNITTES

(DANUBIALIA HUNGARICA XLIX)

Von

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Im Rahmen des internationalen Donauforschungsprogrammes wurden im Hauptstrom des ungarischen Donauabschnittes auch Benthosuntersuchungen durchgeführt. Das Einsammeln der Chironomiden erfolgte hauptsächlich im Zusammenhang mit zoologischen Mehrzweckuntersuchungen, so daß einerseits deshalb, andererseits wegen Transportschwierigkeiten die Züchtung von Larven im allgemeinen nicht möglich war. Das bestimmte Material besteht also aus Larven, weiterhin aus Puppen bzw. Exuvien. Um die taxonomischen Fehler zu umgehen, die sich hieraus ergeben, wurde die Bestimmung der Larven bzw. Puppen nur so weit durchgeführt, wie dies auf Grund unserer heutigen Kenntnisse möglich war.

Charakterisierung des Untersuchungsgebietes

Der ungarische Donauabschnitt ist — sowohl seiner Länge als auch seinem Charakter nach — der mittlere Abschnitt des Stromes, d. h. er erstreckt sich innerhalb der 2850 km Gesamtlänge auf den mittleren Abschnitt vom Stromkm 1443 bis zum Stromkm 1850. Größtenteils besitzt er einen Mittellaufcharakter mit einer durchschnittlichen Strömungsgeschwindigkeit von 1 m/sec und einem Gefälle von 0,06‰, wo sich Schleppkraft und Geschiebefracht das Gleichgewicht halten. Eine Ausnahme bildet bloß der etwa 50 km lange obere ungarische Flußabschnitt, in welchem die durchschnittliche Strömungsgeschwindigkeit 2,1 m/sec, das Gefälle 0,43‰ beträgt. Vom Gesichtspunkt unserer Untersuchungen aus betrachtet, ist es besonders bemerkenswert, daß der größte Teil des Geschiebes hier stets in Bewegung ist.

Erwähnt sei noch, daß der ungarische Donauabschnitt weitgehend reguliert ist und daß er — von den kleineren slowakischen Flüssen abgesehen — von keinen bedeutenden Nebenflüssen gespeist wird.

Untersuchungsstellen und Methode

Wie bereits erwähnt, ist am oberen ungarischen Donauabschnitt der größte Teil des Geschiebes in ständiger Bewegung, so daß die Benthosorganismen hier keine Ansiedlungsmöglichkeit haben.* (Selbst die nur bei Hochwasser in Bewegung geratenden größeren Steine bilden keine entsprechenden Substrate zur Ansiedlung, weil sie von dem ständig in Bewegung befindlichen feineren Geschiebe oft bedeckt werden). Benthosuntersuchungen wurden eben deshalb nur von diesem Abschnitt an über eine Stromlänge von 343 km durchgeführt. An 11

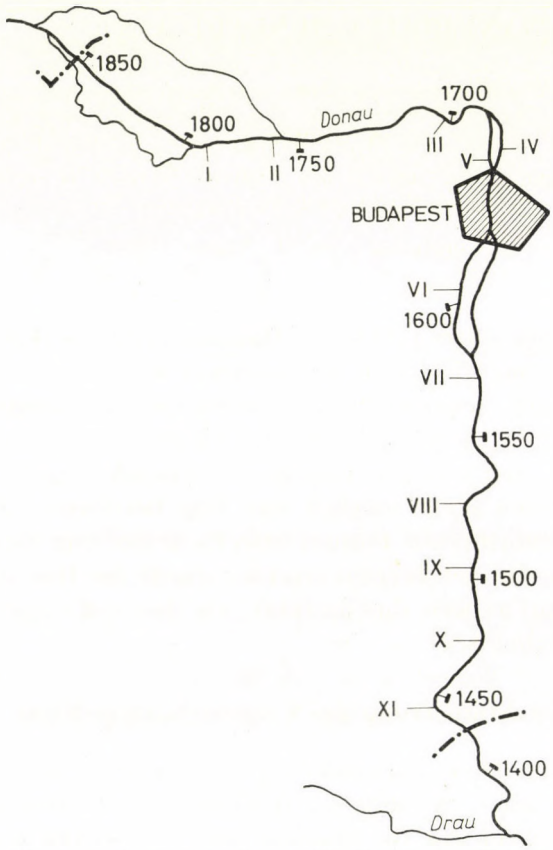

Abb. 1. Die Untersuchungsstellen. — I: Gönyü, II: Komárom, III: Zebegény, IV: Alsógöd, V: Lupasziget, VI: Ercsi, VII: Dunaújváros, VIII: Paks, IX: Gerjen, X: Baja, XI: Mohács

Punkten, also durchschnittlich in Abständen von 54 km, wurden insgesamt 33 Sedimentproben mit einer genügend schweren Dredge genommen. Der Rauminhalt je einer Sedimentprobe betrug 18—20 dm^3. Die Organismen wurden aus dem herausgehobenen Sediment mehrmals ausgespült und durch Sieben des Spülwassers gewonnen.

Bei der Auswahl der Untersuchungsstellen wurden möglichst auch die örtlichen Unterschiede in der Sedimentqualität berücksichtigt. Deswegen wurden an den einzelnen Unter-

* Nach der Verfertigung des Manuskriptes ist die Arbeit von E. Ertlová (Die Mengen des Zoobenthos in den Schottern des Donaumedials. Arch. f. Hydrobiol., Suppl. XXXIV, p. 321—330, 1968) erschienen. Auch ihre Angaben bestätigen, daß ein Zoobenthos, an der oberen Strecke der mittleren Donau, sich nur an den mit in Ruhe befindlichem Sediment und einer Fließgeschwindigkeit unter 2 m/sec gekennzeichneten nicht typischen Stellen ausbilden kann.

suchungsstellen im Querprofil des Stromes an 2—3 verschiedenen Punkten Proben genommen, von denen eine in jedem Fall in die Stromlinie fiel (die letzteren sind in Tabelle I durch Kursivschrift hervorgehoben). Die Entnahme der Proben erfolgte im allgemeinen in den Sommermonaten, am frühesten im Mai, am spätesten — an einer einzigen Stelle — im September.

Die Angaben über die Probestellen, die Zeitpunkte sowie über den Sedimentcharakter sind in Tabelle I und Abbildung 1 zusammengestellt bzw. veranschaulicht.

Quantitative Untersuchungen wurden nicht durchgeführt. Die flecken- oder bandartige Differenzierung, die Unbeständigkeit des Sedimentcharakters sowie die Labilität des Sediments lassen dies illusorisch und irreführend erscheinen. Deswegen wurde die Häufigkeit des Vorkommens der gefundenen Chironomidenarten bzw. Taxa nur mit »vereinzeltes, mäßiges, bzw. massenhaftes Vorkommen« bezeichnet (Tabelle II).

Untersuchungsergebnisse

Artenzusammensetzung. — Insgesamt wurden 12 Taxa erwähnt (Tabelle II). Vom systematischen Gesichtspunkt her muß folgendes bemerkt werden. Die Arten *Rheorthocladius rubicundus* Mg. und *Parachironomus demeijerei* Krus. sind zur Zeit als unsicher zu betrachten, obwohl Lenz in seiner neueren Arbeit [10] die letztere als gute Art betrachtet. *Parachironomus demeijerei* ist übrigens neu für die Fauna Ungarns. Die Puppe der *Cryptochironomus*-Form stimmt mit der von Lenz 1962 aufgestellten Puppe der »*Retina*«-Gruppe völlig überein [10, p. 248], der Begriff Gruppe ist jedoch mit dem zwangsmäßig gebrauchtem Ausdruck »Artengruppe« nicht identisch. Bei der Gruppe von Lenz ist wenigstens der spezifische Wert der Merkmale unbestritten, die Artengruppierung der hierhergehörigen Formen wäre aber nur auf Grund von Merkmalvergleichen sämtlicher Entwicklungsstadien durchführbar.

Ein Vergleich mit den Angaben von benthischen Chironomiden anderer Donauabschnitte scheint zwecklos zu sein. In der Monographie: »Limnologie der Donau« [7] finden wir die aus dem Hauptarm der Donau bisher beschriebenen Chironomidenarten (bzw. Artengruppen) mit der Bemerkung, in welchem Abschnitt sie angetroffen wurden. Ein maßgebender Vergleich läßt sich mit den bis jetzt bekannten Angaben leider nicht ziehen, da a) die Erforschung der einzelnen Abschnitte und b) die angewandte Nomenklatur, taxonomische Bewertung der Forscher äußerst verschieden, weiterhin c) in den meisten Literaturangaben die Bezeichnung der Biotope nur oberflächlich angeführt ist (oder sogar ganz fehlt). Die Benthosuntersuchungen des zweitgrößten Seitenarmes der mittleren Donau, die 129 km lange Mosoner Donau [5], weist bereits gewisse Möglichkeiten zum Vergleich auf. In dem sich stark schlängelnden Donauarm verschieben sich die Lebensbedingungen des Benthos entsprechend dem Mittellaufcharakter mehr in die lenitische Richtung. Entsprechend ließen sich auch im Mosoner Donauarm um 50% mehr Chironomiden-Taxa nachweisen als in dem dreimal so langen Abschnitt des Hauptarmes. Während im Hauptarm sehr wenige typische benthische Chironomiden angetroffen werden konnten, war deren Art- und Individuenzahl in der Mosoner Donau am größten.

Wie auch aus der Tabelle II ersichtlich, waren im Benthal des Hauptarmes am häufigsten vertreten: *Cricotopus fuscus* K. und *Cryptochironomus* sp. (Puppe: *Retina*-Gruppe s. LENZ), weiterhin — etwas mäßiger — *Ablabesmyia* sp.

Tabelle I

Angaben über Wasserstand, Wassertemperatur und Sedimentcharakter an den Untersuchungsstellen

Untersuchungsstelle	Datum	Wasserstand %	Wassertemperatur °C	Art des untersuchten Sedimentes
I. Gönyü Stromkm 1791	28. VI. 1966	55	18,0	a) schlammig b) *sandig-schottrig** c) sandig-schlammig
II. Komárom Stromkm 1768	28. VI. 1966	55	18,0	a) sandig b) *sandig-schottrig*
III. Zebegény Stromkm 1703	4. VII. 1962	33	15,0	a) sandig b) sandig c) *sandig mit Kieselsteinen* d) steinig (30 mm ∅) sandig
IV. Alsógöd Stromkm 1668	9. VII. 1965	73	16,0	a) *sandig* b) schlammig-sandig
V. Lupasziget Stromkm 0 (Szentendrer Arm)	20. IX. 1958	11	17,0	a) *sandig* b) sandig-schlammig c) schlammig
VI. Ercsi Stromkm 1614	13. VII. 1962 28. VI. 1966	33 51	19,0 18,5	a) *sandig-schlammig mit Kieselsteinen* b) sandig-schottrig c) lehmig mit Steinen (150 mm ∅)
VII. Dunaújváros Stromkm 1581	23. V. 1962	57	13,5	a) *sandig mit Kieselsteinen* b) schlammig-sandig c) schlammig-sandig
VIII. Paks Stromkm 1531	13. VII. 1962	33	19,0	a) *steinig* (100 mm ∅) b) sandig mit Kieselsteinen
IX. Gerjen Stromkm 1516	15. VIII. 1962	32	22,0	a) *sandig* b) sandig
X. Baja Stromkm 1480	15. VIII. 1962	31	22,0	a) schlammig-sandig b) sandig-schlammig c) *sandig*
XI. Mohács Stromkm 1448	9. V. 1962	46	13,0	a) sandig b) *sandig* c) schlammig-lehmig d) schlammig-lehmig

* Kursivschrift = in der Stromlinie

Tabelle II

Vorkommen der Chironomiden an den einzelnen Untersuchungsstellen

Systematische Einheit	Entwicklungs-stadium	Untersuchungsstelle										
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Tanypodinae *Ablabesmyia* sp.	L	○	◑	◑			○	●	○			
Orthocladiinae *Cricotopus fuscus* K.	L, P	●	◑	○	◑		○	●	◑	○	◑	◑
Limnophyes transcaucasicus TSHERN.	L						◑	●	◑			○
Microcricotopus bicolor ZETT.	L, P						●	○			○	◑
Prodiamesa olivacea MG.	L				○						○	
Rheorthocladius rubicundus MG.	L	●										
Chironominae *Chironomus thummi* K.	L			○		○	○					
Cryptochironomus (»*Retina*-Gruppe«)	L, P			○	◑	◐		●				●
Polypedilum, *Laetum*-Gruppe	L						○					
Polypedilum, *Nubeculosum*-Gruppe	L, P						●					
Parachironomus demeijerei KRUS.	L								○	○		●
Rheotanytarsus Subsect.	L			◑		◑						

Zeichenerklärung: L = Larve, P = Puppe; ○ = vereinzeltes, ◑ = mäßiges, ● = massenhaftes Vorkommen

und die von TSHERNOWSKI beschriebene *Limnophyes transcaucasicus*. Am meisten an einen Sedimenttyp gebunden waren: *Cricotopus fuscus* K. (Steine mit Algenüberzug), *Cryptochironomus* sp., *Polypedilum*, *Nubeculosum*-Gruppe (schlammiges Sediment). An dieser Stelle sei erwähnt, daß sich unter den vorgefundenen Arten verhältnismäßig viele phytophile, nicht typische benthische Formen nachweisen ließen.

Im Hinblick darauf, daß die Larven im fließenden Wasser aus ihren ursprünglichen Biotopen leichter herausgewaschen werden können, lohnt es sich — in erster Linie gerade vom Gesichtspunkt der phytophilen Arten aus — die Chironomiden-Fauna anderer Biotope des ungarischen Donauabschnittes mit jenen des Benthos zu vergleichen. Zum Vergleich wurden die Untersuchungsergebnisse der aus der Uferregion, vom Aufwuchs der Schwimmkörper und der aus dem Benthal des Mosoner Donauarmes gewonnenen Proben herangezogen. Während der den ganzen ungarischen Donauabschnitt erfassenden Untersuchungen wurden aus den 33 Proben des Benthos im Hauptarm der Donau 12 Taxa, aus den 46 Proben der Uferregion 16 Taxa, aus den 77 Proben des Periphytonaufwuchs der Schwimmkörper 17 Taxa nachgewiesen [2, 3]. Bei den Benthosuntersuchungen im Mosoner Donauarm konnten in 25 Proben 18 Chironomiden-Taxa erbeutet werden [5]. In der nachstehenden Zusammenstellung werden bloß die in den verschiedenen Biotop-Typen gemeinsam und am häufigsten vorkommenden Taxa angeführt.

	B	U	A	BM
Ablabesmyia sp.	++	++	+	
Cricotopus fuscus K.	++	++	+	+
Limnophyes transcaucasicus T.	++		+	
Microcricotopus bicolor ZETT.	++	++	+	++
Orthocladius rubicundus MG.				++
Chironomus thummi K.	+	+		+
Cryptochironomus, *Defectus*-Gruppe				++
Cryptochironomus, *Retina*-Gruppe	++			
Polypedilum, *Nubeculosum*-Gruppe	+	++	+	+

Zeichenerklärung: B = Benthos, U = Uferregion, A = Aufwuchs der Schwimmkörper der Donau, BM = Benthos des Mosoner Donauarmes; + = vereinzeltes, ++ = massenhaftes Vorkommen.

Aus der Zusammenstellung geht folgendes eindeutig hervor: 1. Am häufigsten wurden die Benthos-Chironomiden der Donau — mit Ausnahme eines einzigen — in der Uferregion bzw. im Aufwuchs der Schwimmkörper massenhaft angetroffen. 2. Die benthischen Chironomiden des Mosoner Donauarmes kamen entweder auch in den angeführten Biotopen der Donau vor (gewöhnlich massenhaft), oder ließen sich ausschließlich in der Mosoner Donau nachweisen. Hinsichtlich der Fauna weist die Ähnlichkeit zwischen dem Benthos und der Uferregion des Hauptarmes, sowie des Aufwuchses der Schwimmkörper darauf hin, daß der im Flußbett der Donau lebende, wenn auch noch so schwach ent-

wickelte pflanzliche Überzug weit günstigere Lebensbedingungen für die phytophagen Mitglieder des Benthos sichert als das im allgemeinen an organischem Material ärmere Sediment. Die Verschiedenheit in der Benthos-Fauna des Mosoner Donauarmes und der Donau zeigt, daß der an lenitischen Stellen reichere Mosoner Donauarm den aus dem Hauptarm der Donau nachweisbaren eubenthischen, sedimentfressenden Formen bedeutend günstigere Lebensbedingungen sichert.

Auf Grund der Sedimentqualität ist die Besiedlungsdichte der Benthos-Chironomiden auf dem feineren, an organischem Material verhältnismäßig reicherem, schlammigem Sediment am größten. Dieser folgen die größeren (mindestens 8—10 cm großen), mit Algen überzogenen Steine. Am spärlichsten besiedelt ist das sandige, sandig-schottrige Sediment.

Im Zusammenhang mit der Artenzusammensetzung sei noch hervorgehoben, daß die in den Sedimentproben angetroffenen Hirudineen und Mollusken ebenfalls bearbeitet wurden [6, 11].

Hydrologisch-potamoökologische Beziehungen. F l u ß r e g u l i e r u n g. — Hinsichtlich der Ausbildung der benthischen Chironomidenfauna des Hauptarmes muß der Reguliertheit des Stromabschnittes eine maßgebliche Bedeutung beigemessen werden. Infolge der Regulierung liegen nämlich die im Querschnitt des Strombettes vorhandenen äußeren Strömungsgeschwindigkeiten näher beieinander, hauptsächlich dadurch, daß sich die direkt zum Hauptarm gehörenden stagnierenden oder nur langsam strömenden Wassermengen und damit natürlich auch die Ablagerungsmöglichkeiten der feineren Sedimentfraktionen wesentlich vermindern. Mit der Regulierung wurden zahlreiche tote und Nebenarme abgeschnitten und versperrt, die früher — zeitweilig oder ständig — die Benthos-Fauna des Hauptarmes bereichern konnten. Die Wasserführung der nach wie vor mit dem Hauptarm in Verbindung stehenden toten und Nebenarme (zusammenfassend auch Anlandgewässer genannt) ist im allgemeinen so geregelt, daß sie sich mit dem Hauptstrom im Gleichgewicht hält. Eben deswegen leisten sie zur Bereicherung der Benthos-Fauna des Hauptarmes kaum mehr einen Beitrag. Durch die Regulierung hat die Benthos-Fauna des ungarischen Donauabschnittes zwei bedeutende Gebiete dieses Charakters verloren, u. zw. das Gebiet der Großen und Kleinen Schüttinsel (Stromkm 1850—1790) und den Abschnitt bei Gerjen (Stromkm 1516—1490).

H o c h w a s s e r. — Die mit dem Hochwasser verbundene zeitweilige Zunahme der Geschwindigkeit (die selbst das 2,5—3fache erreichen kann) bedeutet für die Fauna die gefährlichste Selektion, weil das bis dahin in Ruhe befindliche Sediment in Bewegung gerät und die Organismen vom Wasser ausgespült werden. Einen Beweis hierfür liefern die Planktonproben aus dem offenen Wasser, in denen — schon bei einer kleineren Flut — benthische Chironomidenlarven anzutreffen sind. Dies macht sich in dem untersuchten Donau-

abschnitt auch deswegen besonders bemerkbar, weil die hier regelmäßigste Hochwasserperiode, die sog. Sommerhochwasserflut, gerade in den Juni, d.h. in die aktivste Larvenentwicklungszeit vieler Chironomiden fällt.

Strömung und Wasserstandschwankungen. — Die beiden bedeutendsten Umweltfaktoren des Stromes, die Strömung und die Wasserstandschwankungen sind in dem im Gleichgewicht befindlichen, hinsichtlich des hydrologischen Dynamismus des Flusses durch den Mittellaufcharakter gekennzeichneten Abschnitt biologisch besonders ausschlaggebend. Die von den mittleren Werten abweichenden Wasserstands- bzw. Strömungsänderungen lösen nämlich hier entgegengesetzte Prozesse aus (Geschiebeablagerung bzw. -verfrachtung). (Im Ober- bzw. Unterlauf ändert sich im Gegensatz hierzu im allgemeinen der Charakter und die Tendenz der Prozesse nicht, bloß dessen Intensität!) Aus biologischem Gesichtspunkt bedeutet dieser Umstand daß das in Ruhe befindliche Sediment — ein kardinaler Punkt der Lebensbedingungen — nicht ständig gesichert ist. Dies muß hier als eine typische astatische Eigenschaft des Potamobios angesehen werden!

Strömungsmikroklima und Metamorphose. — Ein weiterer bemerkenswert erscheinender potamoökologischer Gesichtspunkt steht ebenfalls mit der Strömung, d. h. des näheren mit dem Strömungsmikroklima an der Stelle des Vorkommens der Organismen im Zusammenhang. Aus der einschlägigen hydrologischen und biologischen Literatur geht bereits hervor, daß sich die Strömung in fließenden Gewässern — sowohl am Grund wie am Periphyton — unter einer gewissen Grenzschicht stark verringert bzw. ganz aufhört. Es bildet sich ein sogenanntes Totwasser, und dieses sichert dem Organismen — in unserem Falle den Chironomidenlarven — die nötigen hydrodynamischen Bedingungen. Die Chironomiden verbringen aber während ihrer Metamorphose nur eine gewisse Periode (die Larvenstadien) unter den von der Strömung gesicherten Verhältnissen. Es ergibt sich also die Frage: Wie können die vor und nach den Larvenstadien befindlichen Formen den Einfluß der Strömung (und der Wasserstandschwankungen) bewältigen.

Im Falle der Benthos-Chironomiden sinken die an der Wasseroberfläche des Stromes abgelegten Eier näher oder entfernter vom Ablegeplatz früher oder später auf den Grund. Es ist unbestimmt, auf welche Sedimentart sie geraten, und dies bedeutet auf jeden Fall im Vergleich zu den Seeverhältnissen eine größere Selektion. Die Puppen geraten ins offene Wasser und werden dort auch fortgeschwemmt, doch ist dies für ihre Entwicklung belanglos, da sie schließlich irgendwo entschlüpfen. Während des Entschlüpfens werden sie — mit Ausnahme von lenitischen Stellen (Uferzone usw.) — vom fließendem Wasser auch bei ruhigem Wetter stark dezimiert.

Wie aus dem Gesagten hervorgeht, sind die einzelnen Stadien der Entwicklung u. a. stark verschiedenen Strömungsverhältnissen ausgesetzt. Bei der Erklärung des Faunenbildes genügt es somit nicht, bloß die Lebensbedingun-

gen der in größter Zahl angetroffenen Larven zu verfolgen. Die Bedingungen der verschiedenen Biotope der einzelnen Entwicklungsstadien weichen voneinander ab. Die Schwierigkeiten der Befriedigung dieser verschiedenen bzw. — hinsichtlich der Metamorphose — wechselnden Anforderungen liefern eine ausreichende Erklärung für die Armut der Chironomidenfauna sowohl vom qualitativen als auch vom quantitativen Gesichtspunkt aus.

Auch potamobiologisch betrachtet, ist es aber bemerkenswert, daß bei den durchgeführten Untersuchungen die Chironomiden — trotz der erwähnten Beschränkungsfaktoren — die Dominanz der Mesofauna repräsentiert haben.

SCHRIFTTUM

1. Ambühl, H. (1959): Die Bedeutung der Strömung als ökologischer Faktor. — Schweiz. Zeitschr. f. Hydrol., **21**, p. 133—264.
2. Berczik, Á. (1965): Die Chironomiden-Larven aus dem Periphyton der Landungsmolen im Donauabschnitt zwischen Budapest und Mohács (Danubialia Hungarica XXXIII). — Acta Zool. Hung., **11**, p. 227—236.
3. Berczik, Á. (1966): Chironomidenlarven aus dem Aufwuchs der Schwimmkörper im Donauabschnitt zwischen Rajka und Budapest (Danubialia Hungarica XXXIX). — Acta Zool. Hung., **12**, p. 41—51.
4. Berczik, Á. (1966): Über den Einfluß einiger hydrologischer Faktoren auf die Besiedlungsmöglichkeiten der Fauna der Mittleren Donau (Danubialia Hungarica XXX). — Ann. Univ. Sci. Budapest, Sect. Biol., **8**, p. 25—32.
5. Berczik, Á. (1967): Benthos-Chironomiden des Mosoner Donauarmes (Danubialia Hungarica XLI). — Opusc. Zool. Budapest, **7**, p. 45—54.
6. Bothár, A. (1966): Beiträge zur Kenntnis der Weichtierfauna der ungarischen Donau (Danubialia Hungarica XXXVI). — Opusc. Zool. Budapest, **6**, p. 93—107.
7. Dudich, E. (1967): Systematisches Verzeichnis der Tierwelt der Donau. — In Liepolt, R.: Limnologie der Donau, Lief. **3**, Stuttgart, p. 4—69.
8. Dudich, E. & Lászlóffy, W. (1960): Einige wissenswerte Kenntnisse über die ungarische Donaustrecke. — Budapest (Rotaprint Ausgabe), p. 1—32.
9. Fittkau, E.-J. (1962): Die Tanypodinae. — Berlin, p. 1—453.
10. Lenz, Fr. (1954—62): Tendipedidae-Tendipedinae. — in Lindner, E.: Die Fliegen der palaearktischen Region, **13c**, p. 139—260.
11. Soós, Á. (1967): On the leech-fauna of the Hungarian reach of the Danube (Danubialia Hungarica XLIV). — Opusc. Zool. Budapest, **7**, p. 241—257.
12. Thienemann, A. (1944): Bestimmungstabellen für die bis jetzt bekannten Larven und Puppen der Orthocladiinen. — Arch. f. Hydrobiol., **39**, p. 551—664.
13. Thienemann, A. (1951): Tanytarsus-Studien II. Die Subsectio Paratanytarsus. — Arch. f. Hydrobiol., Suppl.-Bd. **18**, p. 595—632.
14. Thienemann, A. (1954): Chironomus. — in: Die Binnengewässer, **20**, p. 1—834.
15. Tőry, K. (1952): A Duna és szabályozása. — Budapest, p. 1—454.

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SOME TINEID MOTHS (LEPIDOPTERA) FROM MADAGASCAR

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The Tineid (s. str.) fauna of Madagascar is as good as unknown. It was only MEYRICK who described some species of what he considered to be Tineid taxa in the fourth volume of his Exotic Microlepidoptera, of which, however, only one species (*"Tineola" atricoma* MEYR.) seems to belong to the true Tineids while all others are referable to the Melasinid complex of the Psychidae; and VIETTE who described, among species relegable to other families, a single true Tineid taxon under the name *"Sporadartha"* (recte *Morophaga*) *vadonella* VIETTE, 1954 (in: Nouveaux Tineoidea [s. l.] de Madagascar, Ann. Soc. Ent. France, **123,** p. 78—80).

It is therefore gratifying, and to be thanked to Dr. P. E. L. VIETTE, Paris, that a rather copious Tineid material was made available for study. The majority of the specimens originate from Dr. VIETTE's collectings in Madagascar and are the property of the Musée d'Histoire Naturelle in Paris, wherein also the Holotypes and Paratypes of the new taxa are deposited, with the exception of one Paratype exemplar donated to the Hungarian Natural History Museum, Budapest.

Ceratophaga PETERSEN, 1957

(Beitr. Entom., **7**, 130—131)

Ceratophaga vastella (ZELLER, 1852: Vetensk. Acad. Handl., p. 88). A male (slide 3693) and a female specimen (slide 3694) from "Madagascar W., Station agricole du bas Mangoky, (A. R.), III. 1955" and "Madagascar Nord, foret d'Analamerana, 50 km S. E. Diego Suarez, alt. 80 m, 29. I au 3. II. 1959", (leg. P. VIETTE).

Scalmatica MEYRICK, 1911

(Trans. Linnean Soc., London, **14**, p. 306)

Scalmatica insularis sp. n.

Alar expanse: 11 mm. Head, labial palpi, antennae, thorax and basic color of fore wings pure white; pattern light golden brown: 3 oblong or sub-

triangular spots extending from costa to middle of wing, parallel with each other, at $^1/_4$, $^1/_2$, and $^3/_4$, cilia white; hind wing medium pearly grey, cilia light grey.

Male genital organ: the two uncus-horns, narrow tegumen and wide vinculum typical, valvae subsinuous, apically with two obtuse ridges projecting from plane of valva, aedoeagus medium long, of equal width throughout, preapically punctate (Fig. 1.)

The new species differs from its four known congeners, *separata* GOZMÁNY, 1965 (Acta Zool. Hung., **11,** p. 264, Fig. 12), *ascendens* GOZMÁNY, 1966 (l. c., **12,** p. 60, Fig. 9), *zernyi* GOZMÁNY, 1967 (Ann. Mus. Roy. Afr. Centr., No. **157,** p. 27, Fig. 29) — these three from the African mainland — and the type-species, *rimosa* MEYRICK, 1911 (l. c.) from the Seychelles, by the simpler, more distinct pattern of the fore wings and the more differentiated instead of the simply boot-shaped valvae.

Holotype male: "Madagascar occid., foret de Befasy, 45 km S. de Morondava, 1 au 10. I. 1956, J. PAULIAN + gen. prep. 3691".

Hilaroptera gen. n.

(Derivation of generic name: ἱλαρος = gay + πτερόν = wing)

Hairs loose, labial palpi narrow, antennae ciliate, venation of both wings complete, simple; male genital organ with two laterally displaced uncus-arms, no gnathos, high tegumen, laterally narrow but frontally wide vinculum, wide valvae with divers apical excrescences, valvae connected by transtillae and anellus carrying simple aedoeagus; female genital organ with short ovipositor, highly sclerotized, wide, and complicated genital plate and ostium, large bursa and elongated, splinter-shaped signum.

Type-species: *Hilaroptera viettei* sp. n.

The new genus belongs probably to the Scardiinae; the structure of the female genitalia is, however, rather foreign to that subfamily. The specialized valval complex and the uncus are distinctive.

Hilaroptera viettei sp. n.

Alar expanse: male 22 mm, female 28 mm. Head, labial palpi (second joint laterally blackish), thorax, basic color of fore wings whitish stramineous, antennae grey; fore wing shiny, pattern brownish black, situated on upper half of wing: many dark dots along costa, emitting a nebulous, bisinuate cloud, its two peaks reaching down to fold at $^1/_3$ and $^2/_3$, pattern terminating preapically at $^3/_4$, darkest in cell and especially in discocellular region and its two peaks in fold; cilia concolorous with wing, hind wing light yellowish grey with a brassy shine.

Male genital organ: uncus-arms weak, elongate, erect, dorsally on tegumen each with a small hairy excrescence, valva broad, high, with a digitate sacculus and apically terminating in two peaks, dorsal one with a strongly sclerotized and dentate outgrowth; transtillae connate, lyriform, anellus membraneous, aedoeagus tubular, simple, without cornuti, saccus scutiform (Fig. 5).

Female genital organ: ovipositor-pads wide, pillow-shaped, short, apophyses posteriores short, sclerotized ring of eighth segment narrow, ventrally producing a sinuous and setose ostium, introitus simple, atrium wide, ductus short, bursa large, signum elongate, sclerotized, splinter-shaped, flat (Fig. 9).

The new species cannot be confused with any known Tineid taxon of the Ethiopian region, or any insular form in the Indian Ocean.

Holotype male: "Amplomita, est Belanitra, dct Ambatolampy, 4-V-56, P. Griv. + gen. prep. 3707". Paratype female: "Madagascar Est, env. de Perinet, alt. 900 m, foret de Analamazoatra, le 21-XI-1954, P. Viette + gen. prep. 3696".

I dedicate this finely colored, highly interesting new species to Dr. P. E. L. Viette, in friendship and esteem.

Perissomastix Rothschild et Warren, 1905

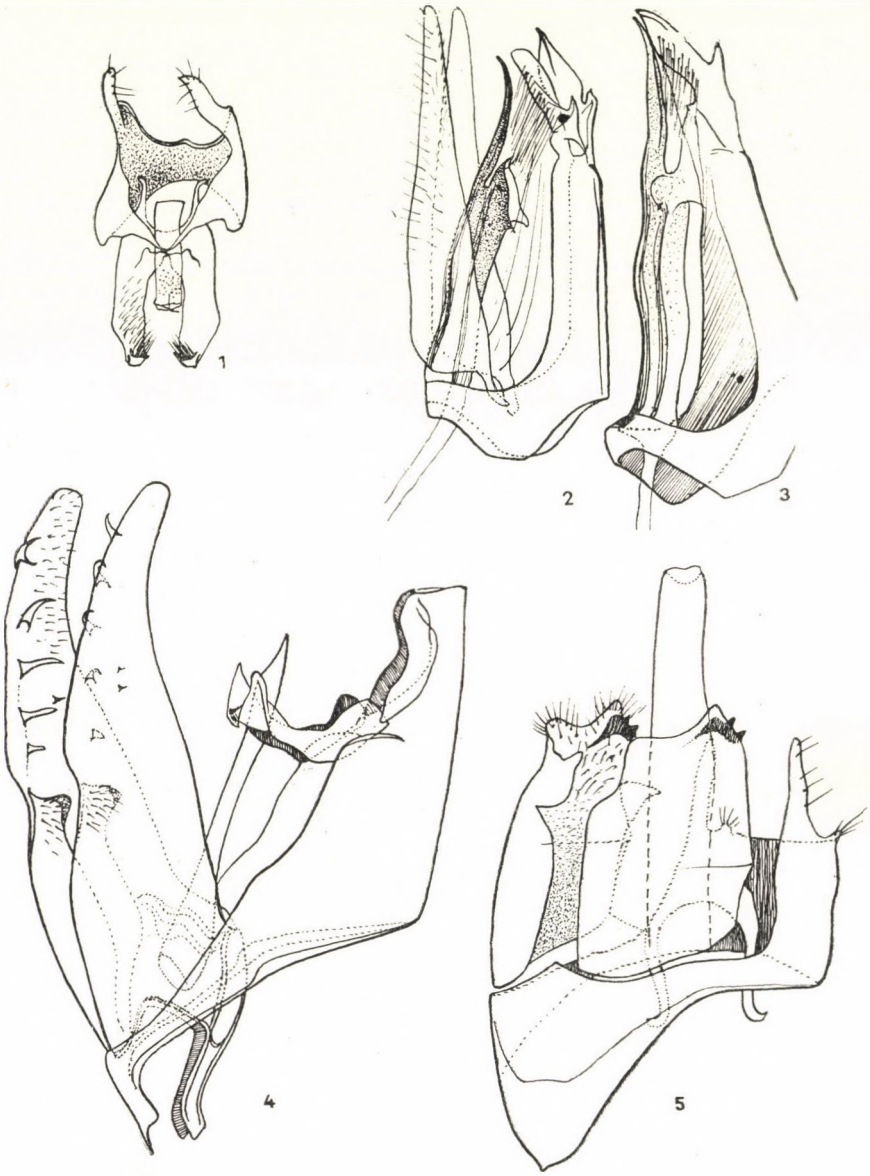
[Nov. Zool., **12**, Nr. 1, p. (33)]

Perissomastix madagascarica sp. n.

Alar expanse: 18—21 mm. Head, labial palpi, base of thorax deep black, antennae brownish yellow, scapulae, thorax, basic color of fore wings brownish grey, fore wing irrorated with deep, vivid violet scales, very dense in costal region (here almost suppressing basic color) but gradually rarer toward dorsum, there almost extinct, cilia concolorous, hind wing brassy grey, cilia concolorous.

Male genital organ: uncus-arms broadly lanceolate, apically sharply pointed but keeled and thus laterally spatulate, setose, basally with a tooth on dorsal side, tegumen very high, vinculum rather narrow, valvae narrow, long, evenly tapering to an obtuse apex, aedoeagus peculiar: an apparently double tube, apical third arcuate ventrad, pointed, sharp, aciculate (Figs. 2, 3).

The new species is the first known taxon of the genus in Madagascar; nor can it, owing to the peculiar construction of the aedoeagus, be confused with any of its black-headed congeners on the African mainland. There is a possibility that *Tineola atricoma* Meyrick, 1931 (Exot. Microl., **4**, p. 94) is conspecific with it [I have not examined the type-specimen, a female measuring 18 mm, deposited in the British Museum (Nat. Hist.)], but the following two points



Figs. 1—5. Male genital organ of 1 = *Scalmatica insularis* sp. n., ventrally, valval complex everted, Holotype, slide 3691; 2 = *Perissomastix madagascarica* sp. n., laterally, uncus dorsolaterally, Holotype, slide 3690; 3 = same, uncus laterally, Paratype, slide 3689; 4 = *Callocosmeta eupicta* gen. n., sp. n., laterally, with tip of aedoeagus slid behind, but not held naturally by, gnathos, Holotype, slide 3695; 5 = *Hilaroptera viettei* gen. n., sp. n., latero-ventrally, Holotype, slide 3707

would seem to preclude this presumption: 1. all females of the known allies are considerably larger than the males, and the males of the present species measure up to 22 mm in contrast with the 18 mm wide female *atricoma* MEYR. specimen, 2. one of the Paratypes, deposited in the Paris Museum, was known to MEYRICK, and he labelled it in his own hand as "*T. othello* MEYR.", as was his wont with nearly all black-headed *Perissomastix* taxa. *P. othello* (MEYR.) occurs, as far as my experience goes, only in Ceylon, and has a vastly different male genital structure. Externally, the new species stands nearest to *P. varii* GOZMÁNY, 1967 (Novos Taxa Entom., Mocambique, No. 53), and though its aedoeagus is similarly sinuous, the uncus is quite differently construed.

Holotype male: "Betroka, Madagascar, III, 1952, E. DIEHL + gen. prep. 3690"; 4 Paratypes: same locality, III. 1952 and 15. II. 1952 + gen. prep. 3689 (this latter deposited in the Hungarian Natural History Museum, Budapest), further "Madagascar occid., foret de Befasy, 45 km S. de Morondava, 1 au 10. I. 1956, R. PAULIAN + gen. prep. 3692", and "Madagascar, (leg.) SIKORA + 1328", deposited in the Natural History Museum, Vienna, in the material collected by SIKORA and identified by MEYRICK.

Scalidomia WALSINGHAM, 1891

(Trans. Ent. Soc. London, p. 83)

Scalidomia horridella (WALKER, 1863; Cat. Lep. Het., **28**, p. 474). Three males (slides 3701, 3702, 3706) and one female (slide 3703) from West (foret de Befasy) and Central (Tananarive and the Imerina Plateau) Madagascar.

Callocosmeta gen. n.

(Derivation of generic name: *καλλος* = beauty + *κοσμεω* = adorn)

Hairs loose, labial palpi with bushy scales below, antennae ciliate, wings elongate, apically obtusely pointed, venation complete, simple. Male genital organ apparently Hapsiferine but valvae with sacculus and a series of sharp, long spines.

Type-species: *Callocosmeta eupicta* sp. n.

The new generic taxon seems to be related to the subfamily Hapsiferinae, but it is distinguished by the construction of the valvae, with no valval spinosity being known among its congeners.

Callocosmeta eupicta sp. n.

Alar expanse: 24 mm. Hairs blackish grey, antennae pearly white, labial palpi ivory yellowish, second joint externally with some blackish scales, base of thorax and scapulae brownish black, otherwise stramineous ivory, basic color of fore wing a lustrous white, appearing on upper half of wing (including also cell), and in basal third (below fold to dorsum); pattern dark pearly grey

and brownish black: an elongate streak from base, between cell and fold, and between fold and dorsum (between $^1/_3$ and $^2/_3$), pattern in these two areas (confluent beyond outher half of fold) almost tigrine, the dark grey and blackish elements alternating as indefinite spots; area beyond cell, above tornus and in apical region pure dark grey, appearing as loosely confluent spots, bordered along termen by indistinct spots of white basic color; entire wing lustrous and scintillating, cilia snow white, with a broad grey band curving around apex in it; hind wing and cilia light grey.

Male genital organ: uncus, tegumen, vinculum, saccus, and gnathos resembling those of a *Scalidomia*-taxon, gnathos medially and ventrally fused, lobate, valvae, anellar structure and aedoeagus also similar to those of a Scalidomid, but valvae in distal half and subdorsally with a row of 5 sharp, arcuate spines, sacculus long, wide, apically dilated into a sharp point and a lobate inner section (Fig. 4).

Owing to the peculiarly constructed valvae, the new species stands isolated among its known (?Hapsiferine) allies.

Holotype male: "Madagascar Est, env. de Perinet, alt. 910 m, foret d'Analamazoatra, le 19-IV-1955, P. VIETTE + gen. prep. 3695".

Ancystrocheira gen. n.

(Derivation of generic name: $\alpha\nu\chi\upsilon\sigma\tau\varrho\omega\nu$ = hook + $\chi\varepsilon\iota\varrho$ = hand)

Hairs loose, labial palpi with appressed brush and erect setae on second joint, antennae finely and bilaterally ciliate, shape and pattern of wings apparently Hapsiferine, venation complete, simple, none of the veins stalked. Male genital organ characterized by Hapsiferine features, but vinculum ventrally very narrow, and valvae with adnate sacculus and a row of strong spines on dorsal margin; aedoeagus long, tubular, simple.

The new genus seems to be related, at least as to genital structure, to the preceding one, but the uncus-arms are narrow, pointed, and convergent into a tip (not truncate), the gnathos-arms slender, and the valval spines are in a marginal position.

Type-species: *Ancystrocheira porphyrica* sp. n.

Ancystrocheira porphyrica sp. n.

Alar expanse: 19 mm. Hairs, labial palpi (scapulae absent from Holotype specimen), thorax and basic color of fore wings light yellowish (argillaceous) brown, pattern dark brown and black: an elongate but indistinct brown stripe along upper and lower side of cell (between costa and cell and between cell and fold), costa with numerous large brown circular spots, middle of cell and discocellular vein with a large blackish brown blotch each, in middle between

them but below fold another oblong, blackish blotch; fold and dorsum bisected by sparse (1 scale thick) indistinct striae, apical region also indistinctly striated with yellowish brown, brown and black cilia of similar color pattern, with two blackish lines in middle and on end; hind wing light brownish grey, cilia pearly grey, with a darker subbasal and terminal line.

Male genital organ: uncus-arms thin, hairy, convergent into a tip, tegumen wide, triangular, gnathos-arms slender, arcuate into a semicircle and directed caudad, preapically fused in middle, apices sharply pointed, vinculum narrow, valvae slender and long, base wide, sacculus adnate, only extreme apex free and pointed, valval apex again wider but sharply truncate, bearing two recurving spines around proximal corner and two other ones appearing on dorsal margin; aedoeagus long, slender, tubular, simple, anellus a short, nearly circular sheath connected to base of valvae (Fig. 7).

The new species is easily distinguishable from the preceding and probably related ally.

Holotype male: "Betroka, Madagascar, VI/IX. 1953, E. DIEHL + gen. prep. 3704"

Chrysocrata gen. n.

(Derivation of generic name: *χρυσος* = gold + *κρατέω* = dominate)

Hairs, labial palpi, antennae (simple on female type-specimen!) Hapsiferine, wings broad but elongate, apically tapering to a point, venation complete, simple, but veins very short and cubitals on fore wing retreated toward base, lower cellular corner emitting m_3.

Female genital organ characterized by a very long, telescoping ovipositor, minute introitus vaginae, very slender ductus and bursa.

Type-species: *Chrysocrata coruscans* sp. n.

The new genus seems to reveal Hapsiferine features, but in want of the male sex, any nearer relegation would be presumptuous.

Chrysocrata coruscans sp. n.

Alar expanse: 24 mm. Head, labial palpi, thorax dark ochreous with a rufous suffusion, basic color of fore wings a deep golden ochreous, observable mainly below fold (from base to $^1/_2$ of wing), in outer $^2/_3$ (from costa to beyond cell) and in a large circular blotch in outer $^3/_4$ (apical area); wing otherwise covered by a deep violet grey suffusion, carrying also some black scales; the most outstanding features are the shiny golden spots consisting of large, prominently convex golden scales (as, e.g. in *Stagmatophora isabellella* COSTA), arranged in indistinct cross striae in the golden ochreous areas, thus 3 below fold, 2 in discocellular area, and 3 spots around apex; cilia ochreous around



Figs. 6—8. Male genital organ of 6 = *Protaphreutis acquisitella* (WLK.), ventrally, aedoeagus removed, slide 10 330 Brit. Mus. (Nat. Hist.), from Mauritius; 7 = *Ancystrocheira porphyrica* gen. n., sp. n., ventrally, aedoeagus removed, Holotype, slide 3704; 8 = female genital organ of *Chrysocrata coruscans* gen. n., sp. n., ventrally, slide 3705

apex, violet grey around tornus; hind wing light violet grey with a strong brassy shine.

Female genital organ: a slender and long, telescoping ovipositor, apophyses posteriores very long, anteriores less so, simple (not forked!), introitus vaginae minute, hardly discernible, not sclerotized, ductus extremely thin and slender, thread-like, bursa very small, without signa (Fig. 8).

Since the terminal plates of the (simple!) apophyses anteriores are not connected dorsally by any sclerotized band or similar structure, as in the Hapsiferine taxa of the African mainland, the new species cannot be confused genitally with any one of them; the distinctive pattern also precludes any such possibility.

Holotype female: "Betroka, Madagascar, V/IX. 1953, E. DIEHL + gen. prep. 3705"

Protaphreutis MEYRICK, 1930

(Trans. Ent. Soc. London, p. 322)

Protaphreutis acquisitella (WALKER, 1863; List Spec. Lep. B. M., **28,** p. 478). The genus, together with 3 new congeners of WALKER's taxon, was described by MEYRICK (l. c.) from Mauritius. This is the first record of a representative of the genus outside Mauritius (east of Madagascar). Since none of the species have been examined genitally and the results published, I submit here a description and figures of the respective organs. Male: uncus hood-shaped, with two large, circular, lateral and membraneous flaps attached basally, tegumen high, wide, cylindrical, gnathos-arms long, slender, pendulous, apically fused, vinculum narrow, saccus small, pointed, valvae long, excurved, slender, simple, margins subparallel, apically obtusely rounded, anellus simple, aedoeagus long, slender, tubular, with an apical row of small cornuti [Fig. 6; "Mauritius, PC, 00 (= 1900) + gen. prep. 10 330" in the British Museum (Nat. Hist.)]. Female: ovipositor moderately long, apophyses anteriores relatively short, antevaginal plates long, with strong setae, ostium wide, triangular, simple, ductus rather wide and long, bursa large, without signa, eighth tergite dorsally with two sclerotized V-shaped laths, mucronately connected in oral direction (Fig. 10; "Fort Dauphin, Madagascar, IV. 1953, E. DIEHL + gen. prep. 3700"). There is also a male specimen collected in the same locality (slide 3699).

Morophaga HERRICH-SCHÄFFER, 1853

(Syst. Bearb. Schmett. Europa, **5** (7), p. 22)

Morophaga vadonella (VIETTE, 1954; Ann. Soc. Ent. France, **123,** p. 78—80). Described as a *Sporadartha*-species, the taxon is referable to the above genus. Since the male genital organ was also published (l. c., Fig. 4), I submit



Figs. 9—11. Female genital organ of 9 = *Hilaroptera viettei* gen. n., sp. n., ventrally, Paratype, slide 3696; 10 = *Protaphreutis acquisitella* (WLK.), lateroventrally, slide 3700; 11 = *Morophaga vadonella* (VIETTE), ventrolaterally, slide 3697

here that of the unknown female: antevaginal pads small, pillow-shaped, setose, introitus simple, atrium long, smooth, ductus longitudinally finely rugulose, bursa relatively small, without signa, apophyses anteriores arcuate caudally and strongly incurved apically toward vagina (Fig. 11; "Madagascar Nord, Nossi-Be, alt. 150 m, foret de Lokobe, 3 au 9. XI. 1958, P. VIETTE + gen. prep. 3697").

Summary. Like those of the Ethiopian region, most of the known Tineid species of Madagascar are also referable to the subfamilies Tineinae, Meessiinae, and Perissomasticinae. Special attention should be paid to the new genera *Hilaroptera*, *Callocosmeta*, *Ancystrocheira*, *Chrysocrata*, and to MEYRICK's *Protaphreutis*. They display features taken and combined, as it were, from the lower Tineid subfamilies, the Myrmecozelinae, Scardiinae, and Hapsiferinae, yet none can unequivocally be assigned to any one of these subfamily taxa. They all agree in having a ciliate male antenna: frequent in Myrmecozelinae, characteristic of the Scardiinae, but exhibited only by *Pitharcha* MEYR. in the Hapsiferinae. They all have a complete venation and free veins, usual in the Myrmecozelinae, rare in the Scardiinae, and occurring only in *Tiquadra* WLK. in the Hapsiferinae. The male genitalia are also intermediate between the general structures characterizing these three subfamilies. The absence of the female corethrogyne would preclude their relationship to the lower Tineids, yet all other features refer them to this large group. The signum of *Hilaroptera* would speak for a Myrmecozeline taxon, but the other female features are foreign to this subfamily. The overall configuration of the female genitalia of *Chrysocrata* and *Protaphreutis* is clearly Hapsiferine, but the apophyses anteriores are simple and not forked. And so on. More and extensive material is needed before a better interpretation can be made of these probably ancient and endemic forms, a few of the many such organisms characterizing the fauna of Madagascar.

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ERGEBNISSE DER ZOOLOGISCHEN FORSCHUNGEN VON DR. Z. KASZAB IN DER MONGOLEI

197. TENEBRIONIDAE (COLEOPTERA) DER VI. EXPEDITION

Von

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ZOOLOGISCHE ABTEILUNG DES UNGARISCHEN NATURWISSENSCHAFTLICHEN MUSEUMS IN BUDAPEST
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Im Jahre 1968 habe ich in der Mongolei meine letzte Expedition absolviert. Diesmal erforschte ich die nordmongolische Gebirgsgegend bis zur Senke der Großen Seen in der Westmongolei. Im Rahmen der Austauschverbindung zwischen der Mongolischen und Ungarischen Akademie der Wissenschaften verbrachte ich diesmal zwei Monate in der Mongolei, und am 13. VI. 1968 nahm eine 45tägige Expedition ihren Anfang, die mich aus Ulan-Baator über Bulgan und Mörön unweit von der sowjetischen Grenze bis zu den Seen Uvs nuur, Örög nuur, Ačit nuur, Cagan nuur und Tolbo nuur führte. Auf der Rückreise vom Tolbo nuur bis Ulaangom nahm ich denselben Weg, von Ulaangom aber fuhr ich nach den Seen Chjargas nuur und Telmen nuur, von hier nach Norden bis zum See Chövsgöl nuur und zurück bis zur Stadt Mörön; von Mörön traf ich — wieder über Bulgan — am 27. VIII. 1968 in der Hauptstadt ein. Insgesamt habe ich bei dieser Reise 4200 km mit dem Wagen zurückgelegt (siehe Karte).

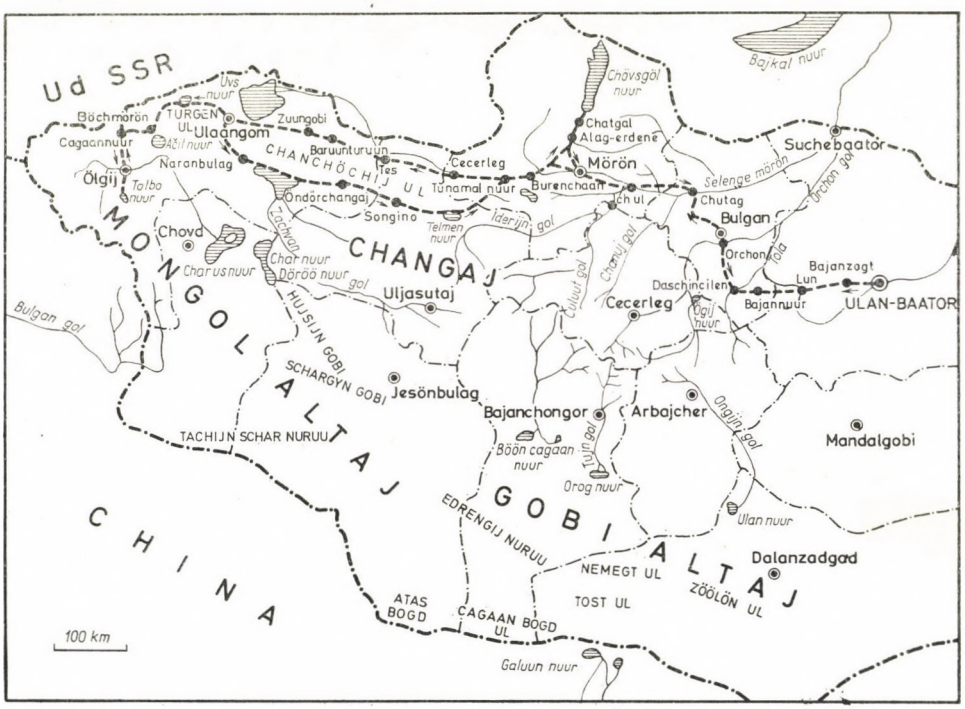
Näheres über den Verlauf der Expedition findet sich im »Reisebericht der VI. Expedition« (KASZAB, 1969a), über die einzelnen Fundstellen und Biotope sowie über die Resultate der Forschungsergebnisse in der »Liste der Fundorte der VI. Expedition« (KASZAB, 1969b). Hier will ich nur kurz erwähnen, daß ich bei meiner letzten Expedition mehr als 130 000 Tiere gesammelt habe, unter denen sich mehr als 36 000 Exemplare Käfer befanden.

CHARAKTER DER TENEBRIONIDEN-FAUNA DER NORDMONGOLEI UND DER SENKE DER GROSSEN SEEN

In der Nord- und Nordwestmongolei findet man vom Taigawald bis zur Wüste alle möglichen Formationen. Der Taigawald sowie die Nadelholzwälder der Nordmongolei enthalten keine Tenebrioniden oder nur einige sibirisch-

transbaikalische Elemente (wie z. B. *Upis ceramboides* L.), welche bis heute in der Mongolei nicht angetroffen wurden. Die alpine Stufe der Hochgebirge des Changaj und Chentej hat ebenfalls keine Tenebrioniden. Demgegenüber findet sich in den Gebirgssteppen und Steppen sowie in den Halbwüsten und Wüsten eine charakteristische und teilweise endemische Tenebrioniden-Fauna.

Die nordmongolische Steppen- und Gebirgssteppen-Fauna ist ziemlich artenarm. In dem gewaltigen Territorium dieser Zone kennen wir insgesamt



Reiseroute der VI. Expedition 1968 in der Nordmongolei

25 Arten resp. Unterarten, aus welchen nur acht Arten endemisch sind (*Anatolica cellicola* FALD., *A. modesta* BOG., *A. sulcipennis sulcipennis* REITT., *A. granulipleuris* REITT., *A. uljasutaja* KASZ., *Microdera interrupta* REITT., *Paranemia bicolor* REITT. und *Crypticus ovatulus* REITT.). Der größte Teil der Fauna ist mit der sibirisch-transbaikalischen gemeinsam. Dieser Umstand hat für die Beurteilung der zoogeographischen Zugehörigkeit der nordmongolischen Steppen- und Gebirgssteppenzone eine entscheidende Bedeutung.

Die Tenebrioniden-Fauna der Senke der Großen Seen ist demgegenüber viel artenreicher, was mit dem wüstenhaften Charakter dieser Becken zusammenhängt. Es ist allgemein bekannt, daß die xero-thermophilen Tenebrioniden ihren Formenreichtum in der Halbwüsten- und Wüstenzone entfalten. Wir

kennen aus diesem Gebiet (Senke der Seen Uvs nuur im Norden bis zum See Char us nuur im Süden) insgesamt 56 Arten, von welchen fast die Hälfte, insgesamt 21 Arten, endemisch sind (37,5%).

Die Senke dieser Seen ist die organische Fortsetzung des zwischen dem Changai und Gobi Altaj liegenden Seentales und besitzt eine etwas verarmte Gobi-Fauna. Die nördliche Lage dieser Becken sowie die Nähe der Hochgebirge des Mongol Altaj im Westen, des Changaj im Osten und des Tuva im Norden bestimmen die Unterschiede gegenüber dem Seental und vor allem gegenüber dem südlichen Teil der Gobi.

Die Senke der Großen Seen ist vom Einfluß der Gobi-Elemente im Süden nicht abgeschlossen. Einige dieser Elemente sind bis zum Norden, selbst am See Uvs nuur vorgekommen (*Anatolica paradoxa* REITT., *A. amoena* FALD., *Microdera kraatzi* REITT., *Platyope mongolica* FALD., *Blaps femoralis medusula* KASZ., *Monatrum prescotti* FALD., *Lobodera altaica* GEBL., *Eumylada punctifera amaroides* REI.), andere dieser Elemente sind aber nur bis an den Südrand der Senke der Großen Seen, bis zum Char us nuur vorgedrungen (*Colposcelis microderoides strigipleuris* KASZ., *Sternoplax zichyi* CSIKI, *Opatrum asperipenne verecundum* REI., *Anemia dentipes* BALL.). Es ist auch sehr charakteristisch und hängt mit der nördlichen Lage und mit der Nähe des Hochgebirges zusammen, daß hier oft gemeinsam mit typischen Wüstenelementen auch die charakteristischen Arten der nordmongolischen Steppen und Bergsteppenzone vorkommen (*Anatolica undulata* GEBL., *Scytosoma pygmaea* GEBL., *Melaxumia angulosa* GEBL., *Blaps rugosa* GEBL., *Bl. miliaria* FISCH.-W., *Bl. variolosa* FALD., *Platyscelis rugifrons* GERM.).

Außer dem Vorkommen der weit verbreiteten Gobi-Elemente geben die zahlreichen Endemiten sowie die mit der Fauna von Tuva gemeinsamen Arten der Senke der Großen Seen einen besonderen Charakter. Unter diesen ist die Verbreitung der *Scythis rectangulus* POPP. und *Melanesthes furvus* KONTK. im Tuva und in der Senke der Großen Seen am bemerkenswertesten. Ein Teil der Endemismen kommt nur am südlichen Randgebiet vor (*Anatolica lacustris* KASZ., *Anatrum songoricum* REI., *Lobodera davadshamsi vulgaris* KASZ., *L. explanata laesa* REI., *L. bruta* REI. und *Falsolobodera skopini* KASZ.) — sogar *Anatrum* und *Falsolobodera* repräsentieren noch endemische Gattungen. Andere Endemismen wurden demgegenüber nur im nördlichen Teil der Senke gefunden (*Anatolica boldi* KASZ., *A. dashidorzsi* KASZ. mit der ssp. *temporalis* KASZ., *A. subtrapezicollis* KASZ., *Scythis pusillus septentrionalis* KASZ., *Lobodera gibbula tetra* REI. und ssp. *major* KASZ., *L. davadshamsi davadshamsi* KASZ., *L. explanata reichardti* KASZ.).

Obwohl im allgemeinen die Zusammensetzung der Tenebrioniden-Fauna der Senke der Großen Seen der Fauna der Gobi entspricht, findet man doch genügend Unterschiede, um das Gebiet als abgesonderten Bezirk der Gobi betrachten zu können.

ELEMENTE DER MONGOLISCHEN TENEBRIONIDEN-FAUNA

Nach unseren jetzigen Kenntnissen sind in der Mongolischen Volksrepublik insgesamt 171 Tenebrioniden-Arten resp. -Unterarten einheimisch. Diese Zahl kann ich im folgenden nicht mehr wesentlich bereichern, weil das ganze Gebiet systematisch durchforscht und in den neueren Materialien kaum etwas Neues zum Vorschein gekommen ist. In diesen 171 Formen sind die Formen, die in der Literatur aus »Mongolia« beschrieben und in der letzten Zeit von den verschiedenen mongolischen Expeditionen nicht wiedergefunden wurden, nicht mitgezählt. Ein Teil dieser aus der »Mongolei« beschriebenen Arten gehört sicher nicht zur Fauna der Mongolischen Volksrepublik, wie z. B. *Anaedus orientalis* MOTSCHULSKY, eine Art, die ein tropisches Element darstellt und höchstens bis zum südlichen Teil der Provinz Kanssu vorkommt. Eine andere Art, *Colpotus faldermanni* BAUDI, welche in den Katalogen ebenfalls die Fundortsangabe »Mongolia« besitzt, kommt nicht in der Mongolei vor, sondern ist ein Vertreter der mandschurischen Fauna. Übrigens ist die Art *Colpotus faldermanni* BAUDI mit *Blindus strigosus* FALDERMANN synonym.

Mehrere Arten aus der POTANINschen Ausbeute sind aus »Mongolia centralis« oder »Mongolia borealis« beschrieben, jedoch ohne nähere Angabe des Fundortes. Auf Grund der Tagebücher POTANINS konnte man aber feststellen, daß diese Arten außerhalb der Mongolischen Volksrepublik, in der zentralen Gobi gesammelt wurden. Es sind: *Anatolica integra* REITT., *A. suturalis* REITT. *Microdera mongolica* REITT. und *Sphenaria vestita* REITT., sowie *Blaps caudata* GEBL.

Die mongolische Fauna wurde eigentlich in den letzten 10 Jahren erforscht. Die Expeditionen der mongolischen Zoologen, die zwei Expeditionen der gemeinsamen deutsch-mongolischen Reise, mehrere Expeditionen von Polen und Tschechen und schließlich meine eigenen sechs Expeditionen im ganzen Land erbrachten ein kolossal großes Material von Tenebrioniden mit ungef. 30 000 Exemplaren, welches ich seit 1964 in einzelnen Publikationen veröffentlicht habe. Insgesamt habe ich rund 70 für die Wissenschaft neue Arten resp. Unterarten beschrieben und 27 Arten resp. Unterarten konnte ich für die Fauna der Mongolei als neu nachweisen.

Die Untersuchung der Verbreitungsgebiete der aus der Mongolei sicher nachgewiesenen Arten resp. Unterarten ergibt ein sehr eigenartiges Bild. Es sind nur insgesamt vier Arten, die nicht der echten zentral- oder innerasiatischen Fauna angehören. Unter diesen Arten ist eine kosmopolit (*Tribolium destructor* UYTT.), die in die Mongolei eingeschleppt wurde und als Vorratsschädling allgemein bekannt ist (0,6% der Gesamtfauna); eine andere Art gehört zur transpaläarktisch-eurosibirischen Fauna (*Crypticus quisquilius* PAYK.; 0,6% der Gesamtfauna) und zwei Arten sind Repräsentanten der submediterranen ponto-zentralasiatischen Fauna (*Gonocephalum rusticum* OL. und *G. pusillum* FABR.; 1,2% der Gesamtfauna).

Alle übrigen Arten gehören der zentral- und innerasiatischen Fauna an, also mehr als 97% der Tiere. Außer diesen ist auch die große Zahl der Endemiten sehr charakteristisch. Von den 171 Arten sind nicht weniger als 104 nur in der Mongolei bekannt (60,8% der Gesamtfauna). Der hohe Prozentsatz der Endemismen hängt vor allem mit der Flügellosigkeit zusammen, außerdem noch mit der sehr beschränkten ökologischen Valenz, die dazu führt, daß ein großer Teil der Arten resp. Unterarten ein mehr oder weniger eng begrenztes Areal besitzt.

Die gesamte Artenmenge der zentral- resp. innerasiatischen Elemente verteilt sich im Grunde auf 4 verschiedene Typen: 1. mandschurisch-mongolischer Typ; 2. turkestanisch-mongolischer Typ; 3. Altaj-Sajan-mongolischer Typ und 4. gobischer Typ.

Zum mandschurisch-mongolischen Typ gehören insgesamt 6 Arten (*Blaps femoralis femoralis* FISCH.-W., *Bl. miliaria* FISCH.-W., *Opatrum subaratum* FALD., *Gonocephalum reticulatum* MOTSCH., *G. subrugulosum* REITT. und *Melanesthes chinganicum* REI.; 3,5% der Gesamtfauna). Unter diesen ist nur *Melanesthes chinganicum* REI. bemerkenswert; sie ist subendemisch und kommt außer in der Mongolei (Südost- und Ost-Mongolei) nur im Chingan Gebirge im Grenzgebiet der Ostmongolei vor.

Zum turkestanisch-mongolischen Typ zählt man insgesamt 10 Arten (*Anatolica lata* STEV., *A. amoena* FALD., *Dolamara cupreomicans* REITT., *Monatrum carinatum* GEBL., *Lobodera dilectans* FALD., *L. beicki beicki* REI., *L. altaica* GEBL., *Psammestus dilatatus* REITT., *Anemia dentipes* BALL. und *Crypticus zuberi* MARS., 5,8% der Gesamtfauna). Alle diese Arten sind entweder Mitglieder der westmongolischen Wüsten- und Halbwüsten-Fauna, oder sie sind ausschließlich im Süden der Gobi einheimisch.

Zum Altaj-Sajan-mongolischen Typ rechne ich 38 Arten (22,2% der Gesamtfauna). Die hierher gehörenden Arten sind die Vertreter der Steppen- und Gebirgssteppen-Arten der Ost- und Nordmongolei. Ich unterscheide in dieser Gruppe drei verschiedene Untergruppen: eine Untergruppe mit weit verbreiteten Arten vom Altaj, vom Sajan-Gebirge und aus der Nordmongolei (insgesamt 16 Arten: *Anatolica strigosa* GEBL., *A. undulata* GEBL., *A. pseudaucta* REITT., *A. aucta* FALD., *A. lepida* FALD., *Scytosoma pygmaea* GEBL., *Melaxumia angulosa* GEBL., *Blaps rugosa* GEBL., *Bl. variolosa* FALD., *Bl. reflexa* GEBL., *Platynoscelis reitteri* SEIDL., *Platyscelis rugifrons* GERM., *Lobodera humeridens* REITT., *L. sequensi* REITT., *Melanesthes faldermanni* MULS. & REY und *M. sibirica* FALD.). Die zweite Untergruppe stellen die endemischen Arten des Mongol Altaj und des westlichen Randgebietes der Senke der Großen Seen (insgesamt 12 Arten: *Anatolica chogsonzhavi* KASZ., *A. salinicola* KASZ., *A. boldi* KASZ., *A. dashidorzsi dashidorzsi* KASZ. mit spp. *temporalis* KASZ., *A. subtrapezicollis* KASZ., *Falsolobodera skopini* KASZ., *Anatrum songoricum* REI., *Lobodera gibbula tetra* REI., und ssp. *major* KASZ., *L. beicki cerberus* REI. und *Melanesthes*

altaica altaica KASZ.). Und schließlich bilden die dritte Untergruppe die Endemiten der ost- und zentralmongolischen Steppenzone sowie die Endemiten der changaischen Gebirgssteppenzone (insgesamt 10 Arten: *Anatolica cellicola* FALD., *A. modesta* BOG., *A. sulcipennis sulcipennis* REITT., *A. granulipleuris* REITT., *A. uljasutaja* KASZ., *Microdera interrupta* REITT., *Lobodera bruta* REI., *Paranemia bicolor* REITT., *Crypticus ovatulus* REITT. und *Belopus steppensis* KASZ.).

Unter allen Verbreitungstypen ist der gobische Typ der bedeutendste. Hierher gehören insgesamt 113 Arten (66,8% der Gesamtfauna). Diese Zahl zeugt davon, daß die Halbwüsten und Wüsten der Gobi eine recht spezielle und im Vergleich mit den übrigen Territorien auch sehr reiche Tenebrioniden-Fauna enthalten. Es ist auch noch sehr bemerkenswert, daß ein hoher Prozentsatz der hierher gehörenden Arten resp. Unterarten in der Mongolischen Volksrepublik endemisch ist. Die endemischen Formen des gobischen Typs sind unter allen Gruppen hier am stärksten vertreten (73,4%).

In der gobischen Gruppe unterscheide ich zahlreiche Verbreitungstypen, die voneinander durch territoriale und ökologische Merkmale abweichen. Zu der einen gehören die transgobischen Elemente; diese Arten sind in mehreren Bezirken, ja selbst in der ganzen Wüste Gobi vom Osten bis zur Senke der Seen und vom Norden, von der Grenze der Halbwüstenzone bis nach Süden in der Ordos und in Kanssu verbreitet (insgesamt 13 Arten, 12,4% der gobischen Gruppe). Unter diesen Arten sind 5 Arten in der Mongolei endemisch (*Anatolica polita borealis* KASZ., *A. sternalis gobiensis* KASZ., *Sternoplax zichyi* CSIKI, *Lobodera gobiensis* KASZ. und *Eumylada punctifera amaroides* REI.), während 8 Arten dieser Gruppe weiter verbreitet sind (*Microdera kraatzi* REITT., *Cyphogenia chinensis* FALD., *Platyope mongolica* FALD., *Pterocoma reitteri* J. FRIV., *Blaps acuminata* FISCH.-W., *Bl. femoralis medusula* KASZ., *Monatrum prescotti* FALD. und *Melanesthes maxima* MÉN.).

Die größte Gruppe des gobischen Typus stellt die zentralgobische mit insgesamt 50 Arten resp. Unterarten dar (42,2% des gobischen Typs), unter diesen 36 Endemismen. Das Territorium enthält das ost- und südgobische Flachland, das Seental bis zur Schargyn Gobi, das Gebiet südlich des Gobi Altaj, den zentralen Teil der Transaltaj Gobi, ein Gebiet, welches nicht nur gewaltig groß ist, sondern auch den am stärksten wüstenhaften Charakter aufweist. Die Endemiten dieser Gruppe sind folgende: *Epitrichia mongolica* KASZ., *E. tsendsureni* KASZ., *Trichosphaena chogsonzhavi* KASZ., *Cyphostethe mongolica* KASZ., *Colposcelis microderoides strigipleuris* KASZ., *C. elegans* KASZ., *Anatolica omnoensis* SKOP., *A. colposcina* SKOP., *A. scythisoides* KASZ., *A. auctiformis* SKOP., *A. grebenscikovi* KASZ., *A. psammophila* SKOP., *Scythis pusillus pusillus* SKOP., *Sc. skopini* KASZ., *Sc. gobiensis* KASZ., *Sc. piechockii piechockii* KASZ. mit ssp. *grossepunctatus* KASZ., *Semenovonymus tenuis* BOG., *Trigonocnera pseudopimelia reitteri* CSIKI, *Sternoplax boldi* KASZ., *Blaps kiritshenkoi* SEM. &

Bog., *Dilamus mongolicus* Kasz., *Monatrum mongolicum* Kasz., *M. horridum humeralis* Kasz., *Lobodera lenczyi* Kasz., *L. nojonica* Kasz., *L. laelaps* Rei., *L. explanata laesa* Rei., *Melanesthes csikii* Kasz., *M. heydeni* Csiki, *M. davadshamsi* Kasz., *M. ciliata* Reitt., *M. psammophila* Kasz., *M. bielawskii bielawskii* Kasz., *Belopus gobiensis* Kasz. und *Catomus mongolicus* Kasz. — Die übrigen 14 Arten dieser Gruppe sind in der zentralen Gobi weiter nach Süden verbreitet: *Colposcelis microderoides microderoides* Reitt., *C. damone* Reitt., *Anatolica nureti* Schust. & Reym., *A. amoenula* Reitt., *A. potanini* Reitt., *A. mucronata* Reitt., *Microdera laticollis kozlovi* Kasz., *Trigonoscelis sublaevigata granicollis* Kasz., *Sternoplax kraatzi* J. Friv., *St. mongolica* Reitt., *Blaps kashgarensis gobiensis* J. Friv., *Lobodera lycaon* Rei., *L. obtusangula* Reitt. und *Eumylada punctifera punctifera* Reitt.

Eine durch die hohe Endemitenzahl charakterisierte Gruppe des gobischen Typs ist die dchungarisch-gobische Gruppe. Es gehören hierher insgesamt 17 Arten (15% des gobischen Typs), unter diesen sind 12 Arten endemisch. Hierher gehört das verhältnismäßig kleine Territorium im Südwesten des Landes, die durch den Mongol Altaj und Bajtak Bogd ul sowie Tachijn Schar nuruu umschlossene Senke, welche sich faunistisch eng an die echte dschungarische Gobi in China anschließt. Hier sind die folgenden 12 Endemiten bekannt: *Colposcelis bulganicus* Kasz., *Anatolica tsendsureni* Skop., *A. guentheri* Kasz., *A. dschungarica* Kasz., *A. montagui* Kasz., *Scythis bulganicus* Kasz., *Sc. dschungaricus* Kasz., *Microdera dzungarica punctipennis* Kasz., *Pterocoma variolaris mongolica* Kasz., *Sternoplax fossor* Kasz., *Lobodera dschungarica* Kasz. und *Melanesthes altaica dschungarica* Kasz. — Mit der chinesischen Dschungarei sind die folgenden 5 Arten gemeinsam: *Microdera strigiventris* Reitt., *Adesmia dejeani* Gebl., *Platyope proctoleuca chinensis* Kasz., *Pterocoma parvula* J. Friv. und *Blaps medusa* Reitt.

Eine besondere Gruppe der Arten haben das Areal der Senke der Großen Seen und teilweise auch die mit ihr in Verbindung stehende, jedoch durch große Gebirgszüge abgesonderte Tuva. Hierher gehören insgesamt 11 Arten resp. Unterarten (10,6% der Gesamtfauna), von welchen 8 in der Senke der Großen Seen endemisch sind (*Anatolica lacustris* Kasz., *A. atshitnura* Kasz., *Scythis pusillus septentrionalis* Kasz., *Microdera jurganovae* Skopin, *Lobodera davadshamsi davadshamsi* Kasz., und ssp. *vulgaris* Kasz., *L. explanata reichardti* Kasz. und *Melanesthes parvula* Kasz.). Es sind auch drei Arten bekannt, die außer in der Senke der Großen Seen auch in der Tuva vorkommen und eine vom zoogeographischen-Standpunkt sehr bemerkenswerte Gruppe repräsentieren (*Scythis rectangulus* Popp., *Melanesthes jenseni jenseni* Schust., *M. furvus* Kontk.).

Die Tenebrioniden-Fauna des Gobi Altaj ist in manchen Zügen gleichfalls sehr eigenartig. Die Endemiten des Gobi Altaj zähle ich auch zu einer speziellen Gruppe. Es sind bisher 9 Arten bekannt, die nur aus dem Gobi-

Altaj-Gebirge bekannt sind (*Anatolica pusilla* KASZ., *A. humerangula* KASZ., *A. cechiniae* BOGD.-KATJK., *A. gobialtajica* KASZ., *Scythis juxtalaca* SKOP., *Lobodera frater* KASZ., *L. parvula* KASZ., *L. kiritshenkoi kiritshenkoi* REI. und ssp. *marginalis* REI.; 7,9% des gobischen Typs). — Hierher könnte noch eine weitere Art gezählt werden, doch kommt sie weiter nach dem Norden, auch im ganzen Mongol-Altaj-Gebirge und teilweise auch noch im Randgebiet des westlichen und südlichen Changaj vor, namentlich die *Anatolica paradoxa* REITT.

Schließlich gehört zum gobischen Typ noch eine Gruppe, u. zw. die Endemiten der Halbwüstenzone. Am Nordrand der Gobi zieht sich eine mehr oder weniger breite, durch ökologische Faktoren charakterisierte Zone hin, die eine Anzahl endemische Formen enthält, Arten, die stammesgeschichtlich der gobischen Fauna angehören. Es sind insgesamt 12 Arten (*Anatolica muchei* KASZ., *A. crassiuscula* BOG., *A. sulcipennis laevior* KASZ., *A. relicta* KASZ., *Microdera globata* FALD., *Blaps femoralis rectispinus* SKOP., *Opatrum asperipenne asperipenne* REITT. und ssp. *verecundum* REI., *Lobodera reitteri* CSIKI, *Melanesthes janseni meridionalis* KASZ., *M. mongolica* CSIKI und *M. bialewskii borealis* KASZ., 10,6% des gobischen Typs).

Aus dieser Zusammenstellung geht klar hervor, daß in der mongolischen Tenebrioniden-Fauna, ja selbst noch in der nordmongolischen Steppen- und Gebirgssteppen-Fauna die zentralasiatischen Elemente dominieren und die Fauna der Gobi eine sehr eigenartige, durch die speziellen ökologischen Bedingungen charakterisierte, an diese Bedingungen seit Jahrmillionen angepaßte endemische Fauna darstellt.

Auf Grund des vorliegenden Materials ist es heute möglich, die Angaben auch vom faunengenetischen Standpunkt aus auszuwerten und den Einfluß der verschiedenen geologischen Epochen, vor allem der Eiszeit im Faunenbild bestimmen zu können. Diese Synthese behalte ich mir aber für eine kommende Arbeit vor.

FAUNISTIK UND TAXONOMIE

Im folgenden gebe ich die Resultate der Bearbeitung des Tenebrioniden-Materials meiner 6. Expedition bekannt. Insgesamt habe ich 4220 Exemplare in 42 Arten resp. Unterarten und weitere 4 Formen gesammelt, von welchen sich eine Art, zwei Unterarten und eine Varietät auch für die Wissenschaft als neu erwiesen haben. Die Typen der hier als neu beschriebenen Formen sind in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest aufbewahrt.

1. **Anatolica strigosa** (GERMAR, 1824)

GERMAR: Ins. Spec. Nov., **1**, 1824, p. 138 (*Tentyria*). — STEVEN: Mém. Mosc., **1**, 1829, p. 86 (*Tentyria*). — REITTER: Verh. nat.-forsch. Ver. Brünn, **39**, 1900, p. 114. — KASZAB: Acta Zool. Hung., **11**, 1965, p. 305.

Untersuchtes Material. — Uvs Aimak: Sandgebiet Altan els, 35 km WNW von Somon Tes, 1400 m, 23. VI. 1968 (Nr. 1006). — Zavchan Aimak: 15 km NW von Somon Songino, 1840 m, 12. VII. 1968 (Nr. 1093). — 22 Exemplare.

Bemerkungen. In der Mongolei kommt diese Art nur im nordwestlichen Landesteil vor. Sie scheint in der niedrigen Gebirgssteppenzone und in den Sandstellen der Westmongolei vorzukommen. Die Art ist in Sibirien ziemlich weit verbreitet (Barnaul, Abakansteppen, Askust, Abakansk, Irbut), ist aber ebensowenig häufig wie in der Mongolei. Die mongolischen Exemplare stimmen morphologisch mit den sibirischen völlig überein.

2. **Anatolica cellicola** (Faldermann, 1835)

Faldermann: Mém. sav. étrang. Acad. St. Petersb., **2,** 1835, p. 398 (*Tentyria*). — Allard: Ann. Soc. Ent. Belg., **27,** 1883, p. 21. — Reitter: Verh. nat.-forsch. Ver. Brünn, **39,** 1900, p. 122. — Kaszab: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 4. — Kaszab: Acta Zool. Hung., **11,** 1965, p. 308. — Kaszab: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 7. — Kaszab: Acta Zool. Hung., **13,** 1967, p. 301. — Kaszab: l.c., **14,** 1968, p. 358.

Untersuchtes Material. — Bulgan Aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 14. VI. 1968 (Nr. 954); id., 24. VII. 1968 (Nr. 1143). — 88 Exemplare.

Bemerkungen. Diese Art ist im zentralen Steppengebiet der Mongolei endemisch; sie findet sich aber nur an den mehr oder weniger größer ausgedehnten *Caragana*-Sandstellen. Wie ich schon an einer anderen Stelle festgestellt habe, ist sie ein Frühjahrstier: auf freien Sandböden und zwischen *Caragana* findet man die Art im Frühjahr in größeren Mengen, während im Spätsommer an denselben Stellen nur vereinzelte Exemplare gefangen werden können.

3. **Anatolica modesta** Bogatschew, 1961

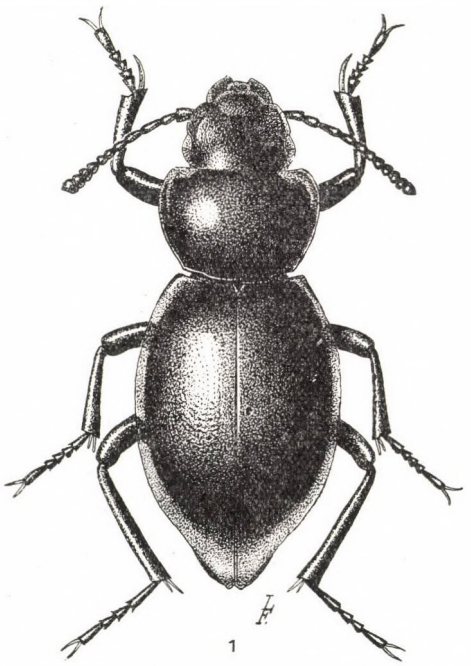
Bogatschew: Trudi Inst. Zool. i Parasitol. Tadzh. SSR, **20,** 1961, p. 118, 120.

Untersuchtes Material. — Uvs Aimak: Sandgebiet Altan els, 35 km WNW von Somon Tes, 1400 m, 23. VI. 1968 (Nr. 1006). — 5 Exemplare.

Bemerkungen. Bogatschew hat sie aus dem nördlichen Changaj-Gebirge, zwischen Telmen nuur und dem Fluß Iderijn gol beschrieben, u. zw. auf Grund eines Einzelstückes (leg. Jurganowa, 9. VIII. 1925). Unweit vom typischen Fundort sammelte ich einige Exemplare einer seltenen Art, die der Beschreibung vollkommen entsprechen. Meine Exemplare schwanken zwischen 10 und 11 mm. Die kleine Serie aus dem Sandgebiet Altan els enthält beide Geschlechter, so daß ich die Geschlechtsmerkmale des ♂ untersuchen konnte, die in der Beschreibung nicht erwähnt sind. Alle Schenkel des ♂ sind einfach, auch die Vorderschenkel unten ohne weißgelb tomentierte Basallinie, nur die Unterseite etwas gerader als bei dem Weibchen. Vorderschienen des ♂ am Außenrand gerade, der Innenrand nur am distalen Drittel kaum etwas erweitert und ganz neben der Basis etwas verengt, weshalb die Vorderschiene innen ein wenig geschwungen ist.

4. **Anatolica atshitnura** sp. nov.

Körper klein, einer *Colposcelis*-Art täuschend ähnlich, ganz schwarz, trüb glänzend, nur die Enddorne der Schienen und die Krallen der Beine rötlich. K o p f breit und flach, am Hinterrand der Augen am breitesten. Schläfen bis zum Hals gerade leicht verengt, ohne Buckel. Augen flach, die Sehfläche schräg nach vorn gerichtet. Wangen vor den Augen parallel, dann breit abgerundet, seitlich zwischen Clypeus und Wangen tief stumpfwinklig ausgebuchtet. Clypeus vorn gerade abgestutzt. Stirn breit, zwischen den Augen leicht gewölbt, neben dem Innenrand der Augen mit je einem flachen, innen kaum



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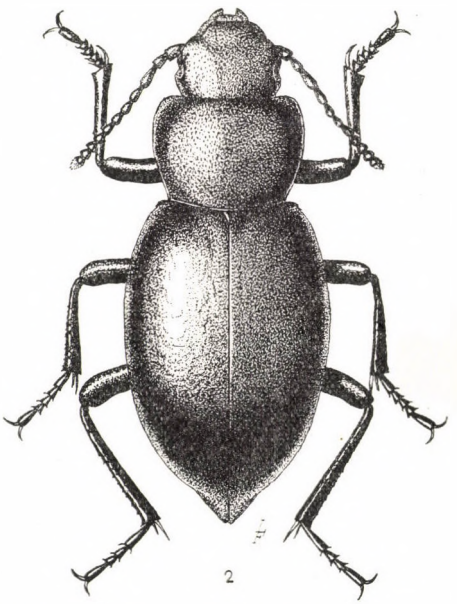


2

Abb. 1. *Anatolica modesta* Bog. — Abb. 2. *A. atshitnura* sp. nov.

abgesetzten Augenwulst. Die Mitte fein, seitlich hinten stärker, an den Wangen feiner und ebenso spärlich punktiert, Clypeus nach vorn allmählich dichter und gröber punktiert, am Vorderrand fast runzelig. F ü h l e r gestreckt, die Basis des Halsschildes etwas überragend. Die Basalglieder sind gestreckt, das 2. mehr als doppelt so lang wie breit (wie 11 : 5), das 3. mehr als 2,5mal so lang wie breit (wie 13 : 5) und länger als das 2. (wie 13 : 11), vom 4. Glied an kürzer, das 4. 1,6mal kürzer als das 3. (wie 8 : 13), die Glieder von 5. an allmählich etwas breiter (die Glieder 4—11. wie 5 : 5,2 : 6 : 6,5 : 7 : 7 : 7,5 : 7), die 4 letzten Glieder rundlich, das Endglied unregelmäßig oval. H a l s s c h i l d

herzförmig, 1,3mal so breit wie in der Mitte lang, die größte Breite liegt in der Mitte, Seiten gebogen, nach vorn stärker gebogen als nach hinten, Vorderrand gerade, nur seitlich gerandet, die Vorderecken bei Ansicht von oben abgerundet, nicht eckig vortretend. Basis fein strichförmig gerandet, breit gebogen und die Hinterecken gerundet breit stumpfwinklig. Oberfläche einfach gewölbt, Seiten gegen den Rand zu nicht steil abfallend. Die Scheibe in der Mitte etwas stärker punktiert als die Stirn, die Punktierung seitlich und vorn ein wenig spärlicher und kaum etwas feiner, der Grund erloschen chagriniert, fettglänzend, die Zwischenräume der Punkte meist viel größer als die Punkte selbst. Flügeldecken langoval, genau 1,5mal so lang wie die gemeinsame Breite vor der Mitte und doppelt so breit wie der Halsschild. Schultern breit gebogen, der scharf abgesetzte Seitenrand an den Schultern gebogen und allmählich in die seitliche Basalrandung übergehend, die jedoch nur seitlich entwickelt ist, ohne eine Schulterecke zu bilden. Oberfläche an der Naht abgeflacht, aber nur am Absturz etwas eingedrückt. Nur mit kaum erkennbarer, feiner, sehr spärlicher Punktierung; der Grund chagriniert und matt. Propleuren mit feiner, erloschener Längsrunzelung, die jedoch die breiten Seitenränder frei läßt. Prosternum zwischen den Hüften flach, hinter den Hüften herabgebogen, nur mit einer ganz kleinen, stumpfen Beule. Beine ziemlich dünn, Vorderschenkel des ♂ unten in der basalen Hälfte mit aus größeren Punkten bestehender Linie, die weißgelb gefärbt ist; Mittel- und Hinterschenkel nahe der Basis mit Spuren von ebensolchen Punkten. Schienen dünn und gerade, Außenseite der Vorderschienen am Ende scharfkantig, Innenseite auch beim ♂ ohne besondere Kennzeichen. Mittel- und Hinterschienen gerade, im Querschnitt fast rundlich, mit sehr kleinen Dörnchen besetzt. Der innere Enddorn der Vorderschienen kräftig und gebogen, so lang wie die gemeinsame Länge der 3 ersten Tarsenglieder, an den Mittel- und Hinterschienen sind die Enddorne normal, bei den Mittelschienen kürzer als das 1. Glied, bei den Hinterschienen kaum länger als die Hälfte des 1. Gliedes; 1. Glied der Hintertarsen weit länger als die gemeinsame Länge des 2. und 3. (wie 20 : 16); das Endglied der Hintertarsen etwas so lang wie die Länge des 2. und 3. Gliedes zusammen (wie 15 : 16). — Länge: 8 mm. Breite: 4 mm.

Untersuchtes Material. — 1 ♂ (Holotypus) aus der Mongolei, Uvs Aimak: Senke des Sees Ačit nuur, Flußtal Altan gadasin chev gol, 20—25 km NO von Somon Böchmörön, 1600 m, 29. VI. 1968 (Nr. 1040), im äußerst öden Gelände einer fast vegetationslosen, mit Schotter und Kiespanzer bedeckten Wüste, am Boden vereinzelt.

Die neue Art ist durch den kleinen, verhältnismäßig flachen Körper, eiförmige Flügeldecken, herzförmig verengten und seitlich gebogenen Halsschild, den punktierten Vorderkörper und die Geschlechtsmerkmale der Beine gekennzeichnet. Nahe verwandt mit *A. modesta* Bog., *A. uljasutaja* Kasz. und *A. scythisoides* Kasz. Die beiden ersten Arten haben abweichende Geschlechtsmerkmale an den Beinen, d. h. es fehlen die weißgelb gefärbten Punkte der

Unterseite der Vorderschenkel; außerdem sind die Flügeldecken stärker oder wenigstens so grob punktiert wie der Vorderkörper, und auch die Fühler kräftiger, das 2. Glied ist jedenfalls nicht länger als das 4. Die Art *A. scythisoides* KASZ. aus dem Gobi Altaj steht ihr sehr nahe, bei dieser ist aber der ganze Körper kurz und breit, die Punktierung des Halsschildes viel dichter. Die Propleuren strichförmig längsgerunzelt, Beine kräftiger und schließlich das 2. Fühlerglied nicht länger als das 4., und das 3. Glied auch nur genau doppelt so lang wie breit.

5. **Anatolica undulata** GEBLER, 1832

GEBLER: Nouv. Mém. Mosc., **2,** 1832, p. 55. — KRAATZ: Revis. Tenebr., Berlin, 1865, p. 98. — ALLARD: Ann. Soc. Ent. Belg., **27,** 1883, p. 22. — REITTER: Verh. nat.-forsch. Ver. Brünn, **39,** 1900, p. 126. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 376. — KASZAB: l.c., **11,** 1965, p. 321. — KASZAB: Reichenbachia, **5,** 1965, p. 132. — KASZAB: l.c., **7,** 1966, p. 245. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 8, 29. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 303.

= *implana* FALDERMANN: Mém. sav. étrang. Acad. St. Petersb., **2,** 1835, p. 400. — BAUDI: Deutsche Ent. Zeitschr., **19,** 1875, p. 38.

= *propinqua* FALDERMANN: Mém. sav. étrang. St. Petersb., **2,** 1835, p. 396. — BAUDI: Deutsche Ent. Zeitschr., **19,** 1875, p. 38.

= *torulosa* FISCHER VON WALDHEIM: Bull. Mosc., **18,** 1844, I, p. 65. — KRAATZ: Revis. Tenebr., Berlin, 1865, p. 98. — BAUDI: Deutsche Ent. Zeitschr., **19,** 1875, p. 38.

Untersuchtes Material. — Central Aimak: zwischen Somon Lun und Somon Bajannuur, 25 km O von Bajannuur, 1200 m, 14. VI. 1968 (Nr. 953). — Uvs Aimak: am Fluß Changilcagijn gol, 6 km SW von Somon Baruunturuun, 1350 m, 24. VI. 1968 (Nr. 1009). — Zavchan Aimak: 15 km NW von Somon Songino, 1840 m, 12. VII. 1968 (Nr. 1093). — 20 Exemplare.

Bemerkungen. Das mongolische Areal dieser Art scheint geklärt zu sein. Sie ist eine charakteristische Bewohnerin der Steppen und niedrigen Bergsteppenzone, u. zw. vom äußersten Osten über die ganze Steppenzone bis zum westlichen Teil des Changaj-Gebirges, des nördlichen Chanchöchij-Gebirges und des nordöstlichen Gebirges des Mongol-Altaj. Im Inneren des Altaj wurde sie bis jetzt nicht aufgefunden. Die Art wurde ursprünglich aus »Daurien« beschrieben, ich kenne aber keine Fundorte außerhalb der mongolischen Volksrepublik.

6. **Anatolica undulata** GEBL. var. **inhumeralis** KASZAB, 1967

KASZAB: Acta Zool. Hung., **13,** 1967, p. 303.

Untersuchtes Material. — Zavchan Aimak: 15 km NW von Somon Songino, 1840 m, 12. VII. 1968 (Nr. 1093). — Chövsgöl Aimak: 8 km N von Somon Burenchaan, am Fluß Delger-mörön, 1450 m, 16. VII. 1968 (Nr. 1114). — 11 Exemplare.

Bemerkungen. Exemplare mit ungerandetem Basalrand der Flügeldecken kommen innerhalb des ganzen Areals der Art vor und sind unter der Stammform ziemlich häufig.

7. **Anatolica aucta** FALDERMANN, 1835

FALDERMANN: Mém. sav. étrang. Acad. St. Petersb., **2,** 1835, p. 401. — ALLARD: Ann. Soc. Ent. Belg., **27,** 1883, p. 21. — REITTER: Verh. nat. forsch. Ver. Brünn, **39,** 1900, p. 125. — KASZAB: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 8. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 376. — KASZAB: l. c., **11,** 1965, p. 320. — KASZAB: Fragm. Faun. Warszawa, **11,** 1965, p. 420. — KASZAB: Reichenbachia, **7,** 1966, p. 245. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 7, 29. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 304. — KASZAB: l. c., **14,** 1968, p. 362. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 38.

Untersuchtes Material. — Chövsgöl Aimak: 8 km N von Somon Burenchaan, am Fluß Delger-mörön, 1450 m, 16. VII. 1968 (Nr. 1114); 4 km NW von der Stadt Mörön, 1500 m, 19. VII. 1968 (Nr. 1127). — 5 Exemplare.

Bemerkungen. Diese Art besitzt in der Mongolei eine weite Verbreitung. Sie ist in der Steppenzone der Ost- und Nordmongolei allgemein verbreitet, jedoch kommt sie nach Westen nur in den Gebirgssteppen bis zum Ostrand des Changaj-Gebirges vor. Aus den Steppen der Senke der Großen Seen kenne ich keinen Fund. Die Grenze ihres Areals nach Norden, außerhalb der Mongolei ist bis heute nicht geklärt, sie kommt aber sicher auch noch in Sibirien vor.

8. **Anatolica lepida** FALDERMANN, 1835

FALDERMANN: Mém. sav. étrang. Acad. St. Petersb., **2,** 1835, p. 394. — BAUDI: Deutsche Ent. Zeitschr., **19,** 1875, p. 38. — REITTER: Verh. nat.-forsch. Ver. Brünn, **39,** 1900, p. 125. — KASZAB: Acta Zool. Hung., **11,** 1965, p. 316.
= *atramentaria* FALDERMANN: Mém. sav. étrang. Acad. St. Petersb., **2,** 1835, p. 395.
= *damascena* KRAATZ: Revis. Tenebr., Berlin, 1865, p. 98.

Untersuchtes Material. — Zavchan Aimak: 95 km WNW von Somon Nömrög, 1850 m, 13. VII. 1968 (Nr. 1099). — 1 Exemplar.

Bemerkungen. Eine Art aus der Gebirgssteppenzone. In der Mongolei wurde sie bisher nur im nördlichen Changaj-Gebirge (Tariat) gefunden. Außerhalb der Mongolei kenne ich die Art nur aus Tuva in Kemtschik und aus Sibirien im Selenga-Tal.

9. **Anatolica pseudaucta** REITTER, 1900

REITTER: Verh. nat.-forsch. Ver. Brünn, **39,** 1900, p. 124. — KASZAB: Fragm. Faun. Warszawa, **11,** 1965, p. 420.

Untersuchtes Material. — Zavchan Aimak: 15 km NW von Somon Songino, 1840 m, 12. VII. 1968 (Nr. 1093). — Chövsgöl Aimak: 8 km N von Somon Burenchaan, am Fluß Delger-mörön, 1450 m, 16. VII. 1968 (Nr. 1114). — 47 Exemplare.

Bemerkungen. Diese Art scheint eine charakteristische Gebirgssteppenart zu sein, doch wurde sie bis jetzt nur sehr sporadisch gesammelt. Ursprünglich hat REITTER die Art aus Kiachta, nahe der mongolischen Grenze beschrieben; sie ist auch aus der Umgebung von Ulan-Baator zum Vorschein gekommen und wurde neuerdings, sehr weit von den bekannten Fundorten, im westlichen Teil des Changaj-Gebirges und des nördlichen Chanchöchij-Gebirges ebenfalls gesammelt.

10. **Anatolica subtrapezicollis** KASZAB, 1965

KASZAB: Acta Zool. Hung., **11**, 1965, p. 309. — KASZAB: Mitt. Zool. Mus. Berlin, **43**, 1967, p. 5, 28.

Untersuchtes Material. — Uvs Aimak: 54 km W von Somon Öndörchangaj, Vorberge des Chanchöchij ul, 1640 m, 10. VII. 1968 (Nr. 1089). — 3 Exemplare.

Bemerkungen. Die Verbreitung dieser Art ist sehr eng beschränkt. Sie wurde ursprünglich auf Grund eines Einzelstückes von Songino, von einem nordwestlichen Ausläufer des Changaj-Gebirges beschrieben. Später sind weitere Fundorte aus der Uvs-nuur-Senke hinzu gekommen (Sagil und Davst). Der im Jahre 1968 entdeckte neue Fundort im Chanchöchij-Gebirge repräsentiert das Bindeglied zwischen den bisher bekannten Lokalitäten. Die Art scheint in der Nordwest-Mongolei längs des Chanchöchij-Gebirges sowie im Nordwesten und Südwesten an diesen Gebirgszügen entlang allgemein verbreitet zu sein.

11. **Anatolica dashidorzsi temporalis** KASZAB, 1965

KASZAB: Acta Zool. Hung., **11**, 1965, p. 308.

Untersuchtes Material. — Uvs Aimak: zwischen dem See Örög nuur und der Stadt Ulaangom, 12 km OSO vom Paß Ulaan davaa (55 km NW von Ulaangom), 1450 m, 28. VI. 1968 (Nr. 1031); Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (Nr. 1033); id., 5. VII. 1968 (Nr. 1065); 3 km WNW von der SW-Ecke des Sees Örög nuur, 1590 m, 29. VI. 1968 (Nr. 1039); id., 5. VII. 1968 (Nr. 1064); am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 7. VII. 1968 (Nr. 1077); 20 km S von der Stadt Ulaangom, 1380 m, 8. VII. 1968 (Nr. 1080). — Bajan-Ölgij Aimak: am Paß Schine davaa, 27 km S von Somon Cagaannuur, 2690 m, 3. VII. 1968 (Nr. 1053). — 16 Exemplare.

Bemerkungen. Diese Unterart ist im westlichen Teil der Senke des Sees Uvs nuur verbreitet und scheint in diesem Gebiet nicht selten zu sein. In der Originalbeschreibung habe ich den Fundort nach der Angabe des Sammlers (A. BOLD) falsch angegeben, namentlich Somon Sagil bei Chjargas nuur. Sagil liegt aber am Westrand des Sees Uvs nuur. — Die nomenklatorische Stammform kommt im östlichen Teil der Senke des Sees Uvs nuur, im Sandgebiet Borig del els (Zuungobi) vor.

12. **Anatolica paradoxa** REITTER, 1900

REITTER: Verh. nat.-forsch. Ver. Brünn, **39**, 1900, p. 120. — KASZAB: Ent. Abhandl. Mus. Dresden, **32**, 1964, p. 4. — KASZAB: Acta Zool. Hung., **11**, 1965, p. 313. — KASZAB: l. c., **13**, 1967, p. 302. — KASZAB: Mitt. Zool. Mus. Berlin, **43**, 1967, p. 4, 28.

Untersuchtes Material. — Uvs Aimak: Senke des Sees Uvs nuur am SW-Rand des Sees, 84 km W von Somon Zuungobi und 63 km O von der Stadt Ulaangom, 790 m, 26. VI. 1968 (Nr. 1019); Tankstelle in der Stadt Ulaangom, 1020 m, 27. VI. 1968 (Nr. 1026); Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (Nr. 1033); id., 5. VII. 1968 (Nr. 1065); 3 km WNW von der SW-Ecke des Sees Örög nuur, 1590 m, 29. VI. 1968 (Nr. 1039); 19 km NW von der Stadt Ulaangom, 1150 m, 8. VII. 1968 (Nr. 1079); Ooschgijn chundi, 65 km SOS von der Stadt Ulaangom, 28 km NW von Naranbulag, 1450 m, 8. VII. 1968 (Nr. 1081); Mogoin arschaan, N-Rand des Sees Chjargas nuur, 48 km OSO von Somon Naranbulag,

1100—1200 m, 9. VII. 1968 (Nr. 1085); 54 km N von Somon Öndörchangaj, Vorberge des Chanchöchij ul-Gebirges, 1640 m, 10. VII. 1968 (Nr. 1089). — Bajan-Ölgij Aimak: rechtes Ufer des Flusses Chovd gol bei der Stadt Ölgij, 1750 m, 30. VI. 1968 (Nr. 1048); NO-Ecke des Sees Tolbo nuur, 2100 m, 1. VII. 1968 (Nr. 1049); ca. 20 km NNW von der Stadt Ölgij, 2100 m, 2. VII. 1968 (Nr. 1053). — 43 Exemplare.

Bemerkungen. Während die Art in der Westmongolei, vor allem in den ariden Stellen des Mongol-Altaj allgemein verbreitet ist, kommt sie auch im zentralen Halbwüstengebiet und im Gobi Altaj vor, wenn auch das Vorkommen hier sehr vereinzelt und selten ist. Außerhalb der Mongolischen Volksrepublik kennen wir nur eine einzige Angabe: »Turkestan«, von REITTER angegeben. Es scheint mir sehr wahrscheinlich, daß sich diese Angabe auf das sogenannte »chinesische« Turkestan bezieht, das zu Sinkiang in China gehört. Das Vorkommen der Art in der westlichen Hälfte des Mongol Altaj ist nicht unwahrscheinlich.

13. **Anatolica amoena** FALDERMANN, 1835

FALDERMANN: Mém. sav. étrang. Acad. St. Petersb., **2,** 1935, p. 398. — BAUDI: Deutsche Ent. Zeitschr., **19,** 1875, p. 37. — BOGDANOW-KATJKOW: Rev. Russe d'Ent., **15,** 1915, p. 5. — KASZAB: Acta Zool. Hung., **11,** 1965, p. 316. — KASZAB: l. c., **13,** 1967, p. 305. — KASZAB: Mittl. Zool. Mus. Berlin, **43,** 1967, p. 6, 28. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 38.
= *typonota* MÉNÉTRIÉS: Bull. Acad. Petrop., **1,** 1836, p. 181.
= *iduna* REITTER: Verh. nat.-forsch. Ver. Brünn, **39,** 1900, p. 122.

Untersuchtes Material. — Uvs Aimak: Sandgebiet Altan els, 35 km WNW von Somon Tes, 1400 m, 23. VI. 1968 (Nr. 1006); am See Bag nuur, 6 km NO von der Somon Zuungobi, 1000 m, 25. VI. 1968 (Nr. 1014); Senke des Sees Uvs nuur, am NW-Rand des Sees, 84 km W von der Somon Zuungobi und 63 km O von der Stadt Ulaangom, 790 m, 26. VI. 1968 (Nr. 1019); am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1028, 1029); id., 7. VII. 1968 (Nr. 1077); 19 km NW von der Stadt Ulaangom, 1150 m, 8. VII. 1968 (Nr. 1079); Ooschgijn chundi, 65 km SOS von Somon Naranbulag, 1450 m, 8. VII. 1968 (Nr. 1081); 10 km NW von Somon Naranbulag, 1350 m, 9. VII. 1968 (Nr. 1082); NW-Ecke des Sees Chjargas nuur, 27 km OSO von Somon Naranbulag, 1240 m, 9. VII. 1968 (Nr. 1083); Mogoin arschaan, N-Rand des Sees Chjargas nuur, 48 km OSO von Somon Naranbulag, 1100—1200 m, 9. VII. 1968 (Nr. 1085); id., 1100 m, 9. VII. 1968 (Nr. 1086); NO-Ecke des Sees Chjargas nuur, ca. 80 km OSO von Somon Naranbulag, 1150 m, 10. VII. 1968 (Nr. 1088). — Bajan-Ölgij Aimak: ca. 20 km NNW von der Stadt Ölgij, 2100 m, 2. VII. 1968 (Nr. 1053). — 298 Exemplare.

Bemerkungen. In der Mongolei ist diese Art die Bewohnerin des Mongol-Altaj, des südlichen Teiles des Changaj-Gebirges und vor allem der Senke der Großen Seen. Sie bewohnt die Halbwüsten und Wüsten, vor allem die Sandstellen, die Beine sind auch dem Sand angepaßt. Nach Osten dringt sie im Changaj höchstens bis zum Randgebiet der wüstenhaften Senken vor. An sandigen Stellen, besonders in größeren Sandgebieten ist sie in der Westmongolei überall häufig. Morphologisch ist die Art sehr variabel, auch in der Größe und Skulptur sind manchmal unter den verschiedenen Populationen große Unterschiede festzustellen; manche Populationen zeichnen sich durch den einheitlich kleineren, kürzer gebauten Körper aus.

14. Anatolica amoena FALD. var. emarginata KASZAB, 1967

KASZAB: Mitt. Zool. Mus. Berlin, **43**, 1967, p. 6, 21, 29. — KASZAB: Acta Zool. Hung., **13**, 1967, p. 306.

Untersuchtes Material. — Uvs Aimak: Sandgebiet Altan els, 35 km WNW von Somon Tes, 1400 m, 23. VI. 1968 (Nr. 1006); am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1029); 19 km NW von der Stadt Ulaangom, 1150 m, 8. VII. 1968 (Nr. 1077). — Bajan-Ölgij Aimak: rechtes Ufer des Flusses Chovd gol bei der Stadt Ölgij, 1750 m, 30. VI. 1968 (Nr. 1048); NO-Ecke des Sees Tolbo nuur, 2100 m, 1. VII. 1968 (Nr. 1049); ca. 20 km NNW von der Stadt Ölgij, 2100 m, 2. VII. 1968 (Nr. 1053). — 277 Exemplare.

Bemerkungen. Diese Form kommt vereinzelt unter der Stammform vor und ist nicht selten. Im Gebiet der Senke der Großen Seen gibt es Populationen, die fast ausschließlich aus dieser Form bestehen, sie könnte also sogar als eine kleine Rasse aufgefaßt werden. Auf Grund der mir vorliegenden Angaben scheint diese Varietät nach dem Norden zu viel häufiger vorzukommen als im Süden ihrer Verbreitung.

15. Scythis rectangulus POPPIUS, 1904

POPPIUS: Öfv. Finska Vet. Ak. Förh., **46** (16), 1904, p. 13. — KASZAB: Acta Zool. Hung., **11**, 1965, p. 329. — KASZAB: Mitt. Zool. Mus. Berlin, **43**, 1967, p. 10, 29.
= *juxtalaca* SKOPIN (partim): Труды научно-исследовательского института защиты растений, Алма-Ата, **8**, 1964, p. 383.

Untersuchtes Material. — Uvs Aimak: 17 km SO von der Stadt Ulaangom, 980 m, 27. VI. 1968 (Nr. 1025); am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1028, 1029); id., 7. VII. 1968 (Nr. 1077); zwischen dem See Örög nuur und der Stadt Ulaangom, 12 km OSO vom Paß Ulaan davaa (55 km NW von Ulaangom), 1450 m, 28. VI. 1968 (Nr. 1031); SW-Ecke des Sees Örög nuur, 1500 m, 29. VI. 1968 (Nr. 1038); 3 km WNW von der SW-Ecke des Sees Örög nuur, 1590 m, 29. VI. 1968 (Nr. 1039); id., 5. VII. 1968 (Nr. 1064); Senke des Sees Ačit nuur, 26 km NO vom Flußtal Altan gadasin chev gol, ca. 33 km WSW vom Paß Zenklengijn davaa, 2150 m, 4. VII. 1968 (Nr. 1062); Südrand des Sees Örög nuur, 1500 m, 5. VII. 1968 (Nr. 1065); Chag, zwischen dem See Örög nuur und dem Paß Ulaan davaa, 10 km WSW vom Paß, 1850 m, 6. VII. 1968 (Nr. 1068); 7 km SO vom Paß Ulaan davaa, zwischen dem See Örög nuur und der Stadt Ulaangom, 1650 m, 7. VII. 1968 (Nr. 1076); 54 km W von Somon Öndörchangaj, Vorberge des Chanchöchij-ul-Gebirges, 1640 m, 10. VII. 1968 (Nr. 1089). — Bajan-Ölgij Aimak: ca. 20 km S vom See Somon Cagaan nuur, 2300 m, 30. VI. 1968 (Nr. 1044); rechtes Ufer des Flusses Chovd gol bei der Stadt Ölgij, 1750 m, 30. VI. 1968 (Nr. 1048); NO-Ecke des Sees Tolbo nuur, 2100 m, 1. VII. 1968 (Nr. 1049); am Fluß Chavcalyn gol, 20 km WSW vom Fluß Böch-mörön gol, 1750 m, 4. VII. 1968 (Nr. 1060). — 149 Exemplare.

Bemerkungen. POPPIUS hat seine Art aus Tuva beschrieben: Kemtschik auf Grund von 4 Exemplaren. Sie ist auch in der Nordwest-Mongolei, vor allem im Mongol Altaj und in der Senke der Großen Seen weit verbreitet und auch häufig. Über die Südgrenze des Areals sowie über die taxonomischen Probleme der Art habe ich an einer anderen Stelle schon früher berichtet.

16. Scythis pusillus septentrionalis KASZAB, 1965

KASZAB: Acta Zool. Hung., **11**, 1965, p. 328. — KASZAB: Mitt. Zool. Mus. Berlin, **43**, 1967, p. 9.

Untersuchtes Material. — Uvs Aimak: Tankstelle in der Stadt Ulaangom, 1020 m, 27. VI. 1968 (Nr. 1026); Ooschgijn chundi, 65 km SOS von der Stadt Ulaangom, 28 km

NW von Somon Naranbulag, 1450 m, 8. VII. 1968 (Nr. 1081); 54 km W von Somon Öndörchangaj, Vorberge des Chanchöchij-ul-Gebirges, 1640 m, 10. VII. 1968 (Nr. 1089). — Bajan-Ölgij Aimak: rechtes Ufer des Flusses Chovd gol bei der Stadt Ölgij, 1750 m, 30. VI. 1968 (Nr. 1048); 12 km WSW vom Fluß Böch-mörön gol, 1650 m, 4. VII. 1968 (Nr. 1061). — 18 Exemplare.

Bemerkungen. Die nomenklatorische Stammform kommt im Gobi Altaj vor, ihre Unterart hingegen nur in der Nordwestmongolei, in der Senke der Großen Seen. Ursprünglich habe ich sie aus der Umgebung vom See Ačit nuur beschrieben. Auf Grund der neuen Aufsammlungen ist ihr Areal wesentlich nach Westen (bis nach Ölgij) und nach Osten (bis zum Südrand des Gebirges Chanchöchij ul) erweitert; sie scheint im ganzen Seengebiet zu finden, aber recht selten zu sein. Ich fand sie in äußerst ödem, wüstenhaftem Gelände südlich exponierter Berghänge unter Steinen.

Bogatschew beschrieb im Jahre 1946 eine Gattung und Art mit dem Namen *Semenovonymus tenuis* aus der Gobi: Noin-bogdo, Sudzhi-Chuduk (wohl im Gebirge Nojon ul im Südgobi Aimak) und vom linken Ufer des Flusses Dzapchyn (Zavchan gol), ohne nähere Angabe des Fundortes (Bogatschew, 1946). Die Gattung ist nach Bogatschew von *Scythis* durch den fehlenden Basalrand der Flügeldecken verschieden. Ich halte diese Form für eine echte *Scythis*, um so mehr als es unter den Arten der Gattung, vor allem in der Gruppe von *Sc. banghaasi* Reitt. und *pusillus* Skopin Arten gibt, bei welchen der Flügeldecken-Basalrand vor dem Schildchen mehr oder weniger breit verkürzt ist. Die Art *Sc. tenuis* Bog. gehört sicher in die Nähe von *Sc. pusillus* Skop. oder *Sc. skopini* Kasz. Ob die Exemplare aus dem Nojon-Gebirge und vom Fluß Zavchan völlig identisch, oder voneinander artlich oder subspezifisch verschieden sind, kann man nur auf Grund der Typenuntersuchung entscheiden.

17. **Scytosoma pygmaea** (Gebler, 1832)

Gebler: Nouv. Mém. Mosc., **2**, 1932, p. 54 (*Tentyria*). — Solsky: Horae Soc. Ent. Ross., **7**, 1870, p. 373 (*Anatolica*). — Reitter: Verh. nat.-forsch. Ver. Brünn, **39**, 1900, p. 162. — Kaszab: Acta Zool. Hung., **10**, 1964, p. 381. — Kaszab: Ent. Abhandl. Mus. Dresden, **32**, 1964, p. 11. — Kaszab: Fragm. Faun. Warszawa, **11**, 1965, p. 422. — Kaszab: Acta Zool. Hung., **11**, 1965, p. 325. — Kaszab: Ent. Blätter, **62**, 1966, p. 50. — Kaszab: Reichenbachia, **7**, 1966, p. 274. — Kaszab: Mitt. Zool. Mus. Berlin, **43**, 1967, p. 31. — Kaszab: Acta Zool. Hung., **13**, 1967, p. 315. — Kaszab: l. c., **14**, 1968, p. 367. — Kaszab: Acta faun. ent. Mus. Nat. Pragae, **13**, 1968, p. 39.

= *bella* Faldermann: Mém. sav. étrang. Acad. St. Petersb., **2**, 1835, p. 393 (*Anatolica*).
= *arcibasis* Reitter: Wien. Ent. Zeit., **14**, 1895, p. 291.

Untersuchtes Material. — Bulgan Aimak: S von Somon Chischig-Öndör, 1400 m, 15. VI. 1968 (Nr. 960). — Chövsgöl Aimak: 8 km N von Somon Burenchaan, am Fluß Delger-mörön, 1450 m, 20. VI. 1968 (Nr. 989); id., 16. VII. 1968 (Nr. 1114); 3 km SW von Somon Burenchaan, 1650 m, 21. VI. 1968 (Nr. 992; 993); 4 km NW von der Stadt Mörön, 1500 m, 19. VII. 1968 (Nr. 1127). — Uvs Aimak: am Fluß Changilcagijn gol, 6 km SW von Somon Baruunturuun, 1350 m, 24. VI. 1968 (Nr. 1009); 17 km SO von der Stadt Ulaangom, 980 m, 27. VI. 1968 (Nr. 1025); 26 km NW von der Stadt Ulaangom, 1150 m, 27. VI. 1968 (Nr. 1027); am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1028; 1029); id., 7. VII. 1968 (Nr. 1077); zwischen dem See

Örög nuur und der Stadt Ulaangom, 12 km OSO vom Paß Ulaan davaa (55 km NW von Ulaangom), 1450 m, 28. VI. 1968 (Nr. 1031); Chag, zwischen dem See Örög nuur und dem Paß Ulaan davaa, 10 km WSW vom Paß, 1850 m, 6. VII. 1968; 20 km S von der Stadt Ulaangom, 1380 m, 8. VII. 1968 (Nr. 1080); Somon Öndörchangaj, 1900 m, 11. VII. 1968 (Nr. 1090). — Zavchan Aimak: 15 km NW von Somon Songino, 1840 m, 12. VII. 1968 (Nr. 1093). — 276 Exemplare.

Bemerkungen. Eine der gemeinsten Tenebrioniden-Arten der mongolischen Steppen- und Gebirgssteppenzone; man findet sie aber meist nur in den niedrigen Gebirgslagen. Die Art ist auch in der Nordwestmongolei weit verbreitet.

18. **Melaxumia angulosa** (GEBLER, 1832)

GEBLER: Nouv. Mém. Mosc., **2,** 1832, p. 53 (*Tentyria*). — FISCHER VON WALDHEIM: Bull. Mosc., **18,** 1844, I, p. 66 (*Anatolica*). — BAUDI: Deutsche Ent. Zeitschr., **19,** 1875, p. 38 (*Anatolica*). — ALLARD: Ann. Soc. Ent. Belg., **27,** 1883, p. 20 (*Anatolica*). — REITTER: Verh. nat.-forsch. Ver. Brünn, **39,** 1900, p. 163. — KASZAB: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 11. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 382. — KASZAB: l. c., **11,** 1965, p. 325. — KASZAB: Fragm. Faun. Warszawa, **11,** 1965, p. 422. — KASZAB: Reichenbachia, **5,** 1965, p. 133. — KASZAB: l. c., **7,** 1966, p. 50. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 9. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 315. — KASZAB: l. c., **14,** 1968, p. 367. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 39.

= *acutangula* FALDERMANN: Bull. Mosc., **6,** 1833, p. 59 (*Anatolica*). — KRAATZ: Revis. Tenebr., Berlin, 1865, p. 98 (*Anatolica*). — REITTER: Wien. Ent. Zeit., **14,** 1895, p. 45.

Untersuchtes Material. — Chövsgöl Aimak: 60 km. WNW von der Stadt Mörön, 1800 m, 19. VI. 1968 (Nr. 984); 3 km SW von Somon Burenchaan, 1650 m, 21. VI. 1968 (Nr. 992, 993); 8 km N von Somon Burenchaan, am Fluß Delger-mörön, 1450 m, 16. VII. 1968 (Nr. 1114). — Uvs Aimak: am Fluß Changilcagijn gol, 6 km SW von Somon Baruunturuun, 1350 m, 24. VI. 1968 (Nr. 1009); zwischen dem See Örög nuur und der Stadt Ulaangom, 12 km OSO vom Paß Ulaan davaa (55 km NW von Ulaangom), 1450 m, 28. VI. 1968 (Nr. 1031); 3 km WNW von der SW-Ecke des Sees Örög nuur, 1590 m, 29. VI. 1968 (Nr. 1039); Chag, zwischen dem See Örög nuur und dem Paß Ulaan davaa, 14 km von diesem, 1900 m, 6. VII. 1968 (Nr. 1067); Chag, zwischen dem See Örög nuur und dem Paß Ulaan davaa, 10 km WSW von diesem, 1850 m, 6. VII. 1968 (Nr. 1068); 7 km SO von Paß Ulaan davaa, zwischen dem See Örög nuur und der Stadt Ulaangom, 1650 m, 7. VII. 1968 (Nr. 1076); Somon Öndörchangaj, 1900 m, 11. VII. 1968 (Nr. 1090). — Bajan-Ölgij Aimak: am Fluß Chavcalyn gol, 20 km WSW vom Fluß Böch-mörön gol, 1750 m, 4. VII. 1968 (Nr. 1060). — Zavchan Aimak: Choit chunch, 26 km ONO vom See Telmen nuur, 2150 m, 13. VII. 1968 (Nr. 1102). — 192 Exemplare.

Bemerkungen. Sie ist eine gemeine Charakterart der mongolischen Steppen- und Gebirgssteppenzone und kommt überall vor. Im Norden erstreckt sich ihre Verbreitung bis nach Südsibirien, die Nordgrenze des Areals ist jedoch bis heute nicht bekannt, hierüber sind in der Literatur nur vereinzelte Angaben publiziert.

19. **Microdera** (**Dordanea**) **kraatzi** (REITTER, 1889)

REITTER: Horae Soc. Ent. Ross., **23,** 1889, p. 684, 685 (*Dordanea*). — REITTER: Deutsche Ent. Zeitschr., 1897, p. 229. — REITTER: Verh. nat.-forsch. Ver. Brünn, **39,** 1900, p. 155. — CSIKI: in ZICHY's Ergebn. der III. asiat. Forschungsr., II, 1901, p. 91. — KASZAB: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 10. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 379. — KASZAB: l. c., **11,** 1965, p. 323. — KASZAB: Fragm. Faun. Warszawa, **11,** 1965, p. 421. — KASZAB: Reichenbachia, **5,** 1965, p. 133. — KASZAB: Ent. Blätter, **62,** 1966, p. 50. — KASZAB: Acta Zool. Hung., **12,** 1966, p. 292. — KASZAB: l. c., **13,** 1967, p. 313. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 10, 29. — KASZAB: Acta Zool. Hung., **14,** 1968, p. 368. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 39.

Untersuchtes Material. — Uvs Aimak: Senke des Sees Ačit nuur, Flußtal Altan gadasin chev gol, ca. 20—25 km NO von Somon Böchmörön, 1600 m, 29. VI. 1968 (Nr. 1040); Ooschgijn chundi, 65 km SOS von der Stadt Ulaangom, 28 km NW von Somon Naranbulag, 1450 m, 8. VII. 1968 (Nr. 1081); NW-Ecke des Sees Chjargas nuur, 27 km OSO von Somon Naranbulag, 1240 m, 9. VII. 1968 (Nr. 1083); Mogoin arschaan, N-Rand des Sees Chjargas nuur, 48 km OSO von Somon Naranbulag, 1100—1200 m, 9. VII. 1968 (Nr. 1085). — Bajan-Ölgij Aimak: rechtes Ufer des Flusses Chovd gol bei der Stadt Ölgij, 1750 m, 30. VI. 1968 (Nr. 1048). — 89 Exemplare.

Bemerkungen. Diese Art ist charakteristisch für die Wüstensteppen der Gobi; ihr Areal erstreckt sich im Nordwesten bis zur Senke der Großen Seen. Es war eine große Überraschung, die Art, die früher nur aus der zentralen Gobi bekannt war, auch in der Nordwestmongolei, u. zw. sehr häufig vorzufinden. Morphologisch ist die Art in ihrem ganzen Areal sehr einheitlich; ich konnte keine subspezifischen Unterschiede zwischen den verschiedenen Populationen feststellen, die voneinander sogar mehrere tausend Kilometer entfernt in isoliert stehenden Senken leben.

20. **Microdera (Dordanea) kraatzi** Reitt. var. **elegantoides** Kaszab, 1964

Kaszab: Acta Zool. Hung., **10,** 1964, p. 380. — Kaszab: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 10. — Kaszab: Fragm. Faun. Warszawa, **11,** 1965, p. 421. — Kaszab: Acta Zool. Hung., **11,** 1965, p. 324. — Kaszab: l. c., **12,** 1966, p. 292. — Kaszab: l. c., **13,** 1967, p. 314. — Kaszab: l. c., **14,** 1968, p. 369.

Untersuchtes Material. — Uvs Aimak: Mogoin arschaan, N-Rand des Sees Chjargas nuur, 48 km OSO von Somon Naranbulag, 1100—1200 m, 9. VII. 1968 (Nr. 1085). — 13 Exemplare.

Bemerkungen. Unter der Stammform kommt diese Varietät überall vereinzelt vor.

21. **Microdera (Dordanea) jurganovae** Skopin, 1964

Skopin: Труды научно-исследовательского института защиты растений, Алма-Ата, **8,** 1964, p. 385. — Kaszab: Acta Zool. Hung., **11,** 1965, p. 324. — Kaszab: l. c., **12,** 1966, p. 292. — Kaszab: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 11, 29. — Kaszab: Acta Zool. Hung., **13,** 1967, p. 314.

Untersuchtes Material. — Uvs Aimak: Senke des Sees Uvs nuur am SW-Rand des Sees, 84 km W von Somon Zuungobi und 63 km O von der Stadt Ulaangom, 790 m, 26. VI. 1968 (Nr. 1019); Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (Nr. 1033). — 6 Exemplare.

Bemerkungen. Eine endemische Art der westmongolischen Senken der Großen Seen. Ich kenne sie vom Norden von der Senke der Seen Uvs nuur, Ačit nuur und Örög nuur sowie im Süden bis zu den Seen Char us nuur und Chovd. Ob die Art weiter nördlich in Tuva vorkommt, ist noch unbekannt, jedoch sehr wahrscheinlich.

22. **Platyope mongolica** Faldermann, 1835

Faldermann: Mém. sav. étrang. Acad. St. Petersb., **2,** 1835, p. 388. — Kraatz: Revis. Tenebr., Berlin, 1865, p. 274. — Semenow: Horae Soc. Ent. Ross., **27,** 1893, p. 253. — Reitter: Verh. nat.-forsch. Ver. Brünn, **31,** 1893, p. 248. — Kaszab: Ent. Abhandl. Mus.

Dresden, **32,** 1964, p. 15. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 383. — KASZAB: l. c., **11,** 1965, p. 330. — KASZAB: Fragm. Faun. Warszawa, **11,** 1965, p. 423. — KASZAB: Reichenbachia, **7,** 1966, p. 249. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 12, 30. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 319. — KASZAB: l. c., **14,** 1968, p. 370. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 40.

Untersuchtes Material. — Bulgan Aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 14. VI. 1968 (Nr. 954). — Uvs Aimak: Am See Bag nuur, 6 km NO von Somon Zuungobi, 1000 m, 25. VI. 1968 (Nr. 1014). — 11 Exemplare.

Bemerkungen. An den Sandstellen der Gobi ist sie weit verbreitet und stellenweise häufig; man findet sie aber auch in der Steppenzone, jedoch nur an weit ausgedehnten Sandstellen, wie z. B. in Bulgan Aimak beim See Bajan nuur. Das Vorkommen in der Senke des Sees Uvs nuur in der Nordwestmongolei, am Sandgebiet Borig del els, beweist die nordwestlichste Verbreitung der Art in der Mongolei.

23. **Blaps femoralis medusula** KASZAB, 1964

KASZAB: Acta Zool. Hung., **10,** 1964, p. 387 (*Bl. femoralis* FISCH. var.). — KASZAB: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 21. — SKOPIN: Труды научно-исследовательского института защиты растений, Алма-Ата, **8,** 1964, p. 372. — KASZAB: Fragm. Faun. Warszawa, **11,** 1965, p. 425. — KASZAB: Acta Zool. Hung., **11,** 1965, p. 332. — KASZAB: Ent. Blätter, **62,** 1966, p. 50. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 13, 30. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 324. — KASZAB: l. c., **14,** 1968, p. 378. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 40.

Untersuchtes Material. — Uvs Aimak: Senke des Sees Uvs nuur am SW-Rand des Sees, 84 km W von Somon Zuungobi und 63 km O von der Stadt Ulaangom, 790 m, 26. VI. 1968 (Nr. 1019); am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1028, 1029); id., 7. VII. 1968 (Nr. 1077); Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (Nr. 1033); 19 km NW von der Stadt Ulaangom, 1150 m, 8. VII. 1968 (Nr. 1079); Ooschgijn chundi, 65 km SOS von der Stadt Ulaangom, 28 km NW von Somon Naranbulag, 1450 m, 8. VII. 1968 (Nr. 1081); SW-Ecke des Sees Chjargas nuur, 27 km OSO von Somon Naranbulag, 1240 m, 9. VII. 1968 (Nr. 1083); Mogoin arschaan, N-Rand des Sees Chjargas nuur, 48 km OSO von Somon Naranbulag, 1100—1200 m, 9. VII. 1968 (Nr. 1085). — Bajan-Ölgij Aimak: ca. 20 km NNW von der Stadt Ölgij, 2100 m, 2. VII. 1968 (Nr. 1053). — 28 Exemplare.

Bemerkungen. Diese Unterart bewohnt die Wüstensteppen der Gobi, und ihre Verbreitung erstreckt sich im Nordwesten bis zur Senke der Großen Seen. Die nomenklatorische Stammform und die ssp. *rectispinus* SKOPIN kommen in der Steppen- und Halbwüstenzone der Zentral- und der Ostmongolei vor.

24. **Blaps rugosa** GEBLER, 1825

GEBLER: in HUMMEL Essais, **4,** 1825, p. 48. — FISCHER VON WALDHEIM: Bull. Mosc., **17,** 1844, I, p. 102. — SOLIER: Studi Ent., **2,** 1848, p. 295, 319. — ALLARD: Ann. Soc. Ent. France, (5), **10,** 1880, p. 319; (6), **2,** 1882, p. 118. — SEIDLITZ: Naturg. Ins. Deutschl., V, 1893, p. 275. — KASZAB: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 21. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 387. — KASZAB: l. c., **11,** 1965, p. 332. — KASZAB: Fragm. Faun. Warszawa, **11,** 1965, p. 425. — KASZAB: Reichenbachia, **5,** 1965, p. 133. — KASZAB: l. c., **7,** 1966, p. 251. — KASZAB: Ent. Blätter, **62,** 1966, p. 50. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 13, 30. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 325. — KASZAB: l. c., **14,** 1968, p. 376. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 40.

Untersuchtes Material. — Central Aimak: Tosgoni ovoo, 6—10 km N von Ulan Baator, 1600—1700 m, 7.—8. VI. 1968 (Nr. 937). — Bulgan Aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 14. VI. 1968 (Nr. 954, 958); id., 24. VII. 1968 (Nr. 1143); SO von Somon Daschinčilen, 1050 m, 23. VII. 1968 (Nr. 1142). — Chövsgöl Aimak: 8 km N von Somon Burenchaan, am Fluß Delger-mörön, 1450 m, 20. VI. 1968 (Nr. 989); id., 24. VII. 1968 (Nr. 1114); 3 km SW von Somon Burenchaan, 1650 m, 21. VI. 1968 (Nr. 992, 993). — Uvs Aimak: am Fluß Changilcagijn gol, 6 km SW von Somon Baruunturuun, 1350 m, 24. VI. 1968 (Nr. 1009); 26 km NW von der Stadt Ulaangom, 1150 m, 27. VI. 1968 (Nr. 1027); am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1028, 1029); id., 7. VII. 1968 (Nr. 1077); Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (Nr. 1033). — 339 Exemplare.

Bemerkungen. Unter sämtlichen *Blaps*-Arten ist diese Art in der Mongolei die gemeinste. Sie kommt aber nur in der Steppen- und Gebirgssteppenzone vor. Besonders häufig ist die Art an Sandstellen, wo sie in den Nagetierlöchern im Sand oder zwischen den Wurzeln der *Caragana* manchmal massenhaft vorkommt. Die Art ist auch außerhalb der Mongolei in Südsibirien weit verbreitet, die wenigen Angaben genügen jedoch nicht, um die Nordgrenze ihres Areals genau feststellen zu können.

25. **Blaps miliaria** Fischer von Waldheim, 1844

Fischer von Waldheim: Bull. Mosc., **17**, 1844, I, p. 103. — Seidlitz: Naturg. Ins. Deutschl., V, 1893, p. 290. — Kaszab: Ent. Abhandl. Mus. Dresden, **32**, 1964, p. 21. — Kaszab: Acta Zool. Hung., **10**, 1964, p. 388. — Kaszab: l. c., **11**, 1965, p. 333. — Kaszab: Fragm. Faun. Warszawa, **11**, 1965, p. 425. — Kaszab: Reichenbachia, **7**, 1966, p. 251. — Kaszab: Ent. Blätter, **62**, 1966, p. 50. — Kaszab: Mitt. Zool. Mus. Berlin, **43**, 1967, p. 14. — Kaszab: Acta Zool. Hung., **13**, 1967, p. 325. — Kaszab: l. c., **14**, 1968, p. 376. — Kaszab: Acta faun. ent. Mus. Nat. Pragae, **13**, 1968, p. 40.

Untersuchtes Material. — Chövsgöl Aimak: 8 km N von Somon Burenchaan, am Fluß Delger-mörön, 1450 m, 20. VI. 1968 (Nr. 989); 3 km SW von Somon Burenchaan, 1650 m, 21. VI. 1968 (Nr. 993). — Uvs Aimak: am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1028); Senke des Sees Ačit nuur, 26 km NO vom Flußtal Altan gadasin chev gol, ca. 33 km WSW vom Paß Zenklengijn davaa, 2150 m, 4. VII. 1968 (Nr. 1062). — Bajan-Ölgij Aimak: NO-Ecke des Sees Tolbo nuur, 2100 m, 1. VII. 1968 (Nr. 1049). — 7 Exemplare.

Bemerkungen. Die Art ist in der Mongolei weit verbreitet und kommt oft mit den Arten *Bl. rugosa* Gebl., *Bl. reflexa* Gebl. und *Bl. variolosa* Fald. gemeinsam vor. Man findet sie meist ebenfalls in der Steppen- und Gebirgssteppenzone, sie dringt jedoch oft auch in die Halbwüstenzone ein, in den echten Wüsten fehlt sie jedoch ganz.

26. **Blaps reflexa** Gebler, 1832

Gebler: Nouv. Mém. Mosc., **2**, 1832, p. 55. — Seidlitz: Naturg. Ins. Deutschl., V, 1893, p. 291. — Kaszab: Ent. Abhandl. Mus. Dresden, **32**, 1964, p. 21. — Kaszab: Acta Zool. Hung., **10**, 1964, p. 388. — Kaszab: l. c., **11**, 1965, p. 334. — Kaszab: Reichenbachia, **5**, 1965, p. 133. — Kaszab: l. c., **7**, 1966, p. 252. — Kaszab: Mitt. Zool. Mus. Berlin, **43**, 1967, p. 14. — Kaszab: Acta Zool. Hung., **13**, 1967, p. 326. — Kaszab: l. c., **14**, 1968, p. 379. — Kaszab: Acta faun. ent. Mus. Nat. Pragae, **13**, 1968, p. 40.

Untersuchtes Material. — Bulgan Aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 14. VI. 1968 (Nr. 954); id., 24. VII. 1968 (Nr.

1143); zwischen Chischig-Öndör und Somon Orchon, 23 km NNO von Chischig-Öndör, 1390 m, 15. VI. 1968 (Nr. 965); SO von Somon Daschinčilen, 1050 m, 23. VII. 1968 (Nr. 1142). — Chövsgöl Aimak: 3 km SW von Somon Burenchaan, 1650 m, 21. VI. 1968 (Nr. 993); 4 km NW von der Stadt Mörön, 1500 m, 19. VII. 1968 (Nr. 1127). — Uvs Aimak: am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1029). — 10 Exemplare.

Bemerkungen. Eine seltene *Blaps*-Art der mongolischen Steppen- und Gebirgssteppenzone. In der Nordmongolei kommt sie überall vor.

27. **Blaps variolosa** FALDERMANN, 1835

FALDERMANN: Mém. sav. étrang. Acad. St. Petersb., **2,** 1835, p. 404. — SEIDLITZ: Naturg. Ins. Deutschl., V, 1893, p. 291. — KASZAB: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 22. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 388. — KASZAB: l. c., **11,** 1965, p. 333. — KASZAB: Reichenbachia, **7,** 1966, p. 252. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 326. — KASZAB: l. c., **14,** 1968, p. 379. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 40.

Untersuchtes Material. — Bulgan Aimak: 11 km W von Somon Bajannuur am Südrand des Sees Bajan nuur, 1000 m, 14. VI. 1968 (Nr. 954, 958); id., 24. VII. 1968 (Nr. 1143); SO von Somon Daschinčilen, 1050 m, 23. VII. 1968 (Nr. 1142). — Uvs Aimak: am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1028). — 16 Exemplare.

Bemerkungen. Eine Charakterart der Steppen- und Bergsteppenzone. Sie ist auch außerhalb der Mongolei in Südsibirien weit verbreitet. Literaturangaben sind auch aus China bekannt, diese Angaben beziehen sich aber auf *Bl. rimskii* SEM. & BOG.

28. **Platynoscelis (Leipopleura) reitteri** (SEIDLITZ, 1893)

SEIDLITZ: Naturg. Ins. Deutschl., V, 1893, p. 346 (*Platyscelis*). — KASZAB: Mitt. Münchn. Ent. Ges., **30,** 1940, p. 172. — KASZAB: Acta Zool. Hung., **11,** 1965, p. 334. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 14.

Untersuchtes Material. — Chövsgöl Aimak: 6 km WNW von Somon Tosoncengel, 1480 m, 18. VI. 1968 (Nr. 980). — 1 Exemplar.

Bemerkungen. Die Art hat ein enges Verbreitungsgebiet: Sajanen in Tuva, das südliche Transbaikalien sowie die nördliche Seite des Changaj-Gebirges in der Mongolei. Bisher war sie in der Mongolei nur aus Tariat (Archangaj Aimak) bekannt. Der in der Literatur bekannte Fundort aus der Mongolei: Beikem (manchmal als Belkem falsch genannt) liegt nicht in der Mongolischen Volksrepublik, sondern in Tuva.

29. **Platynoscelis (s. str.) rugifrons** (GERMAR, 1824)

GERMAR: Ins. Spec. Nov., 1824, p. 139 (*Blaps*). — FISCHER VON WALDHEIM: Ent. imp. russ., II, 1824, p. 192. — SOLIER: Studi Ent., **2,** 1848, p. 210. — SEIDLITZ: Naturg. Ins. Deutschl., V, 1893, p. 344. — KASZAB: Mitt. Münchn. Ent. Ges., **30,** 1940, p. 927. — KASZAB: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 22. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 389. — KASZAB: l. c., **11,** 1965, p. 334. — KASZAB: Fragm. Faun. Warszawa, **11,** 1965, p. 435. — KASZAB: Reichenbachia, **5,** 1965, p. 133. — KASZAB: l. c., **7,** 1966, p. 253. — KASZAB:

Ent. Blätter, **62,** 1966, p. 50. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 15, 30. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 327. — KASZAB: l. c., **14,** 1968, p. 379. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 40.
= *brevis* BAUDI: Deutsche Ent. Zeitschr., **19,** 1875, p. 35.

Untersuchtes Material. — Central Aimak: Tosgoni ovoo, 6—10 km N von Ulan-Baator, 1600—1700 m, 4. VI. 1968 (Nr. 933); id., 7.—8. VI. 1968 (Nr. 937). — Bulgan Aimak: S von Somon Chischig-Öndör, 1400 m, 15. VI. 1968 (Nr. 960). — Chövsgöl Aimak: 6 km WNW von Somon Tosoncengel, 1460 m, 18. VI. 1968 (Nr. 980); 25 km O von der Stadt Mörön, 1650 m, 18. VI. 1968 (Nr. 982); 50—54 km WNW von der Stadt Mörön, 1740—1900 m, 19. VI. 1968 (Nr. 983); 60 km WNW von der Stadt Mörön, 1800 m, 19. VI. 1968 (Nr. 984); 3 km SW von Somon Burenchaan, 1650 m, 21. VI. 1968 (Nr. 993); 8 km N von Somon Burenchaan, am Fluß Delger-mörön, 1450 m, 16. VII. 1968 (Nr. 1114); 4 km NW von der Stadt Mörön, 1500 m, 19. VII. 1968 (Nr. 1127). — Uvs Aimak: am Fluß Changilcagijn gol, 6 km SW von Somon Baruunturuun, 1350 m, 24. VI. 1968 (Nr. 1009); am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1028, 1029); Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (Nr. 1033); id., 5. VII. 1968 (Nr. 1065); 3 km NO von Somon Öndörchangaj, Gebirge-Chanchöchij ul, 2200 m, 11. VII. 1968 (Nr. 1092). — Zavchan Aimak: 15 km NW von Somon Songino, 1840 m, 12. VII. 1968 (Nr. 1093); Choit chunch, 26 km ONO vom See Telmen nuur, 2150 m, 13. VII. 1968 (Nr. 1102). — 159 Exemplare.

Bemerkungen. In Südsibirien und in der Nordmongolei ist diese Art weit verbreitet und in der Steppen- und Bergsteppenzone eine der gemeinsten Tenebrioniden-Art. Man findet sie meist unter Steinen und unter trockenem Pferdemist sowie zwischen Pflanzenwurzeln.

30. **Monatrum prescotti** (FALDERMANN, 1833)

FALDERMANN: Bull. Mosc., **6,** 1833, p. 54 (*Opatrum*). — FALDERMANN: Bull. Mosc. Ent., **1,** 1836, p. 218 (*Opatrum*). — REICHARDT: Tabl. Anal. Faune de l'URSS, **19,** 1936, p. 82. — KASZAB: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 22. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 389. — KASZAB: l. c., **11,** 1965, p. 335. — KASZAB: Fragm. Faun. Warszawa, **11,** 1965, p. 426. — KASZAB: Reichenbachia, **5,** 1965, p. 133. — KASZAB: Ent. Blätter, **62,** 1966, p. 50. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 15, 30. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 328. — KASZAB: l. c., **14,** 1968, p. 382. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 41.
= *carinatum* CSIKI (nec GEBLER, 1830): in ZICHYS Ergebn. d. III. asiat. Forschungsr., II, 1901, p. 91 (*Scleropatrum*). — REITTER: Verh. nat.-forsch. Ver. Brünn, **42,** 1904, p. 137 (*Scleropatrum*).

Untersuchtes Material. — Uvs Aimak: am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1028, 1029); Senke des Sees Ačit nuur, 26 km NO vom Flußtal Altan gadasin chev gol, ca. 33 km WSW vom Paß Zenklengijn davaa, 2150 m, 4. VII. 1968 (Nr. 1062); Ooschgijn chundi, 65 km SOS von der Stadt Ulaangom, 28 km NW von Somon Naranbulag, 1450 m, 8. VII. 1968 (Nr. 1081); Mogoin arschaan, N-Rand des Sees Chjargas nuur, 46 km OSO von Somon Naranbulag, 1100—1200 m, 9. VII. 1968 (Nr. 1085); 54 km W von Somon Öndörchangaj, Vorberge des Chanchöchij ul, 1640 m, 10. VII. 1968 (Nr. 1089). — Bajan-Ölgij Aimak: rechtes Ufer des Flusses Chovd gol bei der Stadt Ölgij, 1750 m, 30. VI. 1968 (Nr. 1048); ca. 20 km NNW von der Stadt Ölgij, 2100 m, 2. VII. 1968 (Nr. 1053). — 230 Exemplare.

Bemerkungen. In der Mongolei ist diese Art weit verbreitet. Man findet sie in der Gobi allgemein an steinigen Bergseiten meist unter Steinen oder zwischen den Wurzeln der *Caragana* oder *Nitraria* im Sand. Die Verbreitung erstreckt sich nach Norden bis zur Nordgrenze der Halbwüstenzone; in der richtigen Steppenzone ist sie nur in extrazonalen wüstenhaften Biotopen sehr

vereinzelt vorgekommen. Im Westen findet man sie bis zum nördlichsten Teil der Senke der Großen Seen, und in den wüstenartigen Senken ist sie ebenso weit verbreitet wie im Süden der Gobi.

31. **Lobodera (Myladion) gobiensis** KASZAB, 1964

KASZAB: Ent. Abhandl. Mus. Dresden, **32**, 1964, p. 24 (*L. reitteri* CSIKI ssp.). — KASZAB: Acta Zool. Hung., **13**, 1967, p. 338.

Untersuchtes Material. — Uvs Aimak: NW-Ecke des Sees Chjargas nuur, 27 km OSO von Somon Naranbulag, 1240 m, 9. VII. 1968 (Nr. 1083). — 4 Exemplare.

Bemerkungen. Das Vorkommen dieser Art in der Senke der Großen Seen ist sehr bemerkenswert. Bisher war sie aus dem Gobi Altaj (Žinst ul: Schinežinst) und aus Beger bekannt. Der neue Fundort liegt vom Vorkommen im Gobi Altaj mehrere hundert Kilometer entfernt. Da ich zwischen den verschiedenen, voneinander weit entfernten Populationen gar keine morphologischen Unterschiede feststellen konnte, bin ich ganz sicher, daß die Verbreitung kontinuierlich ist und die Art später im westlichen Teil des Seentales sowie im südlichen Teil der Senke der Großen Seen vorgefunden werden wird.

32. **Lobodera (Myladion) gibbula tetra** REICHARDT, 1936

REICHARDT: Tabl. Anal. Faune de l'URSS, **19**, 1936, p. 158, 212. — KASZAB: Acta Zool. Hung., **11**, 1965, p. 338.

Untersuchtes Material. — Uvs Aimak: Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (Nr. 1033); id., 5. VII. 1968 (Nr. 1065); 3 km WNW von der SW-Ecke des Sees Örög nuur, 1590 m, 29. VI. 1968 (Nr. 1039); id., 5. VII. 1968 (Nr. 1064). — Bajan-Ölgij Aimak: am Fluß Chavcalyn gol, 20 km WSW vom Fluß Böch-mörön gol, 1750 m, 4. VII. 1968 (Nr. 1060); 12 km WSW vom Fluß Böch-mörön gol, 1650 m, 4. VII. 1968 (Nr. 1061). — 245 Exemplare.

Bemerkungen. Diese Form ist in der Umgebung des Sees Ačit nuur und Örög nuur stellenweise sehr häufig. Insbesondere war sie in einer Steinwüste westlich vom Örög nuur auf einem Plateau sogar sehr gemein: unter fast jedem Stein saßen einige Exemplare. Außer in der Senke dieser Seen ist diese Form anderwärts nicht vorgekommen. Es ist sehr interessant, daß die Form ssp. *major* m., die nachstehend beschrieben wird, von dieser Unterart im Tal des Flusses Chavcalyn gol nur durch wenige Kilometer getrennt ist. Im Engtal des Flusses findet sich die Form ssp. *major* m., auf dem freien Plateau die ssp. *tetra* REI.

33. **Lobodera (Myladion) gibbula major** ssp. nov.

Untersuchtes Material. — Bajan-Ölgij Aimak: rechtes Ufer des Flusses Chovd gol bei der Stadt Ölgij, 1750 m, 30. VI. 1968 (Nr. 1048; darunter Holotypus, Geschlecht nicht untersucht); im Tal des Flusses Chavcalyn gol, 25 km O von Somon Cagannuur, 1850 m, 3. VII. 1968 (Nr. 1058). — 27 Exemplare.

Bemerkungen. Die Art *L. gibbula* FALD. ist eine endemische Art des Altaj-Systems. Die *forma typica* kommt im sowjetischen Altaj in Argut und Topolewka vor. Sie ist durch die kleine Gestalt, die feine Halsschildskulptur und durch die eckig vortretenden Schulterecken gekennzeichnet. Im Mongol Altaj war bisher nur die Form *L. gibbula tetra* REI. bekannt, die größer ist und außerdem eine grobe Halsschildskulptur sowie abgerundete Schulterecken besitzt. Im Mongol Altaj entdeckte ich eine weitere Unterart, die unter allen Formen der Art die größte ist, außerdem sind einige morphologische Merkmale vorhanden, auf Grund deren sie von den beschriebenen Unterarten leicht unterschieden werden kann. Die hierher gehörenden Formen lassen sich voneinander folgendermaßen trennen:

1 (2) Schulterwinkel eckig vortretend. Halsschildseiten nach vorn und hinten gleichmäßig leicht verengt, fein punktiert. Flügeldecken mit kaum erkennbar punktierten Streifen und mit erloschenen und spärlich raspelartigen Körnchen. Kleinste Form. — Länge: 6,5—8 mm. Sibirien: Altaj (Argut, Topolewka) (= *Heliophilus gibbulus* FALD.)
L. gibbula gibbula (FALDERMANN, 1835)

2 (1) Schulter ohne vortretende Ecke, abgerundet. Halsschild grob punktiert. Größere Formen: 7,5—10,5 mm.

3 (4) Kleiner: 7,5—9 mm. Seiten des Halsschildes einfach gerundet, vor den Hinterecken nicht ausgeschweift, deshalb die Hinterecke nur scharf stumpfwinklig ist. Seitenrand schmäler abgesetzt und wenig aufgebogen. Halsschild grob und dicht punktiert, die Körnelung der Flügeldecken erloschen und spärlich. — Mongolei: Mongol Altaj, Senke der Großen Seen (Ačit nuur, Örög nuur)
L. gibbula tetra (REICHARDT, 1936)

4 (3) Größer: 9,5—10,5 mm. Seiten des Halsschildes stark gerundet, vor den Hinterecken mehr oder weniger ausgeschweift, weshalb die Hinterecken schärfer stumpfwinklig, manchmal rechtwinklig, die Seiten hingegen auch vorn vor den Vorderecken oft etwas ausgeschweift sind. Seiten breiter verflacht und stärker ausgebogen, die Punktierung der Scheibe grob und dicht, gleichmäßig. Die Körnelung der Flügeldecken, vor allem seitlich und vorn gröber, weniger erloschen. — Mongolei: Mongol Altaj (Tal des Flusses Chovd bei Ölgij, sowie Chavcalyn gol bei Cagaannuur)
L. gibbula major ssp. nov.

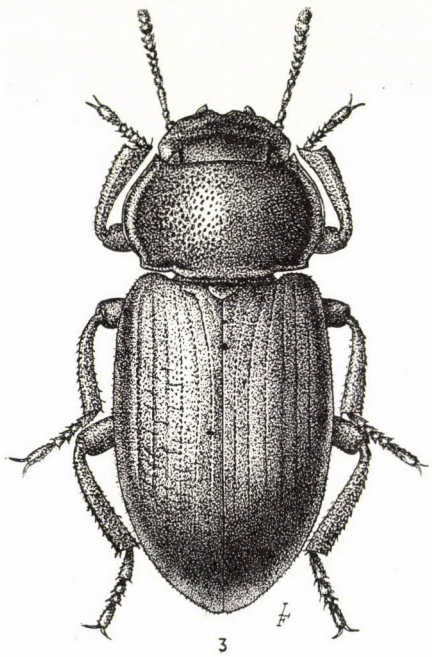
34. **Lobodera (Myladion) davadshamsi davadshamsi** KASZAB, 1965

KASZAB: Acta Zool. Hung., **11**, 1965, p. 336. — KASZAB: Mitt. Zool. Mus. Berlin, **43**, 1967, p. 16.

Untersuchtes Material. — Uvs Aimak: Ooschgijn chundi, 65 km SOS von der Stadt Ulaangom, 28 km NW von Somon Naranbulag, 1450 m, 8. VII. 1968 (Nr. 1081); Mogoin Arschaan, N-Rand des Sees Chjargas nuur, 48 km OSO von Somon Naranbulag, 1100—1200 m, 9. VII. 1968 (Nr. 1085). — 464 Exemplare.

Bemerkungen. Die Art habe ich auf Grund einer Serie beschrieben, die am Nordrand des Sees Chjargas nuur gesammelt wurde. Nun sammelte ich selbst an derselben Stelle eine sehr große Serie, die mit der typischen Form völlig identisch ist. Der Fundort am Mogoin arschaan ist sehr bemerkenswert. Es ist eine südlich exponierte, steile Bergseite mit äußerst öder Steinwüste. Der ganze Berghang und besonders der Bergfuß ist mit Schuttstein bedeckt; unter den kleineren Steinen habe ich fast nichts gefunden, unter den großen, jedoch nicht tief eingebetteten Steinen waren dagegen oft sogar große Mengen von

Tenebrioniden, vor allem *L. davadshamsi* zu finden. Es gab Fälle, in welchen ich unter einem Stein 60 Exemplare dieser Art gefunden habe. Die Art kommt in der Westmongolei sehr vereinzelt vor. Außer am typischen Fundort sammelte ich sie nur in einem — ähnlich öden — Gebiet, am Ooschgijn chundi. Diese Exemplare sind etwas kleiner als die Tiere der typischen Serie, ich konnte jedoch außer in der Größe keine bemerkenswerten Unterschiede feststellen.



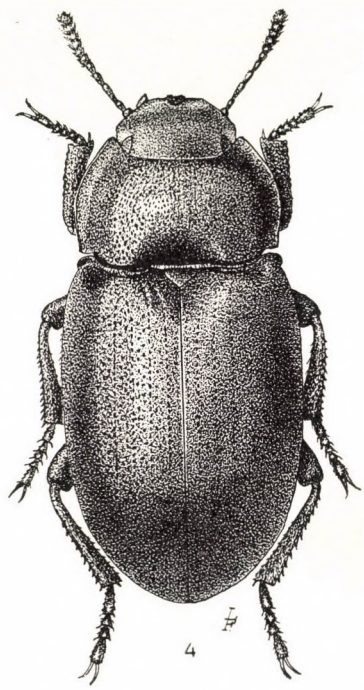


Abb. 3. *Lobodera gibbula major* ssp. nov. — Abb. 4. *L. explanata reichardti* ssp. nov.

35. **Lobodera (Myladion) humeridens** (REITTER, 1896)

REITTER: Deutsche Ent. Zeitschr., 1896, p. 164 (*Penthicus*). — REITTER: Verh. nat.-forsch. Ver. Brünn, **42,** 1904, p. 165 (*Lobothorax*). — REICHARDT: Tabl. Faun. de l'URSS, **19,** 1936, p. 153, 158. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 334.

Untersuchtes Material. — Chövsgöl Aimak: 3 km SW von Somon Burenchaan, 1650 m, 21. VI. 1968 (Nr. 992). — 2 Exemplare.

Bemerkungen. Die Art kommt in der Mongolei in der Gebirgssteppenzone, u. zw. von Ulan-Baator nach Westen bis zu den Ketten des südwestlichen Changaj-Gebirges vor. In der Literatur sind noch Angaben aus dem südöstlichen Altaj: Tschujskij Trakt und Ajgulag bekannt. Die Exemplare aus dem Changaj-Gebirge sind mit der typischen Serie aus Urga (= Ulan-Baator) morphologisch völlig identisch.

36. **Lobodera (Myladion) sequensi** (REITTER, 1896)

REITTER: Deutsche Ent. Zeitschr., 1901, p. 79 (*Penthicus*). — REITTER: Verh. nat.-forsch. Ver. Brünn, **42**, 1904, p. 166 (*Lobothorax*). — REICHARDT: Tabl. Anal. Faune de l'URSS, **19**, 1936, p. 159.

Untersuchtes Material. — Chövsgöl Aimak: 6 km WNW von Somon Tosoncengel, 1480 m, 18. VI. 1968 (Nr. 980); 8 km N von Somon Burenchaan, am Fluß Delgermörön, 1450 m, 16. VII. 1968 (Nr. 1114); 4 km NW von der Stadt Mörön, 1500 m, 19. VII. 1968 (Nr. 1127). — 77 Exemplare.

Bemerkungen. REITTER hat die Art aus dem Quellgebiet des Irkut und aus der Umgebung von Urga (= Ulan-Baator) beschrieben. REICHARDT kennt sie außerdem noch aus Uljasutaj und Mörön (nahe Uljasutaj!). Die beiden letzteren Fundorte sind jedoch nicht genau genug, da z. B. Mörön von Uljasutaj in Luftlinie mehr als 300 km NO liegt. Die Serie aus der weiteren Umgebung von Mörön, die ich selber gesammelt habe, ist von den Typen morphologisch nicht verschieden. Die Art repräsentiert eine charakteristische Gebirgssteppenart des nördlichen Changaj-Gebirges.

37. **Lobodera (Myladion) explanata reichardti** ssp. nov.

Untersuchtes Material. — Uvs Aimak: am Fluß Changilcagijn gol, 6 km SW von Somon Baruunturuun, 1350 m, 24. VI. 1968 (Nr. 1009); 17 km SO von der Stadt Ulaangom, 980 m, 27. VI. 1968 (Nr. 1025, darunter Holotypus ♂); Tankstelle in der Stadt Ulaangom, 1020 m, 27. VI. 1968 (Nr. 1026). — 17 Exemplare.

Bemerkungen. Die Stammform dieser Art kommt in »Siberia occ.: Altaj« vor. Seit der Beschreibung der Art ist sie nicht wieder gefunden worden, und bis heute ist nur die einzige Holotype (im Museum Budapest) bekannt. REICHARDT hat eine Unterart aus der Mongolei unter dem Namen *L. explana laesa* REI. beschrieben. Diese Form sammelte ich selbst im südwestlichen Teil des Changaj-Gebirges. Neuerdings ist es mir gelungen, in der Nordwestmongolei, in der Senke der Großen Seen eine weitere Form dieser Art zu entdecken. Statt einer ausführlichen Beschreibung gebe ich hier eine Bestimmungstabelle der hierher gehörenden drei Unterarten, wie folgt:

1 (2) Die Punktierung des Kopfes an der Stirn länglich; sie bildet in ihrer ganzen Breite scharfe Längsrunzeln. Wangen weit vor den Augen am breitesten, etwas winklig vortretend, nach hinten gerade verengt und vor ihrer Basis, etwa in der Höhe der Augenmitte, plötzlich verengt. Halsschild sehr breit, Seiten stark gebogen, Seitenrand breit verflacht und aufgebogen, besonders in der Mitte, Hinterecken scharf stumpfwinklig, Seiten vor den Hinterecken gerade stark verengt; die Basis in der Mitte breit gerade abgestutzt und ungerandet, der mittlere, ungerandete Teil heruntergebogen, beiderseits mit je einer lappenartig vorgezogenen, stärker nach hinten vorragenden, flachen, erloschen gerandeten Beule. Zwischen diesen Lappen und den Hinterecken die Seiten ausgeschweift verengt weshalb die Hinterecke eher eckig scheint. Scheibe des Halsschildes in der Mitte sehr fein und spärlich, seitlich gröber und länglich punktiert, beiderseits auf der Scheibe mit Spuren einer Längsrunzelung, die Seiten aber spärlich und grob punktiert. Flügeldecken fein, erloschen gekörnelt, seitlich und besonders vorn ist aber die Körnelung dichter und schärfer. — Länge: 11,6 mm. Sibirien: Altaj (= *Penthicus explanatus* REITT.)

L. explanata explanata (REITTER, 1896)

2 (1) Die Punkte des Kopfes rundlich, meist in Längsrunzeln zusammenfließend. Wangen entweder hinter dem Vorderrand der Augen am breitesten und ein Stück vor diesem Teil parallel oder einfach abgerundet, nicht eckig. Hinterecken des Halsschildes abgerundet stumpfwinklig, entweder spärlich und grob oder feiner und dichter punktiert.

3 (4) Basis des Halsschildes beiderseits gerade, schräg nach außen abgestutzt, zwischen den nach hinten vorragenden Beulen und den abgerundeten Hinterecken befinden sich keine Ausrandungen. Seitenrand breit abgesetzt und aufgebogen, die Punktierung grob und meist spärlich. Wangen am Vorderrand der Augen am breitesten, nach vorn fast parallel oder etwas verengt und abgerundet. Stirn grob punktiert, die Punktierung ziemlich eng und seitlich in unregelmäßigen Runzeln verschmolzen, vorn und der Clypeus jedoch einzeln punktiert. — Länge: 10,8—12,5 mm. Mongolei: Gobi Altaj Aimak (südwestliches Changaj-Gebirge)

L. explanata laesa REICHARDT, 1936

4 (3) Basis des Halsschildes beiderseits zwischen den abgerundet-stumpfwinkligen Hinterecken und den nach hinten vorgestreckten Beulen ausgerandet, nicht gerade; Basis beiderseits scharf gerandet. Die Punkte in der Mitte fein und rundlich, seitlich werden sie allmählich gröber und länglich, meist ohne Runzelung. Seiten breit verflacht und stärker aufgebogen, die basalen Beulen flach. Kopf sehr dicht und eng punktiert, seitlich und vorn gerunzelt. Clypeus ebenfalls gerunzelt punktiert. Wangen einfach abgerundet vortretend, etwa am Vorderrand der Augen am breitesten. — Länge: 8,8—11 mm. Mongolei: Uvs Aimak (Senke des Sees Uvs nuur)

L. explanata reichardti ssp. nov.

Die neue Unterart sei zu Ehren und zum Andenken an meinen lieben Kollegen, Herrn AXEL REICHARDT, des ausgezeichneten Monographen der *Opatrinae*, benannt.

38. **Lobodera (Aulonolcus) altaica** (GEBLER, 1830)

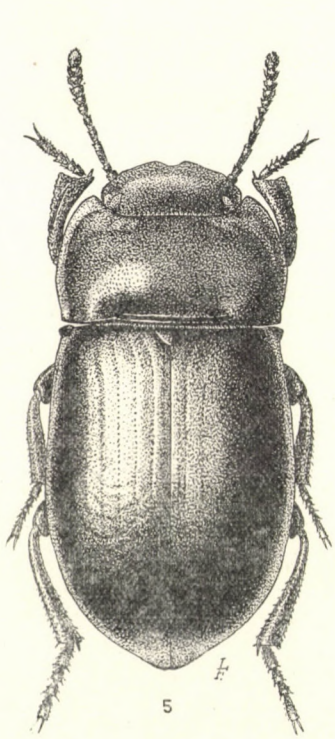
GEBLER: Ledebours Reise, II, 1830, p. 123 (*Pedinus*). — MULSANT & REY: Opusc. Ent., **10,** 1859, p. 27 (*Penthicus*). — REITTER: Deutsche Ent. Zeitschr., 1896, p. 169 (*Penthicus*). — REITTER: Verh. nat.-forsch. Ver. Brünn, **42,** 1904, p. 168 (*Lobothorax*). —REICHARDT: Tabl. Anal. Faune de l'URSS, **19,** 1936, p. 167. — KASZAB: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 24. — KASZAB: Acta Zool. Hung., **11,** 1965, p. 339. — KASZAB: l. c., **13,** 1967, p. 342. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 17, 30. — KASZAB: Acta Zool. Hung., **14,** 1968, p. 388. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 41.

= *tenebrionides* FALDERMANN: Mém. sav. étrang. Acad. St. Petersb., **2,** 1835, p. 411 (*Heliophilus*).

= *sulcibasis* REITTER: Verh. nat.-forsch. Ver. Brünn, **42,** 1904, p. 169 (*Lobothorax*).

Untersuchtes Material. — Chövsgöl Aimak: 3 km SW von Somon Burenchaan, 1650 m, 21. VI. 1968 (Nr. 992, 993); 8 km N von Somon Burenchaan, am Fluß Delgermörön, 1450 m, 16. VII. 1968 (Nr. 1114). — Uvs Aimak: 17 km SO von der Stadt Ulaangom, 980 m, 27. VI. 1968 (Nr. 1025); Tankstelle in der Stadt Ulaangom, 1020 m, 27. VI. 1968 (Nr. 1026); 27 km NW von der Stadt Ulaangom, 1150 m, 27. VI. 1968 (Nr. 1027); am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1028); id., 7. VII. 1968 (Nr. 1077); zwischen dem See Örög nuur und der Stadt Ulaangom, 12 km OSO vom Paß Ulaan davaa (55 km NW von Ulaangom), 1450 m, 28. VI. 1968 (Nr. 1031); Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (Nr. 1033); id., 5. VII. 1968 (Nr. 1065); 3 km WNW von der SW-Ecke des Sees Örög nuur, 1590 m, 29. VI. 1968 (Nr. 1039); 7 km SO vom Paß Ulaan davaa, zwischen dem See Örög nuur und der Stadt Ulaangom, 1650 m, 7. VII. 1968 (Nr. 1076); 20 km S von der Stadt Ulaangom, 1380 m, 8. VII. 1968 (Nr. 1080); Mogoin arschaan, N-Rand des Sees Chjargas nuur, 48 km OSO von Somon Naranbulag, 1100—1200 m, 9. VII. 1968 (Nr. 1085); 3 km NO von Somon Öndörchangaj, Gebirge Chanchöchij ul, 2200 m, 11. VII. 1968 (Nr. 1092). — Bajan-Ölgij Aimak: ca. 20 km S von Somon Cagaannuur, 2300 m, 30. VI. 1968 (Nr. 1044); rechtes Ufer des Flusses Chovd gol bei der Stadt Ölgij, 1750 m, 30. VI. 1968 (Nr. 1048); NO-Ecke des Sees Tolbo nuur, 2100 m, 1. VII. 1968 (Nr. 1049); ca. 20 km NNW von der Stadt Ölgij, 2100 m, 2. VII. 1968 (Nr. 1053); am Fluß Chavcalyn gol, 20 km WSW vom Fluß Böch-mörön gol, 1750 m, 4. VII. 1968 (Nr. 1060). — 802 Exemplare.

Bemerkungen. Die gemeinste Tenebrioniden-Art der Halbwüsten und Wüsten in der Senke der Großen Seen sowie im Mongol Altaj. An den südlich exponierten Berghängen, auf den wüstenhaften Plateaus und in den trockenen Tälern findet man sie unter Steinen überall, manchmal gesellschaftlich. Sie ist morphologisch äußerst variabel: die Größe und Skulptur sowie die Form, vor allem der Halsschild sind bei den verschiedenen Populationen sehr verschieden. Am auffallendsten sind die Größenunterschiede der Populationen. Die Exem-



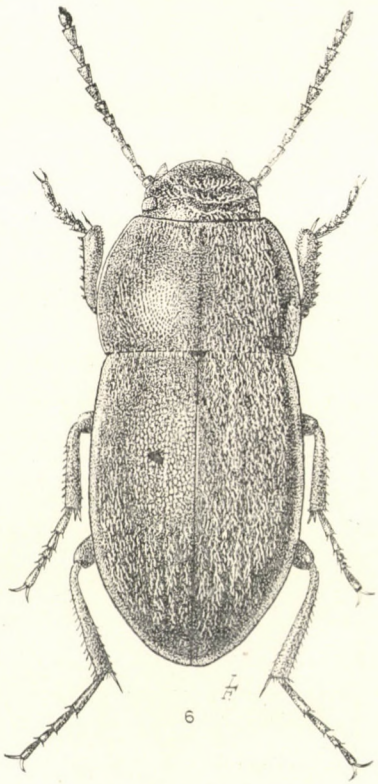


Abb. 5. *Lobodera altaica* GEBL. var. *opaca* var. nov. — Abb. 6. *Crypticus ovatulus* REITT.

plare vom Bajan-Ölgij Aimak sind wesentlich kleiner (9,5—10,5 mm) als die Exemplare vom Nordrand des Sees Chjargas nuur (11—12,5 mm) oder aus der Umgebung von Ulaangom. Die größeren Exemplare haben auch einen etwas abweichenden Halsschild, d. h. die Seiten sind vor den Hinterecken heruntergebogen und nicht abgesetzt, und ebenso ist auch der Rand erloschen. Man könnte eine Anzahl lokaler Formen beschreiben, die aber doch nicht als Rassen aufgefaßt werden können, weil die Merkmale (Größe, Skulptur, Halsschildform) bei den verschiedenen Populationen unabhängig voneinander auftreten

und in ihrem ganzen Areal (wahrscheinlich unter dem Einfluß der ökologischen Faktoren) die verschiedensten Kombinationen der morphologischen Merkmale vorgefunden werden können.

39. **Lobodera (Aulonolcus) altaica** GEBL. var. **opaca** var. nov.

Untersuchtes Material. — U v s A i m a k : am Fluß Changilcagijn gol, 6 km SW von Somon Baruunturuun, 1350 m, 24. VI. 1968 (Nr. 1009). Holotypus (Geschlecht nicht untersucht) und 73 Exemplare.

Bemerkungen. Eine Population aus dem Randgebiet der Verbreitung der Art, die sich durch so auffallende morphologische Merkmale auszeichnet, daß ich sie mit einem besonderen Namen bezeichnen will. Diese Form unterscheidet sich von der im übrigen sehr variablen *L. altaica* GEBL. *forma typica* durch die Flügeldeckenskulptur. Während die *forma typica* eine stark glänzende und grob punktierte Flügeldeckenskulptur besitzt, die stellenweise lederartig gerunzelt ist, besitzt die neue Form am Grunde dicht chagrinierte und matte sowie fein und spärlich punktierte Flügeldecken, die am Absturz einfach fein lederartig gerunzelt und seitlich auch etwas erloschen gekörnt ist. Kopf und Halsschild ebenfalls feiner und dichter punktiert als bei der Stammform. — Länge: 9—10 mm.

40. **Eumylada punctifera amaroides** REICHARDT, 1936

REICHARDT: Tabl. Anal. Faune de l'URSS, **19,** 1936, p. 171, 172 (*E. punctifera* REITT. var.). — KASZAB: Ent. Abhand. Mus. Dresden, **32,** 1964, p. 25. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 398. — KASZAB: l. c., **11,** 1965, p. 340. — KASZAB: Fragm. Faun. Warszawa, **11,** 1965, p. 428. — KASZAB: Ent. Blätter, **62,** 1966, p. 51. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 343. — KASZAB: l. c., **14,** 1968, p. 389. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 41.

Untersuchtes Material. — U v s A i m a k : Ooschgijn chundi, 65 km SOS von der Stadt Ulaangom, 38 km NW von Somon Naranbulag, 1450 m, 8. VII. 1968 (Nr. 1081); NW-Ecke des Sees Chjargas nuur, 27 km OSO von Somon Naranbulag, 1240 m, 9. VII. 1968 (Nr. 1083); Mogoin arschaan, N-Rand des Sees Chjargas nuur, 48 km OSO von Somon Naranbulag, 1100—1200 m, 9. VII. 1968 (Nr. 1085). — 31 Exemplare.

Bemerkungen. Mit diesen Angaben dehnt sich ihre Verbreitung nach Westen und Nordwesten wesentlich aus. Bis jetzt war sie nach Westen bis zum Chasagt-Chajrchan-Gebirge im südwestlichen Changaj bekannt. Die Form ist nach unseren jetzigen Kenntnissen von den nordwestlichen Seenbecken über das Seental zwischen dem Gobi Altaj und dem Changaj-Gebirge bis zur zentralen Gobi, ungefähr bis zur Linie bei Sainschand verbreitet. Die Art ist ein charakteristisches Tier der Halbwüsten und Wüsten; man findet sie meist in grobkörnigem Sand unter Steinen oder am Fuß von Caragana.

41. **Melanesthes (s. str.) furvus** KONTKANEN, 1956

KONTKANEN: Ann. Ent. Fenn., **22,** 1956, p. 58. — KASZAB: Acta Zool. Hung., **11,** 1965, p. 340. — KASZAB: l. c., **13,** 1966, p. 317. — KASZAB: l. c., **13,** 1967, p. 346.

Untersuchtes Material. — Bajan-Ölgij Aimak: ca. 20 km NNW von der Stadt Ölgij, 2100 m, 2. VII. 1968 (Nr. 1053). — 4 Exemplare.

Bemerkungen. Die Art wurde ursprünglich aus der Mongolei: Kemtschik, Jenissei und Soldan beschrieben. Diese Fundorte liegen aber außerhalb der Mongolischen Volksrepublik und gehören zur Fauna von Tuva. In der Mongolei kommt sie aber in der Senke der Großen Seen südlich bis zum Sandgebiet Mongol els am Fluß Zavchan gol vor. Die hier publizierten Angaben repräsentieren die Nordwestgrenze ihrer Verbreitung in der Mongolei.

42. **Melanesthes (s. str.) parvula** KASZAB, 1967

KASZAB: Acta Zool. Hung., **13**, 1967, p. 348.

Untersuchtes Material. — Uvs Aimak: Ooschgijn chundi, 65 km SOS von der Stadt Ulaangom, 28 km NW von Somon Naranbulag, 1450 m, 8. VII. 1968 (Nr. 1081). — 10 Exemplare.

Bemerkungen. Sie hat eine ähnliche Verbreitung wie *Lobodera gobiensis* KASZ. Bis jetzt war die Art nur aus dem Gobi Altaj Aimak: unweit von Jesönbulag (5 km vom Zavchan-Kanal, 90 km O von Jesönbulag) bekannt. Der neue Fundort ist sehr bemerkenswert und beweist, wie viele gemeinsame Züge zwischen der Senke der Großen Seen und dem Seental sowie der Wüste Gobi bestehen.

43. **Melanesthes (s. str.) maxima** MÉNÉTRIÉS, 1854

MÉNÉTRIÉS: in MOTSCHULSKYS Étud. Ent., **3**, 1854, p. 33. — MULSANT & REY: Opusc. Ent. **10**, 1859, p. 32. — REITTER: Verh. nat.-forsch. Ver. Brünn, **42**, 1904, p. 172. — REICHARDT: Tabl. Anal. Faune de l'URSS, **19**, 1936, p. 176, 177. — KASZAB: Acta Zool. Hung., **11**, 1965, p. 431. — KASZAB: l. c., **12**, 1966, p. 319. — KASZAB: l. c., **13**, 1967, p. 347. — KASZAB: l. c., **14**, 1968, p. 392. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13**, 1968, p. 41.

Untersuchtes Material. — Uvs Aimak: am Fluß Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 27. VI. 1968 (Nr. 1029); id., 7. VII. 1968 (Nr. 1077); 54 km W von Somon Öndörchaan, Vorberge des Chanchöchij ul Gebirges, 1640 m, 10. VII. 1968 (Nr. 1089). — 8 Exemplare.

Bemerkungen. Die Art war bisher aus der Wüste Gobi im Seental östlich von Chaliun (zwischen der Senke der Schargyn Gobi und dem Beger nuur) bis zum Chingan-Gebirge bekannt. Sie ist aber auch in der Nordwestmongolei in der Senke der Großen Seen einheimisch und repräsentiert in diesem Gebiet ein weiteres typisches Wüsten- bzw. Halbwüstentier. Die Art lebt ebenfalls an sandigen Stellen unter Steinen oder zwischen den Wurzeln der Caragana.

44. **Melanesthes (s. str.) faldermanni** MULSANT & REY, 1859

MULSANT & REY: Opusc. Ent., **10**, 1859, p. 36. — REITER: Verh. nat.-forsch. Ver. Brünn, **42**, 1904, p. 172. — REICHARDT: Tabl. Anal. Faune de l'URSS, **19**, 1936, p. 176, 177. — KASZAB: Ent. Abhandl. Mus. Dresden, **32**, 1964, p. 25. — KASZAB: Acta Zool. Hung.,

10, 1964, p. 394. — KASZAB: l. c., **11,** 1965, p. 341. — KASZAB: l. c., **12,** 1966, p. 319. — KASZAB: Reichenbachia, **7,** 1966, p. 254. — KASZAB: Ent. Blätter, **62,** 1966, p. 51. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 17, 30. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 346. — KASZAB: l. c., **14,** 1968, p. 392. — KASZAB: Acta faun. ent. Mus. Nat. Pragae, **13,** 1968, p. 41.

= *laticollis* FALDERMANN (nec GEBLER, 1830): Bull. Mosc. **8,** 1835, p. 167.

Untersuchtes Material. — Chövsgöl Aimak: 25 km O von der Stadt Mörön, 1650 m, 18. VI. 1968 (Nr. 982); 3 km SW von Somon Burenchaan, 1650 m, 21. VI. 1968 (Nr. 992); 26 km W vom See Tunamal nuur, 1970 m, 22. VI. 1968 (Nr. 998); 8 km N von Somon Burenchaan, am Fluß Delger-mörön, 1450 m, 16. VII. 1968 (Nr. 1114). — Uvs Aimak: Senke des Sees Uvs nuur am SW-Rand des Sees, 84 km W von Somon Zuungobi und 63 km O von der Stadt Ulaangom, 790 m, 26. VI. 1968 (Nr. 1019). — Zavchan Aimak: 15 km NW von Somon Songino, 1840 m, 12. VII. 1968 (Nr. 1093). — Bulgan Aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 29. VII. 1968 (Nr. 1143). — 36 Exemplare.

Bemerkungen. Charakteristische Art der nordmongolischen Steppen- und Gebirgssteppenzone. Sie hat in der Mongolei eine stark ausgedehnte Verbreitung, südlich bis zum Rand der Übergangszone der Halbwüsten. Im Norden ist sie bis Transbaikalien heimisch. Die Art war von FALDERMANN unter dem Namen *M. laticollis* FALD. (nec GEBLER) aus Irkutsk beschrieben.

45. **Crypticus (s. str.) quisquilius** (PAYKULL, 1798)

PAYKULL: Fauna Suecica, I, 1798, p. 96 (*Helops*). — REITTER: Ent. Nachr., **22,** 1896, p. 146. — ESPANOL: Eos, **26,** 1950, p. 121. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 399. — KASZAB: Ent. Abhandl. Mus. Dresden, **32,** 1964, p. 26. — KASZAB: Reichenbachia, **5,** 1965, p. 133. — KASZAB: Acta Zool. Hung., **11,** 1965, p. 344. — KASZAB: Reichenbachia, **7,** 1966, p. 255. — KASZAB: Ent. Blätter, **62,** 1966, p. 51. — KASZAB: Mitt. Zool. Mus. Berlin, **43,** 1967, p. 18, 30. — KASZAB: Acta Zool. Hung., **13,** 1967, p. 349.

Untersuchtes Material. — Chövsgöl Aimak: 60 km WNW von der Stadt Mörön, 1800 m, 19. VI. 1968 (Nr. 984); 3 km SW von Somon Burenchaan, 1650 m, 21. VI. 1968 (Nr. 992, 993); am See Tunamal nuur, 26 km SW von Somon Scharga, 1950 m, 15. VII. 1968 (Nr. 1111). — Uvs Aimak: am Fluß Changilcagijn gol, 6 km SW von Somon Baruunturuun, 1350 m, 24. VI. 1968 (Nr. 1009); SW-Ecke des Sees Örög nuur, 1500 m, 29. VI. 1968 (Nr. 1038); Somon Öndörchangaj, 1900 m, 11. VII. 1968 (Nr. 1090). — 44 Exemplare.

Bemerkungen. In der Mongolei ist sie eine charakteristische Art der Steppen- und Gebirgssteppenzone. Aus der Nordwestmongolei war sie bisher unbekannt. Die Art ist in Asien vom nördlichen Teil der Mongolei, in der Steppen- und Waldsteppenzone — einer schmalen Zone — nach Westen bis zu den Pyrenäen verbreitet. Obwohl sie ungeflügelt ist, erscheint die Art morphologisch doch sehr einheitlich, und es kommt nur in Europa, an den westlichen und südlichen Randgebieten eine nennenswerte Rassenbildung vor.

46. **Crypticus (Seriscius) ovatulus** REITTER, 1896

REITTER: Ent. Nachr., **22,** 1896, p. 150. — ESPAÑOL: Eos, **31,** 1955, p. 20. — KASZAB: Acta Zool. Hung., **10,** 1964, p. 399. — KASZAB: l. c., **11,** 1965, p. 345. — KASZAB: Reichenbachia, **7,** 1966, p. 256.

Untersuchtes Material. — Uvs Aimak: am Fluß Changilcagijn gol, 6 km SW von Somon Baruunturuun, 1350 m, 24. VI. 1968 (Nr. 1009). — 90 Exemplare.

Bemerkungen. Es gibt in Zentral- und Innerasien einige *Crypticus*-Arten der Untergattung *Seriscius*, die einander sehr ähnlich sind: *rufipes* GEBL., *pubescens* MOTSCH. und *ovatulus* REITT. Die Unterschiede zwischen diesen »Arten« sind nach der Revision von REITTER (1896) sehr diffizil. REITTER sah damals nur sehr wenig Material, meist nur einzelne Stücke, weshalb er die Unterschiede in der Behaarung und Form sowie die Punktierung des Halsschildes überbewertet und für Artunterschiede gehalten hat. Nun konnte ich endlich eine große Serie aus einem Fundort untersuchen und feststellen, daß diese Merkmale sicher keine Artmerkmale sind, weil z. B. die Behaarung von einfarbig braun bis grau und auch mehr oder weniger gefleckt sein kann; die Körperform ist ebenfalls mehr oder weniger oval und die Punktierung des Halsschildes manchmal spärlich und fein, oft dicht und fast runzelig. Man könnte auf Grund der von REITTER angegebenen Merkmale in einer Serie alle drei Arten auffinden. So bin ich zur Überzeugung gekommen, daß die 3 Arten dieser Gruppe einzuziehen sind; man kann später, wenn von außerhalb der Mongolei ebenfalls größeres Material vorliegt, die beschriebenen Formen eventuell als Unterarten wieder gelten lassen. Wenn man diese Meinung akzeptiert, sollte der älteste Name: *Cr. rufipes* GEBLER, 1830 gebraucht werden. Ich verzichte momentan jedoch auf diese Abänderung so lange, bis ich mir aus Ostasien ein größeres Material zur Untersuchung verschafft habe, und behalte für die mongolischen Populationen den Namen *Cr. ovatulus* REITTER bei, die REITTER aus der Mongolei: Urga (= Ulan-Baator) beschrieben hat. Diese Art ist in der Mongolei in der Steppen- und Gebirgssteppenzone weit verbreitet und für diese Zone charakteristisch.

SCHRIFTTUM

1. BOGATSCHEW, A. W. (1946): Новые чернотелки (Tenebrionidae) палеарктики. — Proc. Acad. Sci. Azerb. SSR, **2** (9), p. 391—394.
2. BOGATSCHEW, A. W. (1961): Новые виды жуков-чернотелок (Tenebrionidae) из таджикской ССР, других республик Средней Азии и сопредельных стран. — Труды инст. зоол. и паразит. АН Тадж. ССР, — **20**, p. 107—121.
3. CSIKI, E. (1901): Bogarak, Coleoptera. — in ZICHY, J.: Dritte asiatische Forschungsreise des Grafen Eugen Zichy, II., Horváth, G.: Zoologische Ergebnisse. — Budapest, p. 77—120.
4. KASZAB, Z. (1964a): Beiträge zur Kenntnis der Tenebrioniden-Fauna des mittleren Teiles der Mongolischen Volksrepublik (Coleoptera). — Acta Zool. Hung., **10**, p. 363—404.
5. KASZAB, Z. (1964b): Tenebrioniden der Mongolisch-Deutschen Biologischen Expedition 1962 (4. Coleoptera, Tenebrionidae). — Ent. Abhandl. Mus. Dresden, **32**, p. 1—26.
6. KASZAB, Z. (1965a): Tenebrionidae (Coleoptera), gesammelt von polnischen Expeditionen in der Mongolei in den Jahren 1962—1963. — Fragm. Faun. Warszawa, **11**, p. 417—430.
7. KASZAB, Z. (1965b): Angaben zur Kenntnis der Tenebrioniden-Fauna der Mongolischen Volksrepublik (Coleoptera). — Acta Zool. Hung., **11**, p. 295—346.
8. KASZAB, Z. (1967a): Coleoptera: Tenebrionidae der Mongolisch-Deutschen Biologischen Expedition 1964. Ergebnisse der Mongolisch-Deutschen Biologischen Expeditionen seit 1962. Nr. 19. — Mitt. Zool. Mus. Berlin, **43**, p. 3—33.
9. KASZAB, Z. (1967b): Die Tenebrioniden der Westmongolei (Coleoptera). — Acta Zool. Hung., **13**, p. 279—351.
10. KASZAB, Z. (1968): Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei. 168. Tenebrionidae (Coleoptera). — Acta Zool. Hung., **14**, p. 339—397.

11. KASZAB, Z. (1969a): Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei. 193. Reisebericht der VI. Expedition. — Ann. Hist.-nat. Mus. Nat. Hung., **61** (im Druck).
12. KASZAB, Z. (1969b): Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei. 186. Liste der Fundorte der VI. Expedition. — Folia Ent. Hung., ser. nov., **21**, p. 389—444.
13. KONTKANEN, P. (1956): Zur Kenntnis der Paläarktischen Käferfauna. I. — Ann. Ent. Fenn., **22** (2), p. 55—63.
14. REICHARDT, A. (1936): Revision des Opatrines (Coleoptera, Tenebrionidae) de la région paléarctique. — Tabl. Anal. Faune de l'URSS, **19**, pp. 223.
15. REITTER, E. (1889): Insecta, a cl. G. N. Potanin in China et in Mongolia novissime lecta. IX. Tenebrionidae. — Horae Soc. Ent. Ross., **21**, p. 354—389.
16. SCHUSTER, A. (1922): Insecta, ex Sibiria meridionali et Mongolia in itinere Orjan Olsen 1914 collecta. A. Coleoptera, a Fritz Jensen lecta. V. Tenebrionidae. — Norsk. Ent. Tidsrk., B, I, **4**, p. 163—164.
17. SKOPIN, N. G. (1964): Новые виды чернотелок (Coleoptera, Tenebrionidae) из смежных Казахстаном районов Центральной Азии. — Труды научно-исследовательского института защиты растений, Алма-Ата, **8**, p. 371—388.

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THE SCIENTIFIC RESULTS OF THE HUNGARIAN SOIL ZOOLOGICAL EXPEDITIONS TO SOUTH AMERICA*

13. ACARI: PYGMEPHORIDAE AND SCUTACARIDAE FROM THE MATERIAL OF THE SECOND EXPEDITION (BRAZIL AND BOLIVIA)

By

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The species of the above families, collected and extracted, respectively, have been first discussed in a previous paper [5]. At that time, I treated only those originating from the environs of Guayaramerin, Bolivia. As a continuation of this work, I have by now examined all extracted materials with the exception of that gathered in Uruguay.

Investigations resulted in 58 species, of which 32 proved to be new for science. The description of a new subgenus is also submitted (*Rostrodispus* subgen. n.). These studies suggest most interesting interrelationships in regard to the range of the species involved, but any zoogeographic inference should be drawn only after the identification of also the materials deriving from the Third Expedition.

The detailed data of the collectings are submitted in a separate paper [1]; however, the most important ones should also be listed here, so that in the description of the species reference is made only to the serial number of the logbook of the expedition, as a number of identification for the species and localities themselves. The species treated herein were found in materials collected in the following localities:

Brazil

No. 367. Campinas (São Paolo), forest surrounding city waterworks, 7 Jan., 1967. — BERLESE samples from forest: 1. very wet thick litter (without humus) at tree-trunk; 2. litter with humus, from several sites.

No. 368. Campinas (São Paolo), Botanical Garden, 7 Jan., 1967. — BERLESE sample from thin, wet litter.

* The present article deals with the material of the Second Expedition (1966—67). Leader: Prof. Dr. J. BALOGH; other participants: Dr. S. MAHUNKA, and Dr. A. ZICSI.

No. 369. Campinas (São Paolo), thinned *Eucalyptus* forest (burnt in previous year) in outskirts of city, 7 Jan., 1967. — BERLESE sample from thin litter and underlying soil in forest.

No. 371. Rio de Janeiro (Rio de Janeiro), Botanical Garden, 12 Jan., 1967. — BERLESE sample from litter of virgin forest.

Bolivia

No. 459. Alcoche (La Paz), 600 m, 16 Dec., 1966. — BERLESE samples from S slope of valley above small stream: 3. decaying roots and stolos mixed with litter, 2 m above water level.

No. 462. Puerto Linares (La Paz), 580 m, 17 Dec., 1966. — BERLESE samples from virgin forests on the plains: 2. lower horizon of litter in virgin forest.

No. 463. Puerto Linares (La Paz), 600 m, 17 Dec., 1966. — BERLESE samples from virgin forest on steep incline: 1. thick litter, 2. lower horizon at same site.

No. 464. Between Puerto Linares and Alcoche (La Paz), 600 m, 17 Dec., 1966. — BERLESE samples from moss in virgin forest: 1. moss with bark from lying trunk.

No. 465. Between Puerto Linares and Alcoche (La Paz), 800 m, 17 Dec., 1966. — BERLESE samples from vegetation on steep and rocky declivity: 1. thick moss mat, 5. very thick moss in shaded site; 6. decaying lower horizon of moss in same site.

No. 502. Caranavi (La Paz), 700 m, 20 Dec., 1966. — BERLESE samples from litter at steep cliff wall: 2. suspended litter and roots among shrubs on steep section of wall.

No. 503. Between Caranavi and Coroico (La Paz), 1000 m, 20 Dec., 1966. — BERLESE sample from decaying grass of grassy mountain slope.

No. 504. Coroico (La Paz), 1600 m, 20 Dec., 1966. — BERLESE samples from soil of *Citrus* and coffee plantations: 1. upper horizon of loose, wet litter; 2. lower horizon, with roots and soil, at same site.

No. 507. Coroico (La Paz), 1800 m, 20 Dec., 1966. — BERLESE samples from litter of steep incline: 1. very wet litter below shrubs; 2. lower, rooty horizon at same site.

No. 508. Coroico (La Paz), 1800 m, 20 Dec., 1966. — BERLESE sample taken from moss cushion along road.

No. 512. Unduavi (La Paz), 3200 m, 20 Dec., 1966. — BERLESE sample from *Sphagnum* thriving on steep cliff wall.

No. 515. Unduavi (La Paz), 3800 m, 20 Dec., 1966. — BERLESE samples from moss and lichens: 1. wet thick *Sphagnum*; 2. miscellaneous moss.

No. 519. Between Unduavi and the Pass (La Paz), 4200 m, 21 Dec., 1966. — BERLESE samples from bank of stream: 1. grass cube taken from low, compact lawn on bank.

No. 520. Between Unduavi and La Paz (La Paz), 4850 m, 21 Dec., 1966. — BERLESE sample from plant crust coating cliff.

No. 521. Valley of Rio Abaho (La Paz), 3200 m, 23 Dec., 1966. — BERLESE sample taken at base of sparse *Stipa* vegetation on steep slope.

No. 522. Valley of Rio Abaho (La Paz), 3200 m, 23 Dec., 1966. — BERLESE samples taken below *Mimosa* shrubs: 1. dry litter among bushes.

No. 527. Copacabana (La Paz), 3600 m, 28 Dec., 1966. — BERLESE sample taken on bank of stream: 1. wet litter with roots at base of shrub; 2. roots of *Stipa* clumps at same site.

No. 528. Copacabana (La Paz), 3600 m, 28 Dec., 1966. — BERLESE sample from a dry place: 1. wet litter of Solanaceous plant around ruin.

No. 529. Copacabana (La Paz), farther surroundings of settlement, 4100 m, 28 Dec., 1966. — BERLESE samples taken near spring: 1. felty, peaty grass-cushions with roots; 2. *Stipa* plant from wet site.

No. 532. Tiquina (La Paz), 3800 m, 28 Dec., 1966. — BERLESE samples from dry arroyo: 2. dry clump of grass; 3. humid clump of grass.

No. 533. Huatajata (La Paz), shore of Lake Titicaca, 3800 m, 28 Dec., 1966. — BERLESE samples from lakeside vegetation: 1. sedges; 2. wet sedgy detritus and drift of lake.

No. 535. Between Unduavi and the Pass (La Paz), about 4000 m, 29 Dec., 1966. — BERLESE samples from perpendicular cliffs along stream: 1. thick moss; 2. very wet litter from base of bushes.

The holotypes and the great majority of the paratypes are deposited, under the serial number cited in the diagnosis, in the Zoological Collection of the Hungarian Natural History Museum, Budapest; some paratypes are also deposited in Dr. G. RACK's (Hamburg) collection.

All materials have been jointly collected by the members of the expedition.

PYGMEPHORIDAE

Siteroptes siccatus sp. n.

Length: 245 μ, width: 100 μ.

D o r s a l s i d e (Fig. 1: A): Anterior margin of propodosoma rounded. Stigmata elongated, slit-shaped, situated in a V-shape with reference to one another. Sensillus most characteristic: lower portion calyciform, emitting semicircular upper section. Rim of calyx prolonged into a lateral apex. Setae scapulares externae longest of all hairs, setae verticales only slightly shorter

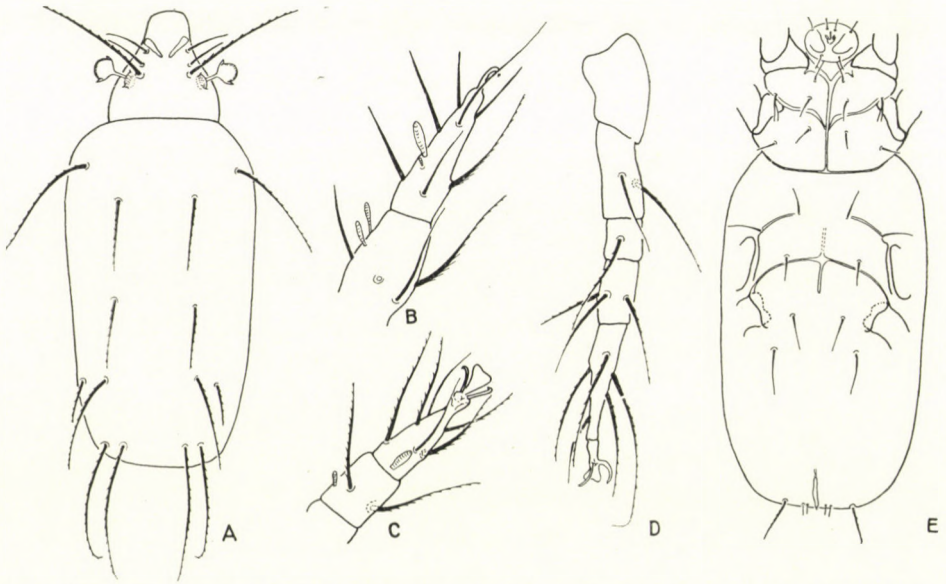

Fig. 1. *Siteroptes siccatus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

than setae scapulares internae. Setae humerales externae long and thin, internae short and thicker, setae dorsales even shorter than these. Setae lumbales internae and setae sacrales internae long and thin, their outer mates shorter.

V e n t r a l s i d e (Fig. 1: E): Coxal area 1 of anterior sternal plate with 3, coxal area 2 with 2, pairs of hairs. Setae coxales I externae bifurcating. Epimeres and epimerites of posterior sternal plate not wholly developed, setae axillares 2 absent. The two interior pairs of caudal hairs minute, outer pair long and considerably more robust.

L e g s: Solenidia of tarsus of leg I (Fig. 1: B) fusiform, ω_3 considerably larger than ω_4. Chaetotaxy and shape of other legs as in Fig. 1: C, D.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1068p-68): No. 512.

R e m a r k s: The relationships of the species will be discussed after the description of the involved taxa treated herein.

Siteroptes sinuosus sp. n.

Length: 225—380 μ, width: 162—215 μ.

D o r s a l s i d e (Fig. 2: A): Propodosoma small, stigmata very long, slit-shaped, situated in a V-shape with reference to one another. Propodosoma with merely 2 pairs of hairs. Setae scapulares externae very long. Sensillus (Fig. 2: B) calyciform, its anterior margin dentate. Setae humerales internae

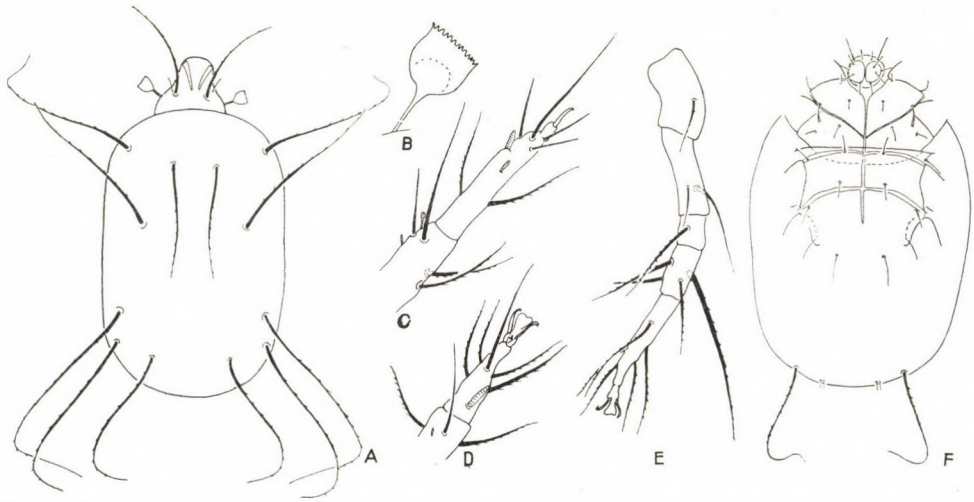

Fig. 2. *Siteroptes sinuosus* sp. n. A = dorsal side, B = sensillus, C = end of leg I, D = end of leg II, E = leg IV, F = ventral side

shorter than their outer mate; setae dorsales very long; setae lumbales internae also long but externae absent. Setae sacrales internae shorter than externae. Some hairs characteristically reclinate, bending almost rectangularly.

V e n t r a l s i d e (Fig. 2: F): Anterior sternal plate emitting 5 pairs of hairs grouped in 3 and 2; setae coxales I externae bifurcate. Epimeres 3 and epimerites 3 of posterior sternal plate well developed, constituting a closed network together with ventrum. Hairs short, setae poststernales internae completely reduced. Setae caudales externae 2 very long, apically recurving, similarly to setae sacrales externae; the other two pairs of hairs minute.

L e g s: Tarsus of leg I (Fig. 2: C) long and thin. Both tarsal and tibial solenidia minute. Shape and chaetotaxy of other legs as shown in Fig. 2: D, E.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1069p-68): No. 521; — 1 ex. (Paratype: T-1070p-68): No. 522-1.

R e m a r k s: Relationships will be discussed subsequent to the description of the species in question.

Siteroptes equisetosus sp. n.

Length: 215—220 μ, width: 100—108 μ.

D o r s a l s i d e (Fig. 3: A): Propodosoma wide, anteriorly rounded, triangular, emitting 3 pairs of setae. Stigmata removed from one another, forming a V with reference to their situation. All dorsal hairs of uniform length, without any essential difference in size; all attaining insertional point of next pair behind them.

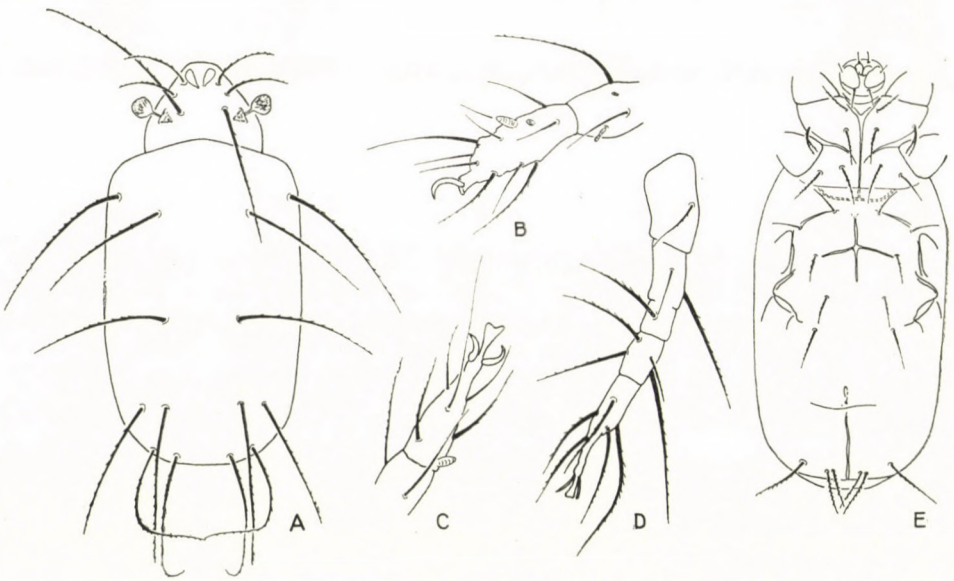

Fig. 3. *Siteroptes equisetosus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II D = leg IV, E = ventral side

V e n t r a l s i d e (Fig. 3: E): Coxal hairs of anterior sternal plate conspicuously long; setae coxales I externae bifurcate. Epimere 1 not reaching sternum. Epimeres 3 and ventrum only partially developed on posterior sternal plate; hairs also long, but setae axillares 2 completely reduced. Three pairs of caudal hairs present, also inner two pairs strikingly long yet shorter than outer pair.

L e g s: Tarsus of leg I (Fig. 3: B) fusiform. Solenidia small, arising near each other at basal section of joint. All other tarsal hairs also short. Configuration and chaetotaxy of legs II—IV as given in Fig. 3: C, D.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1071p-68): No. 527-2; — 1 ex. (Paratype: T-1072p-68): data as for holotype; — 1 ex. (Paratype: T-1073p-68): No. 528-1.

R e m a r k s: Relationships will be discussed subsequent to the description of the species involved.

Siteroptes priscus (KRCZAL, 1959)

Heretofore known only from Europe. It was found in the company of several other species, also inhabiting Europe.

Locality: 527-1 (2).

The species described above belong to the nominate subgenus *Siteroptes*. *S. equisetosus* sp. n. is unique by its caudal hairs. *S. sinuosus* sp. n. can be distinguished by its extremely long and characteristically bent setae caudales externae 2. *S. siccatus* sp. n., similarly to *S. sinuosus* sp. n., exhibits a most interesting sensillus construction, by reason of the lateral spine situated in the median line. This feature was yet as unknown in the species described hitherto.

Pediculaster mesembrinae (R. CANESTRINI, 1880)

Found in several localities, in almost every case together with some other species already known from Europe. In one case, there was also a "*calcaratus*"-type specimen in the material, again corroborating RACK's assumption. I have a similar specimen also from Europe, but this is not identical with the form *P. calcaratus* MAHUNKA, 1963.

Localities: 527-1 (1), 529-1 (3), 532-3 (3), 533-2 (2).

Bakerdania bulbitarsus sp. n.

Length: 205 μ, width: 122 μ.

Dorsal side (Fig. 4: A): Of the two pairs of hairs arising on propodosoma, setae scapulares externae robust (also longest of all dorsal hairs). Clavus

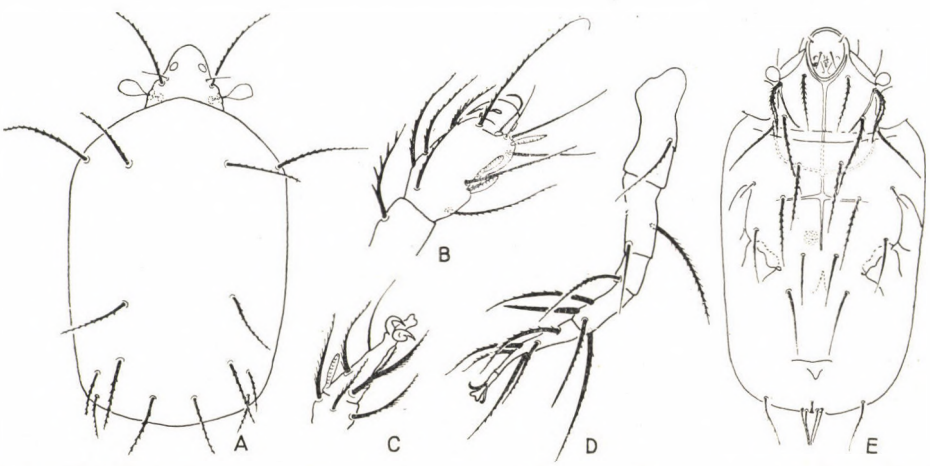

Fig. 4. *Bakerdania bulbitarsus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

of sensillus irregular in shape. Inner humeral hairs longer than outer ones. Setae dorsales, setae lumbales internae, and setae sacrales internae of nearly equal length, latter two pairs arising considerably nearer to one another than setae lumbales internae originating anteriorly to them. Outer mates of these hairs of equal length but much shorter than the inner ones.

Ventral side (Fig. 4: E): Setae coxales I externae of anterior sternal plate bifurcating or lanceolate. Epimeres 3 short, other ventral hairs not specially characteristic. Among caudal hairs, two inner pairs arising adjacent to one another, setae caudales externae 2 extremely far removed.

Legs: Tibiotarsus of leg I (Fig. 4: B) tuberculately incrassate. Solenidium ω_3 about as long as ω_1 and ω_2. Solenidium ω_4 coalescing with convex surface of tarsus. Configuration and chaetotaxy of other legs shown in Fig. 4: C, D.

Type-material: 1 ex. (Holotype: T-1074p-68): No. 503.

Remarks: The new species belongs to the alliance of *Bakerdania tarsalis* (HIRST, 1921). Until now, only the species *B. argentiniensis* (MAHUNKA, 1963) was known from South America, to which *B. tarsalis* and *B. chelata* sp. n., described herein, can now be added. The species described above differs from all hitherto known taxa by the setae sacrales internae standing nearer to one another than to their outer mates, by the tuberiform and incrassate tibiotarsus of leg I, and by the essentially longer solenidium ω_3 than ω_1 and ω_2.

Bakerdania baloghi sp. n.

Length: 167 μ, width: 75 μ.

Dorsal side (Fig. 5: A): Propodosoma small, emitting merely two pairs of hairs; also setae scapulares internae quite minute. Stalk of sensillus extraordinarily long, considerably decumbent toward ventral side. Dorsal hairs comparatively short, thin, and simple. Their relative proportions are shown in Fig. 5: A.

Ventral side (Fig. 5: D): Hairs of coxal areas very minute, setae coxales II externae being longest of all. Epimeres 3 weakly developed, short, also pre- and poststernal hairs short. Three pairs of caudal hairs present, setae caudales internae and externae 1 arising near one another, externae 2 farther removed and also longest of all three pairs.

Legs: Tibiotarsus of leg I with small claw (Fig. 5: B). All solenidia short and originating laterally on tibiotarsus. Tarsi of legs II and IV shaped similarly, claws of all legs large (Fig. 5: C).

Type-material: 1 ex. (Holotype: T-1075p-68): No. 515-1.

I dedicate the new species to the leader of the expedition, Prof. DR. J. BALOGH, in friendship and esteem.

R e m a r k s: A small species, in habit rather resembling *B. centriger* (COOREMANN, 1951), but differing from it sharply by the absence of the spiniform hairs on leg II. From its other congeners, the species can be distinguished by the laterally originating short solenidia of leg I, and the shape and position of the caudal hairs.

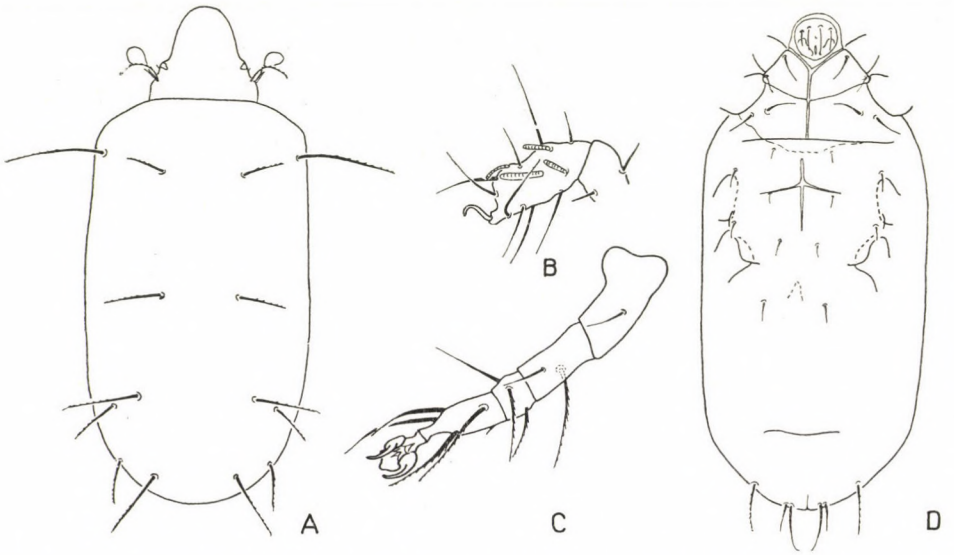

Fig. 5. *Bakerdania baloghi* sp. n. A = dorsal side, B = end of leg I, C = leg IV, D = ventral side

Bakerdania zicsii sp. n.

Length: 225—248 μ, width: 122—135 μ.

D o r s a l s i d e (Fig. 6: A): Anterior margin of propodosoma arcuate, propodosoma emitting two short hairs; also setae scapulares externae quite short. Sensillus egg-shaped. With respect to hysterosomatic hairs, setae humerales internae shorter than externae, setae dorsales not reaching insertional points of setae lumbales internae, these latter somewhat shorter than setae sacrales internae, setae lumbales externae also shorter than setae sacrales externae.

V e n t r a l s i d e (Fig. 6: E): Setae coxales II externae thinnest among hairs arising on coxal areas; also smooth, whereas all other hairs ciliate. Epimeres 3 long, reaching to base of legs. Setae presternales internae longer than externae, poststernal hairs robust, internae reaching deep between externae. These latter projecting beyond vulva. Three pairs of caudal hairs present, externae 1 standing nearer to longer internae than to similarly long externae 2.

L e g s: Tibiotarsus of leg I (Fig. 6: B) with a stalked claw, solenidium ω_3 short and arcuate but essentially more incrassate than ω_4, straight and arising anteriorly to it. Femur of leg IV (Fig. 6: D) considerably longer than trochanter; hair *l* long, projecting beyond tarsal apex.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1076p-68): No. 519-1; — 16 ex. (Paratypes: T-1077p-68): data as for holotype.

I dedicate the new species to my friend and companion during the expedition, Dr. A. ZICSI.

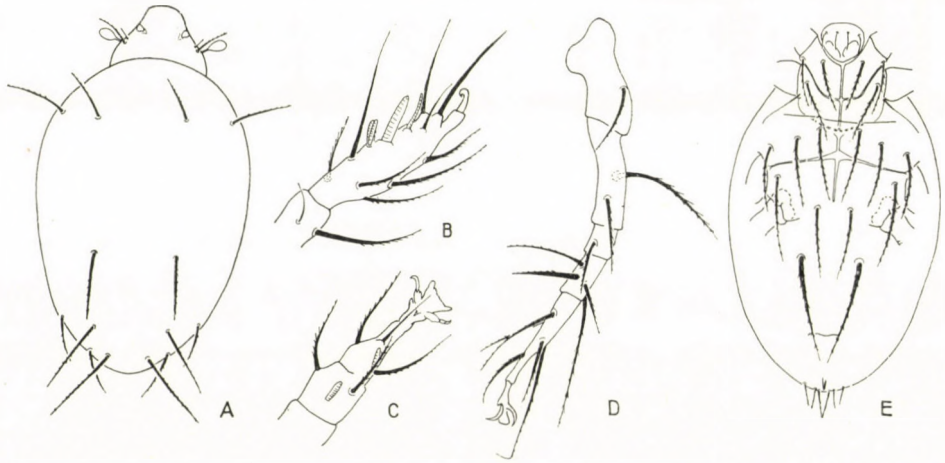

Fig. 6. *Bakerdania zicsii* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

R e m a r k s: The new species belongs to the "*blumentritti*"-group. The very short propodosomatic hairs, the proportions of the other dorsal hairs to each other, and the chaetotaxy of the tibiotarsus of leg I and of leg IV characterize it well and distinguish it, as a combination of characters, from all known similar species.

Bakerdania arvorum nodulosa ssp. n.

Length: 192—220 μ, width: 100—111 μ.

D o r s a l s i d e (Fig. 7: A): Propodosoma wide, bearing two pairs of short hairs. Sensillus arising laterally on propodosoma, decumbent. Dorsal hairs short, their size and arrangement as in the nominate subspecies.

V e n t r a l s i d e (Fig. 7: E): Epimeres and epimerites of anterior and posterior sternal plates strongly incrassate, epimeres 3 with nodes of incrassation. Hairs arising on coxal areas robust, especially setae coxales I internae originating from chitinous tubercles. Setae coxales II externae short and thick. Setae poststernales internae emitted from stout epimeres 4. Setae poststernales externae reaching to vulva. Two pairs of caudal hairs present.

L e g s: Tibiotarsus of leg I (Fig. 7: B) with a thin claw; solenidia long,

thin, arcuate. Solenidium on tarsus of leg II also long; hairs extraordinarily incrassate (Fig. 7: C). Femur of leg IV longer than trochanter (Fig. 7: D).

Type-material: 1 ex. (Holotype: T-1078p-68): No. 520; — 12 ex. (Paratypes: T-1079p-68): data as for holotype.

Remarks: The dorsal chaetotaxy as well as the shape and chaetotaxy of leg I are very similar to those of the nominate subspecies. However, the considerably thickened epimeres and epimerites of the ventral side and

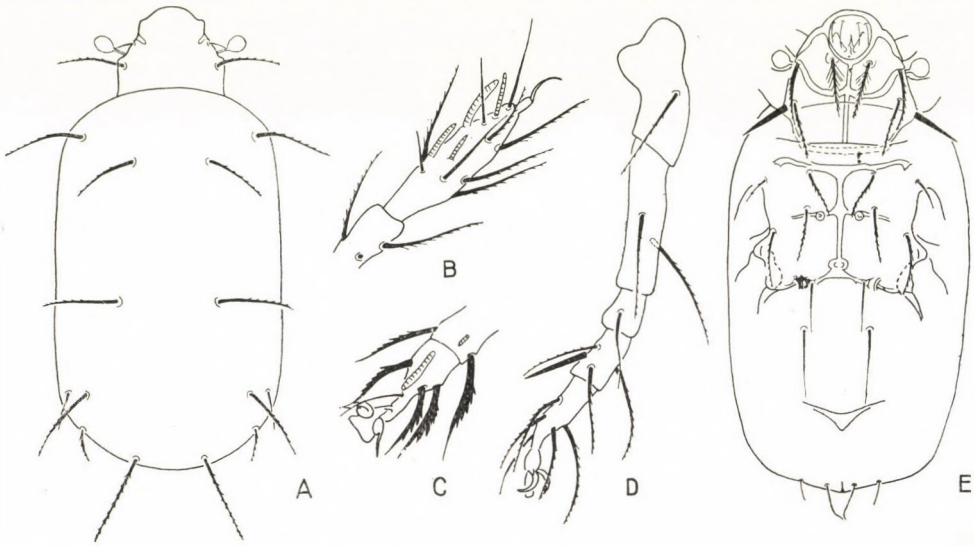

Fig. 7. *Bakerdania arvorum nodulosa* ssp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

the configuration of leg IV are different and thus the specimens may be regarded to represent a taxon of distinct subspecific rank. The nominate subspecies lives also in South America (Argentina); it agrees completely with the European form.

Bakerdania clavata sp. n.

Length: 215—279 μ, width: 78—116 μ.

Dorsal side (Fig. 8: A): Basal portion of propodosoma small, but prestigmatal section long, narrow, margins parallel. Sensillus long, with aciculi, its stalk gradually widening into a clavus. Two pairs of propodosomatic hairs present, setae scapulares externae comparatively long. Setae humerales of hysterosoma arising along a common transversal line, exterior ones longer than interior ones. Setae dorsales not reaching insertional points of setae lumbales; setae lumbales internae longer than setae sacrales internae, but proportion of length reversed in regard of their outer mates.

Ventral side (Fig. 8: E): Epimeres and epimerites thin, epimeres 1 reaching sternum only indistinctly. Hairs of coxal areas robust, setae coxales

I externae slightly incrassate. Posterior sternal plate with well developed epimeres 3 and epimerites 3, reaching base of legs III. Hairs short, one of the poststernal pairs of hairs completely reduced. Three caudal pairs of hairs present, setae caudales internae and externae 1 arising adjacent to one another, setae caudales externae 2 rather removed from them.

L e g s: Tibiotarsus of leg I long (Fig. 8: B), terminally with a stalked

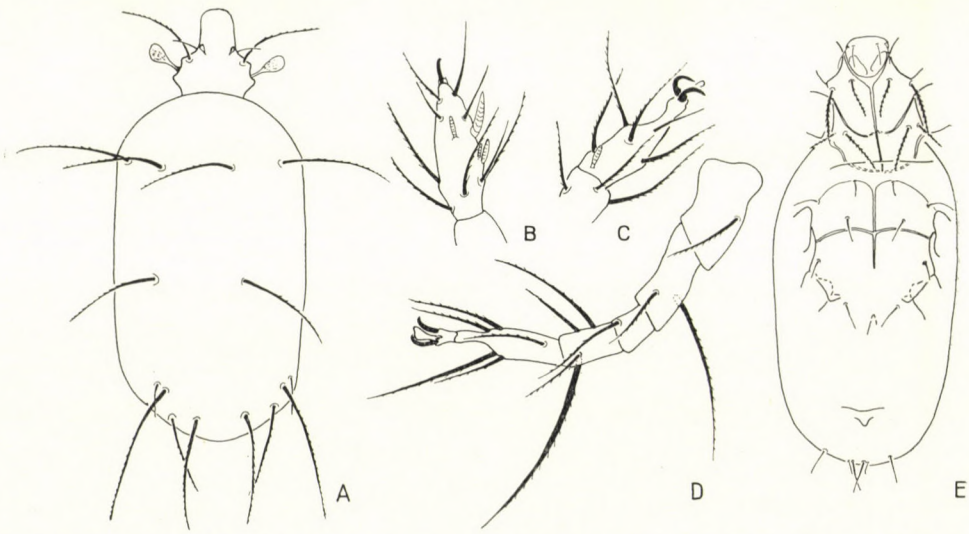

Fig. 8. *Bakerdania clavata* sp. n. A = dorsal side, B = end of leg I, C = end of leg II D = leg IV, E = ventral side

claw. Solenidia arising laterally, short. Tarsi of also other legs short (Fig. 8: C), hairs *l* and *p* of leg IV long (Fig. 8: D).

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1080p-68): No. 520; — 1 ex. (Paratype: T-1081p-68): data as for holotype.

R e m a r k s: As to habit, the new species resembles *B. centriger* (COOREMANN, 1951). However, the absence of the incrassate tarsal hairs distinguishes it from this latter species, while the absence of the interior poststernal hair separates it from all other known congeners.

Bakerdania crenata sp. n.

Length: 163 μ, width: 90 μ.

D o r s a l s i d e (Fig. 9: A): Propodosomatic hairs short. Stalk of sensillus widening gradually, clavus arching downwards. Setae humerales internae of hysterosomatic hairs shorter than and originating posteriorly to externae. Setae dorsales somewhat longer but not reaching insertional points of setae lumbales. Setae lumbales externae as long as setae sacrales externae, but setae lumbales internae slightly shorter than setae sacrales externae.

V e n t r a l s i d e (Fig. 9: D): Epimeres 1 of anterior sternal plate very well developed and strongly and sinuously incrassate. Setae coxales I internae and externae robust, the other two pairs considerably shorter. Epimeres 3 of posterior sternal plate thin and short; also hairs very short. Inner pair of caudal hairs longer than setae caudales externae 1, whereas setae caudales externae 2 removed from them and most robust of all.

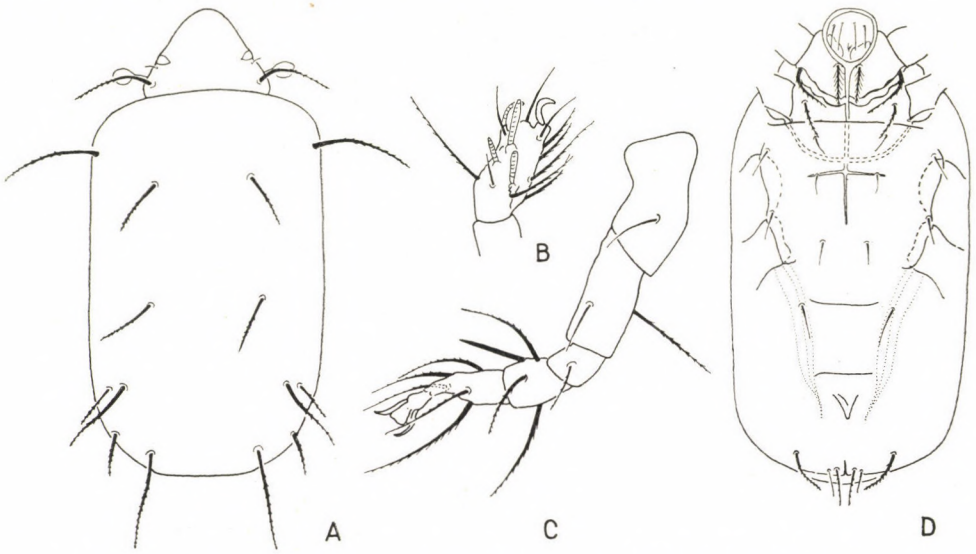

Fig. 9. *Bakerdania crenata* sp. n. A = dorsal side, B = end of leg I, C = leg IV, D = ventral side

L e g s: Tibiotarsus of leg I (Fig. 9: B) with a small claw; solenidium ω_4 thicker and slightly more robust than solenidium ω_3, yet without any difference in length between them. Tarsus of leg II with a long and strongly arcuate claw. Configuration of leg IV shown in Fig. 9: C.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1082p-68): No. 533-1.

R e m a r k s: The most important feature of the new species is the peculiarly incrassate epimere 1. Its nearest ally seems to be *B. baloghi* sp. n., described above, differing from it, however, also by the hairs of the coxal areas.

Bakerdania chelata sp. n.

Length: 207 μ, width: 100 μ.

D o r s a l s i d e (Fig. 10: A): Propodosoma emitting two pairs of hairs. Sensillus gradually widening into a clavus. Setae lumbales internae of hysterosomatic hairs arising at a considerable distance anteriorly to externae; these latter one-third shorter than setae sacrales externae.

Ventral side (Fig. 10: E): Surface of anterior sternal plate reticulated laterally; of its hairs setae coxales I externae bifurcating, setae coxales II internae shorter than externae. Setae presternales internae removed further from one another than externae. Three pairs of caudal hairs present, externae 2 slightly longer than the other two pairs; distance between internae and

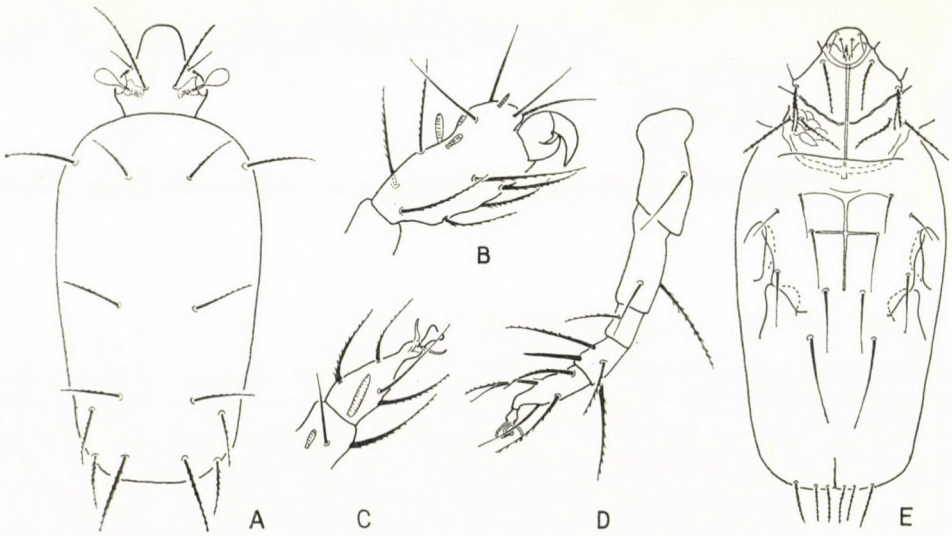

Fig. 10. *Bakerdania chelata* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

externae 1 at most half as great as that between externae 1 and externae 2.

Legs: Tibiotarsus of leg I (Fig. 10: B) with a very large, cheliform or pincer-shaped claw. Solenidium ω_4 adnate to convex surface of tibiotarsus, solenidium ω_3 minute, smaller than solenidia ω_1 and ω_2. On leg II, solenidium originating from base of tarsus (Fig. 10: C). Shape of leg IV shown in Fig. 10: D.

Type-material: 1 ex. (Holotype: T-1083p-68): No. 369.

Remarks: Together with *B. bulbitarsus* sp. n., described herein, the new species belongs to the "*tarsalis*"-group; its dorsal and ventral chaetotaxy is rather similar to that of the main species of the group. Nevertheless, the very large tibiotarsal claw of leg I and the solenidia, as well as the interesting reticulation of the anterior sternal plate, distinguish the new species from both that and all other similar species.

Bakerdania centriger (Cooremann, 1951)

Until now unknown from South America. Our specimens are readily identifiable with the European examples.

Localities: 519-1 (3), 527-1 (2), 533-2 (2).

Bakerdania tarsalis (HIRST, 1921)

The taxon occurred in the materials deriving from the Altiplano.

Localities: 519-1 (2), 521 (5), 527-1 (3).

Bakerdania togata (WILLMANN, 1942)

Hitherto unknown from localities outside of Europe.

Locality: 527-2 (2).

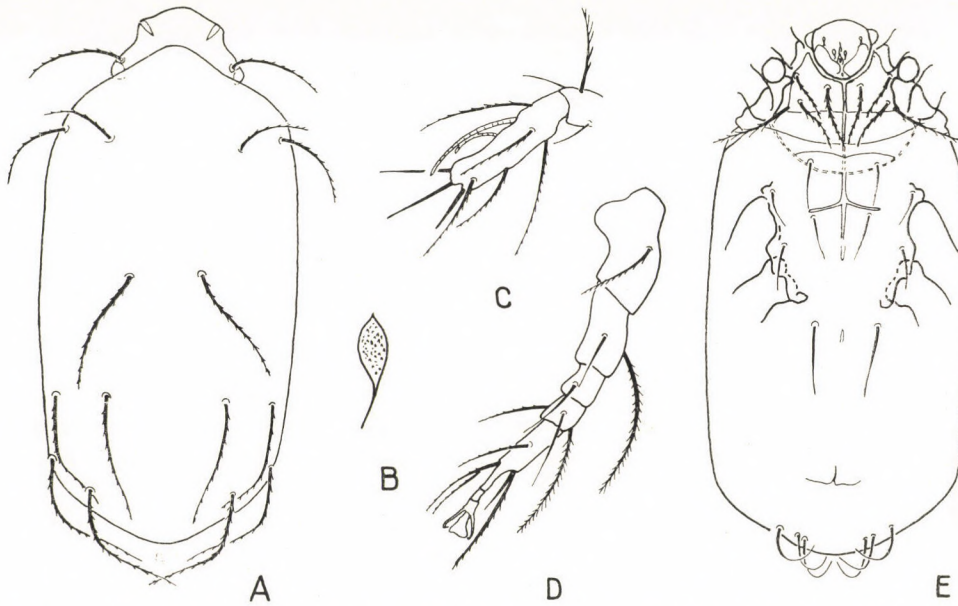

Fig. 11. *Microdispus irmayi* sp. n. A = dorsal side, B = sensillus, C = end of leg I, D = leg IV, E = ventral side

Bakerdania exigua MAHUNKA, 1969

The species was recently described from localities in Hungary. It was now found to occur together with *B. centriger* (COOREMANN, 1951) and *Pediculaster mesembrinae* (R. CANESTRINI, 1880). There is no difference between the European and South American specimens.

Localities: 520 (4), 533-2 (5).

Microdispus irmayi sp. n.

Length: 120—135 μ, width: 67—70 μ.

Dorsal side (Fig. 11: A): Propodosoma small, partially covered by hysterosoma, and emitting one pair of hairs and a large sensillus decumbent

ventrad (Fig. 11: B). Anterior margin of hysterosoma convex, bearing long, thin, weakly but discernibly ciliate hairs.

V e n t r a l s i d e (Fig. 11: E): Anterior sternal plate with robust, long, ciliate hairs. Those of posterior sternal plate considerably thinner, setae poststernales internae completely reduced. Three pairs of long, thin, arcuate, and approximately equally long caudal hairs present; externae 2 rather removed from their mates.

L e g s: Solenidia ω_3 and ω_4 on tibiotarsus of leg I (Fig. 11: C) reaching to or projecting beyond apex of tarsus. Tarsal solenidium of leg II extraordinarily elongated. Trochanter of leg IV (Fig. 11: D) conspicuously wide.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1084p-68): No. 462-2; — 2 ex. (Paratypes: T-1085p-68): data as for holotype.

I dedicate the new species to the late H. DE IRMAY, accompanying our expedition during its voyages in Bolivia.

R e m a r k s: Among the species known heretofore it was only *M. silvestris* JACOT, 1936, and *M. chandleri* CROSS, 1965 (transferred by CROSS to another subgenus), which have no setae poststernales internae.

Microdispus cultellatus sp. n.

Length: 137 μ, width: 100 μ.

D o r s a l s i d e (Fig. 12: A): Clypeus entirely covering propodosoma, its hairs thin, outer pair of hairs longer and more robust than inner one. Setae dorsales and setae lumbales strong, straight, considerably longer than all other hairs. Sacral hairs, especially inner pair, fusiformly incrassate. All ciliate.

V e n t r a l s i d e (Fig. 12: F): Hairs of anterior sternal plate thin, setae coxales I externae shortest, setae coxales II externae longest, all ciliate. Setae poststernales internae arising far anterior to externae, but distance between individual hairs equal. Setae poststernales externae rather robust, projecting beyond vulva but not reaching posterior margin of body. Two pairs of very robust caudal hairs present.

L e g s: On tibiotarsus of leg I (Fig. 12: C), two solenidia projecting far beyond tarsal apex; especially solenidium ω_4 much elongated. On leg IV, hair *p* of tarsus much incrassate, projecting far beyond tarsal apex, also its thickness agreeing with that of tarsus.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1086p-68): No. 463-1.

R e m a r k s: The new species belongs to the "*obovatus*"-group, but the strongly incrassate hair *p* of leg IV distinguishes it from all known congeners.

Microdispus cochleatus sp. n.

Length: 132 μ, width: 108 μ.

D o r s a l s i d e (Fig. 13: A): Clypeus almost entirely covering propodosoma in a superior view, bearing a single, quite short and hardly discernible pair of hairs. Stalk of sensillus extraordinarily long, clavus directed between legs toward ventral side. Setae humerales, setae dorsales, and setae lumbales

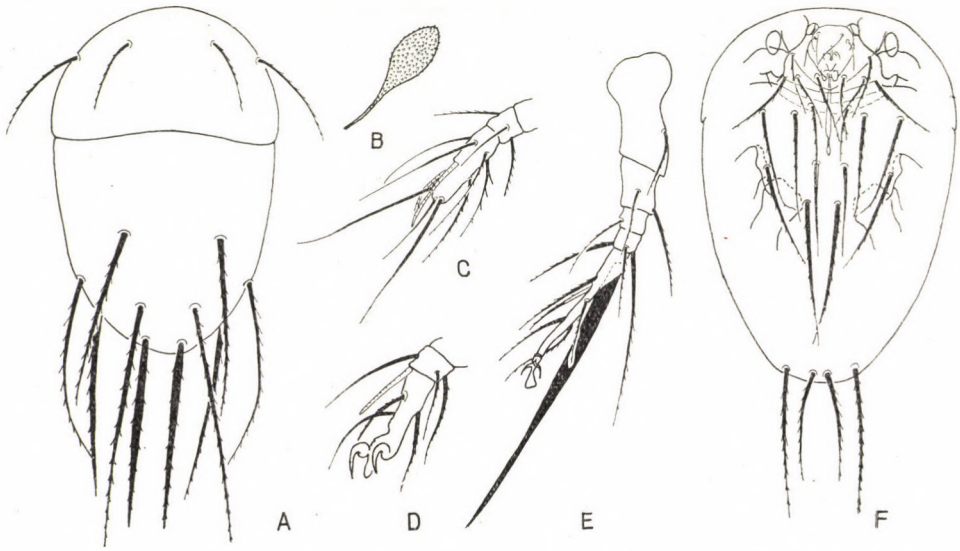

Fig. 12. *Microdispus cultellatus* sp. n. A = dorsal side, B = sensillus, C = end of leg I, D = end of leg II, E = leg IV, F = ventral side

externae long, not incrassate, though very strongly ciliate. Setae lumbales internae shaped similarly to, but slightly thicker than, preceding ones; their cilia very long, longer than diameter of hair. Seta sacrales internae peculiarly modified, cochleariform, their surface reticulated. Setae sacrales externae very long and thin, apically flagellately convoluted.

V e n t r a l s i d e (Fig. 13: E): Setae coxales internae and externae of anterior sternal plate thin and short. Setae coxales II internae longer than these, setae coxales II externae strongly incrassate and ciliate. Setae presternales arising farther removed from one another than extremely long externae. Poststernal hairs modified: internae widely spatulate, their surface reticulate with a strong midrib, originating hardly anteriorly to heavily incrassate but cylindriform externae. Three pairs of caudal hairs present; internae long and thin, externae 1 short and straight, externae 2 strongly incrassate with dentiform, long, lateral cilia.

L e g s: Tibiotarsus of leg I (Fig. 13: B) without claw, even longest solenidium failing to extend beyond apex of tarsus. Hair *n* of genu strongly incrassate and ciliate on both legs I and II. Hair *c* of femur of leg IV (Fig. 13: D) similar to these.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1087p-68): No. 367-2.

R e m a r k s: The unique modification of the hairs of the new species was as yet unknown in the family.

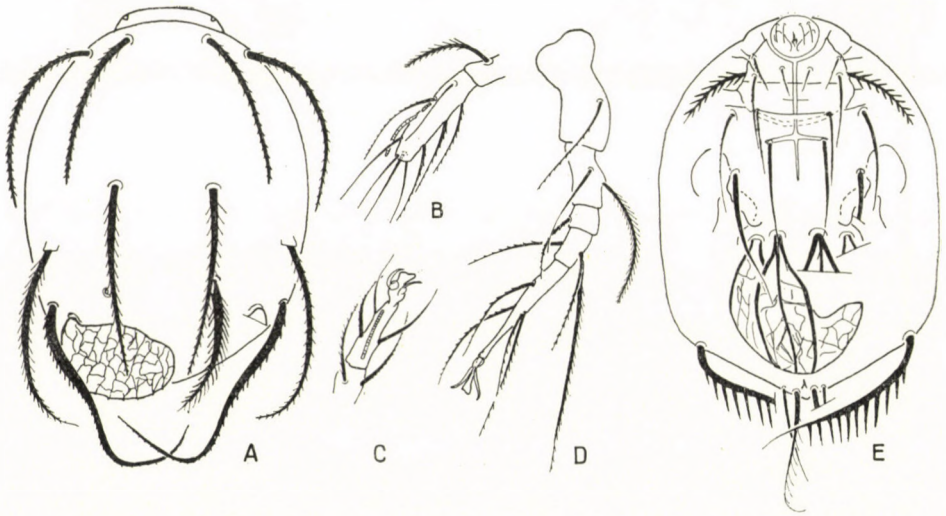

Fig. 13. *Microdispus cochleatus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

Microdispus adjacens sp. n.

Length: 155 μ, width: 76 μ.

D o r s a l s i d e (Fig. 14: A): Propodosoma with one pair of short hairs. Stalk of sensillus very long. Dorsal hairs thin; except for setae lumbales externae and setae sacrales externae, their length gradually increasing posteriorad; the former two pairs shorter and of equal length.

V e n t r a l s i d e (Fig. 14: D): On anterior sternal plate, setae coxales I internae and externae very short, hairs of coxal area 2 longer. Setae presternales internae arising strikingly near one another, their distance half of that between externae. These and setae axillares very short, setae poststernales internae completely reduced. Three pairs of caudal hairs present, internae and externae 1 originating nearer to each one than externae 1 and 2; these latter longest of all.

L e g s: Hairs of leg I (Fig. 14: B) comparatively short, also solenidia ω_3 and ω_4 short, solenidium ω_1 longer than they. Also solenidia of legs II and III very short. Configuration of leg IV shown in Fig. 14: C.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1088p-68): No. 369.

R e m a r k s: The new species belongs to the alliance of *Microdispus silvestris* JACOT, 1936, but its extraordinarily adjacent setae presternales internae separate it from all similarly constructed congeners. The arrangement of the caudal hairs is also characteristical and unique in the group.

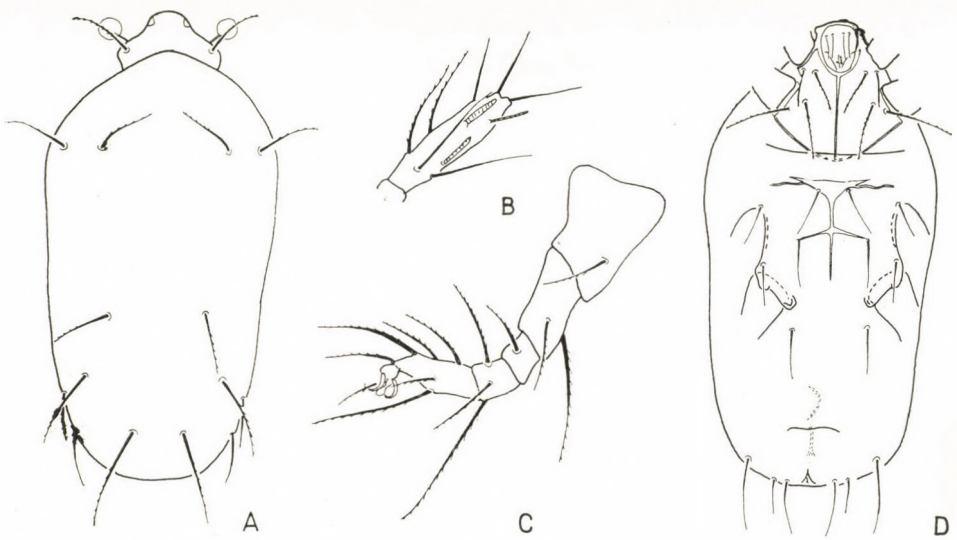

Fig. 14. *Microdispus adjacens* sp. n. A = dorsal side, B = end of leg I, C = leg IV, D = ventral side

Microdispus salicinus sp. n.

Length: 102 μ, width: 67 μ.

D o r s a l s i d e (Fig. 15: A): Propodosoma emitting a single pair of very thin and short hairs. Hysterosomatic hairs unusually modified: setae humerales, setae dorsales, and setae lumbales externae widely phylliform. Setae lumbales internae thin and short. Setae sacrales essentially shorter than phylliform hairs, yet also widened and apically obtuse.

V e n t r a l s i d e (Fig. 15: E): All hairs very minute. Epimeres 3 short, weakly developed. Two pairs of caudal hairs present, with also a small, lamelliform appendage between internae. Hairs short.

L e g s: Tibiotarsus of leg I (Fig. 15: B) without claw, apex of tibiotarsus emitting 3 short hairs of equal length. Solenidia failing to extend beyond apex

of joint, emitting some heavily ciliate hairs. Hair *n* on tarsus of leg IV (Fig. 15: D) very long.

Type-material: 1 ex. (Holotype: T-1089p-68): No. 371.

Remarks: Owing to its peculiarly shaped dorsal hairs, the new species stands unique among its congeners.

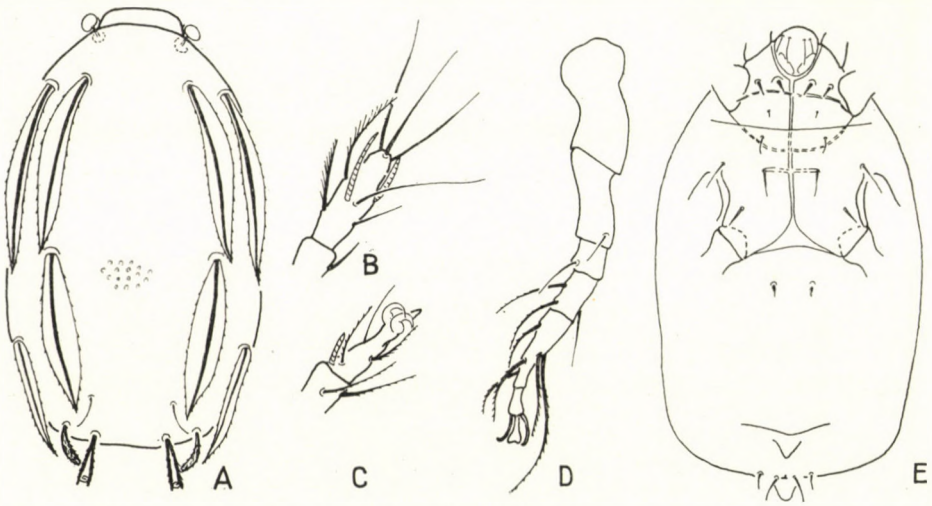

Fig. 15. *Microdispus salicinus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

Rostrodispus subgen. n.

Shape of body and chaetotaxy similar to those of *Microdispus*, but gnathosoma much elongated, thrice as long as wide, also palpi strongly elongated. Gnathosoma nearly reaching epimeres 1.

Type-species: *Microdispus* (*Rostrodispus*) *proboscidatus* sp. n.

Remarks: No similarly elongated gnathosoma was as yet known among the species of the genus *Microdispus*. Since the circumgnathosomatic foramen failed to follow the transformation of the gnathosoma, and as I was unable to observe any other essential difference, I establish a taxon of merely subgeneric rank for this form.

Microdispus (Rostrodispus) proboscidatus sp. n.

Length: 135—152 μ, width: 95—110 μ.

Dorsal side (Fig. 16: A): Clypeus entirely covering propodosoma. Setae humerales of different lengths, exterior pair about thrice longer than

interior one, this latter also considerably thinner. All other dorsal hairs of largely identical construction, thin and long, without any significant difference in size, all ciliate.

V e n t r a l s i d e (Fig. 16: E): Gnathosoma modified as outlined in the description of the subgenus. Coxal and presternal hairs long, all projecting beyond insertional points of those originating posteriorly to them. Also setae poststernales similar to preceding ones, and also externae reaching merely to vulva. Three pairs of caudal hairs present, externae 2 longest of all.

L e g s: Solenidium ω_3 longest of all tibiotarsal hairs on leg I (Fig. 16: B), almost attaining half length of tibiotarsus. Legs II and III with strong claws

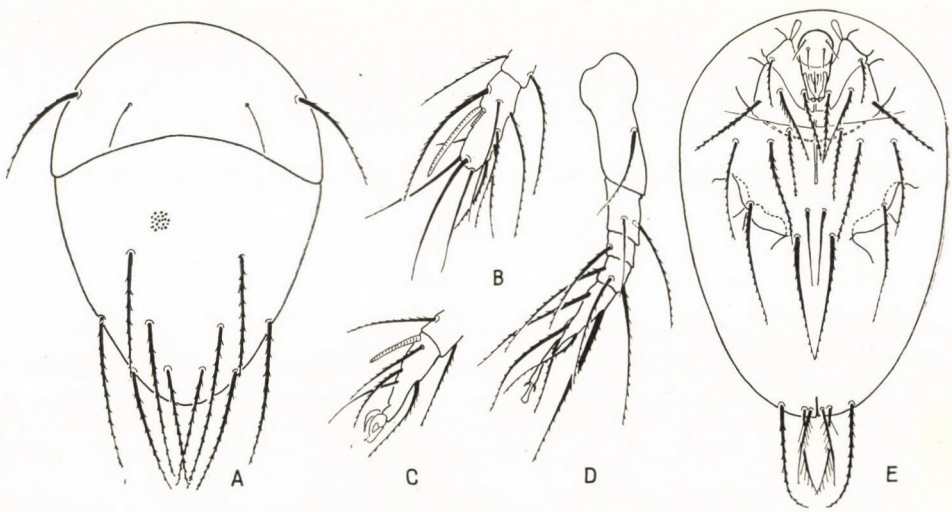

Fig. 16. *Microdispus* (*R.*) *proboscidatus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

(Fig. 16: C). Tarsus of leg IV (Fig. 16: D) with a minute claw but long ambulacrum.

T y p e - m a t e r i a l : 1 ex. (Holotype: T-1090p-68): No. 515-1; — 2 ex. (Paratypes: T-1091p-68): data as for holotype.

R e m a r k s: Aside of the differences already mentioned in the description of the subgenus, the different size of the setae humerales is also a significant differentiating feature.

Microdispus australis MAHUNKA, 1969

It seems that this recently described species is very frequent and widely ranging in the tropical regions of South America.

L o c a l i t i e s : 507-1 (1), 515-1 (3), 367-1 (4), 367-2 (2), 371 (5).

Microdispus silvestris JACOT, 1936

Its occurrence in South America was as yet unknown. The specimens differ from the European exemplars merely in having slightly shorter setae dorsales.

Locality: 527-2 (2).

Diversipes indivertus sp. n.

Length: 165—170 μ, width: 135—145 μ.

Dorsal side (Fig. 17: A): Clypeus small, its margin very narrow,

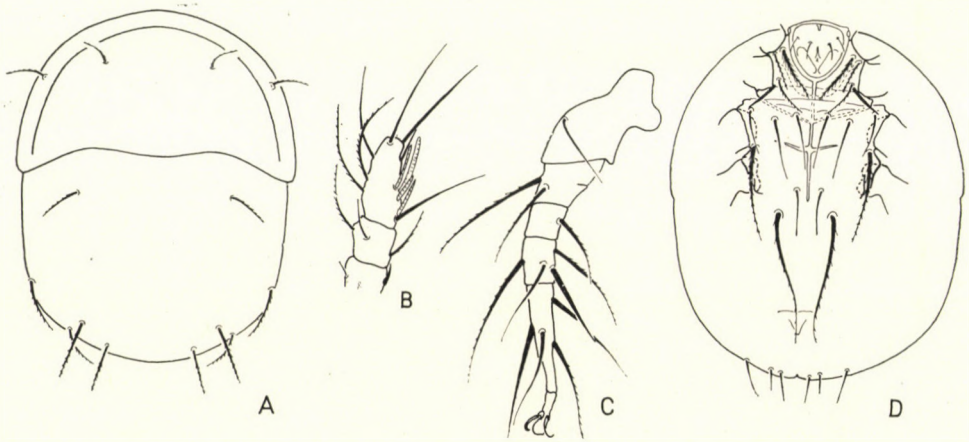

Fig. 17. *Diversipes indivertus* sp. n. A = dorsal side, B = end of leg I, C = leg IV, D = ventral side

hardly discernible. Setae humerales thin and arcuate. Setae dorsales more robust, setae lumbales internae and setae sacralest internae longer.

Ventral side (Fig. 17: D): Setae coxales II externae of anterior sternal plate short and slightly incrassate. Setae presternales, setae axillares 1, and setae poststernales internae thin and short. Setae axillares 2 and setae poststernales externae similar to these latter, but basally slightly incrassate. Latter ones projecting beyond vulva but not reaching posterior margin of body. Externae 2 longest and externae 1 shortest among caudal hairs.

Legs: Tibiotarsus of leg I (Fig. 17: B) without claw. Solenidium ω_1 longest of all, extending even beyond apex of tibiotarsus. Solenidium on tibiotarsus of leg II very long. Inner side of trochanter of leg IV (Fig. 17: C) with a short and obtuse spur.

Type-material: 1 ex. (Holotype: T-1092p-68): No. 512; — 1 ex. (Paratype: T-1093p-68): data as for holotype.

Remarks: No *Diversipes*-species was hitherto known from South America. The short, unthickened dorsal hairs and the central chaetotaxy distinguish the new species from its congeners known from other continents.

Imparipes (Archidispus) abolitus sp. n.

Length: 284 μ, width: 191 μ.

D o r s a l s i d e (Fig. 18: A): Clypeus small, its margin narrow, hairs short. Setae dorsales somewhat longer than setae lumbales internae; these latter shorter than their external mates. Inner setae sacrales longer than outer ones.

V e n t r a l s i d e (Fig. 18: E): Hairs of anterior sternal plate thin, all weakly ciliate. Pre- and poststernal hairs short, latter ones basally very weakly but well discernibly incrassate. Externae 1 of caudal hairs minute, externae 2 slightly longer than internae.

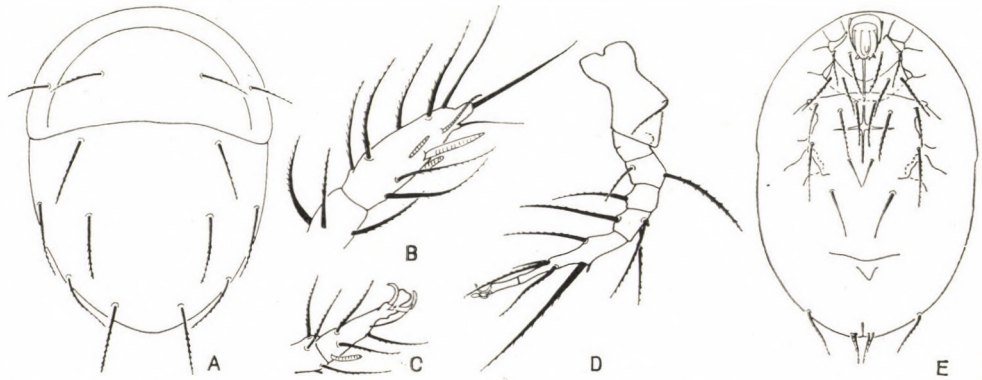

Fig. 18. *Imparipes* (*A.*) *abolitus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

L e g s: Leg I (Fig. 18: B) without claw, solenidia long and thin, solenidium ω_3, though thinner, yet as long as solenidium ω_1. Joints of leg IV (Fig. 18: D) elongate, hair *t* of tarsus short.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1094p-68): No. 533-2.

R e m a r k s: Two species belonging to this subgenus have hitherto been known from South America, both of there possess a claw on leg I and at least one pair of heavily incrassate hairs.

Imparipes (Imparipes) sabulatus sp. n.

Length: 240—280 μ, width: 185—227 μ.

D o r s a l s i d e (Fig. 19: A): Clypeus large, its margin wide. Setae humerales thin and of equal length. Setae dorsales, setae lumbales internae and setae sacrales internae more robust than the preceding ones, and decreasing in length in the above order of sequence. Setae lumbales externae shorter than setae sacrales externae. All weakly ciliate.

V e n t r a l s i d e (Fig. 19: G): Setae coxales I internae and setae coxales II internae of equal length on anterior sternal plate. Setae coxales II externae heavily incrassate. Epimeres 3 of posterior sternal plate robust and long. Base of setae presternales guttiform, strongly incrassate; externae long, not incrassate, extending to insertional points of setae poststernales internae. Setae poststernales externae considerably longer than internae yet failing to reach posterior margin of body. Three pairs of caudal hairs present, externae 1 minute, externae 2 much longer than internae.

L e g s: Tibiotarsus of leg I (Fig. 19: C) with a small claw, solenidia and chaetotaxy of leg agreeing with those of *I. covarrubiasi* MAHUNKA, 1968. Also

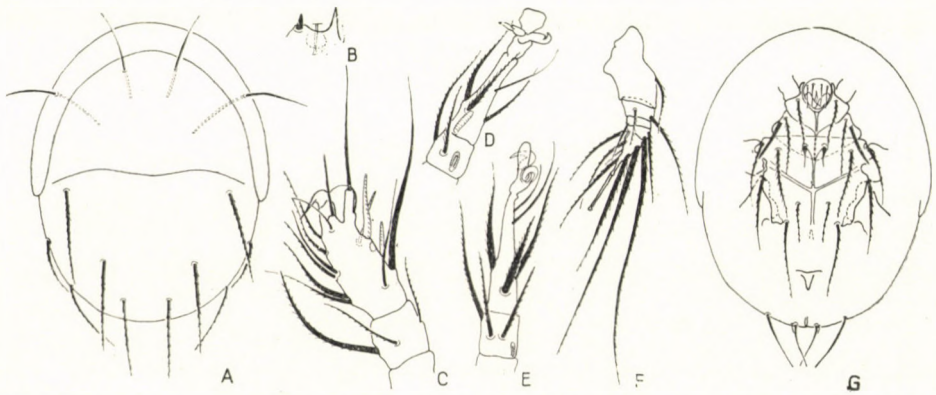

Fig. 19. *Imparipes* (*I.*) *subulatus* sp. n. A = dorsal side, B = bothrydium, C = end of leg I, D = end of leg II, E = end of leg III, F = leg IV, G = ventral side

leg IV (Fig. 19: F) similar to that of this latter species, but hair *l* considerably longer than hair *p*.

T y p e - m a t e r i a l : 1 ex. (Holotype: T-1095p-68): No. 459-3; — 1 ex. (Paratype: T-1096p-68): data as for holotype.

R e m a r k s : The new species stands extremely near to *Imparipes covarrubiasi* MAHUNKA, 1968, but the guttiform incrassation of the bases of the setae presternales internae amply distinguish it. The chaetotaxy of leg IV is also slightly different.

Imparipes (Imparipes) informis sp. n.

Length: 212—227 μ, width: 227—233 μ.

D o r s a l s i d e (Fig. 20: A): Body wide, clypeus large. Setae humerales long and thin, inner pair arising anteriorly to outer one. Setae dorsales longest dorsal hair of all, projecting beyond posterior margin of body. Setae lumbales internae slightly, setae sacrales internae considerably, shorter. Setae sacrales externae and setae lumbales externae much shorter even than these latter ones. All hairs ciliate.

V e n t r a l s i d e (Fig. 20: G): Except for setae coxales II externae and setae caudales externae 1, all hairs very long. Coxal hairs reaching far between presternal setae, and also these latter ones extending to insertional points of setae poststernales. Three pairs of caudal hairs present, internae being longest of all.

L e g s: Tibiotarsus of leg I (Fig. 20: C) with a small claw. Solenidium ω_1 considerably longer and thicker than all other solenidia; solenidia ω_3, ω_2, and ω_4 rather small. Tarsus of leg IV (Fig. 20: F) comparatively long, similarly to hair *c* of femur.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1097p-68): No. 463-2; — 1 ex. (Paratype: T-1098p-68): data as for holotype.

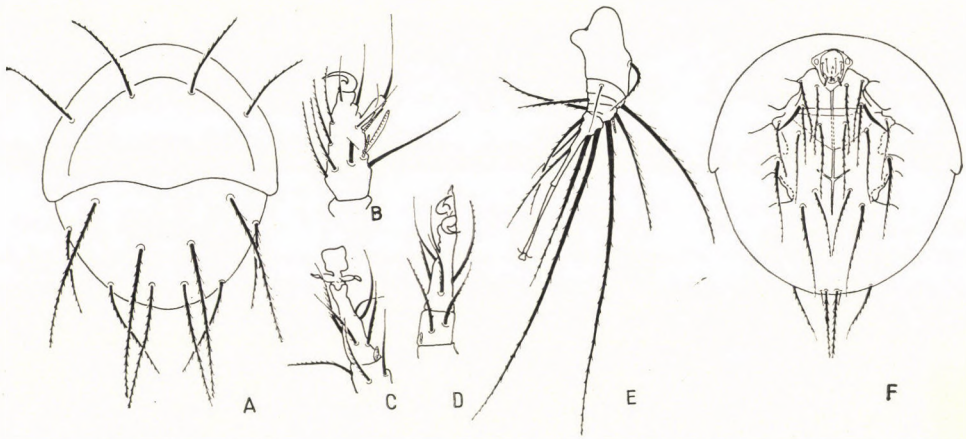

Fig. 20. *Imparipes* (*I.*) *informis* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = end of leg III, E = leg IV, F = ventral side

R e m a r k s: The extraordinarily broad body, the strikingly long hairs of both the dorsal and ventral sides, and the ratio in length of the setae caudales internae to the other two pairs of caudal hairs, well distinguish, as a combination of characters, the new species from all hitherto described congeners.

Imparipes (Imparipes) inunguis sp. n.

Length: 260—269 μ, width: 205—216 μ.

D o r s a l s i d e (Fig. 21: A): Margin of clypeus narrow. Inner pair of setae humerales longer than and arising slightly anteriorly to outer pair. Setae dorsales short, not reaching insertional points of setae lumbales internae. Setae lumbales externae and setae sacrales externae quite short and thin. Two sharp, spiniform hairs adjacent to sensillus on propodosoma.

V e n t r a l s i d e (Fig. 21: F): Hairs of anterior sternal plate thin, comparatively short, especially setae coxales II externae. Setae presternales

internae arising far from one another, and unusually near to externae. Setae poststernales short, externae not reaching even to vulva. Three pairs of short caudal hairs present, internae longest of all.

L e g s: Tibiotarsus of leg I (Fig. 21: B) with a small claw. Solenidium ω_3 slightly longer than considerably thicker solenidium ω_1. Tarsi of legs II and III (Fig. 21: C, D) with strikingly short hairs. Claw of tarsus on leg IV (Fig. 21: E) completely reduced, only a well developed and wide ambulacrum present. Except for hairs *l* and *p*, all hairs short.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1099p-68): No. 465-1; — 3 ex. (Paratypes: T-1100p-68): data as for holotype.

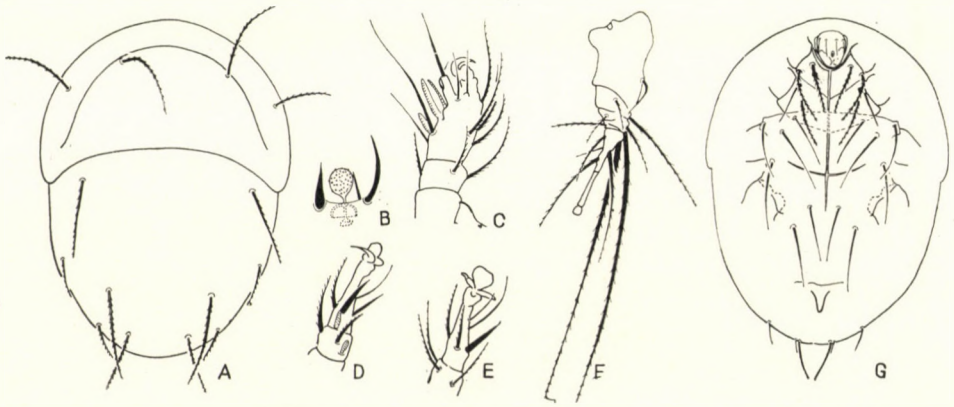

Fig. 21. *Imparipes* (*I.*) *inunguis* sp. n. A = dorsal side, B = sensillus with bothrydium, C = end of leg I, D = end of leg II, E = end of leg III, F = leg IV, G = ventral side

R e m a r k s: By the characteristic chaetotaxy of the legs and the remote origin from one another of the presternal hairs, the new species can be easily separated from all other hitherto described congeners.

Imparipes hystricinus Berlese, 1903

L o c a l i t y: 503 (1).

Imparipes covarrubiasi Mahunka, 1968

A species apparently widely distributed in the tropics.

L o c a l i t i e s: 504-2 (3), 367-1 (2).

Imparipes longiunguis Mahunka, 1969

The species, recently described from Bolivia, was found in several new localities.

L o c a l i t i e s: 465-6 (1), 502-2 (2), 504-2 (1), 507-2 (3).

Imparipes zicsii MAHUNKA, 1968

A widely ranging tropical species.

Localities: 462-2 (4), 464-1 (7), 361 (2).

Imparipes (*Telodispus*) *similis* MAHUNKA, 1968

Apparently widely ranging and everywhere common in the tropics of South America.

Localities: 463-1 (2), 504-1 (1), 504-2 (2), 507-1 (2), 507-2 (3), 367-1 (2), 367-2 (2).

Imparipes heterotrichus MAHUNKA, 1963

Found to occur in almost every country in South America.

Localities: 504-1 (2), 504-2 (2), 507-1 (3), 507-2 (5).

Scutacarus ciliatus sp. n.

Length: 147—165 μ, width: 140—145 μ.

Dorsal side (Fig. 22: A): Posterior margin of dorsal plates with a weak longitudinal indentation. Outer pair of clypeal hairs arising posteriorly to and also shorter than inner pair. Setae lumbales internae and setae sacrales internae even longer than these; all hairs gradually increasing in length in the above order of sequence. Setae lumbales externae and setae sacrales externae spiniform, former shorter than latter ones.

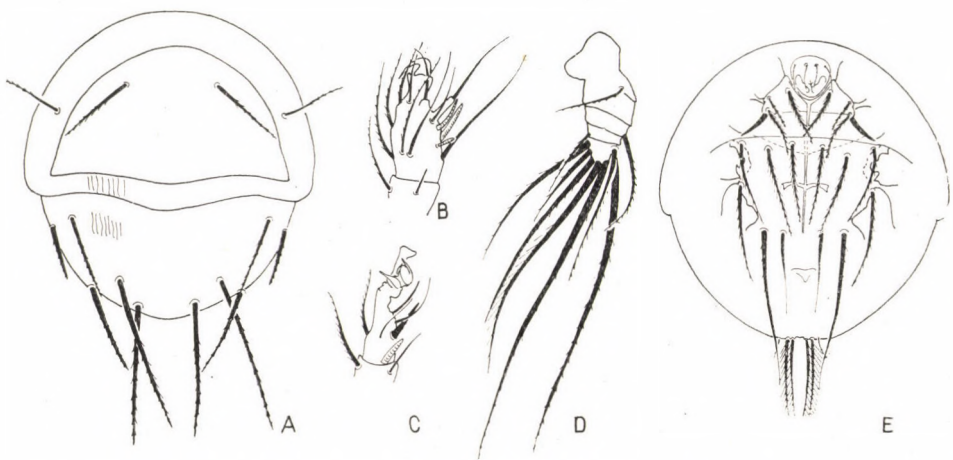

Fig. 22. *Scutacarus ciliatus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

V e n t r a l s i d e (Fig. 22: E): Setae coxales internae of anterior sternal plate considerably longer and more heavily ciliated than their mates. Presternal hairs of posterior sternal plate long, externae reaching bases of poststernal hairs. Setae poststernales externae basally incrassate. Three pairs of caudal hairs present, setae caudales internae and externae 1 of equal length and heavily ciliate; externae 2, arising near them, minute and smooth.

L e g s: Leg I (Fig. 22: B) with a well developed claw. Solenidium ω_1 slightly longer and thicker than solenidium ω_3. Hair *p* of legs II and III (Fig. 22: C) modified into a spine. Hair *c* of femur on leg IV (Fig. 22: B) long, tibiotarsus emitting 7 hairs, their ratio being $p > l > s > r$.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1101p-68): No. 463-1; — 1 ex. (Paratype: T-1102p-68): data as for holotype.

R e m a r k s: By its characteristical caudal hairs and also some other features, the new species stands nearest to *Scutacarus marginatus* MAHUNKA, 1969. However, by the differences appearing on the dorsal side and the chaetotaxy of legs I and IV, it can be separated satisfactorily from the latter.

Scutacarus patentimerus sp. n.

Length: 125—145 μ, width: 107—117 μ.

D o r s a l s i d e (Fig. 23: A*): Free margins of dorsal plates ornamented with longitudinal indentations. All dorsal hairs short, especially clypeal hairs and setae dorsales. All others slightly longer, but without any essential difference in size; thin and weakly ciliate.

V e n t r a l s i d e (Fig. 23: E): Setae coxales I externae of anterior sternal plate very thin and short, setae coxales I internae stout and heavily

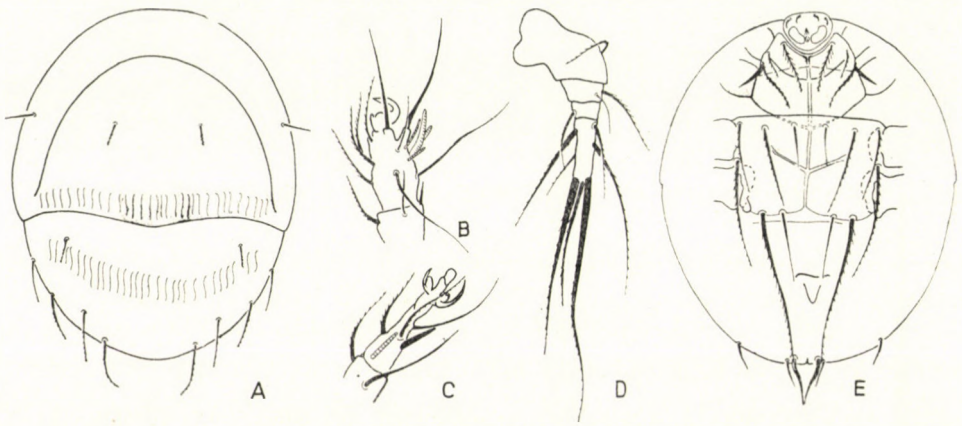

Fig. 23. *Scutacarus patentimerus* sp. n. (Holotype) A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

* Figs. 24: A—E represent the paratype deriving from locality No. 532-2.

ciliate. Free ends of epimeres 3 on posterior sternal plate widening. Setae presternales internae merely half as long as externae. Setae poststernales externae long, reaching posterior margin of body, setae poststernales internae arising on a common transversal line with or slightly anteriorly to them. Three caudal hairs present, internae basally heavily incrassate, externae 1 and externae 2 thin and of about equal length.

L e g s: Tibiotarsus of leg I (Fig. 23: B) with claw. Solenidium ω_1 considerably thicker and longer than solenidium ω_3, this latter similar to soleni-

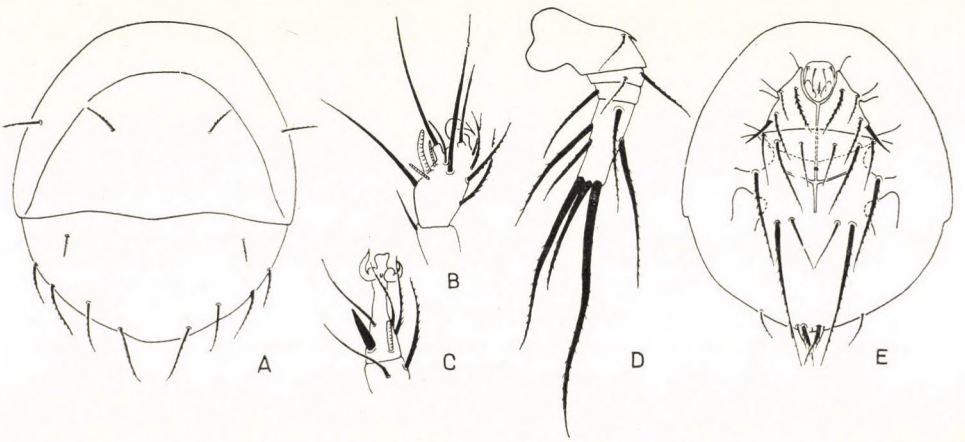

Fig. 24. *Scutacarus patentimerus* sp. n. (Paratype) A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

dium ω_2. Tarsi of legs II and III (Fig. 23: C) with claws of different size. Tibiotarsus of leg IV strongly elongate, about thrice longer than wide (Fig. 23: D).

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1103p-68): No. 507-1; — 4 ex. (Paratypes: T-1104p-68): data as for holotype; — 1 ex. (Paratype: T-1119p-68): No. 532-2.

R e m a r k s: Owing to the elongated tibiotarsus of leg IV, the new species belongs to the "*longitarsus*"-group. However, the poststernal hairs arise along a common transversal line, and the setae caudales internae are incrassate, thereby sharply differing from all hitherto known congeners.

Scutacarus crassipuppis sp. n.

Length: 150 μ, width: 150 μ.

D o r s a l s i d e (Fig. 25: A): Body shape very characteristic, gradually widening posteriorad and attaining its greatest width in last quarter. Posterior margin of body flatly rounded. Setae humerales and setae dorsales rigid and straight. Setae humerales internae originating anteriorly to externae.

All other dorsal hairs arcuate, thin, and longer. Setae sacrales internae slightly longer than setae humerales internae.

V e n t r a l s i d e (Fig. 25: D): Setae coxales I internae of anterior sternal plate slightly thicker and more heavily ciliate than all other coxal hairs. Setae presternales internae arising anteriorly to externae and also shorter than those. Setae poststernales originating on a common transversal line, internae slightly but discernibly longer than externae. Setae caudales internae and

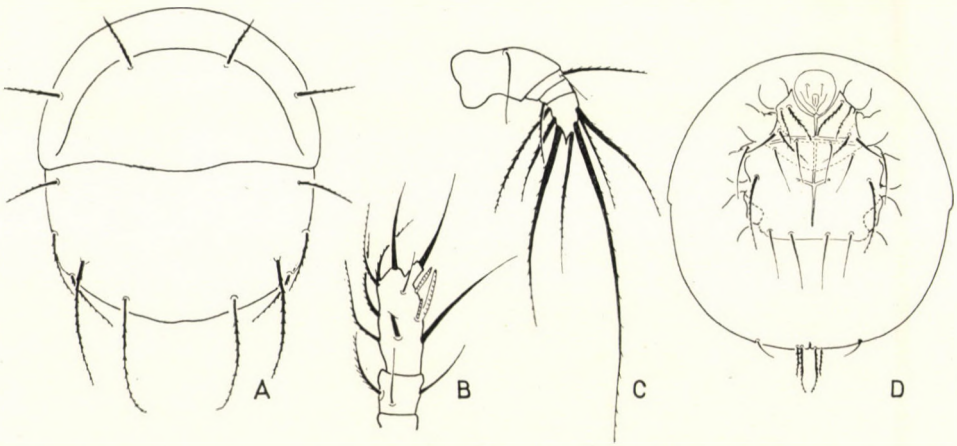

Fig. 25. *Scutacarus crassipuppis* sp. n. A = dorsal side, B = end of leg I, C = leg IV, D = ventral side

externae 1 arising adjacent to one another, internae longer than externae. Setae caudales externae shortest of all caudal hairs, and also rather removed.

L e g s: Tibiotarsus of leg I (Fig. 25: B) without claw. Tarsi of legs II and III arcuate, their claws very strongly developed. Tibiotarsus of leg IV (Fig. 25: C) terminating in a sharp, comparatively long point, the joint emitting 7 hairs, of which hairs *l* and *s* about equally long.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1105p-68): No. 512.

R e m a r k s: It is especially the proportions of the setae poststernales which distinguish the new species from its congeners. The dorsal chaetotaxy is also characteristic. The species stands nearest to *Scutacarus nutatius* MAHUNKA, 1968, described from the Argentine.

Scutacarus radiculatus sp. n.

Length: 142—150 μ, width: 122—142 μ.

D o r s a l s i d e (Fig. 26: A): Clypeal hairs thin and straight. All other dorsal hairs also short, but basally heavily incrassate, terminally elongate into a long apex, ciliate, all originating characteristically near to margins of body.

Ventral side (Fig. 26: E): Setae coxales I internae of anterior sternal plate incrassate and heavily ciliate. Setae coxales I externae and setae coxales II internae thin, setae coxales II externae stouter but short. Presternal hairs short and thin, setae axillares stout and with long cilia. Setae poststernales short, the hairs of both pairs arising near one another. All three caudal hairs approximated, setae caudales internae longest of all, heavily and plumosely ciliate.

Legs: Tibiotarsus of leg I (Fig. 26: B) without claw, solenidium ω_1 essentially larger than ω_3. Configuration of legs II and III shown in Fig.

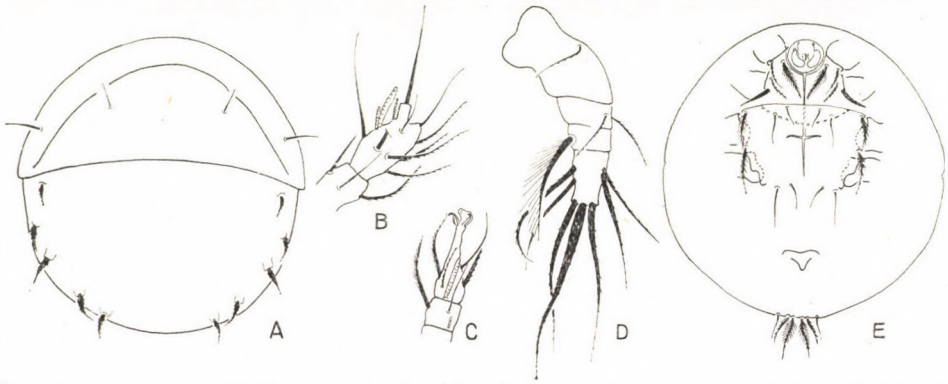

Fig. 26. *Scutacarus radiculatus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

26: C. Both hairs of femur of leg IV (Fig. 26: D) short and thin, but hair of genu very large and thick, with long lateral cilia. Tibiotarsus emitting 7 robust hairs.

Type-material: 1 ex. (Holotype: T-1107p-68): No. 512.

Remarks: By reason of the peculiarly incrassate hairs of the dorsal side and the unusual chaetotaxy of leg IV, the new taxon is unique among the *Scutacarus*-species.

Scutacarus lophotricha sp. n.

Length: 142—165 μ, width: 125—132 μ.

Dorsal side (Fig. 27: A). Clypeal hairs of equal length, internae arising anteriorly to externae. Setae dorsales arcuate and more heavily ciliate. Setae lumbales internae less incrassate but heavily ciliate, whereas all other dorsal hairs strongly incrassate and fasciculately ciliate.

Ventral side (Fig. 27: E): Gnathosoma small. Setae coxales I internae and setae coxales I externae shaped like a pine, with long cilia. Setae coxales II internae thin and essentially shorter than setae coxales II externae.

Pre- and poststernal hairs short, elongately ciliate setae axillares most robust hairs of ventral side. Setae poststernales originating along a common transversal line, setae poststernales approximately half as long as short externae failing to reach even vulva. Three caudal pairs of hairs present, heavily ciliate internae considerably longer than immediately adjacent externae 1; externae 2 arising not too far removed from them.

L e g s: Tibiotarsus of leg I (Fig. 27: B) without claw. Solenidium ω_1 much longer than solenidium ω_3. Hair *p* on tibiotarsus of legs II and III

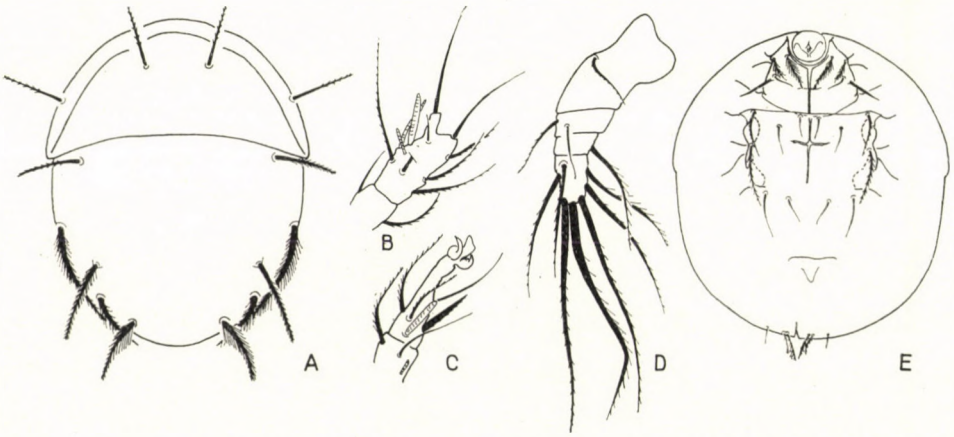

Fig. 27. *Scutacarus lophotricha* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

(Fig. 27: C) spiniform. Tibiotarsus of leg IV (Fig. 27: D) emitting 7 comparatively long and robust hairs, hair *p* somewhat longer than hairs *r* and *s*.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1108p-68): No. 515-1; — 1 ex. (Paratype: T-1109p-68): data as for holotype.

R e m a r k s: Among the South American species bearing fasciculate dorsal hairs, no similar setal combination (*do* and *lui* thin, all others brush-like) is known. The short hairs of the ventral side also separate the new species from its congeners of corresponding setal construction.

Scutacarus obtusus sp. n.

Length: 170—177 μ, width: 147—150 μ.

D o r s a l s i d e (Fig. 28: A): Body surface strongly punctate. Clypeus narrow, of its hairs setae humerales internae shorter than externae and arising far anteriorly to them. Setae dorsales, setae lumbales internae, and setae sacrales internae basally very slightly, whereas setae lumbales externae and setae sacrales externae very heavily, incrassate and also more heavily ciliate than all other hairs.

Ventral side (Fig. 28: D): Setae coxales I internae fasciculate, also setae coxales I externae similar but smaller. Setae coxales II externae smooth, their inner mate ciliate, yet less heavily so than the preceding ones. Setae presternales internae very short, not reaching epimeres 3. Poststernal hairs of equal length, rather short, setae poststernales internae arising obliquely anteriorly to externae. All three pairs of caudal hairs heavily and plumosely ciliate, internae longer than their two other mates.

Legs: Tibiotarsus of leg I (Fig. 28: B) without claw. Solenidium ω_1 long, solenidium ω_3 considerably thinner. Hair *p* on tarsi of legs II and III

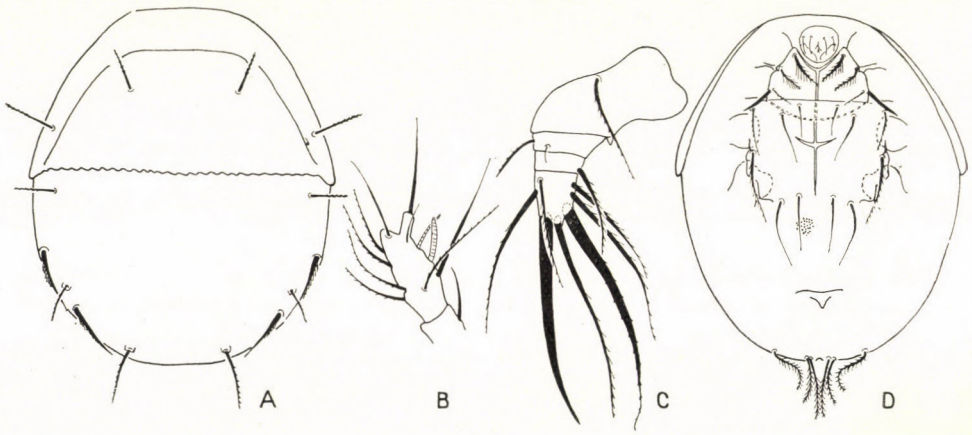

Fig. 28. *Scutacarus obtusus* sp. n. A = dorsal side, B = end of leg I, C = leg IV, D = ventral side

long, thin, but spiniform. Hair *p* of leg IV (Fig. 28: C) heavily incrassate, terminating obtusely. Also hairs *r* and *s* robust, but gradually attenuating, apically setiform.

Type-material: 1 ex. (Holotype: T-1110p-68): No. 515-2; — 1 ex. (Paratype: T-1111p-68): No. 535-2.

Remarks: By reason of the chaetotaxy of leg IV, the new species differs from its known congeners. The characteristic dorsal hairs and setae poststernales are also good distinguishing features.

Scutacarus persimilis sp. n.

Length: 230 μ, width: 177 μ.

Dorsal side (Fig. 29: A): Clypeal hairs thin, long, originating along a common transversal line. Setae dorsales of similar configuration, but setae lumbales internae and setae sacrales internae longer though of similar thinness. Setae lumbales externae longer than setae sacrales externae.

Ventral side (Fig. 29: E): Anterior sternal plate narrow, its hairs short but heavily ciliate. Setae coxales I internae longer and more robust than all other hairs. Setae axillares longest of all hairs arising on posterior sternal plate. Setae poststernales internae and externae of equal length, internae originating anteriorly to externae. Three pairs of caudal hairs present, internae and externae 1 adjacent to one another, comparatively long and thin; externae 2 rather removed and essentially shorter.

Legs: Tibiotarsus of leg I (Fig. 29: B) without claw. Solenidium ω_1 considerably longer and thicker than ω_3. Hair p of leg II and III (Fig. 29: C) modified into a spine. Tibiotarsus of leg IV (Fig. 29: D) emitting seven hairs; order of sequence as to size: $p > s > r$.

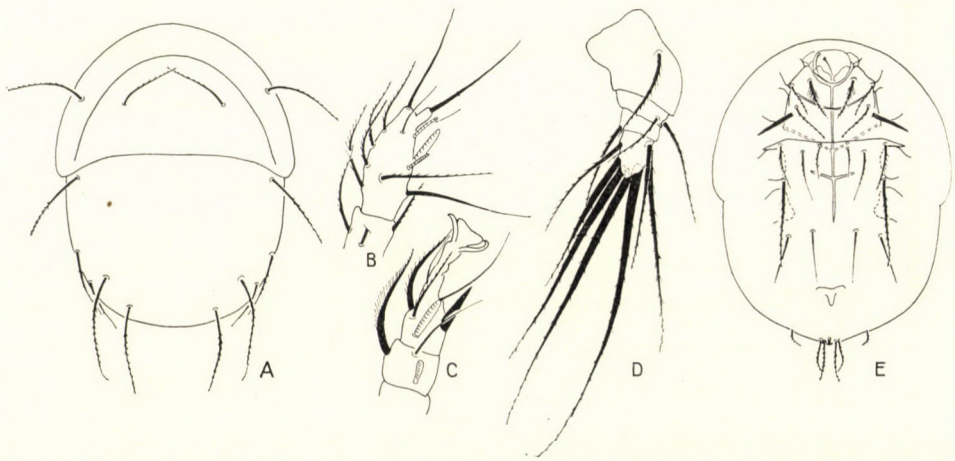

Fig. 29. *Scutacarus persimilis* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

Type-material: 1 ex. (Holotype: T-1112p-68): No. 515-1.

Remarks: With respect to the species lacking a claw on leg I, the new species stands nearest to *S. vitzthumi* MAHUNKA, 1968, and *S. crassipuppis* sp. n., described above. *S. vitzthumi* differs primarily by the different configuration of its poststernal hairs; from *S. crassipuppis* sp. n., by the form of the dorsal hairs and the chaetotaxy of leg IV.

Scutacarus pedicellatus sp. n.

Length: 167—180 μ, width: 152—158 μ.

Dorsal side (Fig. 30: A): Inner clypeal hairs originating posteriorly to outer ones, both of equal length. Setae dorsales shorter than these, all other dorsal hairs thinner but longer, without any essential difference in size (outer hairs slightly shorter than inner ones).

V e n t r a l s i d e (Fig. 30: E): No incrassate hairs present on anterior sternal plate; setae coxales II externae shortest of all, smooth, all other very weakly ciliate. Pre- and poststernal hairs short, setae presternales internae hardly projecting beyond epimeres 3, setae poststernales internae essentially longer than and arising anteriorly to externae. Three pairs of caudal hairs present, internae longest of all, immediately adjacent externae 1 shorter by one-third, externae 2 still much shorter.

L e g s: End of tibiotarsus of leg I (Fig. 30: B) with a protuberance resembling the stalk of a claw, but without any claw present. Tarsus also with

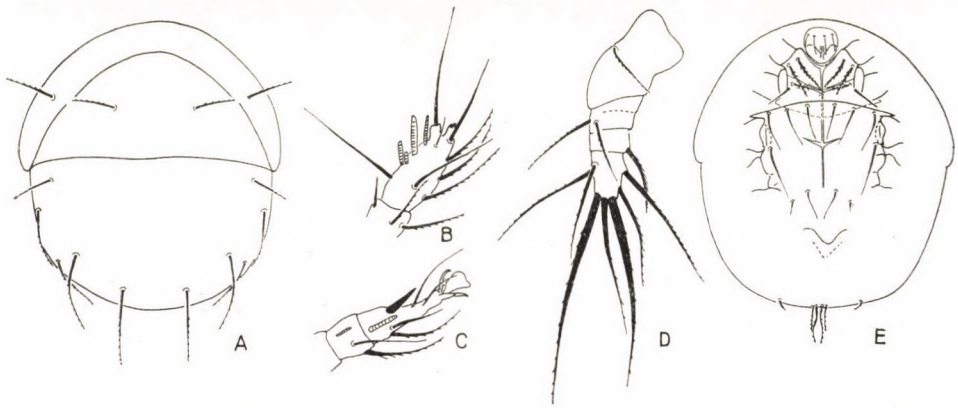

Fig. 30. *Scutacarus pedicellatus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

a short and robust spine. Hair *p* on tarsus of legs II and III (Fig. 30: C) thin but spiniform. Joints of leg IV (Fig. 30: D) elongate, especially femur and tibiotarsus, this latter one almost twice as long as wide. Hair *p* longest of all hairs, hair *s* shorter than hair *r*.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1113p-68): No. 515-2; — 2 ex. (Paratypes: T-1114p-68): data as for holotype.

R e m a r k s: No similarly constructed poststernal hairs are known in species deriving from South America. The configuration of the tibiotarsus of leg I is also unique in the genus.

Scutacarus ibichi sp. n.

Length: 269—318 μ, width: 196—245 μ.

D o r s a l s i d e (Fig. 31: A): Body surface heavily punctate. Clypeal hairs and setae dorsales of equal length. Setae lumbales internae shortest, setae sacrales internae longest, of all dorsal hairs. All ciliate.

V e n t r a l s i d e (Fig. 31: E): Setae coxales I internae most robust of hairs arising on anterior sternal plate. Setae presternales internae short, not

projecting beyond epimeres 3. Setae poststernales internae originating far anteriorly to externae, these latter long but failing to reach posterior margin of body. Internae and externae 1 of caudal hairs thin yet plumosely ciliate; setae caudales externae 2 only slightly shorter but far removed from them, rather weakly ciliate.

L e g s: Tibiotarsus of leg I (Fig. 31: B) with a well developed claw. Hair *n* quite short, whereas hair *p* long and thin. Solenidium ω_1 not much longer than solenidium ω_3, both thin, solenidium ω_4 arcuate and longest of all solenidia. Hair *p* on tarsus of legs II and III (Fig. 31: C) modified into a spine.

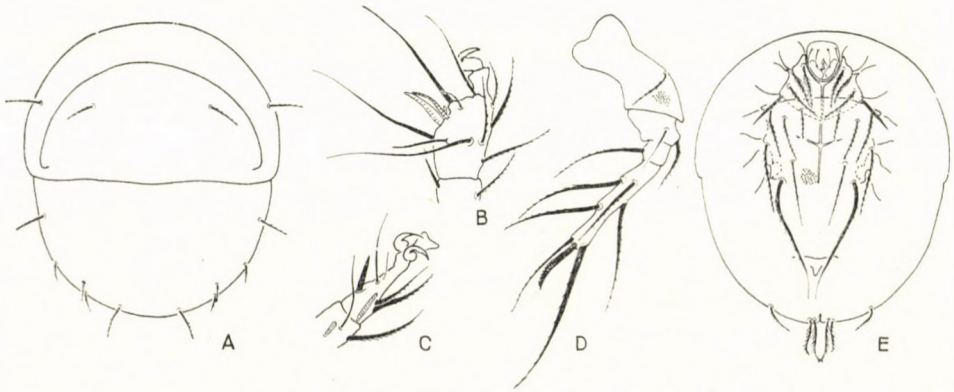

Fig. 31. *Scutacarus ibichi* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

Tibiotarsus of leg IV (Fig. 31: D) elongate, at least five times longer than wide; its hair *r* very short.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1115p-68): No. 519-1; — 12 ex. (Paratypes: T-1116p-68): No. 533-2

R e m a r k s: The new species, belonging to the *"longitarsus"*-group, stands nearest to *Scutacarus longitarsus* BERLESE, 1905, and *S. baculitarsus* MAHUNKA, 1968, described from Chile. However, it differs from both by the configuration and chaetotaxy of legs I and IV.

Scutacarus hoplopes sp. n.

Length: 172—178 μ, width: 125—133 μ.

D o r s a l s i d e (Fig. 32: A): Setae humerales and setae dorsales straight and short. All other dorsal hairs longer and arcuate. Setae lumbales internae slightly shorter than setae sacrales internae, but setae lumbales externae somewhat longer than setae sacrales externae. All well discernibly ciliate.

V e n t r a l s i d e (Fig. 32: E): Setae coxales I internae longest of, and more heavily ciliate than all other hairs of coxal areas. Setae presternales

externae essentially longer than internae, reaching insertional points of poststernal hairs. These latter originating along a common transversal line, long, internae reaching to vulva, externae projecting beyond posterior margin of body. All three caudal pairs of hairs long, internae and externae 1 arising adjacent to one another and slightly longer and more heavily ciliate than externae 2.

L e g s: Tibiotarsus of leg I (Fig. 32: B) with a small claw. Solenidium ω_1 considerably thicker and longer than solenidium ω_3. Solenidium on tarsus of leg II (Fig. 32: C) long, hair *p* spiniform, though still with some discernible

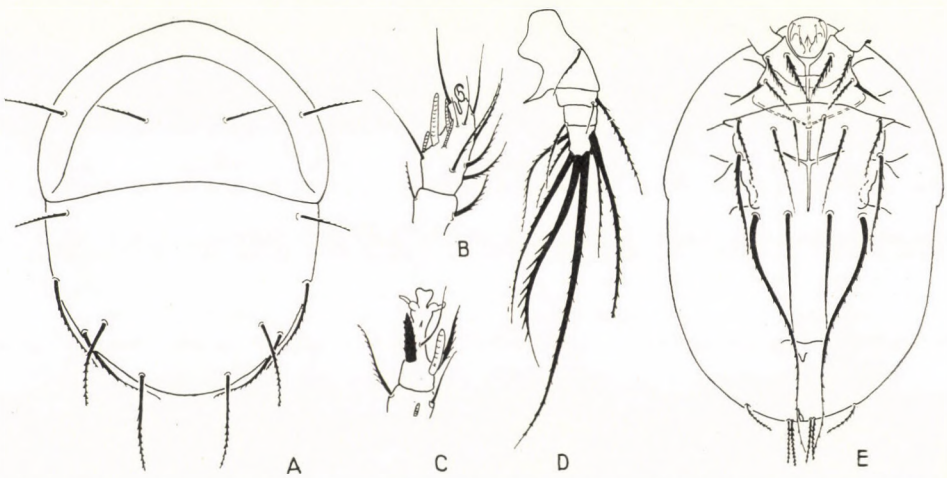

Fig. 32. *Scutacarus hoplopes* sp. n. A = dorsal side, B = end of leg I, C = end of leg II D = leg IV, E = ventral side

lateral cilia. Inner margin of trochanter of leg IV (Fig. 32: D) with a sharp spur below. Tibiotarsus emitting 7 hairs, their order of sequence as to size: $p > s > r > 1$.

T y p e - m a t e r i a l: 1 ex. (Holotype: T-1117p-68): No. 520; — 1 ex. (Paratype: T-1118p-68): data as for holotype.

R e m a r k s: The new species is primarily characterized by the special configuration of the trochanter of leg IV, as yet unknown among its congeners described hitherto.

Scutacarus filicosus sp. n.

Length: 145 μ, width: 100 μ.

D o r s a l s i d e (Fig. 33: A): Clypeal hairs short, setae dorsales of similar size, setae lumbales internae and setae sacrales internae long and arcuate, setae lumbales externae and setae sacrales externae of equal length but shorter than their inner mates.

Ventral side (Fig. 33: E): Setae coxales I internae and setae coxales I externae of anterior sternal plate equally long, basally with some strong cilia. Setae coxales II externae incrassate, spiniform, setae coxales II internae quite thin and also shorter than all other hairs. Anterior margin of posterior sternal plate considerably projecting laterally, as if spurred. Setae presternales short, internae extending to epimeres 3. Setae poststernales internae arising slightly anteriorly to externae, these latter long, projecting beyond vulva but failing to reach posterior margin of body. Setae caudales internae and externae 1 of equal length, arcuate; setae caudales externae 2 long, thin, apically slightly flagellate.

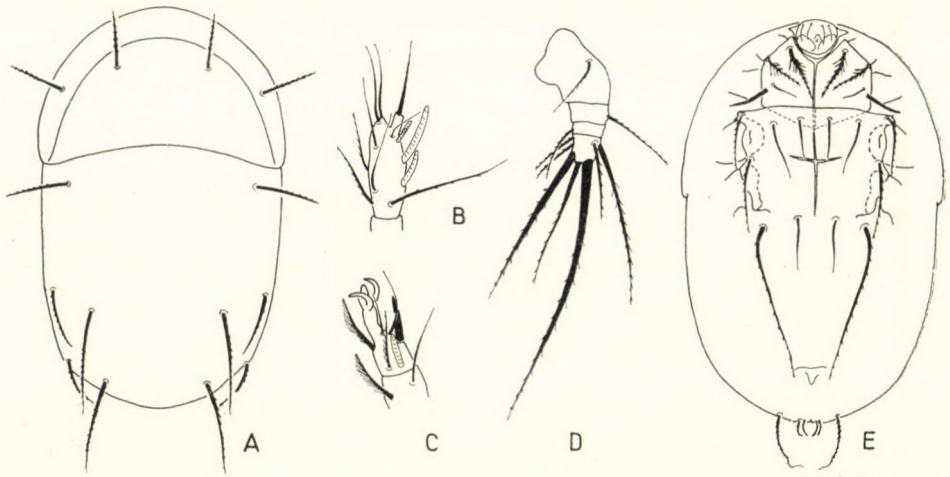

Fig. 33. *Scutacarus filicosus* sp. n. A = dorsal side, B = end of leg I, C = end of leg II, D = leg IV, E = ventral side

Legs: Tibiotarsus of leg I (Fig. 33: B) without claw, solenidium ω_1 essentially longer than ω_3. Tibiotarsus of leg IV (Fig. 33: D) emitting 7 hairs, hair *r* much shorter than hair *s*.

Type-material: 1 ex. (Holotype: T-1120p-68): No. 532-3.

Remarks: Among the species lacking a claw on leg I, none is known with similarly construed caudal hairs.

Scutacarus andrassyi Mahunka, 1968

One of the most common species of tropical regions. Both of the extreme forms, already published in literature [5], occurred, together with the transitional ones.

Localities: 463-1 (3), 463-2 (4), 465-6 (3), 502-2 (6), 507-1 (2), 507-2 (3), 361 (5).

Scutacarus benicus MAHUNKA, 1969

Localities: 465-5 (2), 465-6 (1), 504-2 (2).

Scutacarus brevipes MAHUNKA, 1963

Localities: 515-1 (3), 515-2 (1), 532-3 (3), 533-1 (2), 535-1 (3), 535-2 (3).

Scutacarus exaratus MAHUNKA, 1968

Locality: 463-1 (2).

Scutacarus hermosillai MAHUNKA, 1968

Localities: 462-2 (1), 503 (2), 508 (2).

Scutacarus mamoricus MAHUNKA, 1969

Localities: 507-1 (1), 507-2 (2).

Scutacarus muscorum VITZTHUM, 1924

Localities: 507-1 (5), 507-2 (2), 533-2 (3), 367-2 (4), 371 (3).

Scutacarus muscorum plumiger MAHUNKA, 1964

Locality: 504-1 (2).

Scutacarus parvidentatus MAHUNKA, 1968

Localities: 502-2 (1), 371 (2).

Scutacarus pauper bolivianus MAHUNKA, 1969

Locality: 367-2 (2).

Scutacarus subconfertus MAHUNKA, 1968

Localities: 463-2 (1), 503 (2), 361 (2), 371 (1).

Scutacarus subpectinatus MAHUNKA, 1968

Locality: 504-2 (2).

REFERENCES

1. BALOGH, J., MAHUNKA, S. & ZICSI, A. (1969): The Scientific Results of the Hungarian Soil Zoological Expeditions to South America. 14. A Report on the Collectings of the Second Expedition. — Folia Ent. Hung., **22,** (in print).
2. MAHUNKA, S. (1969): The Scientific Results of the Hungarian Soil Zoological Expeditions to South America. 9. Acari: Pyemotidae and Scutacaridae from the Guayaramerin region in Bolivia. — Acta Zool. Hung., **15,** p. 63—90.

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XV. 3—4. 1969 p. 371—377

NEW MESITIUS SPECIES (HYMENOPTERA: BETHYLIDAE)

By

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(Received January 15, 1969)

Mesitius rufus sp. n.

♀. — Length 5 mm. Head, thorax, legs yellowish red, propodeum more reddish, abdomen black with sides and segments partly dark reddish translucent. Wings short, reaching only to segment 1, fore wings slightly infuscate, veins brown. Body only sparsely covered with white hairs.

Head longer than broad (including eyes, 44 : 38) (magnified ×40, elsewhere in this description) posterior angles moderate obtuse (about 100°); POL : OOL = 7 : 9; surface of frons densely and deeply though not coarsely punctured, small spaces between the punctures shagreened; frontal sulcus indistinct; eyes very convex, with short hairs, separated from mandibles by a distance shorter than their length (10 : 13) and by the same distance from occiput or from margin of temples (11); clypeus conspicuously protruding forming an oblong with the corners rounded and with weakly emarginated anterior margin, its middle part almost right angled, raised into a very high acute keel originating not far from the emarginated anterior margin; antennae rather short, only segments 1—3 slender, when laid back reaching to mesonotum, scape long, slightly thickened distally, length (and breadth) proportions of segments 1—13 = 19 (5) : 7 (4) : 8 (4) : 4 (4) : 4 (4) : 4 (4) : 4 (4.5) : 4 (5) : 4 (5) : 4 (4.5) : 4 (4) : 3.5 (4) : 6 (3). Pronotum quadrate, as broad in front as long (26 : 25) (excluding collar), sides parallel, only very slightly concave and distinctly broadened above tegulae, anterior corner rounded, sinking gradually to anterior collar, with a sharp and deep longitudinal furrow in the middle, surface somewhat more coarsely punctured than head, its hind margin weakly emarginated in the middle and with a narrow impressed and shagreened part just before the margin. Mesonotum twice as broad as long (28 : 14), surface rather smooth, only slightly shining and merely with some punctures, parapsidal furrows distinct but notauli very deep and rather broad, strongly converging distally but running apart almost parallel for a short distance before scutellum,

ending just before margin, scutum with a longitudinal and shallow deepening in the middle, mesonotum well separated from scutellum by a transversal groove and by a pair of pits at its base laterally. Scutellum elongate oval, its length and breadth as 16 : 10, surface smooth, slightly shining. Propodeum short, twice as broad as long (34 : 17, Fig. 1), sides divergent from abdomen, lateral spines rather long, about half as long as propodeum in the middle (10 : 18), surface distinctly divided into areas by median, discal and sublateral carinae (Fig. 1), central areas (between discal carinae) with transverse

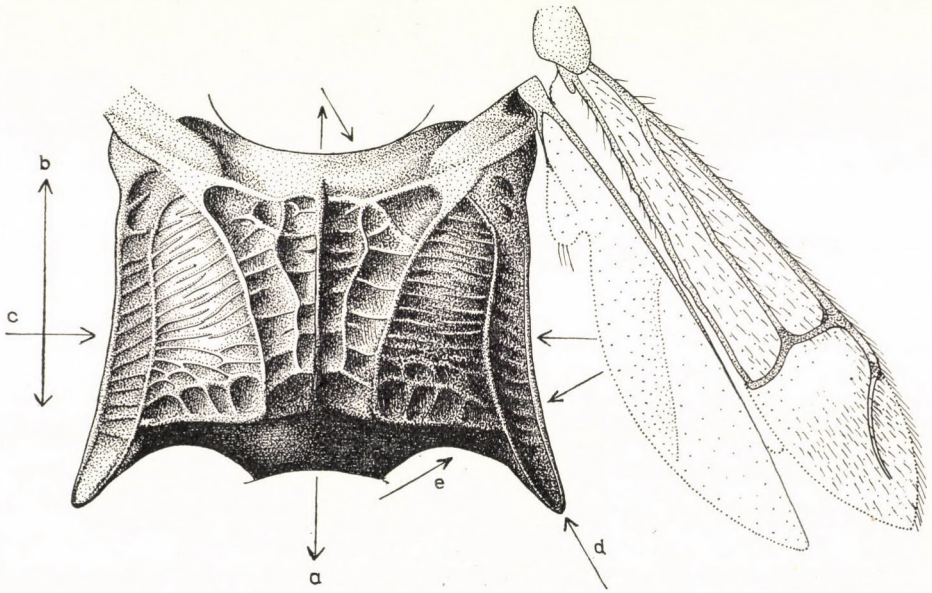

Fig. 1. *Mesitius rufus* sp. n. propodeum and wings, a = length of propodeum measured only in distance "b", c = breadth measured as in "c", d = lateral spine measured from "e" to the tip of "d" (Orig.)

rugosities, sublateral areas with hardly distinct transversal wrinkles, only distally with separated cells, lateral cells with a little more distinct transversal wrinkles, declivity concave and shagreened with superficial punctures. Sides of thorax with large but not deep punctures, episternum below tegulae with a short transversal furrow. Veins distinctly developed (Fig. 1), femora swollen, fore and hind femora distinctly curved. Abdomen smooth shining, segment 1 very finely, 2 finely and sparsely punctured, 3 slightly alutaceous, margins of all segments narrowly pale translucent.

♂. — Unknown.

Specimens examined: Holotype: "Bothaville, Orange Fr. St. Dr. Brauns", "*Mesitius* s. sp. (p. *Braunsi*)" in Biró's writing; "*Mesitius* sp. n. ♀ 1960 det. J. B. Szabó" in Szabó's writing, 1 ♀, Hym. Typ. No. 201 (in Coll. Hung. Nat. Hist. Mus. = Mus. Budapest).

This species resembles *M. brevialatus* BENOIT, 1968, and *M. brevispinosus* BENOIT, 1968, but differs from them chiefly by the eyes which are not shorter than malar space, lateral spines of propodeum not very short, punctures of segment 2 not deep, etc.

Mesitius nagyi sp. n.

♀. — Length 6—6.5 mm. Black, pronotum, legs yellowish red, lower side of antennae, mandibles, sometimes also clypeus brownish red, eventually antennae brownish. Fore wings distinctly brownish infuscate white at base, one spot outside cells, tip with narrower margin. Body sparsely covered with white hairs.

Head slightly longer than broad (including eyes) (52 : 48), posterior angles rounded, sides behind eyes very slightly convergent, almost parallel; frons with a more or less distinct longitudinal depression developed well before anterior ocellus, convex, highest part of face situated above lower margin of eyes, surface densely and distinctly punctured, punctures of frons deep, mostly with sharp margins, having regularly circular shape, bottom scarcely shining, if they sometime attach to one another longitudinally intervals in that case very rarely lower than surrounding, spaces between punctures very narrow, alutaceous, usually smaller than diameter of punctures; ocelli in acute angle, posterior ocelli twice as far from eyes as from each other, POL : OOL = 7 : 15, and rather far separated from occiput (11), all ocelli with a very distinct and rather deep oval groove just beside outer margins; eyes elongate oval, length and breadth as 17 : 15, separated from mandibles by two-thirds the distance of their length (13 : 17) or as far from occiput as the length of malar space or temples; clypeus with arched protruding anterior margin, keel regularly raised then recurved, originating from margin; antennae rather short, only segments 1—3 slender, besides, scape strongly curved, almost four times, pedicel and segment 3 nearly twice as long as broad at tip, length and breadth proportions of segments 1—13 = 22 (6) : 7 (4.5) : 9 (5) : 5.5 (5) : 5 (5) : 5 (5) : 5 (5) : 5 (5) : 5 (5) : 5 (4.5) : 5 (4) : 4 (4) : 8 (3.5). Pronotum only a little broader than long (38 : 33), slightly convergent and rounded in front, with a deep longitudinal furrow in the middle, hind margin broadly impressed with a few small punctures and a little shining, distinctly broadened above tegulae, surface more finely and sparsely punctured than head, smaller punctures among bigger ones, surface finely shagreened. Mesonotum almost three times as broad as long medially (40 : 15), only slightly impressed longitudinally, parapsidal furrows weak, notauli deep, strongly converging proximally but running almost parallel for a half way before scutellum; mesonotum well separated from scutellum by a transverse groove and by a pair of pits at its base laterally. Scutellum oval, length and breadth = 18 : 15, medially with very shallow

longitudinal impression. Propodeum twice as broad as long (44 : 22), sides slightly diverging distally, lateral spines short, distinctly shorter than half length of propodeum (9 : 11) with conspicuous deep and shining central areas, with transverse rugosities, sublateral areas transversally weakly diagonally only, partly lateral areas distinctly transversally, wrinkled; discal carinae strongly convergent proximally, medially becoming parallel then again bending inwards just before its end. Abdomen shining, segment 1 very weakly, segment 2 finely but distinctly and rather densely punctured, without alutaceous basis, segment 3 alutaceous as well as 4—5 finely punctured, before hind margin of segment 3—4 emarginated-impressed medially. Femora especially the 1st pair swollen and curved. Wings as in *carceli* WESTWOOD, but with more or less traces of discoidal veins.

♂. — Unknown.

Specimens examined: Holotype: "Ajaccio, Oct. 27 1897", "*Mesitius*", "*carceli* Ww. Coll. MARSHALL" and "*carcelii* Wwd. (Ajaccio)" in MARSHALL's writing, ♀, Hym. Typ. No. 202 (in Mus. Budapest); Paratype: "Piemont", "*Epyris carcelli* Westw. ♀ Piemont", ♀, Hym. Typ. No. 203 (in Mus. Budapest); "Piemont", ♀, Hym. Typ. No. 204 (in Mus. Budapest); "Piemont", ♀, Hym. Typ. No. 205 (in Mus. Budapest); "France-Vaucluse, Carpentras, 15—23-V-1953 P. M. F. VERHOEFF", ♀ Coll. C. NAGY (Agigea-Romania).

I have named the species in honour of C. NAGY, hymenopterologist of Agigea (Romania), with whom I am collaborating on the *Mesitius* world material.

This species is closely related to *M. carceli* WESTWOOD, 1856, but differs from it chiefly by the following characters: wings remarkably infuscated; punctures of frons more dense, their margins distinct, spaces narrower and rising steeply; longitudinal impression in frons present; outer sides of ocelli with deep grooves; carina on the clypeus rectangularly raised; mesonotum longitudinally with a slight impression in the middle, antennae not yellowish red, etc. Though there are small differences between the paratypes originating from Piemont and Carpentras (in frontal longitudinal impression, in lateral spines of propodeum), I consider that they belong to the same species.

Mesitius kittenbergeri sp. n.

♂. — Length 2.9 mm. Black, pronotum yellowish red, mesonotum, scutellum reddish brown, with darkening in a higher or smaller degree mostly only at the base of mesonotum, abdominal segments partly dark reddish translucent, legs, mandibles and antennae partly brown, sometimes partly pale yellowish brown. Fore wings brownish infuscated with a white base and spot outside the cells and apex, stigma, veins brownish, hind wings hyaline. Body with white pubescence, flagellum with conspicuous long erected hairs around segments (Fig. 1), as long as breadth of one; also sides of abdomen and margins of segments with some scattered longer white hairs.

Head as long as broad (including eyes) (25 : 25), posterior angles moderately obtuse (about 110°), eyes separated from occiput by a smaller distance than its length (8 : 10 in a superior view), face convex, the highest part being

between frons and anterior ocellus (in lateral view), frontal line slight, head rather deeply punctate, space between punctures mostly narrower than punctures, shagreened, sometimes becoming wrinkled, ocelli distinct, with a small deep groove at outer margins, forming an acute triangle, distance hardly different between posterior ocelli and the eyemargin (POL : OOL = 4 : 5), posterior ocelli separated from occiput by a larger distance than from eyes (6 : 5); eyes very convex, hardly longer than broad (10 : 9), only half as far from mandibles as their length (5 : 10), eyes reaching to transversal line of posterior ocelli; mandibles with 3 teeth; anterior margin of clypeus protruding in an obtuse angle and raised in a longitudinal sharp and high keel medially, convex in a quarter circle at base (in lateral view); antennae long and slender, when laid back, reaching abdomen, scape at least twice as long as broad at tip (7 : 3), especially segments 3—5 clavate, (they are nearly twice broader at tip than at the base), length (and breadth) proportions of segments 1—13 = 7 (3) : 4 (2.5) : 6 (3) : 5 (3) : 5 (3) : 5 (2) : 5 (2) : 5 (2) : 4.5 (2) : 4.5 (2) : 4 (2) : 4 (2) : 6 (2). Pronotum transverse, about one and a half as broad in front as long in the middle (16 : 10) (excluding collar), sides parallel medially, rounded and slightly broadened in front, posterior margin weakly emarginate, before it weakly impressed with a row of larger irregular punctures and with a longitudinal deep sulcus in the middle, distinctly broadened above tegulae distally, dorsal surface densely and coarsely punctured, punctures mostly larger than on head, space between punctures shagreened, only poorly shining. Mesonotum transverse, nearly twice as broad between tegulae as long in the middle (20 : 9), shagreened, only poorly shining and at most with some punctures and only with a trace of a shallow deepening distally; parapsidal furrows nearly parallel and not always well developed, notauli conspicuously deep and broad, strongly converging distally but running almost parallel before its end, ending just before margin; scutum with only a trace of longitudinal furrow distally. Mesonotum well separated from scutellum by a transverse groove and by a pair of pits at its base laterally; scutellum oval, only slightly broader than long (9 : 7), surface as mesonotum. Dorsal surface of propodeum transverse, but half diameter of propodeal disc transversally shorter than propodeal length medially (10 : 12), lateral spines short, only one-third as long as propodeum in the middle (4), all carinae present, median and discal carinae converging in the proximal part of propodeum then discal carinae becoming parallel distally, sublateral areas only transversely wrinkled. Episternum shagreened and punctured and with a longitudinal furrow of deeper punctures above the middle of episternum. Abdomen smooth, shining, segment 1 only with some punctures, 2 finely and on paratype slightly deeper but sparsely punctured with a broad base distinctly alutaceous, following segments distinctly alutaceous, with pale translucent margins. Wings perfectly developed, nervature, legs similar to the *Mesitius* character.

Specimens examined: Holotype: "Mto-ja-kifaru, Febr. 1905", "*Mesitius* n. sp." in BIRÓ's writing, "*Mesitius* sp. n. ♂ det. J. B. SZABÓ 1960" in SZABÓ's writing, ♂, Hym. Typ. No. 206 (in Mus. Budapest); Paratype: "Mto-ja-kifaru, 1905. II", "Africa, or. KATONA", "*Mesitius* sp. n. ♂ det. J. B. SZABÓ 1960" in SZABÓ's writing, ♂, Hym. Typ. No. 207 (in Mus. Budapest).

I have named the species in honour of K. KITTENBERGER (= KATONA), the excellent Hungarian hunter, author and collector in Africa.

This species is not related to other *Mesitius* species, and represents a special position among the group formed by *carceli* WESTWOOD, *horvathi* KIEFFER, *cameroni* KIEFFER, etc. owing to the special size of antennal segments with conspicuous long hairs (♂) and the yellowish brownish red and black mesonotum (♀♂).

Mesitius arushai sp. n.

♀. — Length 4.5 mm. Yellowish red, head except the brownish red frontal furrow and surroundings of mouth parts black, upper side of flagellum brownish, femora and tibiae brownish, abdominal segments 1 and 2 partly brownish red, only in the middle black. Fore wings strongly brownish infuscate with a pale yellowish stigma and a spot outside cells and with hyaline base and small streak at tip. Body sparsely covered with white hairs only margins of tergites and sides of tergite 2 with longer white hairs.

Head quadrate, as long as broad (including eyes, 37 : 36), frons together with vertex convex in a quarter circle (in lateral view), lateral sides convergent, posterior angles in obtuse angle; eyes separated from occiput by a less distance of its length (10 : 12), frons with a rather broad but shallow sulcus beginning at anterior ocellus ending in two-thirds distance to clypeus; surface of head coarsely but not very deeply punctated, similar to *alluaudi* KIEFFER's, intervals, between punctures, becoming here and there short longitudinally wrinkles, a remarkable row of large pits just before occipital carina, which gradually becoming smaller laterally, similar to *alluaudi* KIEFFER; ocelli in an acute angle, outer margins of ocelli with small but distinct grooves; eyes oval, only a little longer than broad (16 : 14), separated from mandibles by half distance of its length (8 : 16), anterior margin of clypeus protruding semicircularly and raised very steeply in a longitudinal, sharp and high keel medially; antennae stumpy, reaching (if laid back) to pronotum, remarkably clavate medially, scape slender, gradually thickened towards tip, segment 3 longer than 2, segment 5 remarkably short, segments 4—12 transverse, much broader than long, length (and breadth) proportions of segments 1—13 = 17 (5) : 4 (3) : 5 (4) : 3 (5) : 2.5 (6) : 3 (6) : 4 (7) : 4 (5) : 4 (5) : 4 (5) : 3 (4) : 3 (3.5) : 5 (3). Pronotum three-fourths as long medially as broad proximally (18 : 24), with parallel sides in front, then strongly convergent to tegulae, its anterior angles rectangular, with a very deep longitudinal furrow, surface rough, more coarsely and deeply punctured than head, small spaces between punctures

shagreened, hind margin rather broadly impressed with a remarkable row of deep pits open distally. Mesonotum shagreened, matt, only with scattered punctures, parapsidal furrows indistinct, hardly visible, notauli conspicuously deep and broad, strongly converging distally, but running parallel only just before its end; scutum with a distinct longitudinal furrow, mesonotum well separated from scutellum by a transverse groove and by a pair of pits at its base laterally. Scutellum about as long as broad, deeply and rather densely punctured, especially distally, shagreened, matt. Dorsal surface of propodeum transverse, half diameter of propodeal disc transversally broader than propodeal length medially (16 : 14), posterior angles with remarkably long spines, they are nearly as long as length of propodeum medially (13 : 14), surface of disc very deeply sculptured, each of the two central areas divided by a strongly curved median carina to a shorter median area situated proximally being higher than the others, further to discal area situated proximal-laterally being deeper than the former and also divided to a distal area situated distally being also deep (like discal area), sublateral area smaller than median and discal areas together (5.5 : 6.5), with some transversal wrinkles. Abdominal tergite 1 smooth, remarkably shining, only very finely and sparsely punctured, tergite 2 granulate narrowly at base, scattered but deeply punctured to two-thirds of tergites, these punctures much densely and largely than in *alluaudi* KIEFFER, spaces between punctures smooth, shining and much greater than punctures, tergites 3—4 alutaceous, 3 before hind margin semicircularly emarginated-impressed medially. Legs and wings similar to *alluaudi* KIEFFER.

♂. — Unknown.

Species examined: Holotype: "Africa or. KATONA" (= KITTENBERGER), "Arusha, Chini 1904. III", "*Mesitius* sp. n. (p. *fortidens*)" in BIRÓ's writing, 1 ♀, Hym. Typ. No. 208 (in Mus. Budapest).

This species is closely related to *M. alluaudi* KIEFFER, 1913, but differs from it chiefly by the following characters: frons with sulcus, head as long as broad, eyes separated from occiput by a less distance than its length, central areas of propodeum divided to further 3 distinct areas, sublateral areas only with some distinct wrinkles etc.; it also differs from *brevispinosus* BENOIT, 1968, by punctures of pronotum-scutellum, sculpture of propodeum etc.

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A SYNOPSIS OF THE PHAENOCARPA FÖRST. SPECIES OF THE NEOTROPIC REGION (HYMENOPTERA: BRACONIDAE, ALYSIINAE)

By

J. PAPP

BAKONYI MÚZEUM, VESZPRÉM

(Received August 30, 1968)

In 1952, G. T. RIEGEL published a catalogue of the Neotropic Alysiinae and Dacnusiinae. 32 Alysiine species were reported, including 3 *Phaenocarpa* species. In 1958, C. F. W. MUESEBECK described a new *Phaenocarpa* species from Panama, increasing the number of the known Neotropic *Phaenocarpa* species to 4. I had the opportunity to examine the collection of 3 museums (Washington, Berlin, Budapest) concerning this genus. The result of my synopsis comprises 6 further new taxa (*Ph. delicata* sp. n., *Ph. gahani* sp. n., *Ph. heynei* sp. n., *Ph. obliqua* sp. n., *Ph. rubra* sp. n., and *Ph. subtilistriata* sp. n.), and a key for the known Neotropic *Phaenocarpa* species. My work was based on the investigation of 25 *Phaenocarpa* specimens. Unfortunately, I had no opportunity to examine ASHMEAD's two species, *Ph. mexicana* ASHM. and *Ph. pleuralis* ASHM., therefore their characters in the key are only compilations on the basis of their original descriptions.

The list of the Neotropic Phaenocarpa species is as follows (distribution in brackets):

Ph. anastrephae MUESEBECK, ♀♂, 1958 (Panama)
Ph. coxalis SZÉPLIGETI, ♀, 1904 (Peru)
Ph. delicata sp. n., ♂ (Argentina)
Ph. gahani sp. n., ♀ (Panama)
Ph. heynei sp. n., ♀♂ (Costa Rica)
Ph. mexicana ASHMEAD, ♀, 1895 (Mexico)
Ph. obliqua sp. n., ♀ (Peru)
Ph. pleuralis ASHMEAD, ♀, 1896 (Lesser Antilles)
Ph. rubra sp. n., ♀♂ (Peru)
Ph. subtilistriata sp. n., ♀ (Costa Rica)

As the above list shows, the number of the known Neotropic *Phaenocarpa* species is at present 10, including 6 new species.

The designation of the alar veins and cells are abbreviated according to FISCHER (1963, p. 204).

Acknowledgements. I am much obliged to R. C. FROESCHNER (United States National Museum, Washington), Dr. E. KÖNIGSMANN (Zoological Museum, Berlin), and Dr. L. MÓCZÁR (Hungarian Natural History Museum, Budapest), who had kindly lent me the *Phaenocarpa* material.

Key to species

1 (6) Length at most 2 mm.

2 (3) Ovipositor very short, scarcely projecting. Tergite 1 a little wider than long, with two carinae. Metathorax areolated. Body yellow, legs white. Head, mesopleura, and all tergites black. Length 1.85 mm. — St. Vincent Island (Lesser Antilles)

Ph. pleuralis ASHM., ♀

3 (2) Ovipositor at least as long as half of abdomen.

4 (5) 2nd joint of flagellum one-third longer than first. Ovipositor as long as abdomen. Tergite 1 longer than wide, longitudinally striated. Abdomen scarcely longer than thorax. Metathorax rugulose, with two smooth areas at base. Body black, polished. Prosternum rufous. Three basal joints of antennae, mandibles, and legs brownish yellow. Flagellum, except first joint, brownish black. Length 2 mm. — Mexico

Ph. mexicana ASHM., ♀

5 (4) 2nd joint of flagellum twice longer than first. Ovipositor shorter than abdomen (2 : 3). Tergite 1 as long as its hind width, almost smooth, with two distally converging carinae. Abdomen visibly longer than thorax (3 : 2). Metathorax smooth and shiny, along median longitudinal carina finely rugulose, area petiolaris little. Body polished. Head and thorax brown, abdomen brownish yellow. Scape and pedicel light yellow, flagellar joints 1—5 gradually darkening, further joints brown, last five joints whitish. Mandibles yellow. Legs light yellow, coxae white. Length 1.62 mm. — Panama

Ph. gahani sp. n., ♀

6 (1) Length over 2 mm.

7 (10) Parapsides distinct and equally deep.

8 (9) 2nd flagellar joint more than twice longer than 1st one (2 : 0.95). Thorax stout, its length to height as 1 : 0.71. Cu_2 elongated, $r_2 : cuqu_1$ as 2 : 1, r_2 and cu_2 somewhat converging distally (Fig. 11), *n. rec.* antefurcal. Upper part of mandible obliquely cut (Fig. 12). Ovipositor about combined length of thorax and abdomen. Body black, mesonotum and 1st tergite brownish black, legs yellow, mandibles rusty brownish. Length 4 mm. — Peru

Ph. obliqua sp. n., ♀

1

9 (8) 2nd flagellar joint one and a half times longer than 1st one (1 : 0.6). Thorax of norma, form, its length to height as 1 : 0.62. Cu_2 not elongated, $r_2 : cuqu_1$ as 1 : 1 (Fig. 2) *n. rec.* interstitial. Upper tooth of mandible rounded (Fig. 3). Head, thorax, and tergite 1 black, abdomen brownish black. Legs dark, coxae brownish yellow. Mandible brownish yellow. Length 4.6 mm. — Peru

Ph. coxalis SZÉPL., ♀

10 (7) Parapsides incomplete.

11 (14) Parapsides distinct in their anterior half, obsolescent posteriorly. Abdomen shorter than thorax.

12 (13) Cu_2 elongated ($r_2 : cuqu_1$ as 1 : 0.45, Fig. 1e, MUESEBECK 1958, p. 417). Upper tooth of mandible rounded (Fig. 1). 2nd joint about twice longer than 1st one. Tergite 1 quadratic, hardly longer than its hind width. Body yellow, stemmaticum black. Length 3—3.5 mm. — Panama

Ph. anastrephae MUES., ♀♂

13 (12) Cu_2 not elongated ($r_2 : cuqu_1$ as 1 : 0.75, Fig. 14). Upper tooth of mandible bisinuated (Fig. 13). 2nd flagellar joint almost 3 times longer than 1st one. Tergite 1 longer than its hind width. Body testaceous, head black, mandibles rusty, legs yellowish, hind tibia and tarsus black. Length 3.8—4.2 mm. — Peru

Ph. rubra sp. n., ♀♂

14 (11) Parapsides impressed basally, on upper part of mesonotum obsolescent or almost indistinct. Abdomen at least as long as thorax.

15 (16) Stigma broad, Cu_2 hardly longer than stigma (Fig. 4). Parapsides deep on declivous section of mesonotum, their further section obsolescent. 2nd flagellar joint almost twice longer than 1st one. Upper tooth of mandible acute, an incision between median and lower teeth (Fig. 5). Abdomen somewhat longer than head and thorax

together. Body black, abdominal segments 1—2 and legs yellow. Hind tibiae and tarsi fumous. Wings hyaline. Length 4 mm. — Argentina

Ph. delicata sp. n., ♂

16 (15) Stigma narrow, Cu_2 elongated. Short parapsides deep at base, further indistinct.

17 (18) Tergite 1 (Fig. 16) visibly broadening posteriorly (its length to hind width as 1 : 0.7), scutum with very fine longitudinal striation. Thoracic length to height as 1 : 0.8. Sternauli broad (compared with the next species). *N. rec.* almost interstitial (Fig. 17). Body black. Tegulae brownish yellow, tergite 1 rusty. Legs yellow, hind tibiae and tarsi fumous. Wings subhyaline. Length 3.8 mm. — Costa Rica

Ph. subtilistriata sp. n., ♀

18 (17) Tergite 1 (Fig. 10) broadening posteriorly, (its length to hind width as 1 : 0.6), with fine longitudinal striation. Thoracic length to height as 1 : 0.73. Sternauli narrow (compared with the previous species). *N. rec.* somewhat antefurcal (Fig. 8). Body brownish black, tergite (2 + 3) dark rusty. Legs yellow, coxae whitish, hind tibiae and tarsi fumous. Wings hyaline. Length 3.5 mm. — Costa Rica

Ph. heynei sp. n., ♀♂

Phaenocarpa anastrephae MUES., ♀♂ (Fig. 1)

Phaenocarpa anastrephae MUESEBECK, 1958, Proc. U. S. Nat. Mus., **107**, p. 457, ♀♂.

By M. R. C. FROESCHNER's kindness I was lent 6 ♀ and 4 ♂ specimens (4 ♀ and 1 ♂ paratypes) from the U. S. Nat. Mus. There is no need to add any further comments to the original description.

A well distinguishable species, differing by its vivid yellow color, size and form of body, venation of wing, and outline and sculpture of tergite 1, from all known *Phaenocarpa* species of the world.

Phaenocarpa coxalis SZÉPL., ♀ (Figs. 2—3)

Phaenocarpa (*Idiolexis*) *coxalis* SZÉPLIGETI, 1904, Ann. Mus. Nat. Hung., **2**, p. 197, ♀.
Phaenocarpa coxalis: 1952 RIEGEL, Ill. Acad. Sci. Trans., **45**, p. 181.

Nearest to *Phaenocarpa testaceiventris* (CAM.) (Oriental Region), but differing from it by the form of the mandible, outline of head and thorax, venation of wing, and length of body.

Locality: Marcapata, Peru.

Only the female holotype specimen is known (in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 1444).

The holotype is not in the best condition: right flagellum missing, left flagellum with 11 joints. Fore wings creased and stuck to hind wings. Median right leg and ovipositor missing.

Phaenocarpa delicata sp. n., ♂ (Figs. 4—5)

♂. Head transverse, almost twice broader than long (1 : 0.55). Eyes a little protruding, nearly round, bare. Ocelli on an isosceles triangle, its base somewhat longer. Face almost smooth, shiny, suture between face and clypeus very deep. Mandible (Fig. 5) with three teeth, between upper and median teeth somewhat incised. Palpi short. Tempora narrow, as wide as one-third diameter

of eye. Face, clypeus, and mandible with long hairs. Antennae broken; however, longer than body. Right flagellum with 29 joints, left one missing. 2nd flagellar joint almost twice longer than 1st one (1 : 0.55). Flagellar joints 5—16-17 gradually shortening, further ones of equal length.

Thorax narrower than head (2 : 1.5), shiny. Mesonotum posteriorly with a short linear impression. Laterally from prescutellar furrow mesonotum with a little tooth. Declivous section of mesonotum with deep parapsides, farther

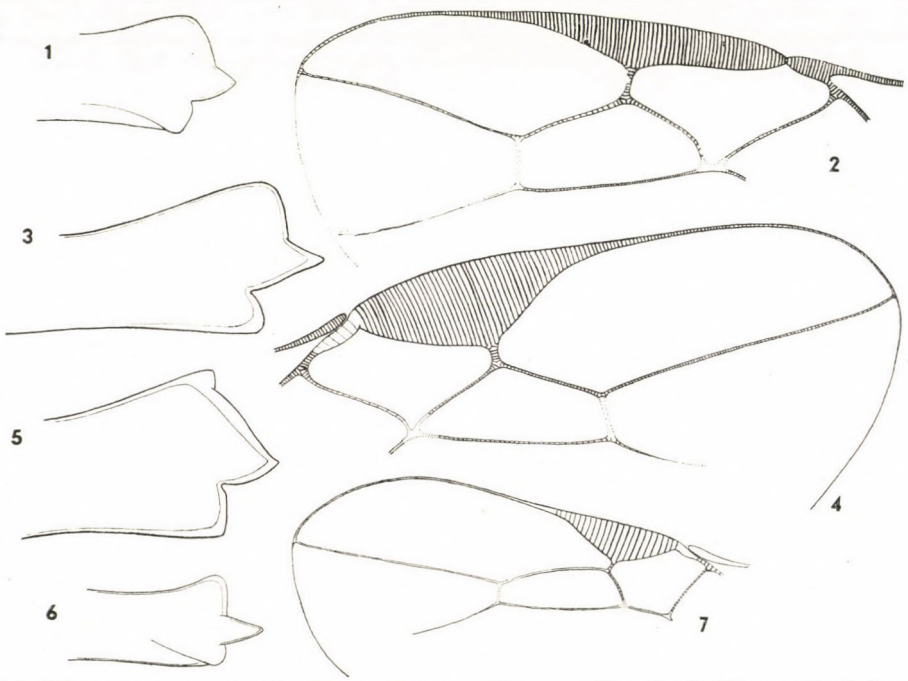


Fig. 1. *Phaenocarpa anastrephae* MUES. ♀♂, mandible. — Figs. 2—3. *Ph. coxalis* SZÉPL. ♀, 2 = part of left fore wing, 3 = mandible. — Figs. 4—5. *Ph. delicata* sp. n. ♂, 4 = part of right fore wing, 5 = mandible. — Figs. 6—7. *Ph. gahani* sp. n. ♀, 6 = mandible, 7 = part of left fore wing

parapsides obsolescent. Propodeum areolated with longitudinal and transverse carinae, almost smooth and shiny. Sternauli hardly crenulated.

Fore wing almost as long as body (0.95 : 1). Stigma broad, Cu_2 hardly longer than distal tip of stigma (Fig. 4), $cuqu_1$ somewhat longer than r_2. *N. rec.* interstitial. Nervulus somewhat postfurcal.

Legs thin with no specific character. Some parts of legs missing.

Abdomen somewhat longer than head and thorax together (1 : 0.8), elongated, its greatest width (on hind margin of 2nd segment) shorter than thoracic breadth. Tergite 1 trapeze-like, its length equal with hind breadth, with two converging keels, almost smooth and shiny. Tergite 2 posteriorly

broadening, its length somewhat shorter than its hind breadth. Further tergites gradually narrowing. Tergites smooth and shiny.

Head and thorax black. Abdominal segments 1—2 reddish yellow, further segments blackish brown. Antennae brownish black, joints 19—23 (subapical annulus) white. Mandible dark, rusty, palpi pale. Legs reddish yellow, hind tibiae and tarsi fumous. Wings hyaline, stigma and veins yellowish brown, tegulae brownish yellow.

Length 4 mm, alar expanse 8.8 mm.

♀ and host unknown.

Locality: Tucuman, Argentina, Dec. 1950, 1 ♀ (holotype), leg. GOLBACH. Holotype in the Hungarian Natural History Museum, Budapest. Hym. Typ. No. 1445.

The new species stands nearest to *Ph. magna* PAPP (Ethiopian Region), but differs from it by the following features: slenderer body, dentation of mandible, incomplete parapsides, venation of wings, form and sculpture of 1st tergite.

Phaenocarpa gahani sp. n., ♀ (Figs. 6—7)

♀. Head somewhat cubic, ratio of its width to length as 1 : 0.6, and ratio of cephalic to thoracic width as 1 : 0.68, smooth and shiny. Face with very fine punctation, hairy. Labial palpi as long as height of head. Eyes nearly round, not protruding from outline of head. Ocelli forming an equilateral triangle. Tempora narrow, ratio of its breadth to horizontal diameter of eye as 1 : 3. Mandible (Fig. 6) not robust, upper and lower teeth rounded, median one spiniform. Antennae 1.5 times longer than body, with 20 joints, hairy. Ratio of funicle 1—3 as 1 : 2 : 1.75. Flagellar joints 4—12-13 gradually shortening, further ones of equal length but 3 times longer than broad.

Thorax rather stout, proportion of its length, width, and height as 2 : 1.9 : 1.3, smooth and shiny. Pronotum and declivous section of mesonotum with fine rugosity. Parapsides well impressed on declivous section of mesonotum, farther indistinct. Prescutellar furrow with one median crenula. Sternauli short, finely crenulated. Propodeum with a median longitudinal carina and with area petiolaris; along the keels shortly transversely rugulose, otherwise propodeum smooth and shiny.

Fore wing (Fig. 7) somewhat longer than body (1.7 mm). Stigma triangular. Cu_2 elongated, r_1 very short, arising nearly from middle of stigma, r_2 somewhat concave, r_3 almost straight, ending on tip of wing, $r_2 : r_3$ as 1 : 2. *N. rec.* antefurcal. Brachial cell absent.

Legs normal, hind tibia a little longer than tarsus (1 : 0.95). Right fore leg (except coxa) missing.

Abdomen longer than thorax (3 : 2), but shorter than head and thorax together (3 : 3.1), its widest section (at fourth segment) equal with width of mesonotum (between tegulae). Tergite 1 as long as its hind width, its two

converging keels extending somewhat farther than proximal half of scutum. Entire first tergite with fine rugosity. Further tergites smooth and shining, abdomen apically hairy. Ovipositor short, a little longer than half of abdomen (0.65 : 1).

Head and thorax brown, abdomen brownish yellow. Scape and pedicel light yellow, flagellar joints 1—5 gradually darkening, further ones brown, apical ones whitish. Mandible and tergite 1 yellow. Legs light yellow, coxae and trochanters whitish. Wings hyaline. Veins vivid yellow except n. costalis, n. basalis, n. media, n. analis. Stigma yellowish brown, its distal apex vivid yellow.

Length 1.62 mm, alar expanse 3.6 mm.

♂ unknown.

Host: *Anastrephe striata?* (Diptera)

Locality: Ancon, Canal Zone, Panama, 1 ♀ (holotype), leg. J. ZETEK.
Holotype in the U. S. National Museum, Washington. (USNM Typ. nr. 70279).

I dedicate this species to Mr. A. B. GAHAN who established that this specimen represents a new specific taxon.

The new species stands nearest to *Ph. mexicana* ASHM., but differs from it by the following features: proportional length of flagellar joints 1—3, venation of wings, dentation of mandible, and color of body.

Phaenocarpa heynei sp. n., ♀♂ (Figs. 8—10)

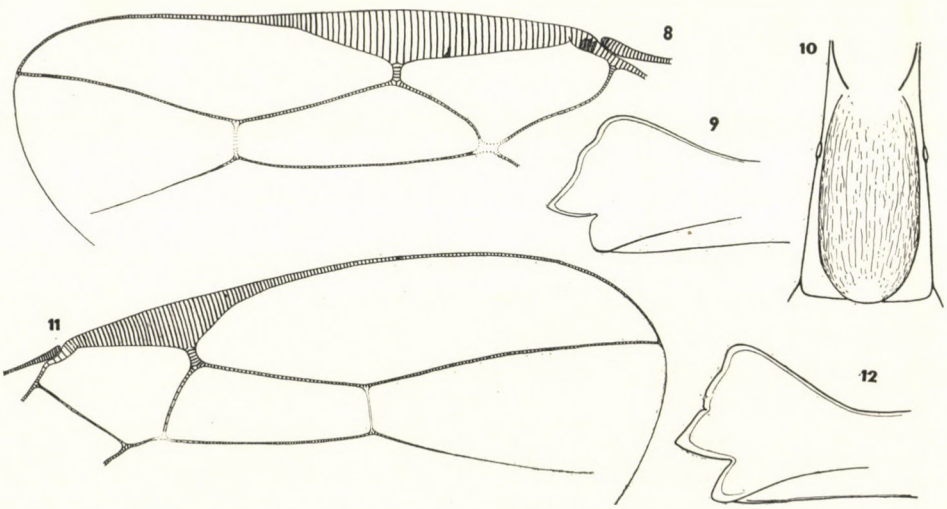
♀. Head transverse, about twice broader than long (1 : 0.48), glabrous. Eyes somewhat protruding from outline of head. Ocelli on an isosceles triangle, its base little longer. Face with sporadic, very fine punctation. Clypeus conic. Tempora as wide as half diameter of eye. Mandible (Fig. 9) normal, between median and lower teeth with an incision. Labial palpi about twice longer than height of head. Face, clypeus, and mandible with hairs. Antennae longer than body, 37-jointed. Proportional length of flagellar joints 1—3 as 2 : 5 : 4.5, joints 4—25-28 gradually shortening, further joints of equal length (3 times longer than wide). Right antenna incomplete, of 19 joints.

Thorax normal (though somewhat elongated as compared with *Ph. subtilistriata* sp. n.), proportion of its length, width, and height as 1 : 0.45 : 0.73. Parapsides impressed deeply on basal declivous section, farther indistinct. Thorax glabrous, metapleura hairy. Prescutellar furrow with four crenulae. Propodeum with area basalis and above it with a median carina. Along the carina and area basalis finely sculptured, otherwise propodeum smooth. Sternauli narrow (compared with *Ph. subtilistriata* sp. n.).

Fore wing somewhat longer than body (1 : 0.95), elongated. Stigma narrow, r_1 arising from distal third. Proportional length of r_2 and r_3 as 0.71 : 1, and r_2 to $cuqu_1$ as 1 : 0.62. Vein r_2 rather straight, r_3 arched. Cu_2 elongated, about 3 times longer than broad. *N. rec.* somewhat antefurcal (Fig. 8).

Legs elongated, hind tibiae longer than tarsi.

Abdomen almost as long as head and thorax together, elongated, widest at hind margin of 3rd segment; however, narrower than thorax. Tergite 1 (Fig. 10) elongated trapezoidal, broadening posteriorly, its length to breadth as 1 : 0.6, with a fine longitudinal striation, spiracles placed before midlength, two short converging keels extending to basal fourth. Tergites (2 + 3) about



Figs. 8—10. *Phaenocarpa heynei* sp. n. ♀♂, 8 = part of left fore wing, 9 = mandible, 10 = 1st tergite. — Figs. 11—12. *Ph. obliqua* sp. n. ♀, 11 = part of right fore wing, 12 = mandible

1.5 times longer than tergite 1, further tergites narrow. Ovipositor almost one and a half times longer than body (1 : 0.68). Hind half of abdomen hairy.

Head and thorax blackish brown, abdomen dark rusty brown. Mandible brown, palpi pale. Funicular joints 18—22 white, otherwise antennae blackish, basally brownish black. Tegulae yellowish. Legs yellow, hind tibiae and tarsi fumous. Wings hyaline, stigma and veins brownish yellow.

Length 3.7 mm, alar expanse 8.5 mm.

♂. Differences against female: body shorter, almost as long as fore wing, Cu_2 more elongated.

Length 2.6 mm, alar expanse 5.6 mm.

Host unknown.

Locality: Costa Rica, Turrialba, 21 April, 1 ♀ (holotype) and 1 ♂ (allotype), leg. HEYNE.

Holotype and allotype in the Zoological Museum, Berlin.

I dedicate the new species to Mr. V. HEYNE who collected the two type-specimens.

The new species stands nearest to *Ph. subtilistriata* sp. n. (Nearctic Region) and *Ph. madagascariensis* SZÉPL. (Ethiopian Region), but differs from

both by the following features: form and dentation of mandible, size of head, thorax, and abdomen, venation of wing, color of body.

Phaenocarpa obliqua sp. n., ♀ (Figs. 11—12)

♀. Head transverse, twice broader than long (1 : 0.45), smooth and shiny. Eyes somewhat protruding from outline of head, almost round (at mandible its margin impressed). Ocelli on an equilateral triangle, fore ocellus somewhat greater than two hind ones. Tempora narrow, as wide as half diameter of eye. Distal half of mandible widened, its upper part obliquely cut (upper tooth hardly bisinuated) (Fig. 12). Length of labial palpi about height of head. Face, clypeus, and margin of mandible hairy. Antennae broken, right antenna with 8, left one with 6 joints. Proportional length of flagellar joints 1—3 as 1 : 2.1 : 1.7.

Thorax stout, smooth and shiny, proportion of its length, height, and width as 1 : 0.56 : 0.71. Parapsides impressed equally, distally meeting in a linear incision ("dimple"). Median longitudinal line impressed, however, not so deep as parapsides. Propodeum areolated, shiny. Metapleura and propodeum with dispersed hairs. Sternauli bisinuated and crenulated.

Fore wing a little longer than body (1 : 0.96). Stigma (Fig. 11) normal, r_1 short, arising somewhat distally, r_2 almost straight, r_3 arched, proportion of r_2 to r_3 as 1 : 1.85. Cu_2 elongated, 3 times longer than broad, r_2 : $cuqu_1$ as 2 : 1, apically with almost parallel sides (r_2 and cu_2 converging somewhat distally). *N. rec.* antefurcal.

Legs normal, left hind leg only with basitarsus, right one with 3 tarsal joints.

Abdomen longer than thorax (2.5 : 2), but shorter than head and thorax together (2.5 : 3). Tergite 1 somewhat longer than its hind width (1 : 0.86), spiracles medially, proximally from spiracles tergite narrowing. Scutum margined, with some longitudinal (and not deep) striae. Further tergites smooth and shiny, with dispersed setiform hairs. Ovipositor about combined length of thorax and abdomen, with dispersed setae.

Body black. Mesonotum and tergite 1 brownish black. Mandible brownish rusty. Antennae brown, its inner side somewhat lighter. Palpi pale. Legs yellow. Apex of hind femora, tibiae, and tarsi somewhat fumous. Wings somewhat fumous, stigma and veins yellowish brown.

♂ and host unknown.

Length 4 mm.

Locality: Pachitea, Peru, 1 ♀ (holotype).
Holotype in the Hungarian Natural History Museum, Budapest. Hym. Typ. No. 1446.

The new species stands nearest to *Ph. testaceiventris* (CAM.) (Oriental Region), but differs from it by the following features: form of mandible, outline and sculpture of tergite 1, venation of wing, size and color of body.

Phaenocarpa rubra sp. n., ♀♂ (Figs. 13—14)

♀. Head transverse, twice broader than long, smooth and shiny. Clypeus and median part of face punctated, otherwise face with very dispersed and fine punctation. Face, clypeus, and mandible hairy. Eyes round. Ocelli on an isosceles triangle, hind ocelli greater than the fore one, base of triangle (or distance between the hind two ocelli) greater than its sides. Labial palpi somewhat longer than height of head. Tempora narrow, ratio of its breadth to horizontal diameter of eye as 1 : 2.2. Mandible (Fig. 13) broad, its upper tooth bisinuated, median one spiky, between median and lower teeth incised. Antennae damaged; however, incomplete antennae longer than body. Ratio of length of flagellar joints 1—3 as 1 : 2.9 : 2.1.

Thorax normal, smooth and shiny. Ratio of thoracic length, height, and width as 3 : 2.3 : 1.2. Parapsides distinct in its anterior half, posteriorly obsolescent, ending medially in a dimple. Scutellum semicircular, its hind part fused with metanotum. Propodeum with longitudinal and transverse keels. Sternauli short, finely crenulated.

Fore wing somewhat longer than length of body, 1.15 : 1 (4.5—5 mm). Stigma elongated triangular. Cu_2 not elongated, $r_2 : cuqu_1$ as 1 : 0.75 (Fig. 14). Ratio of r_2 and r_3 as 1 : 2, both veins straight, r_3 reaching apex of wing. *N. rec.* nearly interstitial (oχ antefurcal). Brachial cell absent.

Legs normal. Hind tibiae and tarsi of nearly equal length.

Abdomen shorter than thorax (1 : 1.3—1.4). Its widest section also narrower than breadth of thorax (at tegulae), 1 : 1.1—1.2. Tergite 1 trapezoidal, its length somewhat longer than its hind base (1 : 0.9), with two posteriorly converging keels. Tergites 2 and 3 of almost equal length (1 : 0.8), smooth and shiny, further tergites concealed. Abdomen with dispersed hairs. Ovipositor (in lateral view) almost as long as abdomen (0.75 : 1).

Body testaceous, head and antennae black. Mandibles dark rusty. Antennal joints 17-19—22 whitish. Legs testaceous, apex of hind femora, tibiae, and tarsi brownish black. Wings almost hyaline, stigma blackish brown, veins brown.

Length 3.8—4.2 mm, alar expanse 9—11 mm.

♂. Similar to female; however, all tergites visible, tergites 4—7 dark brown. Length 4.5 mm.

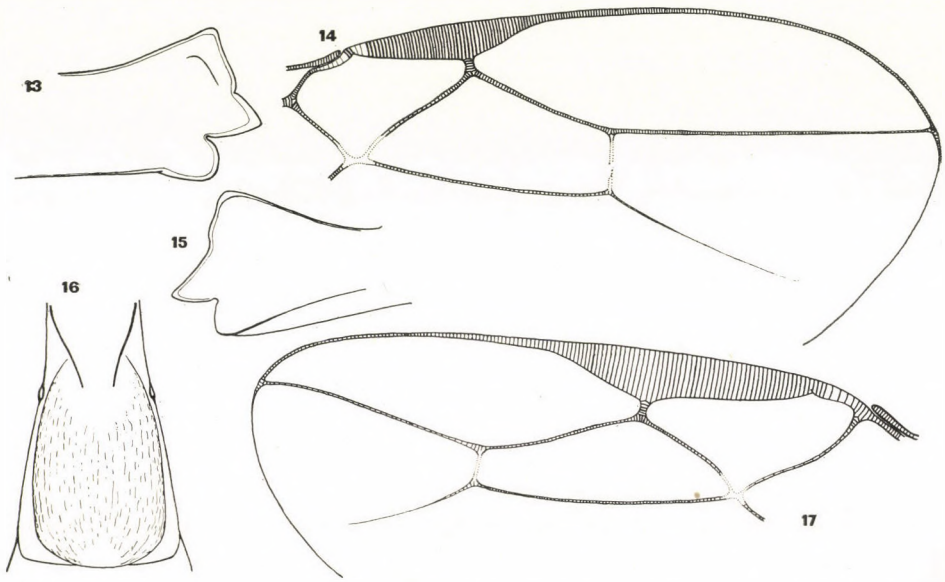
Host unknown.

Localities: 1. Marcapata, Peru, 5 ♀ (1 holotype, 4 paratypes), leg. V. STAUDINGER. 2. Depart. Cuzco, Peru, 1 ♀ (paratype). 3. Depart. Cuzco, Marcapata-Thal Nbfl. d. Madre de Dios, 1000—2000 m, 1900, 1 ♂ (allotype), leg. S. V. GARLEPP.

Holotype, allotype, and 4 ♀ paratypes in the Zoological Museum, Berlin; 1 ♀ paratype in the Hungarian Natural History Museum, Budapest.

Remarks. — 1. Antennae of all types damaged. 2. Fore right leg of 2 ♀ and 1 ♂, median left leg of 1 ♀ paratype missing. 3. Wing of some types damaged.

The new species stands nearest to the African species *Idiasta nigriceps* (SZÉPL., 1911) (= *Coelalysia nigriceps*: TURNER, 1917, p. 177), and to the Central American species *Ph. anastrephae* MUES., 1958. From the former it differs by the long r_2 (almost twice longer than $cuqu_1$), somewhat slender body, outline of mandible, and somewhat elongated tergite 1. From the latter by the more impressed parapsides, form of body, outline of mandible and tergite 1.



Figs. 13—14. *Phaenocarpa rubra* sp. n. ♀♂, 13 = mandible, 14 = part of right fore wing. — Figs. 15—17. *Ph. subtilistriata* sp. n. ♀, 15 = mandible, 16 = 1st tergite, 17 = part of left fore wing

Phaenocarpa subtilistriata sp. n., ♀ (Figs. 15—17)

♀. Head transverse, almost twice broader than long (1 : 0.49), smooth and shiny. Face, clypeus, and mandible hairy. Clypeus rounded. Eyes not protruding from outline of head. Ocelli on an isosceles triangle, its base a little longer than its side. Tempora as wide as one-third diameter of eye. Mandible (Fig. 15) similar to that of *Ph. heynei* sp. n., however, between upper and median teeth more incised. Labial palpi about twice longer than height of head. Antennae damaged, right antenna with 18, left one with 14 joints. Proportional length of flagellar joints 1—3 as 2 : 4.6 : 2.5.

Thorax normal (rather stout compared with *Ph. heynei* sp. n.). Proportional length, height, and width of thorax as 1 : 0.56 : 0.8. Parapsides impressed deeply on basal declivous section, farther indistinct. Thorax with dispersed hairs, metapleura hairy. Prescutellar furrow with 3 crenulae. Posterior half of propodeum rugulose, here keels indistinct, median longitudinal carina extending only on upper half. Sternauli broad (compared with *Ph. heynei* sp. n.).

Fore wing about as long as body (1 : 0.98). Stigma (Fig. 17) elongated triangular, r_1 arising almost from middle of stigma. Proportional length of r_2 to r_3 as 0.7 : 1, and r_2 to $cuqu_1$ as 1 : 0.68. Vein r_2 scarcely bisinuated, r_3 arched. Cu_2 elongated, about 3 times longer than broad. *N. rec.* almost interstitial.

Legs elongated, hind tibiae longer than tarsi.

Abdomen as long as head and thorax together, elongated, widest at 2nd segment; however, narrower than thorax. Tergite 1 (Fig. 16) visibly broadening posteriorly (its length to its hind breadth as 1 : 0.7), scutum with a very fine longitudinal striation. Spiracles nearly before midlength; two short converging keels extending on basal fourth. Tergites (2 + 3) almost twice longer than tergite 1, further tergites narrow. Ovipositor 1.5 times longer than abdomen, nearly as long as body.

Body black. Mandible, scape, and pedicel rusty brown, funicular joints 17—18 whitish (thus antennae with a white ring). Palpi pale. Tegulae brownish yellow, tergite 1 rusty. Legs yellow, hind tibiae and tarsi fumous. Wing subhyaline, stigma and veins yellowish brown.

Length 3.8 mm, alar expanse 8 mm.

♂ and host unknown.

Locality: Turrialba, Costa Rica, V. 21, 1 ♀ (holotype), leg. HEYNE.
Holotype in the Zoological Museum, Berlin.

The new species stands nearest to *Ph. heynei* sp. n. (Neotropic Region) and *Ph. madagascariensis* SZÉPL. (Ethiopian Region), but differs from both species by the following features: form and dentation of mandible, size of head, thorax, and abdomen, venation of wing, color of body.

REFERENCES

1. ASHMEAD, W. H. (1895): Some Parasitic Hymenoptera from Baja, California and Tepic, Mexico. — Proc. Calif. Acad. Sci., **5** (2), p. 539—555.
2. ASHMEAD, W. H. (1896): Report on the Parasitic Cynipidae, Part of the Braconidae, the Ichneumonidae, the Proctotrupidae, and Part of the Chalcididae. Part II. — Journ. Linn. Soc. Zool., London, **25**, p. 108—254.
3. CAMERON, P. (1911): On the Hymenoptera of the Georgetown Museum, British Guaiana. — Demerara Journ. Roy. Agric. Soc., **1**, p. 153—186 and 306—330.
4. FISCHER, M. (1963): Neue Zuchtergebnisse von Braconiden (Hymenoptera). — Zeitschr. angew. Zool. **50**, p. 195—214.
5. MUESEBECK, C. F. W. (1958): New Neotropical Wasps of the Family Braconidae (Hymenoptera) in the U. S. National Museum. — Proc. U. S. Nat. Mus., **107**, p. 405—461.
6. PAPP, J. (1966): New Phaenocarpa Förster Species from the Ethiopian Region (Hymenoptera, Braconidae). — Acta Zool. Hung., **12**, p. 133—144.
7. PAPP, J. (1967): A Synopsis of the Phaenocarpa Först. Species of the Oriental Region (Hymenoptera, Braconidae, Alysiinae). — Reichenbachia, **8**, p. 139—157.
8. RIEGEL, G. T. (1952): Neotropical Exodont Braconidae (Hymenoptera). — Ill. Acad. Sci. Trans., **45**, p. 177—181.
9. SZÉPLIGETI, GY. (1904): Südamerikanische Braconiden. — Ann. Mus. Nat. Hung., **2**, p. 173—197.
10. SZÉPLIGETI, GY. (1911): Braconidae der I. Zentral-Afrika-Expedition. — Wiss. Ergebn. dtsch. Zentral-Afrika Exped. 1907—1908, **3** (Zool.), p. 393—418.
11. TURNER, R. E. (1917): On a Braconid Parasite of Glossina. — Bull. Entom. Res., **8**, p. 177.

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ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
XV. 3—4. 1969 p. 391—396

DIE SYSTEMATISCHE STELLUNG VON SCROBIPALPA HUNGARIAE (STAUDINGER, 1871) (LEPIDOPTERA: GELECHIIDAE)

Von

K. SATTLER

DEPARTMENT OF ENTOMOLOGY, BRITISH MUSEUM (NATURAL HISTORY) LONDON

(Eingegangen am 15. Januar 1969)

Kürzlich hat sich POVOLNÝ in zwei Veröffentlichungen mit dieser Art befaßt (1967, p. 172; 1968, p. 18). In der ersten Publikation wird die Art in die Gattung *Scrobipalpopsis* versetzt. Die zweite Publikation holt die Diskussion der systematischen Stellung und der Verbreitung nach, die in der ersten wegen anderer Themenstellung unterblieben war. Leider erwiesen sich nahezu sämtliche Angaben POVOLNÝs als falsch, so daß eine Berichtigung geboten erscheint.

Für Untersuchungsmaterial und Auskünfte danke ich den Herren Dr. L. GOZMÁNY Magyar Nemzeti Múzeum, Budapest, Dr. F. KASY, Naturhistorisches Museum, Wien, Dr W. SAUTER, Entomologisches Institut, Eidgenössische Technische Hochschule, Zürich, Dr. W. WITTMER, Naturhistorisches Museum, Basel.

Scrobipalpa hungariae (STAUDINGER, 1871)*

Gelechia hungariae STAUDINGER, 1871, Berl. ent. Z., **14**, p. 300.
Locus typicus: Ungarn: Budapest. Lectotypus ♂: Zoologisches Museum der Humboldt-Universität, Berlin.

Literatur:

WOCKE 1871, p. 290 (*Gelechia*)
REBEL 1901, p. 143 (*Gelechia*)
MEESS 1910, p. 361 (*Gelechia*)
MÜLLER-RUTZ 1914, p. 483 (*Gelechia*)
MEYRICK 1925, p. 82 (*Gelechia*)
VORBRODT 1928, p. 119 (*Gelechia*)
GOZMÁNY 1955, p. 314; f. 19 [♂ Genit.] (*Gelechia*)
GOZMÁNY 1957, p. 210 (*Gnorimoschema*)
SATTLER 1960, p. 69 (*Scrobipalpa*)
POVOLNÝ 1967, p. 172 (*Scrobipalpopsis*)
POVOLNÝ 1968, p. 18; t. 15, f. 74 [♂ Genit.] (*Scrobipalpopsis*)

Falsche Determinationen:

POVOLNÝ 1968: t. 15, f. 75 [♀ Genit.] (*Scrobipalpopsis*) [= *Scrobipalpa* sp.?]

Untersuchtes Material: 10 ♂♂, 3 ♀♀, u. zw.: 1 ♂, 1 ♀ (ohne Daten) HOFMANN Coll. — 2 ♂♂ Hungary, 1866, STAUDINGER, STAINTON Coll. — 1 ♂ Ungarn, 1867, STAUDINGER, HOFMANN Coll. — 1 ♂ Ungarn, 1867, STAUDINGER, Magyar Nemzeti Múzeum, Budapest. — 1 ♂, 1 ♀ Hungaria, 7. VI. 1869, STAUDINGER, CHRISTOPH Coll. — 1 ♂ Ungarn, 1870, STAUDINGER, HOFMANN Coll. — 1 ♂ (ohne Fundort) 1870, STAUDINGER, ZELLER Coll. — 1 ♂ Budapest, Farkas-v., 25. III. 1904, UHRYK, Magyar Nemzeti Múzeum, Budapest. —

* Entgegen POVOLNÝs Annahme ist die Beschreibung dieser Art erst 1871, nicht 1870 erschienen.

1 ♂ Budaörs, Csikihegyek, 5. IV. 1928, UHRIK, Magyar Nemzeti Múzeum, Budapest. — 1 ♀ Budakeszi, Hársbokorhegy, 15. VIII. 1952, BAJÁRI, Magyar Nemzeti Múzeum, Budapest.

Soweit nicht anders bezeichnet, befindet sich das untersuchte Material im British Museum (Natural History), London.

Für die generische Übereinstimmung mit *Scrobipalpopsis petasitis* (PFAFFENZELLER) — Typusart der Gattung *Scrobipalpopsis* POVOLNÝ, 1967 — sprechen nach POVOLNÝs Ansicht: 1. die »eigenartige Vorderflügelzeichnung«, 2. die Genitalarmaturen, 3. die Verbreitung (»ausgesprochene Hochgebirgsform«).

1. Die eintönige dunkle Art läßt im Vorderflügel nur drei Punkte (in der Falte, in der Zelle, an der Querader) und Spuren der Saumflecke erkennen. Diese Zeichnung ist keinesfalls eigenartig, sondern gehört zu einem weitverbreiteten Grundmuster bei Lepidopteren. Sie kommt in gleicher oder abgewandelter Form bei vielen Gruppen vor. Es sei nur daran erinnert, daß sich an denselben Stellen die Elemente der bekannten Noctuidenzeichnung (Zapfen-, Ring-, Nierenmakel, Saumflecke) finden. In den Gelechiidae — auch außerhalb der Gnorimoschemini — lassen sich zahlreiche Beispiele dieses Zeichnungsmusters geben. Es ist kein Zufall, daß der kenntnisreiche Lepidopterologe STAUDINGER die Art *hungariae* neben die heute in eine andere Tribus gehörende *Filatima spurcella* (HERRICH-SCHÄFFER) stellte. Unter ausschließlicher Berücksichtigung der Vorderflügelzeichnung erscheint dies nicht unverständlich. Dieses einfache Grundmuster, das nicht einmal eine spezielle Ausprägung (wie etwa bei den Noctuidae) zeigt, ist für die Diskussion der systematischen Stellung der *hungariae* belanglos. Es spricht weder für noch gegen eine nähere Verwandtschaft mit *petasitis*.

2. Nach POVOLNÝ haben die männlichen Genitalien »dieselbe plumpe an *Scrobipalpa* erinnernde, aber 'akromegalische' Prägung«. Unter »akromegalischer Prägung« kann ich mir in diesem Zusammenhang nichts vorstellen. Die männliche Armatur entspricht in den Proportionen und im Gesamteindruck wie in den geprüften Einzelmerkmalen ganz und gar *Scrobipalpa*-Arten (wie etwa *acuminatella*) und weicht von *Scrobipalpopsis petasitis* ab.

Der Uncus der *petasitis* (Abb. 1) ist etwas ventrad verlagert. Seine Seiten sind kissenartig verdickt und deutlich beborstet. Die Innenwand des Uncus hat keinen auffallend abgesetzten sklerotisierten Endteil. Die Gnathos ist ein starker Haken, an der Basis viel stärker als vor der Spitze. Die vom Tegumen ausgehenden Arme, an denen die Gnathos aufgehängt ist, sind gerade und nicht nach vorn verlängert. Die relativ kurze Valva reicht nur bis zur Uncusbasis. Der basale Fortsatz der Valva und der hintere Fortsatz des Vinculums sind beide gleichlang. Beide Fortsätze sind stark verlängert und erreichen die Gnathosbasis. Die Gnathos reicht daher tief in den Mittelausschnitt des Hinterrandes des Vinculums. Der Uncus der *hungariae* (Abb. 2) bildet die Verlängerung des Tegumens und ist nicht ventrad verlagert. Seine Seiten sind nicht kissenartig verdickt und beborstet. Nur am Hinterrand steht ein deutliches

Borstenpaar. Die Innenwand ist im Endteil sklerotisiert, der Vorderrand des sklerotisierten Teiles deutlich bogig und scharf abgegrenzt. Der schlanke Haken der Gnathos ist an der Basis kaum stärker als vor der Spitze. Die vom Tegumen ausgehenden Arme der Gnathosbasis sind geknickt und nach vorn

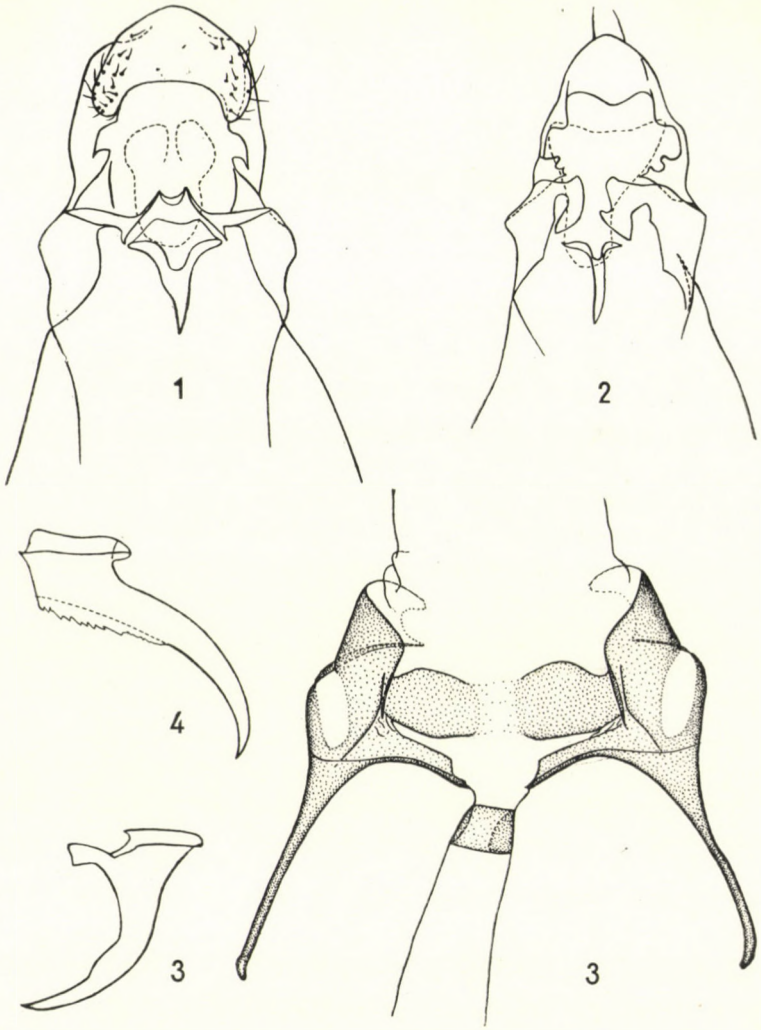

Abb. 1 = *Scrobipalpopsis petasitis* (PFAFFENZELLER), ♂, Uncus-Gnathos-Komplex. Genitalpräparat — 15435 — British Museum (Nat. Hist.). — Abb. 2 = *Scrobipalpa hungariae* (STAUDINGER), ♂, Uncus-Gnathos-Komplex. Genitalpräparat — 15442 — British Museum (Nat. Hist.). — Abb. 3 = *Scrobipalpa hungariae* (STAUDINGER), ♀, Genitalarmatur. Genitalpräparat — 640 d — SATTLER. — Abb. 4 = *Scrobipalpopsis petasitis* (PFAFFENZELLER), ♀, Signum bursae. Genitalpräparat — 15425 — British Museum (Nat. Hist.). — Membranöser Basalteil der Gnathos in Abb. 1 und 2 nur gestrichelt, um die darunterliegenden Strukturen klar zu zeigen

geschwenkt. Die Gnathos setzt daher nicht zwischen den Armen (wie *petasitis*) sondern vor ihnen an. Die Valva ist länger und reicht fast bis zum Ende des Uncus. Der hintere Fortsatz des Vinculums ist deutlich kleiner als der basale Fortsatz der Valva. Beide Fortsätze sind nicht stark nach hinten verlängert und erreichen die Gnathosbasis nicht, obwohl diese gegenüber *petasitis* stark nach vorn verlagert ist. Die Gnathos ragt kaum in den Mittelausschnitt des Hinterrandes des Vinculums. POVOLNÝs Angaben zur weiblichen Genitalarmatur können hier außer Betracht bleiben, da er ein falsches ♀ abbildet (1968: t. 15, f. 75). Ich konnte nicht herausfinden, welche Art dargestellt wird, doch sei hier auf die große Ähnlichkeit mit der eine Tafel vorher abgebildeten *Scrobipalpa vartianorum* POVOLNÝ (t. 14, f. 68) hingewiesen. Es ist mir unklar, weshalb POVOLNÝ in der abgebildeten »*hungariae*«-Armatur generische Übereinstimmung mit *petasitis* sehen will, während er gleichzeitig *vartianorum* mit nahezu identischem ♀ zu *Scrobipalpa atriplicella* (FISCHER VON ROESLERSTAMM) — und damit zu typischen *Scrobipalpa* — stellt. Während er allerdings bei *vartianorum* die Apophysenwurzeln »stark konvex ausgeschnitten« nennt, wird bei »*hungariae*« der gattungscharakteristische »konkave« Ausschnitt der Apophysenwurzel erwähnt.

Das echte ♀ der *hungariae* (Abb. 3) hat eindeutige *Scrobipalpa*-Genitalien. Die Apophyses posteriores erreichen nur etwa die doppelte Länge der Apophyses anteriores (und sind damit viel kürzer als bei *petasitis*). Das achte Sternit hat einen großen eckigen Ausschnitt, der bis auf die Umgebung des Ostium bursae sklerotisiert ist. Am Vorderrand des Sternites erstrecken sich die Basen der Apophyses anteriores gegen die Mitte, ohne jedoch vor dem Ostium zusammenzustoßen. Die Apophyses anteriores verschmälern sich gleichmäßig von der breiten Basis her und sind in der vorderen Hälfte dünn, stabförmig. Das Signum ist ein großer, gleichmäßig gekrümmter, glatter Haken. Mit *petasitis* hat dieses Genital nichts zu tun (vgl. POVOLNÝ 1967: f. 115). Neben anderen Eigentümlichkeiten fällt bei *petasitis* auch das gleich an der Basis umgeknickte Signum auf (Abb. 4, hier zur Ergänzung von POVOLNÝs Abbildung in Lateralansicht).

Auf Grund der Genitalarmaturen wird *hungariae* in die Nähe von *Scrobipalpa acuminatella* (SIRCOM) gestellt. Im ♂ haben beide die Verkleinerung der hinteren Fortsätze des Vinculums und die Tendenz zur Verbreiterung des Saccus gemeinsam. Im ♀ fehlt beiden die netzartige Struktur des achten Sternites, die für viele *Scrobipalpa* typisch ist. Außerdem haben beide ein rechteckig ausgeschnittenes achtes Sternit und ein glattes Signum, das bei *acuminatella* jedoch in der Mitte stark umgebogen ist. Es muß betont werden, daß die Stellung bei *acuminatella* als provisorisch zu betrachten ist. Es gibt zur Zeit keine ordnende Darstellung der Gattung *Scrobipalpa*. Während einerseits noch nicht einmal alle europäischen Arten geklärt sind, wurden andererseits in den letzten Jahren zahlreiche neue hinzugefügt, teilweise ohne Vergleich mit

bekannten Arten und ohne Angabe ihrer Stellung innerhalb der Gattung. *Scrobipalpa* gehört daher zur Zeit zu den unübersichtlichsten Gruppen.

3. POVOLNÝ erklärt die Lokalitätsangabe »Ofen« für irrtümlich und den Namen *hungariae* für irreführend. Er schreibt unter anderem wörtlich: »Die Bezeichnung 'Ofen' ist äußerst problematisch, nach meiner Überzeugung aus wissenschaftlichen Gründen offenbar falsch, weil diese Art eine ausgesprochene Hochgebirgsform darstellt.« POVOLNÝs Argumentation ist etwa folgende: da die Art in Macugnaga und Zermatt vorkommt, ist sie eine Hochgebirgsform, und da sie eine Hochgebirgsform ist, kann sie nicht in Ungarn vorkommen.

STAUDINGERS Sammler, der Musiker JÁNOS PECH, lebte um die Mitte des vorigen Jahrhunderts in Budapest und sammelte in der Umgebung der Stadt. Es erscheint mir zweifelhaft, daß er je in Hochgebirgslokalitäten sammelte. Wie schon aus STAUDINGERS Beschreibung hervorgeht, erbeutete PECH *hungariae* in Anzahl. Sie ist daher auch über STAUDINGER in fast jede bessere Sammlung des vorigen Jahrhunderts gelangt (vgl. Untersuchtes Material). Es ist schwer zu verstehen, daß POVOLNÝ die Angabe so zuverlässiger Gewährsmänner für »äußerst problematisch« hält. Alle Zweifel habe ich nun durch eine Anfrage in Budapest beseitigen können. Dort existieren nämlich mehrere in späteren Jahren von weiteren Sammlern erbeutete Stücke. POVOLNÝS Vermutung, die Art sei seit ihrer Entdeckung offenbar nicht mehr gefunden worden, hat sich damit als unbegründet erwiesen. POVOLNÝS Verbreitungsangabe »Macugnaga« geht auf ein altes Tier aus der Coll. STAUDINGER zurück. Da das Etikett weder Sammler noch Daten angibt und das Tier zu dem auch nicht in der alten Literatur erwähnt wird, bedarf der Fundort dringend der Bestätigung. Die Angabe »Zermatt« belegt POVOLNÝ weder durch Material noch durch Literaturangabe. Nach freundlicher brieflicher Mitteilung von Herrn Prof. Dr. D. POVOLNÝ, Brno, bezieht sich seine Angabe auf GAEDE (der sie von MÜLLER-RUTZ und VORBRODT übernommen hat). Nach MÜLLER-RUTZ (1914, p. 483) und VORBRODT (1928, p. 119) fing STANGE bei Zermatt ein Tier zwischen dem 7. und 12. VIII. 1912 (det. REBEL). Den Verbleib dieses Falters habe ich bisher nicht ausfindig machen können. Eine Überprüfung erscheint dringend geboten. Als nachgewiesenes Verbreitungsgebiet darf für *hungariae* bisher nur Ungarn gelten, während die beiden Angaben für das Alpengebiet als höchst unsicher zu betrachten sind.

POVOLNÝ gelangt zu der Auffassung: »Alle diese Umstände . . . zeugen von der Altertümlichkeit der besprochenen Art, welche höchstwahrscheinlich zu den überlebenden Tertiärrelikten der Hochgebirgsfauna Europas gehört.« Die Prüfung des vorgelegten Beweismateriales hat ergeben, daß diese Ansicht nicht gehalten werden kann.

SCHRIFTTUM

1. GOZMÁNY, L. (1955): Notes on Some Hungarian Gelechioidea and Coleophoridae. — Ann. Hist.-nat. Mus. Nat. Hung., (N. S.) **6,** p. 314, f. 19.
2. GOZMÁNY, L. (1957): Microlepidoptera IV. — in: Fauna Hungariae, **40,** p. 210.
3. MEESS, A. (1910): in HOFMANN, E., SPULER, A.: Die Schmetterlinge Europas, **2,** p. 361.
4. MEYRICK, E. (1925): Lepidoptera Heterocera, Fam. Gelechiidae. — Lepid. Cat., **184,** p. 82.
5. MÜLLER-RUTZ, J. (1914): in VORBRODT, K., MÜLLER-RUTZ, J.: Die Schmetterlinge der Schweiz, **2,** p. 483.
6. POVOLNÝ, D. (1967): Die stammesgeschichtlichen Beziehungen der Tribus Gnorimoschemini im Weltrahmen (Lepidoptera, Gelechiidae). — Acta ent. Mus. Nat. Prag, **37,** p. 170—172.
7. POVOLNÝ, D. (1968): Neue und wenig bekannte Taxone aus der Tribus Gnorimoschemini Povolný, 1964 (Lepidoptera, Gelechiidae). — Acta Sci. nat. Acad. Sci. bohemoslov., (N. S.) **2** (3), p. 16—19, t. 14, 15, 19.
8. REBEL, H. (1901): in STAUDINGER, O., REBEL, H.: Catalog der Lepidopteren des palaearctischen Faunengebietes. II. Theil. Fam. Pyralidae — Micropterygidae, p. 143.
9. SATTLER, K. (1960): Generische Gruppierung der europäischen Arten der Sammelgattung Gelechia (Lepidoptera, Gelechiidae). — Dt. ent. Z., (N. F.) **7,** p. 69.
10. VORBRODT, C. (1928): Die Schmetterlinge von Zermatt. — Dt. ent. Z. Iris, **42,** p. 119.
11. WOCKE, M. (1871): in STAUDINGER, O., WOCKE, M.: Catalog der Lepidopteren des europaeischen Faunengebiets. II. Microlepidoptera, p. 290.

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IDENTIFICATION KEY TO THE LEECH (HIRUDINOIDEA) GENERA OF THE WORLD, WITH A CATALOGUE OF THE SPECIES. VI. FAMILY: GLOSSIPHONIIDAE

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I. Introduction

In the present — and last — paper of the series of contributions, published in previous volumes of the journal (**11,** p. 417—463, **12,** p. 145—160 and 371—407, **13,** p. 417—432, **15,** p. 151—201), I propose to discuss the family Glossiphoniidae. There is again, unfortunately, no space available to treat my evaluations and their justification of the genera and species listed below, or for a thorough discussion of problems in synonymy. In general, I wish to point out merely the followings.

The most urgent task, with respect to the family Glossiphoniidae, is the establishing of the specific and generic characters. Until this is done by a detailed study and the knowledge of the organisational or structural features of a number of incompletely or hardly known species, the identification of several species and even genera will continue to remain labile. This holds especially for some much disputed specific, generic, or indeed subfamily, characteristics, as the position of the mouth pore in the oral sucker; the configuration, disposition, and the changes in numbers of the gastric caeca not only between the species of a genus but also intraspecifically; the evaluation of the cutaneous and sensory papillae or tubercles at the specific and generic levels; the numbers of nephridia and ganglia; the evolvement of the terminal end of the reproductive organ; and the taxonomic interpretation of the number of complete somites as well as the annulation of the given segments. It is therefore concurrently with the pointing out of these problems that I submit herein the following generic key in which I have attempted to bridge over, on the basis of our present knowledge and by recourse to literature data as well as the results of my investigations heretofore obtained, the difficulties arising from our incomplete informations and uncertainties outlined above.

Divergently from the preceding parts, I was constrained to introduce two new taxic names in this final contribution. For the species *Oculobdella lucida* MOORE, 1954, I had to establish a new genus, since, primarily by the configuration of the terminal end of its reproductive organ, it differs generically (and within the family uniquely!) from the type-species, *Oculobdella socimulcensis* CABALLERO, 1931. Now the genus *Oculobdella* will again remain monotypical, because I erect for the other species heretofore relegated to it, namely *lucida* MOORE, 1954, the new genus **Marvinmeyeria,** dedicating it to my estimable friend and colleague, Prof. Dr. MARVIN C. MEYER, who indicated already at the description of the species (MEYER & MOORE, Wasmann Journ. Biol., **12,** 1954, p. 80) that a new genus will probably have to be established to receive it. For the species *Placobdella ornata* OKA, 1929 (nec VERRILL, 1872), I introduce the name **okai** nom. nov., since the specific name *ornata* is already preoccupied in this genus. I give the new name in honour of the late Prof. Dr. A. OKA, the excellent Japanese hirudinologist.

Since by the present paper this series of contributions comes to an end, it becomes now possible to give a numerical survey, tabulated below, of the present taxonomic situation prevailing in the class Hirudinoidea. The table contains merely the taxa treated in the six papers of the series.

Table I

Families[1]	Valid		Synonymous		Dubious	
	genera	species[2]	genera	species[3]	genera	species
Piscicolidae	43	121	21	47	9	25
Semiscolecidae	4	10	—	2	—	—
Trematobdellidae[4]	4	6	—	—	—	—
Americobdellidae	1	1	3	—	—	—
Diestecostomatidae	2	5	3	1	—	—
Erpobdellidae	17	60 (9)	17	34	2	12
Haemadipsidae[5]	9	28 (7)	2	17	—	1
Hirudinidae	25	94 (1)	23	73	4	26
Glossiphoniidae	22	135 (15)	23	85	4	45
	127	459 (32)	92	259	19	108

[1] The families are listed according to the order of publications and not in their systematic sequence.

[2] Figures in brackets denote the number of infraspecific taxa.

[3] Figures contain also the infraspecific taxa.

[4] The genus *Barbronia* JOHANSSON, 1918, was accounted for only in the family Erpobdellidae.

[5] On pages 421, 423, and 430 of Part IV, read *Planobdella* BLANCHARD, 1894, instead of *Placobdella* BLANCHARD, 1894.

Summarizing now also the new taxa and the changes in category described or executed since the publication of the several parts of the series, we find that there belong at present about 500 species, assigned to approximately 140 genera, to the class Hirudinoidea.

II. Identification Key to the Genera of the World

1 (2) Attaining maturity, terminal end of female organ evolving, concurrently with the inactivation of the primary female gonopore ($XIIa_2/a_3$), into a brood pouch which, shifting caudad, becomes localized in somites XVII and XVIII, forming there a new brood pouch orifice. Anus shifted unusually and conspicuously forward and opening at XXIV/XXV instead of on XXVI or XXVII. Complete somite 3-annulate. 1 pair of eyes, 7 pairs of gastric caeca, 6 pairs of testes present. Salivary glands very diffuse. Gonopores separated by 2 annuli. Length: 4—5 mm. Hosts: freshwater crustaceans and amphibians. — Type-species: *Marsupiobdella africana* GODDARD & MALAN, 1912. Monotypical. South Africa (Cape Province, Natal)

*11. **Marsupiobdella** GODDARD & MALAN, 1912

2 (1) Terminal end of female organ without a brood pouch. Anus not shifted forward to XXIV/XXV except in *Placobdella pediculata* HEMINGWAY, 1908.

3 (4) Proboscis extremely long, extending posteriorly to about half length of body, to somite XIV; emitting preapically three radially arranged and obliquely reclinate spines. Body much elongated, ten times as long as wide, *Piscicola*-like. Complete somite 3-annulate. No eyes or sensory papillae. Gonopores separated by 1 annulus. No postanal annulus present. 6 pairs of gastric caeca, 5 pairs of testes, and 8 pairs (?!) of nephridia present. An extremely specialized Glossiphoniid. Length: 13—17 mm. Host: unknown. — Type-species: *Ancyrobdella biwae* OKA, 1917. Monotypical. Japan (Lake Biwa, from 80 m depth)

2. **Ancyrobdella** OKA, 1917

4 (3) Proboscis not conspicuously long, without any reclinate spines. Body not exceedingly elongated, not *Piscicola*-like.

5 (6) Beginning with annulus 18, every annulus terminating bilaterally and marginally in a short and cylindrical appendage each, their ends digitately ramifying. Complete somite 3-annulate. 1 pair of eyes and 1 postanal annulus present. Sensory papillae microscopically minute. Gonopores separated by 1 annulus. Anatomy unknown. Length: 8—10 mm. Host: unknown. — Type-species: *Podoclepsis festae* DEQUAL, 1916. Monotypical. Ecuador

20. **Podoclepsis** DEQUAL, 1916**

* This and the following numbers agree with the serial number of the genus within the catalogue of the species.

** RINGUELET synonymized it with *Helobdella* BLANCHARD, 1896, and since then not considered a distinct genus. Prior to the detailed study of the type-specimens, this action cannot be unconditionally justified.

6 (5) Beginning with annulus 18, the annuli do not terminate, bilaterally and marginally, in digitately ramifying appendages.

7 (8) Caudal sucker with a marginal circle of about 30 or 60 glands and retractile papillae, their positions indicated by faint radiating ridges marking dorsal surface of sucker. Complete somite 3- or 6-annulate. Dorsal side with merely one median or 5 longitudinal rows of tubercles. 1 pair of eyes, 6 or 7 pairs of gastric caeca and 5 pairs of testes present. Gonopores separated by 2 or 4 annuli. Length: 1.5—9 mm. Hosts: turtles, ?fish, ?vertebrates. — Type-species: *Actinobdella inequiannulata* MOORE, 1901. Three species known. North America

1. **Actinobdella** MOORE, 1901

8 (7) Caudal sucker without circle of retractile glands and papillae.

9 (18) Complete somite dorsally 2-annulate [furrow between two annuli $(a_1a_2)/a_3$ definite (*Paratorix* LUKIN & EPSHTEIN, 1960, some *Oligobdella* species) or furrow very shallow and often hardly recognizable (*Oligoclepsis* OKA, 1935, some *Oligobdella* species)], or apparently 3-annulate [then furrow a_1/a_2 very shallow (*Torix* BLANCHARD, 1893), or acutally 3-annulate, but in this case annulus a_1 considerably narrower than a_2 (*Baicaloclepsis* LUKIN & EPSHTEIN, 1959)]. Complete somite ventrally usually 3-annulate, exceptionally 2-annulate (*Oligobdella* species). Mouth pore apical or subapical. 0—2 pairs of eyes, 5 or 6 pairs of testes and 6 or 7 pairs of gastric caeca present.

10 (15) Complete somites 2-annulate dorsally.

11 (12) Complete somites 2-annulate both dorsally and ventrally, first annulus, coalesced from annuli (a_1a_2), invariably longer than second one (a_3). Surface of body smooth, without conspicuous tubercles. 1 pair (American species) or 2 pairs of eyes (Asiatic species), 7 pairs of gastric caeca, and 5 or 6 pairs of testes present. Gonopores separated by 1 annulus. Length: 4—16 mm. Hosts: amphibians. — Type-species: *Microbdella biannulata* MOORE, 1900. Four species known. USA, Brazil, Japan, Soviet Union

14. **Oligobdella** MOORE, 1918

12 (11) Complete somites dorsally 2-annulate, ventrally 3-annulate. Body never smooth, invariably covered with numerous papillae of about equal size (in general about 15 per annulus).

13 (14) The two dorsal annuli of complete somite of different length: coalesced annulus (a_1a_2) essentially longer than annulus a_3. 2 pairs of eyes, first pair of 7 pairs of gastric caeca substantially shorter than all other ones. Length: 15—20 mm. Host: unknown. — Type-species: *Torix baicalensis* STSHEGOLEV, 1922. Monotypical. Lake Baikal

18. **Paratorix** LUKIN & EPSHTEIN, 1960

14 (13) Complete somite consisting of two equal-sized annuli on dorsal side, that is, coalesced annulus (a_1a_2) as long as annulus a_3. 1 pair of eyes present. Anatomy unknown. Length: 12 mm. Host: unknown. — Type-species: *Oligoclepsis tukubana* OKA, 1935. Monotypical. Japan

15. **Oligoclepsis** OKA, 1935

15 (10) Complete somite apparently or factually 3-annulate on dorsal side, but in latter case annulus a_1 essentially shorter than annulus a_2.

16 (17) Complete somite factually 3-annulate on dorsal side, but annulus a_1 very conspicuously shorter than annulus a_2. Dorsal side of body covered with tubercles of diverse size. 2—0 pairs of eyes and 6 pairs of gastric caeca present; of these latter, the first pair small or almost completely rudimentary. Length: 15—40 mm. Host: unknown. — Type-species: *Clepsine echinulata* GRUBE, 1871. Two species known. Lake Baikal

3. **Baicaloclepsis** LUKIN & EPSHTEIN, 1959

17 (16) Complete somite only apparently 3-annulate on dorsal side, since furrow a_1/a_2 very shallow and often hardly discernible. Surface of body with conspicuous papillae. 1 pair of eyes and 6 pairs of gastric caeca present; of these latter, the first pair strikingly elongated and connected to outer world by an opening each on both sides (at XI/XII). Length: 2—7 mm. Hosts: turtles, snails. — Type-species: *Torix mirus* BLANCHARD, 1893. Two species known. North Vietnam, China, Soviet Union (Lake Hanke)

22. **Torix** BLANCHARD, 1893

18 (9) Complete somite mostly 3-annulate and annulus a_1 never strikingly shorter than annulus a_2, or rarely 6-annulate, but in the latter case 6 pairs of gastric caeca present, mouth pore apical or subapical.

19 (20) Rings of 6-annulate complete somite on dorsal side of about equal length and their interannular furrows equally deep, whereas ventral annuli of diverse length: annulus b_3 longest and annulus b_4 shortest of all, furrow between these two also shallower and less distinct than the other furrows. Mouth pore apical. 1 pair of eyes, 2 postanal annuli and 6 pairs of testes present. Gonopores separated by 2 annuli. Anatomy unknown. Length: 36 mm. Host: unknown. — Type-species: *Desmobdella paranensis* OKA, 1930. Monotypical. Brazil

6. **Desmobdella** OKA, 1930

20 (19) Complete somite 3-annulate; rarely apparently 6- or 5-annulate (owing to secondarily more or less faintly subdivided state of all three annuli or merely annuli a_1 and a_3), then if 6 pairs of gastric caeca present (some *Helobdella* species), mouth pore not apical, but situated at base of oral sucker, if, however, mouth pore apical or subapical (some

Placobdella and *Haementeria* species), then invariably more than 6 pairs of gastric caeca present.

21 (28) At most 6 pairs of gastric caeca present; in most cases 6 pairs. Salivary glands diffuse.

22 (23) Typically 2 or 3 pairs of eyes (diverse rates of coalescence of the eye-pairs also occur, even advancing to the state when there is apparently but one pair of eyes; a careful study will, however, establish that they consist of not one but more eyes). 6 pairs of gastric caeca, 0—2 postanal annuli, 4, 5, 6 or 10 pairs of testes present. Gonopores separated by 0—2 annuli; sperm duct forming a long, simple, open loop posteriorad. Length: 3—33 mm. Hosts: aquatic invertebrates, primarily snails, crustaceans, insect larvae, worms. — Type-species: *Hirudo complanata* LINNAEUS, 1758. Eleven species known. World-wide

7. **Glossiphonia** JOHNSON, 1816

23 (22) Only one pair of eyes present.

24 (25) Mouth pore in centre on depth of oral sucker. Usually 6 pairs of gastric caeca present, seldom 5 or 4 pairs; some species with merely postcaeca (*elongata*, *similis*) or, indeed, without any gastric caeca (*michaelseni*, *obscura*). Although complete somite generally 3-annulate, rarely subdivided (*diploides*, *duplicata*, *longicollis*) and then apparently 6-annulate. Usually 6, occasionally 5, rarely 4 (*ampullariae*, *punctatolineata*), or exceptionally 7 (*michaelseni*), pairs of testes present. 0—1 postanal annulus. Gonopores separated by 1 or 2 annuli. At present a very heterogeneous genus. Length: 5—35 mm. Hosts: aquatic invertebrates, primarily insect larvae, crustaceans, snails, tadpoles. — Type-species: *Hirudo stagnalis* LINNAEUS, 1758. Twenty-eight species known. World-wide, excepting the Notogaea; most species known from the Neotropic Region

9. **Helobdella** BLANCHARD, 1896

25 (24) Mouth pore apical or subapical, that is, on anterior rim of oral sucker.

26 (27) Gonopores separated by 2 annuli. 5 pairs of gastric caeca, 5 pairs of testes, and $^1/_2$ postanal annulus present. All papillae situated on annulus a_2: in 1 median, 2 intermedian, and 2 inner paramarginal longitudinal rows each. Between these latter two, another row each, of considerably smaller papillae present, joined also by two outer paramarginally located rows of equally small papillae. Length: about 10 mm. Hosts: aquatic snails. — Type-species: *Glossiphonia socimulcensis* CABALLERO, 1931. Monotypical. Mexico

13. **Oculobdella** AUTRUM, 1936

27 (26) Both male and female gonopores uniting in a common bursal pore, whereas anterior end of each ovisac terminating in a short duct open-

ing separately into a very peculiar common vaginal pouch. This latter receiving oviducts on each side and then tapering by a small pore into bursa. 5 pairs of testes and 1—2 postanal annuli present. Body smooth, not papillated. Length: 4—22 mm. Host: unknown. — Type-species: *Oculobdella lucida* MOORE, 1954. Monotypical. Canada

12. **Marvinmeyeria** gen. n.

28 (27) At least 7 pairs of gastric caeca present.

29 (36) 7 pairs of gastric caeca present.

30 (33) Mouth pore situated centrally on depth of oral sucker.

31 (32) Dorsal side with 4 conspicuous pairs of longitudinal rows of papillae; 3 pairs of them (members of inner paramedian, and inner and outer paramarginal rows) situated on annulus a_2, 1 pair (outer paramedian rows) on annulus a_3. Typically with 3, only seldom with 2, pairs of eyes, but diverse variations may occur depending on their rate of coalescence. Gonopores separated by 2 annuli. Body soft. 1 postanal annulus present. Anatomy unknown. Length: 20—40 mm. Hosts: snails. — Type-species: *Clepsine verrucata* FR. MÜLLER, 1844. Monotypical. North and Central Europe, Siberia

5. **Boreobdella** JOHANSSON, 1929

32 (31) Dorsal side often smooth or covered merely with quite minute and hardly discernible papillae; if, rarely, more robustly developed (*tricarinata*), then arranged in at most 3 longitudinal lines on annulus a_2; annulus a_3 never with papillae. 1 or 2 pairs, exceptionally (*hardingi*, *cancricola*) 3 pairs, of eyes, 0—2 postanal annuli, and 6 pairs of testes present. Salivary glands diffuse, rarely compact. Length: 3—21 mm. Hosts: mollusks, crustaceans, fish, amphibians. — Type-species: *Glossiphonia algira* MOQUIN-TANDON, 1846. Sixteen species known. World-wide but heretofore unknown form the Notogaea

4. **Batracobdella** VIGUIER, 1879

33 (30) Mouth pore apical or subapical, that is, on anterior rim of oral sucker.

34 (35) 0—1 pair of eyes present. Annuli a_1 and a_3 of triannulate complete somite eventually secondarily more or less divided on ventral side. Gonopores separated by 2 annuli. 1—2 postanal annuli and 6, exceptionally 5, pairs of testes present. Epididymis very often a tight mass. Arrangement, evolvement, and form of tubercles highly variable. Body at rest very broad and flat. At present an unacceptably heterogeneous genus. Length: 5—70 mm. Hosts: amphibians and reptiles. — Type-species: *Clepsine costata* FR. MÜLLER, 1846. Thirtyone species known. World-wide

19. **Placobdella** BLANCHARD, 1893 (emend. AUTRUM, 1936)

35 (34) 2—3 pairs of eyes present. Gonopores separated by 2 annuli; 0—1 postanal ring and 6 pairs of testes present. Number and arrangement of papillae highly diverse per species. 1 or 2 pairs of compact salivary glands (except *garoui*). A sperm duct forming a posteriorly decurrent, Glossiphonid-like loop. Length: 5—25 mm. Hosts: amphibians and reptiles. — Type-species: *Placobdella quadrioculata* MOORE, 1930. Five species known. Ethiopian Region, Ceylon, India, China

16. **Parabdella** AUTRUM, 1936

36 (29) Invariably more than 7 pairs of gastric caeca present.

37 (38) 4 pairs of eyes present, situated along inner paramedian lines. Proboscis short, extending posteriorad only to somite VII. Mouth pore situated centrally on depth of oral sucker. 8—12 pairs of gastric caeca present. Gonopores separated by 2, 4, or 5 annuli. Body soft, except when distended with eggs. Length: 5—40 mm. Hosts: reptiles, birds, mammals. — Type-species: *Hirudo tessulata* O. F. MÜLLER, 1774. Eleven species known. World-wide, excepting the Notogaea

21. **Theromyzon** PHILIPPI, 1867

38 (37) 1—3 pairs of eyes present; proboscis extending posteriorad invariably beyond somite VII.

39 (40) 1 pair of eyes and 10 pairs of gastric caeca present. Annuli a_1 and a_3 of complete somites nearly always divided ventrally but only rarely dorsally. Gonopores separated by 2 annuli. Length: 5—250 mm (the typical species of the genus is the longest of all recently living leeches, in an extended state reaching even 50 cm!). Hosts: homoiothermic vertebrates, also man. — Type-species: *Haementeria ghilianii* DE FILIPPI, 1849. Five species known. Neotropic Region, Mexico

8. **Haementeria** DE FILIPPI, 1849

40 (39) 2—3 pairs of eyes present.

41 (42) Mouth pore situated centrally on depth of oral sucker (excepting *japonica* OKA, but this species has merely 2 pairs of eyes). 2 or 3 pairs of eyes, mostly 9, or exceptionally (*marginata* O. F. MÜLLER) 10—11 pairs of gastric caeca, $^1/_2$—2 postanal annuli, and 6, exceptionally (*marginata*) 10 pairs of testes, present. Gonopores separated by 2, exceptionally (*bhatiai* BAUGH) $1\,^1/_2$ annuli. Length: 5—30 mm. Hosts: fish, amphibians, rarely mollusks. — Type-species: *Hirudo marginata* O. F. MÜLLER, 1774. Four species known. Palaearctic Region, India, Kashmir, Japan, Sumatra

10. **Hemiclepsis** VEJDOVSKÝ, 1884

42 (41) Mouth pore apical or subapical, on anterior rim of oral sucker. 3 pairs of eyes, 9 pairs of gastric caeca, 1 postanal annulus, and 6 pairs of testes present. Gonopores separated by 2 annuli. Length: 10—20 mm. Hosts: turtles, freshwater crustaceans. — Type-species: *Paraclepsis praedatrix* HARDING, 1924. Two species known. India, Thailand
17. **Paraclepsis** HARDING, 1924

III. Catalogue of the Species[1,2]

Familia: GLOSSIPHONIIDAE

1. genus: **Actinobdella** MOORE, 1901

MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5,** p. 504. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 99. — MOORE (1924): Publ. Ontario Fish. Res. Labor., No. **23,** p. 26—27. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 88.

Type-species: *Actinobdella inequiannulata* MOORE, 1901

1. **annectens** MOORE (1906): Bull. Bur. Fish., **25,** p. 160—162, Figs. 1—2. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 90, Fig. 57. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 5.
Distribution: Canada.

2. **inequiannulata** MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5,** p. 504—508, Pl. XLIII, Figs. 8—11. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 99—102, Pl. III, Figs. 19—20. — MILLER (1929): Ohio State Univ., F. T. Stone Labor., Columbus, Contr. Nr. **2,** p. 22—23. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 89, Figs. 56a—b. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 5.
Distribution: U. S. A.

3. **triannulata** MOORE (1924): Publ. Ontario Fish. Res. Labor., No. **23,** p. 23—27, Fig. 1. — RAWSON (1930): Publ. Ontario Fish. Res. Labor., No. **40,** p. 35. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 88—89. — MEYER & MOORE (1954): Wasmann Journ. Biol., **12,** p. 66—67. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 6.
Distribution: Canada.

[1] Similarly to the preceding ones, also this Catalogue fails to comprise the entire literature referring to the given species; indeed, not all species mentioned in the same paper are in several cases listed in the Catalogue.

[2] Subsequently to the dispatch of my MS to the printer's office, I received two recent and most valuable comprehensive papers, containing the descriptions of even new taxa; I was thus unable to incorporate their data into the Catalogue.
They are:

PAWLOWSKI, L. K. (1968): Hirudinea. in: Catalogus faunae Poloniae. — Warszawa, **11** (3), p. 1—94.

SKET, B. (1968): Zur Kenntnis der Egel-Fauna (Hirudinea) Jugoslawien. — Acad. Sci. Art. Slovenica, Cl. IV, Pars Historiconaturales, Dissertationes, **11** (4), p. 127—178.

Professor PAWLOWSKI's work is a comprehensive revision of all recorded hirudinological data and literature from Poland. SKET's work publishes the revision and distributional data of leeches known from Yugoslavia, and presents also the description of 1 new species and 7 new subspecies. One of them belongs to the family Glossiphoniidae, namely *Glossiphonia complanata maculosa* ssp. n. (p. 132—133, 162, Figs. 1—2).

2. genus: **Ancyrobdella** OKA, 1917

OKA (1917): Annot. Zool. Jap., **9**, p. 192—193. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 31—32.

Type-species: *Ancyrobdella biwae* OKA, 1917

1. **biwae** OKA (1917): Annot. Zool. Jap., **9**, p. 185—193, Fig. 1. — OKA (1917): Mem. Asiat. Soc. Bengal, **6**, p. 169—174, Pl. VII, Figs. 9—12. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 32, Figs. 19—20.
Distribution: Japan (Lake Biwa).

3. genus: **Baicaloclepsis** LUKIN & EPSHTEIN, 1959

LUKIN & EPSHTEIN (1959): The 10th conference of the problems of parasitology and natural-nidus diseases. Moscow, **2**, p. 189. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk S.S.S.R., **131**, p. 457. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk S.S.S.R., **134**, p. 478—479. — KOZHOV (1963): Lake Baikal and its life, The Hague, p. 90.

Type-species: *Clepsine echinulata* GRUBE, 1871

1. **echinulata** (GRUBE, 1871): Arch. f. Naturg., **37**, p. 110—112, Pl. IV, Figs. 2, 2a—b (*Clepsine*). — BLANCHARD (1893): Bull. Soc. Zool. France, **18**, p. 93—94 (*Placobdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 91—92 (*Clepsine*). — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk S.S.S.R., **131**, p. 458—459, Figs. 1b, 3b.
Distribution: Lake Baikal.

2. **grubei** LUKIN & EPSHTEIN (1959): The 10th conference on the problems of parasitology and natural-nidus diseases. Moscow, **2**, p. 189. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk S.S.S.R., **131**, p. 458, Figs. 1a, 2, 3a.
Distribution: Lake Baikal.

4. genus: **Batracobdella** VIGUIER, 1879

VIGUIER (1879): C. R. Acad. Sci. Paris, **89**, p. 110—112. — BLANCHARD (1888): Dict. enc. Sci. Méd. (4) **14**, p. 135—136. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 107—108. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 36. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 181. — MANN (1953): Proc. Zool. Soc. London, **123**, p. 381. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 90. — PAWLOWSKI (1963): Zesz. Nauk. Univ. Łódz., Nauki Matem.-Przyrod. Ser. II, No. **14**, p. 102—103, 109—110. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59**, p. 244.

SYNONYMY:

Batrachobdella VIGUIER (1879) (nec CABALLERO, 1931): Ann. Mag. Nat. Hist., (5) **4**, p. 250—251.
Clepsine SAVIGNY (1822) (partim): Système des Annelides. Paris, **1** (3), p. 107, 118.
Clepsinides AUGENER (1926): Zool. Anz., **68**, p. 244—246.
Dundjibdella SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32**, p. 353. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 51.

Type-species: *Glossiphonia algira* MOQUIN-TANDON, 1846

1. **algira** (MOQUIN-TANDON, 1846): Monographie de la famille des Hirudinées. Paris, p. 364—366, Pl. XIII, Figs. 10—15 (*Glossiphonia*). — DIESING (1850): Systema Helminthum. Vindobonae, **1**, p. 449—450 (*Clepsine*). — BLANCHARD (1893): Ann. Soc. Españ. Hist. Nat., **22**, p. 247—252, Figs. 1—4 (*Glossiphonia*). — WOLTERSTORFF (1900): Zool. Anz., **23**, p. 23—27 (*Glossosiphonia*). — KOWALEWSKI (1900): Mém. Soc. Zool. France, **13**, p. 66—88, Pls. III—V, Figs. 1—35 (*Helobdella*). — PLOTNIKOV (1907): Ann. Mus.

Zool. Acad. Imp. Sci. St.-Pétersb., **10,** p. 137 (*Glossosiphonia*). — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 274—275, Figs. 12—13 (*Helobdella*). — JOHANSSON (1926): Mitt. Zool. Mus. Berlin, **12,** p. 228—231 (*Batrachobdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 36—37, Fig. 25. — MOORE (1944): Ann. Mag. Nat. Hist., (11) **11,** p. 183—185. — LUKIN & EPSHTEIN (1960): Zool. Journ. Moscow, **39,** p. 1429. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 93—95, Figs. 58—59 (*Batrachobdella*). — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 248, Figs. 4, 22, 27.

= *latasti* VIGUIER (1879): C. R. Acad. Sci. Paris, **89,** p. 110—112. — VIGUIER (1879): Ann. Mag. Nat. Hist., (5) **4,** p. 250—251 (*Batrachobdella*). — VIGUIER (1880): Arch. Zool. exp. gén., **8,** p. 373—390, Pl. 29—30.

= *schottlaenderi* JOHANSSON (1926): Mitt. Zool. Mus. Berlin, **12,** p. 228 (*Placobdella*) nom. nudum.

Distribution: North Africa, Portugal, Spain, Balearean Islands, Corsica, Crimean Peninsula.

2. **amnicola** MOORE (1958): Ann. Natal Mus., **14,** p. 313—316, Pl. VII, Figs. 5—7. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 248—249, Figs. 4, 23, 28. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 6 (*Batrachobdella*).
Distribution: Natal.

3. **cancricola** (OKA, 1928): Proc. Imp. Acad. Tokyo, **4,** p. 607—608, Figs. A—B (*Hemiclepsis*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 43. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 245, Figs. 2, 8, 15.
Distribution: China.

4. **dubia** RINGUELET (1958): Acta Zool. Lilloana, **15,** p. 121—126, Figs. 1—6. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 246, Figs. 3, 10, 16. — RINGUELET (1968): Physis, **27,** p. 377.
Distribution: Argentina.

5. **gemmata** (BLANCHARD, 1900): Ergebn. Hamb. Magalhaens. Sammelreise 1892/93. Hamburg, **3** (3), p. 11—12, Figs. IVa—b (*Helobdella*). — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 31—32, Pl. I, Fig. 5 (*Helobdella*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 838—839, Fig. 29 (*Helobdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 17 (*Helobdella*). — RINGUELET (1942): Not. Mus. La Plata, **7,** Zool. No. 59, p. 223. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 182. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 51—55, Figs. 25—26. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 249, Figs. 4, 24, 39.
Distribution: Chile, Argentina, Uruguay.

6. **hardingi** BAUGH (1960): Parasitology, **50,** p. 295—298, Figs. 5a—b. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 244, Figs. 1, 7, 13.
Distribution: India.

7. **lobata** (BHATIA, 1934): Ann. Parasit. hum. et comp., **12,** p. 121—129, Figs. 1—4 (*Glossiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 40—41. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 249, Figs. 35, 38, 42.
Distribution: India.

8. **magnidiscus** (MOORE, 1938): Publ. Carnegie Inst., No. **491,** p. 68—70, Figs. 1—2 (*Glossiphonia*). — RINGUELET (1949): Not. Mus. La Plata, **14,** Zool. No. 122, p. 144. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 248, Figs. 4, 21, 29. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 7 (*Glossiphonia*).
Distribution: Mexico, Guatemala.

9. **mahabiri** BAUGH (1960): Zool. Anz., **165,** p. 468—472, Figs. 1a—b, 2a—d. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 247, Figs. 4, 19, 25.
Distribution: India.

10. **nilotica** (JOHANSSON, 1909): Zool. Anz., **35,** p. 152—154 (*Clepsine*). — JOHANSSON (1913): Res. Swedish Zool. Exp. Egypt and the White Nile 1901, Pt. 5, No. **24,** p. 17—23, Fig. 6, Pl, Figs. 7—8 (*Clepsine*). — MOORE (1933): Journ. Linn. Soc. London, **38,** p. 299 (*Glossiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 39—40, Figs. 28—29. — MOORE (1944): Ann. Mag. Nat. Hist., (11) **11,** p. 185—186. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 12—13, 45, 52—53, Figs. 2—3. — SCIACCHITANO (1954): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 4, Miscell. Zool., **1,** p. 279. — MOORE (1958): Ann. Natal Mus., **14,** p. 312—313, Pl. VIII, Fig. 16 (*Batrachobdella*). — SCIACCHITANO (1959): South African Animal Life, **6,** p. 8—9. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 252—253. — SOÓS (1967): Ann. Hist.-Nat. Mus. Nat. Hung., **59,** p. 250, Figs. 4, 36, 43.

= *dartevellei* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 355, Fig. 8 (*Dundjibdella*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 52.

= *rubra* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 354—355, Fig. 7 (*Dundjibdella*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 52.

= *trilineata* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 356 (*Dundjibdella*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 52.

Distribution: Sudan, East, Central and South Africa.

11. **nuda** (MOORE, 1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 354—357, Pl. XIX, Figs. 3—4, Pl. XXI, Figs. 20—23 [*Glossiphonia* (*Helobdella*)]. — MOORE (1930): Proc. Acad Nat. Sci. Philadelphia, **82,** p. 175—176 [*Glossiphonia* (*Helobdella*)]. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 42. — LUKIN (1960): Zool. Journ. Moscow, **39,** p. 41, Fig. 1 (*Helobdella*). — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 247, Figs. 3, 12, 17. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 8 [*Glossiphonia* (*Helobdella*)].

Distribution: China, Amur Basin.

12. **quadrata** MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 304—306, Pl. 26, Fig. 20. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 45, 51—52. — SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61,** p. 288. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 246—247, Figs. 2, 11, 18. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 6.

= *bomensis* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 356—357, Figs. 10—11 (*Dundjibdella*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 51.

= *bomensis* var. *grisea* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 357 (*Dundjibdella*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 52.

Distribution: Ethiopia, Congo.

13. **paludosa** (CARENA, 1824): Mem. Real. Accad. Sci. Torino, **28,** p. 331—334 (*Hirudo*). — MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées. Montpellier, p. 103—105, Pl. IV, Fig. 3 (*Clepsine*). — DE BLAINVILLE (1828): Dict. Sci. Nat. Paris, **57,** p. 565 (*Glossobdella*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 371—373, Pl. XIV, Figs. 2—4 (*Glossiphonia*). — DIESING (1850): Systema Helminthum. Vindobonae, **1,** p. 452 (*Clepsine*). — ÖRLEY (1886): Mathem. term.-tud. Közlem., **22** (2), p. 104 (*Clepsine*). — APÁTHY (1888): Zool. Jahrb. Syst., **3,** p. 773—774 (*Clepsine*). — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 146, p. 2—3 (*Glossiphonia*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 30—31 (*Glossosiphonia*). — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13,** p. 75—76, Fig. 130 (*Glossosiphonia*). — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 272, Fig. 10 (*Glossosiphonia*). — GEDROYĆ (1915): Rozpr. Wiad. Muz. im. Dzied., Lwow, **2,** p. 48—50, Figs. 12A—C (*Glossosiphonia*). — DEQUAL (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31,** No. 713, p. 2—3 (*Glossosiphonia*). — AUGENER (1926): Zool. Anz., **68,** p. 244—246 (*Clepsinides*). — JOHANSSON (1929): Hirudinea. in DAHL: Die

Tierwelt Deutschlands, T. **15,** p. 144, Figs. 21a—f (*Batrachobdella*). — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 108—110, Figs. 75—76 (*Batrachobdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 38—39, Figs. 26A—B, 27. — PAWLOWSKI (1938): Arch. Hidrobiol. Ichtyol. Suwalki, **11,** p. 48—49 (*Batrachobdella*). — BENNIKE (1943): Fol. Limnol. Scand., No. **2,** p. 66—67, 76—77, Figs. 12C, 28I (*Batrachobdella*). — PAWLOWSKI (1948): Fragm. Faun. Mus. Zool. Polon., **5,** No. 20, p. 327—329, Figs. 1a—c. — SANDNER (1951): Acta Zool. Oecol. Univ. Lódz, No. **4,** p. 34. — MANN (1953): Proc. Zool. Soc. London, **123,** p. 381—383, 389—390, Figs. 12—16. — MANN (1955): Journ. Anim. Ecol., **24,** p. 133. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 7—8, Figs. 6, 18. — WOJTAS (1959): Soc. Sci. Lodz., Sect. III. No. **58,** p. 52—53, Fig. 18. — SCIACCHITANO (1960): Libro Homenaje al Doctor Eduardo Caballero y Caballero, 1930—1960, No. **24,** p. 533—534. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 158. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 90—93, Figs. 54—57. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 249, Figs. 4, 6, 30—34, 41.

= *geei* OKA (1926): Annot. Zool. Jap., **11,** p. 59—62, Figs. 1—2 (*Hemiclepsis*).

= *smaragdina* OKA (1910): Annot. Zool. Jap., **7,** p. 167—168 (*Glossiphonia*). — OKA (1917): Mem. Asiat. Soc. Bengal, **6,** p. 166—167 (*Glossiphonia*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 353—354 (*Glossiphonia*). — OKA (1928): Proc. Imp. Acad. Tokyo, **4,** p. 543—545, Figs. 1A—B (*Glossiphonia*). — MOORE (1930): Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 174—175 (*Glossiphonia*).

= *succinea* DE FILIPPI (1837): Memoria sugli Anellidi della famiglia delle Sanguisughe. Milano, p. 28 (*Clepsine*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 386 (*Glossiphonia*).

Distribution: Europe, Afghanistan, China, Japan, North America.

14. **reticulata** (KABURAKI, 1921): Rec. Ind. Mus., **22,** p. 700—701, Fig. 2 (*Glossosiphonia*). — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 65—66, Fig. 25 (*Glossiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 41—42, Fig. 30. — MOORE (1938): Bull. Raffles Mus., **14,** p. 64—65. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 248, Figs. 4, 20, 26.
Distribution: India, Malay Peninsula.

15. **singularis** (OKA, 1931): Proc. Imp. Acad. Tokyo, **7,** p. 121—123, Figs. A—C (*Hemiclepsis*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 42—43, Fig. 31. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 244, Figs. 1, 9, 14.
Distribution: China.

16. **tricarinata** (BLANCHARD, 1897): Hirudineen. in MÖBIUS: Die Thierwelt Ost-Afrikas, **4,** Lief. 2, No. 13, p. 4—5, Pl. Figs. 2a—c, 3 (*Helobdella*). — MOORE (1933): Journ. Linn. Soc. London, **38,** p. 299 (*Glossiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 18—19, Fig. 13 (*Helobdella*). — AUGENER (1936): SB. Ges. naturf. Fr. Berlin, Jahrg. **1935,** p. 391—392 (*Helobdella*). — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 302—304, Pl. 26, Fig. 19. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 10—12, 45, 51. — SCIACCHITANO (1957): Rev. Zool. Bot. Afr., **56,** p. 374. — SCIACCHITANO (1959): South African Animal Life, **6,** p. 8. — SCIACCHITANO (1961): Publ. Cult. Co. Diam., Angola, Lisboa, No. **52,** p. 109—110, Figs. 1—2. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176. — SCIACCHITANO (1965): Rev. Zool. Bot. Afr., **71,** p. 30. — SOÓS (1967): Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 250, Figs. 37, 40.

= *plurilineata* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 355—356, Fig. 9 (*Dundjibdella*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 51.

= *triserialis* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 353—354, Fig. 6 (*Dundjibdella*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 51.

Distribution: South, Central and East Africa.

SPECIES INQUIRENDAE:

1. *amudarjensis* (MOLTSCHANOV, 1914): Ann. Mus. Zool. Acad. Imp. Sci. St.-Pétersb., **18,** p. 145—147, Figs. 1—2 (*Glossosiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 44.
Distribution: Turkestan.
2. *kasmiana* (OKA, 1910): Annot. Zool. Jap., **7,** p. 169 (*Hemiclepsis*). — OKA (1917): Mem. Asiat. Soc. Bengal, **6,** p. 167 (*Hemiclepsis*). — OKA (1928): Proc. Imp. Acad. Tokyo, **4,** p. 64—66, Figs. A—C (*Hemiclepsis*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 37—38.
Distribution: Japan, China.
3. *windhukensis* (AUGENER, 1936): SB. Ges. naturf. Fr. Berlin, Jahrg. **1935,** p. 389—390, Fig. 2 (*Clepsinides*).
Distribution: Southwest Africa.

5. genus: **Boreobdella** JOHANSSON, 1929

JOHANSSON (1929): Hirudinea. in DAHL: Die Tierwelt Deutschlands, T. **15,** p. 142. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 111. — MANN (1953): Proc. Zool. Soc. London, **123,** p. 383. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 95. — PAWLOWSKI (1963): Zesz. Nauk. Univ. Lódz., Nauki Matem.-Przyrod. Ser. II, No. 14, p. 102—103, 109.

Type-species: *Clepsine verrucata* FR. MÜLLER, 1844

1. **verrucata** (FR. MÜLLER, 1844): De Hirudinibus circa Berolinum hucusque observantis. Diss. Berlin, p. 23—25 (*Clepsine*). — JOHNSTON (1865): A Catalogue of the British Non-parasitical Worms in the Collection of the British Museum. London, p. 51 (*Glossiphonia*). — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13,** p. 74 (*Glossosiphonia*). — GEDROYĆ (1915): Rozpr. Wiad. Muz. im. Dzied., Lwow, **2,** p. 42—43, Figs. 9A—E (as variety of *Glossosiphonia complanata*). — JOHANSSON (1929): Hirudinea. in DAHL: Die Tierwelt Deutschlands, T. **15,** p. 144, Fig. 22. — PAWLOWSKI (1936): Arch. Hydrobiol. Ichtyol. Suwalki, **10,** p. 11—15, Fig. 2, Pl. I, Figs. 3—6. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 111—115, Figs. 77—78. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 43—44, Fig. 32 (*Batracobdella*). — BENNIKE (1943): Fol. Limnol. Scand., No. **2,** p. 73—76, Figs. 14—15A—B, 28H. — VERRIEST (1950): Biol. Jaarb. Dodonaea, **17,** p. 205—206, 226, Fig. 10 (*Batracobdella*). — MANN (1953): Proc. Zool. Soc. London, **123,** p. 383—384, Figs. 17, 22. — MANN (1954): Freshwater Biol. Ass., Sci. Publ. No. **14,** p. 13, 19, Figs. 19, 25. — LUKIN (1956): Zool. Journ. Moscow, **35,** p. 1417—1419. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 8, Figs. 19—21 (*Batracobdella*). — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 157—158, Fig. 10 (*Batracobdella*). — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 95—99, Figs. 60—62.

= *octoserialis* STSHEGOLEV (1922): Arb. Biol. Wolgastat., **6,** p. 233—240, Fig. 1 (*Glossosiphonia*). — BEHNING (1924): Monogr. Biol. Wolgastat., Saratov, No. 1, p. 168—169 (*Glossosiphonia*) — LUKIN (1929): Trav. Soc. Nat. Kharkov, **52,** p. 51—56. — MANNSFELD (1934): Korr.-bl. Naturf.-Ver. Riga, **61,** p. 160 (*Glossosiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 9 (*Glossiphonia*). — PAWLOWSKI (1936): Ann. Mus. Zool. Polon., **11,** p. 339—345, Fig. 1.

Distribution: Europe, except South Europe.

6. genus: **Desmobdella** OKA, 1930

OKA (1930): Proc. Imp. Acad. Tokyo, **6,** p. 239. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 56. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 184.

Type-species: *Desmobdella paranensis* OKA, 1930

1. **paranensis** OKA (1930): Proc. Imp. Acad. Tokyo, **6,** p. 239—242, Figs. A—B. — OKA (1932): Ann. Mus. Zool. Polon., **9,** 319—322, Pl. XLIV, Figs. 2A—B. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 56, Fig. 39. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 184.
Distribution: Brasil.

7. genus: **Glossiphonia** JOHNSON, 1816

JOHNSON (1816): A Treatise on the medicinal Leech. London, p. 25. — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 352—353. — BLANCHARD (1888): Dict. enc. Sci. Méd., (4) **14,** p. 135. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Ser. Zool., No. **5,** p. 75. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 122. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 6—7. — MANN (1953): Proc. Zool. Soc. London, **123,** p. 377—378. — HOFFMANN (1955): Arch. Inst. Grand-Ducal Luxemb., (N. S.) **22,** p. 194. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 6. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 99. — SOÓS (1966): Ann. Hist.-nat. Mus. Nat. Hung., **58,** p. 271—272.

SYNONYMY:

Clepsina (error) DE FILIPPI (1837): Memoria sugli Anellidi della famiglia delle Sanguisughe. Milano, p. 6.
Clepsine SAVIGNY (1822) (partim): Système des Annelides. Paris, **1** (3), p. 107, 118.
Glossobdella DE BLAINVILLE (1827): Dict. Sci. Nat. Paris, **47,** p. 267. — DE BLAINVILLE (1828): Dict. Sci. Nat. Paris, **57,** p. 565.
Glossopora JOHNSON (1817): Philos. Trans. R. Soc., London, **1817,** p. 21. — DE BLAINVILLE (1818) (partim): in LAMARCK: Histoire naturelle des animaux sans Vertèbres, Paris, **5,** p. 296.
Glossosiphonia BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 24—25. — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13,** p. 73. — HARDING (1910): Parasitology, **3,** p. 154. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 269. — GEDROYĆ (1915): Rozpr. Wiad. Muz. im. Dzied., Lwow, **2,** p. 38—39. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 903.

Type-species: *Hirudo complanata* LINNEAUS, 1758

1. **annandalei** OKA (1922): Rec. Ind. Mus., **24,** p. 527—529, Figs. 3a—c, 4. — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 350. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 65—68, Figs. 26a—c. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 10, Fig. 8. — PAWLOWSKI (1958): Bull. Soc. Sci. Lettr. Lódz, Cl. III., 9, No. 11, p. 3—4, Figs. 2—3.
Distribution: India.

2. **australiensis** GODDARD (1908): Proc. Linn. Soc. N. S. Wales, **33,** p. 322—337, Figs. 1—8. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 14—15. — INGRAM (1957): Pap. Proc. R. Soc. Tasmania, **91,** p. 211, 225—227, Figs. 50—54. — RICHARDSON (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 232—233.
Distribution: Australia, Tasmania.

3. **complanata** (LINNEAUS, 1758): Syst. Nat., ed. 10, p. 650 (*Hirudo*). — BLANCHARD (1892): Bull. Soc. Zool. France, **17,** p. 178—182, Figs. 1—2. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 27—30, Figs. 2—3 (*Glossosiphonia*). — HARDING (1910): Parasitology, **3,** p. 158—161, Figs. 9—10, Pl. XIV, Figs. 22—27 (colored) (*Glossosiphonia*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 348—350. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 57—60, Figs. 21—22. — MILLER (1929): Ohio State Univ., F. T. Stone Labor., Columbus, Contr. No. **2,** p. 17—18. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 122—126,

Figs. 84—86. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 7—9, Figs. 5—6. — MEYER (1937): Canad. Field-Nat., **51,** p. 118. — MEYER (1937): Ohio Journ. Sci., **37,** p. 249. — BENNIKE (1943): Fol. Limnol. Scand., No. **2,** p. 66—68, Figs. 12A—B, 28A. — MANN (1953): Proc. Zool. Soc. London, **123,** p. 378—379, 388—389, Figs. 1, 21. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 6—7, Figs. 1, 14—15, 21. — WOJTAS (1959): Soc. Sci. Lodz., Sect. III, p. 53—54. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 99—101, Fig. 63.

= *cimiciformis* BAIRD (1869): Proc. Zool. Soc. London, **1869,** p. 317—318 (*Glossiphonia*)
= *crenata* KIRBY (1794): Trans. Linn. Soc. London, **2,** p. 318—319, Pl. 29 (*Hirudo*).
= *elegans* VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 132, Fig. 3b (*Clepsine*).
= *elegans* CASTLE (1900) (nec VERRILL, 1872): Bull. Mus. comp. Zoöl., Harvard, **36,** p. 46—50, Pl. 2, Fig. 5, Pl. 3, Fig. 11, Pl. 7, Figs. 28—31 (*Glossiphonia*).
= *pallida* VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 131, Fig. 3a (*Clepsine*).
= *patelliformis* NICHOLSON (1873): Canad. Journ., **13,** p. 493 (*Clepsine*).
= *sabariensis* ÖRLEY (1886): Mathem. term.-tud. Közlem., **22** (2), p. 101 (*Clepsine*). — APÁTHY (1888): Zool. Jahrb. Syst., **3,** p. 772 (*Clepsine*).
= *sexoculata* BERGMANN (1757): Kongl. Vetensk. Akad. Handl., **18,** p. 313, Pl. VI, Figs. 12—13 (*Hirudo*).
= *tuberculata* JOHNSON (1817): Philos. Trans. R. Soc. London, **1817,** p. 346, Pl. XVII, Figs. 1—10 (*Glossopora*).
Distribution: Holarctic Region, Congo, ? Argentina.

3a. **complanata mollissima** MOORE (1898): Proc. U. S. Nat. Mus. Washington, **21,** p. 547—548, Pl. XL, Fig. 2. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 923—924, Fig. 23. — MOORE & MEYER (1951): Wasmann Journ. Biol., **9,** p. 59.
Distribution: Bering and Kodiak Islands.

3b. **complanata nebulosa** KALBE (1964): Mitt. Zool. Mus. Berlin, **40** p. 141—144, Eigs. 1—3.
Distribution: Germany.

3c. var. **concolor** (APÁTHY, 1888): Zool. Jahrb. Syst., **3,** p. 770—771, 790—791 (*Clepsine*). — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 126—128, Fig. 87 (f. *concolor*). — BENNIKE (1943): Fol. Limnol. Scand., No. **2,** p. 66, Figs. 28B—D (subsp. *concolor*). — VERRIEST (1950): Biol. Jaarb. Dodonaea, **17,** p. 233, Fig. 14 (subsp. *concolor*). — MANN (1953): Proc. Zool. Soc. London, **123,** p. 379, 388—389, Figs. 2—4 (f. *concolor*). — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 7 (f. *concolor*). — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 102—104, Fig. 64 (colored) (distinct species).
Distribution: Europe.

4. **cruciata** BHATIA (1930): Ann. Parasit. hum. comp., **8,** p. 344—348, Figs. 1—2. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 11, Fig. 9.
Distribution: India.

5. **disjuncta** MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 299—300, Pl. 25, Fig. 1. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 9—10, 45, 48, Fig. 1. — SCIACCHITANO (1959): South African Animal Life, **6,** p. 7. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 175. — SCIACCHITANO (1967): Journ. Nat. Hist., **1,** p. 189. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 7.

= ? *namaquaensis* AUGENER (1936): SB. Ges. naturf. Fr. Berlin, Jahrg. **1935,** p. 388—389.
Distribution: Ethiopian Region.

6. **heteroclita** (LINNAEUS, 1761): Fauna Suecia, ed. 2, No. 2085, p. 364 (*Hirudo*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 26—27 (*Glossosiphonia*). — HARDING (1910): Parasitology, **3,** p. 155—158, Fig. 7, Pl. XIV, Figs. 18—21 (colored) (*Glossosiphonia*). — RYERSON (1915): Contr. Canad. Biol., 1911—

1914, Fasc. **2**, p. 168. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 60—62, Fig. 23. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 128—129, Fig. 88. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 11—12, Figs. 10a—d. — BENNIKE (1943): Fol. Limnol. Scand., No. **2**, p. 68—71, Fig. 13. — MANN (1953): Proc. Zool. Soc. London, **123**, p. 379—381, 389. — INGRAM (1957): Pap. Proc. R. Soc. Tasmania, **91**, p. 221, 224. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 7, Figs. 16a—d. — PAWLOWSKI (1958): Bull. Soc. Sci. Lettr. Lódz, Cl. III. **9**, No. 11, p. 5—6, Fig. 4. — WOJTAS (1959): Soc. Sci. Lodz., Sect. III, p. 55. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 104—107, Figs. 65—67. — RICHARDSON (1968): Proc. Linn. Soc. N. S. Wales, **92**, p. 233.

= *arcuata* MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 384.
= *carenae* MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées. Montpellier, p. 105, Pl. IV, Fig. 4 (*Clepsine*).
= *polonica* LINDENFELD & PIETRUSZYNSKI (1890): Pam. Fizyjograf., **10**, p. 423—426, Fig. M, Pl. XIV, Figs. 25a—b (colored) (*Clepsine*). — BLANCHARD (1899): Bull. Soc. Zool. France, **24**, p. 183 (*Clepsine*).
= *trioculata* CARENA (1820): Mem. Real. Accad. Sci. Torino, **25**, p. 303—306, Pl. 12, Fig. 22 (*Hirudo*).
Distribution: Holarctic Region, India, Central and East Africa.

6a. var. **hyalina** (O. F. MÜLLER, 1774): Vermium terrestrium et fluviatilum. Havniae et Lipsiae, **1** (2), p. 49—51 (*Hirudo*). — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 130, Fig. 89. — BENNIKE (1943): Fol. Limnol. Scand., No. **2**, p. 98, Fig. 28E. — VERRIEST (1950): Biol. Jaarb. Dodonaea, **17**, p. 230, Fig. 15. — MANN (1953): Proc. Zool. Soc. London, **123**, p. 381, Figs. 5—6, 10. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 7.
Distribution: Europe.

6b. var. **papillosa** (BRAUN, 1805): Systematische Beschreibung einiger Egelarten. Berlin, p. 64—66, Pl. 7, Figs. 7—10 (colored) (*Hirudo*). — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 130—131, Fig. 90. — BENNIKE (1943): Fol. Limnol. Scand., No. **2**, p. 98, Fig. 28F. — VERRIEST (1950): Biol. Jaarb. Dodonaea, **17**, p. 231, Fig. 16. — MANN (1953): Proc. Zool. Soc. London, **123**, p. 381, Figs. 7—9, 11. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 7, Fig. 16b.
Distribution: Europe.

6c. var. **striata** (APÁTHY, 1888): Zool. Jahrb. Syst., **3**, p. 772—773, 790 (*Clepsine*). — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 131, Fig. 91. — VERRIEST (1950): Biol. Jaarb. Dodonaea, **17**, p. 231. — MANN (1953): Proc. Zool. Soc. London, **123**, p. 381. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 7.
Distribution: Europe.

7. **intermedia** GODDARD (1909): Proc. Linn. Soc. N. S. Wales, **34**, p. 468—475, Pl. XLV, Figs. 1, 6, Pl. XLVI, Figs. 8—9, 11. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 15—16. — INGRAM (1957): Pap. Proc. R. Soc. Tasmania, **91**, p. 221. — RICHARDSON (1968): Proc. Linn. Soc. N. S. Wales, **92**, p. 233.
Distribution: Australia, Tasmania.

8. **mesembrina** RINGUELET (1949): Not. Mus. La Plata, **14**, Zool. No. 122, p. 141—145, Figs. 1—2. — RINGUELET (1968): Physis, **27**, p. 375.
Distribution: Argentina.

9. **novaecaledoniae** JOHANSSON (1918): Hirudineen. in SARASIN & ROUX: Nova Caledonia, A. Zool. **2**, p. 373—380, Figs. 1—2, Pl. XII, Fig. 1. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 15. — INGRAM (1957): Pap. Proc. R. Soc. Tasmania, **91**, p. 224.
Distribution: New Caledonia.

10. **tasmaniensis** INGRAM (1957): Pap. Proc. R. Soc. Tasmania, **91,** p. 221—224, Figs. 46—49. — RICHARDSON (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 233—234.
Distribution: Tasmania.

11. **weberi** BLANCHARD (1897): Hirudinea. in WEBER: Zool. Ergebn. in Niederl. Ostindien, **4,** p. 332—334, Figs. 1A—B. — KABURAKI (1921): Rec. Ind. Mus., **22,** p. 695—699, Fig. 1 (*Glossosiphonia*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 351—352. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 62—65, Fig. 24, Pl. II, Fig. 10 (colored). — MOORE (1933): Journ. Linn. Soc. London, **38,** p. 298. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 13—14, Fig. 11. — INGRAM (1957): Pap. Proc. R. Soc. Tasmania, **91,** p. 224.
Distribution: India, Burma, Indonesia, ?Uganda.

11a. **weberi lata** OKA (1910): Annot. Jap. Zool., **7,** p. 168. — KABURAKI (1921): Rec. Ind. Mus., **22,** p. 699—700 (*Glossosiphonia*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 352—353. — OKA (1928): Proc. Imp. Acad. Tokyo, **3,** p. 545—546, Figs. 2A—B. — MOORE (1930): Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 175. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 14. — MOORE (1946): Occ. Pap. B. Bishop Mus., **18,** p. 172—173. — LUKIN (1960): Zool. Journ. Moscow, **39,** p. 41—42.
Distribution: Amur Basin, Japan, China, Hawaii.

11b. **weberi lata** var. **multipapillata** MOORE (1930): Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 175, Pl. 7, Figs. 6—8. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 7.
Distribution: Manchuria.

SPECIES INQUIRENDAE:

1. *chappuisi* HARANT & VERNIÈRES (1936): Mém. Mus. Nat. Hist. Nat. (N. S.) **4,** p. 222—223, Fig. 2.
Distribution: Kenya.
2. *galla* SCIACCHITANO (1939): Boll. pesca piscicult. idrobiol., Roma, **15,** p. 6, Fig. 1.
Distribution: East Africa.
3. *inflexa* GODDARD (1908): Proc. Linn. Soc. N. S. Wales, **33,** p. 337—338, Figs. 9—10. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 92. — RICHARDSON (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 233.
Distribution: Australia.
4. *megacephala* APÁTHY & ÖRLEY (1886): Mathem. term.-tud. Közlem., **22** (2), p. 99. — APÁTHY (1888): Zool. Jahrb. Syst., **3,** p. 768.
Distribution: Hungary.
5. *novaezealandiae* DENDY & OLLIVER (1901): Trans. Proc. New Zealand Inst., **33,** p. 99—103 [*Glossiphonia* (*Clepsine*)]. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 35 (*Oligobdella*). — RICHARDSON (1947): New Zealand Sci. Congr., **1947,** p. 201 (*Oligobdella*).
Distribution: New Zealand.
6. *swampina* BOSC (1802): Histoire naturelle des vers. Art. Sangsues, **1,** p. 247, Pl. VIII, Fig. 5. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 16.
Distribution: Carolina.
7. *trisulcata* BAIRD (1869): Proc. Zool. Soc. London, **1869,** p. 317.
Distribution: unknown.
8. *verrucata* SCIACCHITANO (1939) (nec FR. MÜLLER, 1844): Rev. Zool. Bot. Afr., **32,** p. 351, Figs. 3—4.
Distribution: Congo.

8. genus: **Haementeria** DE FILIPPI, 1849

DE FILIPPI (1849): Mem. Real. Accad. Sci. Torino, (2) **10,** p. 401. — LEUCKART (1854): Arch. f. Naturg., **20,** p. 339. — BLANCHARD (1888): Dict. enc. Sci. Méd. (4) **14,** p. 136—137. — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 6—7. — BLANCHARD (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11,** No. 263, p. 8—9. — BRANDES

(1901): Hirudinei. in LEUCKART & BRANDES: Die Parasiten des Menschen, **1** (2), p. 892. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 955—956. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 56—58. — CORDERO (1941): Bol. Acad. Nac. Cienc. Córdoba, **35,** p. 198—200. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 187—188. — PAWLOWSKI (1963): Zesz. Nauk. Univ. Lódz., Nauki Matem.-Przyrod. Ser. II, No. **14,** p. 103—105, 110. — RINGUELET (1968): Physis, **27,** p. 374.

SYNONYMY:

Blennobdella E. BLANCHARD (1849): in GAY: Historia fisica y politica de Chile. Paris, Zool. **3,** p. 50.

Hybobdella WEYENBERGH (1879) (partim): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 243. — WEYENBERGH (1879): Period. Zool., **1,** p. 231.

Liostomum BLANCHARD (1899) (nec WAGLER, 1831): Bull. Soc. Zool. France, **24,** p. 186—187. — WEBER (1915) (nec WAGLER, 1831) (partim): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 49—51.

Type-species: *Haementeria ghilianii* DE FILIPPI, 1849

1. **ghilianii** DE FILIPPI (1849): Mem. Real. Accad. Sci. Torino, (2) **10,** p. 401—412, Pl. I, Figs. 1—6. — DIESING (1850): Systema Helminthum. Vindobonae, **1,** p. 652. — BLANCHARD (1888): Dict. enc. Sci. Méd., (4) **14,** p. 136. — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 7—16, Figs. 5—6. — BLANCHARD (1899): Bull. Soc. Zool. France, **24,** p. 187—189 (*Liostomum*). — BRANDES (1901): Hirudinei. in LEUCKART & BRANDES: Die Parasiten des Menschen, **1** (2), p. 892—893. — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 55—57, Pl. II, Figs. 19—20 (*Liostomum*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 959—962, Figs. 37A—D and two plates without number. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 83—84, Fig. 53. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 188—189.
Distribution: North Brasil, French Guayana.

2. **gracilis** (WEYENBERGH, 1883): An. Ateneo Uruguay, **5,** p. 427—428 (*Hybobdella*). — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 68—70, Pl. III, Fig. 26 (*Liostomum*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 964. — CORDERO (1941): Bol. Acad. Nac. Cienc. Córdoba, **35,** p. 200—203, Figs. 1a—b. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 190—191. — RINGUELET (1945): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 26, p. 106—107. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 229. — RINGUELET (1968): Physis, **27,** p. 374.

= *bonaerensis* MAC DONAGH (1928): La Semana Méd. Buenos Aires, **35,** p. 230—235, Figs. 3—5, 8. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 75—76 [*Haementeria* (*? Placobdella*)]. — CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 31—36.
= *brasiliensis* WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 61—64, Pl. III, Figs. 22—23 (*Liostomum*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 966—968, Fig. 40. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 64—65 [*Haementeria* (*Placobdella*)]. — CORDERO (1937): Ann. Acad. Sci., **9,** p. 22.
= *cordovensis* AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 69 [*Haementeria* (*Placobdella?*)].
= *? depressa* E. BLANCHARD (1849): in GAY: Historia fisica y politica de Chile. Paris, Zool. **3,** p. 49, Pl. II, Fig. 5 (*Blennobdella*).
= *santiagensis* WEYENBERGH (1883): An. Ateneo Uruguay, **5,** p. 428—429 (*Nephelis*).
Distribution: Brasil, Chile, Paraguay, Uruguay, Argentina.

3. **officinalis** DE FILIPPI (1849): Gazzetta med. Lombard., (2) **2,** p. 438. — BLANCHARD (1888): Dict. enc. Sci. Méd., (4) **14,** p. 136. — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 16—23, Figs. 7—9. — BRANDES (1901): Hirudinei. in LEUCKART & BRANDES: Die Parasiten des Menschen, **1** (2), p. 894—896. — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 52—55,

Pl. II, Figs. 15—18 (partim, as *Liostomum coccineum* WAGLER, 1831). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 956—959, Fig. 36. — CABALLERO (1930): An. Inst. Biol. México, **1,** p. 319—325, Figs. 1—4. — CABALLERO (1932): An. Inst. Biol. México, **3,** p. 41—42, Figs. 1—2. — OKA (1932): Ann. Mus. Zool. Polon., **9,** p. 322. — KRAUSE & WILKE (1934): Zool. Anz., **107,** p. 30—32, Figs. 1—4. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 82—83, Fig. 40. — CABALLERO (1940): An. Inst. Biol. México, **12,** p. 752. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 189—190.

= *granulosa* JIMÉNEZ (1865): Gaceta méd. México, **1,** p. 484, Pl. I (colored) (*Glossiphonia*).

= *mexicana* DE FILIPPI (1849): Gazzetta med. Lombard., (2) **2,** p. 438. — BLANCHARD (1888): Dict. enc. Sci. Méd., (4) **14,** p. 136—137.

Distribution: Paraguay, Venezuela, Mexico.

4. **paraguayensis** (WEBER, 1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel p. 64—66, Pl. III, Figs. 24a—b (*Liostomum*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 968—970, Figs. 41A—B. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 65—66 [*Haementeria* (*Placobdella?*)]. — CORDERO (1937): An. Acad. Brasil. Sci., **9,** p. 22, Fig. 4. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 191—192. — RINGUELET (1945): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 26, p. 107—109, Figs. 6—8. — RINGUELET (1968): Physis, **27,** p. 374.

Distribution: Venezuela, Brasil, Paraguay, Argentina.

5. **tuberculifera** (GRUBE, 1871): Arch. f. Naturg., **37,** p. 107—108 (*Clepsine*). — BLANCHARD (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11,** No. 263, p. 8 (partim, as *H. officinalis* DE FILIPPI, 1849). — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 52—55, Pl. II, Fig. 15—18 (partim, as *Liostomum coccineum* WAGLER, 1831). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 956—959 (partim as *H. officinalis* DE FILIPPI, 1849). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 76, Fig. 40 [*Haementeria* (*Placobdella?*)]. — CORDERO (1941): Bol. Acad. Nac. Cienc., **35,** p. 203—207, Figs. 2a—d. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 190. — RINGUELET (1945): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 26, p. 105—106, Fig. 5. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 229—230. — RINGUELET (1968): Physis, **27,** p. 374.

= *dorningii* WEYENBERGH (1879): Bol. Acad. Nac. Cienc. Córdoba, **3,** p. 243—244 (*Hybobdella*). — WEYENBERGH (1879): Period. Zool., **1,** p. 123—124 (*Hybobdella*). — BLANCHARD (1888): Dict. enc. Sci. Méd., (4) **14,** p. 159 (*Hylobdella*).

= *helleri* WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 57—60, Pl. III, Fig. 21 (*Liostomum*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 964—966, Fig. 39. — AUGENER (1930): Zool. Anz., **90,** p. 313—314. — CORDERO (1937): Ann. Acad. Brasil. Sci., **9,** p. 22, Fig. 3.

Distribution: Venezuela, Cuba, Holland Guayana, Brasil, Argentina.

SPECIES INQUIRENDAE:

1. *dissimilis* CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 36—40. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 192—193.
Distribution: Paraguay.
2. *laevis* (WEBER, 1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 66—68, Pl. III, Fig. 25, Pl. VI, Fig. 52 (*Liostomum*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 970—971. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 77 [*Haementeria* (*Placobdella*)]. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 192.
Distribution: Brasil.
3. *lutzi* PINTO (1920): Brasil-Medico, **34,** p. 569, Figs. 1—3. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 971—973, Figs. 42, 42a and a plate (photo) (without number). — CORDERO (1936): Ann. Acad. Brasil. Sci., **8,** p. 225—227. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 65 [*Haementeria* (*Placobdella?*)]. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 192.
Distribution: Brasil.

9. genus: **Helobdella** Blanchard, 1896

Blanchard (1896): Boll. Zool. Anat. comp. Univ. Torino, **11**, No. 263, p. 4. — Blanchard (1897): Hirudineen. in Möbius: Die Thierwelt Ost-Afrikas, **4**, Lief. 2, No. 143, p. 4. — Blanchard (1900): Ergebn. Hamb. Magalhaens. Sammelreise 1892/93. Hamburg **3** (3), p. 9. — Johansson (1909): Hirudinea. in Brauer: Die Süsswasserfauna Deutschlands, H. **13**, p. 76. — Harding (1910): Parasitology, **3**, p. 162. — Rousseau (1912): Ann. Biol. Lacustre, **5**, p. 272. — Gedroyć (1915): Rozpr. Wiad. Muz. im. Dzied., Lwow, **2**, p. 50. — Pinto (1923): Rev. Mus. Paulista, **13**, p. 932. — Harding (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 68. — Pawlowski (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 131. — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 16. — Ringuelet (1942): Not. Mus. La Plata, **7**, Zool. No. 59, p. 217—218. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 170. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **4**, Zool. No. 25, p. 9. — Mann (1953): Proc. Zool. Soc. London, **123**, p. 384. — Autrum (1958): Hirudinea. in Brohmer: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 7. — Lukin (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 107.

SYNONYMY:

Anoculobdella Weber (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 45—46. — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 54. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 185.

Bakedebdella Sciacchitano (1939): Rev. Zool. Bot. Afr., **32**, p. 357. — Sciacchitano (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 57.

Type-species: *Hirudo stagnalis* Linnaeus, 1758

1. **ampullariae** Ringuelet (1945): Rev. Mus. La Plata (N. S.) **4**, Zool. No. 26, p. 101—104, Figs. 3—4. — Ringuelet (1949): Not. Mus. La Plata, **14**, Zool. No. 122, p. 153—154. — Ringuelet (1968): Physis, **27**, p. 376.
   Distribution: Argentina.

2. **brasiliensis** Weber (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 46—47, Pl. II, Fig. 13 (*Anoculobdella*). — Pinto (1923): Rev. Mus. Paulista, **13**, p. 992—994, Fig. 51 (*Anoculobdella*). — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 54—55 (*Anoculobdella*). — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 185 (*Anoculobdella*). — Ringuelet (1959): Physis, **21**, p. 197.

   = *taeniata* Cordero (1937): An. Mus. Arg. Cienc. Nat., **39**, p. 28—31 (*Placobdella*). — Ringuelet (1942): Not. Mus. La Plata, **7**, Zool. No. 59, p. 220. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 179—180. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **4**, Zool. No. 25, p. 35—39, Figs. 16—17. — Ringuelet (1945): Rev. Mus. La Plata (N. S.) **4**, Zool. No. 26, p. 100. — Ringuelet (1949): Rev. Mus. La Plata, **14**, Zool. No. 122, p. 152.
   Distribution: Brasil, Uruguay, Argentina.

3. **chilensis** Blanchard (1900): Ergebn. Hamb. Magalhaens. Sammelreise 1892/93. Hamburg, **3** (3), p. 14—16, Figs. VIII—IX. — Weber (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 34—35, Pl. I, Figs. 7a—b. — Pinto (1923): Rev. Mus. Paulista, **13**, p. 941—942, Fig. 31. — Oka (1932): Ann. Mus. Zool. Polon., **9**, p. 326. — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 20—21. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 174—175. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **4**, Zool. No. 25, p. 12—13. — Ringuelet (1968): Physis, **27**, p. 375.
   Distribution: Brasil, Chile, Argentina, Tierra del Fuego.

4. **conchata** (Caballero, 1941): An. Inst. Biol. México, **12**, p. 747—752, Figs. 1—4 (*Glossosiphonia*). — Soós (1966): Ann. Hist.-nat. Mus. Nat. Hung., **58**, p. 276. — Ringuelet (1969): Physis, **27**, p. 386.
   Distribution: Mexico.

5. **conifera** (MOORE, 1933): Journ. Linn. Soc. London, **38,** p. 297—298 (*Glossiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 30. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 300—302, Pl. 25, Fig. 2, Pl. 26, Fig. 18. — MEYER (1951): Hirudinea. in: Explor. Park Nat. Albert, No. **76,** p. 6—7. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 45, 57—58. — MOORE (1958): Ann. Natal Mus., **14,** p. 310—312, Fig. 3, Pl. VII, Fig. 4. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 253. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 177. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 6—7 (*Glossiphonia*).
Distribution: Ethiopia, Uganda, Congo, Natal, Transvaal.

6. **cordobensis** RINGUELET (1943): Not. Mus. La Plata, **8,** Zool. No. 69, p. 234—236 (as variety of *H. triserialis* E. BL.). — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 174 (as variety of *H. triserialis* E. BL.). — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 12, Fig. 4 (as variety of *H. triserialis* E. BL.). — RINGUELET (1968): Physis, **27,** p. 376.
Distribution: Argentina.

7. **diploides** RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 221—227, Figs. 1b, 4—5.
Distribution: Paraguay.

8. **duplicata** (MOORE, 1911): Hirudinea of Southern Patagonia. in: Rep. Princeton Univ. Exped. to Patagonia 1896—1899, **3,** Zoology, Pt. VII, p. 675—680, Pl. XLIX, Fig. 10, Pl. L, Figs. 16—22 (*Glossiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 27—28, Fig. 17. — CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 20—21. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 176—177. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 22—26, Fig. 11. — RINGUELET (1945): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 26, p. 97—98. — RINGUELET (1949): Not. Mus. La Plata, **14,** Zool. No. 122, p. 149. — RINGUELET (1953): Not. Mus. La Plata, **16,** Zool. No. 142, p. 216. — RINGUELET (1958): Acta Zool. Lilloana, **15,** p. 126—128. — RINGUELET (1968): Physis, **27,** p. 375. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 7 (*Glossiphonia*).

8a. var. **aplacophora** RINGUELET (1958): Acta Zool. Lilloana, **15,** p. 128. — RINGUELET (1968): Physis, **27,** p. 376.

8b. var. **tuberculata** RINGUELET (1958): Acta Zool. Lilloana, **15,** p. 128. — RINGUELET (1968): Physis, **27,** p. 375.
Distribution: South Patagonia, Uruguay, Argentina, Bolivia.

9. **elongata** (CASTLE, 1900): Bull. Mus. comp. Zool. Harvard, **36,** p. 39—42, Fig. B, Pl. 6, Figs. 23—27 (*Glossiphonia*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 916—917, Fig. 20 (*Glossosiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 28.

= *nepheloidea* GRAF (1899): Nova Acta Acad. Leop. Halle, **72,** p. 224 (*Clepsine*) nom. nud. — MOORE (1906): Bull. Bur. Fish., **25,** p. 158 (*Glossiphonia*). — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 76—77, Pl. I, Fig. 2 (*Glossiphonia*). — RYERSON (1915): Contr. Canad. Biol., 1911—1914, Fasc. **2,** p. 168 (*Glossiphonia*). — MOORE (1924): Publ. Ontario Fish. Res. Labor., No. **23,** p. 22. — MILLER (1929): Ohio State Univ., F. T. Stone Labor., Columbus, Contr. No. **2,** p. 15—16 (*Glossiphonia*). — RAWSON (1930): Publ. Ontario Fish. Res. Labor., No. **40,** p. 35 (*Glossiphonia*). — BERE (1931): Trans. Wisconsin Acad. Sci. Arts, Letters, **26,** p. 439. — MEYER (1937): Ohio Journ. Sci., **37,** p. 249. — MATHERS (1948): Proc. Iowa Acad. Sci., **55,** p. 400, Pl. 1, Fig. 2.
Distribution: North America.

10. **godeti** WEBER (1916): Zool. Anz., **48,** p. 116—118, Figs. 1—3. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 26.
Distribution: Peru (5000 m).

11. **hyalina** RINGUELET (1942): Rev. Mus. La Plata, **7,** Zool. No. 59, p. 220—221. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 180—181. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 39—44, Figs. 18—20. — RINGUELET (1949): Not. Mus. La Plata, **14,** Zool. No. 122, p. 153. — RINGUELET (1968): Physis, **27,** p. 376.
Distribution: Argentina.

12. **longicollis** WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 41—42, Pl. I, Fig. 10. — PINTO (1923): Rev. Mus Paulista, **13,** p. 944—945, Fig. 33. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 24, Fig. 15. — RINGUELET (1942): Not. Mus. La Plata, **7,** Zool. No. 59, p. 218. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 177—178. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 32—35. — RINGUELET (1949): Not. Mus. La Plata, **14,** Zool. No. 122, p. 150—152, Fig. 4. — RINGUELET (1968): Physis, **27,** p. 376.
Distribution: Paraguay, Argentina.

13. **luteopunctata** WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 35—37, Pl. I, Figs. 8a—b. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 977—979, Fig. 44 (*Placobdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 22—23. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 178—179.

= *luteopunctata* APÁTHY (1905) (see in WEBER, 1915, p. 37) nom. nudum.
Distribution: Chile.

14. **michaelseni** BLANCHARD (1900): Ergebn. Hamb. Magalhaens. Sammelreise 1892/93. Hamburg, **3** (3), p. 12—13. Figs. V—VI. — MOORE (1911): Rep. Princet. Univ. Exped. to Patagonia, 1896—1899, **3,** Zoology, Pt. VII, p. 685—686, Pl. L, Figs. 13—14 (*Glossiphonia*). — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 33—34, Pl. I, Figs. 6a—b. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 940, Fig. 30. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 23. — CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 21—22. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 175. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 13—18, Figs. 5—7. — RINGUELET (1945): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 26, p. 97. — CORDERO (1946): Comun. Zool. Mus. Hist. Nat. Montevideo, **2,** No. 26, p. 1—4, Figs. 1A—B. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 218, Fig. 1a. — RINGUELET (1949): Not. Mus. La Plata, **14,** Zool. No. 122, p. 148—149. — RINGUELET (1968): Physis, **27,** p. 376.

= *anoculis* WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 42—44, Pl. II, Fig. 11. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 995—996, Fig. 53. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 30. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 178. — CORDERO (1946): Comun. Zool. Mus. Hist. Nat. Montevideo, **2,** No. 26, p. 1—4, Figs. 1A—B. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 218—221, Figs. 2—3.
Distribution: Tierra del Fuego, Argentina, Chile, Uruguay, Paraguay, Brasil.

15. **moorei** CABALLERO (1933): An. Inst. Biol. México, **4,** p. 183—185, Figs. 5—8. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 19—20.
Distribution: Mexico.

16. **nociva** HARDING (1924): Ann. Mag. Nat. Hist., (9) **14,** p. 492—493, Pl. XI. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 70—72, Fig. 28, Pl. II, Fig. 9 (colored). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 17—18.
Distribution: India.

17. **obscura** RINGUELET (1942): Not. Mus. La Plata, **7,** Zool. No. 59, p. 222. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 181. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 47—51, Figs. 22—24. — RINGUELET (1945):

Rev. Mus. La Plata (N. S.) **4,** Zool. No. 26, p. 100—101, Fig. 2. — RINGUELET (1953): Not. Mus. La Plata, **16,** Zool. No. 142, p. 216—220, Figs. 1—5. — RINGUELET (1968): Physis, **27,** p. 377.
Distribution: Argentina, Peru, Brasil.

18. **papillata** (MOORE, 1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245,** p. 3, 10. — MOORE (1959): Hirudinea. in: WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 549. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 8.

= *papillifera* var. *b* VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 131 (*Clepsine*).
Distribution: U. S. A.

19. **paraguayensis** WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 44—45, Pl. II, Fig. 12. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 945—946. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 20, Fig. 14. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 178.
Distribution: Paraguay.

20. **peruviensis** WEBER (1916): Zool. Anz., **48,** p. 118—119, Figs. 4—5. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 21.
Distribution: Peru (5140 m).

21. **punctatolineata** MOORE (1939): Puerto Rico Journ. Publ. Health, Trop. Med., **14,** p. 422—429, Figs. 1—2. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 548. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 156. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 8.
Distribution: Puerto Rico.

22. **scutifera** BLANCHARD (1900): Ergebn. Hamb. Magalhaens. Sammelreise 1892/93. Hamburg, **3** (3), p. 9—11, Figs. II—III. Pl. Figs. 6—7. — MOORE (1911): Rep. Princet. Univ. Exped. to Patagonia 1896—1899, **3,** Zoology, Pt. VII, p. 680—681 (*Glossiphonia*). — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 30—31, Pl. I, Figs. 4a—b. — GEDROYĆ (1915): Rozpr. Wiad. Muz. im. Dzied., Lwow, **2,** p. 50—53. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 937—938, Fig. 28. — AUGENER (1931): Mitt. Zool. Inst. Mus. Hamburg, **44,** p. 313. — OKA (1932): Ann. Mus. Zool. Polon., **9,** p. 325—326. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil. p. 26—27. — PAWLOWSKI (1936): Ann. Mus. Zool. Polon., **11,** p. 365—368. — CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 19—20. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 176. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 18—21, Figs. 8—10. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 215—217, Figs. 1c—d. — RINGUELET (1949): Not. Mus. La Plata, **14,** Zool. No. 122, p. 149. — RINGUELET (1968): Physis, **27,** p. 375—376.

= *crassa* APÁTHY (1905) (see WEBER, 1915, p. 31) nom. nudum.
Distribution: South America, Mexico.

23. **similis** RINGUELET (1942): Not. Mus. La Plata, **7,** Zool. No. 59, p. 221. — RINGUELET (1943): Physis, **19,** p. 374—377, Fig. 3. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 180—181. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 44—47, Fig. 21. — RINGUELET (1945): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 26, p. 100, Fig. 1. — RINGUELET (1968): Physis, **27,** p. 377.
Distribution: Argentina, Chile.

24. **simplex** (MOORE, 1911): Rep. Princet. Univ. Exped. to Patagonia 1896—1899, **3,** Zoology, Pt. VII, p. 681—684, Pl. XLIX, Fig. 11, Pl. L, Figs. 15, 23—24 (*Glossiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 22. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 177. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 26—32, Figs. 12—15. — RINGUELET (1945): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 26, p. 98—100. — RINGUELET (1949): Not. Mus. La Plata, **14,** Zool. No. 122, p. 150. — RINGUELET (1968): Physis, **27,** p. 378. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 8 (*Glossiphonia*).

= *montevidensis* CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 22—25 [*Helobdella* (*Podoclepsis*)]. — RINGUELET (1942): Not. Mus. La Plata, **7,** Zool. No. 59, p. 219. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 179.
Distribution: Argentina, Uruguay.

25. **sp. nov.** ? RINGUELET (1953): Not. Mus. La Plata, **16,** Zool. No. 142, p. 220—223, Fig. 6.
Distribution: Bolivia.

26. **stagnalis** (LINNAEUS, 1758): Syst. Nat., ed. 10, p. 649 (*Hirudo*). — DE FILIPPI (1837): Memoria sugli Anellidi della famiglia delle Sanguisughe. Milano, p. 27 (*Clepsine*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 25—26 (*Glossosiphonia*). — BLANCHARD (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11,** No. 263, p. 4—5. — MOORE (1898): Proc. U. S. Nat. Mus. Washington, **21,** p. 549 (*Glossiphonia*). — BLANCHARD (1900): Ergebn. Hamb. Magalhaens. Sammelreise 1892/93. Hamburg, **3** (3), p. 8. — CASTLE (1900): Bull. Mus. comp. Zool. Harvard, **36,** p. 21—33, Fig. A, Pl. 1, Figs. 1, 3, Pl. 2, Fig. 4, Pl. 3, Figs. 7—10, 12, Pl. 8, Fig. 34 (*Glossiphonia*). — MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5,** p. 497—498. — MOORE (1906): Bull. Bur. Fish., **25,** p. 157—158, Pl. XXXII, Fig. 2 (colored). — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13,** p. 76, Figs. 131—132. — HARDING (1910): Parasitology, **3,** p. 162—164, Fig. 8, Pl. XIV, Figs. 13—17 (colored). — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 272—274, Fig. 11. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 77—80, Pl. I, Fig. 1, colored plate A (*Glossiphonia*). — WEBER (1913): Mém. Soc. neuchât. Sci. Nat., **5,** p. 734. — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 25—27, Pl. I, Figs. 2—3. — GEDROYĆ (1915): Rozpr. Wiad. Muz. im. Dzied., Lwow, **2,** p. 50—53, Figs. 13A—F. — RYERSON (1915): Contr. Canad. Biol., 1911—1914, Fasc. **2,** p. 167 (*Glossiphonia*). — MOORE (1922): Canad. Field-Nat., **36,** p. 9 [*Glossiphonia* (*Helobdella*)]. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 932—934, Fig. 26 and as *Glossosiphonia* p. 904—905, Fig. 13. — MOORE (1924): Publ. Ontario Fish. Res. Labor., No. **23,** p. 22. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 68—70, Fig. 27. — BERE (1929): Contr. Canad. Biol. Stud. Fish. Toronto (N. S.) **4** (14), p. 178. — JOHANSSON (1929): Hirudinea. in DAHL: Die Tierwelt Deutschlands, T. **15,** p. 146, Figs. 31—32. — MILLER (1929): Ohio State Univ. F. T. Stone Labor., Columbus, Contr. **2,** p. 14—15 (*Glossiphonia*). — RAWSON (1930): Publ. Ontario Fish. Res. Labor., No. **40,** p. 35. — BERE (1931): Trans. Wisconsin Acad. Sci. Arts Letters, **26,** p. 438. — HARDING (1932): Proc. Zool. Soc. London, **1932,** p. 84. — MOORE (1936): Canad. Field-Nat., **50,** p. 113. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 24—26, Figs. 4A, 16. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 131—133, Figs. 92—93. — MEYER (1937): Canad. Field-Nat., **51,** p. 118. — MEYER (1937): Ohio Journ. Sci., **37,** p. 249. — CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 19. — MOORE (1939): Ann. Mag. Nat. Hist., (11) **3,** p. 81. — CABALLERO (1940): An. Inst. Biol. México, **11,** p. 449—451, Figs. 1A—B (*Glossiphonia*). — BENNIKE (1943): Fol. Limnol. Scand., No. **2,** p. 71—73, Fig. 28G. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 170—171. — MATHERS (1948): Proc. Iowa Acad. Sci., **55,** p. 399—400, Pl. 1, Fig. 1. — RINGUELET (1949): Not. Mus. La Plata, **14,** Zool. No. 122, p. 146—147, Figs. 3a—b. — VERRIEST (1950): Biol. Jaarb. Dodonaea, **17,** p. 204—205, 223—224, Fig. 8. — MOORE & MEYER (1951): Wasmann Journ. Biol., **9,** p. 59—60. — MANN (1953): Proc. Zool. Soc. London, **123,** p. 384, 390, Fig. 18. — MEYER & MOORE (1954): Wasmann Journ. Biol., **11,** p. 68. — HOFFMANN (1955): Arch. Inst. Grand-Ducal Luxemb. (N. S.) **22,** p. 198—199, Figs. 9A—B. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 7, Figs. 9, 12, 17. — PAWLOWSKI (1958): Bull. Soc. Lettr. Lódz, Cl. III. **9,** No. 11, p. 8—10, Fig. 6. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 548. — SCIACCHITANO (1960): Libro Homenaje al Doctor Eduardo Caballero y Caballero 1930—1960, México, No. **24,** p. 354. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 156. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 107—109, Fig. 68. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176. — J. E. MOORE (1964): Nat. Mus. Canada, Nat. Hist. Pap., No. **27,** p. 3—4. — J. E. MOORE (1966): Nat. Mus. Canada, Nat. Hist. Pap., No. **32,** p. 2—3. — RINGUELET (1968): Physis, **27,** p. 375. — SOÓS (1968): Opusc. Zool. Budapest, **7,** p. 254—256.

= *bioculata* BERGMANN (1757): Kongl. Vetensk. Acad. Handl., **18,** p. 308, Pl. VI, Figs. 9—11 (*Hirudo*). — O. F. MÜLLER (1774): Vermium terrestrium et fluviatilum. Havniae et Lipsiae, **1** (2), p. 41—43 (*Hirudo*). — BRAUN (1805): Systematische Beschreibung einiger Egelarten. Berlin, p. 53—55, Pl. 6, Figs. 1—5 (colored) (*Hirudo*). — CARENA (1820): Mém. Real. Accad. Sci. Torino, **25,** p. 302, Pl. XII, Fig. 21 (colored) (*Hirudo*). — SAVIGNY (1822): Système des Annelides. Paris, **1** (3), p. 119 (*Clepsine*). — MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées. Montpellier, p. 102, Pl. IV, Fig. 2 (*Clepsine*). — DE BLAINVILLE (1827): Dict. Sci. Nat. Paris, **47,** p. 265 (*Erpobdella*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 366—369, Pl. XIII, Figs. 16—26 (*Glossiphonia*). — DIESING (1850): Systema Helminthum. Vindobonae, **1,** p. 448—449 (*Clepsine*). — APÁTHY (1888): Zool. Jahrb. Syst., **3,** p. 789—790 (*Clepsine*). — BLANCHARD (1893): Bull. Soc. Zool. France, **18,** p. 92 (*Glossiphonia*).

= *circulans* SOWERBY (1806): The British Miscellary, **2,** p. 31, Pl. LXXVI (*Hirudo*). — JOHNSON (1816): A Treatise on the medicinal Leech. London, p. 27 (*Hirudo*). MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 384—385 (*Glossiphonia*).

= *gibbosa* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 358, Fig. 12 (*Bakedebdella*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 58. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 177.

= *modesta* VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 129—130, Fig. 2 (*Clepsine*). — VERRILL (1874): Rep. Comm. Fish and Fisheries, **1872/73,** p. 679, Fig. 1 (*Clepsine*).

= *perate* JOHNSON (1816): A Treatise on the medicinal Leech. London, p. 26—28 (*Glossiphonia*).

= *pulligera* DAUDIN (1800): Recueil de mémoires sur des espèces de Mollusques, de Vers et de Zoophytes. Paris, p. 19—22, Pl. I, Figs. 1—3 (*Hirudo*). — DE BLAINVILLE (1827): Dict. Sci. Nat. Paris, **47,** p. 266, Pl. XXXVII, Fig. 6 [*Hirudo* (*Glossobdella*)].

= *punctata* JOHNSON (1825): Further observations on the medicinal Leech. London, p. 50, Pl. XVII, Figs. 11—13 (*Glossopora*).

Distribution: Cosmopolitan, as yet unknown from the Notogea.

27. **titicacensis** RINGUELET (1959): Physis, **21,** p. 193—197, Fig. 1.
Distribution: Peru.

28. **triserialis** (E. BLANCHARD, 1849): in GAY: Historia fisica y politica Chile. Paris, Zool. **3,** p. 50 (*Glossiphonia*). — GRUBE (1859): Vidensk. Meddel. Dansk. naturh. Foren. **1858,** p. 115—116 (*Clepsine*). — BLANCHARD (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11,** No. 263, p. 5—8. — BLANCHARD (1900): Ergebn. Hamb. Magalhaens. Sammelreise 1892/93. Hamburg, **3** (3), p. 13—14, Fig. VII, Pl. Fig. 8 (colored). — WEBER (1913): Mém. Soc. neuchât. Sci. Nat., **5,** p. 734. — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 27—29, Pl. VI, Fig. 49. — DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32,** No. 724, p. 4—5. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 934—936, Fig. 27. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 16—17. — CORDERO (1937): Ann. Acad. Brasil. Sci., **9,** p. 16—17. — CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 25—26. — RINGUELET (1943): Not. Mus. La Plata, **8,** Zool. No. 69, p. 215—226, Figs. 1—2. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 171—173. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 9—10, Fig. 1—3. — RINGUELET (1945): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 26, p. 96—97. — CORDERO (1946): Comun. Zool. Mus. Nat. Hist. Montevideo, **2,** No. 30, p. 1—9, Figs. 1A—B. — RINGUELET (1948): Not. Mus. La Plata, **13,** Zool. No. 113, p. 214—215. — RINGUELET (1949): Not. Mus. La Plata, **14,** Zool. No. 122, p. 148. — RINGUELET (1968): Physis, **27,** p. 377—378.

= *fusca* CASTLE (1900): Bull. Mus. comp. Zool., Harvard, **36,** p. 34—39, Pl. 4, Figs. 13—18 (*Glossiphonia*). — MOORE (1906): Bull. Bur. Fish., **25,** p. 158, Pl. XXXII, Fig. 5 (colored) (*Glossiphonia*). — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 80—81, Pl. I, Fig. 3 (*Glossiphonia*). — RYERSON (1915): Contr. Canad. Biol., 1911—1914, Fasc. **2,** p. 167 (*Glossiphonia*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 914—916, Fig. 19 (*Glossosiphonia*).

— Moore (1924): Publ. Ontario Fish. Res. Labor., No. **23**, p. 22. — Miller (1929): Ohio State Univ. F. T. Stone Labor., Columbus, Contr. No. **2**, p. 16—17 (*Glossiphonia*). — Bere (1931): Trans. Wisconsin Acad. Sci. Arts Letters, **26**, p. 439 (*Glossiphonia*). — Oka (1932): Ann. Mus. Zool. Polon., **9**, p. 325. — Caballero (1935): An. Inst. Biol. México, **6**, p. 49—52, Figs. 1—3 (*Glossosiphonia*). — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 28—30, Fig. 18. — Moore (1936): Canad. Field-Nat., **50**, p. 113 (*Glossiphonia*). — Meyer (1937): Ohio Journ. Sci., **37**, p. 249. — Meyer (1937): Canad. Field-Nat., **51**, p. 118 (*Glossiphonia*). — Caballero (1940): An. Inst. Biol. México, **11**, p. 451—452, Fig. 2 (*Glossiphonia*). — Mathers (1948): Proc. Iowa Acad. Sci., **55**, p. 400—401, Pl. 1, Fig. 3. — Moore & Meyer (1951): Wasmann Journ. Biol., **9**, p. 60, Pl. IX, Figs. 4—5. — Meyer & Moore (1954): Wasmann Journ. Biol., **12**, p. 68. — Moore (1959): Hirudinea. in Ward & Whipple: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 548. — Mann (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11**, p. 156. — J. E. Moore (1966): Nat. Mus. Canada, Nat. Hist. Pap., No. **32**, p. 2.

= *lineata* Verrill (1874): Rep. Comm. Fish and Fisheries **1872/73**, p. 683 (as *Clepsine papillifera* var. *lineata*). — Moore (1898): Proc. U. S. Nat. Mus. Washington, **21**, p. 549 (*Glossiphonia*). — Moore (1901): Bull. Illinois State Labor. Nat. Hist., **5**, p. 493—497, Pl. XLII, Fig. 6 (*Glossiphonia*). — Moore (1936): Publ. Carnegie Inst. Washington, No. **457**, p. 41—42. — Cordero (1937): Ann. Acad. Brasil. Sci., **9**, p. 15—16. — Ringuelet (1943): Not. Mus. La Plata, **8**, Zool. No. 69, p. 229—230, Fig. 3. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 173. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **4**, Zool. No. 25, p. 10. — Moore (1959): Hirudinea. in Ward & Whipple: Fresh-water Biology. New York, 2nd ed. chap. 23, p. 548. — Mann (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11**, p. 156. — Ringuelet (1968): Physis, **27**, p. 378.

= *lineolata* Grube (1871): Arch. f. Naturg., **37**, p. 106—107 (*Clepsine*).

= *trituberculata* Weber (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 48—49, Pl. II, Figs. 14, Pl. VI, Figs. 50—51 (*Anoculobdella*). — Pinto (1923): Rev. Mus. Paulista, **13**, p. 994—995, Fig. 52 (*Anoculobdella*). — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 55, Fig. 38 (*Anoculobdella*). — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 185 (*Anoculobdella*). — Cordero (1946): Comun. Zool. Mus. Nat. Hist. Montevideo, **2**, No. 30, p. 1—9, Figs. 1A—B.

Distribution: North, Central and South America.

28a. var. **nigricans** Ringuelet (1943): Not. Mus. La Plata, **8**, Zool. No. 69, p. 231—232, Fig. 4. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 173—174. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **4**, Zool. No. 25, p. 11. — Ringuelet (1968): Physis, **27**, p. 377.
Distribution: Argentina, Uruguay.

28b. var. **striata** Ringuelet (1943): Not. Mus. La Plata, **8**, Zool. No. 69, p. 232—234, Fig. 5. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 174. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **4**, Zool. No. 25, p. 12. — Ringuelet (1968): Physis, **27**, p. 377.
Distribution: Argentina, Uruguay.

28c. var. **unilineata** Ringuelet (1943): Not. Mus. La Plata, **8**, Zool. No. 69, p. 232. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 173. — Ringuelet (1944): Rev. Mus. La Plata (N. S.) **4**, Zool. No. 25, p. 12. — Ringuelet (1968): Physis, **27**, p. 377.
Distribution: Argentina.

SPECIES INQUIRENDAE:

1. *budgei* Grube (1871): Arch. f. Naturg., **37**, p. 105—106 (*Clepsine*). — Weber (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 29—30. — Pinto (1923): Rev. Mus. Paulista, **13**, p. 937. — Autrum (1936): Hirudineen. in Bronns: Klassen

und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 30—31. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 174.
Distribution: Brasil.

2. *columbiensis* WEBER (1913): Mém. Soc. neuchât. Sci. Nat., **5,** p. 734—735. — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 37—38. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 942. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 31.
Distribution: Columbia.

3. *fuhrmanni* WEBER (1913): Mém. Soc. neuchât. Sci. Nat., **5,** p. 735—736, Fig. 1. — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 38—39, Pl. I, Fig. 9. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 942—943, Fig. 32. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 21—22.
Distribution: Columbia.

4. *hemispherica* WEBER (1913): Mém. Soc. neuchât. Sci. Nat., **5,** p. 736. — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 40. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 943—944. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 31.
Distribution: Columbia.

5. *huaroni* WEBER (1916): Zool. Anz., **48,** p. 121—122, Fig. 7. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 21.
Distribution: Peru.

6. *javanica* BLANCHARD (1897): Not. Mus. Leyden, **19,** p. 80—81, Pl. 4, Figs. 1—3. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 936—937. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 18, Fig. 12.
Distribution: Java.

7. *jeanneli* HARANT & VERNIÈRES (1936): Mém. Mus. Nat. Hist. Nat., (N. S.) **4,** p. 221—222, Fig. 1.
Distribution: Kenya.

8. *nigropunctata* DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32,** No. 724, p. 6 (as variety of *Helobdella gemmata* BLANCHARD, 1900). — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **4,** Zool. No. 25, p. 55.
Distribution: Costa Rica.

9. *villarsi* WEBER (1916): Zool. Anz., **48,** p. 120—121, Fig. 6. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 23—24.
Distribution: Peru.

10. genus: **Hemiclepsis** VEJDOVSKÝ, 1884

VEJDOVSKÝ (1884) (partim): SB. Kgl. Böhm. Ges. Wiss. in Prag, Jahrg. **1883,** p. 421. — BLANCHARD (1894) (partim): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 31—32. — LIVANOW (1902): Zool. Jahrb. Syst., **17,** p. 354—356. — HARDING (1910): Parasitology, **3,** p. 151. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 266. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 96. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 928—929. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 83. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 96. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 50—51. — MANN (1953): Proc. Zool. Soc. London, **123,** p. 386. — HOFFMANN (1955): Arch. Inst. Grand-Ducal Luxemb. (N. S.) **22,** p. 190. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 9. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 155. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 87. — Soós (1967): Opusc. Zool. Budapest, **7,** p. 234—235.

SYNONYMY:

Clepsine SAVIGNY (1822) (partim): Système des Annelides. Paris, **1** (3), p. 107, 118.
Haemiclepsis (error) GEDROYĆ (1915): Rozpr. Wiad. Muz. im. Dzied., Lwow, **2,** p. 28—29.

Haemocharis DE FILIPPI (1837) (nec SAVIGNY, 1822): Memoria sugli Anellidi della famiglia delle Sanguisughe. Milano, p. 26.

Type-species: *Hirudo marginata* O. F. MÜLLER, 1774

1. **bhatiai** BAUGH (1960): Parasitology, **50,** p. 291—295, Figs. 3—4.
Distribution: India.

2. **japonica** (OKA, 1932): Proc. Imp. Acad. Tokyo, **8,** p. 51—53, Figs. A—C (*Placobdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 51.
Distribution: Japan.

3. **marginata** (O. F. MÜLLER, 1774): Vermium terrestrium et fluviatilum. Havniae et Lipsiae, **1** (2), p. 46—47 (*Hirudo*). — MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées. Montpellier, p. 133, Pl. VII, Fig. 2 (*Piscicola*). — DE BLAINVILLE (1828): Dict. Sci. Nat. Paris, **57,** p. 558 (*Ichthyobdella*). — DE FILIPPI (1837): Memoria sugli Anellidi della famiglia delle Sanguisughe. Milano, p. 26 (*Haemocharis*). — FR. MÜLLER (1844): Arch. f. Naturg., **10** (1), p. 376, Pl. X, Fig. 14 (*Clepsine*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 375—379, Pl. XIV, Figs. 10—20 (*Glossiphonia*). — DIESING (1850): Systema Helminthum. Vindobonae, **1,** p. 447 (*Clepsine*). — APÁTHY (1888): Zool. Jahrb. Syst., **3,** p. 787—789 (*Clepsine*). — BLANCHARD (1892): Bull. Soc. Zool. France, **17,** p. 173—178, Figs. 1—2 (*Glossiphonia*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 33—34, Figs. 5—6. — LIVANOW (1902): Zool. Jahrb. Syst., **17,** p. 354—355. — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13,** p. 71—72, Figs. 119—120. — HARDING (1910): Parasitology, **3,** p. 151—154, Figs. 5—6, Pl. XIV, Figs. 28—32. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 266—267. — GEDROYĆ (1915): Rozpr. Wiad. Muz. im. Dzied., Lwow, **2,** p. 29—32, Figs. 6A—D (*Haemiclepsis*). — KABURAKI (1921): Rec. Ind. Mus., **22,** p. 694—695. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 83—86, Figs. 34—35, Pl. II, Figs. 1—2 (colored). — JOHANSSON (1929): Hirudinea. in DAHL: Die Tierwelt Deutschlands, T. **15,** p. 142, Figs. 15—16. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 96—100, Figs. 68—70. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 51—52, Figs. 35—36. — BENNIKE (1943): Fol. Limnol. Scand., No. **2,** p. 79—82, Figs. 17, 28L. — VERRIEST (1950): Biol. Jaarb. Dodonaea, **17,** p. 207, 227, Fig. 11. — MANN (1953): Proc. Zool. Soc. London, **123,** p. 386—387, 390, Fig. 20. — HOFFMANN (1955): Arch. Inst. Grand-Ducal Luxemb. (N. S.) **22,** p. 190—192, Figs. 5A—B. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 9, Fig. 3a. — PAWLOWSKI (1958): Bull. Soc. Sci. Lettr. Lódz, Cl. III. **9,** No. 11, p. 7—8, Fig. 5. — BAUGH (1960): Zool. Anz., **165,** p. 476—477, Figs. 5—6. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 88—90, Figs. 52—53.

= *cephalota* CARENA (1820): Mem. Real. Accad. Sci. Torino, **25,** p. 298—301, Pl. 12, Figs. 19—20 (*Hirudo*). — DE BLAINVILLE (1827): Dict. Sci. Nat. Paris, **47,** p. 266, Pl. XXVII, Figs. 5, 5a (*Glossobdella*, but named in plate *Ichthyobdella*).
= *flava* DALYELL (1853): The Powers of the Creator displayed in the Creation. London, **2,** p. 45, Pl. V, Figs. 1—19 (colored) (*Hirudo*).
= *oscillatoria* SAINT-AMAS (1825): Mém. Soc. Linn. Paris, **3,** p. 193, Pl. VIII (*Hirudo*).
= *tesselata* MOQUIN-TANDON (1826) (nec O. F. MÜLLER 1774): Monographie de la famille des Hirudinées. Montpellier, p. 133, Pl. VII, Fig. 2 (*Piscicola*).
= *variegata* BRAUN (1805): Systematische Beschreibung einiger Egelarten. Berlin, p. 61—63, Pl. 7, Figs. 1—6 (colored) (*Hirudo*).
Distribution: Palearctic Region, Kashmir.

3a. **marginata asiatica** MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 359—363, Pl. XXI, Fig. 24. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 87—88, Fig. 35. — AUGENER (1931): Arch. f. Hydrobiol., Suppl. **8,** p. 746—747. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 52—53. — BHATIA (1939): Bull. Dept. Zool. Panjab Univ., **2,** p. 10—11, Fig. 4. — BHATT (1960): Proc. Indian Sci. Congr., **47,** p. 445. — SOÓS (1967): Opusc. Zool. Budapest, **7,** p. 237,

Fig. 5. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 8—9.
Distribution: Kashmir, Pakistan, Sumatra.

4. **viridis** CHELLADURAI (1934): Rec. Ind. Mus., **36,** p. 345—353, Figs. 1—4. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 53. — SOÓS (1967): Opusc. Zool. Budapest, **7,** p. 236, Figs. 3, 8.
Distribution: India.

11. genus: **Marsupiobdella** GODDARD & MALAN, 1912

GODDARD & MALAN (1912): Ann. South Afr. Mus., **11,** p. 309. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 90.

Type-species: *Marsupiobdella africana* GODDARD & MALAN, 1912

1. **africana** GODDARD & MALAN (1912): Ann. South Afr. Mus., **11,** p. 309—313. — GODDARD & MALAN (1913): Trans R. Soc. South Afr., **3,** p. 249—254, Pl. XV, Figs. 1—8, Pl. XVI, Figs. 9—13, Pl. XVII, Figs. 14—16. — BYCHOWSKY (1921): Rev. Suisse Zool., **29,** p. 79, Pl. V, Fig. 35. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 90—91, Fig. 58. — MOORE (1958): Ann. Natal Mus., **14,** p. 324—327, Fig. 7, Pl. VIII, Fig. 15. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 177. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 257.
Distribution: South Africa.

12. genus: **Marvinmeyeria** gen. nov.

SOÓS (1969): Acta Zool. Hung., **15,** p. 402—403.

Type-species: *Oculobdella lucida* MOORE, 1954

1. **lucida** (MOORE, 1954): Wasmann Journ. Biol., **12,** p. 68—80, Pl. I, Figs. 1—2, Pl. II (*Oculobdella*). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 551 (*Oculobdella*). — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 159 (*Oculobdella*). — J. E. MOORE (1964): Mus. Nat. Canada, Nat. Hist. Pap., No. **27,** p. 4—7, Fig. 1 (*Oculobdella*). — J. E. MOORE (1966): Nat. Mus. Canada, Nat. Hist. Pap., No. **32,** p. 3—4 (*Oculobdella*). — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 9 (*Oculobdella*).
Distribution: Canada.

13. genus: **Oculobdella** AUTRUM, 1936

AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt. 4. Buch, 1. Teil, p. 53—54. — MEYER & MOORE (1954): Wasmann Journ. Biol., **12,** p. 80. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 551.

Type-species: *Glossiphonia socimulcensis* CABALLERO, 1931

1. **socimulcensis** (CABALLERO, 1931): An. Inst. Biol. México, **2,** p. 85—90, Figs. 1—7 (*Glossiphonia*). — OKA (1932): Ann. Mus. Zool. Polon., **9,** p. 325 (*Glossiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 54, Fig. 37. — RINGUELET (1968): Physis, **27,** p. 385 (*Helobdella*).
Distribution: Mexico.

14. genus: **Oligobdella** MOORE, 1918

MOORE (1918): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, chap. 20, p. 654. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs,

4, III. Abt., 4. Buch, 1. Teil, p. 33. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R. **131,** p. 459—460. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **134,** p. 480—481.

SYNONYMY:

Microbdella MOORE (1900) (nec GERVAIS, 1836; *Branchiobdella*): Proc. Acad. Nat. Sci. Philadelphia, **1900,** p. 51.

Type-species: *Microbdella biannulata* MOORE, 1900

1. **biannulata** (MOORE, 1900): Proc. Acad. Nat. Sci. Philadelphia, **1900,** p. 51—62, Pl. VI, Figs. 1—8 (*Microbdella*). — MOORE (1918): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, chap. 20, p. 654. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 989—992, Figs. 50, 50A (*Microbdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 33—34. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 159. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed., chap. 23, p. 550. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 9 (*Microbdella*).
Distribution: U. S. A. (North Carolina).

2. **brasiliensis** CORDERO (1937): Ann. Acad. Brasil. Sci., **9,** p. 17—19, Fig. 1. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 184.
Distribution: Brasil.

3. **orientalis** OKA (1925): Annot. Zool. Jap., **10,** p. 311—315, Figs. 1—2. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 35, Fig. 23. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **134,** p. 480—481, Figs. 1B, 2A, 3.
Distribution: Japan, Soviet Union (Lake Sikotan).

4. **tagoi** OKA (1925): Annot. Zool. Jap., **10,** p. 330—333, Figs. 4—5. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 34—35, Figs. 22A—B. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **134,** p. 480—481.
Distribution: Japan.

15. genus: **Oligoclepsis** OKA, 1935

OKA (1935): Proc. Imp. Acad. Tokyo, **11,** p. 66. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 36. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **131,** p. 459—460. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **134,** p. 479.

Type-species: *Oligoclepsis tukubana* OKA, 1935

1. **tukubana** OKA (1935): Proc. Imp. Acad. Tokyo, **11,** p. 66—68, Fig. 1. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 36, Fig. 24. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **131,** p. 459. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **134,** p. 479.
Distribution: Japan.

16. genus: **Parabdella** AUTRUM, 1936

AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 80 (as subgenus of *Haementeria* DE FILIPPI, 1849).

Type-species: *Placobdella quadrioculata* MOORE, 1930

1. **aspera** (MOORE, 1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 309—311, Pl. 25, Figs. 5—7 [*Placobdella* (*Parabdella*)]. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 14—16, 44, 56 (*Placobdella*). — SCIACCHITANO (1954):

Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 4, Miscell. Zool., **1**, p. 279 [*Placobdella* (*Parabdella*)]. — SCIACCHITANO (1957): Rev. Zool. Bot. Afr., **56**, p. 374. — SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61**, p. 290. — SCIACCHITANO (1961): Publ. Cult. Co. Diam., Angola, Lisboa, No. **52**, p. 110. — SCIACCHITANO (1962): Monit. Zool. Ital., **69**, p. 144—145. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71**, p. 177. — MEYER (1968): Proc. U. S. Nat. Mus., **125**, No. 3664, p. 10 [*Placobdella* (*Parabdella*)].
Distribution: Congo, Ruanda, Angola, Transvaal.

2. **ceylanica** (HARDING, 1909): Proc. Cambridge philos. Soc., **15**, p. 233—234 (*Glossiphonia*). — KABURAKI (1921): Mem. Ind. Mus., **5**, p. 671—673, Fig. 5 (*Glossosiphonia*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76**, p. 357—359, Pl. XIX, Figs. 5—7, Pl. XXV, Fig. 25 (*Placobdella*). — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 73—74 (*Placobdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 80—81 [*Haementeria* (*Parabdella*)]. — BHATT (1960): Proc. Indian Sci. Congr., **47**, p. 445 (*Placobdella*).
Distribution: Ceylon, India.

3. **garoui** (HARDING, 1932): Proc. Zool. Soc. London, **1932**, p. 81—83, Fig. 1 (*Glossiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 9 (*Glossiphonia*). — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90**, p. 307. — MOORE (1958): Ann. Natal Mus., **14**, p. 316—319, Figs. 4—5, Pl. I, Fig. 9, Pl. II, Figs. 10—11 [*Placobdella* (*Parabdella*)]. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71**, p. 177.
Distribution: Ethiopia, Natal.

4. **quadrioculata** (MOORE, 1930): Proc. Acad. Nat. Sci. Philadelphia, **82**, p. 178—180, Pl. 8, Figs. 10—12 (*Placobdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 80 [*Haementeria* (*Placobdella*)]. — MEYER (1968): Proc. U. S. Nat. Mus., **125**, No. 3664, p. 11 (*Placobdella*).
Distribution: China.

5. **stuhlmanni** (BLANCHARD, 1897): Hirudineen. in MÖBIUS: Die Thierwelt Ost-Afrikas, **4**, Lief. 2, No. 13, p. 3—4, Pl. I, Figs. 1a—b (*Glossosiphonia*). — MOORE (1933): Journ. Linn. Soc. Zool. London, **38**, p. 299 (*Glossiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 9—10, Fig. 7 (*Glossiphonia*). — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90**, p. 306—309, Pl. 25, Figs. 12, 16—17 [*Placobdella* (*Parabdella*)]. — MEYER (1951): Hirudinea. in: Explor. Parc Nat. Albert, No. **76**, p. 10—11 [*Placobdella* (*Parabdella*)]. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 44, 56—57 (*Placobdella*). — SCIACCHITANO (1954): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 4, Miscell. Zool., **1**, p. 279—280 [*Placobdella* (*Parabdella*)]. — SCIACCHITANO (1957): Rev. Zool. Bot. Afr., **56**, p. 374. — SCIACCHITANO (1960): Rev. Zool. Bot. Afr., **61**, p. 289—290. — SCIACCHITANO (1961): Publ. Cult. Co. Diam., Angola, Lisboa, No. **52**, p. 110. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24**, p. 253—254. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71**, p. 177. — SCIACCHITANO (1967): Journ. Nat. Hist., **1**, p. 190—191.

= ? *papillosa* SCIACCHITANO (1939) (nec BRAUN, 1805): Rev. Zool. Bot. Afr., **32**, p. 350, Fig. 2 (*Glossiphonia*).
Distribution: East, Central and South Africa.

17. genus: **Paraclepsis** HARDING, 1924

HARDING (1924): Ann. Mag. Nat. Hist., (9) **14**, p. 495. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 88. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 84 (as subgenus of *Haementeria*).

Type-species: *Paraclepsis praedatrix* HARDING, 1924

1. **praedatrix** HARDING (1924): Ann. Mag. Nat. Hist., (9) **14**, p. 495—497, Pl. XIV. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma,

London, p. 88—90, Fig. 36, Pl. II, Figs. 11—12 (colored). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 84—85, Fig. 54 [*Haementeria* (*Paraclepsis*)].
Distribution: India.

2. **vulnifera** HARDING (1924): Ann. Mag. Nat. Hist., (9) **14,** p. 497—498, Pl. XV. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 91—92, Fig. 37. — PEARSE (1933): Journ. Siam. Soc. Nat. Hist., Bangkok, Suppl., **9,** p. 188. — MOORE (1935): Bull. Raffles Mus., **10,** p. 68. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 85 [*Haementeria* (*Paraclepsis*)].
Distribution: India, Thailand.

18. genus: **Paratorix** LUKIN & EPSHTEIN, 1960

LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **134,** p. 479. — KOZHOV (1963): Lake Baikal and its life. The Hague, p. 90.

Type-species: *Torix baicalensis* STSHEGOLEV, 1922

1. **baicalensis** (STSHEGOLEV, 1922): Russ. Hydrobiol. Zeitschr., **1,** p. 136—137, 142, Fig. 1, Pl. I (*Torix*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 87—88 (*Torix ?*). — LUKIN & EPSHTEIN (1959): The 10th conference of the problems of parasitology and natural-nidus diseases, Moscow—Leningrad, **2,** p. 189 (*Torix*). — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **131,** p. 459—460, Figs. 1c, 3c. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **134,** p. 479.
Distribution: Lake Baikal.

19. genus: **Placobdella** BLANCHARD, 1893 (emend. AUTRUM, 1936)

BLANCHARD (1893): Bull. Soc. Zool. France, **18,** p. 93—94. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 34. — BRANDES (1901): Hirudinei. in LEUCKART & BRANDES: Die Parasiten des Menschen, **1** (2), p. 896. — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13,** p. 76. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 84. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 275. — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 70. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 973. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 72—73. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs **4,** III. Abt., 4. Buch, 1. Teil, p. 58—59. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 186. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 53. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 549. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 158. — PAWLOWSKI (1963): Zesz. Nauk Univ. Lódz., Nauki Matem.-Przyrod. Ser. II, No. **14,** p. 103—105, 110.

SYNONYMY:

Trachybdella PINTO (1920): Brasil Medico, **34,** p. 624. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 996.

Type-species: *Clepsine costata* FR. MÜLLER, 1846

1. **auroguttata** MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 317—318, Pl. 26, Fig. 21. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 10.
Distribution: Uganda.

2. **bancrofti** (BEST, 1931): Trans. Proc. R. Soc. S. Australia, **55,** p. 23—31, Figs. 1—18 (*Helobdella*). — AUTRUM (1936): Hirudinea. in BRONNS: Klassen und Ordnungen des Tier-

reichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 73 [*Haementeria* (*Placobdella*)]. — RICHARDSON (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 234.
Distribution: Australia (Queensland).

3. **bdellae** INGRAM (1957): Pap. Proc. R. Soc. Tasmania, **91,** p. 228—231, Figs. 55—59, 61. — RICHARDSON (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 234.
Distribution: Tasmania.

4. **bistriata** (PINTO, 1920): Brasil Medico, **34,** No. 38, p. 625—626, Figs. A—E (*Trachybdella*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 997—999, Figs. 54A—E and a plate without number (*Trachybdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 63 [*Haementeria* (*Placobdella*)]. — CORDERO (1936): Ann. Acad. Brasil. Sci., **8,** p. 221—225. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 186—187.
Distribution: Brasil.

5. **costata** (FR. MÜLLER, 1846): Arch. f. Naturg., **12,** p. 82—85, Pl. III, Figs. 1—2 (*Clepsine*). — DIESING (1850): Systema Helminthum. Vindobonae, **1,** p. 450—451 (*Clepsine*). — KOWALEWSKI (1897): Mém. Acad. Imp. Sci. St.-Pétersb., (8) **5,** No. 3, p. 1—15, Pls. I—II (*Clepsine*). — KOWALEWSKI (1899): C. R. Acad. Sci. Paris, **128,** p. 1185—1188. — KOWALEWSKI (1900): Mém. Acad. Imp. Sci. St.-Pétersb., (8) **11,** No. 1, p. 1—77, Fig. 1, Pl. I—X (colored). — LISKIEWICZ (1925): Arch. f. Naturg., **91,** A, p. 277—278. — BOWKIEWICZ (1926): Arch. Hydrobiol. Ichtyol. Suwalki, **1,** p. 336—350 (*Haementeria*). — MANNSFELD (1928): Zool. Anz., **78,** p. 215—221, Figs. 1—4 (*Haementeria*). — HECHT (1930): SB. Ges. naturf. Fr. Berlin, Jahrg. **1930,** p. 143—157, Figs. 1—7 (*Haementeria*). — AUTRUM (1932): Zool. Anz., **98,** p. 45—46 (*Haementeria*). — MALBRANDT (1932): Zool. Anz., **100,** p. 43—45 (*Haementeria*). — MANNSFELD (1934): Korr.-bl. Naturf.-Ver. Riga, **61,** p. 162—164, Figs. 1—5 (*Haementeria*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 59—61, Figs. 4B, 41 [*Haementeria* (*Placobdella*)]. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26,** p. 115—122, Figs. 79—83 (*Haementeria*). — PAWLOWSKI (1936): Arch. Hydrobiol. Ichtyol. Suwalki, **10,** p. 15—19, Pl. II, Figs. 5—8 (*Haementeria*). — EPURE (1947): Ann. Sci. Univ. Jassy, Sci. Nat., **30,** p. 32 (*Haementeria*). — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, p. 9, Figs. 13, 26 (*Haementeria*). — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 158 [*Placobdella* (*Haementeria*)]. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 110—113, Figs. 69—70 (*Haementeria*). — SOÓS (1963): Ann. Hist.-nat. Mus. Nat. Hung., **55,** p. 291—292 (*Haementeria*).

= *affinis* DIESING (1850): Systema Helminthum. Vindobonae, **1,** p. 450 (*Clepsine*). — GRIMM (1876): Trudy Aralo-Kaspisk Exped., St.-Pétersb., Lief. **2,** p. 95 (*Clepsine*).

= *catenigera* MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 373—375, Pl. XIV, Figs. 5—9 (*Glossiphonia*). — DIESING (1850): Systema Helminthum. Vindobonae, **1,** p. 451 (*Clepsine*). — BLANCHARD (1893): Bull. Soc. Zool. France, **18,** p. 98—104, Figs. 1—5. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 35—37, Figs. 7—11. — SCRIBAN (1904): Ann. Sci. Univ. Jassy, **3,** p. 17. — PLOTNIKOV (1907): Ann. Mus. Zool. Acad. Imp. Sci. St.-Pétersbg., **10,** p. 137—138. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 276—277, Figs. 18—19. — ANNANDALE (1913): Journ. Asiat. Soc. Bengal, **9,** p. 211. — DEQUAL (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31,** No. 713, p. 3, 7. — AUGENER (1925): Zool. Anz., **62,** p. 173. — AUGENER (1930): Zool. Anz., **90,** p. 315—316 [*Haementeria* (*Placobdella*)]. — LEIGH-SHARPE (1933): Bull. Soc. Sci. Nat. Maroc, **13,** p. 127, Figs. 7—8.

= *catenigra* (error) PINTO (1923): Rev. Mus. Paulista, **13,** p. 973—974.

= *guernei* BLANCHARD (1893): Bull. Soc. Zool. France, **18,** p. 96—98, Figs. 3—5. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 275—276, Figs. 14—15. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 910—912, Fig. 17 (*Glossosiphonia*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 91. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30,** p. 110.

= *nusbaumi* GEDROYĆ (1913): Bull. Intern. Acad. Sci. Cracovie (B) **1913,** p. 36—41, Figs. 6—10 (*Haementeria*). — GEDROYĆ (1915): Rozpr. Wiad. Muz. im. Dzied.,

Lwow, **2,** p. 25—28, Figs. 2—5 (*Haementeria*). — Pinto (1923): Rev. Mus. Paulista, **13,** p. 962—963, Figs. 38A—C (*Haementeria*).

= *raboti* Blanchard (1893): Bull. Soc. Zool. France, **18,** p. 94—96, Figs. 1—2. — Johansson (1909): Hirudinea. in Brauer: Die Süsswasserfauna Deutschlands, H. **13,** p. 77, Fig. 133. — Rousseau (1912): Ann. Biol. Lacustre, **5,** p. 277—278, Figs. 20—21. — Pinto (1923): Rev. Mus. Paulista, **13,** p. 974—976, Fig. 43. — Johansson (1929): Hirudinea. in Dahl: Die Tierwelt Deutschlands, T. **15,** p. 144, Fig. 23 (*Haementeria*).

= *roszkowskii* Oka (1932): Ann. Mus. Zool. Polon., **9,** p. 322—323, Pl. XLV, Figs. 3A—C. — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 61 [*Haementeria* (*Placobdella*)]. — Pawlowski (1936): Ann. Mus. Zool. Polon., **11,** p. 359—365, Fig. 1.

Distribution: Europe (except North and Nordwestern Europe), North Africa.

6. **emydae** Harding (1920): Mem. Ind. Mus., **5,** p. 514—517, Fig. 2. — Kaburaki (1921): Rec. Ind. Mus., **22,** p. 701—702. — Pinto (1923): Rev. Mus. Paulista, **13,** p. 987—989, Fig. 49. — Harding (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 74—76, Fig. 29. — Bhatia (1930): Zool. Anz., **91,** p. 225—243, Figs. 1—3. — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 67—68, Figs. 40, 45 [*Haementeria* (*Placobdella*)].
Distribution: India, Burma.

7. **fimbriata** (Johansson, 1909): Zool. Anz., **35,** p. 148—151, Fig. 2 (*Clepsine*). — Johansson (1913): Res. Swedish Zool. Exp. Egypt and White Nile 1901, Pt. 5, No. **24,** p. 8—14, Fig. 4, Pl. I, Figs. 3—4 (*Clepsine*). — Moore (1933): Journ. Linn. Soc. London, **38,** p. 299. — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 74, Fig. 48 [*Haementeria* (*Placobdella*)]. — Moore (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 318—320, Pl. 26, Fig. 23. — Sciacchitano (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 16—18, 44, 54, Figs. 4—5. — Sciacchitano (1963): Monit. Zool. Ital., **70—71,** p. 176.

= *africana* Sciacchitano (1937): Rev. Zool. Bot. Afr., **29,** p. 427 (*Haementeria*).
Distribution: Sudan, Uganda, Kenya, Congo, Nigeria.

8. **fulva** Harding (1924): Ann. Mag. Nat. Hist., (9) **14,** p. 494—495, Pl. XIII. — Harding (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 78, Fig. 31, Pl. II, Fig. 7 (colored). — Augener (1930): Zool. Anz., **90,** p. 314—315 [*Haementeria* (*Placobdella*)]. — Augener (1931): Arch. f. Hydrobiol., Suppl. **8,** p. 747—750. — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 66—67, Fig. 44 [*Haementeria* (*Placobdella*)].
Distribution: India, Sumatra, Java.

9. **gracilis** (Blanchard, 1897) (nec Weyenbergh, 1877): Hirudinea. in Weber: Zool. Ergebn. in Niederl. Ostindien, **4,** p. 334—335, Figs. 2A—B (*Helobdella*). — Kaburaki (1921): Rec. Ind. Mus., **22,** p. 702. — Pinto (1923): Rev. Mus. Paulista, **13,** p. 976—977. — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 72. [*Haementeria* (*Placobdella*)]. — Bhatt (1960): Proc. Indian Sci. Congr., **47,** p. 445 (*Helobdella*).
Distribution: Java, India.

10. **hollensis** (Whitman, 1892): Festschr. z. 70. Geburtstage R. Leuckarts. Leipzig, p. 385—395, Pl. 39—40 (*Clepsine*). — Graf (1899): Acta Acad. Leop., Halle, **72,** p. 224, Pl. XIII, Fig. 110 (*Clepsine*). — Moore (1906): Bull. Bur. Fish., **25,** p. 160. — Moore (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. No. **5,** p. 94—96, Pl. II, Fig. 11. — Moore (1918): Hirudinea. in: Ward & Whipple: Fresh-water Biology, New York, chap. 20, p. 654. — Autrum (1936): Hirudineen. in Bronns: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 81. — Mathers (1948): Proc. Iowa Acad. Sci., **55,** p. 407. — Moore (1959): Hirudinea. in Ward & Whipple: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 550.
Distribution: U. S. A., Canada: Ontario.

11. **horai** Baugh (1960): Parasitology, **50,** p. 287—291, Figs. 1—2.
Distribution: India.

12. **indica** BAUGH (1960): Zool. Anz., **165,** p. 472—476, Figs. 3—4.
Distribution: India.

13. **jaegerskioeldi** (JOHANSSON, 1909): Zool. Anz., **35,** p. 146—148, Fig. 1 (*Clepsine*). — JOHANSSON (1913): Res. Swedish Zool. Exp. Egypt and the White Nile 1901, Pt. 5, No. **24,** p. 3—8, Figs. 1—3, Pl. I, Figs. 1—2 (*Clepsine*). — MOORE (1933): Journ. Linn. Soc. London, **38,** p. 299. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 75, Fig. 49 [*Haementeria* (*Placobdella*)]. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 313—314, Pl. 25, Figs. 3—4. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 16, 44, 54. — MOORE (1958): Ann. Natal Mus., **14,** p. 323—324, Pl. VIII, Fig. 14. — SCIACCHITANO (1961): Publ. Cult. Co. Diam., Angola, Lisboa, No. **52,** p. 111. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176.
Distribution: Sudan, Uganda, Congo, Northern Rhodesia, Zululand.

14. **maculata** WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 70—73, Pl. III, Figs. 27a—b, 28. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 985—986, Fig. 48. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 63—64, Figs. 40, 43 [*Haementeria* (*Placobdella*)]. — CORDERO (1937): Ann. Acad. Brasil. Sci., **9,** p. 19—21, Fig. 2. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 186.
Distribution: Brasil.

15. **maorica** BENHAM (1907): Trans. Proc. New Zealand Inst., **39,** p. 181—185, Pl. VIII, Figs. 1—5. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 68 [*Haementeria* (*Placobdella*)]. — INGRAM (1957): Proc. Pap. R. Soc. Tasmania, **91,** p. 231, Fig. 60.
Distribution: New Zealand.

16. **molesta** CORDERO (1934): Bol. Univ. Nac. La Plata, **18,** p. 19—22, Figs. 5—6. — CORDERO (1937): An. Mus. Arg. Cienc. Nat., **39,** p. 26—28. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 187.
Distribution: Uruguay.

17. **montifera** MOORE (1906): Bull. Bur. Fish., **25,** p. 160. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 88—90, Pl. I, Fig. 5, Pl. II, Fig. 10. — RYERSON (1915): Contr. Canad. Biol., 1911—1914, Fasc. **2,** p. 170. — MOORE (1924): Publ. Ontario Fish. Res. Labor., No. **23,** p. 23. — MILLER (1929): Ohio State Univ. F. T. Stone Labor., Columbus, Contr. No. **2,** p. 18—19. — BERE (1931): Trans. Wisconsin Acad. Sci. Arts Letters, **26,** p. 439. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 64, Fig. 40 [*Haementeria* (*Placobdella*)]. — MEYER (1937): Canad. Field-Nat., **51,** p. 118. — MEYER (1937): Ohio Journ. Sci., **37,** p. 249. — MATHERS (1948): Proc. Iowa Acad. Sci., **55,** p. 405—406, Pl. 2, Fig. 3. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 549. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool. **11,** p. 158. — MEYER (1968): Proc. U. S. Nat. Mus. **125,** No. 3664, p. 11.

= *carinata* VERRILL (1874) MOORE, 1901 (nec DIESING, 1850): Bull. Illinois State Labor., Nat. Hist., **5,** p. 498—504, Pl. XLII, Fig. 5 (*Hemiclepsis*).
= *papillifera* var. *carinata* VERRILL (1874): Rep. Comm. Fish and Fisheries **1872/73,** p. 683—684 (*Clepsine*). — MOORE (1952): Not. Nat., Acad. Nat. Sci. Philadelphia, No. **245,** p. 10 (*Clepsine*).
Distribution: U. S. A.

18. **moorei** (AUTRUM, 1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 70—71, Fig. 40 [*Haementeria* (*Placobdella*)].

= *mexicana* MOORE (1898) (nec DE FILIPPI, 1849): Proc. U. S. Nat. Mus. Washington, **21,** p. 550, Pl. XL, Fig. 3. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 979—980, Fig. 45. — OKA (1932): Ann. Mus. Zool. Polon., **9,** p. 325. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 10.
Distribution: Mexico.

19. **multilineata** MOORE (1953): Not. Nat., Acad. Nat. Sci. Philadelphia, No. **250,** p. 1—4, Pl I, Fig. 1. — BECK (1954): Utah Acad. Sci. Arts Letters, **31,** p. 75. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 550. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 159. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 11.
Distribution: Southern States of U. S. A.

20. **multistriata** (JOHANSSON, 1909): Zool. Anz., **35,** p. 151 (*Clepsine*). — JOHANSSON (1913): Res. Swedish Zool. Exp. Egypt and the White Nile 1901, Pt. 5, No. **24,** p. 14—16, Figs. 5, Pl. I, Figs. 5—6 (*Clepsine*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 984. — AUGENER (1936): SB. Ges. naturf. Fr. Berlin, Jahrg. **1935,** p. 392—395, Fig. 3 (*Haementeria*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 72—73 [*Haementeria* (*Placobdella*)]. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 311—313, Pl. 26, Fig. 22. — MEYER (1951): Hirudinea. in: Explor. Parc Nat. Albert, Fasc. **76,** p. 9—10. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 44, 53—54. — MOORE (1958): Ann. Natal Mus., **14,** p. 319—320, Pl. VII, Fig. 8. — SCIACCHITANO (1962): Monit. Zool. Ital., **69,** p. 144. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176.

= *aegyptiaca* HARDING (1911): Ann. Mag. Nat. Hist., (8) **7,** p. 388—389, Fig. 1. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 73 [*Haementeria* (*Placobdella*)].
Distribution: Egypt, Liberia, Sudan, Congo, Tanganyika, Natal, Southwest Africa.

21. **okadai** (OKA, 1925): Annot. Zool. Jap., **10,** p. 333—335, Figs. 6—7 (*Hemiclepsis*). — MOORE (1930): Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 176—177, Pl. 7, Fig. 9. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 66 [*Haementeria* (*Placobdella*)].
Distribution: Japan, China.

22. **okai** nom. nov. (for *ornata* OKA, 1929, nec VERRILL, 1872): Proc. Imp. Acad. Tokyo, **5,** p. 249—251, Figs. A—B. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 76—77 [*Haementeria* (*Placobdella*)]. — MEYER & BARDEN (1955): Wasmann Journ. Biol., **13,** p. 305.
Distribution: Taiwan.

23. **ornata** (VERRILL, 1872) (nec OKA, 1929): Amer. Journ. Sci. Arts, **3,** p. 130 (*Clepsine*). — VERRILL (1874): Rep. Comm. Fish and Fisheries **1872/73,** p. 680—682 (*Clepsine*). — MOORE (1952): Not. Nat., Acad. Nat. Sci. Philadelphia, No. **245,** p. 3, 9 (*Clepsine*). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 550. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 159. — J. E. MOORE (1964): Nat. Mus. Canada, Nat. Hist. Pap., No. **27,** p. 7. — J. E. MOORE (1966): Nat. Mus. Canada, Nat. Hist. Pap., No. **32,** p. 4.

= *rugosa* VERRILL (1874): Rep. Comm. Fish and Fisheries, **1872/73,** p. 681—682 (as variety of *Clepsine ornata*). — MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5,** p. 487—492, Pl. XLII, Figs. 2—3. — MOORE (1906): Bull. Bur. Fish., **25,** p. 160. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 86—88, Pl. A, Pl. I, Fig. 6, 9. — RYERSON (1915): Contr. Canad. Biol., 1911—1914, Fasc. **2,** p. 170. — OKA (1917): Mem. Asiat. Soc. Bengal, **6,** p. 167. — MOORE (1922): Canad. Field-Nat., **36,** p. 9. — BERE (1929): Contr. Canad. Biol. Fish. Toronto (N. S.) **4,** (14), p. 179. — MILLER (1929): Ohio State Univ. F. T. Stone Labor., Columbus, Contr. No. **2,** p. 20—21. — RAWSON (1930): Publ. Ontario Fish. Res. Labor., No. **40,** p. 35. — BERE (1931): Trans. Wisconsin Acad. Sci. Arts Letters, **26,** p. 439. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 61—62, Fig. 42 [*Haementeria* (*Placobdella*)]. — MOORE (1936): Canad. Field-Nat., **50,** p. 113. — MEYER (1937): Canad. Field-Nat., **51,** p. 118. — MEYER (1937): Ohio Journ. Sci., **37,** p. 249—250. — CABALLERO (1940): An. Inst. Biol. México, **11,** p. 255—260, Figs. 1—6. — MATHERS (1948): Proc. Iowa Acad. Sci., **55,** p. 404—405, Pl. 2, Fig. 2. — MOORE (1952): Not. Nat., Acad.

Nat. Sci. Philadelphia, No. **245,** p. 3, 9 (*Clepsine*). — MEYER & MOORE (1954): Wasmann Journ. Biol., **12,** p. 84.

= *stellata* VERRILL (1874): Rep. Comm. Fish and Fisheries **1872/73,** p. 681 (as variety of *Clepsine ornata*). — MOORE (1952): Not. Nat., Acad. Nat. Sci. Philadelphia, No. **245,** p. 9 (*Clepsine*).

Distribution: North America, Mexico, Japan (Lake Biwa).

24. **papillifera** (VERRILL, 1872): Amer. Journ. Sci. Arts, **3,** p. 130—131 (*Clepsine*). — VERRILL (1874): Rep. Comm. Fish and Fisheries **1872/73,** p. 683—684 (*Clepsine*). — MOORE (1952): Not. Nat., Acad. Nat. Sci. Philadelphia, No. **245,** p. 3, 10 (*Clepsine*). — MEYER & MOORE (1954): Wasmann Journ. Biol., **12,** p. 81—83. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 159. — J. E. MOORE (1964): Nat. Mus. Canada, Nat. Hist. Pap., No. **27,** p. 8.
Distribution: North America.

25. **parasitica** (SAY, 1824): Narrative of Expedition of the Source of St. Peter's River, Philadelphia, **2,** Appendix, p. 266 (*Hirudo*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 341—342 (*Hirudo*). — DIESING (1850): Systema Helminthum. Vindobonae, **1,** p. 450 (*Clepsine*). — CASTLE (1900): Bull. Mus. comp. Zool., Harvard, **36,** p. 51—57, Pl. 1, Figs. 2, 3a—b, Pl. 2, Fig. 6, Pl. 8, Figs. 32—33, 37 (*Glossiphonia*). — MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5,** p. 480—486, Pl. XLII, Figs. 1, 4. — MOORE (1906): Bull. Bur. Fish., **25,** p. 159—160. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 84—85, Pl. A, Pl. I, Figs. 7—8, colored plate D. — RYERSON (1915): Contr. Canad. Biol., 1911—1914, Fasc. **2,** p. 169. — MOORE (1922): Canad. Field-Nat., **36,** p. 9. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 920—921, Fig. 22 (*Glossosiphonia*). — MILLER (1929): Ohio State Univ. F. T. Stone Labor., Columbus, Contr. No. **2,** p. 19—20. — BERE (1931): Trans. Wisconsin Acad. Sci. Arts Letters, **26,** p. 439. — MOORE (1936): Canad. Field-Nat., **50,** p. 113. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 69—70, Fig. 46 [*Haementeria* (*Placobdella*)]. — MEYER (1937): Ohio Journ. Sci., **37,** p. 249. — PAWLOWSKI (1948): Fragm. Faun. Mus. Zool. Polon., **5,** p. 329. — MATHERS (1948): Proc. Iowa Acad. Sci., **55,** p. 403—404, Pl. 2, Fig. 1. — MOORE (1952): Not. Nat., Acad. Nat. Sci. Philadelphia, No. **245,** p. 8. — MEYER & MOORE (1954): Wasmann Journ. Biol., **12,** p. 84. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 550, Figs. 23,4. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 195. — J. E. MOORE (1964): Nat. Mus. Canada, Nat. Hist. Pap., No. **27,** p. 8.

= *chelydrae* WHITMAN (1889): Journ. Morphol., **2,** p. 587 (*Clepsine*) nom. nudum. — WHITMAN (1891): Journ. Morphol., **4,** p. 407—418, Pl. 1 (*Clepsine*). — MOORE (1952): Not. Nat., Acad. Nat. Sci. Philadelphia, No. **245,** p. 8 (*Clepsine*).

= *plana* WHITMAN (1891): Journ. Morphol., **4,** p. 407—418, Pl. 1 (*Clepsine*). — CASTLE (1900): Bull. Mus. comp. Zool., Harvard, **36,** p. 54—55, Pl. 8, Figs. 32, 37 (*Clepsine*). — MOORE (1952): Not. Nat., Acad. Nat. Sci. Philadelphia, No. **245,** p. 8 (*Clepsine*).

= var. *rugosa* CASTLE (1900) (nec VERRILL, 1874): Bull. Mus. comp. Zool., Harvard, **36,** p. 56—57, Fig. C, Pl. 8, Fig. 33 (*Clepsine*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 921—922 (*Glossosiphonia*).

Distribution: North America.

26. **pediculata** HEMINGWAY (1908): Amer. Naturalist, **42,** 527—532, Figs. 1—3. — HEMINGWAY (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 29—51, Pl. C, Figs. 1—10, Pl. D, Figs. 11—16, Pl. E, Figs. 17—22. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 90—93, Pl. II, Figs. 13—18. — BERE (1931): Trans. Wisconsin Acad. Sci. Arts Letters, **26,** p. 439. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch. 1. Teil, p. 79—80, Figs. 52A—B [*Haementeria* (*Placobdella*)]. — MEYER (1937): Ohio Journ. Sci., **37,** p. 249. — MATHERS (1948): Proc. Iowa Acad. Sci., **55,** p. 406—407. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 550. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 158. — BRANSON & AMOS (1961): Southwestern Nat., **6,** p. 53.
Distribution: U. S. A.

27. **pulchra** MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 314—316, Pl. 25, Figs. 8—9. — MEYER (1951): Hirudinea. in: Explor. Parc Nat. Albert, Fasc. **76,** p. 7—9. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 44, 55—56. — SCIACCHITANO (1963): Ann. Transvaal Mus., **24,** p. 253. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 11.

= *schoutedeni* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 450, Fig. 7a—b (*Haementeria*). — SCIACCHITANO (1936): Rev. Zool. Bot. Afr., **28,** p. 161 (*Haementeria*). — SCIACCHITANO (1937): Rev. Zool. Bot. Afr., **29,** p. 426 (*Haementeria*). — SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 348 (*Haementeria*).
Distribution: Tanganyika, Northern Rhodesia, Congo, Transvaal.

28. **siamensis** (OKA, 1917): Mem. Asiat. Soc. Bengal, **6,** p. 167—169, Pl. VII, Figs. 6—8 (*Hemiclepsis*). — MOORE (1930): Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 177—178. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 71 [*Haementeria* (*Placobdella*)].
Distribution: Thailand, China (Nanking).

29. **striata** OKA (1932): Ann. Mus. Zool. Polon., **9,** p. 323—325, Pl. XLV, Figs. 4A—B. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 62, Fig. 40 [*Haementeria* (*Placobdella*)]. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3,** Zool. No. 22, p. 187.
Distribution: Brasil.

30. **undulata** HARDING (1924): Ann. Mag. Nat. Hist., (9) **14,** p. 493—494, Pl. XII. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 78—81, Fig. 32. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 71—72, Fig. 47 [*Haementeria* (*Placobdella*)].
Distribution: Ceylon.

31. **unita** MOORE (1958): Ann. Natal Mus., **14,** p. 320—323, Fig. 6, Pl. VIII, Figs. 12—13. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176. — MEYER (1968): Proc. U. S. Nat. Mus., **125,** No. 3664, p. 12.
Distribution: Southwest Africa, Natal.

SPECIES INQUIRENDAE:

1. *carinata* DIESING (1850): Systema Helminthum. Vindobonae, **1,** p. 450 (*Clepsine*). — DIESING (1858): Denkschr. mathem.-naturw. Cl. K. Akad. Wiss. Wien, **14,** p. 75—76, Pl. III, Figs. 14—17 (*Clepsine*). — BLANCHARD (1893): Bull. Soc. Zool. France, **18,** p. 104—107, Figs. 1—2. — BLANCHARD (1893): Rev. Biol. Nord France, **6,** p. 43. — ROUSSEAU (1912): Ann. Biol. Lacustre, **5,** p. 276, Figs. 16—17. — ANNANDALE (1913): Journ. Asiat. Soc. Bengal, **9,** p. 213. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 980—981. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 61 [*Haementeria* (*Placobdella*)].
Distribution: Near-East, Astrachan.
2. *inleana* OKA (1922): Rec. Ind. Mus., **24,** p. 522—527, Figs. 1—2 (*Glossiphonia*). — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 76—77, Figs. 30a—c. — AUGENER (1930): Zool. Anz., **90,** p. 314—315 (*Haementeria*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 78—79, Fig. 51 (*Haementeria*).
Distribution: Burma, Ceylon.
3. *omoensis* HARANT & VERNIÈRES (1936): Mém. Mus. Nat. Hist. Nat. (N. S.) **4,** p. 223—224, Fig. 3 (*Haementeria*).
Distribution: Kenya.
4. *phalera* GRAF (1899): Acta Acad. Leop. Halle, **72,** p. 225, Pl. XIV, Figs. 116—117 (*Clepsine*). — MOORE (1906): Bull. Bur. Fish., **25,** p. 160. — RYERSON (1915): Contr. Canad. Biol., 1911—1914, Fasc. **2,** p. 170—171. — MOORE (1922): Canad. Field-Nat., **36,** p. 9. — MILLER (1929): Ohio State Univ. F. T. Stone Labor., Columbus, Contr. No. **2,** p. 21—22. — BERE (1931): Trans. Wisconsin Acad. Sci. Arts Letters, **26,** p. 439. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 77—78, Fig. 50 [*Haementeria* (*Placobdella*)]. — MATHERS

(1948): Proc. Iowa Acad. Sci., **55,** p. 407—408, Pl. 2, Fig. 5. — MEYER & MOORE (1954) Wasmann Journ. Biol., **12,** p. 84. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 548 (*Batrachobdella*). — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 158 (*Batracobdella*).

Distribution: North America.

5. *picta* VERRILL (1872): Amer. Journ. Sci. Arts, **3,** p. 128—129 (*Clepsine*). — VERRILL (1874): Rep. Comm. Fish. and Fisheries **1872/73,** p. 678—679 (*Clepsine*). — MOORE (1906): Bull. Bur. Fish., **25,** p. 159. — RYERSON (1915): Contr. Canad. Biol., 1911—1914, Fasc. **2,** p. 171. — MILLER (1929): Ohio State Univ. F. T. Stone Labor., Columbus, Contr. No. **2,** p. 21. — BERE (1931): Trans. Wisconsin Acad. Sci. Arts Letters, **26,** p. 439. — MOORE (1936): Canad. Field-Nat., **50,** p. 113. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 78 [*Haementeria* (*Placobdella*)]. — MEYER (1937): Ohio Journ. Sci., **37,** p. 250. — MOORE (1952): Not. Nat., Acad. Nat. Sci. Philadelphia, No. **245,** p. 3, 8—9. — MEYER & MOORE (1954): Wasmann Journ. Biol., **12,** p. 67. — BECK (1954): Proc. Utah Acad. Sci. Arts Letters, **31,** p. 77 (*Batrachobdella*). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 548 (*Batrachobdella*). — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 158 (*Batrachobdella*).

Distribution: North America.

6. *tuberculosa* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 449 (*Haementeria*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 94 (*Haementeria*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 55. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176.

= *stappersi* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 449, Fig. 6 (*Haementeria*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 94, Fig. 59 (*Haementeria*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 55.

Distribution: Congo.

7. *verruculosa* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 448—449 (*Haementeria*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 94 (*Haementeria*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 55. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71,** p. 176.

= *gallici* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26,** p. 450—451, Fig. 3 (*Haementeria*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 95, Fig. 60 (*Haementeria*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 55.

Distribution: Congo, Ethiopia.

20. genus: **Podoclepsis** DEQUAL, 1916

DEQUAL (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **21,** No. 717, p. 2. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 33.

Type-species: *Podoclepsis festae* DEQUAL, 1916

1. **festae** DEQUAL (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31,** No. 717, p. 2—4, Figs. 1—5. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 33, Figs. 21/I—II. — RINGUELET (1959): Physis, **21** p. 192—193 (*Helobdella*).

Distribution: Ecuador, Peru.

21. genus: **Theromyzon** PHILIPPI, 1867

PHILIPPI (1867): Arch. f. Naturg., **33,** p. 76. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 81—82. — PAWLOWSKI (1936):

Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 100. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 44—45. — BHATIA (1939): Bull. Dept. Zool. Panjab Univ., **2**, p. 4—5. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 182—183. — MANN (1953): Proc. Zool. Soc. London, **123**, p. 385. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, 1. Lief. 7b, p. 8. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Freshwater Biology, New York, 2nd ed. chap. 23, p. 548. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11**, p. 155.

SYNONYMY:

Clepsine SAVIGNY (1822) (partim): Système des Annelides. Paris, **1** (3), p. 107, 118.
Dartevellida SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32**, p. 353. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 50.
Haemocharis DE FILIPPI (1837) (nec SAVIGNY, 1822): Memoria sugli Anellidi della famiglia delle Sanguisughe. Milano, p. 5—6.
Protoclepsine MOORE (1898): Proc. U. S. Nat. Mus. Washington, **21**, p. 546.
Protoclepsis LIVANOW (1902): Zool. Jahrb. Syst., **17**, p. 342—344.

Type-species: *Hirudo tessulata* O. F. MÜLLER, 1774

1. **affinis** BENNIKE (1940): Danish Sci. Invest. Iran, Copenhagen, Pt. **2**, p. 3—6. Fig. 2.
D i s t r i b u t i o n : Iran.

2. **cooperi** (HARDING, 1932): Proc. Zool. Soc. London, **1932**, p. 83—84, Fig. 2 (*Placobdella*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 82 (*Haementeria*). — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90**, p. 320—321, Pl. 25, Figs. 10—11. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71**, p. 176. — SCIACCHITANO (1967): Journ. Nat. Hist., **1**, p. 190.
D i s t r i b u t i o n : Ethiopia.

3. **garjaewi** (LIVANOW, 1902): Zool. Jahrb. Syst., **17**, p. 346—347, Pl. 13, Figs. 2, 4, 7, 9—10 (*Protoclepsis*). — PINTO (1923): Rev. Mus. Paulista, **13**, p. 951—952 (*Protoclepsis*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 45.
D i s t r i b u t i o n : Lake Baikal.

3a. **garjaewi groenlandicum** BENNIKE (1939): Medd. Grønland, **125** (2), p. 1—8, Figs. 1—2.
D i s t r i b u t i o n : Greenland, Iceland.

4. **lineatum** SCIACCHITANO (1963): Ann. Transvaal Mus., **24**, p. 249—251, Figs. 1—4. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71**, p. 176.
D i s t r i b u t i o n : Transvaal.

5. **maculosum** (RATHKE, 1862): Beiträge zur Entwicklungsgeschichte der Hirudineen. Leipzig, p. 73—74 (*Clepsine*). — GRUBE (1871): Arch. f. Naturg., **37**, p. 114—115, Pl. IV, Fig. 1 (*Clepsine*). — BLANCHARD (1899): Bull. Soc. Zool. France, **24**, p. 181—182 (*Clepsine*). — LIVANOW (1902): Zool. Jahrb. Syst., **17**, p. 357—358 (*Protoclepsis*). — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13**, p. 73, Figs. 123—124 (*Protoclepsis*). — ROUSSEAU (1912): Ann. Biol. Lacustre, **5**, p. 269, Fig. 7 (*Protoclepsis*). — BEHNING (1924): Monogr. Biol. Wolgastat. Saratov, No. **1**, p. 168 (*Protoclepsis*). — LISKIEWICZ (1925): Arch. f. Naturg., **91** A, p. 278 (*Protoclepsis*). — MANNSFELD (1928): Zool. Anz., **78**, p. 210 (*Protoclepsis*). — JOHANSSON (1929): Hirudinea. in DAHL: Die Tierwelt Deutschlands, T. **15**, p. 143, Figs. 19—20 (*Protoclepsis*). — MANNSFELD (1934): Korr.-bl. Naturf.-Ver. Riga, **61**, p. 159 (*Protoclepsis*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 46—47, Fig. 33. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 105—107, Fig. 74. — PAWLOWSKI (1936): Arch. Hydrobiol. Ichtyol. Suwalki, **10**, p. 7—11, Pl. I, Fig. 1, Pl. II, Figs. 1—4. — PAWLOWSKI (1938): Arch. Hydrobiol. Ichtyol. Suwalki, **11**, p. 47—48. — VERRIEST (1950): Biol. Jaarb. Dodonaea, **17**, p. 225. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 8—9, Fig. 22. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11**, p. 155. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 83—87, Figs. 50—51 (*Protoclepsis*).

= *meyeri* (LIVANOW, 1902): Zool. Jahrb. Syst., **17,** p. 345—346, Pl. 13, Figs. 4, 11 (*Protoclepsis*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 950—951 (*Protoclepsis*). — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 548. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 155. — J. E. MOORE (1964): Nat. Mus. Canada, Nat. Hist. Pap., No. **27,** p. 8.

= *moorei* PINTO (1923): Rev. Mus. Paulista, **13,** p. 912—913, Fig. 18 (*Glossosiphonia*).

= *sexoculata* MOORE (1898): Proc. U. S. Nat. Mus. Washington, **21,** p. 546—547, Pl. XL, Fig. 1 (*Protoclepsine*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 346—348. — HARDING (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 82—83. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 47. — MOORE (1936): Mem. Conn. Acad., **10,** p. 191—192. — BHATIA (1939): Bull. Dept. Zool. Panjab Univ., **2,** p. 9. — MEYER (1968): Proc. U. S. Nat. Mus. **125,** No. 3664, p. 10 (*Protoclepsine*).

= ? *tessulata* MALM (1860) (nec O. F. MÜLLER, 1774): Kongl. Vetensk. Vitt. Samh. Handl., **8,** p. 213—217, Pl. 4, Figs. 12a—d (colored) (*Clepsine*).

= *tesselata* var. *marmorata* LINDENFELD & PIETRUSZIŃSKI (1890): Pam. Fizyjograf. **10,** p. 423, Pl. XIV, Fig. 24 (*Clepsine*). — PAWLOWSKI (1936): Arch. Hydrobiol. Ichtyol. Suwalki, **10,** p. 8.

Distribution: Holarctic Region, north of about Lat. 40°; Assam.

6. **matthaii** BHATIA (1939): Bull. Dept. Zool. Panjab Univ., **2,** p. 6—10, Figs. 2—3, Pl. I, Fig. 1.
Distribution: Kashmir.

7. **mollissimum** (GRUBE, 1871) (nec MOORE, 1898): Arch. f. Naturg., **37,** p. 112—114, Pl. IV, Fig. 3 (*Clepsine*). — LIVANOW (1902): Zool. Jahrb. Syst., **17,** p. 350—353, Pl. 14, Figs. 3, 5, 8 (*Protoclepsis*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 49—50.
Distribution: Lake Baikal.

8. **propinquum** RINGUELET (1947): Not. Mus. La Plata, **12,** Zool. No. 103, p. 217—221, Fig. 1. — RINGUELET (1958): Acta Zool. Lilloana, **15,** p. 128—134, Figs. 7—10. — RINGUELET (1968): Physis, **27,** p. 374.
Distribution: Argentina.

9. **rude** (BAIRD, 1869): Proc. Zool. Soc. London, **1869,** p. 317 (*Glossiphonia*). — MOORE & MEYER (1951): Wasmann Journ. Biol., **9,**, p. 60—67, Pl. IX, Figs. 1—3. — MEYER & MOORE (1954): Wasmann Journ. Biol., **12,** p. 84—89. — OLIVER (1958): Canad. Field-Nat., **72,** p. 163. — MOORE (1959): Hirudinea. in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed. chap. 23, p. 548. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 155. — J. E. MOORE (1964): Nat. Mus. Canada, Nat. Hist. Pap., No. **27,** p. 8—9. — J. E. MOORE (1966): Nat. Mus. Canada, Nat. Hist. Pap., No. **32,** p. 4—5.

= *occidentalis* VERRILL (1874): Rep. Comm. Fish and Fisheries **1872/73,** p. 685 (*Clepsine*). — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5,** p. 96—98, Pl. II, Fig. 12 (*Hemiclepsis*). — MOORE (1922): Canad. Field-Nat., **36,** p. 9—10 (*Protoclepsis*). — BERE (1929): Contr. Canad. Biol. Fish. Toronto, (N. S.) **4** (14), p. 179. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 45—46. — MOORE (1952): Not. Nat., Acad. Nat. Sci. Philadelphia, No. **245,** p. 4, 11—12 (*Clepsine*). — OLIVER (1958): Canad. Field-Nat., **72,** p. 163.

Distribution: Canada, Northern part of U. S. A.

10. **tessellatoides** (LIVANOW, 1902): Zool. Jahrb. Syst., **17,** p. 349—350, Pl. 13, Fig. 5 (*Protoclepsis*). — PINTO (1923): Rev. Mus. Paulista, **13,** p. 952—953 (*Protoclepsis*). — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 49.
Distribution: Lake Baikal.

11. **tessulatum** (O. F. MÜLLER, 1774): Vermium terrestrium et fluviatilum. Havniae et Lipsiae, **1** (2), p. 45—46 (*Hirudo*). — BRAUN (1805): Systematische Beschreibung einiger Egelarten. Berlin, p. 56—57, Pl. 6, Figs. 6—10 (colored) (*Hirudo*). — SAVIGNY (1822):

Système des Annelides. Paris, **1** (3), p. 117—118 (*Nephelis*). — DE BLAINVILLE (1827): Dict. Sci. Nat. Paris, **47**, p. 261 (*Hirudo*). — DE BLAINVILLE (1828): Dict. Sci. Nat. Paris, **57**, p. 558 (*Ichthyobdella*) and p. 564 (as variety of *Erpobdella vulgaris*). — BRIGHTWELL (1842): Ann. Mag. Nat. Hist., **9**, p. 13, Pl. I, Figs. 15—17 (colored) (*Nephelis*). — FR. MÜLLER (1844): Arch. f. Naturg., **10**, p. 376 (*Clepsine*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 379—381 (*Glossiphonia*). — DIESING (1850): Systema Helminthum. Vindobonae, **1**, p. 447—448 (*Clepsine*). — VEJDOVSKÝ (1884): SB. Kgl. Böhm. Ges. Wiss. in Prag, Jahrg. **1883**, p. 421—423 (*Hemiclepsis*). — APÁTHY (1888): Zool. Jahrb. Syst., **3**, p. 769, 789 (*Clepsine*). — BLANCHARD (1892): Mém. Soc. Zool. France, **5**, p. 56—68, Fig. 1 (*Glossiphonia*). — BLANCHARD (1892): Actas Soc. Sci. Chili, **2**, 177—187, Figs. 1—2 (*Glossiphonia*). — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8**, No. 145, p. 23—24 (*Glossiphonia*). — BLANCHARD (1893): Bull. Soc. Zool. France, **18**, p. 197—198 (*Glossiphonia*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9**, No. 192, p. 32, Fig. 4 (*Hemiclepsis*). — LIVANOW (1902): Zool. Jahrb. Syst., **17**, p. 348—349, Pl. 13, Figs. 1, 13 (*Protoclepsis*). — PLOTNIKOV (1907): Ann. Mus. Zool. Acad. Imp. Sci. St.-Pétersb., **10**, p. 139 (*Hemiclepsis*). — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13**, p. 72—73, Fig. 122 (*Protoclepsis*). — HARDING (1910): Parasitology, **3**, p. 148—151, Fig. 4, Pl. XV, Figs. 33—35 (colored) (*Protoclepsis*). — MOORE (1911): Rep. Princeton Univ. Exp. to Patagonia, 1896—1899, **3**, Zoology, Pt. VII, p. 686—687 (*Hemiclepsis*). — ROUSSEAU (1912): Ann. Biol. Lacustre, **5**, p. 267—268, Fig. 6 (*Protoclepsis*). — GEDROYĆ (1915): Rozpr. Wiad. Muz. im. Dzied., Lwow, **2**, p. 33—37, Figs. 7A—D (*Protoclepsis*). — WEBER (1915): Monographie des Hirudinées Sud-Americaines. Neuchâtel, p. 74—78, Pl. IV, Figs. 29—30 (*Protoclepsis*). — PINTO (1923): Rev. Mus. Paulista, **13**, p. 947—950, Fig. 34 (*Protoclepsis*). — JOHANSSON (1929): Hirudinea. in DAHL: Die Tierwelt Deutschlands, T. **15**, p. 143, Figs. 17—18 (*Protoclepsis*). — OKA (1932): Proc. Imp. Acad. Tokyo, **8**, p. 457—459, Fig. 1 (*Protoclepsis*). — OKA (1932): Ann. Mus. Zool. Polon., **9**, p. 326 (*Protoclepsis*). — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 101—105, Figs. 71—72. — PAWLOWSKI (1936): Arch. Hydrobiol. Ichtyol. Suwalki, **10**, p. 5—7. — PAWLOWSKI (1936): Fol. Morphol. Warszawa, **6**, p. 87—91, Figs. 1—2. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4**, III. Abt., 4. Buch, 1. Teil, p. 47—49, Fig. 34. — HOTZ (1938): Rev. Suisse Zool., **45**, Suppl., p. 1—380. — BENNIKE (1943): Fol. Limnol. Scand., No. **2**, p. 77—79, Figs. 16, 28K. — RINGUELET (1944): Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 183. — VERRIEST (1950): Biol. Jaarb. Dodonaea, **17**, p. 225, Fig. 9. — MANN (1953): Proc. Zool. Soc. London, **123**, p. 385—386, 390, Figs. 19, 23. — HOFFMANN (1955): Arch. Inst. Grand-Ducal Luxemb. (N. S.) **22**, p. 192—193, Figs. 6A—B (*Protoclepsis*). — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 8, Figs. 22, 24. — WOJTAS (1959): Soc. Sci. Lódz., Sect. III. No. 58, p. 51—52, Fig. 17. — DRESSCHER & ENGEL (1960): Wetensch. Meded. Konink. Nederl. Natuurh. Ver., No. **39**, p. 22—25, Figs. 9, 15—18. — MANN (1961): Hirudinea. in: Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11**, p. 155. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 80—83, Figs. 48—49 (*Protoclepsis*).

= *eacheana* THOMPSON (1846): Ann. Mag. Nat. Hist., **33**, p. 390—391, Fig. 1 (*Glossiphonia*).

= *pallens* PHILIPPI (1867): Arch. f. Naturg., **33**, p. 76—77, Pl. 2, Figs. Aa—c. — BLANCHARD (1893): Bull. Soc. Zool. France, **18**, p. 14—16. — BLANCHARD (1893): Actas Soc. Sci. Chili, **3**, p. XXV—XXVII.

= *vitrina* JONSTON (1865): A Catalogue of the British Non-parasitical Worms in the Collection of the British Museum. London, p. 317—318 (*Glossiphonia*).

Distribution: Holarctic Region, South America.

SPECIES INQUIRENDA:

1. *rigatum* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32**, p. 352—353, Fig. 5 (*Dartevellida*). — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16**, p. 50. — SCIACCHITANO (1963): Monit. Zool. Ital., **70—71**, p. 176.
Distribution: Congo.
2. *tesselata* var. *granata* MÉGNIN (1906): Arch. Parasit., **10**, p. 71—76 (*Hemiclepsis*). — PINTO (1923): Rev. Mus. Paulista, **13**, p. 931—932 (*Hemiclepsis*).
Distribution: Europa.

22. genus: **Torix** BLANCHARD, 1893

BLANCHARD (1893): Bull. Soc. Zool. France, **18,** p. 185. — BLANCHARD (1898): Bull. Sci. France Belgique, **28,** p. 339. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 989. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 86. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **131,** p. 459—460. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **134,** p. 479—480. — KOZHOV (1963): Lake Baikal and its life. The Hague, p. 90—91.

Type-species: *Torix mirus* BLANCHARD, 1893

1. **cotylifer** BLANCHARD (1898): Bull. Sci. France Belgique, **28,** p. 343—344. — MOORE (1930): Proc. Acad. Sci. Nat. Philadelphia, **82,** p. 169—174, Fig. 1, Pl. 7, Figs. 1—5, — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs. **4,** III. Abt., 4. Buch, 1. Teil, p. 86—87, Fig. 55. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **134,** p. 479—480, Figs. 1A, 2B.
   Distribution: China (Shanghai, Peking), Soviet Union (Lake Hanke).

2. **mirus** BLANCHARD (1893): Bull. Soc. Zool. France, **18,** p. 185—186. — BLANCHARD (1898): Bull. Sci. France Belgique, **28,** p. 339—342, Figs. 1—4. — PINTO (1923): Rev. Mus. Paulista, **13,** p. 989. — MOORE (1930): Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 174. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 87. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **131,** p. 459—460. — LUKIN & EPSHTEIN (1960): Dokl. Akad. Nauk U. S. S. R., **134,** p. 479.
   Distribution: North Vietnam (Cao-Bang).

GENERA INQUIRENDAE:

1. **Dermobdella** PHILIPPI (1867): Arch. f. Naturg., **33,** p. 77.
   Type-species: *Dermobdella purpurea* PHILIPPI, 1867
   purpurea PHILIPPI (1867): Arch. f. Naturg., **33,** p. 77—78, Pl. II, Figs. Ba—c.
   Distribution: Chile.
2. **Granelia** HARANT & VERNIÈRES (1935): Arch. Soc. Sci. méd. biol. Montpellier, **16,** p. 219.
   Type-species: *Granelia naivashae* HARANT & VERNIÈRES, 1935
   naivashae HARANT & VERNIÈRES (1935): Arch. Soc. Sci. méd. biol. Montpellier, **16,** p. 219. — HARANT & VERNIÈRES (1936): Mém. Mus. Nat. Hist. Nat., (N. S.) **4,** p. 225, Figs. 4—5.
   Distribution: Kenya.
3. **Semilageneta** GODDARD (1908): Proc. Linn. Soc. N. S. Wales, **33,** p. 338.
   Type-species: *Semilageneta hilli* GODDARD, 1908
   hilli GODDARD (1908): Proc. Linn. Soc. N. S. Wales, **33,** p. 338—342, Figs. 11—13.
   Distribution: Australia.
4. **Trigonobdella** SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 358.
   Type-species: *Trigonobdella bomensis* SCIACCHITANO, 1939
   bomensis SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 358—359, Fig. 13.
   Distribution: Congo.

GENERIC STATUS UNCERTAIN

1. **Clepsina sanguinea** DE FILIPPI (1837): Memoria sugli Anellidi della famiglia delle Sanguisughe. Milano, p. 25, Fig. 15. — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées. Paris, p. 370, Pl. XIV, Fig. 1 (*Glossiphonia*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 32, Fig. 4.
   Distribution: Italy.
2. **Clepsine coecum** GRIMM (1876): Trudy Aralo-Kaspisk Exped., St.-Pétersbg., Lief. **2,** p. 94—95. — AUTRUM (1936): Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch, 1. Teil, p. 92.
   Distribution: Lake Baikal.
3. **Celpsine octostriata** GRUBE (1866): Jahresb. Schles. Ges. vaterl. Cultur, **44,** p. 61. — GRUBE (1871): Arch. f. Naturg., **37,** p. 109—110, Pl. IV, Fig. 4. — AUTRUM (1936):

Hirudineen. in BRONNS: Klassen und Ordnungen des Tierreichs, **4,** III. Abt., 4. Buch 1. Teil, p. 93. — RICHARDSON (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 232.
Distribution: Australia.

4. **Clepsine n. sp.?** JOHANSSON (1911): Hirudinea. in: Die Fauna Südwest-Australiens, **3,** Lief. 12, p. 421—423, Fig. 8. — RICHARDSON (1968): Proc. Linn. Soc. N. S. Wales, **92,** p. 232.
Distribution: Australia.
5. **Haementeria dartevellei** SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 349—350, Fig. 1. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 50.
Distribution: Congo.
6. **Haementeria mammillosa** SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32,** p. 349. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool., **16,** p. 49—50.
Distribution: Congo.
7. **Hirudo (Erpobdella) oniscus** DE BLAINVILLE (1827): Dict. Sci. Nat., Paris, **47,** p. 264, Pl. XXXVII, Fig. 7. — DE BLAINVILLE (1828): Dict. Sci. Nat., Paris, **57,** p. 565 (*Glossobdella*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, p. 383—384 (*Glossiphonia*). — DIESING (1850): Systema Helminthum, Vindobonae, 1, p. 455 (*Clepsine*).
Distribution: North America.

REFERENCES

1. ANNANDALE, N. (1913): A report on the biology of the Lake of Tiberias. II. The leeches of the Lake of Tiberias. — Journ. Asiat. Soc. Bengal, **9,** p. 211—214.
2. APÁTHY, ST. (1888): Süsswasser-Hirudineen. Ein systematischer Essay. — Zool. Jahrb. Syst., **3,** p. 725—794.
3. AUGENER, H. (1925): Blutegel von der Balkanhalbinsel. — Zool. Anz., **62,** p. 161—173.
4. AUGENER, H. (1926): Nachtrag zur Blutegelfauna der Balkanhalbinsel nebst Bemerkungen über Egel aus anderen Gebieten. — Zool. Anz., **68,** p. 239—247.
5. AUGENER, H. (1930): Mitteilungen über einige Polychaeten und Hirudineen aus den Zoologischen Museen von Basel, Berlin und Hamburg. — Zool. Anz., **90,** p. 303—316.
6. AUGENER, H. (1931): Hirudinea der Deutschen Limnologischen Sunda-Expedition. — Arch. f. Hydrobiol., Suppl. **8,** p. 733—758.
7. AUGENER, H. (1931): Die bodensässigen Polychäten nebst einer Hirudinee der Meteor-Fahrt. — Mitt. Zool. Inst. Mus. Hamburg, **44,** p. 279—313.
8. AUGENER, H. (1936): Hirudineen aus Deutsch-Südwestafrika. — SB. Ges. naturf. Fr. Berlin, Jahrg. **1935,** p. 381—397.
9. AUTRUM, H. (1932): Ein neuer Fundort von Haementeria costata (Fr. Müller) in Deutschland und Bemerkungen über den möglichen Wirt des Egels. — Zool. Anz., **98,** p. 45—46.
10. AUTRUM, H. (1936): Hirudineen. — in BRONNS: Klassen und Ordnungen des Tierreichs, Leipzig, **4,** III. Abt., 4. Buch, 1. Teil, 1. Lief., p. 1—96.
11. AUTRUM, H. (1939): Hirudineen. VII. Geographische Verbreitung. — in BRONNS: Klassen und Ordnungen des Tierreichs, Leipzig, **4,** III. Abt., 4. Buch, 2. Teil, p. 497—520.
12. AUTRUM, H. (1939): Hirudineen. X. Literatur über Hirudineen. — in BRONNS: Klassen und Ordnungen des Tierreichs, Leipzig, **4,** III. Abt., 4. Buch, 2. Teil, p. 539—642.
13. AUTRUM, H. (1958): Hirudinea. — in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1,** Lief. 7b, pp. 30.
14. BAIRD, W. (1869): Descriptions of some new Suctorial Annelides in the Collection of the British Museum. — Proc. Zool. Soc. London, **1869,** p. 310—318.
15. BAUGH, S. CH. (1960): Studies on Indian Rhynchobdellid leeches. I. — Parasitology, **50,** p. 287—301.
16. BAUGH, S. CH. (1960): Studies on Indian Rhynchobdellid Leeches. II. — Zool. Anz., **165,** p. 468—477.
17. BECK, D. E. (1954): Ecological and distributional notes on some Utah Hirudinea. — Proc. Utah Acad. Sci. Arts Letters, **31,** p. 73—78.
18. BEHNING, A. I. (1924): Zur Erforschung der am Flußboden der Wolga lebenden Organismen. — Monogr. Biol. Wolgastat., Saratov, No. **1,** pp. 398.
19. BENHAM, W. B. (1907): Two New Species of Leech in New Zealand. — Trans. Proc. New Zealand Inst., **39,** p. 180—192.

20. BENNIKE, S. A. B. (1939): The Greenland variety of Theromyzon garjaewi (Livanow). — Meddel. Grønland, **125,** No. 2, p. 1—8.
21. BENNIKE, S. A. B. (1940): On some Iranian Freshwater Hirudinea. — Danish Sci. Investig. in Iran, Part II, p. 1—10.
22. BENNIKE, S. A. B. (1943): Contributions to the ecology and biology of the Danish freshwater leeches (Hirudinea). — Fol. Limnol. Scand., No. **2,** p. 1—109.
23. BERE, R. (1929): Reports of the Jasper Park Lakes Investigations, 1925—26. III. The leeches. — Contr. Canad. Biol. Fish. Toronto (N. S.) **4** (14), p. 177—183.
24. BERE, R. (1931): Leeches from the Lakes of northeastern Wisconsin. — Trans. Wisconsin Acad. Sci. Arts Letters, **26,** p. 437—440.
25. BERGMANN, T. (1757): Afhandling om Iglar — Svensk. Kongl. Vetensk. Akad. Handl., **18,** p. 304—314.
26. BEST, E. W. (1931): The anatomy of an Australian leech, Helobdella bancrofti. — Trans. Proc. R. Soc. S. Australia, **55,** p. 23—31.
27. BHATIA, M. L. (1930): On the anatomical details of Placobdella emydae Harding. A leech parasitic on Indian Turtles. — Zool. Anz., **91,** p. 225—243.
28. BHATIA, M. L. (1930): Sur une nouvelle Hirudinée Rhynchobdelle, Glossiphonia cruciata n. sp., provenant du vivier à truites d'Achha Bal, Kashmir (1). — Ann. Parasit. hum. comp., **8,** p. 344—348.
29. BHATIA, M. L. (1934): Nouvelle sangsue rhynchobdellide, Glossiphonia lobata n. sp., de l'établissement de pisciculture d'Achha Bal (Kashmir) (1). — Ann. Parasit. hum. comp., **12,** p. 121—129.
30. BHATIA, M. L. (1939): On some leeches from the Dal Lake, Kashmir. — Bull. Dept. Zool. Panjab Univ., **2,** p. 1—17.
31. BHATT, B. D. (1960): On some fresh-water leeches from Kumaon (U. P.). — Proc. Indian Sci. Congr., **47,** p. 445.
32. DE BLAINVILLE, H. (1818): Hirudinea. — in LAMARCK: Histoire naturelle des animaux sans Vertèbres, Paris, **5,** p. 291—292.
33. DE BLAINVILLE, H. (1827): Sangsues. — in: Dict. Sci. Nat., Paris, **47,** p. 205—273.
34. DE BLAINVILLE, H. (1828): "Vers". — in: Dict. Sci. Nat., Paris, **57,** p. 365—625.
35. BLANCHARD, E. (1849): Annelides. — in GAY: Historia fisica y politica de Chile, Paris, Zool. **3,** p. 47—48.
36. BLANCHARD, R. (1888): Hirudinées. — in: Dict. enc. Sci. Méd., (4) **14,** p. 129—162.
37. BLANCHARD, R. (1892): Courtes notices sur les Hirudinées: IV. Description de la Glossiphonia marginata (O. F. Müller); V. Description de la Glossiphonia sexoculata Bergmann. — Bull. Soc. Zool. France, **17,** p. 173—178 and 178—182.
38. BLANCHARD, R. (1892): Description de la Glossiphonia tessellata. — Mém. Soc. Zool. France, **5,** p. 56—68.
39. BLANCHARD, R. (1892): Présence de la Glossiphonia tessellata au Chili. Description complémentaire de cette Hirudinée. — Actas Soc. Sci. Chile, **2,** p. 177—187.
40. BLANCHARD, R. (1893): Révision des Hirudinées du Musée de Turin. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 145, p. 1—32.
41. BLANCHARD, R. (1893): Sur quelques Hirudinées du Piémont. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **8,** No. 146, p. 1—12.
42. BLANCHARD, R. (1893): Sanguijuelas de la península ibérica. — Anal. Soc. Españ. Hist. Nat., **22,** p. 243—258.
43. BLANCHARD, R. (1893): Courtes notices sur les Hirudinées: VII. Sur le Theromyzon pallens Philippi, 1867; X. Hirudinées de l'Europe boréale; XI. Description de la Placobdella catenigere (M.-Td.), 1846; XII. Description de la Placobdella carinata (Diesing), 1850; XIV. Sur la Blennobdella depressa Ém. Blanchard, 1849; XVIII. Encore la Glossiphonia tessellata. — Bull. Soc. Zool. France, **18,** p. 14—16, 92—98, 98—104, 104—108, 112—113 and 197—198.
44. BLANCHARD, R. (1893): Torix mirus (n. g., n. sp.). — Bull. Soc. Zool. France, **18,** p. 185—186.
45. BLANCHARD, R. (1893): Theromyzon pallens Philippi synonyme de Glossiphonia tessellata O. F. Müller. — Actas Soc. Sci. Chili, **3,** p. XXV—XXVII.
46. BLANCHARD, R. (1893): Voyage du docteur Th. Barrois aux Açores. Hirudinées. — Rev. Biol. Nord. France, **6,** p. 40—41.
47. BLANCHARD, R. (1894): Hirudinées de l'Italie continentale et insulaire. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **9,** No. 192, p. 1—84.
48. BLANCHARD, R. (1896): Viaggio del dott. A. Borelli nella Republica Argentina e nel Paraguay. XXI. Hirudinées. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **11,** No. 263, p. 1—24.

49. Blanchard, R. (1897): Hirudinées des Indes néerlandaises. — in Weber: Zool. Ergebn. in Niederl. Ostindien, **4**, p. 332—356.
50. Blanchard, R. (1897): Hirudinées du Musée de Leyde. — Not. Leyden Mus., **19**, p. 73—113.
51. Blanchard, R. (1897): Hirudineen Ost-Afrikas. — in Möbius: Die Thierwelt Ost-Afrikas und der Nachbargebiete, **4**, Lief. 2, No. 14, p. 1—8.
52. Blanchard, R. (1898): Nouveau type d'Hirudinée (Torix mirus). — Bull. Sci. France Belgique, **28**, p. 339—344.
53. Blanchard, R. (1899): Courtes notices sur les Hirudinées: XXV. Sur la Clepsine maculosa Rathke, 1862; XXVI. Sur la Clepsine polonica Lindenfeld et Pietruszyński, 1890; XXVII. Sur les genres Liostoma Wagler et Haementeria de Filippi; XXVIII. Sur le Liostomum Ghilianii (F. de Filippi, 1849). — Bull. Soc. Zool. France, **24**, p. 181—182, 183, 183—187 and 187—189.
54. Blanchard, R. (1900): Hirudineen. — in: Ergebn. Hamb. Magalhaens. Sammelreise 1892/93, Hamburg, **3** (3), p. 1—20.
55. Bosc, L. A. G. (1802): Histoire naturelle des vers. — Article Sangsues, **1**, p. 271—290.
56. Brandes, G. (1886—1901): Hirudinei. — in Leuckart & Brandes: Die Parasiten des Menschen und die von ihnen herrührenden Krankheiten. Leipzig, **1** (2), 2nd ed., p. 535—897.
57. Branson, B. A. & Amos, B. G. (1961): The leech Placobdella pediculata Hemingway parasitizing Aplodinotus grunniens in Oklahoma. — Southwestern Nat., **6**, p. 53.
58. Braun, J. F. Ph. (1805): Systematische Beschreibung einiger Egelarten, sowohl nach ihren äussern Kennzeichen als nach ihrem innern Bau. — Berlin, p. 1—74.
59. Bowkiewicz, J. (1926): Haementeria costata (F. Müller) w jeziorze Krzyzaki pod Wilnem. — Arch. Hydrobiol. Ichtyol. Suwalki, **1**, p. 336—350.
60. Brightwell, T. (1842): On Hirudo geometra Linn., and some other species of British freshwater leeches. — Ann. Mag. Nat. Hist., **9**, p. 11—15.
61. Bychowsky, A. (1921): Über die Entwicklung der Nephridien von Clepsine sexoculata Bergmann (complanata Savigny), ein Beitrag zum Nephridienproblem. — Rev. Suisse Zool., **29**, p. 41—131.
62. Caballero, E. (1930): Revisión de los Hirudíneos mexicanos. II. Haementeria officinalis. — An. Inst. Biol. México, **1**, p. 319—325.
63. Caballero, E. (1931): Glossiphonia socimulcensis nv. sp. — An. Inst. Biol. México, **2**, p. 85—90.
64. Caballero, E. (1932): Algunas sanguijuelas de la región de Tenancingo. — An. Inst. Biol. México, **3**, p. 41—42.
65. Caballero, E. (1933): Sanguijuelas del estado de Guanajuato. — An. Inst. Biol. México, **4**, p. 179—185.
66. Caballero, E. (1935): Hirudíneos de México. XI. Glossosiphonia fusca Castle 1900. — An. Inst. Biol. México, **6**, p. 49—52.
67. Caballero, E. (1940): Sobre la presencia de la Placobdella rugosa (Hirudinea: Glossosiphonidae) en las aguas del lago de Xochimilco. XIII. — An. Inst. Biol. México, **11**, p. 255—260.
68. Caballero, E. (1940): Sanguijuelas del lago de Patzcuaro y descripción de una nueva especie, Illinobdella patzcuarensis. XIV. — An. Inst. Biol. México, **11**, p. 449—464.
69. Caballero, E. (1941): Hirudíneos de México. XVI. Nuevos huéspedes y localidades para algunas sanguijuelas ya conocidas y descripción de una nueva especie. — An. Inst. Biol. México, **12**, p. 747—757.
70. Caballero, E. (1956): Hirudíneos de México. XX. Taxa y nomenclatura de la clase Hirudinea hasta géneros. — An. Inst. Biol. México, **27**, p. 279—302.
71. Caballero, E. (1960): Hirudíneos de México. XXII. Taxa y nomenclatura de la clase Hirudinea hasta géneros (Nueva edición). — An. Inst. Biol. México, **30**, p. 227—242.
72. Carena, H. (1820): Monographie du genre Hirudo, ou description des espèces de Sangsues qui se trouvent ou qui sont en usage en Piemont. — Mem. Real. Accad. Sci. Torino, **25**, p. 273—316.
73. Carena, H. (1824): Monographie du genre Hirudo. Supplément. — Mem. Real. Accad. Sci. Torino, **28**, p. 331—337.
74. Castle, W. E. (1900): Some North American Fresh-Water Rhynchobdellidae, and their Parasites. — Bull. Mus. comp. Zool. Harvard, **36**, p. 17—64.
75. Chelladurai, J. E. (1934): On a new Indian leech, Hemiclepsis viridis sp. nov. — Rec. Ind. Mus., **36**, p. 345—352.
76. Cordero, E. H. (1934): Descripción de los nuevos Hirudíneos del Plata, de los géneros Piscicola y Placobdella. — Bol. Univ. Nac. La Plata, **18**, p. 13—22.

77. CORDERO, E. H. (1936): Revisión de los tipos de Hirudíneos brasileros descriptos por César Pinto en 1920. — Ann. Acad. Brasil. Sci., **8,** p. 221—231.
78. CORDERO, E. H. (1937): Los Hirudíneos del nordeste del Brasil. I. Especies recogidas por Clemente Pereira en 1933 y por el autor en 1935. — Ann. Acad. Brasil. Sci., **9,** p. 13—26.
79. CORDERO, E. H. (1937): Hirudíneos neotropicales y subantárcticos nuevos, críticos o ya conocidos del Museo Argentino de Ciencias Naturales. — An. Mus. Arg. Cienc. Nat., **39,** p. 1—77.
80. CORDERO, E. H. (1941): Revisión de las especies de Hirudíneos de la República Argentina, descriptos por Weyenbergh en 1879 y 1883. — Bol. Acad. Nac. Cienc. Córdoba, **35,** p. 182—214.
81. CORDERO, E. H. (1946): Notes sur les Hirudinées, III. Helobdella anoculis Weber = H. michaelseni R. Bl. — Comun. Zool. Mus. Hist. Nat. Montevideo, **2,** No. 26, p. 1—4.
82. CORDERO, E. H. (1946): Notes sur les Hirudinées, IV. Anoculobdella trituberculata Weber = Helobdella triserialis (Em. Bl.). — Comun. Zool. Nus. Hist. Nat. Montevideo, **2,** No. 30, p. 1—9.
83. DALYELL, J. G. (1853): The Powers of the Creator displayed in the Creation. — London, **2,** pp. 450.
84. DAUDIN, F. M. (1800): Recueil de mémoires et de notes sur des espèces inédites ou peu connues de Mollusques, de Vers et de Zoophytes. — Paris, pp. 107, spec. p. 19—23.
85. DENDY, A. & OLLIVER, M. F. (1901): On a New Zealand fresh-water leech [Glossiphonia (Clepsine) novaezealandiae n. sp.]. — Trans. Proc. New Zealand Inst., **33,** p. 99—103.
86. DEQUAL, L. (1916): Nuovi dati sulla distribuzione degli Irudinei italiani. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **31,** No. 713, p. 1—8.
87. DEQUAL, L. (1916): Viaggio del Dott. E. Festa nel Darien, nell'Ecuador e regioni vicine. XXV. Irudinei. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **31,** No. 717, p. 1—20.
88. DEQUAL, L. (1917): Nuovi Irudinei esotici del Museo Zoologico di Torino. — Boll. Mus. Zool. Anat. comp. Univ. Torino, **32,** No. 724, p. 1—20.
89. DIESING, C. M. (1850): Systema Helminthum. — Vindobonae, **1,** pp. 680, spec. p. 446—456, 652.
90. DIESING, K. M. (1858): Vierzehn Arten von Bdellideen. — Denkschr. mathem.-naturw. Cl. K. Akad. Wiss. Wien, **14,** p. 63—80.
91. DRESSCHER, G. N. & ENGEL, H. (1960): De nederlandse Bloedzuigers (Hirudinea). — Wetensch. Meded. Konink. Nederl. Natuurh. Ver., No. **39,** p. 1—60.
92. EPURE, E. X. (1947): Die Fauna der Hirudineen im Banat. — Ann. Sci. Univ. Jassy (Sci. Nat.) **30,** p. 29—37.
93. DE FILIPPI, F. (1837): Memoria sugli Anellidi della famiglia delle Sanguisughe. Coll'indicazione di alcune specie indigene della Lombardia. — Milano, p. 1—32.
94. DE FILIPPI, F. (1849): Sopra un nuovo genre (Haementeria) di Annelidi della famiglia delle Sanguisughe. — Mem. Real. Accad. Sci. Torino (2) **10,** p. 401—412.
95. DE FILIPPI, F. (1849): Nuovo genere di sanguisughe medicinali. — Gazzetta med. Lombard., (2) **2,** p. 437—438.
96. GEDROYĆ, M. (1913): Zur Kenntnis der europäischen Hirudineenarten. — Bull. Intern. Acad. Sci. Cracovie, (B), **1913,** p. 32—47.
97. GEDROYĆ, M. (1915): Pijawki (Hirudinea) Polski. Studyum monograficzne. — Rozpr. Wiad. Muz. im. Dzied., Lwow, **2,** p. 1—101.
98. GODDARD, E. J. (1908): Contribution to our knowledge of Australian Hirudinea. Part. I. — Proc. Linn. Soc. N. S. Wales, **33,** p. 320—342.
99. GODDARD, E. J. (1909): Contribution to our knowledge of Australian Hirudinea. Part. III. — Proc. Linn. Soc. N. S. Wales, **34,** p. 467—486.
100. GODDARD, E. J. & MALAN, D. E. (1912): The South African Hirudinea. Part. I. — Ann. S. Afr. Mus., **11,** p. 307—319.
101. GODDARD, E. J. & MALAN, D. E. (1913): Contributions to a knowledge of South African Hirudinea. On some points in the anatomy of Marsupiobdella africana. — Trans. R. Soc. S. Afr., **3,** p. 249—254.
102. GRAF, A. (1899): Hirudineenstudien. — Nova Acta Acad. Leop., Halle, **72,** p. 215—404.
103. GRIMM, O. A. (1876): Vermes. — in: Das Kaspische Meer und seine Fauna. — Trudy Aralo-Kaspisk. Exped., St.-Pétersb., Lief. **2,** p. 88—96.
104. GRUBE, A. E. (1859): Annulata Örstediana. — Vidensk. Meddel. Dansk. naturh. Foren., **1858,** p. 105—120.
105. GRUBE, A. E. (1871): Beschreibungen einiger Egelarten. — Arch. f. Naturg., **37,** p. 87—121.

106. HARANT, H. & VERNIÈRES, P. (1936): Mission scientifique de l'Omo. Hirudinea. III. Fasc. 27 (Zoologie). — Mém. Mus. Nat. Hist. (N. S.), **4**, p. 219—226.
107. HARDING, W. A. (1909): Note on two new Leeches from Ceylon. — Proc. Cambridge philos. Soc., **15**, p. 233—234.
108. HARDING, W. A. (1910): A Revision of the British Leeches. — Parasitology, **3**, p. 130—201.
109. HARDING, W. A. (1911): Note on a new Leech (Placobdella aegyptiaca) from Egypt. — Ann. Mag. Nat. Hist., (8) **7**, p. 388—389.
110. HARDING, W. A. (1920): Fauna of Chilka Lake. Hirudinea. — Mem. Ind. Mus., **5**, p. 509—517.
111. HARDING, W. A. (1924): Descriptions of some new Leeches from India, Burma, and Ceylon. — Ann. Mag. Nat. Hist., (9) **14**, p. 489—499.
112. HARDING, W. A. (1927): Hirudinea. — in HARDING & MOORE: The Fauna of British India, including Ceylon and Burma. London, pp. XXXVIII + 302, spec. p. 57—96.
113. HARDING, W. A. (1932): Report on the Hirudinea: Mr. Omer-Cooper's Investigation of the Abyssinian Fresh Water (Hugh Scott Expedition). — Proc. Zool. Soc. London, **1932**, p. 81—86.
114. HECHT, G. (1930): Haementeria costata (Fr. Müller) [= H. catenigera (M.-Td.)] in Deutschland. — SB. Ges. naturf. Fr. Berlin, Jahrg. **1930**, p. 143—157.
115. HEMINGWAY, E. E. (1908): Placobdella pediculata n. sp. — Amer. Natural., **42**, p. 527—532.
116. HEMINGWAY, E. E. (1912): The leeches of Minnesota. Part II: The anatomy of Placobdella pediculata. — Geol. Nat. Hist. Suv. Minnesota, Zool. Ser. No. **5**, p. 29—63.
117. HOFFMANN, J. (1955): Faune hirudinéenne du Grand-Duché de Luxembourg. — Arch. Inst. Grand-Ducal Luxemb. Sect. Sci. Nat. (N. S.) **22**, p. 175—211.
118. HOTZ, H. (1938): Protoclepsis tesselata (O. F. Müller). Ein Beitrag zur Kenntnis von Bau und Lebensweise der Hirudineen. — Rev. Suisse Zool., **45**, Suppl., p. 1—380.
119. INGRAM, D. M. (1957): Some Tasmanian Hirudinea. — Pap. Proc. R. Soc. Tasmania, **91**, p. 191—232.
120. JIMÉNEZ, L. M. (1865): Apuntes sobre algunas de las especies de las sanguijuelas de México. — Gaceta Méd. México, **1**, p. 483—491.
121. JOHANSSON, L. (1909): Hirudinea, Egel. — in BRAUER: Die Süsswasserfauna Deutschlands, H. **13**, II, p. 67—81.
122. JOHANSSON, L. (1909): Einige neue Arten Glossiphoniden aus dem Sudan. — Zool. Anz., **35**, p. 146—154.
123. JOHANSSON, L. (1913): Hirudineen aus dem Sudan. — in JÄGERSKIÖLD: Res. Swedish Zool. Exp. Egypt and the White Nile 1901, Pt. 5, No. **24**, p. 1—42.
124. JOHANSSON, L. (1918): Hirudineen von Neu-Caledonien und den Neuen Hebriden. — in SARASIN & ROUX: Nova Caledonia, A. Zoologie, **2**, Lief. 4, p. 373—394.
125. JOHANSSON, L. (1926): 4. Hirudinea. — in ARNDT: Beiträge zur Kenntnis der Land- und Süsswasserfauna Korsikas. I., Mitt. Zool. Mus. Berlin, **12**, p. 228—233.
126. JOHANSSON, L. (1929): Hirudinea (Egel). — in DAHL: Die Tierwelt Deutschlands, T. **15**, p. 133—155.
127. JOHNSON, J. R. (1816): A Treatise on the medicinal Leech; including its medical and natural history, with a description of its anatomical structure; also remarks upon the diseases, preservation and management of leech. — London, pp. XII + 147.
128. JOHNSON, J. R. (1817): Observations on the Hirudo vulgaris. — Philos. Trans. R. Soc. London, **1817**, p. 339—346.
129. JOHNSON, J. R. (1825): Further observations on the medicinal Leech. — London, pp. XV + 112.
130. JOHNSTON, G. (1865): A Catalogue of the British Non-parasitical Worms in the Collection of the British Museum. — London, pp. 366, spec. p. 36—54.
131. KABURAKI, T. (1921): Notes on some Leeches in the Collection of the Indian Museum. — Rec. Ind. Mus., **22**, p. 689—719.
132. KABURAKI, T. (1921): On some Leeches from the Chilka Lake. — Mem. Ind. Mus., **5**, p. 661—675.
133. KIRBY, W. (1794): Description of three new species of Hirudo. — Trans. Linn. Soc. London, **2**, p. 316—320.
134. KOWALEWSKI, A. (1897): Études biologiques sur les Clepsines. — Mém. Acad. Sci. St.-Pétersb., (8) **5**, No. 3, p. 1—15.
135. KOWALEWSKI, A. (1899): Quelques notes sur l'Haementeria costata Müller. — C. R. Acad. Sci. Paris, **128**, p. 1185—1188.
136. KOWALEWSKI, A. (1900): Phénomènes de la fécondation chez l'Helobdella algira (Moquin-Tandon). — Mém. Soc. Zool. France, **13**, p. 66—88.

137. KOWALEWSKI, A. (1900): Étude biologique de l'Haementeria costata Müller. — Mém. Acad. Sci. St.-Pétersb., (8) **11,** No. 1, p. 1—77.
138. KOZHOV, M. (1963): Lake Baikal and its life. — Monogr. Biol., The Hague, **11,** pp. VIII + 344, spec. p. 88—92.
139. KRAUSE, M. & WILKE, B. (1934): Über die Fortpflanzung von Haementeria officinalis. — Zool. Anz., **107,** p. 30—32.
140. LEIGH-SHARPE, W. H. (1933): Report upon a collection of leeches from Morocco and elsewhere. — Bull. Soc. Sci. Nat. Maroc, **13,** p. 121—128.
141. LEUCKART, R. (1854): Bericht über die Leistung in der Naturgeschichte der niederen Thiere während der Jahre 1848—1853. — Arch. f. Naturg., **20,** p. 289—473, spec. p. 339.
142. LINDENFELD, H. & PIETRUSZYŃSKI, J. (1890): Przyczynek do fauny pijawek krajowych (Hirudinei). — Pam. Fizyjograf., **10,** p. 399—437.
143. LINNAEUS, C. (1758): Systema naturae. — Lipsiae, ed. X., p. 648—651.
144. LINNAEUS, C. (1761): Fauna Suecica. — Holmiae, ed. 2, p. 364—365.
145. LISKIEWICZ, ST. (1925): Die Hirudineen des nord-östlichen Polens. — Arch. f. Naturg., **91,** A, p. 277—280.
146. LIVANOW, N. (1902): Die Hirudineen-Gattung Hemiclepsis Vejd. — Zool. Jahrb. Syst. **17,** p. 339—362.
147. LUKIN, E. I. (1929): Remarques biologiques sur les Hirudinées du basin du Donetz. — Trav. Soc. Nat. Kharkov, **52,** p. 33—76.
148. LUKIN, E. I. (1956): On the occurrence in the USSR of an interesting species of Leeches, Boreobdella verructa (Fr. Müller). — Zool. Journ. Moscow, **35,** p. 1417—1419.
149. LUKIN, E. I. (1962): Hirudinea. — in: The Fauna of Ukraine. Kiew, **30,** pp. 196.
150. LUKIN, E. I. & EPSHTEIN, V. M. (1959): The 10th conference on the problems of parasitology and natural-nidus diseases. — Moscow, **2,** p. 189 (in Russian).
151. LUKIN, E. I. & EPSHTEIN, V. M. (1960): Endemic Baikalian leeches from the family Glossiphonidae. — Dokl. Acad. Sci. U.S.S.R., **131,** p. 457—460.
152. LUKIN, E. I. & EPSHTEIN, V. M. (1960): The leeches of the subfamily Toricinae nov. subfam. and their geographical distribution. — Dokl. Acad. Sci. U.S.S.R., **134,** p. 478—481.
153. LUKIN, E. I. & EPSHTEIN, V. M. (1960): New Data on the Leech Fauna of Fresh-water of the Crimea. — Zool. Journ. Moscow, **39,** p. 1429—1432.
154. MACDONAGH, E. J. (1928): Hirudíneos: Haementeria bonaerensis n. sp. y una Helobdella sp. huésped de cercarias, con una aclaración sobre el nombre saguaypé. — La Semana Méd., Buenos Aires, **35,** p. 230—235.
155. MALBRANDT, U. (1932): Ein neuer Fundort von Haementeria costata (Fr. Müller) in Deutschland. — Zool. Anz., **100,** p. 43—45.
156. MALM, A. W. (1863): Svenska Iglar, Disciferae. — Göteborgs Kongl. Vetensk. Vitt. Samh. Handl., **8,** p. 153—263.
157. MANN, K. H. (1953): A revision of the British leeches of the family Glossiphoniidae, with a description of Batracobdella paludosa (Carena, 1824) a leech new to the British fauna. — Proc. Zool. Soc. London, **123,** p. 377—391.
158. MANN, K. H. (1954): A Key to the British Freshwater Leeches, with notes on their Ecology. — Freshwater Biol. Ass., Sci. Publ., No. **14,** p. 1—21.
159. MANN, K. H. (1955): The ecology of the British freshwater leeches. — Journ. Animal Ecol., **24,** p. 98—119.
160. MANN, K. H. (1961): The systematics of freshwater and terrestrial leeches. — in MANN: Leeches (Hirudinea). Intern. Ser. Monogr. Pure Appl. Biol., Div. Zool., **11,** p. 147—168.
161. MANNSFELD, W. (1928): Beiträge zur Kenntnis der Hirudineenfauna Lettlands. I. Mitteilung. — Zool. Anz., **78,** p. 209—224.
162. MANNSFELD, W. (1934): Zur Kenntnis der Hirudineenfauna Lettlands. — Korr.-bl. Naturf.-Ver. Riga, **61,** p. 156—167.
163. MATHERS, C. K. (1948): The Leeches of the Okoboji Region. — Proc. Iowa Acad. Sci., **55,** p. 397—425.
164. MEYER, M. C. (1937): Leeches of Southeastern Missouri. — Ohio Journ. Sci., **37,** p. 248—251.
165. MEYER, M. C. (1937): Notes on some leeches from Ontario and Quebec. — Canad. Field-Nat., **51,** p. 117—119.
166. MEYER, M. C. (1951): Hirudinea. — in: Explor. Parc Nat. Albert, Mission G. F. de Witte (1933—1935), Fasc. **76,** p. 1—29.
167. MEYER, M. C. (1968): Moore on the Hirudinea with Emphasis on his Type-Specimens. — Proc. U. S. Nat. Mus., **125,** No. 3664, p. 1—32.

168. MEYER, M. C. & BARDEN, A. A. (1955): Leeches Symbiotic on Arthropoda, especially Decapod Crustacea. — Wasmann Journ. Biol., **13,** p. 297—311.
169. MEYER, M. C. & MOORE, J. P. (1954): Notes on Canadian Leeches (Hirudinea), with the Description of a New Species. — Wasmann Journ. Biol., **12,** p. 63—96.
170. MILLER, J. A. (1929): The Leeches of Ohio. — Ohio State Univ. F. T. Stone Labor., Columbus, Contr. No. **2,** p. 1—38.
171. MOLTSCHANOV, L. A. (1914): Eine neue Egel-Art aus dem Amu-Darja (Glossosiphonia amudarjensis sp. n., Celpsinidae, Hirudinea). — Ann. Mus. Zool. Acad. Imp. Sci. St.-Pétersb., **18,** p. 145—147.
172. MOORE, J. E. (1964): Notes on the Leeches (Hirudinea) of Alberta. — Nat. Mus. Canada, Nat. Hist. Papers, No. **27,** p. 1—15.
173. MOORE, J. E. (1966): Further Notes on Alberta Leeches (Hirudinea). — Nat. Mus. Canada, Nat. Hist. Papers, No. **32,** p. 1—11.
174. MOORE, J. P. (1898): The leeches of the U. S. National Museum. — Proc. U. S. Nat. Mus. Washington, **21,** p. 543—563.
175. MOORE, J. P. (1900): A description of Microbdella biannulata with especial regard to the constitution of the leech somite. — Proc. Acad. Nat. Sci. Philadelphia, **5,** p. 50—73.
176. MOORE, J. P. (1901): The Hirudinea of Illinois. — Bull. Illinois State Labor., Nat. Hist., **5,** No. 12, p. 479—547.
177. MOORE, J. P. (1906): Hirudinea and Oligochaeta collected in the Great Lakes region. — Bull. Bur. Fish., **25,** p. 153—172.
178. MOORE, J. P. (1911): Hirudinea of Southern Patagonia. — Rep. Princeton Univ. Exp. to Patagonia 1896—1899, **3,** Zoölogy, Part VII, Stuttgart, p. 669—687.
179. MOORE, J. P. (1912): The leeches of Minnesota. — Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. No. **5,** p. 1—150.
180. MOORE, J. P. (1918): The leeches (Hirudinea). — in WARD & WHIPPLE: Fresh-water Biology, New York, chap. 20, p. 646—660.
181. MOORE, J. P. (1922): The fresh-water leeches (Hirudinea) of Southern Canada. — Canad. Field.-Nat., **36,** p. 6—11 and 37—39.
182. MOORE, J. P. (1924): Notes on some Asiatic leeches (Hirudinea), principally from China, Kashmir, and British India. — Proc. Acad. Nat. Sci. Philadelphia, **76,** p. 343—388.
183. MOORE, J. P. (1924): The leeches (Hirudinea) of Lake Nipigon. — Publ. Ontario Fish. Res. Labor., No. **23,** p. 17—31.
184. MOORE, J. P. (1930): Leeches (Hirudinea) from China with descriptions of a new species. — Proc. Acad. Nat. Sci. Philadelphia, **82,** p. 169—192.
185. MOORE, J. P. (1933): Scientific results of the Cambridge Expedition to the East African Lakes, 1930—1. Leeches. — Journ. Linn. Soc. London, Zool., **38,** p. 297—299.
186. MOORE, J. P. (1935): Leeches from Borneo and the Malay Peninsula. — Bull. Raffles Mus., **10,** p. 67—69.
187. MOORE, J. P. (1936): The Leeches of Lake Nipissing. — Canad. Field-Nat., **50,** p. 112—114.
188. MOORE, J. P. (1936): Hirudinea from Yucatan. — Publ. Carnegie Inst. Washington, No. **457,** p. 41—43.
189. MOORE, J. P. (1936): Report on Hirudinea. — Mem. Conn. Acad., **10,** p. 191—192.
190. MOORE, J. P. (1938): Leeches (Hirudinea) principally from the Malay Peninsula, with descriptions of new species. — Bull. Raffles Mus., **14,** p. 64—80.
191. MOORE, J. P. (1938): Leeches (Hirudinea) from Yucatan caves. — Publ. Carnegie Inst. Washington, No. **491,** p. 67—70.
192. MOORE, J. P. (1939): Additions to our Knowledge of African Leeches (Hirudinea). — Proc. Acad. Nat. Sci. Philadelphia, **90,** p. 297—360.
193. MOORE, J. P. (1939): Helobdella punctato-lineata, a new leech from Puerto Rico. — Puerto Rico Journ. Publ. Health, Trop. Med., **14,** p. 422—429.
194. MOORE, J. P. (1939): Leeches (Hirudinea) from the Atlas Mountains of Morocco. — Ann. Mag. Nat. Hist., (11) **3,** p. 80—87.
195. MOORE, J. P. (1944): The leeches (Hirudinea) of Lake Huleh, Palestine. — Ann. Mag. Nat. Hist., (11) **11,** p. 182—190.
196. MOORE, J. P. (1952): Professor A. E. Verrill's freshwater leeches. A tribute and a critique. — Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245,** p. 1—15.
197. MOORE, J. P. (1953): Three undescribed North American leeches (Hirudinea). — Not. Nat. Acad. Nat. Sci. Philadelphia, No. **250,** p. 1—13.
198. MOORE, J. P. (1958): The leeches (Hirudinea) in the Collection of the Natal Museum. — Ann. Natal Mus., **14,** p. 303—340.
199. MOORE, J. P. (1959): Hirudinea. — in WARD & WHIPPLE: Fresh-water Biology, New York, 2nd ed., chap. 23, p. 542—557.

200. MOORE, J. P. & MEYER, M. C. (1951): Leeches (Hirudinea) from Alaskan and Adjacent Waters. — Wasmann Journ. Biol., **9**, p. 11—77.
201. MOQUIN-TANDON, A. (1826): Monographie de la famille des Hirudinées. — Montpellier, p. 1—152.
202. MOQUIN-TANDON, A. (1846): Monographie de la famille des Hirudinées. — Paris, 2nd ed., p. 1—448.
203. MÜLLER, FR. (1844): Über Hirudo tessulata und marginata O. F. Müll. — Arch. f. Naturg. **10**, (1) p. 370—376.
204. MÜLLER, FR. (1844): De Hirudinibus circa Berolinum hucusque observantis. Diss. — Berlin, pp. 36.
205. MÜLLER, FR. (1846): Clepsine costata, neue Art. — Arch. f. Naturg., **12**, p. 82—85.
206. MÜLLER, O. F. (1774): Vermium terrestrium et fluviatilum, seu animalium infusoriorum helminthicorum, et testaceorum, non marinorum succincta historia. — Havniae et Lipsiae, **1** (2), Helminthica, pp. 72, spec. p. 37—51.
207. NICHOLSON, H. A. (1873): Contributions to the fauna canadensis. — Canad. Journ., **13**, p. 493—498.
208. OKA, A. (1910): Synopsis der japanischen Hirudineen, mit Diagnosen der neuen Species. — Annot. Zool. Jap., **7**, p. 165—183.
209. OKA, A. (1917): Ancyrobdella biwae n. g., n. sp., ein merkwürdiger Rüsselegel aus Biwa-See. — Annot. Zool. Jap., **9**, p. 185—193.
210. OKA, A. (1917): Zoological results of a tour in the Far East. Hirudinea. — Mem. Asiat. Soc. Bengal, **6**, p. 157—176
211. OKA, A. (1922): Hirudinea from the Inlé Lake, S. Shan States. — Rec. Ind. Mus., **24**, p. 521—534.
212. OKA, A. (1925): Notices sur les Hirudinées d'Extrême Orient, I—IV and V—VII. — Annot. Zool. Jap., **10**, p. 311—326, and 327—335.
213. OKA, A. (1926): Notices sur les Hirudinées d'Extrême Orient, VIII. — Annot. Zool. Jap. **11**, p. 59—62.
214. OKA, A. (1928): Description de l'Hemiclepsis kasmiana. — Proc. Imp. Acad. Tokyo, **4**, p. 64—66.
215. OKA, A. (1928): Description de deux espèces japonaises de Glossiphonia (Gl. smaragdina et Gl. lata). — Proc. Imp. Acad. Tokyo, **4**, p. 543—546.
216. OKA, A. (1928): Sur une nouvelle espèce d'Hemiclepsis, parasite d'un crabe fluviatile de Chine. — Proc. Imp. Acad. Tokyo, **4**, p. 607—608.
217. OKA, A. (1929): Sur une nouvelle Placobdella, parasite d'une crevette fluviatile de Formose. — Proc. Imp. Acad. Tokyo, **5**, p. 249—251.
218. OKA, A. (1930): Sur un nouveau genre d'Hirudinées provenant de l'Amérique du Sud. — Proc. Imp. Acad. Tokyo, **6**, p. 239—242.
219. OKA, A. (1931): Sur une nouvelle espèce d'Hemiclepsis, provenant de Chine. — Proc. Imp. Acad. Tokyo, **7**, p. 121—123.
220. OKA, A. (1932): Sur une nouvelle espèce de Placobdella, P. japonica n. sp. — Proc. Imp. Acad. Tokyo, **8**, p. 51—53.
221. OKA, A. (1932): Hirudinées extraeuropéennes du Musée Zoologique Polonais. — Ann. Mus. Zool. Polon., **9**, p. 313—328.
222. OKA, A. (1932): Sur la présence de la Protoclepsis tessellata au Japon et la distribution géographique de cette Hirudinée en Extrême Orient. — Proc. Imp. Acad. Tokyo, **8**, p. 457—459.
223. OKA, A. (1935): Description d'un nouveau genre d'Hirudinée de la famille des Glossiphonides, Oligoclepsis tukubana n. g., n. sp. — Proc. Imp. Acad. Tokyo, **11**, p. 66—68.
224. OLIVER, D. R. (1958): The Leeches (Hirudinea) of Saskatchewan. — Canad. Field-Nat., **72**, p. 161—165.
225. ÖRLEY, L. (1886): A magyarországi piócák faunája. (Fauna Hirudinearum Hungariae). — Mathem. term.-tud. Közlem., **22** (2), p. 63—115.
226. PAWLOWSKI, L. K. (1936): Pijawki (Hirudinea). — in: Fauna Slodkowodna Polski, Warszawa, No. **26**, p. 1—176, spec. p. 96—133.
227. PAWLOWSKI, L. K. (1936): Über den Bau den Verdauungskanals des Egels Theromyzon tesselata (O. F. Müll.). — Fol. Morphol. Warszawa, **6**, p. 87—91.
228. PAWLOWSKI, L. K. (1936): Zur Ökologie der Hirudineenfauna der Wigryseen. — Arch. Hydrobiol. Ichtyol. Suwalki, **10**, p. 1—47.
229. PAWLOWSKI, L. K. (1936): Über die wahre systematische Stellung des Egels Glossosiphonia octoserialis Stschegolew, 1922. — Ann. Mus. Zool. Polon., **11**, p. 339—345.
230. PAWLOWSKI, L. K. (1936): Über zwei Hirudineenarten: Placobdella roszkowskii Oka und Helobdella scutifera R. Blanchard. — Ann. Mus. Zool. Polon., **11**, p. 359—369.

231. Pawlowski, L. K. (1938): Neue Fundorte von drei seltenen Egelarten in Polen. — Arch. Hydrobiol. Ichtyol. Suwalki, **11**, p. 47—50.
232. Pawlowski, L. K. (1948): Contribution à la connaissance des sangsues (Hirudinea) de la Nouvelle-Écosse, de Terre-Neuve et des îles françaises Saint-Pierre et Miquelon. — Fragm. Faun. Mus. Zool. Polon., **5**, p. 317—353.
233. Pawlowski, L. K. (1958): Hirudinées dans la collection du Docteur K. Lindberg. — Bull. Soc. Sci. Lettr. Lódz, Cl. III, **9**, No. 11, p. 1—13.
234. Pawlowski, L. K. (1963): Nomenclature des Hirudinées Européennes. — Zesz. Nauk Univ. Lódz., Nauki Matem.-Przyrod. Ser. II, No. **14**, p. 99—110.
235. Pearse, A. S. (1933): Parasites of Siamese Fishes and Crustacea. — Journ. Siam. Soc. Nat. Hist., Bangkok, Suppl. **9**, p. 179—191.
236. Philippi, R. A. (1867): Kurze Notiz über zwei chilenische Blutegel. — Arch. f. Naturg., **33**, p. 76—78.
237. Pinto, C. (1920): Contribuicao ao estudo dos hirudineos do Brazil (Haementeria lutzi nov. sp.). Nota previa. — Brazil-Medico, **34**, No. 35, p. 567—570.
238. Pinto, C. (1920): Contribuicao ao estudo dos hirudineos do Brazil. II. Trachybdella bistriata n. gen., n. sp. — Brazil-Medico, **34**, No. 38, p. 624—626.
239. Pinto, C. (1923): Ensaio Monographico dos Hirudineos. — Rev. Mus. Paulista, **13**, p. 853—1118.
240. Plotnikov, V. (1907): Glossosiphoniidae, Hirudinidae et Herpobdellidae du Musée Zoologique de l'Académie Impériale des Sciences. — Ann. Mus. Zool. Acad. Imp. Sci. St.-Pétersb., **10**, p. 133—158.
241. Rathke, H. (1862): Beiträge zur Entwicklungsgeschichte der Hirudineen. — Leipzig, pp. 116.
242. Rawson, D. S. (1930): The bottom fauna of Lake Simcoe and its role in the ecology of the lake. — Publ. Ontario Fish. Res. Labor., No. **40**, p. 35—36.
243. Richardson, L. R. (1947): A Review of New Zealand Leeches. — New Zealand Sci. Congr., **1947**, p. 201—202.
244. Richardson, L. R. (1968): An annotated list of Australian leeches. — Proc. Linn. Soc. N. S. Wales, **92**, p. 227—245.
245. Ringuelet, R. (1942): Descripciones preliminares de nuevos Hirudíneos argentinos. — Not. Mus. La Plata, **7**, Zool. No. 59, p. 217—227.
246. Ringuelet, R. (1943): Sobre dos Hirudíneos del sur de Chile: Mesobdella gemmata (E. Bl.) y Helobdella similis Ring. — Physis, **19**, p. 362—378.
247. Ringuelet, R. (1943): Sobre la morfología y variabilidad de Helobdella triserialis (Em. Bl.) (Hirudinea, Glossiphoniidae). — Not. Mus. La Plata, **8**, Zool. No. 69, p. 215—240.
248. Ringuelet, R. (1944): Sinopsis sistemática y zoogeográfica de los Hirudíneos de la Argentina, Brasil, Chile, Paraguay y Uruguay. — Rev. Mus. La Plata (N. S.) **3**, Zool. No. 22, p. 163—232.
249. Ringuelet, R. (1944): Revisión de los Hirudíneos argentinos de los géneros Helobdella R. Bl. Batracobdella Vig., Cylicobdella Gr. y Semiscolex Kinb. — Rev. Mus. La Plata (N. S.) **4**, Zool. No. 25, p. 5—93.
250. Ringuelet, R. (1945): Hirudíneos del Museo de La Plata. — Rev. Mus. La Plata (N. S.) **4**, Zool. No. 26, p. 95—137.
251. Ringuelet, R. (1947): Notas sobre Hirudíneos neotropicales. III. Theromyzon propinquus nov. sp., de la Argentina. — Not. Mus. La Plata, **12**, Zool. No. 100, p. 217—222.
252. Ringuelet, R. (1948): Notas sobre Hirudíneos neotropicales. V. Especies de la República del Paraguay. — Not. Mus. La Plata, **13**, Zool. No. 113, p. 213—244.
253. Ringuelet, R. (1949): Notas sobre Hirudíneos neotropicales. VI. Presencia del género Glossiphonia en la Argentina y otras adiciones al conocimiento de la hirudofauna de los países del Plata. — Not. Mus. La Plata, **14**, Zool. No. 122, p. 141—159.
254. Ringuelet, R. A. (1953): Notas sobre Hirudíneos neotropicales. VIII. Algunas especies de Bolivia y Perú. — Not. Mus. La Plata, **16**, Zool. No. 142, p. 215—224.
255. Ringuelet, R. A. (1954): La clasificación des los Hirudíneos. — Not. Mus. La Plata, **17**, Zool. No. 146, p. 1—15.
256. Ringuelet, R. A. (1958): Hirudíneos del lago Argentino (Santa Cruz, Argentina) coleccionados por el Dr. A. Willink. — Acta Zool. Lilloana, **15**, p. 121—141.
257. Ringuelet, R. A. (1959): Una colección de Hirudíneos del Perú. I. Sanguijuelas del lago Titicaca. — Physis, **21**, p. 187—199.
258. Ringuelet, R. A. (1968): Llave o clave para el reconocimiento de las sanguijuelas conocidas de la República Argentina (Hirudinea) y apuntamientos sobre la hirudofauna neotropica y transicional mexicana. — Physis, **27**, p. 367—390.

259. ROUSSAU, E. (1912): Les Hirudinées d'eau douce d'Europe. — Ann. Biol. Lacustre, **5,** p. 259—295.
260. RYERSON, C. G. S. (1915): Notes on the Hirudinea of Georgian Bay. — Contr. Canad. Biol., 1911—1914, Fasc. **2,** p. 165—176.
261. SAINT AMAS, B. (1825): Description d'une espèce nouvelle de Sangsue, l'Hirudo oscillatoria. — Mém. Soc. Linn. Paris, **3,** p. 193.
262. SANDNER, H. (1951): Badania nad fauna pijawek. — Acta Zool. Oecol. Univ. Lodz, No. **4,** p. 1—50.
263. SAVIGNY, J. C. (1822): Système des Annelides. — in: Système de diverses classes d'animaux sans Vertèbres. Paris, **1** (3), p. 105—120.
264. SAY, TH. (1824): Sur les Hirudo parasitica, lateralis, marmorata et decora dans le voyage du major Long (Narrative of Expedition to the Source of St. Peter's River, Lake Winnipeek, Lake of the Woods, 1823). — Philadelphia, **2,** Appendix, p. 266—269.
265. SCIACCHITANO, I. (1935): Sanguisughe del Congo Belga. — Rev. Zool. Bot. Afr., **26,** p. 448—460.
266. SCIACCHITANO, I. (1936): Una nuova sanguisuga del Congo Belga. — Boll. Mus. Zool. Anat. comp. Genova, **16,** p. 3—6.
267. SCIACCHITANO, I. (1936): Altre Sanguisughe del Congo Belga. — Rev. Zool. Bot. Afr., **28,** p. 161—163.
268. SCIACCHITANO, I. (1937): Irudinei del Congo Belga. — Rev. Zool. Bot. Afr., **29,** p. 426—429.
269. SCIACCHITANO, I. (1939): Nuovi Irudinei del Congo Belga. — Rev. Zool. Bot. Afr., **32,** p. 348—367.
270. SCIACCHITANO, I. (1939): Irudinei dell'Africa Orientale Italiana. — Boll. pesca, piscicult. idrobiol., Roma, **15,** p. 5—11.
271. SCIACCHITANO, I. (1952): Irudinei del Congo Belga. — Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 8, Sci. Zool. **16,** p. 1—87.
272. SCIACCHITANO, I. (1954): Contributo alla conoscenza degli Irudinei del Congo Belga. — Ann. Mus. Roy. Congo Belge, Tervuren, Sér. 4, Miscell. Zool. **1,** p. 278—283.
273. SCIACCHITANO, I. (1957): Contributo alla conoscenza degli Irudinei del Congo Belga (Nota seconda). — Rev. Zool. Bot. Afr., **56,** p. 373—381.
274. SCIACCHITANO, I. (1959): Hirudinea. — in: South African Animal Life. Results of the Lund University Expedition in 1950—1951, **6,** p. 7—11.
275. SCIACCHITANO, I. (1960): Sangsues de l'Afghanistan. Contribution à l'étude de la fauna d'Afghanistan. — Libro homenaje al Doctor Eduardo Caballero y Caballero. 1930—1960. México, No. **24,** p. 533—541.
276. SCIACCHITANO, I. (1960): Contributo alla conoscenza degli Irudinei del Congo Belga (Nota terza). — Rev. Zool. Bot. Afr., **61,** p. 287—309.
277. SCIACCHITANO, I. (1961): Irudinei dell'Angola. — Publ. Cult. Co. Diam. Angola, Lisboa, No. **52,** p. 109—118.
278. SCIACCHITANO, I. (1962): Su alcune sanguisughe del Parco Nazionale Kruger (Sud Africa). — Monit. Zool. Ital. Firenze, **69,** p. 144—148.
279. SCIACCHITANO, I. (1963): A collection of Hirudinea submitted by F. M. Chutter (National Institute for Water Research, Pretoria), and the geographical distribution of Hirudinea in South Africa. — Ann. Transvaal Mus., **24,** p. 249—260.
280. SCIACCHITANO, I. (1963): Le attuali conoscenza sulla distribuzione geografica degli Irudinei nella Regione Etiopica. — Monit. Zool. Ital. Firenze, **70—71,** p. 175—184.
281. SCIACCHITANO, I. (1965): Nuovo contributo alla conoscenza degli Irudinei dell'Africa. — Rev. Zool. Bot. Afr., **71,** p. 29—33.
282. SCIACCHITANO, I. (1967): Leeches (Hirudinea) from Ethiopia. — Journ. nat. Hist., **1,** p. 189—194.
283. SCRIBAN, J. A. (1904): Contribution à la faune des Hirudinées d'eau douce de Roumanie. — Ann. Sci. Univ. Jassy, **3,** p. 17—20.
284. SOÓS, Á. (1963): New Leeches (Hirudinea) from the Fauna of Hungary. — Ann. Hist.-nat. Mus. Nat. Hung., **55,** p. 285—292.
285. SOÓS, Á. (1966): On the Genus Glossiphonia Johnson, 1816, with a Key and Catalogue to the Species (Hirudinoidea: Glossiphoniidae). — Ann. Hist.-nat. Mus. Nat. Hung., **58,** p. 271—279.
286. SOÓS, Á. (1967): On the Genus Batracobdella Viguier, 1879, with a Key and Catalogue to the Species (Hirudinoidea: Glossiphoniidae). — Ann. Hist.-nat. Mus. Nat. Hung., **59,** p. 243—257.
287. SOÓS, Á. (1967): On the Genus Hemiclepsis Vejdovský, 1884, with a Key and Catalogue of the Species (Hirudinoidea: Glossiphoniidae). — Opusc. Zool. Budapest, **7,** p. 233—240.

288. Soós, Á. (1967): On the Leech Fauna of the Hungarian Reach of the Danube (Danubialia Hungarica XLII). — Opusc. Zool. Budapest, **7**, p. 241—257.
289. Soós, Á. (1965—1969): Identification Key to the Leech (Hirudinoidea) Genera of the World, with a Catalogue of the Species. I—V. — Acta Zool. Hung., **11**, p. 417—463; **12**, p. 145—160, and 371—407; **13**, p. 417—432; **15**, p. 151—201.
290. Sowerby, J. (1806): The British Miscellany. — London, **1**, pp. 271, spec. p. 31.
291. Stshegolev, G. (1922): Bemerkungen über die Hirudineen Rußland. I. Glossosiphonia octoserialis nov. sp. — Arb. Biol. Wolgastat., **6**, p. 233—240.
292. Stshegolev, G. (1922): Eine neue Egelart aus dem Baikalsee. — Russ. Hydrobiol. Zeitschr., **1**, p. 136—142.
293. Thompson, W. (1846): Additions to the Fauna of Ireland, including a few species unrecorded in that of Britain; with the description of an apparently new Glossiphonia. — Ann. Mag. Nat. Hist., **18**, p. 383—397.
294. Verriest, G. (1950): Contribution à l'étude des Hirudinées des eaux douces de la Belgique. — Biol. Jaarb. Dodonaea, **17**, p. 200—243.
295. Verrill, A. E. (1872): Descriptions of North American fresh-water leeches. — Amer. Journ. Sci. Arts, **3**, p. 126—139.
296. Verrill, A. E. (1874): Synopsis of the North American fresh-water leeches. — Rep. Comm. Fish and Fisheries **1872/73**, p. 666—689.
297. Vejdovský, Fr. (1884): Exkrečńí soustava Hirudineí. — SB. kgl. Böhm. Ges. Wiss. in Prag, Jahrg. **1883**, p. 417—433.
298. Viguier, C. (1879): Anatomie comparée des Hirudinées (Organisation de la Batracobdella [B. Latasti]). — C. R. Acad. Sci. Paris, **89**, p. 110—112.
299. Viguier, C. (1879): On the Organization of Batrachobdella (B. Latasti, C. Vig.). — Ann. Mag. Nat. Hist., (5) **4**, p. 250—251.
300. Viguier, C. (1880): Mémoires sur l'organisation de la Batracobdelle, Batracobdella Latastii (C. Vig.). — Arch. Zool. exp. gén., **8**, p 373—390
301. Weber, M. (1913): Hirudinées columbiennes. — Mém. Soc. neuchâtel. Sci. Nat., **5**, p. 731—747.
302. Weber, M. (1915): Monographie des Hirudinées Sud-Americaines. — Neuchâtel, pp. 134.
303. Weber, M. (1916): Hirudinées péruviennes. — Zool. Anz., **48**, p. 93—96 and 115—122.
304. Weyenbergh, D. H. (1879): Algunas nuevas sanguijuelas o chancacas de la familia Gnathobdellia y revista de esta familia. — Bol. Acad. Nac. Cienc. Arg., **3**, p. 231—244 Period. Zool. Argent., **3**, p. 112—125.
305. Weyenbergh, D. H. (1883): Tres nuevas especies de sanguijuelas. — An. Ateneo Uruguay, **5**, p. 427—430
306. Whitman, C. O. (1889): Some new facts about the Hirudinea. — Journ. Morphol., **2**, p. 586—599.
307. Whitman, C. O. (1891): Description of Clepsine plana. — Journ. Morphol., **4**, p. 407—418.
308. Wojtas, F. (1959): Les sangsues (Hirudinea) de la rivière Grabia. — Soc. Sci. Lodz., Sect. III. No. **58**, p. 1—64.
309. Wolterstorff, W. (1900): Über Discoglossus pictus und Glossosiphonia algira auf Corsica. — Zool. Anz., **23**, p. 23—27.

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ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
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ZWEI NEUE ARTEN DER GATTUNG THERIOAPHIS WALK. (HOMOPTERA: APHIDIDAE) AUS UNGARN

Von

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(DIREKTOR: PROF. DR. J. NAST)

(Eingegangen am 21. November 1968)

Therioaphis hillerislambersi sp. n. (Abb. 1—6)

Ungeflügeltes vivipares Weibchen

Morphologische Kennzeichen. Körper etwa 1,61—1,79 mm lang. Tergum unpigmentiert und deutlich sklerotisch; selten sind die kegelförmigen Tuberkeln, an denen die Dorsalhaare sitzen, ganz wenig schattiert. Dorsale Haare in 4 Längsreihen, die pleuralen fehlen. Spinale Haare auf den abdominalen Tergiten III, V und VII deutlich seitlich versetzt, recht lang und mit erweiterten Spitzen, jene am III. Abdominaltergit etwa 0,060—0,080 mm lang, ihre basalen Tuberkeln 0,050—0,080 mm lang; die marginalen Haare ein wenig kürzer. Das VIII. Abdominaltergit mit nur 2 Haaren, die etwa 0,050—0,080 mm lang sind und auf einer gemeinsamen Haarplatte aufsitzen. Subgenitalplatte kaum sichtbar, ohne sichtbare Skulptur und unpigmentiert, mit 6—8 Haaren am Vorderrande und etwa 6—9 Haaren längs des Hinterrandes. Fühler 6gliedrig, stets länger als der Körper, hell, apikalwärts allmählich jedoch schwach dunkler werdend; das 3. Glied mit 4—8 sekundären Rhinarien im basalen $^1/_3$ bis zur $^1/_2$ des Gliedes. Processus terminalis 1,1 bis 1,3mal so lang wie die Basis des 6. Fühlergliedes und 1,7 bis 2,1mal so lang wie das 2. Glied der Hintertarsen. Fühlerhaare nicht zahlreich, sehr kurz und kaum sichtbar, am 3. Glied nur bis $^1/_3$ des basalen Durchmessers des Gliedes. Rüssel kurz, bis zu den mittleren Coxen reichend, hell mit dunkler Spitze. Rüsselendglied etwa 0,7—0,8mal so lang wie das 2. Glied der Hintertarsen, mit 4 Haaren außer den subapikalen Haarpaaren. Siphonen gut sichtbar, hell, zuweilen etwas schattiert, ohne Flansche. Cauda kolbenförmig, mit 2 langen apikalen und etwa 6—10 kurzen ventralen Haaren. Beine nur wenig dunkler als der Körper. Erste Tarsenglieder mit 2 dorsalen und 5 ventralen Haaren.

Farbe der lebenden Tiere: Körper einheitlich gelb, ohne dunkle Flecken.

Maße einiger Tiere in mm:

Nr.	Körper	Fühler	Flagellarglieder				Rüsselendglied	2. Gl. der H.-t.	Sipho	Cauda	Rhin. am 3. Gl.
			3	4	5	6					
1	1,71	1,76	0,56	0,35	0,32	0,18 + 0,21	0,08	0,10	0,05	0,15	8; 4
2	1,68	1,83	0,58	0,38	0,35	0,17 + 0,20	0,08	0,10	0,05	0,15	6; 8
3	1,66	1,81	0,63	0,37	0,32	0,17 + 0,19	0,09	0,11	0,06	0,17	7; 7
4	1,65	1,82	0,57	0,36	0,35	0,18 + 0,21	0,09	0,11	0,07	0,16	7; 6
5	1,66	?	0,55	0,36	?	?	0,08	0,11	0,06	0,17	4; ?
6	1,75	1,92	0,60	0,33	0,34	0,18 + 0,23	0,09	0,11	0,06	0,16	6; ?
7	1,72	1,84	0,58	0,38	0,35	0,17 + 0,21	0,08	0,11	0,05	0,17	7; 6
8	1,61	1,78	0,56	0,38	0,33	0,16 + 0,21	0,08	0,11	0,05	0,18	6; 6
9	1,79	1,81	0,57	0,38	0,35	0,16 + 0,21	0,08	0,11	0,06	0,15	7; 7
10	1,67	1,76	0,57	0,34	0,34	0,17 + 0,20	0,08	0,11	0,05	0,15	8; 7

Junglarve

Embryonen mit 4 Längsreihen langer Dorsalhaare, die pleuralen fehlen. Spinalhaare am III. Abdominaltergit bis 0,035 mm lang. Übrige Merkmale nicht sichtbar.

Wirtspflanze: *Dorycnium herbaceum.*

Holotypus: ein ungeflügeltes vivipares Weibchen (Präp. Nr. 2827a): Ungarn, Villányi-hegység: Szársomlyó, 25. VIII. 1965, auctor leg. Paratypen: mehrere ungeflügelte vivipare Weibchen, Daten wie beim Holotypus.

Holotypus und ein Teil der Paratypen befinden sich in der Sammlung des Verfassers im Zoologischen Institut der Polnischen Akademie der Wissenschaften in Warszawa, die übrigen Paratypen in der Zoologischen Abteilung des Ungarischen Naturwissenschaftlichen Museums in Budapest und in der Sammlung von Herr D. HILLE RIS LAMBERS, Bladluisonderzoek T. N. O., Bennekom, Niederlande.

Biologie: Unbekannt, die Tiere leben in kleinen Gruppen an den Blättern der Wirtspflanzen, ohne Ameisenbesuch.

Systematische Stellung: Die neue Art ist mit *T. dorycnii* (PINTERA) und *T. obscura* H. R. L. et BOSCH nahe verwandt. *T. dorycnii* (PINTERA) unterscheidet sich von *T. hillerislambersi* sp. n. vor allem durch das Fehlen von ungeflügelten viviparen Morphen sowie durch eine höhere Zahl der dorsalen Haare am VIII. Abdominaltergit. Dagegen unterscheidet sich *T. obscura* H. R. L. et BOSCH von der neuen Art sofort durch die dunkle Pigmentierung des Dorsums, durch dunklere Fühler sowie durch die viel niedrigeren Tuberkeln unter den Dorsalhaaren und eine höhere Zahl der Haare am Rüsselendglied.

Die neue Art ist Herrn Dr. D. HILLE RIS LAMBERS (Bennekom) zu Ehren benannt.

Therioaphis hungarica sp. n. (Abb. 7—16)

Ungeflügeltes vivipares Weibchen

Morphologische Kennzeichen. Körper etwa 1,46—1,89 mm lang. Tuberkeln, auf denen die Dorsalhaare aufsitzen, dunkelbraun, die Haarplatten viel heller, aber dunkelbraun gerandet. Dorsale Haare in 4 Längs-

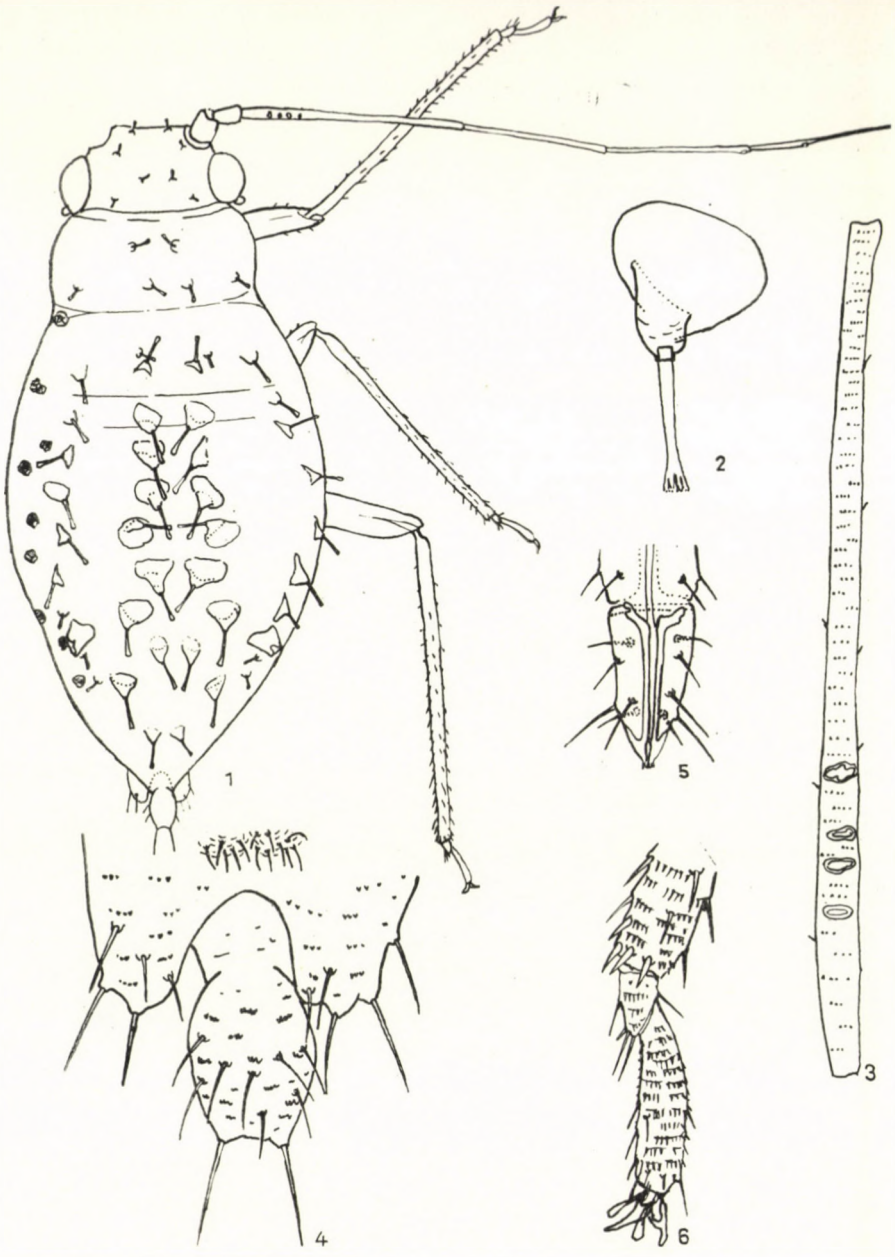

Abb. 1—6. *Therioaphis hillerislambersi* sp. n., ungeflügeltes vivipares Weibchen: 1 = Habitus, 2 = Spinales Haar mit Tuberkel und Haarplatte, 3 = 3. Fühlerglied, 4 = Cauda von der ventralen Seite, 5 = Rüsselendglied, 6 = Hintertarsus

reihen, die pleuralen fehlen. Spinale Haare auf den abdominalen Tergiten III, V, und VII deutlich seitlich versetzt, lang und mit verbreiteten Spitzen; jene am III. Abdominaltergit etwa 0,045—0,060 mm lang, ihre basalen Tuberkeln etwa 0,035—0,050 mm hoch; die marginalen Haare etwas kürzer, bis 0,050 mm lang. Das VIII. Abdominaltergit mit 4 Haaren: 2 langen spinalen, die auf kleinen Tuberkeln auf einer gemeinsamen Platte sitzen, und 2 dünnen und kürzeren marginalen Haaren, die zuweilen weder auf Tuberkeln noch auf Platten inserieren; die spinalen sind etwa 0,055—0,075 mm lang. Subgenitalplatte kaum sichtbar, mit 0—6 Haaren am Vorderrande und etwa 6—11 Haaren längs des Hinterrandes. Fühler 6gliedrig, so lang oder etwas länger als der Körper, hell, mit gedunkeltem letztem Glied und gedunkelten Spitzen der Glieder 1, 3, 4 und 5; das 3. Glied mit 2—11 ovalen und recht kleinen sekundären Rhinarien im basalen $^1/_3$ bis $^3/_4$ des Gliedes. Processus terminalis 1,2 bis 1,5mal so lang wie die Basis des 6. Fühlergliedes und etwa 1,5 bis 1,6mal so lang wie das 2. Glied der Hintertarsen. Fühlerhaare kaum sichtbar, nur bis 0,3mal so lang wie der basale Durchmesser des 3. Gliedes. Rüssel kurz, hell mit gedunkelter Spitze, kaum bis zu den mittleren Coxen reichend. Rüsselendglied kürzer als das 2. Glied der Hintertarsen (nur 0,75- bis 0,95mal so lang), mit 6—8, selten 9 Haaren außer den 3 subapikalen Haarpaaren. Siphonen recht lang, viel heller als die Haarplatten, ohne Flansche. Cauda kolbenförmig, mit 2 langen apikalen und etwa 4—7 kürzeren ventralen Haaren. Beine normal, hell, nur die apikalen Hälften der Femora, die basalen Enden der Tibien und die Tarsen gedunkelt, gelblichbraun. Erste Tarsenglieder mit 2 dorsalen und 5 ventralen Haaren.

Farbe der lebenden Tiere: wie bei *T. ononidis* (KALTENBACH).

Maße einiger Tiere in mm:

Nr.	Körper	Fühler	Flagellarglieder				Rüsselendglied	2. Gl. der H.-t.	Sipho	Cauda	Rhin. am 3. Gl.
			3	4	5	6					
1	1,65	1,65	0,57	0,32	0,29	0,14 + 0,19	0,09	0,12	0,08	0,17	7; 3
2	1,69	1,76	0,63	0,34	0,30	0,15 + 0,19	0,10	0,11	0,10	0,18	10; 9
3	1,65	?	0,56	?	?	?	0,10	0,11	0,08	0,18	8; 7
4	1,89	1,89	0,67	0,38	0,33	0,16 + 0,19	0,10	0,12	0,10	0,18	9; 6
5	1,72	1,68	0,55	0,34	0,30	0,15 + 0,18	0,10	0,11	0,08	0,17	?; 11
6	1,49	1,63	0,57	0,33	0,29	0,12 + 0,18	0,09	0,11	0,08	0,16	3; 2
7	1,56	1,69	0,58	0,33	0,31	0,14 + 0,19	0,09	0,11	0,08	0,16	?; 3
8	1,46	1,57	0,55	0,30	0,27	0,13 + 0,18	0,10	0,11	0,08	0,16	4; 4
9	1,62	1,63	0,56	0,31	0,29	0,14 + 0,18	0,10	0,11	?	0,16	5; 7

Geflügeltes vivipares Weibchen

Morphologische Kennzeichen. Abdomen mit deutlichen braunen intersegmentalen Pleuralskleriten, jene zwischen den Tergiten IV und V fließen oft mit den spinalen Haarplatten des IV. und des V. Tergits zusam-

men, ähnlich wie bei *T. ononidis* (KALT.); die spinalen Haarplatten an den Tergiten V und VII fließen oft mit den Marginalplatten zusammen. Die marginalen Haarplatten auf den Tergiten I und III viel heller als auf den übrigen Tergiten. Dorsale Haare kurz und dünn mit schwach erweiterten Spitzen; spinale Haare auf dem III. Abdominaltergit bis 0,030 mm lang, die marginalen von derselben Länge. Auch die Tuberkeln, an denen die Spinalhaare auf-

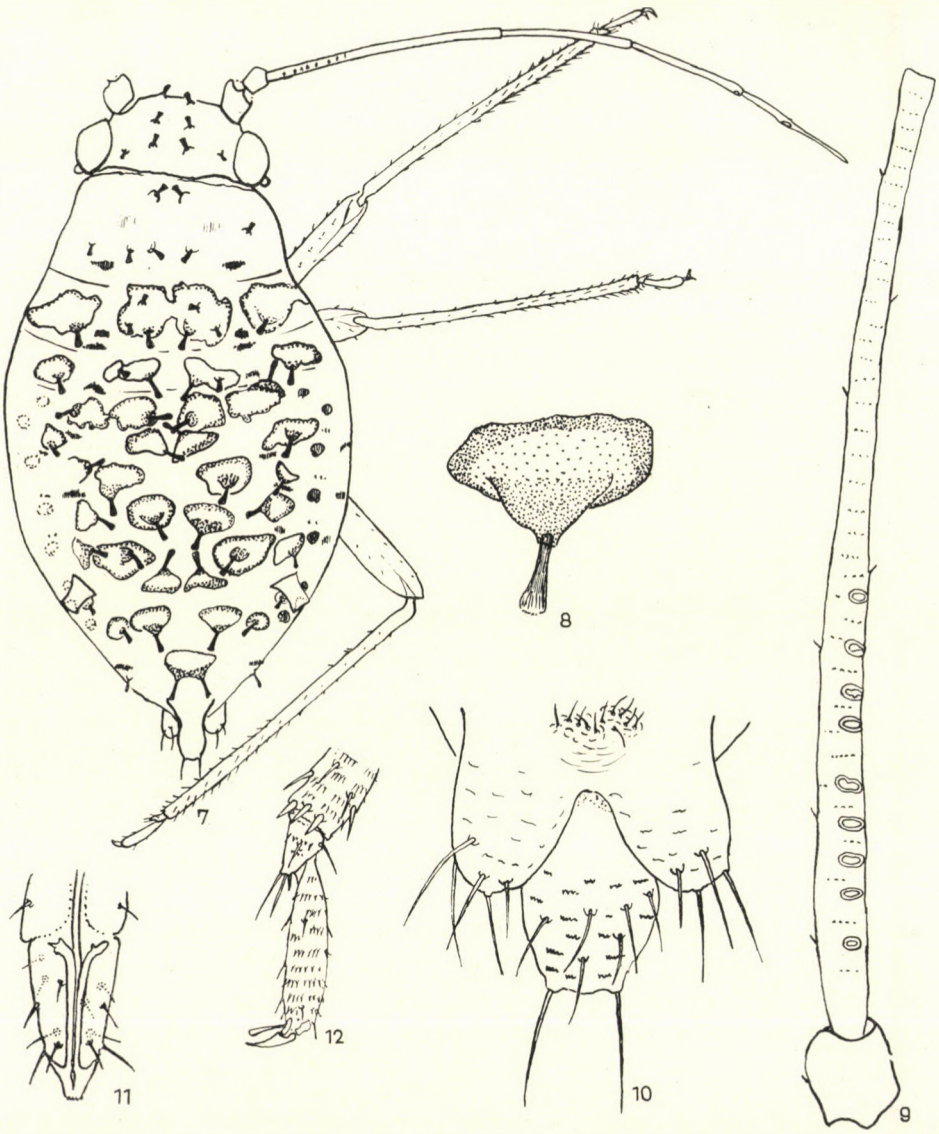

Abb. 7—12. *Therioaphis hungarica* sp. n., ungeflügeltes vivipares Weibchen: 7 = Habitus, 8 = Dorsales Haar mit Tuberkel und Haarplatte, 9 = 3. Fühlerglied, 10 = Cauda von der ventralen Seite, 11 = Rüsselendglied, 12 = Hintertarsus

sitzen, niedrig, etwa bis 0,025 mm hoch. Spinale Haare auf dem VIII. Abdominaltergit etwa 0,055 mm lang. Fühler kürzer als der Körper; das 3. Glied mit 8 und 7 sekundären Rhinarien in der basalen Hälfte des Gliedes. Flügel mit normaler Aderung, die Adern dunkel berandet. Übrige Merkmale wie bei den ungeflügelten viviparen Tieren.

Farbe des lebenden Tieres: wie beim ungeflügelten viviparen Weibchen.

Maße des einzigen Exemplares: Körper 1,91 mm, Fühler 1,85 mm, Flagellarglieder 0,65 : 0,37 : 0,33 : 0,16 + 0,19 mm, Rüsselendglied 0,10 mm, 2. Glied der Hintertarsen 0,11 mm, Sipho 0,07 mm, Cauda 0,18 mm.

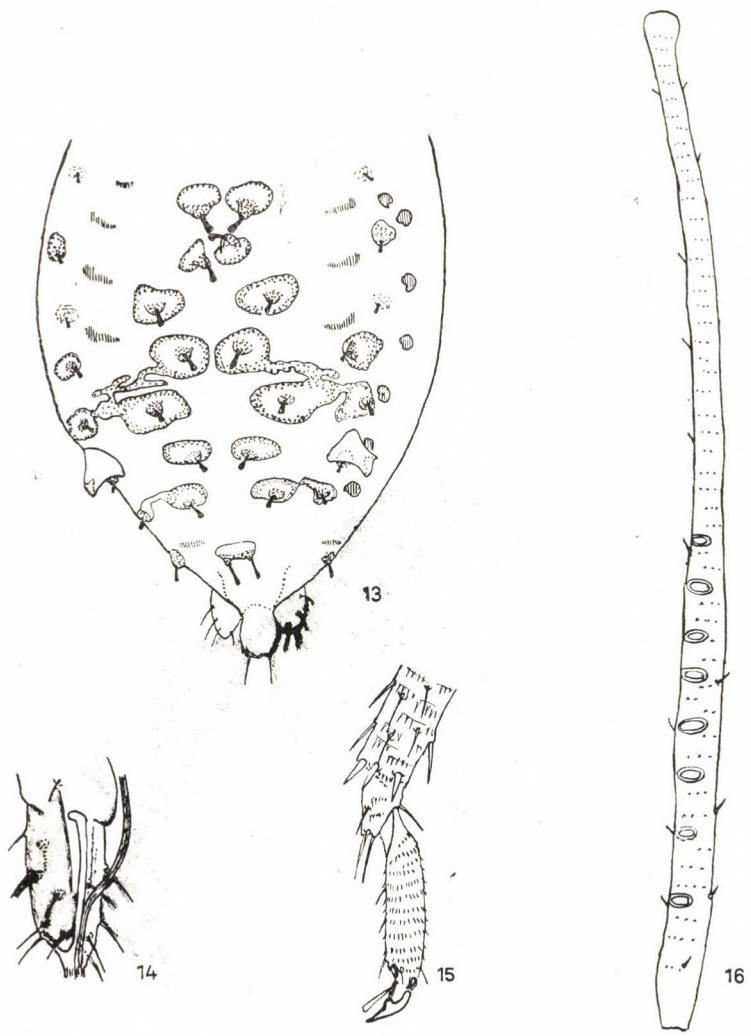

Abb. 13—16. *Therioaphis hungarica* sp. n., geflügeltes vivipares Weibchen: 13 = Abdomen, 14 = Rüsselendglied, 15 = Hintertarsus, 16 = 3. Fühlerglied

Junglarve

Die Embryonen mit 4 Längsreihen langer Dorsalhaare, die pleuralen fehlen. Spinalhaare auf dem III. Abdominaltergit bis 0,030 mm lang. Übrige Merkmale nicht sichtbar.

Wirtspflanze: eine rosig blühende *Ononis*-Art.

Holotypus: ein ungeflügeltes vivipares Weibchen (Präp. Nr. 2829a); Ungarn, Villányi-hegység: Szársomlyó, 25. VIII. 1965, auctor leg. Paratypen: ein geflügeltes vivipares Weibchen und mehrere ungeflügelte vivipare Weibchen, Daten wie beim Holotypus.

Holotypus und ein Teil der Paratypen befinden sich in der Sammlung des Verfassers im Zoologischen Institut der Polnischen Akademie der Wissenschaften in Warszawa, die übrigen Paratypen in der Zoologischen Abteilung des Ungarischen Naturwissenschaftlichen Museums in Budapest und in der Sammlung von Herrn D. HILLE RIS LAMBERS, Bladluisonderzoek T. N. O. in Bennekom, Niederlande.

Biologie: Unbekannt, die Tiere leben in kleinen Gruppen an den Blättern der Wirtspflanze, ohne Ameisenbesuch.

Systematische Stellung: Die neue Art ist mit den an *Ononis* spp. lebenden Arten *T. alatina* H. R. L. et BOSCH, *T. natricis* H. R. L. et BOSCH und *T. ononidis* (KALTENBACH) verwandt und scheint der letztgenannten Art am nächsten zu stehen. Sie unterscheidet sich aber leicht von allen diesen Arten durch das kurze und schwach behaarte Rüsselendglied sowie durch die etwas stärker erweiterten Spitzen der Dorsalhaare.

Bestimmungstabelle der bisher aus Ungarn bekannten Arten der Gattung Therioaphis Walker[1]

1 Zumindest ein Teil der dorsalen Haare lang und mit erweiterten Spitzen, auf kegelförmigen Tuberkeln sitzend 2
— Dorsale Haare unscheinbar und stumpf, auf flachen Haarplatten sitzend. An *Lotus corniculatus* ..... **T. brachytricha** H. R. L. et BOSCH

2 Abdominale Tergite mit nur 4 Haaren; auch die Embryonen und Junglarven mit nur 4 Haaren pro Tergit 3
— Mindestens einige von den abdominalen Tergiten mit mehr als 4 Haaren; Embryonen und Junglarven mit 4 oder 6 Haaren pro Tergit 8

3 Rüsselendglied deutlich länger als das 2. Glied der Hintertarsen, mit 8—12 Haaren außer den subapikalen Haarpaaren. An *Ononis* spp. ..... **T. ononidis** (KALTENBACH)
— Rüsselendglied kürzer als das 2. Glied der Hintertarsen, sehr selten mit mehr als 6 Haaren außer den subapikalen Haarpaaren 4

4 Spinale Haare auf den abdominalen Tergiten I bis V sehr kurz, bei Embryonen nur 0,013 mm, bei den adulten Tieren bis 0,026 mm lang. Marginale Haare bei den Embryonen und Larven etwa 2mal so lang wie die spinalen. Alle vivipare Morphen geflügelt. An *Melilotus* spp. ..... **T. riehmi** (BÖRNER)
— Spinale Haare zumindest auf dem I. Abdominaltergit viel länger, mindestens 0,035 mm lang. Marginale Haare bei Embryonen und Junglarven kaum länger als die spinalen 5

5 Alle vivipare Morphen geflügelt. An *Dorycnium sericeum* .... **T. dorycnii** (PINTERA)
— Ungeflügelte vivipare Morphen vorhanden 6

6 Alle Haarplatten und Tuberkeln, auf denen die dorsalen Haare sitzen, dunkel pigmentiert. Rüsselendglied mit 6—8 Haaren außer den subapikalen Haarpaaren. An *Ononis* sp.

[1] Nach HILLE RIS LAMBERS und VAN DEN BOSCH (1964) aufgestellt.

..... **T. hungarica** sp. n.
— Haarplatten und kegelförmige Tuberkeln, wenn vorhanden, blaß, ohne sichtbare Pigmentierung. Rüsselendglied mit weniger Haaren. Nicht an *Ononis* spp. 7

7 Alle kegelförmigen Tuberkeln, auf denen die Dorsalhaare sitzen, hell, kaum pigmentiert. Das VIII. Abdominaltergit mit nur 2 Haaren. Sekundäre Rhinarien nur auf die basale Hälfte des 3. Gliedes begrenzt. An *Dorycnium herbaceum* .....
..... **T. hillerislambersi** sp. n.
— Marginale Tuberkeln des II. Abdominaltergits mit deutlichem dunklen Fleck. Das VIII. Abdominaltergit mit 4 Haaren. Sekundäre Rhinarien nehmen mehr als die halbe Länge des 3. Gliedes ein. An *Trifolium alpestre* und *T. medium* ..... **T. subalba** BÖRNER

8 Alle Haarplatten samt Tuberkeln, an denen die dorsalen Haare sitzen, dunkel pigmentiert. An den abdominalen Tergiten I—IV stets mehr als 6 Haare vorhanden. An verschiedenen Papilionaceen ..... **T. trifolii** (MONELL)
— Alle Haarplatten und Tuberkeln, mit Ausnahme der marginalen auf dem II. Abdominaltergit, hell und nicht pigmentiert. Die abdominalen Tergite I—IV selten mit mehr als 5 bis 6 Haaren. An *Trifolium alpestre* und *T. medium* ..... **T. subalba** BÖRNER

SCHRIFTTUM

1. BÖRNER, C. (1952): Die Blattläuse Mitteleuropas (Europae centralis Aphides). — Mitt. Thür. Bot. Ges., Weimar, **3**, pp. 259.
2. HILLE RIS LAMBERS, D. und VAN DEN BOSCH, R. (1964): On the genus Therioaphis Walker, 1870, with descriptions of new species (Homoptera, Aphididae). — Zool. Verhandl., Leiden, **68**, pp. 47.

Anschrift des Verfassers: Warszawa, ul. Wilcza 64, Polen.

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EUPITHECIA SZELENYII SP. NOV. (LEPIDOPTERA: GEOMETRIDAE)

By

A. VOJNITS

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(Received July 4, 1968)

In the course of reviewing the species belonging to the *innotata*-group (*Eupithecia nanata* HB., *innotata* HUFN., *unedonata* MAB.), I have critically examined the Hungarian and Palaearctic materials of the Hungarian Natural History Museum, further the collection deriving from the material captured by the nationwide light trap network (deposited also in the above Museum), and Dr. L. KOVÁCS's collection of Lepidoptera. The main results of the survey might be summarized as follows:

1. The identification of *nanata*, occurring also in Hungary, is not especially difficult.

2. The species *innotata* and *unedonata*, the latter one as yet unknown from Hungary, are closely allied but there is no doubt as to their specific distinctness.

3. The forms heretofore relegated to *innotata* can be separated into two groups, only one of which is the true *innotata*. The other form represents, according to my investigations, a new species. Both occur in Hungary. The systematic place of the new species is between *innotata* and *unedonata*.

Eupithecia szelenyii sp. nov.*

Both sexes of the new species is larger than those of *innotata*, the measurements of the alar expanse being as follows:

		szelenyii	*innotata*
First brood:	males	22.20 mm	19.50 mm
	females	23.75 mm	23.00 mm
Second brood:	males	19.25 mm	17.14 mm
	females	20.00 mm	18.50 mm

* I discuss mainly those features of the new species by which it differs from its nearest ally, *innotata* HB.

The termen of the fore wing of *szelenyii* is also relatively longer than that of *innotata*, hence the wing is more elongated. The basic color of the new species is grey without any, or merely a suggestion of, brownish suffusion; the cilia

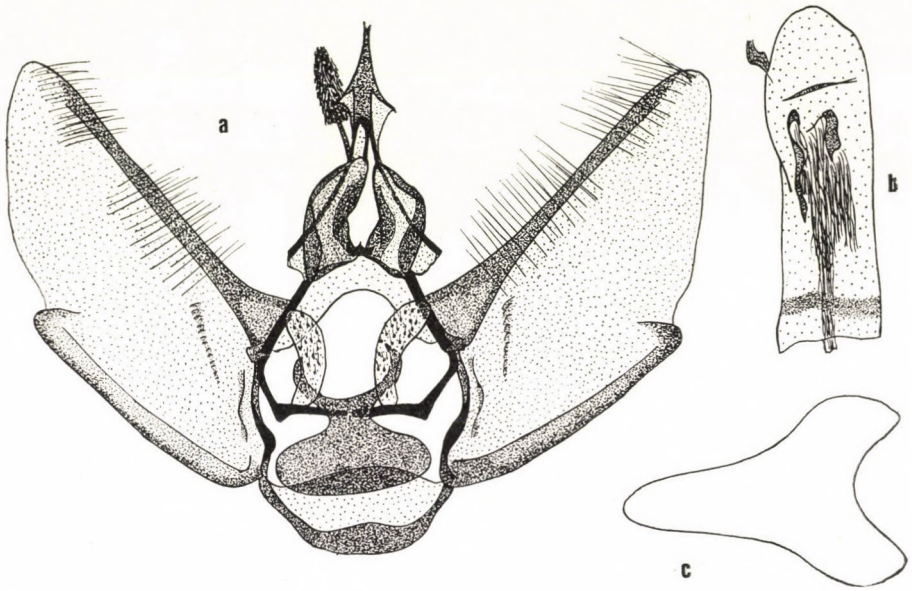

Fig. 1. *Eupithecia szelenyii* sp. nov. — a = male genital organ, b = aedoeagus, c = eighth male sternite (slide 421, VOJNITS)

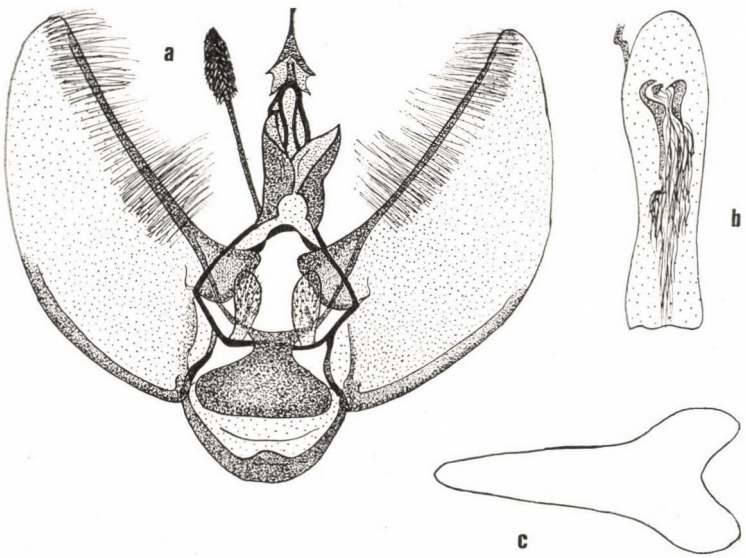

Fig. 2. *Eupithecia innotata* HUFN. — a = male genital organ, b = aedoeagus, c = eighth male sternite (slide 422, VOJNITS)

are light grey, with some darker greyish bars. In *innotata*, on the other hand, the fore wing is definitely brown, the termen is more or less evenly fuscous.

The pattern decurrent along the termen of the fore wing is white in *szelenyii* and yellowish in *innotata*. The double line delimiting the median field towards the termen is also quite light, occasionally white, whereas it is nearly concolorous with the basic color in *innotata*, and often wholly obsolescent. The color of the median field is hardly darker than that of the terminal field, while in *innotata* the median field is essentially darker owing to the greyish suffusion. The cross-striae demarcating the median field towards the base are well discernible, but quite indistinct in *innotata*. The discal spot is slightly nearer to the termen than in the case of *innotata*.

The hind wing is light grey, the base whitish, the terminal zone of darker grey; in *innotata* the hind wing is light fuscous. The discal spot is not or hardly discernible; well visible in *innotata*. The underside of the wings is light grey; a rather darker greyish brown in *innotata*.

Genitalia. The differences apparent in the genital organs are, despite a considerable tendency to intraspecific variation, constant and well demarcable. Male genitalia: (Fig. 1a, b; Fig. 2a, b). The valval dorsum of *szelenyii* bears a rather large tooth, whereas that of *innotata* is more or less rounded. The aedoeagi display deviations only in size: longer and stouter in the new species; the entire organ is also more robust and larger than in *innotata*. Female genitalia: The shape of the bursa shows remarkable differences (Fig. 3a, b); equally long in both species but somewhat narrower and more elongate (pyriform) in *szelenyii*, and more rotund in *innotata*. The last sternite of *szelenyii* is essentially wider than in *innotata* (Figs. 1c, 2c).

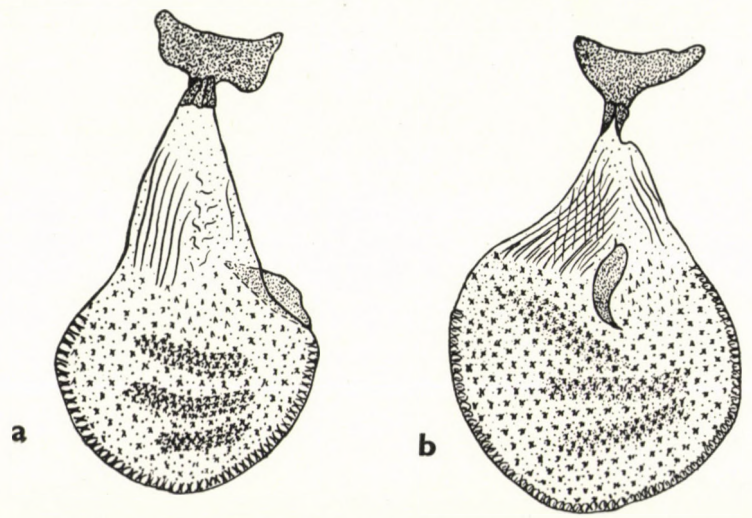

Fig. 3. Bursa copulatrix — a = *Eupithecia szelenyii* sp. nov., b = *E. innotata* HUFN. (slides 417, 418, VOJNITS)

Holotype male: Galyatető, Mts. Mátra, 15 April, 1961, leg. Dr. Gy. Lengyel. — Paratypes: Fót, 7 May, 1949, 1 ♂, leg. Dr. L. Issekutz; Bálvány, Mts. Bükk, 900 m, 24 August, 1949, 1 ♂, leg. Dr. L. Issekutz; Szécsény, 2 Sept., 1950, 1 ♂, leg. Dr. L. Issekutz; Farkasrét, Budapest, 25 April, 1951, 1 ♀, leg. Dr. Gy. Lengyel; Szár, 29 April, 1951, 1 ♀, leg. Dr. L. Issekutz; Pasarét, Budapest, 6 Sept., 1956, 1 ♀, leg. Dr. Gy. Éhik; same, 8 May, 1959, 1 ♀, leg. Dr. Gy. Éhik; Soroksár, 26 March, 1961, 1 ♂, e.l., leg. Dr. Gy. Éhik; Galyatető, Mts. Mátra, 15 April, 1961, 1 ♀, leg. Dr. Gy. Lengyel; Pasarét, Budapest, 1 Sept., 1961, 1 ♀, leg. Dr. Gy. Éhik; Tompa, 7 May, 1964, 1 ♂, lighttrap; Pasarét, Budapest, 1 Sept., 1964, 1 ♂, leg. Dr. Gy. Éhik; Misina, Mts. Mecsek, 11 March, 1966, 1 ♂, e.l., leg. J. Szőcs. — All type-specimens deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest.

I dedicate the new species to Dr. G. Szelényi, one of the outstanding personalities of entomological research in Hungary.

Distribution. According to the data at my disposal, *E. szelenyii* sp. nov. occurs, beyond the confines of the Carpathian Basin, also in Austria and Germany, but it seems to be by far not so widely ranging as *innotata*, occurring almost in the entire European continent.

Habitat. *E. szelenyii* sp. nov. occurs in both hilly and mountainous regions as well as in the plains. Though *innotata* was also widely collected, it is most frequent in habitats on mainly a sandy substrate (Ágasegyháza, Kaposvár, etc.) in Hungary.

Phenology. The first brood of the new species flies in the second half of April and the first half of May; the second brood in the last third of August and the first third of September. The imagos of *innotata* take to the wing some days earlier, and terminate their flight also earlier, in Hungary.

Foodplant. According to the observations and breeding experiments (Dr. L. Kovács, Dr. Gy. Lengyel, J. Szőcs), the larvae of the new species were found on *Artemisia campestris*, those of *innotata* mainly on *A. scoparia* and only sporadically on *A. maritima* and *A. campestris*.

Acknowledgements. My thanks are due to Dr. L. Kovács for his support of my work, and to Dr. L. Gozmány for his help in the evaluation of the slides.

Author's address: Budapest, II., Herman Ottó út 15, Hungary.

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A. Keve

Das Vogelleben der mittleren Donau

Studia Biologica 7.

in German . 127 pages . 17×25 Paper-bound

The author summarizes the accumulated the ornithological knowledge in respect of the Middle Ganubian Reach in connection with international Danube research. Besides dizcussing nestling birds, migratory birds are also treated in detail. The study presents positive bromatological data which throw light upon provisionchain and its importance in agriculture. The fundamentals included are of excellent starting points for further investigations.

Phaenoanalysis and Quantitative Inheritance

Ed. by Gy. Fábián

In preparation in English . Approx . 240 pages . 17×25 cm . Cloth

The volume presents a selection of studies on animal genetics elaborated by Hungarian research workers. The editor of the book together with his collaborators search for possibilities how the phaenogenetic analysis of quantitative characteristics of diverse forms were solvable on the bases of prevalent growtv equations. The authors extended their field of study over wild and domesticated types as wall as their hybrid forms. A wide scale of vertebrates is included in their experimental work.

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ACTA ZOOLOGICA

ТОМ. XV ВЫП. 3-4

РЕЗЮМЕ

РЕЗУЛЬТАТЫ ВЕНГЕРСКОЙ НАУЧНОЙ ЭКСПЕДИЦИИ ПО ИЗУЧЕНИЮ ПОЧВЕННОЙ ФАЗЫ ЮЖНОЙ АМЕРИКИ
12. ACARI: ORIBATIDAE ИЗ МАТЕРИАЛА ВТОРОЙ ЭКСПЕДИЦИИ III

Й. БАЛОГ и М. МАХУНКА (Будапешт)

В настоящей работе авторы продолжают сообщение результатов обработки материала, собранного в ходе второй экспедиции в Южную Америку, соответственно принципам первых двух сообщений указанной серии статьей. В этой статье дается описание трех новых родов (**Calozetes gen. nov., Licnozetes gen. nov., а Oxyoppia gen. nov.**), также 27 новых видов.

CHIRONOMIDAE В БЕНТОСЕ ВЕНГЕРСКОГО УЧАСТКА ДУНАЯ (DANUBIALIA HUNGARICA XLIX)

А. БЕРЦИК (Будапешт)

Сообщаются результаты обработки материала **Chironomidae**, собранного при изучении бентоса на 11 осаждения были обнаружены 12 таксонов. Автор подчеркивает, что в связи с исследованием рек при толковании картины фауны в повышенной мере приходится учитывать гидрологические условия и своеобразные потамоэкологические условия.

НЕКОТОРЫЕ ВИДЫ TINEIDAE (LEPIDOPTERA) ИЗ МАДАГАСКАРА

Л. А. ГОЗМАНЬ (Будапешт)

Автор проводил обработку материала **Tineidae** храняемого в парижском Музе естествознания. До сих пор было известно только два вида этого семейства в Мадагаскаре не этом занимающем в отношении **Tineidae** своеобразное зоогеографическое место острове Дается описание 4 новых родов и 6 новых видов. Новые роды по всей вероятности выдвигают необходимость выделения нового подсемейства. Известные уже виды и роды являются представителями африканских или мавританский таксонов.

РЕЗУЛЬТАТЫ НАУЧНОЙ ЭКСПЕДИЦИИ З. КАСАБ В МОНГОЛИЮ
197. TENEBRIONIDAE (COLEOPTERA) ИЗ МАТЕРИАЛА ШЕСТОЙ ЭКСПЕДИЦИИ

З. КАСАБ (Будапешт)

В 1968 году совершил двухмесячную научную экспедицию в Северной и Северозападной Монголии. Настоящая статья содержит результаты и обработки материала **Tenebrionidae**, собранных всего на этот раз 4220 экземпляров. Всего были обнаружены 42 вида и 4 видоизменения, среди них один вид (**Anatolica atshitnura sp. nov.**), два подвида

(**Lobodera gibbula major** ssp. nov., **L. explanata reichardti** ssp. nov.) и одно видоизменение **Lobodera altaica** var. **opaca** var. nov.) оказываются новыми для науки. Наряду с изложением фаунистических и таксономических данных собранного материала сообщается и таблица о распределении элементов фауны известного до сих пор в Монголии 171 вида Tenebrionidae.

ФАУНИСТИЧЕСКИЕ РЕЗУЛЬТАТЫ ВЕНГЕРСКИХ НАУЧНЫХ ЭКСПЕДИЦИЙ ПО ИЗУЧЕНИЮ ПОЧВЕННОЙ ЗООЛОГИИ В ЮЖНУЮ АМЕРИКУ. 13. ACARI: ВИДЫ PYGMEPHORIDAE И SCUTACARIDAE, ИЗ МАТЕРИАЛА ВТОРОЙ ЭКСПЕДИЦИИ (БРАЗИЛИЯ, БОЛИВИЯ)

Ш. МАХУНКА (Будапешт)

Из материала, собранного в ходе указанной научной экспедиции, автор сообщает описание новых видов Pygmephoridae и Scutacaridae. В предыдущем номере нашего журнала он описал 25 новых видов из Гваярамерина. В настоящей статье он, наряду с описанием 33 новых видов выявляет также много из уже раньше описанных видов. Дается также описание нового подрода (**Rostrodispus** subgen. nov.) из рода *Microdispus*.

НОВЫЕ ВИДЫ MESITIUS (HYMENOPTERA: BETHYLIDAE)

Л. МОЦАР (Будапешт)

На основе коллекций Будапештского Музея Естествознания и Британского Музея автор дает описание 4 новых видов (**Mesitius rufus** sp. nov., **M. nagyi** sp. nov., **M. kittenbergeri** sp. nov. и **M. arushai** sp. nov.) из Южной Европы и Восточной-Африки.

СИНОПСИС НЕОТРОПИЧЕСКИЙ ВИДОВ PHAENOARPA FÖRST. (HYMENOPTERA: BRACONIDAEC)

Й. ПАПП (г. Веспрем, Венгрия)

На основе экземпляров, хранящихся в будапештском, берлинском и вашингтонском музеях, дается описание 6 новых видов *Phaenocarpa* Först. из неотропических областей. Число видов, известных до сих пор из этой области, составляет теперь 10. Перед подробным описанием новых видов сообщается также ключ для идентификации неотропических видов *Phaenocarpa*.

СИСТЕМАТИЧЕСКОЕ ПОЛОЖЕНИЕ ВИДА SCROBIPALPA HUNGARIAE (STAUDINGER, 1871) (LEPIDOPTERA: GELECHIIDAE)

К. САТТЛЕР (Лондон)

На основе нового венгерского материала *Scrobipalpa hungariae* автор проводит коррекцию объективных ошибок, связанных с прежним определением этого вида, а также неправильных заключений о его происхождении, распространении и его систематическом положении. После изложения и объяснения структуры полового органа этого вида автор выявляет, что в противоположность мнению Повольни на основе имеющихся до сих пор данных, *Scrobipalpa hungariae* является эндемическим видом в Венгрии.

КЛЮЧ ДЛЯ ОПРЕДЕЛЕНИЯ РОДОВ ПИЯВОК ВСЕГО МИРА (HIRUDINOIDEA) И КАТАЛОГ ВИДОВ. VI. СЕМЕЙСТВО: GLOSSIPHONIIDAE

А. ШООШ (Будапешт)

В настоящей шестой части своей серии статей автор ознакомит нас с семейством Glossiphonidae. В отличие от прежних частей, в этой работе автор выдвигает два новых таксона, именно: для вида *Oculobdella lurida* Moore, 1954 род **Marvinmeyeria** gen. nov., а для вида *Placobdella ornata* Oka, 1928 (nec Verrill, 1872) род **Pl. okae** nom. nov. Каталог содержит 22 рода и 120 видов.

ДВА НОВЫХ ВИДА THERIOAPHIS ИЗ ВЕНГРИИ (HOMOPTERA: APHIDIDAE)

Х. СЕЛЕГИЕВИЦ (Варшава)

Дается описание двух новых видов из собственного сбора автора (горы Виллань); именно: **Therioaphis hillerislambersi spec. nov.**, и **Th. hungarica spec. nov.** После описания видов сообщается ключ для идентификации венгерских видов ***Therioaphis***.

НОВЫЙ ВИД EUPITHECIA SZELENYII SPEC. NOV. (LEPIDOPTERA: GEOMETRIDAE)

А. ВОЙНИЧ (Будапешт)

Обсуждаются виды группы ***innotata*** рода ***Eupithecia*** Curt., встречаемые в Европе. Автор устанавливает, что отграничить вид ***E. nanata*** HB. встречаемый и в Венгрии от остальных видов не наталкивается на трудности. Виды ***E. innotata*** Hufn. и ***E. unedonata*** Mab. близит друг к другу, однако, по мнению автора в их видовой самостоятельности нельзя сомневаться. Последнего вида до сих пор не удалось собрать в Венгрии.

При основательном изучении форм, причисляемых досюда к виду ***E. innotata***, выяснилось, что они обособляемы на две группы. Одна группа на самом деле относится к виду ***innotata***, описанному ещё Хуфнагелем, другая же на основе постоянных отклонений внешних морфологических признаков и построения половых органов, представляет собой самостоятельный вид, описанный автором под названием **Eupithecia szelenyii spec. nov.**

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