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A. ÁBRAHÁM, J. BALOGH, I. BOROS, S. KOTLÁN, G. SZELÉNYI,  
V. SZÉKESSY

REDIGIT

E. DUDICH

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## NEW ORIBATIDS (ACARI) FROM SOUTH AFRICA

By

J. BALOGH and S. MAHUNKA

ZOOSYSTEMATICAL INSTITUTE, L. EÖTVÖS UNIVERSITY OF SCIENCES, BUDAPEST (DIRECTOR: PROF. DR. E. DUDICH) AND THE ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST (DIRECTOR: DR. Z. KASZAB)

(Received August 20, 1965)

R. F. LAWRENCE (Natal Museum, Pietermaritzburg) sent us a very rich Oribatid material, collected by him, for identification. This material supplements very favourably the earlier African collectings subserving the description of a part of the Oribatid mites of Equatorial Africa, East Africa, Angola, and Madagascar. Since a considerably greater amount of new taxa than expected have been found in the material, it seems expedient that they be published in a number of shorter publications. The complete working up of the material will be followed by a summary report, to be planned as a comprehensive publication, complemented with a key, on the known Oribatid fauna of South Africa.

The order of sequence of the new species described below follows the provisional system of BALOGH: A Synopsis of the World Oribatid (Acari) Genera (1965).

Deposition of type material: Holotypes, and a part of the Paratypes, are deposited in the Natal Museum (NM); the rest of the Paratypes are preserved in the Hungarian Natural History Museum (HNHM), Budapest.

Thanks are due to Mrs. ÉVA KOVÁCS, who rendered efficient help both in the scientific working up of the material and in the drawing of the figures.

***Steganacarus multituberculatus* sp. n. (Fig. 1)**

938.4 × 500 μ. Sensillus short, setiform, proclinate and decumbent when viewed laterally. Hairs of aspis poorly visible due to cerotegument of single type-specimen. Aspis ornamented medially with a crest-like protuberance.

Notogastral hairs short, widening phylliform or blade-shaped, pointed, situated mostly on spherical tubercles. At least 10 large tubercles visible laterally, giving an extremely singular appearance to animal. This feature distinguishes the new species from all known congeners.

Genital and anal plates with chaetotaxy characteristic of genus. All anal hairs short and setiform.

Type-material: Holotype and 4 Paratypes in the NM, 4 Paratypes in the HNHM.

Locality: Town Bush, Pietermaritzburg, leg. R. F. LAWRENCE.

***Phyllhermannia angulata* sp. n. (Figs. 2—3)**

602.7—622.3 × 318.5—343  $\mu$ . Sensillus exclinate, straight, apical half finely ciliate. Interlamellar hairs horizontally inclinate, apically extending beyond each other. Anteriorly of interlamellar hairs a transversal chitinous line, medially with an angle anteriorad; an indistinct tubercle behind each interlamellar hair.

Notogaster with 16 pairs of long, pointed, slightly blade-shaped hairs; posterior hairs shorter than others. Posterior part of notogaster with three pairs of obtuse angles. Hairs arranged in 4 longitudinal rows, basally with 4 longitudinal chitinous ribs, only slightly elevated from notogastral surface. This latter with a fine, indistinct, polygonal structure.

Ventral side: epimeral hairs 3—1—2—5, hairs in part finely ciliate. 3 + 6 pairs of genital hairs: three exterior ones phylliform, pointed, six inner ones minute but partly widening to phylliform. 3 pairs of adanal and 2 pairs of anal hairs not widening, setiform.

Type-material: Holotype and 35 Paratypes in the NM; 35 Paratypes in the HNHM.

Locality: Umhlali, Natal, leg. R. F. LAWRENCE.

***Phyllhermannia serrata* sp. n. (Figs. 4—5)**

534.1—539 × 269.5—284.2  $\mu$ . Sensillus exclinate, slightly arcuate, apically hardly perceptibly incrassate, smooth. Interlamellar hairs inclinate and obliquely proclinate. Transversal chitinous line of prodorsum wanting. Posteriorly of interlamellar hairs, a hardly elevated, indistinct portion each, covered with granules.

Notogaster with 16 pairs of hairs, of which 2 posteromarginal hairs short, phylliform, those originating anteriorly of pair 13 arranged in four longitudinal lines, fine, setiform. Notogaster smooth, oval, without any sculpture or ribs.

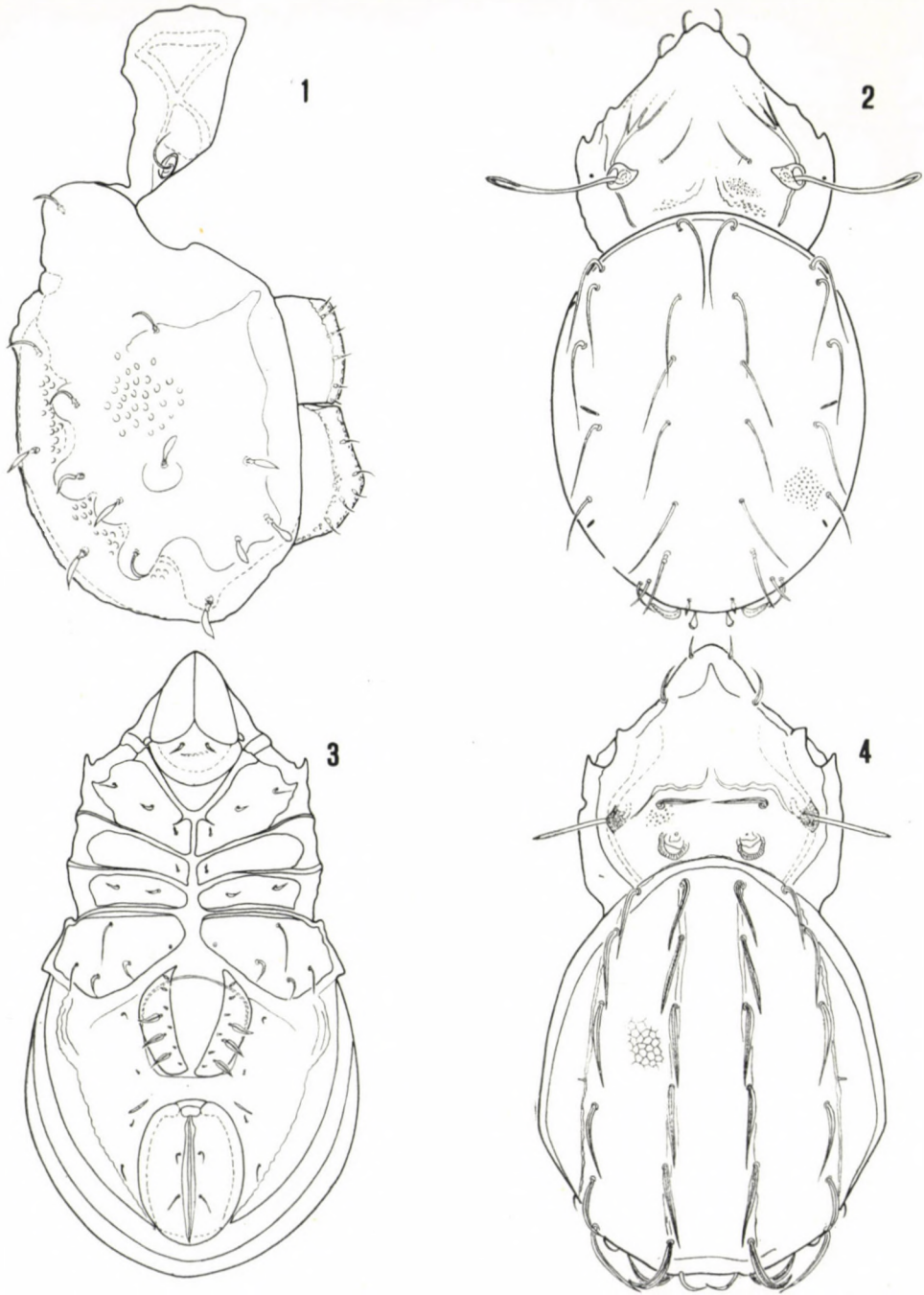
Ventral side: epimeral hairs 3—1—2—5; hairs of epimere IV, especially 2 outer ones, strikingly long. All epimeral hairs setiform, smooth. 3 + 6 pairs of genital hairs present, 3 outer ones phylliform, short. 3 pairs of adanal and 2 pairs of anal hairs short, fusiform.

Type-material: Holotype and 1 Paratype in the NM.

Locality: Knysna, Cape Province, leg. R. F. LAWRENCE.

There are five *Phyllhermannia* species known from the Ethiopian Region. They can be distinguished by the following key:





Figs. 1—4. 1 = *Steganacarus multituberculatus* sp. n., lateral; 2—3 = *Phyllhermannia angulata* sp. n. 2 = dorsal, 3 = ventral; 4 = *Phyllhermannia serrata* sp. n., dorsal

- 1 (4) Interlamellar region without a transversal chitinous line.  
 2 (3) Sensillus finely granulated. Notogastral hairs lanceolate.  $860 \times 450 \mu$ .  
 Tanganyika *P. africana* BALOGH, 1958  
 3 (2) Sensillus smooth. Notogastral hairs setiform.  $540 \times 284 \mu$ . South  
 Africa *P. serrata* sp. n.  
 4 (1) Interlamellar region with a transversal chitinous line.  
 5 (6) Interlamellar hairs short, much shorter than half distance between  
 them. Notogaster with a rough, polygonal sculpture. Madagascar  
*P. exornata* BALOGH, 1962  
 6 (5) Interlamellar hairs long, longer than half distance between them.  
 Notogaster smooth, or with fine, hardly discernible polygonal sculpture.  
 7 (8) Posterior half of notogaster with 3 pairs of obtuse angles, and 2 pairs  
 of longitudinal, slightly elevated chitinous ribs. South Africa  
*P. angulata* sp. n.  
 8 (7) Posterior half of notogaster rounded, its surface without longitudinal  
 chitinous ribs. Madagascar *P. pauliani* BALOGH, 1962

***Phereliodes* (?) *longiceps* sp. n. (Figs. 6—7)**

$795.6 \times 489.6 \mu$ . Sensillus exclinate and reclinate, setiform, pointed, throughout finely ciliated. Interlamellar hairs short but well discernible, bacilliform. Lamellar and rostral hairs rather long, thin, originating almost along a common line. Prodorsum longer than wide, anteriorly attenuating, with X-shaped chitinous lines.

Notogaster covered with concentrically situated exuviae (Fig. 6), with 1 or 2 pairs of hairs on posterior apices. Notogaster with a polygonal structure.

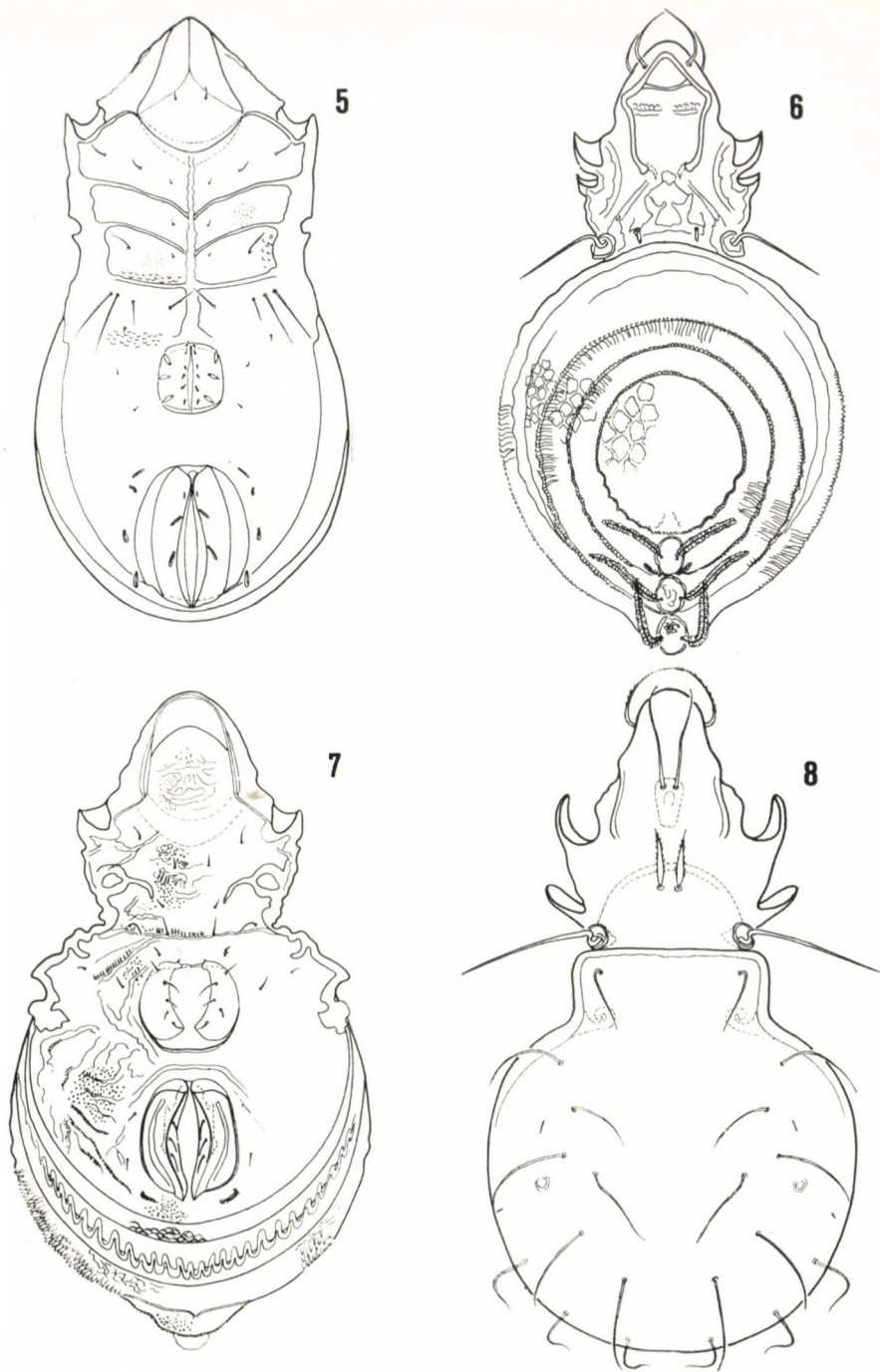
Ventral side: 5 pairs of genital, 3 pairs of anal, and 3 pairs of adanal hairs. Ventral plate with irregular rugosities, and a granulation partly following wrinkles.

Type-material: Holotype and 2 Paratypes in the NM, 2 Paratypes in the HNHM.  
 Locality: Town Bush, Pietermaritzburg, leg. R. F. LAWRENCE.

This interesting species was here relegated to the genus *Phereliodes* exclusively on the basis of a single artificial feature: the number of the anal hairs. Until considerably more species are known than today, the system of the family Plateremacidae cannot satisfactorily be elaborated. The above species can be easily distinguished and sharply separated by the characteristics given in the diagnosis and the drawings, from all other taxa described and relegated to the family.

***Hymenobelba coarctata* sp. n. (Figs. 8—9)**

$784-833 \times 416.5-460.6 \mu$ . Sensillus setiform, smooth, exclinate. Interlamellar hairs arising near each other, lanceolate, marginally ciliate. Lamellar hairs originating near each other, on a chitinous tubercle, setiform, long, reaching rostrum. Rostral hairs inclinate, sparsely ciliate. Starting from



Figs. 5—8. 5 = *Phyllhermannia serrata* sp. n., ventral; 6—7 = *Phereliodes* (?) *longiceps* sp. n. 6 = dorsal, 7 = ventral; 8 = *Hymenobelba coarctata* sp. n., dorsal

bothrydia, a semicircular, indistinct line, decurrent anteriorly of interlamellar hairs.

Notogaster extremely attenuating anteriorly, being narrower than prodorsum. Dorsosejugal suture straight. 10 pairs of notogastral hairs present, all setiform, smooth, rather long: three hairs *p* shorter than others.

Ventral side: 6 pairs of genital, and 2 pairs of anal hairs. Ventral plate with only 10 pairs of hairs. Ventral plate longer than wide.

Type-material: Holotype and 30 Paratypes in the NM, 30 Paratypes in the HNHM.

Locality: Grahamstown, Cape Province, leg. R. F. LAWRENCE.

### *Hymenobelba annulus* sp. n. (Figs. 10–11)

749.7 × 382.2 μ. Sensillus setiform, exclinate, with 5–6 sparsely spaced cilia. Interlamellar hairs setiform, ciliate, apically not reaching bases of lamellar hairs. These latter arising on an annuliform chitinous line, pointed, smooth, extending to rostrum. Rostral hairs arcuate, ciliate, rather long. Anteriorly of interlamellar hairs, a transversal, weakly arcuate, short chitinous line.

Notogaster moderately attenuating anteriorly, dorsosejugal suture straight. 10 pairs of notogastral hairs; base of hairs lanceolately incrassate, then rapidly mucronate to aciculiform, extremely thin. Hairs *p* considerably shorter than others.

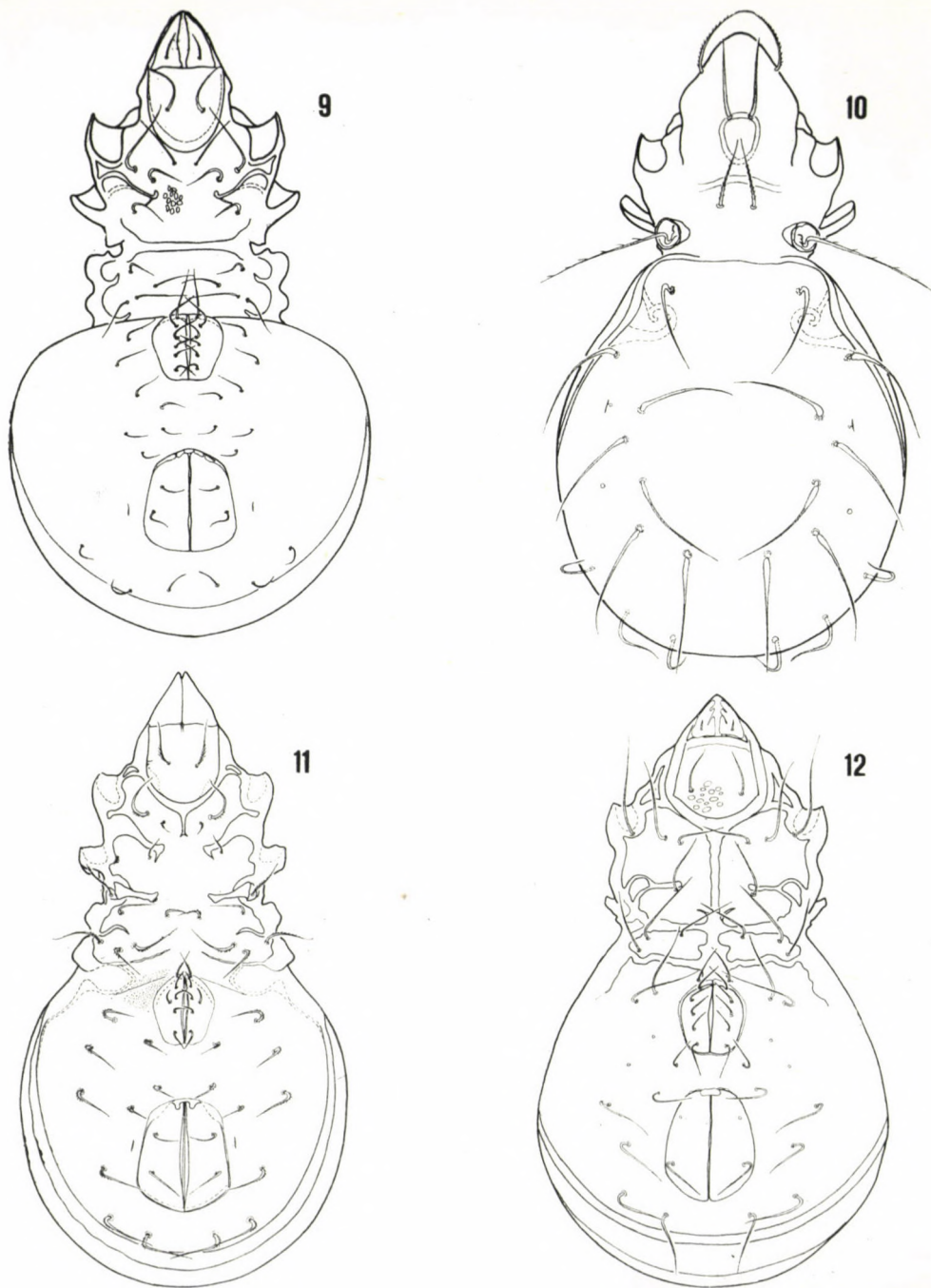
Ventral side: 6 pairs of genital, 2 pairs of anal hairs present. Ventral plate with 9 pairs of hairs. Hairs basally ciliate. Ventral plate longer than wide.

Type-material: Holotype in the NM, one Paratype in the HNHM.

Locality: Town Bush, Pietermaritzburg, leg. R. F. LAWRENCE.

There are 4 species known of the *Hymenobelba* group. They can be distinguished as follows:

- 1 (2) Prodorsum without chitinous costulae. Ventral plate with 15 pairs of hairs. South America *Andesamerus peculiaris* HAMMER, 1962
- 2 (1) Prodorsum with chitinous costulae. Ventral plate with 7–10 pairs of hairs.
- 3 (4) Chitinous costulae of prodorsum Y-shaped, furcate. Epimeral hairs partly lanceolate. Madagascar *Hymenobelba ypsilon* BALOGH, 1962
- 4 (3) Chitinous costulae of prodorsum not furcate. Epimeral hairs setiform.
- 5 (6) Prodorsum anteriorly extremely attenuating, rectangular. Sensillus smooth. South Africa *H. coarctata* sp. n.
- 6 (5) Prodorsum anteriorly less attenuating, obtuse-angled. Sensillus with 5–6 cilia. South Africa *H. annulus* sp. n.



Figs. 9–12. 9 = *Hymenobelba coarctata* sp. n., ventral, 10–11 = *Hymenobelba annulus* sp. n. 10 = dorsal, 11 = ventral; 12 = *Reteremulus aciculatus* sp. n., ventral

**Reteremulus** gen. n.

Fam. Eremobelbidae. Similar to *Eremulus* BERLESE, 1908, hence the listing of characters distinguishing the two genera seems sufficient. Pedotecta 2 very small, almost entirely vestigial. Prodorsum with a polygonal network, and a similarly constructed costula. 11 pairs of notogastral hairs, 5 pairs of genital hairs. All hairs of epimeral and ventral regions simple, not ramifying.

Type-species: *Reteremulus aciculatus* sp. n.

**Reteremulus aciculatus** sp. n. (Figs. 12–13)

715.4 × 436.1  $\mu$ . Sensillus thin, flagelliform, with extremely small, dispersed granules, almost smooth. Interlamellar hairs long, fine, removed from each other. Lamellar and rostral hairs rather long, thin, smooth. Prodorsum with a rough, regular, polygonal reticulation, hence costulae less conspicuous. Rostrum almost pointed.

Notogaster with 11 pairs of long, very fine, almost flagelliform hairs. A polygonal structure anteriorly, in transversal groove of notogaster. This latter with pointed, spiniform aciculi.

Ventral side: epimeral hairs 3–1–3–3; also 8 pairs of ventral hairs.

Type-material: Holotype and 3 Paratypes in the NM, 3 Paratypes in the HNHM.

Locality: Town Bush, Pietermaritzburg, leg. R. F. LAWRENCE.

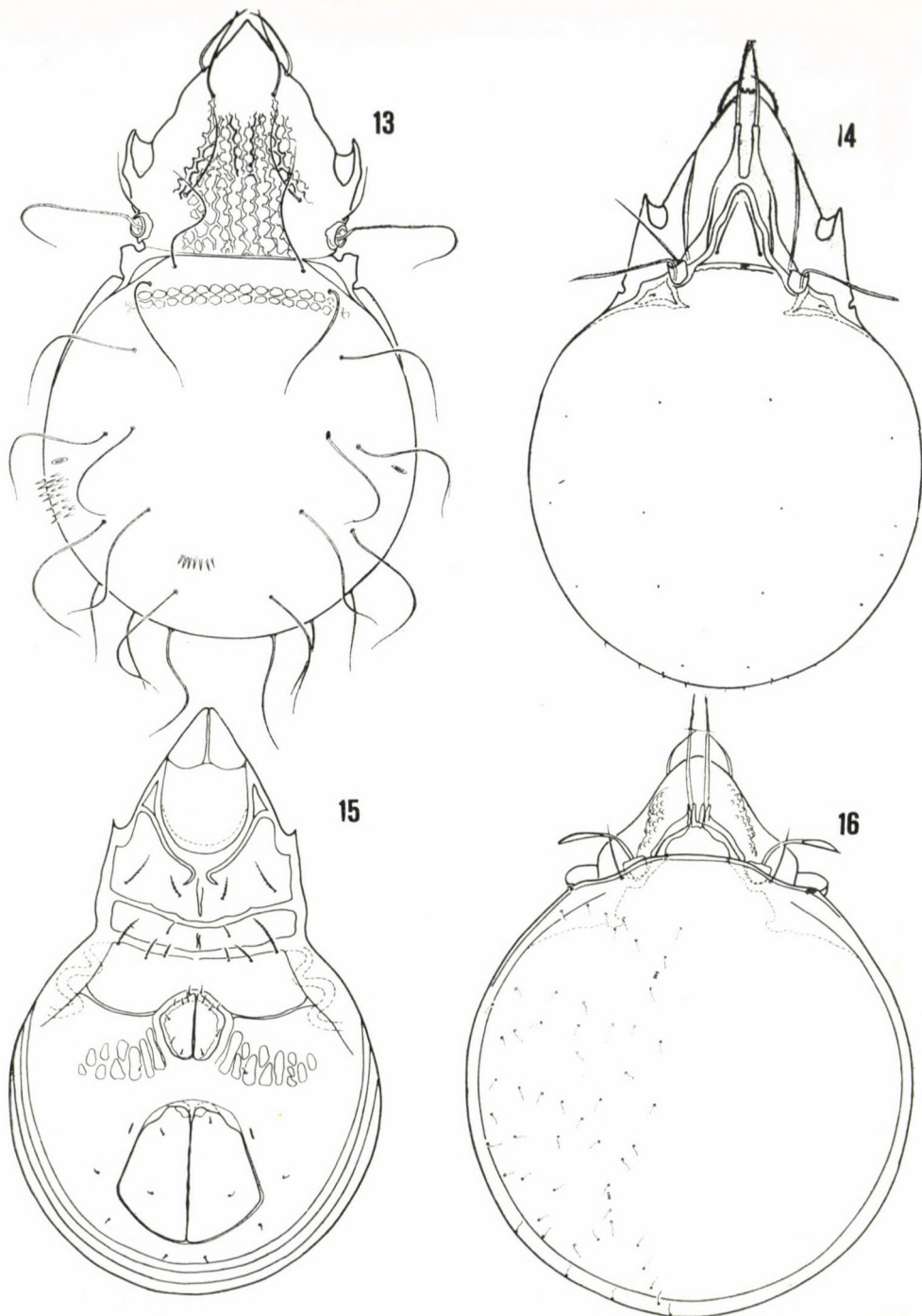
**Furcoppia** gen. n.

Fam. Metrioppiidae. Lamellae decurrent near one another, converging and fusing, with long, thin cuspides. Pedotecta 2 absent. Rostrum denticulate. 11 pairs of extremely small notogastral hairs, 6 pairs of genital hairs. Legs 3-dactylous. — The new genus, though corresponding in its structure to the Metrioppiid type, imitates, by the configuration of its lamellae, the family Astegistidae, especially the genus *Cultroribula*.

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

**Furcoppia imitans** sp. n. (Figs. 14–15)

637 × 411.6  $\mu$ . Sensillus setiform, exclinate and slightly reclinate, pointed, apically still slightly (but hardly perceptibly) thicker, with very fine cilia. Interlamellar hairs medium long, exostigmatal hairs smooth, very long, hardly shorter than sensillus. Lamellae shaped like an inverted V, with extremely long, thin cuspis, bearing straight, smooth, lamellar hairs. Rostral hairs thick, strongly ciliate. Rostral region dentate. Pedotecta 2 entirely absent.



Figs. 13—16. 13 = *Reteremulus aciculatus* sp. n., dorsal; 14—15 = *Furcoppia imitans* sp. n.  
14 = dorsal, 15 = ventral; 16 = *Multoribula multipunctata* sp. n., dorsal

Notogaster with 11 pairs of, partly almost evanescent, hairs. Notogaster without sculpture. Femur 4 below with a sharp crest, proximally terminating in a tooth.

Ventral side: epimeral region resembling the *Ceratoppia*-type. Epimeral hairs finely ciliate. Genital plates relatively small, with 6 pairs of minute genital hairs; anal plates considerably larger, almost twice longer than genital plates. Near genital plates, in vicinity of aggenital hairs, rather large areolae arranged in a transversal line.

Type-material: Holotype, in the NM.

Locality: Town Bush, Pietermaritzburg, leg. R. F. LAWRENCE.

### **Multoribula** gen. n.

Fam. Astegistidae (?). About 50–55 pairs of notogastral hairs, represented only by alveoli, except for humeral hair. 6 pairs of genital, 2 pairs of anal, 1 pair of aggenital, 3 pairs of adanal hairs. Genital and anal plates large, almost touching each other. Legs tridactylous.

Type-species: *Multoribula multipunctata* sp. n.

The new genus essentially differs, by the high number of the notogastral alveoli and its general habit, not only from all known Astegistid genera, but also every Oribatid taxon.

### **Multoribula multipunctata** sp. n. (Figs. 16–17)

816 × 663  $\mu$ . Sensillus exclinate, apically incrassately fusiform, apex pointed, smooth. Exostigmatal hair long, smooth. Lamellae short, strongly converging, and meeting in middle of prodorsum, with short, deeply incised cuspides. Lamellar hairs long, considerably projecting beyond rostrum. Rostral hairs rather long, arcuate. Prodorsum relatively small and wide, with a wide rostrum.

Legs tridactylous. Femur of leg 2 with 6–7 large, lanceolate hairs, and similar but much shorter ones on leg 1.

Notogaster with very large, rounded, slightly projecting shoulders. About 50–55 pairs of irregularly spaced alveoli; only humeral alveolus bearing a visible hair. Nourishing channels leading to alveoli well discernible.

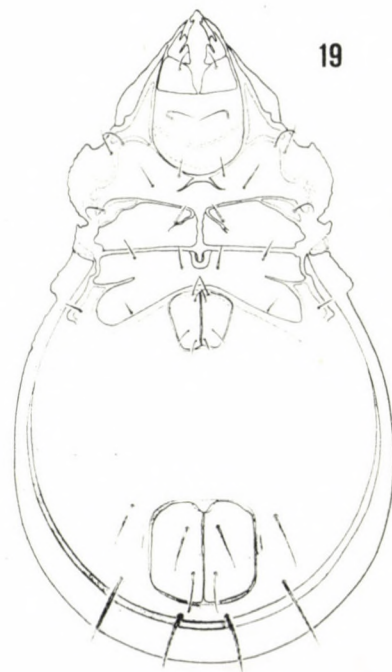
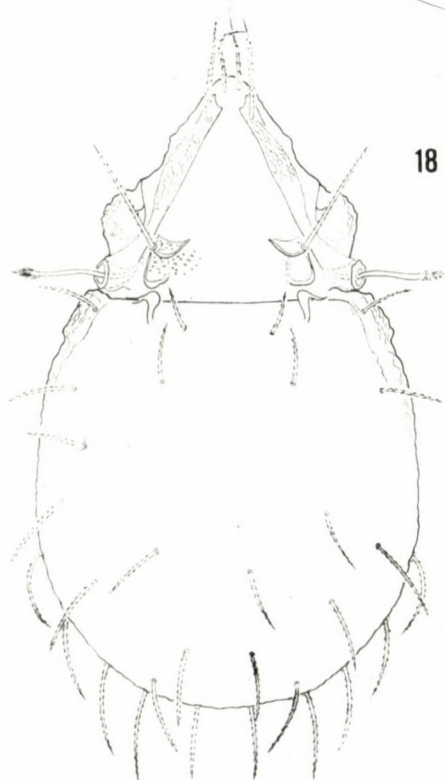
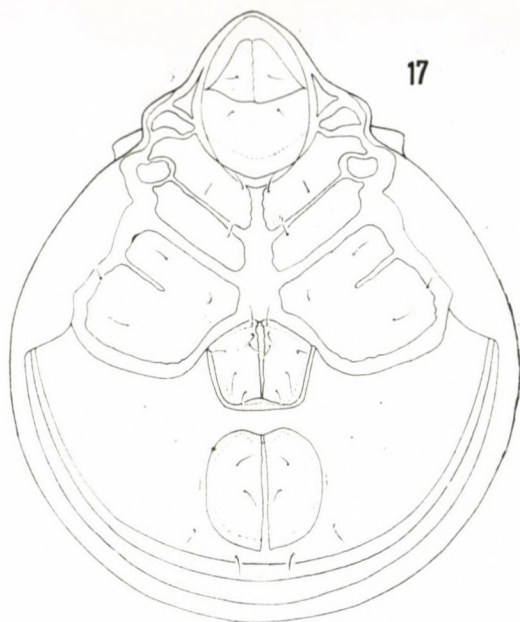
Epimeres very large, oblique, occupying half length of ventral plate. Free portion of ventral plate twice as wide as long, semicircular. Genital and anal plates large, almost meeting.

Type-material: Holotype in the NM, one Paratype in the HNHM.

Locality: New Hanover, Natal, leg. R. F. LAWRENCE.

We have relegated this new species only provisionally to the family Astegistidae. We have been unable to connect it with any one of the known Oribatids.





Figs. 17–19. 17 = *Multoribula multipunctata* sp. n., ventral; 18–19 = *Carabocepheus lounsburyi* subsp. *latior* subsp. n. 18 = dorsal, 19 = ventral

*Carabocephus* BERLESE, 1910

We have found a number of exemplars of a *Carabocephus* species in the South African material. The specimens could not be identified with the species *Carabocephus lounsburyi* BERLESE, 1910, since the shape of the specimens, the sensillus, and the notogastral hairs differ sharply from BERLESE's drawing and description. The differences are bigger than explicable by a faulty drawing, hence we describe the taxon as a new subspecies. The diagnosis of the genus is as follows:

14 pairs of notogastral and 4 pairs of genital hairs. Lamellae narrow, interlamellar hair arising on a singular plate, lamellar hair originating anteriorly of lamellar apex. Dorsosejugal suture with an enantiophysis each, within bothrydium.

*Carabocephus lounsburyi* ssp. **latior** ssp. n. (Figs. 18—19)

1020 × 642.6  $\mu$ . Sensillus exclinate, rather short, apically hardly perceptibly incrassate, with dense, penicilliform cilia. Lamellae and pedotecta 1 tuberculate, prodorsum minutely foveolate and punctate.

Dorsosejugal suture straight, with 2 pairs of enantiophyses. 15 pairs of notogastral hairs considerably shorter than those of nominate form, aciculate.

Four pairs of genital hairs, much shorter than anal hairs, and these again shorter than 3 pairs of adanal hairs. Adanal and anal hairs with short cilia. By the shorter hairs and wider body, the taxon differs sharply from the nominate form described by BERLESE.

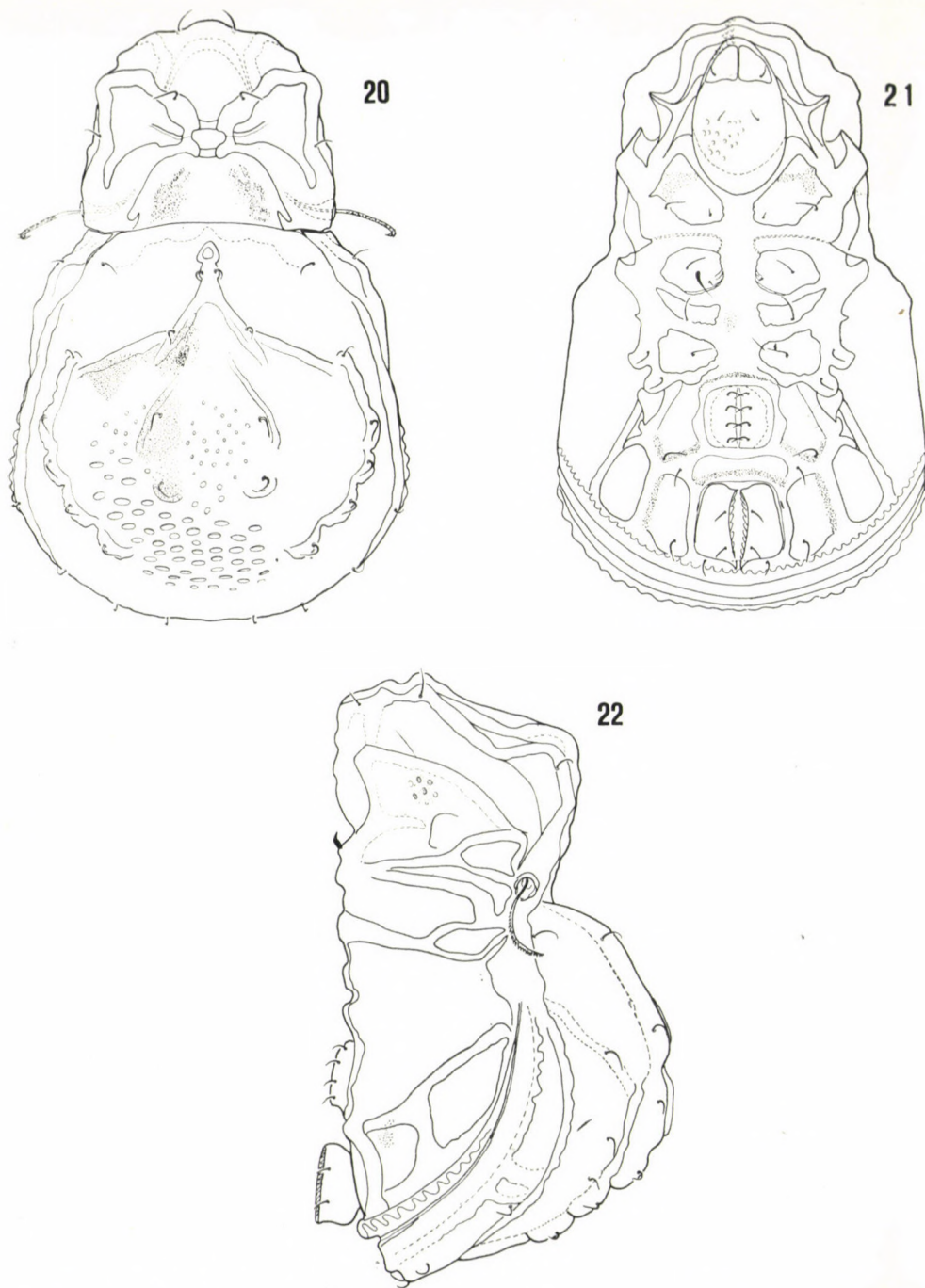
Type-material: Holotype and 18 Paratypes in the NM, 18 Paratypes in the HNHM.

Locality: Grahamstown, Cape Province, leg. R. F. LAWRENCE.

*Machadocephus sagitta* sp. n. (Figs. 20—22)

686 × 431.2  $\mu$ . Sensillus setiform, hardly incrassate, finely ciliate, apically recurving. Interlamellar hair (when viewed from above) situated on anterior portion of prodorsum, fine, smooth, apically exclinate. Lamellar hair, when viewed from above, in a "rostral" position, also fine and smooth. Rostral hair discernible only in a lateral view, short, blade-shaped. Lamellae from above forming an intricate, X-shaped elevation. Lateral view of taxon rather characteristic (Fig. 22).

Notogaster with 14 pairs of minute, extremely thin, smooth hairs, all arcuate, decumbent to body surface. Notogaster anteriorly and medially with a conspicuous, sagittiform crest. All hairs situated on flat tubercles, resembling



Figs. 20—22. *Machadocepeus sagitta* sp. n. 20 = dorsal, 21 = ventral, 22 = lateral

chitinous crests in a lateral view. Notogaster medially with small, posteriorly with larger, rounded foveoli.

Ventral side: 4 pairs of genital, 1 pair of aggenital, 3 pairs of adanal, 2 pairs of anal hairs. Pori *iad* far removed from anal plate. Ventral plate with three pairs of large, hexagonal areas, bordered by thick chitinous laths.

Type-material: Holotype in the NM, one Paratype in the HNHM.

Locality: Amanzimtoti, Natal, leg. R. F. LAWRENCE.

The shape of the lamellae and the sculpture of the notogaster sharply distinguish the new species from all known congeners.

### ***Oppia antennata* sp. n. (Figs. 23—24)**

431.2—475.3 × 254.8—275.3  $\mu$ . Sensillus extremely long, longer than prodorsum, filiform, ciliate. Interlamellar and rostral hairs rather similar, of medium length, setiform. Prodorsum without any costulae. Medially between bothrydia, 2 pairs of minute, rounded, chitinous tuberculi, situated like enantiophyses.

Notogaster with 10 pairs of notogastral hairs, hairs *ta* considerably shorter than hairs *te*, *ti*, and extremely long hairs *r*<sub>3</sub>. Hair *ms* broken away. Hairs *r*<sub>1</sub> and *r*<sub>2</sub> much shorter than hairs *r*<sub>3</sub>. Hairs *p* short.

Ventral side: 6 pairs of genital hairs. Genital plates considerably smaller than anal plates. Pori *iad* situated laterally of and removed from anal plates.

Type-material: Holotype and 13 Paratypes in the NM, 13 Paratypes in the HNHM.

Locality: Table Mountain, Drummond, leg. R. F. LAWRENCE.

The big, new species can be distinguished by the shape of the sensillus and the four chitinous tubercles of the prodorsum, thereby differing from all known *Oppia*-species.

### ***Oppia fortis* sp. n. (Figs. 25—26)**

661.5 × 411.6  $\mu$ . Resembling *Oppia capensis* (PAOLI, 1908), with the following differences: sensillus setiform (fusiform in *O. capensis*), ciliate. An enantiophysis each, anteriorly of dorsosejugal suture (only a solitary tubercle in *capensis*). Notogastral hairs ciliate (smooth in *capensis*); 10 pairs of notogastral hairs; hair *ta* long.

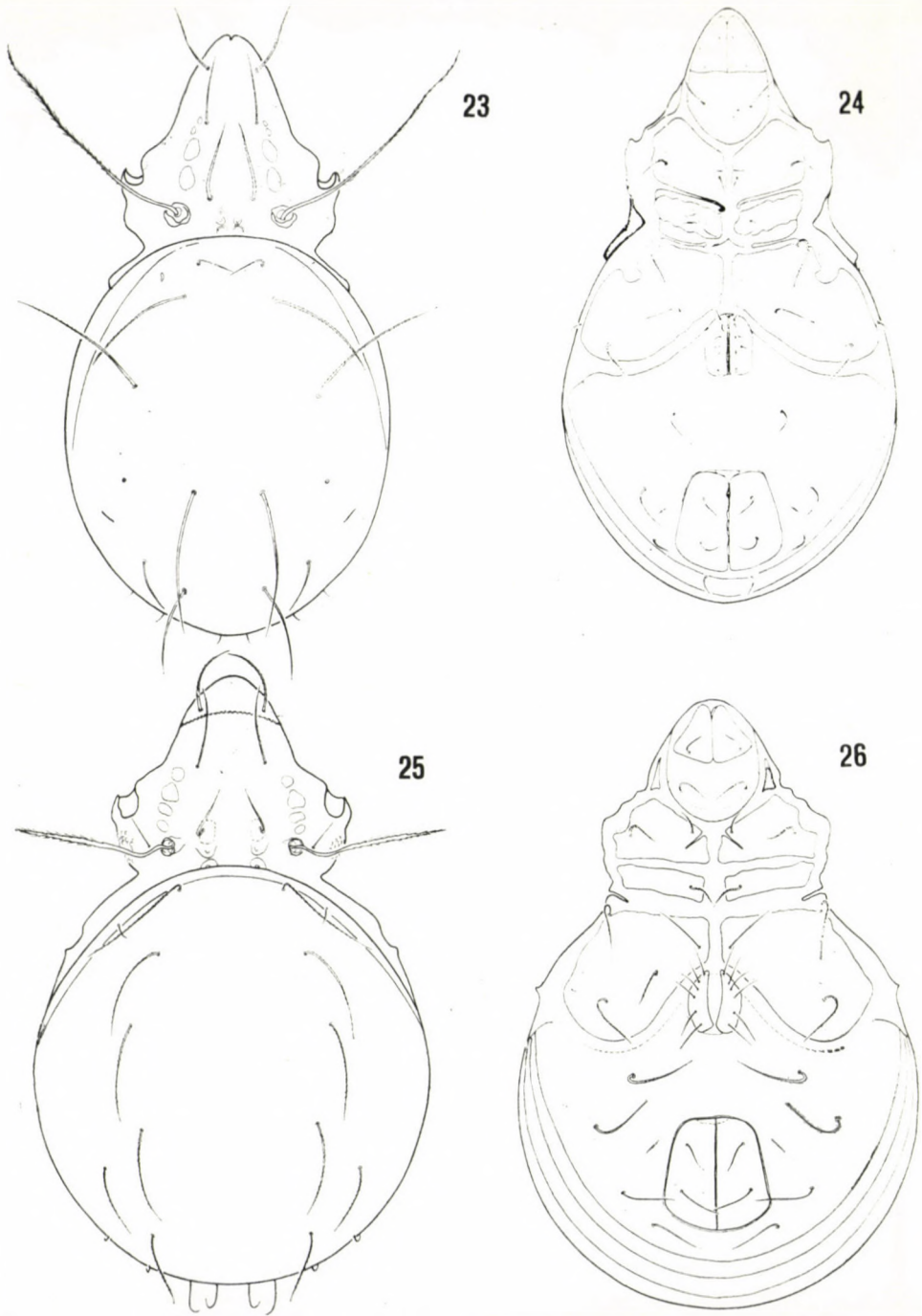
Ventral side: 6 pairs of genital hairs, relatively long. Aggenital, adanal, and anal hairs long; pori *iad* slightly removed from anus.

Type-material: Holotype and 38 Paratypes in the NM, 38 Paratypes in the HNHM.

Locality: High Flats, Natal, leg. R. F. LAWRENCE.

### ***Pseudotocepeus medius* sp. n. (Figs. 27—28)**

617.4—627.2 × 303.8—318.5  $\mu$ . Sensillus exclinate and reclinate, apically fusiform, pointed, hairless. Interlamellar, lamellar, and rostral hairs seti-



Figs. 23-26. 23-24 = *Oppia antennata* sp. n. 23 = dorsal, 24 = ventral; 25-26 = *Oppia fortis* sp. n. 25 = dorsal, 26 = ventral

form, rather long, ciliate. A thin, costula-like line decurrent from bothrydium to base of lamellar hairs. Prodorsum medially with irregular tubercles, laterally with small granules.

Notogaster with 10 pairs of hairs. Hair *ta* slightly longer than others, ciliate on one side, other hairs long, apically flagelliform, smooth.

Ventral side: 3 pairs of genital, 2 pairs of anal, 3 pairs of adanal, and 1 pair of aggenital hairs. Adanal and anal hairs long. Pori *iad* removed from, and laterally of, anus.

Type-material: Holotype and 3 Paratypes in the NM, 2 Paratypes in the HNHM.

Locality: Port Elisabeth, leg. R. F. LAWRENCE.

The new species can be easily distinguished and separated by the shape of the sensillus, the notogastral hairs, and its size, from the species *P. pauliani* BALOGH, 1960, and *P. pygmeus* BALOGH, 1962 (Madagascar).

### **Longocephus** gen. n.

Fam. Otocephidae. 10 pairs of notogastral, and 3 pairs of genital hairs. Pori *iad* situated laterally and removed from anal plates. Prodorsum with lamellae. Dorsosejugal suture medially with an unpaired tubercle.

Type-species: *Longocephus australis* sp. n.

The genus contains yet another known species: *Pseudotocephus longus* BALOGH, 1960.

### **Longocephus australis** sp. n. (Figs. 29—30)

1366—1377 × 550.8—561  $\mu$ . Sensillus very short, with a short peduncle, apically fusiform, apex pointed, with very short cilia. Interlamellar hairs bacilliform, granulated. Lamellar and rostral hairs arising near each other, ciliate, arcuate. Lamellae narrow, long, parallel.

Notogaster with 10 pairs of bacilliform, rather short hairs. Dorsosejugal suture medially with a large, rounded tubercle. Notogaster with indistinct foveolae.

Type-material: Holotype in the NM.

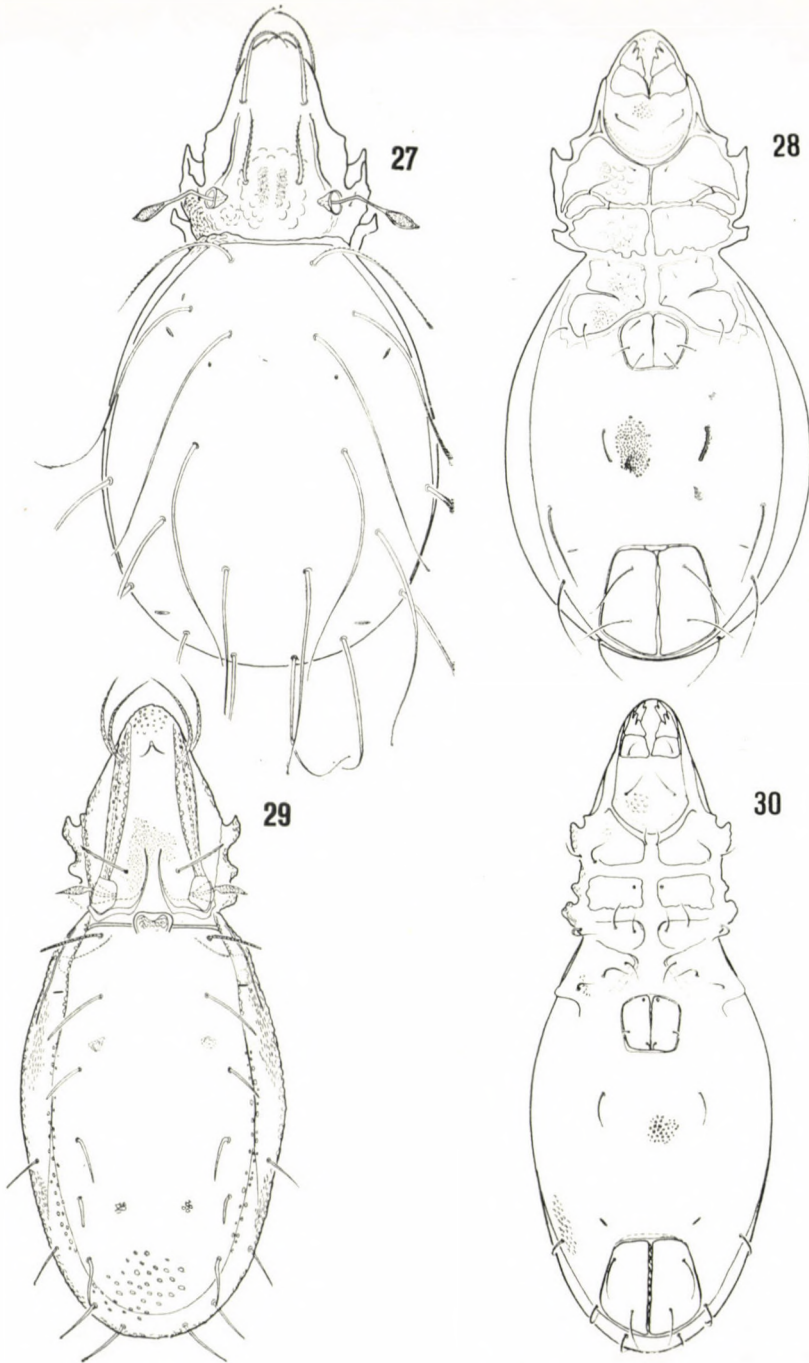
Locality: Town Bush, leg. R. F. LAWRENCE.

The new species can be separated from its other known congener, *Longocephus longus* (BALOGH, 1960), by the shape of the sensillus and the notogastral hairs.

### **Papillocephus** gen. n.

Fam. Otocephidae. 10 pairs of notogastral, and 3 pairs of genital hairs. Dorsosejugal suture without tubercles. Majority of notogastral hairs widening, papilliform. Body covered with cerotegument.

Type-species: *Papillocephus heterotrichus* sp. n.



Figs. 27—30. 27—28 = *Pseudotocepheus medius* sp. n. 27 = dorsal, 28 = ventral; 29—30 = *Longocephalus australis* sp. n. 29 = dorsal, 30 = ventral

**Papillocephus heterotrichus** sp. n. (Figs. 31–32)

715.4–720 × 352.8–357.7  $\mu$ . Sensillus short, apically incrassate, disciform. Interlamellar hairs lanceolate, ciliate, pointed. Lamellar hair rather thick, arcuate, ciliate, rostral hair setiform, arcuate. A slightly arched costula decurrent between bothrydium and base of lamellar hair; interlamellar region with two short, chitinous laths.

Notogaster with 10 pairs of hairs. Hairs *ta* minute, lanceolate, pointed, other hairs large, papilliform, apically incrassate. Notogaster covered with thick cerotegument, obscuring hairs and sculpture.

Ventral side: 3 pairs of genital, 3 pairs of adanal, 2 pairs of anal hairs. Aggenital hair not discernible. Ventral plate with large, scattered foveolae.

Type-material: Holotype in the NM.  
Locality: Umhlali, leg. R. F. LAWRENCE.

**Trichocephus** gen. n.

Fam. Otocephidae. 14 pairs of notogastral, 3 pairs of genital hairs. Prodorsum with a singular, foveolate plate.

Type-species: *Trichocephus lamellatus* sp. n.

**Trichocephus lamellatus** sp. n. (Figs. 33–34)

656.6 × 338.1  $\mu$ . Sensillus S-shaped, exclinate and proclinate, apically slightly incrassate. Interlamellar hairs extremely long, extending almost to base of lamellar hairs. Medium portion of costula occupied by 4 costulae, ornamented with irregular foveolae. Lamellar and rostral hairs originating terminally of this plate.

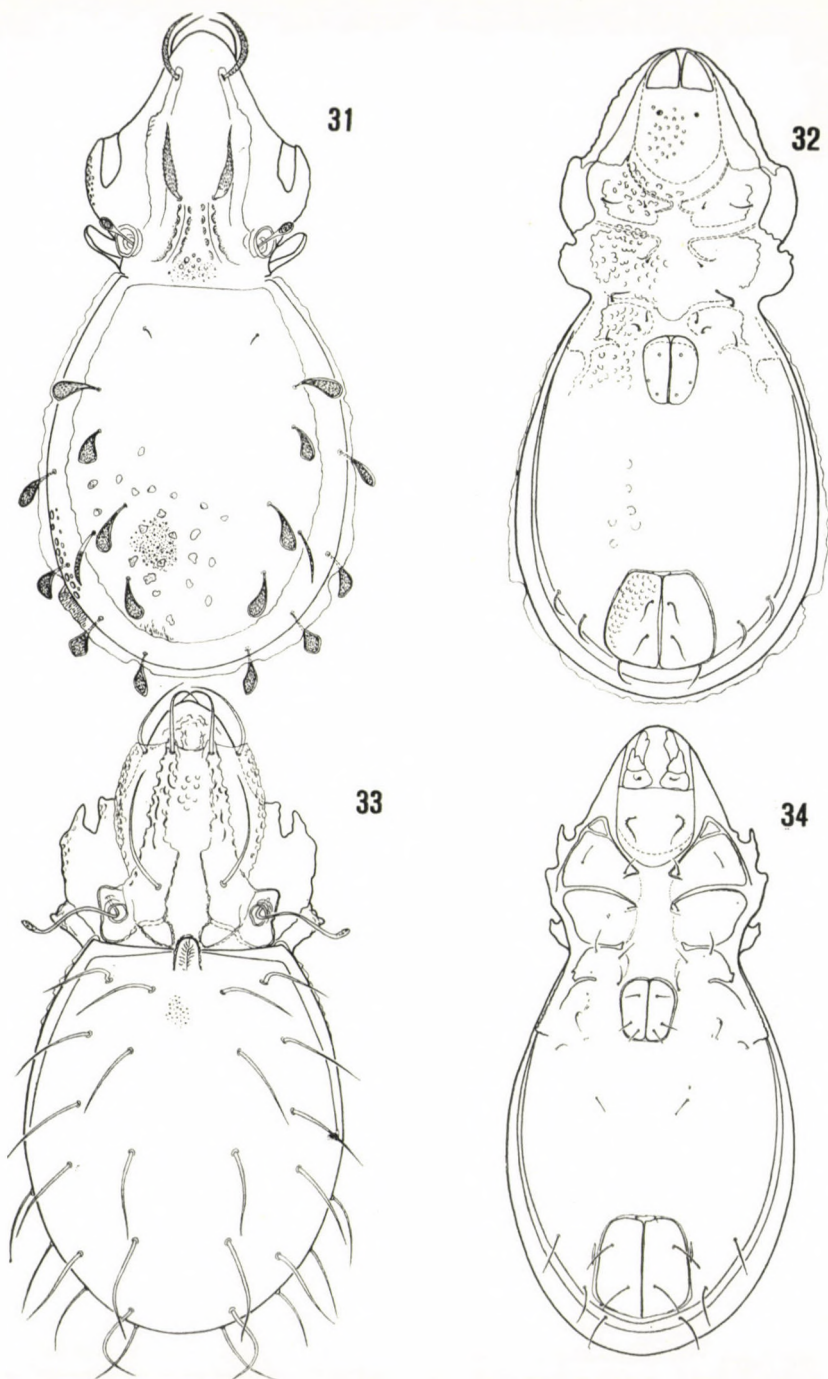
Notogaster with 14 pairs of smooth, setiform, but rather thick hairs. Dorsosejugal suture straight, medially with an unpaired, proclinate tubercle. Notogaster finely punctured.

Ventral side: 3 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Pori *iad* parallel with, and closely adjacent to, anal plate.

Type-material: Holotype and 4 Paratypes in the NM, 4 Paratypes in the HNHM.  
Locality: Town Bush, Pietermaritzburg, leg. R. F. LAWRENCE; Nkandkla Forest, Zululand, leg. R. F. LAWRENCE.

With the description of the above 4 new species and 3 new genera, the classification of the family Otocephidae is essentially altered. Also the key, given in BALOGH's work [A Synopsis of the World Oribatid (Acari) Genera, p. 36–37], is to be modified. With the insertion of the new genera, the key will run as follows:





Figs. 31–34. 31–32 = *Papillocephus heterotrichus* sp. n. 31 = dorsal, 32 = ventral; 33–34 = *Trichocephus lamellatus* sp. n. 33 = dorsal, 34 = ventral

- 1 (6) Four pairs of genital hairs.
- 2 (3) 9 pairs of notogastral hairs: hairs *ta* absent. Three tubercles on anterior margin of notogaster. — E. Afr. *Leptotocephus* BALOGH, 1961
- 3 (2) 10 pairs of notogastral hairs. Four tubercles on anterior margin of notogaster.
- 4 (5) Pedotecta 2 very large, broad. Two double tubercles on anterior margin of notogaster. — Java *Otocephus* BERLESE, 1904.
- 5 (4) Pedotecta 2 not strikingly large. Four separated tubercles on anterior margin of notogaster. — Orb. terr. *Dolicheremaeus* JACOT, 1938
- 6 (1) Three pairs of genital hairs.
- 7 (8) Notogastral hairs dilated: fusiform or papilliform. — S. Afr.  
*Papillocephus* BALOGH and MAHUNKA, 1966
- 8 (7) Notogastral hairs not dilated: bacilliform, setiform, or flagelliform.
- 9 (10) 14 pairs of notogastral hairs. — S. Afr.  
*Trichocephus* BALOGH and MAHUNKA, 1966
- 10 (9) 10 pairs of notogastral hairs.
- 11 (12) Well developed lamellae decurrent from bothrydium to rostral region. Body strongly elongated. Prodorsum with true lamellae. One median tubercle on anterior margin of notogaster. — Madagascar, S. Afr.  
*Longocephus* BALOGH and MAHUNKA, 1966
- 12 (11) At most a low, disintegrated chitinous costula decurrent between bothrydium and rostral region. Prodorsum without true lamellae. No median tubercle on anterior margin of notogaster. — Madagascar, S. Afr.  
*Pseudotocephus* BALOGH, 1961

***Pilizetes australis* sp. n. (Figs. 35–36)**

387.5–410 × 290–295  $\mu$ . Sensillus reclinate and exclinate, apically slightly incrassate, finely ciliate, apex very sharply pointed. Interlamellar hairs inclinate, not longer than lamellar hairs. Rostral hairs originating below.

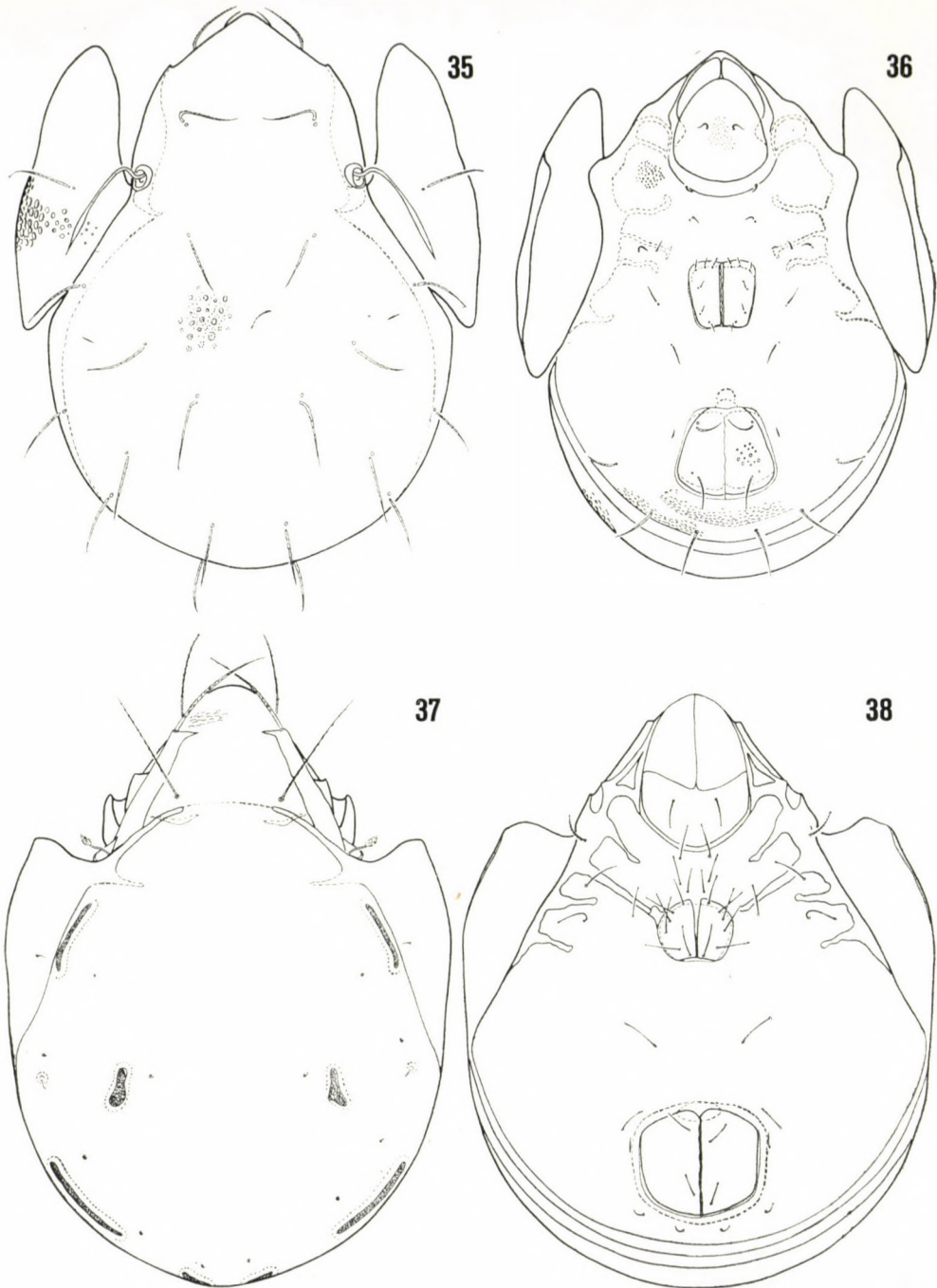
Dorsosejugal suture absent. Pteromorpha with rounded foveolae. 10 pairs of medium long notogastral hairs, all setiform, pointed, very finely serrate. Notogaster with indistinct punctation and evanescent, sparsely spaced foveolae.

Ventral side: 6 pairs of genital hairs, all minute. 1 pair of rather short aggenital, 2 pairs of medium long anal, and 3 pairs of slightly longer adanal hairs. Anal plates unevenly and sparsely, ventral plate more densely, punctate.

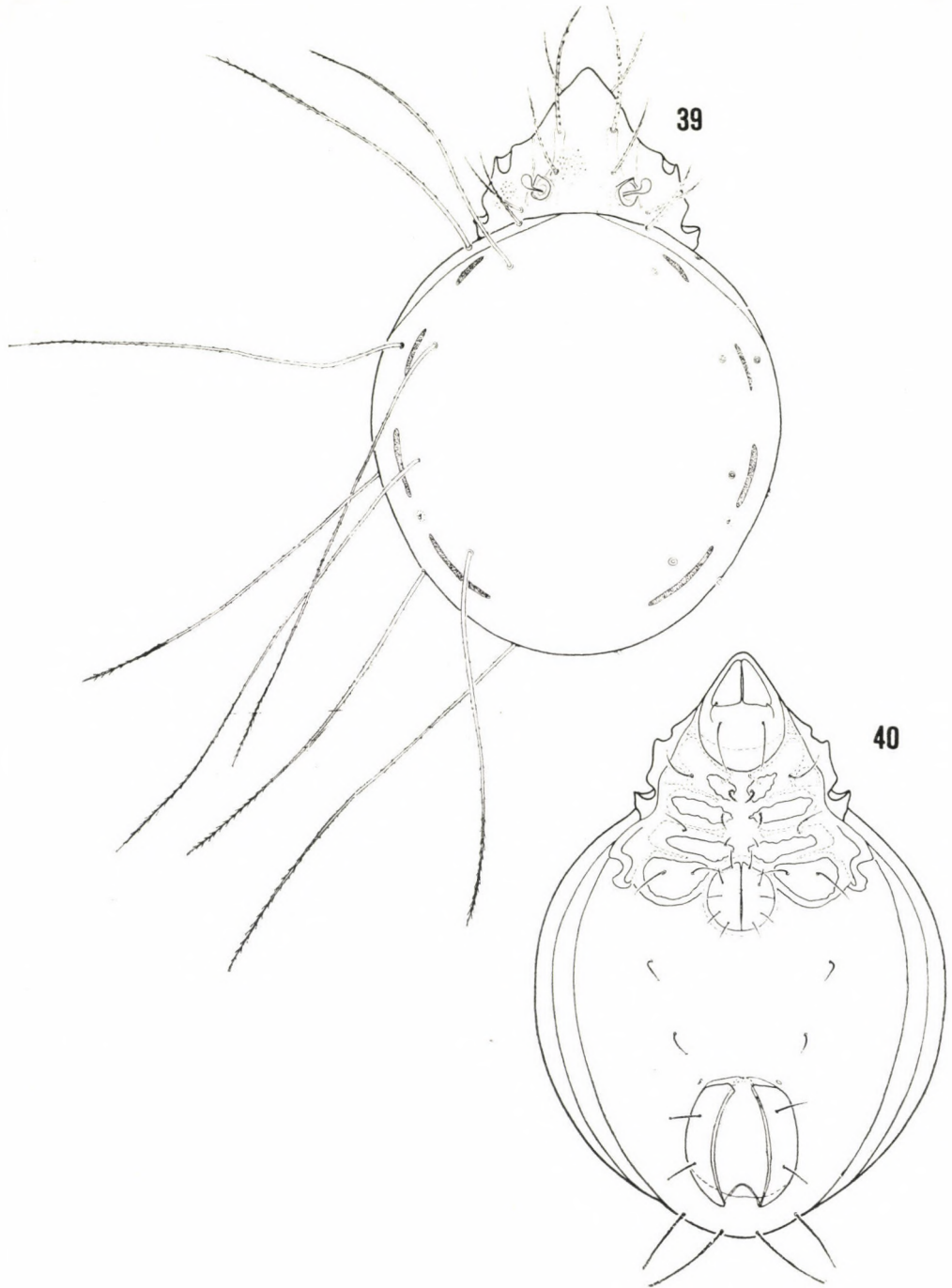
Type-material: Holotype and 3 Paratypes in the NM, 4 Paratypes in the HNHM.

Locality: Park Rynie, S. Coast, leg. R. F. LAWRENCE, Natal, leg. R. F. LAWRENCE.

The new species is similar only to *Pilizetes subglaber* BALOGH, 1962 (Tanganyika), but it also differs sharply by the shape of the sensillus and the ventral hairs, as well as the sculpture of the pteromorpha and the notogaster.



Figs. 35—38. 35—36 = *Pilizetes australis* sp. n. 35 = dorsal, 36 = ventral; 37—38 = *Terrazetes longiporosus* sp. n. 37 = dorsal, 38 = ventral



Figs. 39—40. *Capiloppia capillata* sp. n. 39 = dorsal, 40 = ventral

**Terrazetes longiporosus** sp. n. (Figs. 37—38)

867—989.4 × 714—785.4  $\mu$ . Sensillus short, apically sphaerically incrasate, slightly pointed, with very small cilia. Interlamellar hairs very thin, long, sparsely ciliate. Lamellar and rostral hairs considerably shorter, ciliate.

Dorsosejugal suture medially indistinct. Areae porosae very long, narrow, ribbon-shaped, as well as  $A_2$  and  $A_3$ , but  $A_3$  well discernible only from a posterior view: in a characteristically diverging position (Fig. 37).  $A_1$  slightly elongate.

Ventral side: 6 pairs of genital, 1 pair of aggenital, 3 pairs of adanal, 2 pairs of anal hairs. Genital, aggenital, and anal hairs rather long.

Type-material: Holotype and 12 Paratypes in the NM, 11 Paratypes in the HNHM.

Locality: Champagne Castle Hotel, Natal, leg. R. F. LAWRENCE.

The new species can be easily distinguished from *Terrazetes mauritius* JACOT, 1936 (Mauritius), by the lack of the prodorsal structure and the shape of the areae porosae.

**Capiloppia** gen. n.

Fam. Oribatulidae. 10 pairs of partly very long notogastral hairs. 4 pairs of narrow, ribbon-shaped areae porosae. Short, linear, almost parallel lamellae, without translamella. 5 pairs of genital hairs.

Type-species: *Capiloppia capillata* sp. n.

The new genus can be compared only to *Phauloppia*, but the number and length of the notogastral hairs, as well as the shape of the areae porosae and the number of the genital hairs, separate it satisfactorily.

**Capiloppia capillata** sp. n. (Figs. 39—40)

1040.4—1254.6 × 816—887.4  $\mu$ . Sensillus short, apically sphaerical. Prodorsal hairs short, ciliate. Lamellae linear, decurrent near one another, short. Prodorsum granulated.

Notogaster circular, with hardly projecting pteromorphae. 10 pairs of notogastral hairs, except for hairs *ta*, very long, as long as or longer than notogaster, ciliate. Areae porosae narrow and long, ribbon-shaped.

Ventral side: 5 pairs of radially situated, rather long, genital hairs. Of 3 pairs of adanal hairs, hairs  $ad_1$  and  $ad_2$  in a postanal position, and longer than half length of anal plate, hairs  $ad_3$  and pori *iad* in a praeanal position, hairs  $ad_3$  and *ag* considerably shorter than hairs  $ad_2$  and  $ad_3$ .

Type-material: Holotype and 5 Paratypes in the NM, 5 Paratypes in the HNHM.

Locality: Kranzhop, Natal, leg. R. F. LAWRENCE.

Authors' addresses: Prof. Dr. J. BALOGH: Budapest, VIII., Puskin u. 3, Hungary;  
Dr. S. MAHUNKA: Budapest, VIII., Baross u. 13, Hungary



THE SCIENTIFIC RESULTS  
OF THE HUNGARIAN SOIL ZOOLOGICAL  
EXPEDITION TO THE BRAZZAVILLE-CONGO

3. THE ORIBATID MITES (ACARI) OF BRAZZAVILLE-CONGO. I.

By

J. BALOGH and S. MAHUNKA

ZOOSYSTEMATICAL INSTITUTE, L. EÖTVÖS UNIVERSITY OF SCIENCES, BUDAPEST (DIRECTOR: PROF. DR. E. DUDICH) AND THE ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST (DIRECTOR: DR. Z. KASZAB)

(Received August 20, 1965)

A Hungarian zoological expedition worked in the territory of Brazzaville-Congo from October, 1963, till 21 January, 1964. Several organisations called the expedition into being. The UNESCO had actively participated in its preparation, sponsoring it both financially (in part) and authoritatively. Valuable support was given by the "Office de la Recherche Scientifique et Technique Outre-Mer", Paris and Brazzaville, by various facilities and lodgings for the HQ of the expedition in Brazzaville, by the supplementary scientific and camping equipment, as well as a car and escort during the journey. The effective work of the expedition was greatly aided also by the "Institute de Recherches pour les Huiles et Oleagineux", at its plantation sites in Sibiti, and the "Service de l'Agriculture, Station Agronomique" (in the followings SAGRO), at its settlement in Loudima. The Hungarian Academy of Sciences made available two zoologists for a period of three months, and financed their scientific equipment. The Hungarian Ministry of Culture delegated an entomologist of the Natural History Museum, to participate in the expedition.

Our present paper contains a part of the results obtained from the extraction of our collectings and samples taken from diverse agricultural soils around Loudima. There were so many new forms found in the material that we think it advisable to summarize the systematic results in a separate paper.

During our research work in Brazzaville-Congo, valuable help was received from the Brazzaville Office of the "Recherche Scientifique et Technique Outre-Mer". We have to thank, in the first place, Professor R. PAULIAN, Inspector General, for his extensive and friendly help in the organisation of our investigations. Valuable help was rendered also by the entire staff of the Institute. We should like to point out those who gave us direct and personal help in our scientific work, dedicating to them each a new taxon found in the material.

Our thanks are also due to Mrs. ÉVA KOVÁCS, who gave us valuable help both in the scientific working out of the material and the preparation of the figures.

Deposition of type-material: Holotypes and Paratypes in the Zoological Department of the Hungarian Natural History Museum, and some Paratypes in the Zoosystematical Institute of the L. Eötvös University of Sciences, Budapest.

**Brachychthonius pauliani** sp. n. (Fig. 1)

172.5 × 77.5 μ. Sensillus rather long, pointed, aciculate. Prodorsal hairs setiform, smooth, pointed. Prodorsal basis with 3 pairs of transversal areolae.

Notogastral areolae rather large, situated in median line, undivided. Hairs of posterior half of notogaster slightly widening, blade-shaped, pointed, except for hairs *e*, *f*, *h*, *ps*. All notogastral hairs smooth.

Type-material: Holotype.

Locality: Loudima, fruit plantation, 11 Dec., 1963, J. BALOGH and A. ZICSI.

The new species belongs to the species group *Brachychthonius maculatus* FORSSLUND, 1962. The new species differs from the sole African species of the complex, *B. heterotrichus* BALOGH, 1963, by the shape of the notogastral hairs, from *B. similis* HAMMER, 1961 (Peru), *B. maculatus* FORSSLUND, 1962 (Europe), and *B. semiornatus* EVANS, 1952 (Europe), also by the shape of the notogastral hairs.

**Schizozetes similis** sp. n. (Figs. 2—3)

178—187 × 96—102 μ. Rather resembling the single known species, *Sch. quadrilineatus* BALOGH, 1962 (Peru), of the genus *Schizozetes* BALOGH, 1962. Hence the two figures and a differential diagnosis sufficiently delimit the new taxon.

Lamellar cuspides with only two pointed apices. Interlamellar hairs longer. Sensillus more densely ciliate. Notogaster with 3 pairs of longitudinal lines. Anteriorly and in median line of notogaster, some longitudinal wrinkles. Part of notogastral hairs longer than others.

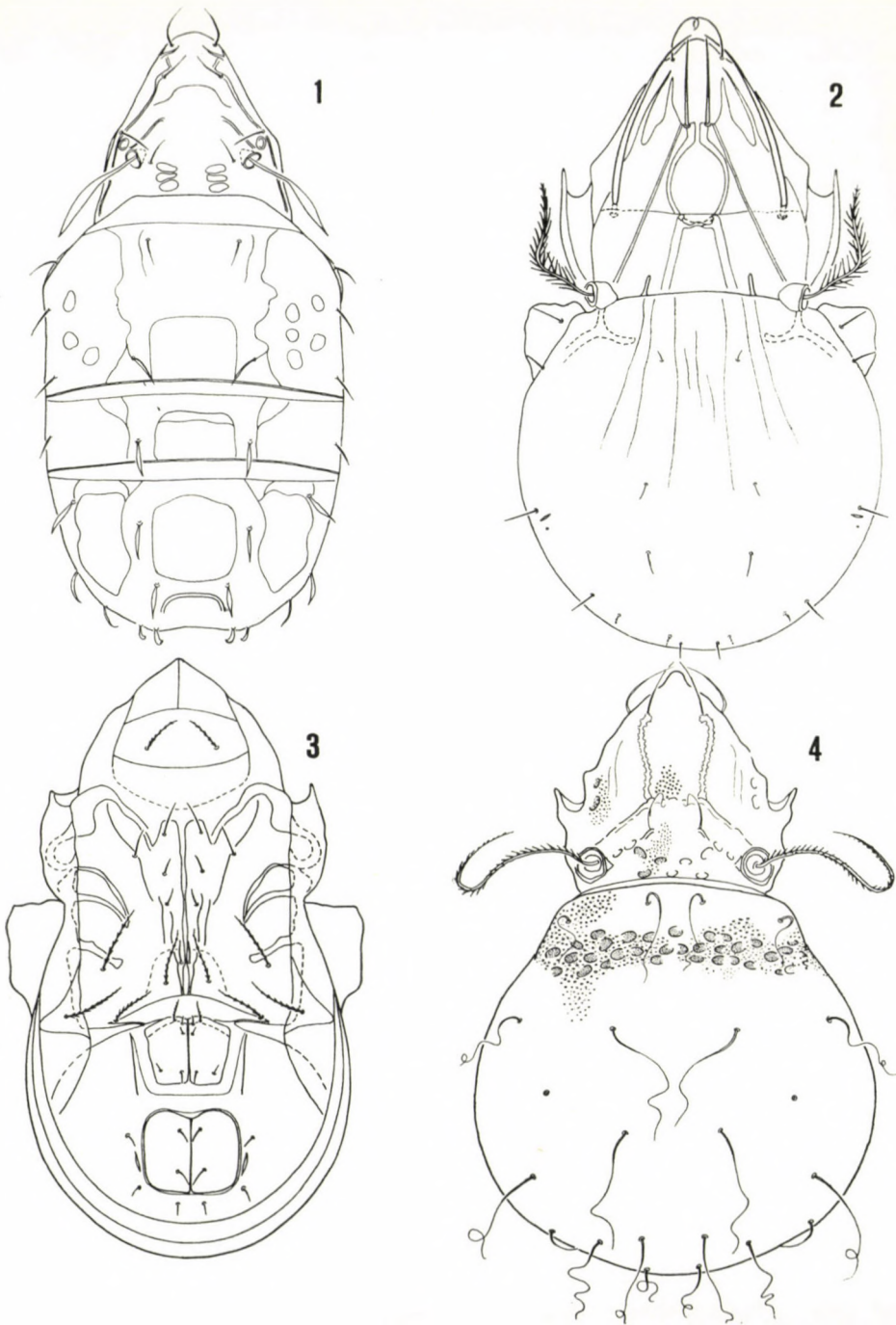
Type-material: Holotype and 9 Paratypes.

Locality: Loudima, fruit plantation, 11 Dec., 1963, J. BALOGH and A. ZICSI.

**Eremulus adami** sp. n. (Figs. 4—5)

237 × 128 μ (♂), 280—294 × 173—181 μ (♀). Sensillus of usual S-shape, with dense, short cilia. Interlamellar hairs originating removed from each other, on a small chitinous crest, throughout flagelliform. Lamellar and rostral hairs thin, not flagellate. Lamellar costulae weakly S-shaped, interlamellar area with fine granulation. Area between bothrydia with some larger areolae and granulation.





Figs. 1-4. 1 = *Brachychthonius pauliani* sp. n., dorsal; 2-3 = *Schizozetes similis* sp. n., 2 = dorsal, 3 = ventral; 4 = *Eremulus adami* sp. n., dorsal

Notogastral hairs thin, long, flagelliform; transversal hollow in front of notogaster with large, rounded areolae. Notogaster granulated.

Greater part of ventral, genital, and epimeral hairs 3–4-branched from basis, stelliform. Anal and adanal hairs simple. 6 pairs of genital hairs. Pori *iad* removed from anal plate.

Type-material: Holotype and 4 Paratypes.

Locality: Loudima, forestry, 11 Dec., 1963, J. BALOGH and A. ZICSI.

Though it is a difficult task to distinguish the *Eremulus*-species from one another, the combination of the features described above (especially the interlamellar hairs originating far from one another, the great areoles of the transversal hollow of the notogaster, and the length below 300  $\mu$ ) does not occur in any of the known species.

#### *Cultroribula humerata* sp. n. (Figs. 6–7)

242.3–247.5  $\times$  163.5–170  $\mu$ . Sensillus rather long, apically strongly dilated, apex pointed. Interlamellar hairs rather long, their apices reaching cuspidal bases when seen from above. Lamellar hairs long, basal portion thick, apical portion acicular. Lamellar cuspis originating in front of half prodorsal length, and extending almost to rostrum.

Notogaster longer than wide, with an anteriorly attenuating, well developed humeral appendage resembling horizontal pteromorpha. 10 pairs of notogastral hairs; those on humeral appendage considerably longer than others, while hairs  $p_2$  and  $p_3$  much shorter than others.

Ventral side: 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Pori *iad* situated at posterior half of anal plate. Genital and anal plates separated by a rather wide zone.

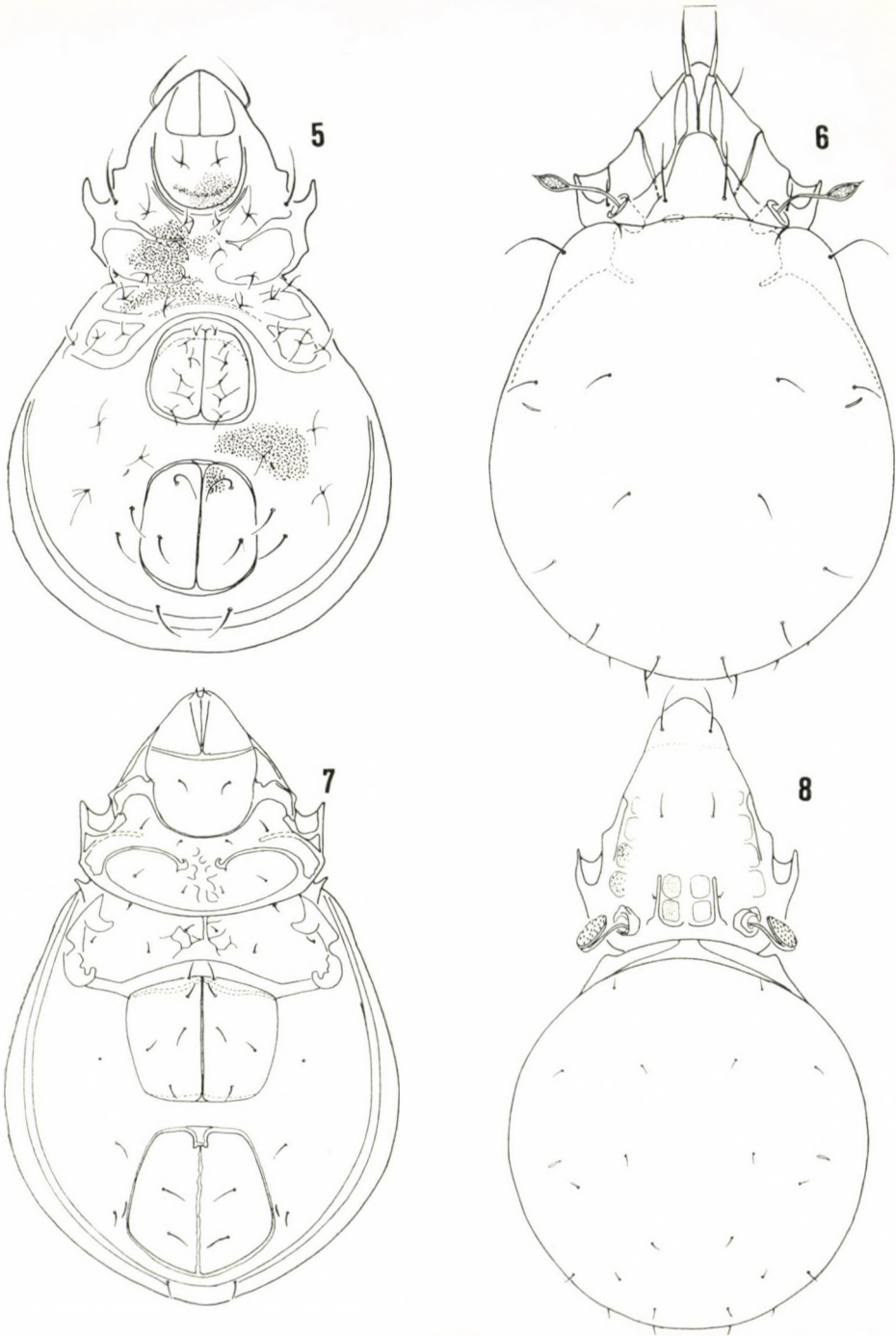
Type-material: Holotype and 1 Paratype.

Locality: near Jacob, Loudima, 7 Dec., 1963, J. BALOGH and A. ZICSI.

Although all *Cultroribula*-species described hitherto are rather similar to each other, the new species can be satisfactorily separated from them. *Cultroribula tropica* BALOGH, 1958 (Congo), has an almost round notogaster, considerably shorter notogastral hairs, and almost meeting genital and anal plates. The other known species differ in the shape of the lamellae and the notogaster, and in the length of the notogastral hairs.

#### *Oppia cohici* sp. n. (Fig. 8)

285–292  $\times$  166–175  $\mu$ . Peduncle of sensillus thin, apically rapidly incrassate, proclinate and inclinate, incrassate portion and apex with dense spinulae. Interlamellar hair extremely short, lamellar and rostral hairs longer,



Figs. 5—8. 5 = *Eremulus adami* sp. n., ventral; 6—7 = *Cultroribula humerata* sp. n., 6 = dorsal, 7 = ventral; 8 = *Oppia cohici* sp. n., dorsal

rostrum rounded. Prodorsum between bothrydia with two chitinous lines anteriorad, enclosing 2 pairs of areolae. True costulae absent.

Notogaster without chitinous crest. 11 pairs of notogastral hairs, hairs *ta* well discernible.

Ventral side: 5 pairs of genital hairs. Pori *iad* adjacent to anal plates. Base of hairs *ad*<sub>1</sub> and *ad*<sub>2</sub> bulbous, then mucronate. This feature distinguishes the new species from all known *Oppia* taxa. The combination of characters shown (the shape of the hairs *ad*<sub>1</sub> and *ad*<sub>2</sub>, the 11 pairs of notogastral hairs, the well developed hairs *ta*, the shape of the sensillus, and the absence of true costulae and a notogastral crest) also separate it from its congeners.

Type-material: Holotype and 5 Paratypes.

Locality: Loudima, forestry, 11 Dec., 1963, J. BALOGH and A. ZICSI.

### *Oppia deboissezoni* sp. n. (Figs. 9–10)

232–239 × 95–97  $\mu$ . Sensillus rather long, extending to half prodorsal length, apical half incrassately fusiform, with 9–11 cilia situated on one side, apex pointed. Interlamellar and lamellar hairs very short, fine, rostral hairs slightly longer, smooth, arising near each other. Rostrum rounded. Prodorsum without any costulae or areolae.

Notogaster long, oval, one and a half times as long as wide, without any chitinous crests. 10 pairs of notogastral hairs, all rather small. Hairs *ta* also well developed, not smaller than others.

Ventral side: 5 pairs of genital hairs. Hairs *ad*<sub>3</sub> in a preanal position, pori *iad* situated at anterior apex of anal plates, almost preanally. All ventral hairs smooth and fine.

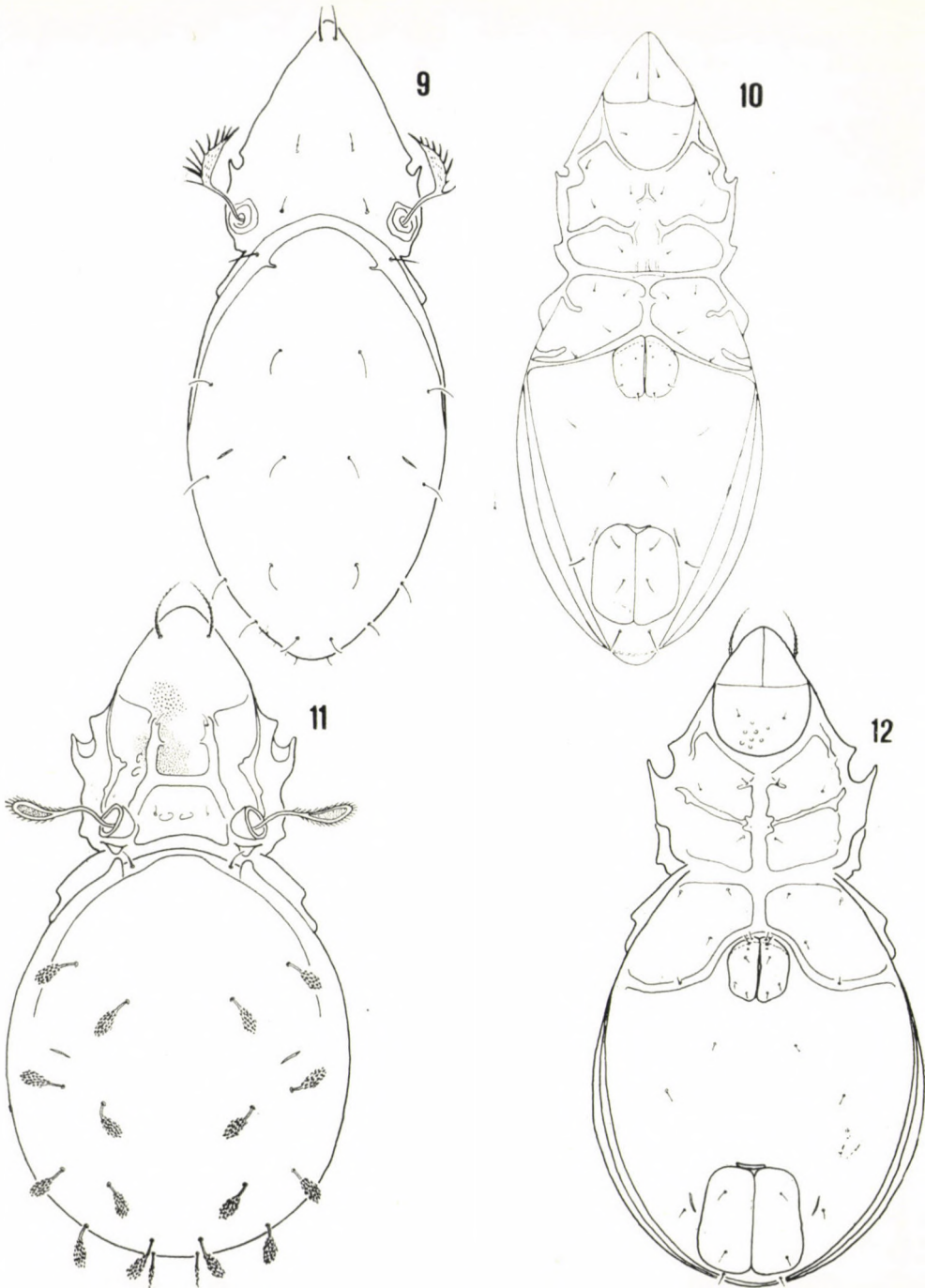
Type-material: Holotype and 4 Paratypes.

Locality: Loudima, forestry, 11 Dec., 1963, J. BALOGH and A. ZICSI.

The combination of features given above (the shape of the sensillus, the absence of costulae and areae porosae, the 10 pairs of well developed notogastral hairs) is not known to occur in any *Oppia* taxon hitherto described.

### *Stachyoppia translamellata* sp. n. (Figs. 11–12)

210–219 × 100–109  $\mu$ . Sensillus rather long, apically incrassate, densely ciliate, apex rounded. Interlamellar and lamellar hairs minute, smooth, rostral hairs long, ciliate. Decurrent from bothrydia to lamellar hairs an H-shaped costula, its transversal connective advancing anteriorly of interlamellar hairs. Prodorsum granulated. Posteriorly of bothrydium, an enantiophysis, formed by posterior tubercle of prodorsum and anterior tubercle of dorsosejugal suture.



Figs. 9–12. 9–10 = *Oppia deboiszezoni* sp. n. 9 = dorsal, 10 = ventral; 11–12 = *Stachy-  
oppia translamellata* sp. n. 11 = dorsal, 12 = ventral

Notogaster with 10 pairs of hairs. Hairs *ta* setiform, smooth, arising on dorsosejugal suture within its tubercle; other notogastral hairs dilating, densely aciculate.

Ventral side: 6 pairs of genital hairs. Hairs *ad*<sub>2</sub> situated exteriorly of pori *iad*, hairs *ad*<sub>3</sub> strongly preanally. All ventral hairs minute.

Type-material: Holotype and 1 Paratype.

Locality: Loudima, forestry, 11 Dec., 1963, J. BALOGH and A. ZICSI.

The three known *Stachyoppia* taxa can be distinguished as follows:

- 1 (2) Apex of sensillus rounded. Lamellar hair setiform, smooth. Hair *ad*<sub>1</sub> setiform, smooth. Under 200  $\mu$ . — Congo *S. translamellata* sp. n.
- 2 (1) Apex of sensillus pointed. Lamellar hair dilating, aciculate. Hair *ad*<sub>1</sub> dilating, aciculate. Above 300  $\mu$ .
- 3 (4) Hairs *in* and *ad*<sub>2</sub> setiform, smooth. Prodorsum without costulae. — Bulgaria *S. kosarovi* JELEVA, 1962
- 4 (3) Hairs *in* and *ad*<sub>2</sub> dilated, aciculate. Prodorsum with costulae — Congo *S. muscicola* BALOGH, 1961

#### *Striatoppia margaritifera* sp. n. (Figs. 13–14)

265  $\times$  132.5  $\mu$ . Sensillus proclinate and inclinate, apically strongly dilating, aciculated on external side. Interlamellar hairs setiform, minute, smooth. Lamellar hairs small, ciliate on one side. Rostral hairs slightly longer, finely ciliate. Prodorsum granulated, with costulae. Interlamellar region with 2 pairs of areolae. Apex of rostrum truncate.

Notogaster with 10 pairs of hairs. Hairs *ta* very small, arising on dorsosejugal suture, smooth, setiform. Hairs *p* slightly incrassate, apices not pointed when seen from above. Other hairs lanceolate, small, pointed. Dorsosejugal suture with 2 minute tubercles, medially with a blunt point. Notogaster with indistinct longitudinal lines, ornamented by moniliform granules. Between longitudinal lines, notogastral surface irrorated with smaller and larger granules.

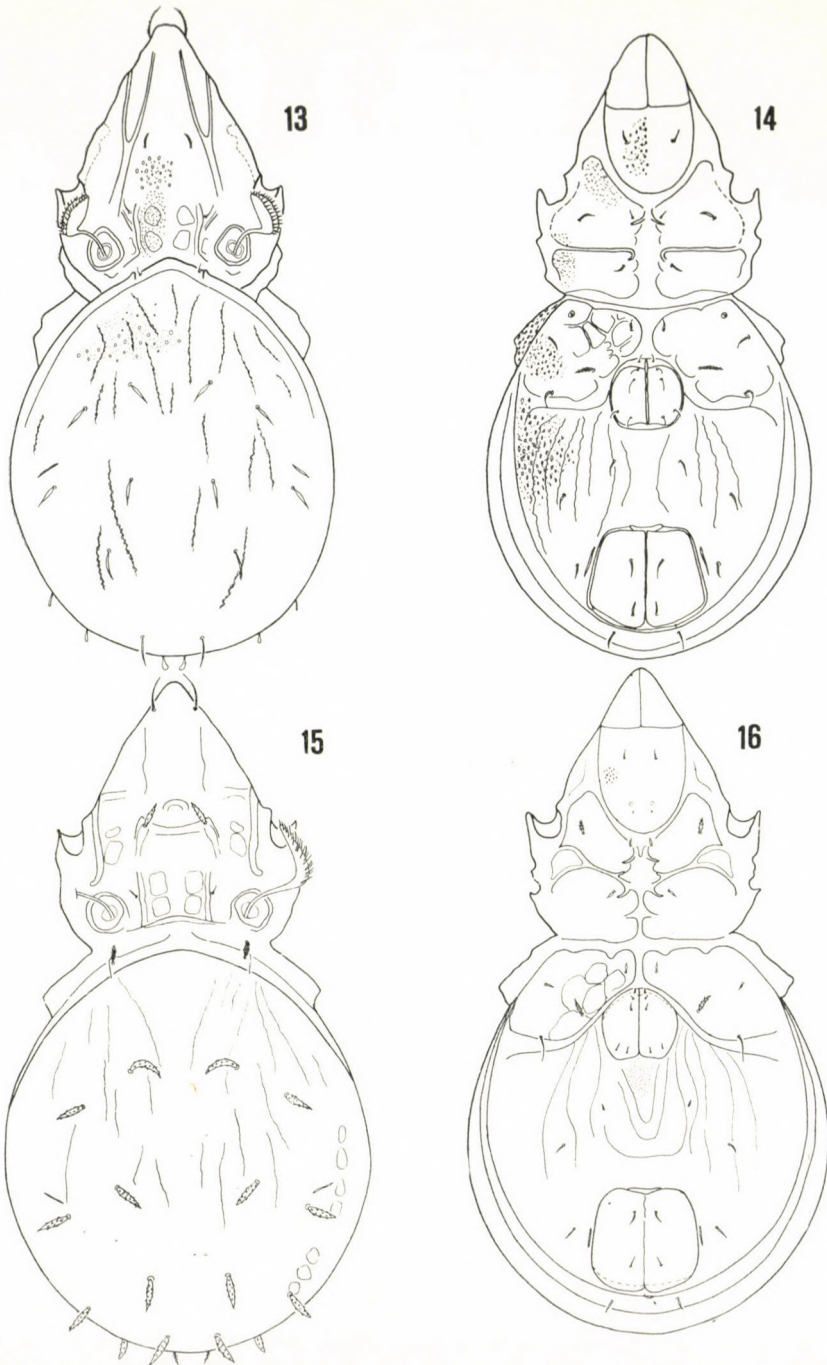
Ventral side: 5 pairs of genital hairs. Ventral hairs lanceolate except for genital hairs. Ventral surface with longitudinal lines and granules of different sizes.

Type-material: Holotype.

Locality: Loudima, forestry, 11 Dec., 1963, J. BALOGH and A. ZICSI.

#### *Striatoppia papillata* sp. n. (Figs. 15–16)

216–240  $\times$  112–128  $\mu$ . Sensillus proclinate and inclinate, pointed, densely aciculate on external side. Interlamellar hair small, setiform, smooth, lamellar hair dilating, pointed, finely ciliate. Rostral hair considerably longer,



Figs. 13–16. 13–14 = *Striatoppia margaritifera* sp. n. 13 = dorsal, 14 = ventral; 15–16 = *Striatoppia papillata* sp. n. 15 = dorsal, 16 = ventral

setiform, smooth. Prodorsum with costulae imitating lamella and translamella. Dorsosejugal suture with 2 tubercles and medially an unpaired projection.

Notogaster with 10 pairs of hairs. Hairs *ta* situated on tubercle of dorsosejugal suture, penicilliform, hair  $p_1$  thin, ciliate, other notogastral hairs incrassate to papilliform, ornamented with minute aciculi, pointed. Notogaster with longitudinal and oblique chitinous lines arising from two dorsosejugal tubercles.

Ventral side: 5 pairs of genital hairs. Hair  $ad_3$  in a preanal position. Ventral and epimeral hairs partly papillately incrassate, ciliate.

Type-material: Holotype and 19 Paratypes.

Locality: Loudima, forestry, 11 Dec., 1963, J. BALOGH and A. ZICSI.

With the above two species, the *Striatoppia* taxa known from the Ethiopian Region increased to four. The species can be distinguished as follows:

- 1 (2) Hair *ta* setiform, smooth. Longitudinal lines of notogaster with moniliform granules. — Congo **S. margaritifera** sp. n.
- 2 (1) Hair *ta* penicilliform. Longitudinal lines of notogaster without moniliform granules.
- 3 (4) Lamellar hair setiform. — Madagascar *S. madagascariensis* BALOGH, 1960
- 4 (3) Lamellar hair dilating.
- 5 (6) Hair  $p_1$  considerably thinner than others, not papilliform. Papilliform hairs without costulae. 5 pairs of genital hairs. 216–240  $\mu$  **S. papillata** sp. n.
- 6 (5) Hair  $p_1$  like other notogastral hairs. Papilliform hairs with longitudinal costulae. 4 pairs of genital hairs. 280  $\mu$ . *S. machadoi* BALOGH, 1958

#### **Suctobelba horrida** sp. n. (Figs. 17–18)

148–157  $\times$  82–90  $\mu$ . Sensillus comparatively short, inclinate and proclinate, apically incrassate, pointed, smooth. Interlamellar hairs minute, rostral hair corresponding to *Suctobelba*-type.

Notogaster anteriorly with 4 longitudinal crests, uniting in front in a hamate appendage each. 10 pairs of notogastral hairs, first 6 pairs considerably longer than posterior 4 pairs.

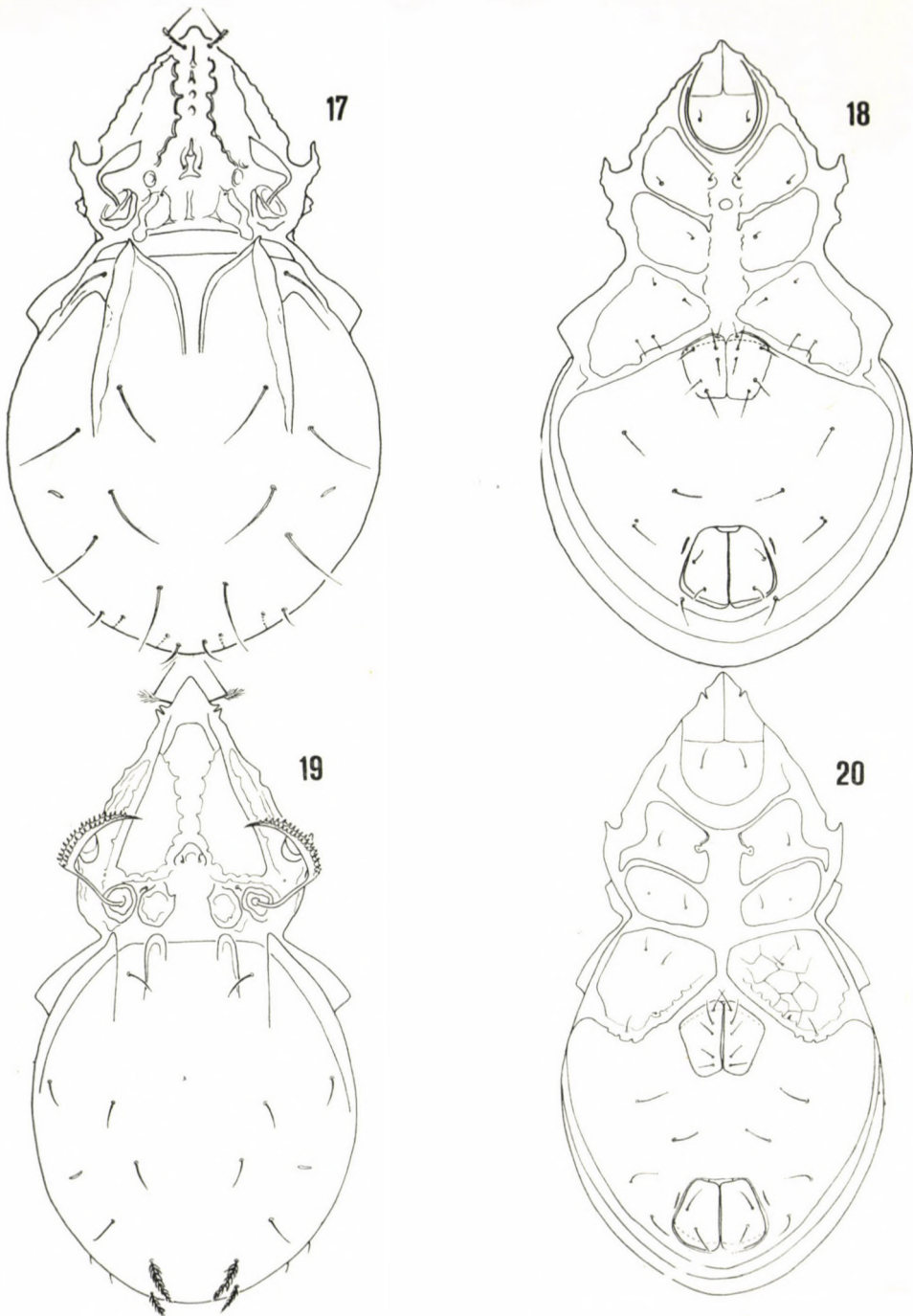
Ventral side: 5 pairs of genital hairs. Ventral hairs setiform, smooth, rather small, hair  $ad_3$  in a preanal position.

Type-material: Holotype and 11 Paratypes.

Locality: Loudima, forestry, 11 Dec., 1963, J. BALOGH and A. ZICSI.

The new species belongs to the alliance of *Suctobelba mirabilis* BALOGH, 1958, and *Suctobelba hamifera* BALOGH, 1958, but it differs from both, and from





Figs. 17—20. 17—18 = *Suctobelba horrida* sp. n. 17 = dorsal, 18 = ventral; 19—20 = *Suctobelba penicillata* sp. n. 19 = dorsal, 20 = ventral

the related taxa described from South America, by the shape of the sensillus and the notogastral chitinous crests.

*Suctobelba penicillata* sp. n. (Figs. 19—20)

187.5—195 × 65—94  $\mu$ . Sensillus long, inclinate and proclinate, extremely pointed, with serrate aciculi in two rows. Interlamellar and lamellar hairs very small, smooth. Rostral hair of *Suctobelba*-type, geniculate. Rostrum pointed, with 2 pointed teeth on both sides.

Notogaster: dorsosejugal suture with usual 2 pairs of tubercles. Outer tubercles pointed, inner ones bluntly rounded. 9 pairs of discernible notogastral hairs; hairs  $p_1$  and  $r_1$  plumate. This feature distinguishes the new species from all known *Suctobelba* taxa.

Type-material: Holotype.

Locality: Around Jacob, Loudima, 7 Dec., 1963, J. BALOGH and A. ZICSI.

*Eremella induta* BERLESE, 1913 (Figs. 21—22)

It seems quite probable that this species is identical with the one described by BERLESE from Java, and of which he also published a good figure. We submit below another drawing and some supplementary diagnostic features.

248 × 140  $\mu$ . Structure of prodorsum and notogaster agreeing with BERLESE's figure, but BERLESE failed to observe the three  $p$  hairs.

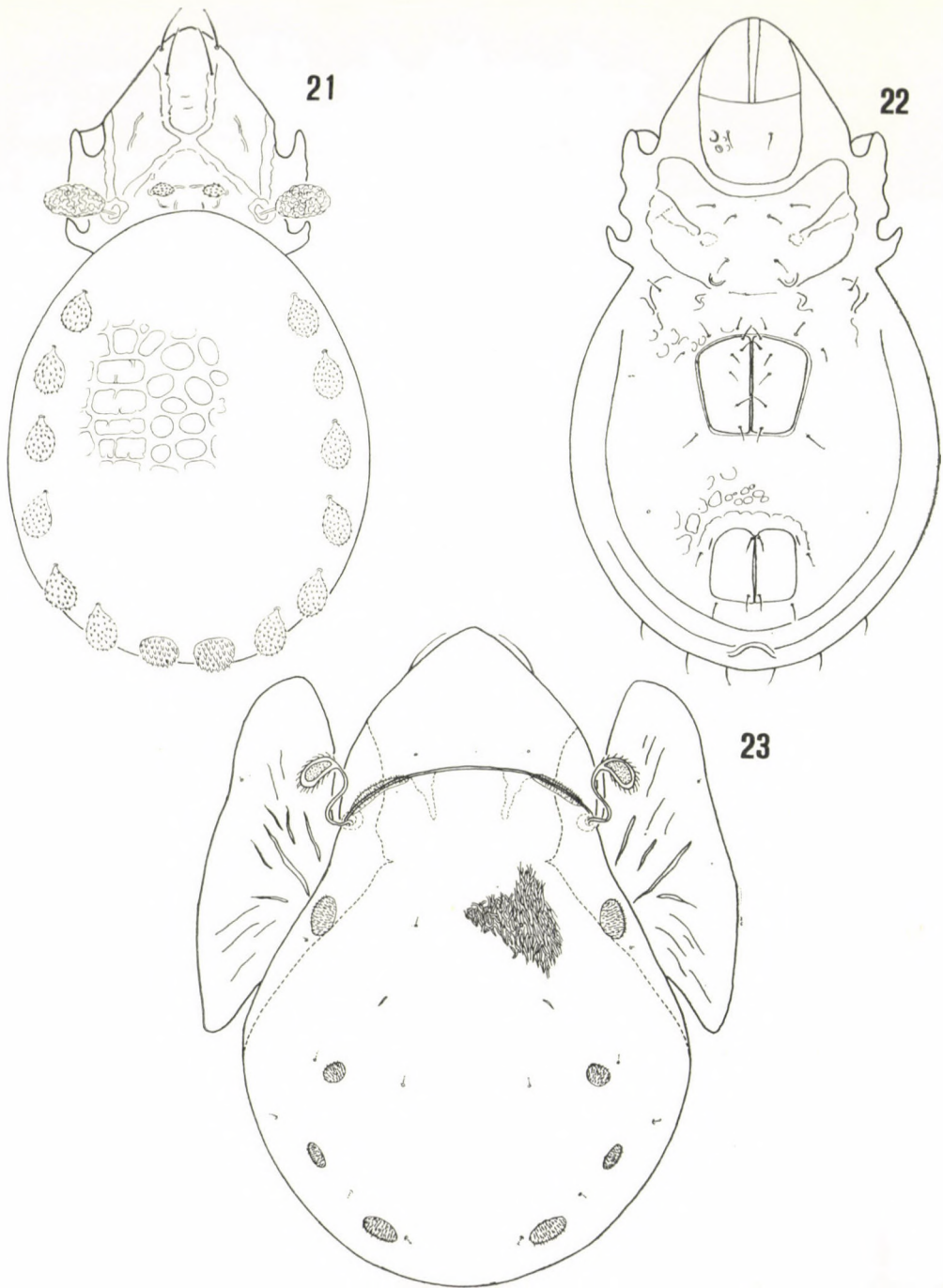
Main features of ventral side: 6 pairs of genital, 1 pair of aggenital, 3 pairs of adanal, 2 pairs of anal hairs. Hair  $ad_3$  in a preanal and extremely lateral position. Hairs  $ag$  arising in a line almost common with posterior margin of genital plate. All ventral hairs short, smooth. Ventral plate with sculpture similar to that of notogaster. Distance between genital and anal plates as long as length of genital plate.

Locality: Loudima, forestry, 11 Dec., 1963, J. BALOGH and A. ZICSI.

*Galumna scripta* sp. n. (Fig. 23)

345—377 × 235—262  $\mu$ . Sensillus bent in S-shape, apically incrassate and rounded, covered with minute hairs. Interlamellar and lamellar hairs reduced, represented only by alveoli; rostral hair rather long.

Dorsosejugal suture sharp, areae porosae dorsosejugales long, ribbon-shaped when viewed from above. Areae porosae  $Aa$ ,  $A_1$ ,  $A_2$ , and  $A_3$  rather large, oval, or nearly circular. Notogaster ornamented with fine, short, longitudinal lines.



Figs. 21—23. 21—22 = *Eremella induta* BERLESE, 1913, 21 = dorsal, 22 = ventral; 23 = *Galumna scripta* sp. n., dorsal

Ventral side: area porosa postanal is not discernible. Ventral plate with short, longitudinal lines, especially between genital and anal plates. All ventral hairs extremely short.

Type-material: Holotype and 40 Paratypes.

Locality: Loudima, SAGRO, 5 Dec., 1963, J. BALOGH and A. ZICSI.

The new species can be easily separated, from all recognizably described *Galumna*-species, by the absence of the interlamellar and lamellar hairs, the shape of the sensillus, the size of the areae porosae dorsosejugales, the absence of the area porosa postanal, and the linear sculpture of the body.

### **Heteroleius** gen. n.

Fam. Oribatulidae. 12 pairs of notogastral hairs, 3 pairs of genital hairs. Notogaster with 4 pairs of sacculi. Leg 3-dactylous.

Type-species: *Heteroleius longissimus* sp. n.

The 3 pairs of genital and 12 pairs of notogastral hairs, the 4 pairs of sacculi, and the very weakly developed horizontal pteromorphae cannot, as a combination of features, be found in any of the hitherto known Oribatulid genera. By reason of these characters, the species, respectively genus, described above stand further from the allied Oribatulid genera than these latter from each other. We deemed it justified therefore to establish the new genus even on the basis of the single Holotype specimen.

### **Heteroleius longissimus** sp. n. (Figs. 24—25)

297 × 150  $\mu$ . Sensillus extremely short, peduncle thin, terminally disciform, incrassate; when seen frontally and slightly laterally, rounded and smooth. Interlamellar hairs medium long, smooth, lamellar and rostral hairs finely ciliate. Rostrum rounded. Lamellae narrow, almost linear.

Dorsosejugal suture flatly arcuate. Notogaster one and a half times as long as wide, attenuating anteriorad, widest in posterior third. Horizontal pteromorphae extremely narrow, extending far posteriorad. Pori *im* rather large.

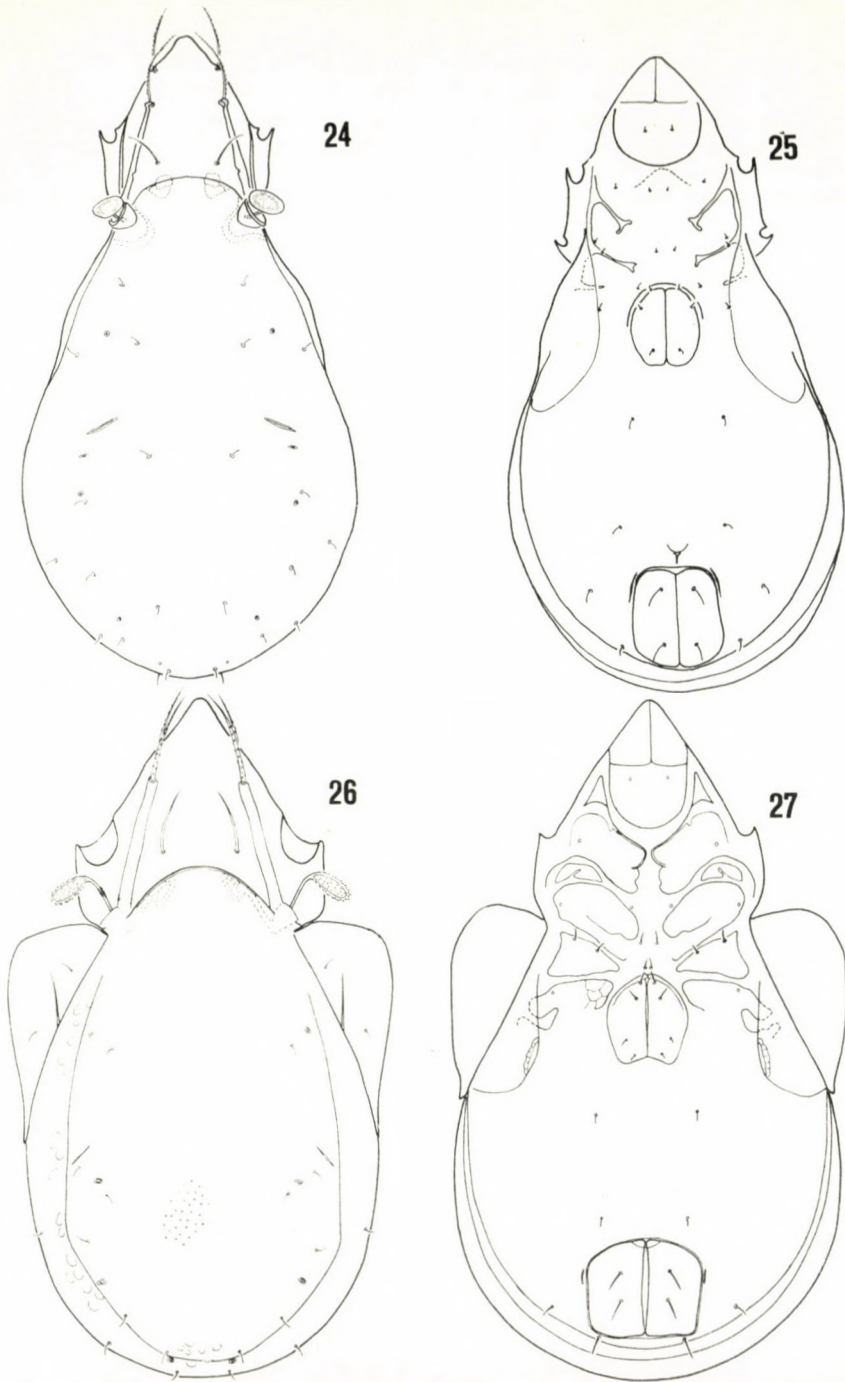
Ventral side: 3 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Hairs *ad*<sub>3</sub> in a preanal position. All ventral hairs minute, smooth.

Type-material: Holotype.

Locality: Loudima, forestry, 11 Dec., 1963, J. BALOGH and A. ZICSI.

### **Haplozetes** (?) **insignis** sp. n. (Figs. 26—27)

306.2—331.2 × 162.5—181.2  $\mu$ . Sensillus exclinate and reclinate, apically dilating, apex rounded. Interlamellar hairs smooth, apically extending to base of lamellar hairs. Lamellar and rostral hairs projecting beyond rostrum,



Figs. 24—27. 24—25 = *Heteroleius longissimus* sp. n. 24 = dorsal, 25 = ventral; 26—27 = *Haplozetes (?) insignis* sp. n. 26 = dorsal, 27 = ventral

with extremely small and dispersed aciculi. Rostrum rounded. Lamellae narrow, not marginal.

Dorsosejugal suture arcuate anteriorad. 11 pairs of notogastral hairs. Pteromorphae movable. 4 pairs of sacculi.

Ventral side: 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Hairs  $ag_3$  in a preanal position. All ventral hairs minute, smooth. Ventral plate smooth.

Type-material: Holotype and 2 Paratypes.

Locality: Loudima, forestry, 11 Dec., 1963, J. BALOGH and A. ZICSI.

The species is rather problematic. By its habits, the 4 pairs of sacculi the shape of the lamella, and the 4 pairs of genital hairs, it might be considered as a *Scheloribates* taxon, but, due to the movable pteromorphae, we were under the necessity of relegating it to the genus *Haplozetes*, though apparently unrelated to it.

Authors' addresses: Prof. Dr. J. BALOGH: Budapest, VIII., Puskin u. 3, Hungary;  
Dr. S. MAHUNKA: Budapest, VIII., Baross u. 13, Hungary

# CHIRONOMIDENLARVEN AUS DEM AUFWUCHS DER SCHWIMMKÖRPER IM DONAUABSCHNITT ZWISCHEN RAJKA UND BUDAPEST

(DANUBIALIA HUNGARICA XXXIX)

Von

Á. BER CZIK

INSTITUT FÜR TIERSYSTEMATIK DER L. EÖTVÖS-UNIVERSITÄT, BUDAPEST  
(DIREKTOR: PROF. DR. E. DUDICH)

(Eingegangen am 15. September 1965)

Im Laufe der systematischen biologischen Erforschung des ungarischen Donauabschnittes sammelten wir unter anderen auch den Aufwuchs der festen Schwimmkörper (insbesondere der Anlegepontons) dem ganzen Hauptstrom entlang ein. Vom algologischen Gesichtspunkt aus wurde der größte Teil des Materials (Nagymaros-Mohács, Strom-km 1695—1448) bereits bearbeitet (15, 16, 17). Zu zoologischen Untersuchungen standen uns von den 45 annähernd gleichmäßig verteilten Punkten des 417 km langen Donauabschnittes insgesamt 77 Proben zur Verfügung. Das Nematodenmaterial des 200 km langen Donauabschnittes zwischen Budapest und Mohács bearbeitete I. ANDRÁSSY (1), während ich selbst von demselben Abschnitt eine Beschreibung der Chironomiden gab (5). In der vorliegenden Abhandlung bearbeite ich die Chironomidenlarven aus den Periphyton-Proben des ungarischen Donauabschnittes oberhalb von Budapest.

Obwohl aus dem Fachschrifttum viele periphytonbewohnende Chironomidenlarven bekannt sind, wurde bisher noch von keinem Fluß eine auf systematischer Aufsammlung fußende Bearbeitung ähnlichen Charakters publiziert.

## Charakterisierung des Untersuchungsgebietes und der Sammelstellen

Der untersuchte Flußabschnitt gliedert sich hydrologisch, morphologisch in drei Teile (Abb. 1). Der erste ist der Abschnitt zwischen Rajka und Gönyü (Sammelstellen 1—6; Strom-km 1848—1791), die sog. »ungarische obere Donau«. Der Fluß hat hier ein durchschnittliches Gefälle von  $0,30\text{‰}$ , die Fließgeschwindigkeit beträgt bei Niederwasser 1,8—2,1 m/sec (bei Hochwasser über 3,0 m/sec!). Die Verunreinigung des Wassers ist hier geringer als in den folgenden Stromabschnitten. Den biologischen Charakter und Zustand des

Flusses beeinflussen mehrere Stromarme und tote Flußarme der Kleinen und Großen Schüttinsel in erheblichem Maße. — Für den zweiten, zwischen Gönyü und Visegrád gelegenen Teil (Sammelstellen 7—13; Strom-km 1791—1693) ist — wie in den übrigen ungarischen Donauabschnitten — ein wesentlich geringeres Gefälle ( $0,06^{0/00}$ ) und bei Niederwasser eine Fließgeschwindigkeit von 1,0—1,2 m/sec (bei Hochwasser 2,0—2,5 m/sec) charakteristisch. Das Ausmaß der Verunreinigung ist im allgemeinen größer, stellenweise gerade in den ufernahen Stromlinien, wo die von Periphyton belegten Biotope empfindlich berührt sind. In diesem Teil empfängt die Donau die Kleine Donau,

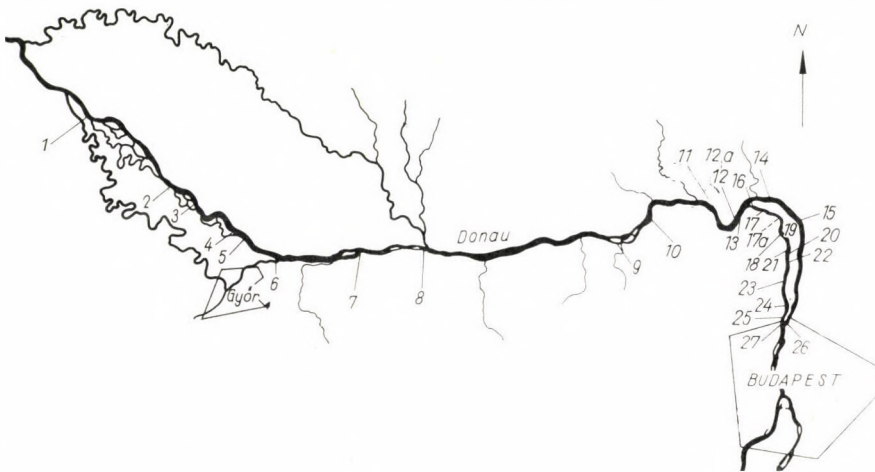


Abb. 1. — 1 = Rajka, Strom-km 1848; 2 = Dunaremete, Strom-km 1824; 3 = Ásványráró, Strom-km 1816; 4 = Strom-km 1810; 5 = Medve, Brücke, Strom-km 1806; 6 = Strom-km 1796; 7 = Lovadi-Berg, Strom-km 1784; 8 = Komárom, Strom-km 1768; 9 = Tát, Strom-km 1728; 10 = Esztergom, Strom-km 1719; 11 = Zebegény, Strom-km 1703; 12 = Nagymaros, Strom-km 1694,6; 12a = Strom-km 1694,6; 13 = Visegrád, Strom-km 1693,4; 14 = Nógrád-vertece, Strom-km 1687; 15 = Vác, Strom-km 1679,5; 16 = Kisoroszi, Donauarm von Szentendre, Strom-km 29; 17 = Dunabogdány, Strom-km (Sz.) 27; 17a = Dunabogdány, Strom-km (Sz.) 24; 18 = Tahí, Strom-km (Sz.) 20; 19 = Tahitótfalu, Strom-km (Sz.) 19,5; 20 = Pócsmegyer, Strom-km (Sz.) 15,6; 21 = Leányfalu, Strom-km (Sz.) 15,5; 22 = Szigetmonostor, Strom-km (Sz.) 13; 23 = Szentendre, Strom-km (Sz.) 10; 24 = Lupa-Insel, Strom-km (Sz.) 3,5; 25 = Pünkösdfürdő, Strom-km (Sz.) 1; 26 = Budapest: Újpest-Megyér, Strom-km 1657,3; 27 = Budapest: Rómaifürdő, Strom-km 1655,8. — Anmerkung: Die Zahlen in der Abbildung sind auf der Uferseite der Probeentnahme (rechtes Ufer — linkes Ufer) eingezeichnet

die Nebenflüsse Waag, Gran und Eipel, die ihr zwar wenig Wasser zuführen, jedoch sowohl in biologischer Hinsicht als auch im Grad der Verunreinigung sehr verschieden sind. Hydrologisch betrachtet, trägt das Ende dieses Donauabschnittes, das kaum 8 km lange Donauknie, in gewissem Grade fremden Charakter. Im engen Tal nimmt die Fließgeschwindigkeit des eingeeengten Stromes vorübergehend zu, wodurch die Verhältnisse für das Periphyton (Sammelstelle 13!) eine wesentliche Veränderung erfahren. Besonders stark



zeigt sich diese Wirkung dort, wo auch die Strömungslinie nahe am Ufer verläuft. — Der dritte Teil des erörterten Donauabschnittes zwischen Visegrád und Budapest, bei der Insel von Szentendre (Sammelstellen 14—27; Strom-km 1691—1656) gleicht hinsichtlich der Gefälleverhältnisse und der Fließgeschwindigkeit weitgehend dem zweiten Teil. Er umfaßt die einzige mit dem Hauptstrom an beiden Enden offen verbundene Verzweigung des ungarischen Donauabschnittes, den Donauarm von Szentendre. Dieser 31 km lange Arm ist etwa halb so breit, wie der mit ihm im großen und ganzen parallel verlaufende Hauptstrom, der sog. Vácer Donauarm. Da sich der inländische Personenschiffsverkehr hauptsächlich auf dem Donauarm von Szentendre abwickelt, konnten wir Periphyton-Proben auf dieser Strecke in erster Linie an den dortigen Anlegepontons sammeln. Der Verunreinigungsgrad gleicht im allgemeinen dem des zweiten Teiles, nimmt aber ständig zu. Nebenflüsse gibt es in diesem Abschnitt nicht.

Hinsichtlich des Charakters der einzelnen Sammelstellen sei bemerkt, daß sich unter ihnen 18 Anlegepontons (Sammelstellen 5, 10, 12—27) befanden. Bei den übrigen 11 handelte es sich um Bojen, an einer Stelle um stagnierende Holzstücke am Wasser usw. Mit Ausnahme an der Sammelstelle 6 schwammen sämtliche untersuchten Substrate bei jedem Wasserstand auf dem Wasserspiegel, waren also von der unmittelbaren Wirkung der Wasserstandschwankung unabhängig. Die Pontons der Schiffanlegestellen (Sammelstellen 10, 12—17) werden für die Zeit vom 15. November bis 15. März von den Anlegeplätzen in den Winterhafen geschleppt, jedoch nur für eventuelle Ausbesserungsarbeiten aus dem Wasser gehoben. Das Schicksal der weiteren Substrate gestaltet sich im Laufe des Jahres verschieden, während der Vegetationszeit finden sie sich jedoch — fast zur gleichen Zeit mit den Anlegepontons — unbedingt auf den zur Untersuchung herangezogenen Sammelstellen unter Verhältnissen, die der Periphytonbildung entsprechen.

Die Daten über die Hauptmasse des untersuchten Periphytongebildes (zum Teil auf Grund der Angaben von G. SZEMES und G. TAMÁS) sowie über die Art des Substrats sind folgende:

1. Rajka, Anlegeponton für Boote. Strom-km 1848. — Überzug: schwach entwickelte *Cladophora*. — Substrat: Eisen.
2. Dunaremete, ein ständig auf dem Wasser schwimmender morscher Baumast. Strom-km 1824. — Überzug: dünner Algenbelag. — Substrat: Holz.
3. Ásványráró, mit pflanzlichem Detritus bedeckter, auf dem Wasser schwimmender Ast. Strom-km 1816. — Überzug: dünner Algenbelag mit viel Detritus. — Substrat: Holz.
4. Ständig auf dem Wasser schwimmender, morscher Ast. Strom-km 1810. — Überzug: dünner Algenbelag. — Substrat: Holz.
5. Brücke bei Medve, in einer kleineren Bucht stagnierendes Algengewebe. Strom-km 1806. — Überzug: *Cladophora*. — Substrat: Algengewebe.
6. Wrack eines Schleppers in Ufernähe. Strom-km 1796. — Überzug: schwach entwickelte *Cladophora*. — Substrat: Eisen.
7. Lovadi-Berg, auf dem Wasser schwimmende, abgestorbene Weidenäste. Strom-km 1784. — Überzug: dünner Algenbelag. — Substrat: Holz.

8. Komárom, Wand eines ausschließlich im örtlichen Verkehr gebrauchten Motorschiffes. Strom-km 1768. — **Ü berzug**: dünner *Cladophoren*belag. — **S ubstrat**: Eisen.
9. Tát, auf dem Wasser schwimmende abgestorbene Äste. Strom-km 1728. — **Ü berzug**: Unbestimmtes Algenewebe. — **S ubstrat**: Holz.
10. Esztergom, Schiffsstation. Strom-km 1719. — **Ü berzug**: unbestimmtes Algenewebe, zum Teil *Cladophora*. — **S ubstrat**: Eisen.
11. Zebegény, auf dem Wasser schwimmende abgerissene Teile submerser Pflanzen, in einer kleinen Bucht stagnierend. Strom-km 1703. — **Ü berzug**: findet sich nicht. — **S ubstrat**: pflanzlicher Detritus.
12. Nagymaros, Schiffsstation. Strom-km 1694,6. — **Ü berzug**: *Cladophora*, *Oscillatoria*, *Lyngbya*. — **S ubstrat**: Eisen.
- 12a. 24 Stunden vor der Probeentnahme ans Ufer geschleppte Boje. Strom-km 1694,6. — **Ü berzug**: vorwiegend *Cladophorengewebe*. — **S ubstrat**: Eisen.
13. Visegrád, Schiffsstation. Strom-km 1693,4. — **Ü berzug**: *Cladophora*, *Oscillatoria*, *Lyngbya*. — **S ubstrat**: Eisen.
14. Nógrádverőce, Schiffsstation. Strom-km 1687. — **Ü berzug**: *Cladophora*, *Leptothrix ochracea*, *Sphaerotilus natans*. — **S ubstrat**: Eisen.
15. Vác, Schiffsstation. Strom-km 1679,5. — **Ü berzug**: *Cladophora glomerata*, *Cladophora fracta*, *Oscillatoria*, *Lyngbya*. — **S ubstrat**: Eisen.
16. Kisoroszi, Schiffsstation. Donauarm von Szentendre, Strom-km 29. — **Ü berzug**: *Fontinalis antipyretica* (det. DR. Á. BOROS), *Chamaesiphon incrustans* und *Cladophora* in geringer Menge. — **S ubstrat**: Eisen.
17. Dunabogdány, Schiffsstation. Donauarm von Szentendre, Strom-km 27. — **Ü berzug**: *Cladophora* mit Diatomea-Flecken. — **S ubstrat**: Eisen.
- 17a. Dunabogdány, auf der Wasserfläche stagnierender Ast. Donauarm von Szentendre, Strom-km 24. — **Ü berzug**: unbestimmtes Algenewebe. — **S ubstrat**: Holz.
18. Tahi, Schiffsstation. Donauarm von Szentendre, Strom-km 20. — **Ü berzug**: *Cladophora*. — **S ubstrat**: Eisen.
19. Tahitótfalu, Schiffsstation. Donauarm von Szentendre, Strom-km 19,5. — **Ü berzug**: *Cladophora*, *Lyngbya*. — **S ubstrat**: Eisen.
20. Pócsmegyer, Schiffsstation. Donauarm von Szentendre, Strom-km 15,6. — **Ü berzug**: *Cladophora glomerata*, *Cladophora fracta*. — **S ubstrat**: Eisen.
21. Leányfalu, Schiffsstation. Donauarm von Szentendre, Strom-km 15,5. — **Ü berzug**: *Cladophora*. — **S ubstrat**: Eisen.
22. Szigetmonostor, Schiffsstation. Donauarm von Szentendre, Strom-km 13. — **Ü berzug**: *Cladophora*, *Bangia atropurpurea*, Bacillariophyceae — **S ubstrat**: Eisen.
23. Szentendre, Schiffsstation. Donauarm von Szentendre, Strom-km 10. — **Ü berzug**: *Cladophora glomerata*, *Bangia atropurpurea*. — **S ubstrat**: Eisen.
24. Lupa-Insel, Schiffsstation. Donauarm von Szentendre, Strom-km 3,5. — **Ü berzug**: *Cladophora glomerata*, *Cladophora fracta*. — **S ubstrat**: Eisen.
25. Pünkösdfürdő, Schiffsstation. Donauarm von Szentendre, Strom-km 1. — **Ü berzug**: *Eurhynchium rusciforme* (det. DR. Á. BOROS), *Cladophora*, *Chamaesiphon incrustans*, *Bangia atropurpurea*, Bacillariophyceae. — **S ubstrat**: Eisen.
26. Budapest: Schiffsstation Újpest-Megyer. Strom-km 1657,3. — **Ü berzug**: *Cladophora glomerata*, *Cladophora fracta*, *Cladothrix dichotoma*. — **S ubstrat**: Eisen.
27. Budapest: Schiffsstation Rómaifürdő. Strom-km 1655,8. — **Ü berzug**: *Cladophora*, *Leptothrix ochracea*, *Beggiatoa alba*. — **S ubstrat**: Eisen.

**Art und Zeitpunkt der Probeentnahmen.** Die Probeentnahme geschah ebenso, wie in meiner früheren Arbeit (5, S. 227) geschildert, d. h. auf jeder Sammelstelle entnahm ich im allgemeinen zwei Proben, deren eine ich abriß, während ich die andere möglichst von der abgekehrten Seite des Substrats mit dem Abschabernetz sammelte. Der Abstand der Pontonen vom Ufer lag bei etwa 12 m. Das aufbewahrte Material fixierte ich in 4%iger Formalinlösung bzw. in 70%igem Alkohol.

Das zur zeitgemäßen Bestimmung der Chironomiden heute unerläßliche Zuchtverfahren kam wegen der großen Entfernung von den Sammelstellen sowie wegen der Transport- und sonstigen technischen Schwierigkeiten nicht in Frage.

Die bearbeiteten Proben stammen zum Teil aus verschiedenen Jahren und Jahreszeiten. Die Zeitpunkte der Probeentnahmen — mit den zugehörigen Wassertemperaturen — sind in der hier folgenden Aufstellung zusammengefaßt.

Wie hieraus hervorgeht, konzentrierten sich die zu den verschiedenen Zeitpunkten durchgeführten Probeentnahmen auf zwei Jahreszeiten: auf den Hochsommer und den Herbst. Diese beiden Jahreszeiten sind in biologischer Hinsicht gleich wertvoll. Sie haben sich unter den gegebenen Umständen als gute Sammelzeiten erwiesen.

Lfd. Nr. der Sammelstelle	Zeitpunkt der Probentnahme	Wasser- temperatur in °C
12—27.	31. VII. 1958	21,0
1.	25. X. 1959	10,5
2, 4, 6.	11. XI. 1959	7,5
7.	12. XI. 1959	7,5
9.	13. XI. 1959	7,5
17a.	10. VIII. 1960	18,0
3, 8.	31. VIII. 1960	20,0
10, 11, 12a	11. X. 1961	14,0
5.	20. IX. 1962	14,5

**Übersicht des gesammelten Materials.** Aus den 45 Proben, die von 29 Punkten des untersuchten Donauabschnittes stammten, wählte ich jedes der Makrofauna angehörende Tier aus. Etwa 40% der Proben enthielt ausschließlich Chironomidenlarven. Auch in den Proben der übrigen Sammelstellen überwogen in der Fauna die Chironomiden, die sonstigen Elementen verteilen sich wie folgt:

Sammelstelle	Die angetroffenen Nicht-Chironomiden	Exemplare
3. Ásványráró	Oligochaeta	1
4. Strom-km 1810	<i>Stylaria lacustris</i> L. <i>Gammarus</i>	20 3
5. Brücke von Medve	Dipterenlarve	5
6. Strom-km 1796	<i>Stylaria lacustris</i> L.	4
9. Tát	Oligochaeta <i>Asellus aquaticus</i> L.	7 2
11. Zebegény	Oligochaeta Trichopterenlarve <i>Gammarus</i>	12 3 7
12. Nagymaros, Schiffsstation	Oligochaeta Dipterenlarve	1 6
12a. Nagymaros	Dipterenlarve	4
13. Visegrád	Dipterenlarve	4
14. Nógrádverőce	Oligochaeta Dipterenlarve	3 1
15. Vác	Oligochaeta Dipterenlarve	20 4
16. Kisoroszi	Dipterenlarve	1
17a. Dunabogdány	<i>Hydra</i> Oligochaeta	1 1
19. Tahitótfalu	Dipterenlarve	3
21. Leányfalu	Dipterenlarve	7
25. Pünkösdfürdő	<i>Gammarus</i>	1
26. Újpest-Megyer	Dipterenlarve	2
27. Rómaifürdő	Dipterenlarve	1

Es sei hier noch bemerkt, daß ich auf der mit der laufenden Nr. 12a bezeichneten Sammelstelle, im Überzug der bei Nagymaros an das Ufer geschleppten Boje außer einigen Dipterenlarven, die keine Chironomiden sind, sonst nichts gefunden habe, obwohl die Boje 24 Stunden vor der Aufsammlung herausgeschleppt worden und somit der Überzug noch naß war.

### Die Artenzusammensetzung der Chironomiden-Fauna

Die insgesamt aufgesammelten 279 Chironomidenlarven und Puppen gehörten 13 Arten an. Ihre Verteilung nach Sammelstellen enthält die Tabelle I. Die Verteilung nach Unterfamilien ist folgende:

Unterfamilie	Exemplar	%
Tanypodinae .....	20	7,0
Orthoclaidiinae .....	248	51,7
Chironominae .....	118	41,3
Insgesamt:	286	100,0

Tabelle I

Art	Fundort											
	1. Rajka	2. Dunaremete	3. Ásványráró	4. Strom-km 1810	5. Medve, Brücke	6. Strom-km 1798	7. Lovadi-Berg	8. Komárom	9. Tát	10. Esztergom	11. Zebegény	12. Nagymaros
<i>Ablabesmyia</i> sp. ....	1		1		1			1		2		1
<i>Cricotopus</i> , <i>Silvestris</i> -Gruppe ...												
<i>Cricotopus algarum</i> .....			12	1			1				14	16
<i>Cricotopus bicinctus</i> .....											2'	3'
<i>Eukiefferiella longicalcar</i> .....												
<i>Eukiefferiella bavarica</i> .....												
<i>Microcricotopus bicolor</i> .....												
<i>Monodiamesa</i> sp. B. ....												
<i>Cryptochironomus</i> sp. ....						1					2	
<i>Glyptotendipes</i> ( <i>Phytochironomus</i> ) <i>fodiens</i> .....									8			
<i>Parachironomus varus</i> .....										1		
<i>Polypedilum</i> , <i>Nubeculosum</i> -Grup- pe .....	1	1						2		1		4
<i>Rheotanytarsus rivulorum</i> .....												
Jahreszeit .....	H	H	S	H	H	H	H	S	H	H	H	S
Zahl der gefundenen Arten ....	2	1	2	1	1	1	1	2	1	3	3	4
Zahl der gefundenen Larven ..	2	1	13	1	1	1	1	3	8	4	18	24

Die mit Strich (') bezeichneten Zahlen beziehen sich auf Puppen. H = Herbst, S =

Zu den einzelnen Arten bzw. Artengruppen sei kurz folgendes vermerkt:

## TANYPODINAE

1. *Ablabesmyia* sp. JOH. — Eine nähere Bestimmung ist auf Grund unserer derzeitigen Kenntnisse nicht möglich. Die über die ganze Welt zerstreut in verschiedenen Biotopen lebenden Arten dieses Genus sind auch in Ungarn allgemein verbreitet (5, Abb. 2).

## ORTHOCLADIINAE

2. *Cricotopus*, *Silvestris*-Gruppe. — Hierher gehören kosmopolitische, euryöke Arten.

3. *Cricotopus algarum* K. — Kommt im Donauabschnitt unterhalb Budapest massenhaft vor, ist eine charakteristische Art der Pflanzenüberzüge (5, Abb. 3).

12a. Nagymaros	13. Visegrád	14. Nógrádverőce	15. Vác	16. Kisröszki	17. Dunabogdány	17a. Dunabogdány	18. Tahai	19. Tahitótfalu	20. Főcsmegeyer	21. Ledényfalu	22. Szigetmonostor	23. Szentendre	24. Lupus-Insel	25. Pünkösdfürdő	26. Budapest: Újpest-Megyer	27. Budapest: Rómafürdő	Auch im Abschnitt Budapest—Mohács gefunden
	1	3		2	2	2				1			1	1		1	×
	6	4	15	2			2		4	2	2	6		16	10	1	×
		1												2			×
	2			1'		3								3	1		×
				1'													×
						2											×
	14		36	3	4			1	8		11	4	5	8			×
S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	×
0	4	3	2	7	2	3	1*	1	2	2	2	2	2	6	2	2	×
0	23	8	51	23	6	7	2*	1	12	3	13	10	6	31	11	2	

Sommer, \* = auf Grund einer einzelnen Probe.

4. *Cricotopus bicinctus* MG. — Ich fand eine Larve und 5 Puppen bzw. Exuvien. Diese ermöglichten eine genaue Artenbestimmung. In Ungarn als Reisschädling bekannt (3). Kam auch aus den abgestorbenen Teilen von Wasserpflanzen hervor. Diese Art fand ich auch in dem aus dem Fluß Gran, einem aus den Karpaten kommenden, linksseitigen Nebenfluß der Donau, stammenden Material (4). Aus dem ungarischen Donauabschnitt bisher nicht bekannt.

5. *Eukiefferiella longicalcar* K. — Eine auch in der Donau verbreitete Art (5, 10), ein typischer Bewohner der Vegetation fließender Gewässer.

6. *Eukiefferiella bavarica* GOETGH. — Die einzige gefundene Puppe konnte auf Grund der Arbeit von ZAVŘEL (22) mit Gewißheit bestimmt werden. Es ist interessant, daß diese Art nach ZAVŘEL — unter anderen — die Ansiedlung in der *Fontinalis antipyretica* besonders bevorzugt, ich selbst fand jedoch die Puppe an einem gering bemoosten Fundort, im *Fontinalis*-Überzug. Die Art ist neu für die Fauna Ungarns.

7. *Microcricotopus bicolor* ZETT. — Eine in Ungarn bislang nur aus der Donau zum Vorschein gekommene, pflanzenbewohnende Art.

8. *Monodiamesa* sp. B. THIEN. — THIENMANN sammelte die Exuvien der sp. B. in den Torneträsk-Seen in Lappland in großer Zahl und verglich sie auch auf dieser Grundlage mit *M. bathyphyla* (18, p. 223—224). Er gibt an, daß er in Material aus dem östlichen Arm der Donau bei Bratislava (leg. Dr. HRABÉ) ganz ähnliche Puppen gefunden hat. Die von mir gesammelte Exuvie stimmt mit der THIENEMANNschen Beschreibung völlig überein. Neu für die Fauna Ungarns.

#### CHIRONOMINAE

9. *Cryptochironomus* sp. — Die Larven der diesem Genus angehörenden Arten können nach unseren heutigen Kenntnissen nicht getrennt werden. Aus stehenden und fließenden Gewässern gleich gut bekannte Raubarten.

10. *Glyptotendipes (Phytochironomus) fodiens* K. — Die auf Grund der Arbeit von LENZ (13) bestimmten Larven sind aus der Donau nur aus Ungarn nachgewiesen.

11. *Parachironomus varus* GOETGH. — Auf Grund der Arbeit von LENZ (13, p. 201) konnten diese Larven durch die Lage der Ringorgane an der Antenne und durch die Ausbildungsform der Prämandibel eindeutig bestimmt werden. Die Art ist neu für die Fauna Ungarns.

12. *Polypedilum, Nubeculosum-Gruppe*. — Hierher gehören die im ungarischen Donauabschnitt massenhaft vorkommenden, periphytonbewohnenden Chironomidenlarven.

13. *Rheotanytarsus rivulorum* K. — Aus der Donau bisher nur aus Ungarn zum Vorschein gekommen.

Hier sei bemerkt, daß bei den stellenweise in größerer Anzahl gefundenen Arten (*Ablabesmyia* sp., *Cricotopus*, *Silvestris*-Gruppe, *Cricotopus algarum*, *Polypedilum*, *Nubeculosum*-Gruppe) das verschiedene Alter der zu gleicher Zeit und an gleicher Stelle gesammelten Larven besonders auffallend war. An den Sammelstellen kommen derselben Art angehörende Larven in den verschiedensten Entwicklungsstadien vor, — eine Erscheinung, die auf bisher noch nicht erforschte, eigenartige Schwärmverhältnisse schließen läßt.

### Die quantitativen Verhältnisse der Chironomiden

Die in gleicher Weise durchgeführten Aufsammlungen — obwohl sie nicht quantitativen Charakters sind — lassen zugleich auch eine gewisse quantitative Auswertung zu. Auch die verschiedenen Zeitpunkte der Sammlung haben hierbei keine störende Auswirkung (p. 44). Im Sommer war nämlich die Vegetation der Überzüge bereits voll entwickelt, im Herbst dagegen noch nicht so stark zugrunde gegangen, daß dadurch die Lebensbedingungen der Fauna ausschlaggebend beeinträchtigt gewesen wären. Wahrscheinlich hätten wir an den Sammelstellen, an denen wir unsere Untersuchungen im Herbst durchgeführt haben, im Sommer (zumindest was die Individuenzahl anbelangt) eine reichere Fauna vorgefunden. In seinen großen Zügen ändert sich das Bild dadurch nicht, und eine eingehendere Analyse war mit diesen Untersuchungen ohnehin nicht beabsichtigt.

Tabelle 1 läßt deutlich das Überwiegen der Larven zweier Arten, nämlich des *Cricotopus algarum* und der *Polypedilum*, *Nubeculosum*-Gruppe erkennen. Sie erreichten 75% sämtlicher gesammelter Larven, und auch ihre Häufigkeit in den Sammelstellen ist groß: sie beträgt 57%. An Häufigkeit werden diese beiden Arten auch von den Larven von *Ablabesmyia* sp. erreicht, die aber — wenn auch überall nur in geringer Zahl — doch in 49% der Sammelstellen vorkommen. Die Larven der übrigen 10 Arten bzw. Artengruppen kommen nur in geringer Zahl (im allgemeinen insgesamt unter 10 Exemplaren je Art) und nur an wenigen Sammelstellen vor.

Es würde sich lohnen, die ökologischen Ansprüche und Verhältnisse der einzelnen Arten eingehend zu untersuchen und den Wechsel der Generationen und die populationsdynamischen Prozesse zu klären. Dies geht jedoch weit über die Zielsetzungen meiner vorliegenden Abhandlung hinaus. Indes gibt es zwischen den Abundanzverhältnissen und den überzubildenden Pflanzen manche Zusammenhänge, die bereits jetzt mit Sicherheit als festliegend angesehen werden können.

In erster Reihe kann festgestellt werden, daß unter den Verhältnissen des untersuchten Donauabschnittes Wassermoose (in diesem Falle: *Fontinalis antipyretica* und *Eurhynchium rusciforme*) einen hervorragend guten Biotop für die Chironomidenlarven bilden, wie dies aus den Angaben für Kisoroszi

und Pünkösdfürdő (Sammelstellen 16 und 25) hervorgeht (Tabelle 1). Beide Mooskolonien waren von den Kolonien des *Chamaesiphon incrustans* (Cyanophyta!) stark bedeckt.

Den anderen sehr auffälligen Zusammenhang bildet die Tatsache, daß die Cladophorenkolonien die ärmste Fauna haben. Ein Vergleich der Tabelle I mit der Beschreibung der Sammelstellen zeigt viele Beispiele hierfür (Sammelstellen 1, 5, 14, 19, 21, 27!). Die Erscheinung tritt in diesem Falle deshalb nicht so klar hervor wie — im entgegengesetzten Sinne — bei den beiden Wassermoosarten, weil die Cladophorenarten an sämtlichen Fundorten, jedoch in sehr verschiedener Zahl und als Mitglieder von verschiedenen Algenassoziationen vorkommen (Dies kommt auch in der Arbeit von G. TAMÁS (16) gut zum Ausdruck). Je weniger Arten in der Assoziation neben den dominanten Cladophoren auftreten, um so ärmer ist die vorgefundene Fauna.

Wahrscheinlich findet die enorme Abweichung zwischen den Wassermoosen und den Cladophorenkolonien ihre Erklärung in den zwischen diesen beiden bestehenden großen morphologischen Unterschieden, ist doch die verzweigte, beblätterte Wassermooskolonie offenbar ein geeigneterer Biotop als die dicht verflochtene geschlossene Cladophorenmasse! Bei Flüssen muß auch damit gerechnet werden, daß sich das in ansehnlicher Menge vorhandene Schwebstoffsediment in den Cladophorengeweben meist weit besser absetzt und aus ihnen schwerer ausgespült wird als aus den Wassermoosen.

Zur Charakterisierung der quantitativen Verhältnisse kann noch gesagt werden, daß die ungarische obere Donau (Strom-km 1848—1791) im allgemeinen, im Verhältnis zu den übrigen Donauabschnitten, an Periphyton-Fauna wesentlich ärmer ist. Dies erklärt sich vermutlich aus der hier stets größeren Fließgeschwindigkeit (siehe p. 41).

Abschließend verdient noch auf den Umstand hingewiesen zu werden, daß die Untersuchungsergebnisse im Abschnitt Budapest—Mohács (5) hinsichtlich der herrschenden Arten sowie der Zusammenhänge zwischen Fauna und aufwuchsbildender Vegetation in jedem wesentlichen Zug mit jenen des Abschnittes zwischen Rajka—Budapest decken.

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TINEID MOTHS FROM THE RUWENZORI RANGE  
(LEPIDOPTERA)

By

L. A. GOZMÁNY

ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST  
(DIRECTOR: DR. Z. KASZAB)

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I received from Mr. J. BRADLEY, of the British Museum (Nat. Hist.), a material of Tineid moths collected by D. S. FLETCHER in 1952. The material originates from the lower reaches of the Ruwenzori Range, the highest altitude represented in the material being 4700 ft.

Identification revealed that the material consists of 23 species, 19 of which were found to be new. The Holotypes and most of the Paratypes are deposited in the British Museum (Nat. Hist.), while some Paratypes were retained by, and deposited in, the Hungarian Natural History Museum, Budapest.

It is my agreeable duty to thank Mr. BRADLEY for the ceding of the material for identification, and the Directorate of the British Museum (Nat. Hist.) for the loan and the gift of the specimens concerned.

## Abbreviations of locality and capture data:

SF = Semliki Forest, 2850 ft, 22. VIII.—3. IX. 1952

B = Bandibugyo, 3400 ft, 22. VIII.—3. IX. 1952

I = Ibanda, 4700 ft, 10—21. VIII. 1952.

## Abbreviations of Museums:

BM = British Museum (Nat. Hist.)

HNHM = Hungarian Natural History Museum.

*Phthoropoea* WALSINGHAM, 1896

(Proc. Zool. Soc., London, p. 282)

Syn.: *Plemyristis* MEYRICK, 1915; Exot. Microl., 1, p. 369.*Polycompsistis* MEYRICK, 1932; Exot. Microl., 4, p. 325.*Gnathosaristis* MEYRICK, 1936; Exot. Microl., 5, p. 54.? *Aphanoptis* MEYRICK, 1927; Boll. Soc. Ent. Ital., 59, p. 161.*Phthoropoea oenochares* (MEYRICK, 1920)

(Exot. Microl., 2, p. 362)

A female specimen from the SF (gen. prep. 2484).

*Paraclystis* MEYRICK, 1915

(Exot. Microl., 1, p. 293)

Syn.: *Plastopolypus* SILVESTRI, 1920; Boll. Lab. Zool. Portici, 14, p. 297.  
*Emmetoeca* MEYRICK, 1921; Ann. Transvaal Mus., 8, p. 127.  
*Passalactis* MEYRICK, 1935; Proc. Ent. Soc., London, 10, p. 49.

*Paraclystis melipecta* MEYRICK, 1915

(l. c.)

Syn.: *Plastopolypus divisus* SILVESTRI, 1920 (l. c.; = *integer* SILVESTRI, 1920, l. c.)  
*Emmetoeca melicosma* MEYRICK, 1921 (l. c.)  
*Passalactis tentatrix* MEYRICK, 1935 (l. c.)

A female specimen from the SF (gen. prep. 2485).

*Monopis* HÜBNER, 1825

(Verz. bek. Schmett., p. 401)

*Monopis ruwenzorica* sp. n.

Alar expanse: 10–12 mm.—Head, third joint of labial palpi light yellowish, scape of antennae yellow with a black spot, antennae dark grey, scapulae, thorax fuscous mixed with some light ochreous scales; basic color of fore wing light ochreous with some stramineous, densely irrorated with fuscous at base along and below costa, below cell and in fold, and densest (and most dark) in apical area, basic color thus surviving only basad in cell, along dorsum, in an indistinct light streak from hyaline spot to above tornus, and as a large, subtriangular, preapical spot on costa; hyaline spot conspicuous, sericeo-stramineous, rather nearer to base than middle of wing; cilia light stramineous with a strong, dark, subbasal and an outer line of scales; hind wing light stramineous grey, greyest in apical area, cilia silky stramineous grey.

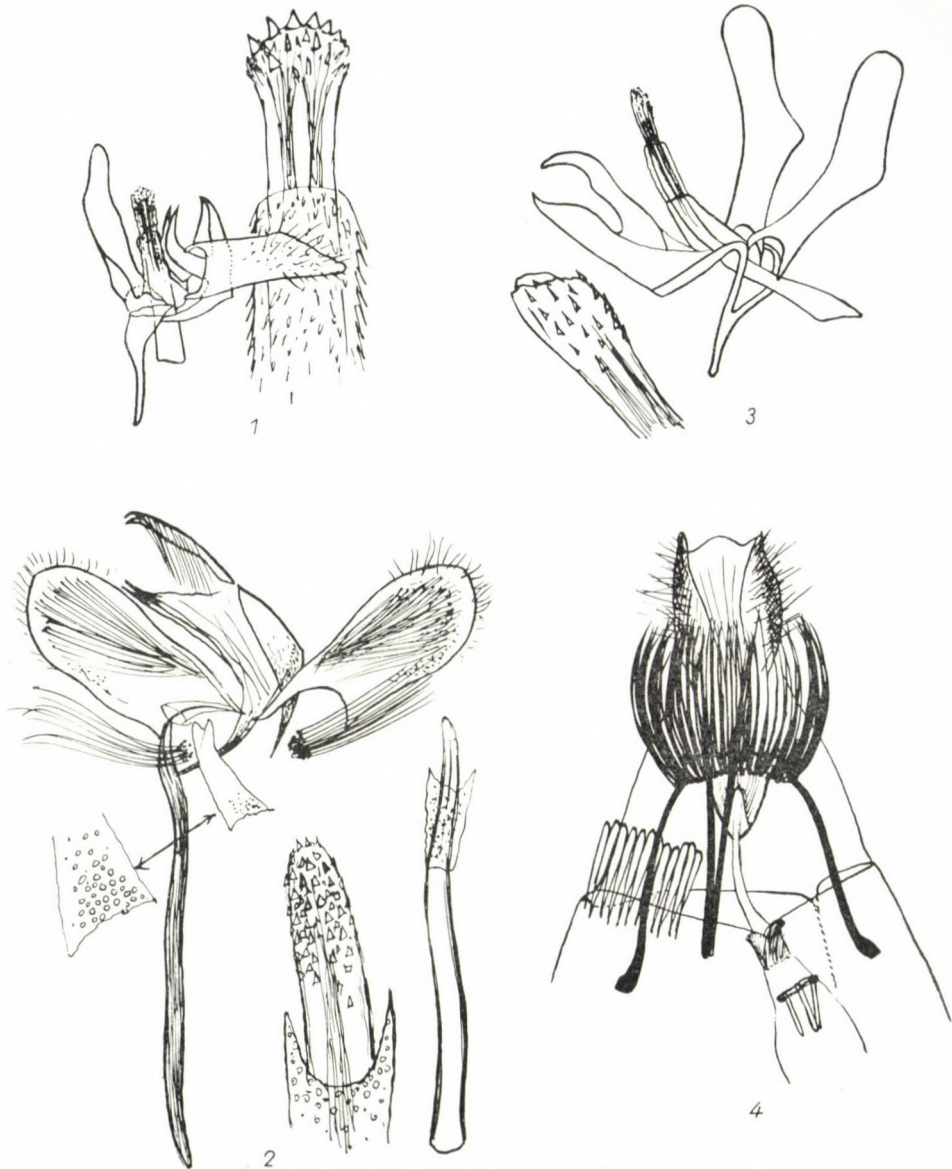
Male genital organ: very compact, uncus straight; gnathos large; vinculum very strongly sclerotized, hardly allowing spreading of valvae; saccus very short; valvae with parallel margins to 2/3, then dorsal margin tapering to pointed apex; aedoeagus short, bulky, with numerous rows of cornuti (Fig. 1).

The new species is externally different from all known congeners in the Ethiopian Region; the very strong gnathos and the extremely short saccus also delimit it from all known forms.

Examined material: Holotype (SF, gen. prep. 2490), and Paratype (SF, gen. prep. 2491); in the BM and the HHM.

***Monopis evanescens* sp. n.**

Alar expanse: 17—18 mm (cilia worn). — Head, palpi stramineous ivory, antennae yellowish-grey, scapulae, thorax, fore wing very worn, almost free



Figs. 1—4. Male genital organ of: 1 = *Monopis ruwenzorica* sp. n., ventro-laterally, right valva half removed, aedoeagus in situ, apex also magnified, Paratype, gen. prep. 2491; 2 = *Monopis evanescens* sp. n., ventrally, Holotype, gen. prep. 2481; 3 = *Monopis miranda* sp. n., laterally, aedoeagus in situ, Paratype, gen. prep. 2494. — 4 = Female genital organ of *Monopis miranda* sp. n., ventrally, in situ, Paratype, gen. prep. 2487

of hairs and scales, apical area with some yellowish rufous scales, hyaline spot elongately oval, in middle of wing; hind wing medium grey or fuscous.

**Male genital organ:** uncus straight, pointed; gnathos of usual shape; valvae large, broad, evenly rounded apically; saccus strong, long; aedoeagus as long as saccus, slightly sinuous, apically with an accumulation of dot-like cornuti; a pair of coremata with long hairs present (!) (Fig. 2).

The presence of the coremata, a unique occurrence in the genus and the subfamily of the Tineinae (I can give no account of it nor relegate the otherwise typical taxon to any other genus), separates the new species from all known congeners.

Examined material: Holotype (I, gen. prep. 2481); in the BM.

### ***Monopis miranda* sp. n.**

Alar expanse: 10—12 mm. — Head, third joint of labial palpi light yellowish, otherwise palpi fuscous, scape blackish, antennae dark grey, hairs above eyes rufous, scapulae and thorax rufous and stramineous; basic color of fore wing light stramineous ochreous, clearest along wide median zone of wing, otherwise marginal areas much irrorated with rufous to fuscous, especially in middle of costa, in apical area (here forming a rather extensive blotch), and along termen; hyaline spot elongately oval, almost double, in middle of wing, below it (almost in 2/3 of fold) and above it (behind 1/2 of costa, thus rather apicad) a dark spot each; cilia yellowish ochreous with 2 continuous, conspicuous dark lines, hence cilia evenly zonate; hind wing light grey, cilia yellowish-grey.

**Male genital organ:** uncus normal; gnathos very long, strongly sclerotized, almost Gelechiid; vinculum very strongly sclerotized; saccus extremely short, furcate; valvae long, narrow, sharply bent in middle, with an angular corner on lower margin; aedoeagus long, with rows of small cornuti (Fig. 3).

**Female genital organ:** entirely foreign to the genus *Monopis* HBN.: ovipositor very short, apophyses posteriores blade-like, as if fit for cutting, resembling those of Incurvariidae, apophyses anteriores very short, straddling, bearing caudad a sarong-like dense curtain of bristles covering ostium; ductus short, with a peculiar excrescence in mouth of bursa; this latter hardly visible, with a pectinate signum consisting of a horizontal bar and three similar teeth (Fig. 4).

The male genital organ, with its peculiar gnathos and strongly bent or broken valvae, and the entire construction of the female genital organ set the new species aside from all of its allies. Despite the absolutely characteristic external features of a *Monopis* taxon, I still hesitate to include it in this genus. However, until more material are forthcoming, or the life-history known, etc.,

I cannot do otherwise. Besides these latter two fantastic species, the Central African highlands seem to shelter yet a number of singular *Monopis* taxa; *malescripta* MEYR. has the hyaline spot on the hind wings, *liparota* MEYR. and *altivagans* MEYR. are gigantic species (measuring up to 28 mm).

Examined material: Holotype (SF, gen. prep. 2488), and 2 Paratypes (SF, gen. preps. 2487, 2494); in the BM and the HNHM.

*Monopis malescripta* MEYRICK, 1938

(Institut des Parcs Nationaux du Congo Belge, fasc. 14, p. 26)

The second known specimen of the extraordinary taxon, described from the Albert Park. The hyaline spot is on the hind wing, it is rather elongated and sharply delimited within the cell. The specimen was found in a cave!

Examined material: "Uganda: Entebbe, Lake Victoria, Bugonga Point + Cave No. 2, 20. IX. 1952, D. S. FLETCHER, B. M. 1952-566 + B. M. genitalia slide 8457 (BRADLEY) + *Monopis malescripta* det. DR. GOZMÁNY".

*Etnodona* MEYRICK, 1915

(Exot. Microl., 1, p. 289)

*Etnodona esoterica* sp. n.

Alar expanse: 11 mm. — Head, palpi stramineous, scapulae, thorax, and fore wing rather worn, light stramineous with some golden shine, discocellular with a small blackish spot, cilia concolorous; hind wing light stramineous yellow, cilia whitish.

Male genital organ: uncus two small, parallel lobes on both sides of membraneous tegumen (or gut?); valvae small, of usual structure; saccus and vinculum very thin, forming a conspicuous ventral fork; aedoeagus tubular, simple; anellus two small, wedge-shaped arms (Fig. 5).

The new species seems to be the lightest colored of all of its allies; among the small-sized taxa it can be compared genitally only to *phalacropis* MEYRICK, 1915, but its saccus is widely triangular, and the animal is purplish-grey.

Examined material: Holotype (B, gen. prep. 2489); in the BM.

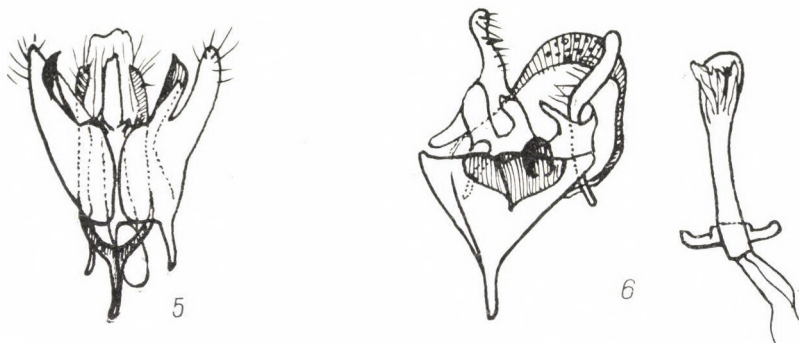
*Emblematodes* MEYRICK, 1914

(Exot. Microl., 1, p. 288)

*Emblematodes aberrans* sp. n.

Alar expanse: 7-8 mm. — Head yellow, tending to fulvous toward vertex, antennae dark grey, scapulae and thorax aeneous fuscous; fore wing very narrow, pattern highly complicated: base dark purplish-black (narrow on

dorsum and extending to 1/4 along costa) with numerous iridescent, light bluish-violet scales, this area followed by a lighter yellowish region tending to strongly shining dark coppery in cell (bordered along fold and dorsum by black scales, along costa by two indistinct blackish lines), this area again delimited by two very oblique, long, iridescent bluish-violet stripes from 1/2 of costa to beyond discocellular and turning slightly back and ending on tornus, their margins dotted by blackish scales, outer third of wing with a large purplish-black triangle on costa, ending in middle of wing in a large, rather circular brassy blotch,



Figs. 5—6. Male genital organ of: 5 = *Etnodona esoterica* sp. n., ventrally, Holotype, gen. prep. 2489; 6 = *Emblematodes aberrans* sp. n., ventrally, aedeagus removed, Paratype, gen. prep. 2492

behind these entire apical area filled with margaritaceous violet scales; last three features bordered along costa, around apex and along termen by alternating black and sericeous yellowish spots, these latter continuing into cilia, transecting and thus chequering wide, subbasal, blackish line in middle of yellowish cilia, mixed also with greyish to rufous hairs; hind wing shining, almost metallic bronzy green; cilia dark greyish.

**Male genital organ:** no uncus or gnathos; tegumen a shallow, narrow, longitudinal band; valvae free from base of embracing saccus and costal fold; anellus strongly sclerotized, ventrally almost cordiform with a short, tubular, hole-shaped opening; saccus very wide caudad but extremely short ventrad; aedeagus tubular, apically spoon-shaped, with a folded, membranous opening, basally with a strong cross-bar (Fig. 6).

The pattern and the features of the genital organ (valval complex and short saccus) delimit the new species from its single known congener, *cyanochra* MEYRICK, 1914 (l. c.), the type-species of the genus, also a Central African montane element.

Examined material: Holotype (B) and three Paratypes (B, gen. prep. 2492); in the BM and the HNHM.



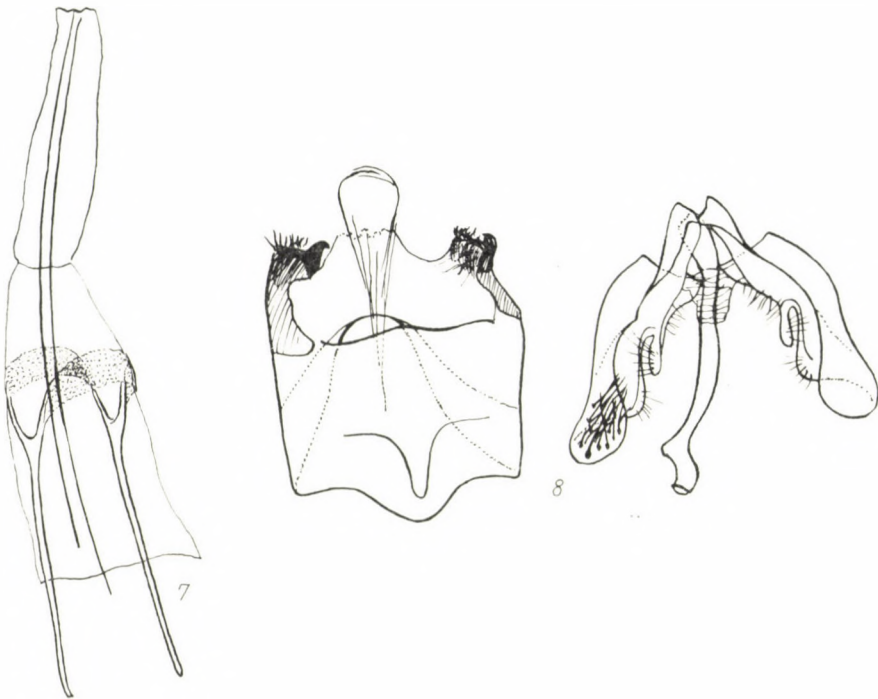
*Afrocelestis* GOZMÁNY, 1965

(Lambillionea, 64, p. 3)

*Afrocelestis minuta* (GOZMÁNY, 1965)

(Acta Zool. Hung., II, p. 262)

The second known specimen, a single female, of the taxon recently described from the SW Ethiopian mountains, about 5° N and 7° E of the Ruwenzori Range.



Figs. 7—8. Female genital organ of *Afrocelestis minuta* (GOZMÁNY, 1965), ventrally, tip of ovipositor broken away, gen. prep. 2474; 8 = Male genital organ of *Dinica diana* sp. n., ventrally, valval complex everted and removed, Holotype, gen. prep. 2475

**F e m a l e g e n i t a l o r g a n:** ovipositor long but broken in examined specimen, apophyses anteriores simple, evenly bifurcate, both ventral and dorsal arms supporting a poorly sclerotized, narrow band, no ostium, ductus or bursa indiscernible (Fig. 7).

The specimen wholly resembles the male, except for its slightly bigger size.

Examined material: (SF, gen. prep. 2474); in the BM.

*Dinica* GOZMÁNY, 1965

(Lambillionea, 64, p. 5-6)

*Dinica diana* sp. n.

Alar expanse: 12 mm. — Head, labial palpi, thorax chalk-white, antennae grey ringed with light greyish, scapulae brownish fuscous, this color continuing also onto costa of fore wing, emitting a small wave toward (but not reaching) fold at 1/5, then retreating to its normal width (about 1/5 of breadth of wing) along costa, to sweep in a large arc to middle of wing (into 2/3 of cell), retreating again in a very oblique line to 2/3 of costa; costa from here to apical area with a light yellowish suffusion, otherwise wing chalky white; cilia colorous; hind wing light grey, slightly yellowish, cilia whitish.

Male genital organ: lateral lobes of uncus strong spiny pads with a sharp, strongly sclerotized, recurving thorn ventrad; vinculum narrow dorsally but very wide ventrally; valvae and sacculus of characteristic structure; aedoeagus long, sinuous, but sharply broken apically (Fig. 8).

The new species differs externally by its strikingly small size from all three of its known congeners: all being almost twice as large; also, *hyacinthopa* (MEYRICK, 1932) and *orphnospila* (MEYRICK, 1934) are dark, fuscous and blackish; *aspirans* (MEYRICK, 1920), though whitish ochreous, shows a quite dissimilar, fuscous pattern. The extraordinary shape of the aedoeagus of the new species alone delimits it from its above allies.

Examined material: Holotype (SF, gen. prep. 2475); in the BM.

The peculiar genus is restricted to the Central African highlands and mountains (Ruwenzori: *hyacinthopa*, *orphnospila*, *diana*; Mt. Kenya: *aspirans*).

*Scalmatica* MEYRICK, 1911

(Trans. Linn. Soc. London, 14, p. 306)

*Scalmatica ascendens* sp. n.

Alar expanse: 15 mm. — Head, labial palpi, scapulae, thorax, basic color of fore wings chalk-white, antennae sericeous yellowish-white; pattern blackish, some few scales on costa at 1/3 and 2/3, and an aggregation of irregular spots and dots in lower apical area between veins  $r_5$  and  $cu_1$ , discocellular and termen; cilia white, with some blackish scales on termen.

Male genital organ: of characteristic structure, but valvae much broader, more sharply bent, and more rapidly attenuating apically than in *zernyi* GOZMÁNY, 1966 (in litt.) (Fig. 9).

The nearest ally of the new species, *zernyi* GOZM., has a considerably more extensive pattern, narrower and more evenly arching and attenuating valvae.

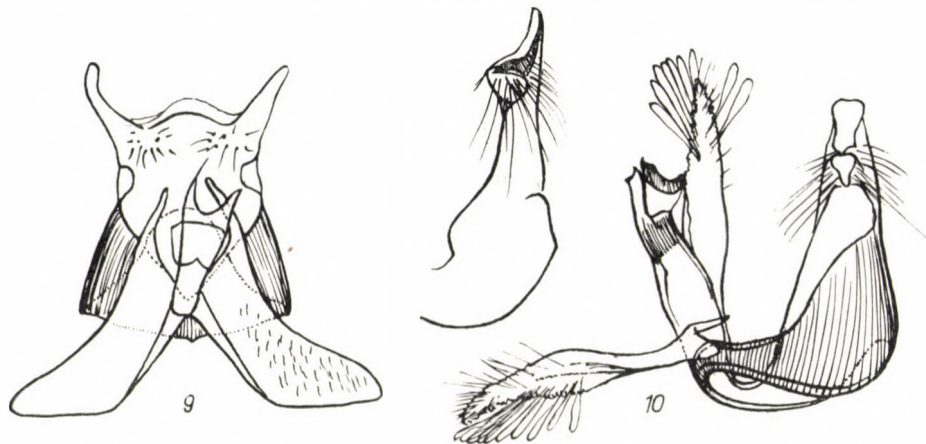
Examined material: Holotype (B, gen. prep. 2017); in the BM.

*Perissomastix* ROTHSCHILD and WARREN, 1905

(Nov. Zool., 12, Nr. 1, p. 33)

Syn.: *Malacyntis* MEYRICK, 1908; Proc. Zool. Soc. London, p. 738.*Catabola* DURRANT, 1913; Nov. Zool., 20, Nr. 1, p. 142.*Psolarcha* MEYRICK, 1933; Exot. Microl., 4, p. 412.*Perissomastix deviata* sp. n.

Alar expanse: 13—15 mm. — Head, labial palpi, scape and first few antennal joints black, antenna then dark grey, clearing apicad, scapulae, thorax basally blackish then tending, together with fore wing, to deep rufous



Figs. 9—10. Male genital organ of: 9 = *Scalmatica ascendens* sp. n., ventrally, valval complex everted, Holotype, gen. prep. 2017; 10 = *Perissomastix deviata* sp. n., valval complex laterally, uncus ventrally, Paratype, gen. prep. 2472; uncus also laterally, Holotype, gen. prep. 9546, BM

with a strong bronzy to dark golden shine, costa darkest basad, wing lightest along dorsum; cilia concolorous; hind wing dark grey, cilia concolorous.

**Male genital organ:** uncus deviating from usual *Perissomastix*-structure, arms fused into a spatulate process, inclinate ventrally into two wedge-shaped and centrally meeting appendages, excavated beneath; tegumen nearly straight dorsally; valvae long, thin, margins emorse; aedeagus long, bulky, apically with a narrow, tubular process and dorsally with a seemingly free, horizontally swinging, sausage-shaped excrescence, yet connected back to aedeagal base by a transparent, membraneous sheath (Fig. 10).

The new species, though externally seemingly belonging to the "othello"-group, is relegable in fact to a special subgroup characterized by most diversely formed uncus and the sausage-shaped process of the aedeagus, together with the weakly sclerotized, thin valvae with emorse margins. The species forming this subgroup are, however, light sericeous yellowish, of very small size,

resembling *Tineola biselliella* HUMMEL! (*P. pygmina* GOZMÁNY, 1965; Acta Zool. Hung., II, p. 269, from the Ethiopian mountains, lacks the "sausage" on the aedoeagus but is otherwise typical; the description of two other species, found in Elisabethville, Katanga, is in print). The new species excels by its coloration and relatively large size.

Examined material: Holotype [I + B. M. genitalia slide 9546 (BRADLEY)], and 8 Paratypes (7 from I, gen. prep. 2472, and one from SF, gen. prep. 2010); in the BM and the HNHM.

### *Hyperbola* GOZMÁNY, 1965

(Acta Zool. Hung., II, p. 269—270)

#### *Hyperbola bradleyi* sp. n.

Alar expanse: 16—18 mm. — Head yellow, labial palpi fuscous but third joint yellowish, antennae dark fuscous at base but lightening apicad, scapulae and thorax dark fuscous but base of thorax with a yellowish spot; base and costa of fore wing fuscous, otherwise a deep, dark golden ochreous with a rufous tinge especially below costa, wing shiny, cilia concolorous with grey and darker scales; hind wing medium grey with a yellowish shine, cilia grey.

Male genital organ: uncus lobes with terminally extended pads bearing a great number of dark pegs, characteristic of genus, arranged in marginal rows and scattered also between them, lobes strong, brachial; vinculum a wide ring; valvae of characteristic oval shape and strong, long costal bristles, with also a very conspicuous bundle of bristles apically; aedoeagus very peculiarly formed: bent in an even arch, as if bifid longitudinally, lower tube more strongly sclerotized than upper, wider, terminally shorter section (Fig. 11).

The new species passes well among its congeners; however, the specially formed aedoeagus and the great amount of black pegs of the uncus delimit it from all known allies.

Examined material: Holotype [SF + B. M. genitalia slide 9539 (BRADLEY)] and 5 Paratypes [SF, gen. prep. 2470, and genitalia slide 8453 (BRADLEY)]; in the BM and the HNHM.

I dedicate the fine new species to Mr. J. BRADLEY, eminent English microlepidopterist, in friendship and esteem.

#### *Phalloscardia* gen. n.

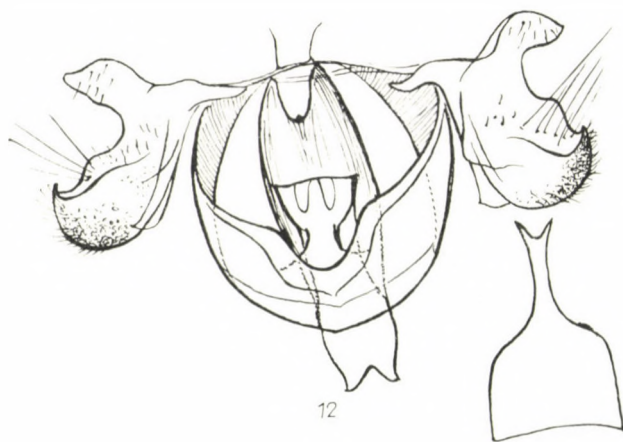
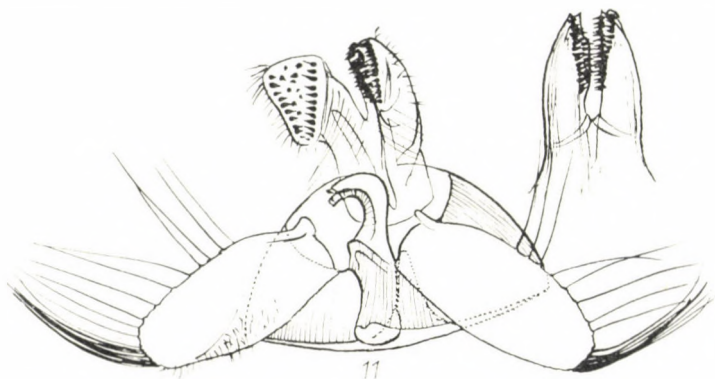
[Derivation of generic name: *φαλλος* (penis) + *Episcardia*]

Type-species: *Tinea semiumbrata* MEYRICK, 1920; Voyage de Ch. Alluaud et R. Jeannel en Afrique Oriental, II, Microlepidoptera, p. 102.

Male genital organ: vinculum, valvae, and articulation of aedoeagus episcardid, but aedoeagus an elongate, semicylindrical shell, uncus

atrophied into two bristles, their function transmitted to furcately elongated caudal process of last tergite reduced into a relatively small shield-like plate. Small coremata-bundles present.

Female genital organ unknown.



Figs. 11—12. Male genital organ of: 11 = *Hyperbola bradleyi* sp. n., ventrally, uncus bent frontally, Paratype, gen. prep. 2470; uncus also ventrally erect, Holotype, gen. prep. 9539, BM; 12 = *Phalloscardia semiumbrata* (MEYRICK, 1920), ventrally, also last tergite, gen. prep. 4534, BM

The new genus is a derivation of *Episcardia* RAGONOT, 1895, being dissimilar by the peculiarly shaped aedeagus and the transmission of the function of the uncus-arms — nearly invariably well developed in *Episcardia* RAG. — to the last abdominal tergite. Monotypical.

*Phalloscardia semiumbrata* (MEYRICK, 1920)

(1. c.)

The second known specimen of the taxon described from the Nairobi Forest, alt. 1700 m.

**Male genital organ:** valvae almost entirely bifid into a smaller, simple, pointed costal lobe and a larger spoon-shaped (there globular) dorsal lobe with numerous strong bristles medially and dense hairs distally; aedoeagus long, strongly keeled, extremely mobile due to elastic articulation by a chalyceid ventral process; no membranous portion (vesica, spermoduct) or cornuti visible, merely ventral, sclerotized shell of organ (Fig. 12).

Examined material: B + B. M. genitalia slide 9543 (BRADLEY) + *Phalloscardia semiumbrata* MEYR. det. DR. GOZMÁNY.

*Episcardia* RAGONOT, 1895

(Bull. Soc. Ent. France, p. CV)

*Episcardia fletcheri* sp. n.

Alar expanse: 15 mm. — Head, antennae light sericeous yellowish, scapulae, thorax, basal 1/3 of costa fuscous with a strong rufous shine, fore wing dark stramineous with a reddish-violet shine, cilia lighter yellowish; hind wing medium grey, cilia grey with a subbasal yellowish line.

**Male genital organ:** uncus indiscernible, probably only membranous among folds of teguminal membranes; valva large, generally subtriangular, with a long, recurving hook basally, in situ reclining in location of uncus, crossing other hook of opposite valva; aedoeagus long, strong, articulation of usual episcardid structure; vinculum broad, wide, strong, deeply excised only dorsally (Fig. 13).

The lack of a conspicuous uncus and the shape of the valva distinguishes the new species, and delimit it from all known congeners.

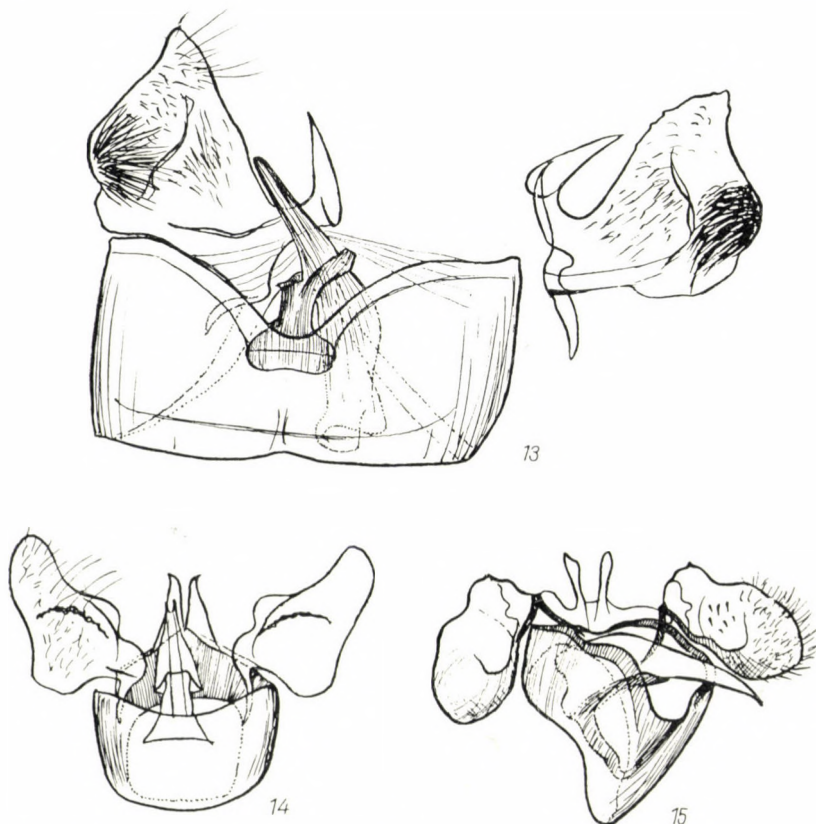
Examined material: Holotype (SF, gen. prep. 2477); in the BM.

I dedicate the new species to Mr. D. S. FLETCHER, its collector, of the expedition to the Ruwenzori Range.

*Episcardia epixena* sp. n.

Alar expanse: 13–15 mm. — Head vivid lemon yellowish, antennae whitish, scapulae and thorax light plumbeous yellowish; fore wing light sericeous stramineous, with a more or less expressed golden shine, costa finely dark, cilia yellowish-white; hind wing light margaritaceous grey, cilia stramineous white.

Male genital organ: uncus-arms elongately triangular, apically pointed; vinculum narrow dorsally, wide ventrally; valva subtriangular with very sinuous margins, especially along costa at base, medially with a slightly arcuate ridge; aedoeagus rather wide also apically, orifice seemingly furcate (Fig. 14).



Figs. 13–15. Male genital organ of: 13 = *Episcardia fletcheri* sp. n., ventrally, right valva removed, Holotype, gen. prep. 2477; 14 = *Episcardia epixena* sp. n., ventrally, Paratype, gen. prep. 2473; 15 = *Episcardia sinuosa* sp. n., ventrally, Paratype, gen. prep. 2480

The new species stands nearest to *E. magnifica* GOZMÁNY, 1966 (in print), but the strongly sinuous, or sublobate costa of the valva, the position and decurrence of the valval ridge, as well as the apical construction of the aedoeagus separate it satisfactorily; the differences in color are also considerable.

Examined material: Holotype [I + B. M. genitalia slide 9540 (BRADLEY)], and 2 Paratypes (I, gen. preps. 2011, 2473); in the BM and the HNHM.

***Episcardia sinuosa* sp. n.**

Alar expanse: 10–14 mm. — Head yellow, antennae yellowish-white, scapulae and thorax purplish fuscous; fore wing honey-colored to stramineous, occasionally strongly suffused with light grey, cilia whitish-yellow; hind wing grey with a brassy shine, cilia whitish with a subbasal grey line.

**Male genital organ:** uncus-arms soft, fine, dactyloid lobes; vinculum very deeply excised dorsally but extremely long ventrally; valvae suboval, costa sinuous, basal wave with a fine point, distally finely rounded and subglobular, resembling a slipper; aedoeagus large, strong, beak-shaped, apically mucronate, articulation to ventral wall of vinculum of characteristic episcardid structure (Fig. 15).

The new species is allied to *jansei* GOZMÁNY, 1965, (*Acta Zool. Hung.*, II, p. 272) and *oenopis* (MEYRICK, 1908; *Proc. Zool. Soc. London*, p. 740), but the combined differences in the shape of the uncus-arms, the valvae, and the structure of the aedoeagus separate the new taxon satisfactorily.

Examined material: Holotype (SF, gen. prep. 2015), and 3 Paratypes (SF, gen. preps: 2478, 2480; B, gen. prep. 2471); in the BM and the HNHM.

***Episcardia extraphalla* sp. n.**

Alar expanse: 12 mm. — Head yellow, antennae yellowish-white, scapulae and thorax dark purplish fuscous, fore wing honey-colored, with some rufous to light purplish shine, cilia stramineous grey; hind wing greyish, cilia whitish-grey.

**Male genital organ:** uncus-arms two exclinate, erect and elongate lobes, medially strongly sclerotized, margins membranous; valva irregularly broken and composed of several dissimilar portions: a basally recurving, angular arm, an elongate apical triangle, and a distal, rounded, globular portion, much darkened and sclerotized, bearing numerous large insertion points of large scales; vinculum not wholly contiguous, sclerotization imperfect under uncus, here also very narrow, broadening only toward ventral surface; aedoeagus long, large, tubular, slightly arching, widest at rapidly mucronate apex (Fig. 16).

The new species might be compared to the former taxa, but the complicated valval structure and the shape of the aedoeagus differentiate it satisfactorily.

Examined material: Holotype (SF, gen. prep. 2479); in the BM.

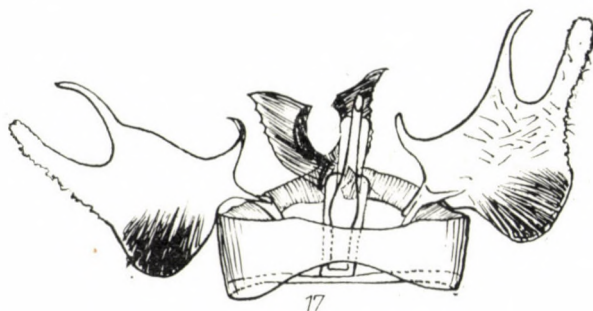
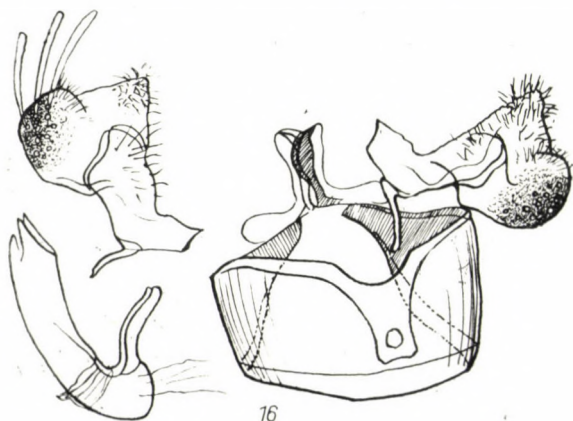
***Episcardia ensigera* sp. n.**

Alar expanse: 14 mm. — Head, antennae light yellowish-(ochreous) white, scapulae and thorax purplish-grey with a brassy shine; fore wing dark



stramineous with some rufous and light golden shine, apical field with some irroration of rufous scales; cilia yellowish-white; hind wing grey with a strong brassy golden shine, cilia whitish.

Male genital organ: uncus-arms two strong crests (like a heavy broadsword), arcuate above, serrate externally and very concave internally;



Figs. 16—17. Male genital organ of: 16 = *Episcardia extraphalla* sp. n., ventrally, left valva removed, aedeagus removed, laterally, Holotype, gen. prep. 2479; 17 = *Episcardia ensigera* sp. n., ventrally, Paratype, gen. prep. 2482

vinculum a very narrow band, widest laterally and again constricted ventrally; valva essentially circular with three long appendages; proximal two elongated, aciculate, recurving, distal one elongately lobate with emorse margins, distal base with a large, circular batch of densely arranged spines; aedeagus fine, slender, tubular (Fig. 17).

Genitally, the new species stands nearest to *effulgens* GOZMÁNY, 1965 (Acta Zool. Hung., II, p. 273), but the shape of the uncus and the vinculum are conspicuously different.

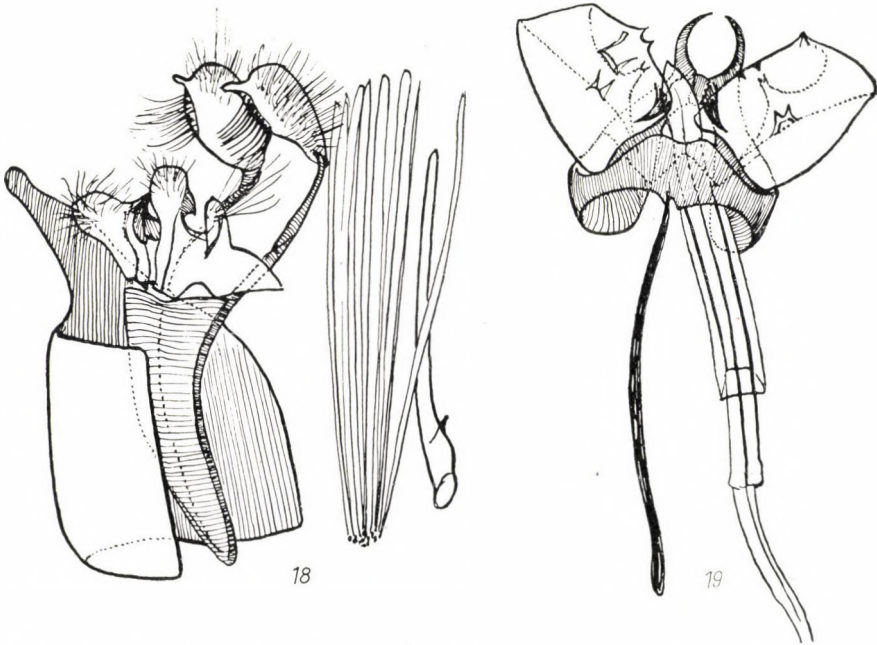
Examined material: Holotype (SF, gen. prep. 2476), and one Paratype (B, gen. prep. 2482); in the BM and the HNHM.

*Tinissa* WALKER, 1864

(List Specimens Lep. Ins. Brit. Mus., 29, p. 780)

*Tinissa ruwenzorica* sp. n.

Alar expanse: 22 mm. — Head, labial palpi white mixed with grey, scape white, antennae greyish-white, scapulae and thorax basally fuscous, distally profusely mixed with white; basic color of fore wing stramineous,



Figs. 18—19. Male genital organ of: 18 = *Tinissa ruwenzorica* sp. n., ventro-laterally, in situ (in left half of last abdominal segment), corema and aedeagus removed, Holotype, gen. prep. 1957; 19 = *Organodesma ornata* sp. n., ventrally, Holotype, gen. prep. 2016

lightest basally, gradually more suffused with light brownish and yellowish-brown apically, pattern very indistinct, consisting of numerous cross striae, distinct only on costa and dorsum, evanescent in middle of wing; most conspicuous feature a wide, medially broken angular transverse stripe, confluent of about three narrow striae, in  $\frac{3}{4}$  of wing, interrupted at discocellular and above tornus by a brassy patch, followed by a dark stramineous transversal stripe delimiting apical area, this latter brownish stramineous toward costa and dark fuscous toward tornus and termen, these colors arranged rather along veins; cilia whitish, with a blackish subbasal line; hind wing light, almost translucent whitish-grey; cilia whitish.

**Male genital organ:** uncus two elongate, balloon-shaped pads, hairy dorsally but with a row of strong bristles ventrally; vinculum extremely narrow, rod-like; saccus shield-shaped, long, valval complex hardly homologizable, a hairy, clavate appendage with a claw-shaped, pointed excrescence inwards, and another hairy outgrowth distally; aedoeagus relatively short, coremata longer, last abdominal segment strongly sclerotized, with an ex-clinate, long, dorsal appendage on side, embracing and backing genital organ (Fig. 18).

The new species is amply distinct by its uncus, the structure of the valvae, and the short aedoeagus from its sole congener in the Ethiopian Region, *spaniastra* MEYRICK, 1932 (Trans. Ent. Soc. London, **80**, p. 118), with its uncus-pads having recurving, dorsal hooks, differently constructed valvae, and an aedoeagus much longer than the entire genital organ; this latter species was described from the Jem-Jem Forest, Ethiopia, 8000 ft., hence this genus, too, seems to be an alpine taxon.

Examined material: Holotype ("Uganda: Ruwenzori Range, Mahoma River, 6700 ft. 13-16. VIII. 1952, D. S. FLETCHER + gen. prep. 1957"); in the BM.

*Organodesma* GOZMÁNY, 1965

(Lambillionea, **64**, p. 6-8)

*Organodesma ornata* sp. n.

Alar expanse: 13-14 mm. — Head, labial palpi light whitish-brown, with some stramineous, antennae concolorous, with an anterior, longitudinal, brown stripe, scapulae and thorax light ochreous rufous or fawnish; basic color of fore wing light stramineous-rufous, but visible only as transversal stripes between 5 wide, also transversally situated, zones or patches of deep fawnish bordered by a line of chocolate brown scales; these patches bearing long, semierect, light yellowish to stramineous bundles of hairs and scales characteristic of genus: at base, one in fold at 1/5, another one in fold at 1/3 with a neighbouring one above it in cell, one below costa at 2/3, and three at 3/4 (one on costa and two on discocellular, all three forming a bar of bundles delimiting apical area basad), apical area with some irregularly spaced striae of basic color, fawnish and blackish, giving a slightly chequered appearance to this region (as though in a *Lithocolletis*-species); cilia stramineous; with two dark lines and some dark bars; hind wing grey, with a strong brassy shine, cilia yellowish-grey.

**Male genital organ:** uncus-arms resembling a strong forceps or chelae with sharply pointed apices, otherwise vinculum, valvae, saccus, and aedoeagus of a structure characteristic of the genus (Fig. 19).

Aside of the differences in basic color and pattern, the new species can be separated at once, by the configuration of its uncus, from all known congeners.

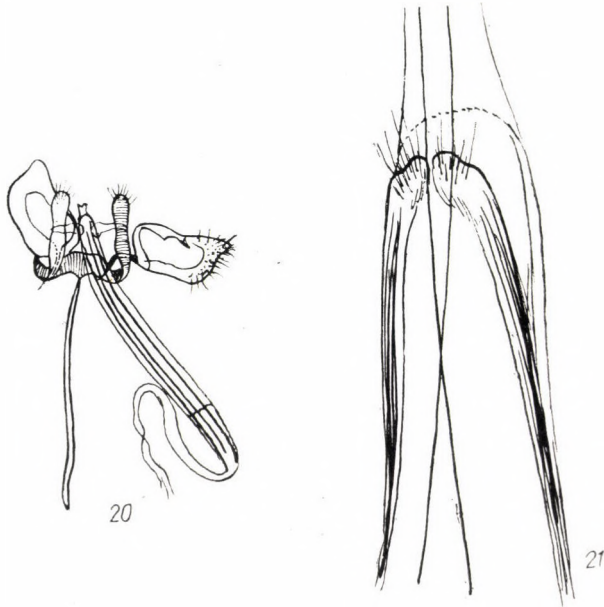
Examined material: Holotype (SF, gen. prep. 2016), and one Paratype (SF, gen. prep. 2012); in the BM and the HNHM.

*Silosca* GOZMÁNY, 1965

(Acta Zool. Hung., II, p. 279)

*Silosca leucomicra* sp. n.

Alar expanse: 11 mm. — Head, labial palpi, antennae light whitish stramineous, scapulae and thorax concolorous but with a sparse admixture of deep brown (tips of whitish scales); basic color of fore wings whitish, pattern very light fawnish (or rufous), consisting of irregular, narrower and broader, transversal, often incomplete, striae, with a number (a light sprinkling) of chocolate brown scales (tips of white ones) along cell and in fold: dark design-elements rather inextensive, hence white basic color in preponderance; characteristic bundles of semierect hairs and scales white: at base, in middle of cell, at end of fold, and some scales on and beyond discocellular (thus their number



Figs. 20—21. Male genital organ of: 20 = *Silosca leucomicra* sp. n., dorsally, Holotype, gen. prep. 2483; 21 = Female genital organ of ? gen. ? spec., ventrally, genital slide 9549, BM.

also fewer than in all known allies); cilia white with some protruding fawnish and brown scales; hind wing whitish-grey, cilia whitish with some yellowish shine.

**Male genital organ:** widely separated uncus-arms two small, erect, elongate lobes, constricted in middle; gnathos two small arms subtending aedoeagus; valvae roughly quadrangular with involute margins and a small tooth; aedoeagus as long as bacilliform saccus (Fig. 20).

The new species stands alone in the genus by its very small size and the angular valvae; it resembles only the organ of *petaloxantha* (MEYRICK, 1931; Exot. Microl., 4, p. 98), which has, however, ovably rounded valvae.

Examined material: Holotype (SF, gen. prep. 2483); in the BM.

? gen. ? spec.

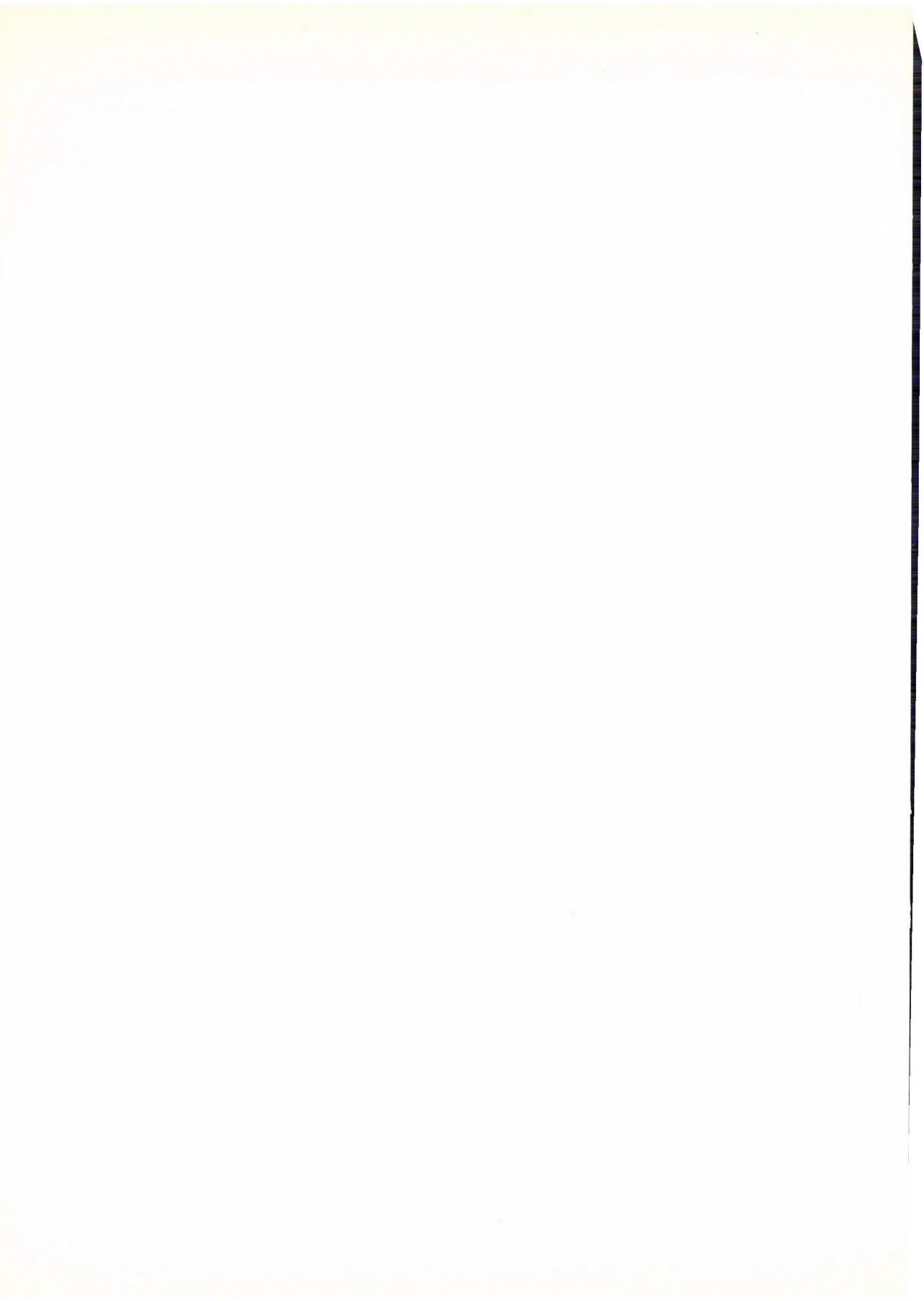
A female specimen of unknown relationship.

Alar expanse: 25 mm. — Head, labial palpi fuscous mixed with yellowish, antennae ringed yellow and fuscous, scapulae and thorax fuscous with some yellowish scales along margins; basic color of fore wing fuscous, with a dense admixture of black scales and some irregular, yellow intrusions forming small dots mainly around margins, cilia yellowish-grey; hind wing yellowish, with some greasy fuscous scales around margins and more in apical area, cilia light yellowish.

**Female genital organ:** apophyses anteriores not discernibly delimited in slide, probably due to insufficient staining, meeting clavately in middle, hairy, ostium, ductus and bursa not discernible (Fig. 21).

Examined material: "Uganda: Ruwenzori Range, Nyamaleju, 10,530 ft. 14—19. VII. 1952, D. S. FLETCHER + B. M. genitalia slide 9549" (BRADLEY); in the BM.

Author's address: Budapest, VIII., Baross u. 13, Hungary



THREE NEW SYMMOCID SPECIES  
FROM WEST AND CENTRAL AFRICA  
(LEPIDOPTERA)

By

L. A. GOZMÁNY

ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST  
(DIRECTOR: DR. Z. KASZAB)

(Received July 1, 1965)

*Aprominta australis* sp. n.

Alar expanse: 14-15 mm. — Head vivid ochreous yellow, second joint of labial palpi blackish, inside and third joint vivid ochreous yellow, scape and basal fifth of antennae blackish, tending lighter and finally light grey, scapulae and thorax fuscous basally, ochreous yellow caudally; basic color of fore wing a deep ochreous yellow, sparsely irrorated with fuscous, pattern sharp, fuscous blackish: a spot on costa at base, two spots at 1/3 (in cell and fold) in a perpendicular line, two on discocellular (at 2/3), upper one considerably larger than lower one, this latter slightly displaced from perpendicular, rather toward tornus, some blackish dots around and below apex, cilia yellow,

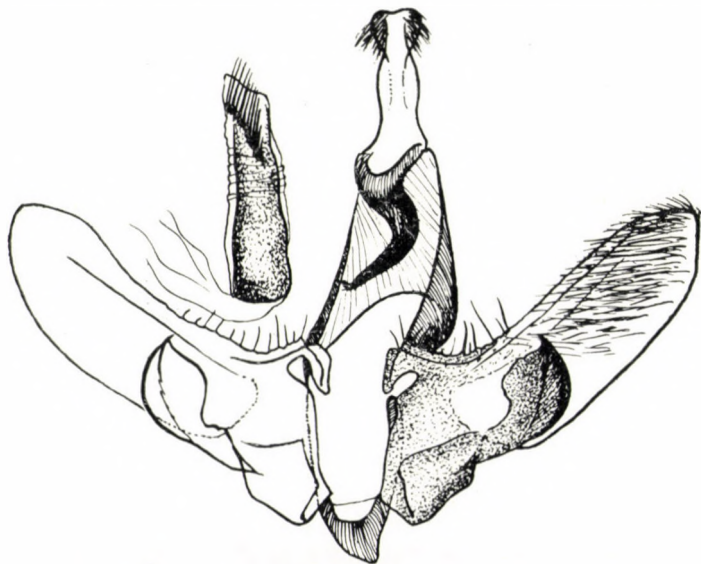


Fig. 1. Male genital organ of *Aprominta australis* sp. n., ventrally, aedeagus removed, Holotype, gen. prep. 2504

with numerous blackish scales; hind wing sericeous to stramineous light grey, cilia light yellowish-grey with an extensive but indistinct greyish subbasal shade.

**Male genital organ:** uncus, tegumen, and gnathos of normal structure; valva spatulate, widely rounded apically, margins parallel, no costal appendage, transtillae blunt, reclinate folds, upper margin serrate; sacculus half as long as valva, basally wide, apically strongly falcate, arcuate in a wide and even arch, subtending a large, semicircular lobe; anellus short, angular; saccus short, rounded (Fig. 1). Aedoeagus sinuous basally, straight apically, with a batch of long cornuti in vesica.

Female unknown.

The venation of the new species relegates it to the genus *Aprominta* GOZMÁNY, 1957; the genital structure is also characteristic, but the pattern resembles that of the true *Symmoca*-taxa. This is the second known species from Africa; *A. africana* GOZMÁNY, 1961, though superficially similar, has long, acicular valval appendages.

**Type-material:** Holotype: "Africa, Guinée, Coyah + 1963. XII. 8, leg. DR. K. FERENCZ + gen. prep. 2504"; one male Paratype: ditto, but "1964. VI. 23" (two generations?) deposited in the Hungarian Natural History Museum, Budapest.

#### ***Afrosymmoca* gen. n.**

Wings as in *Aprominta* GOZMÁNY, 1957, but hind wing very narrow, hence  $rr + m_1$  on a very long stalk.

Of the nearly related genera, *Clerogenes* MEYRICK, 1921 (South Africa), has both cubitals present on the fore wing and  $m_3 + cu_1$  on a minute stalk on the hind wing, but the pattern is rather similar except for the obliquely situated first pair of spots; *Pantacordis* GOZMÁNY, 1957, though of an almost identical venation, is precluded by the absence of a distinct pattern and the different construction of the male genital organ.

**Type-species:** *A. seydeli* sp. n.

#### ***Afrosymmoca seydeli* sp. n.**

Alar expanse: 13–14 mm. — Head stramineous, second joint of labial palpi fuscous externally, stramineous internally, together with third joint; antennae grey, scapulae and thorax stramineous, occasionally with some fuscous scales basally; fore wing stramineous, with a sparse irroration of blackish scales especially in apical area, pattern blackish: two spots at 1/3 (one in cell and one in fold), lower one slightly more removed from base, upper spot larger, two confluent discocellulars, a preapical and tornal indistinct spot or accumulation of dark scales, smallish dots around apex and along termen,



cilia concolorous, with numerous blackish scales; hind wing light grey, cilia yellowish-white.

Male genital organ: uncus, gnathos, and tegumen of normal Symmocid construction; valva weak, evenly tapering to rounded apex, dorsum with a very weak, dactyloid appendage, costa here refolded into intricate transtillar complex: two reclinate, long lobes connected basally by a bridge, apically with two aciculiform, recurving spines in juxtaposition, subtending tubular anellus (not shown in figure); sacculus straight, margins subparallel, costa slightly serrate, apex pointed; saccus short; aedoeagus short, cylindrical with two bundles of aciculate cornuti (Fig. 2).

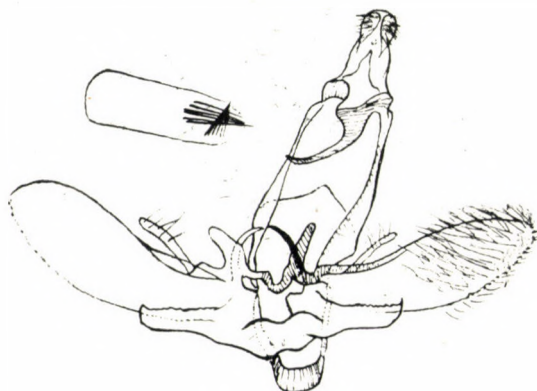


Fig. 2. Male genital organ of *Afrosymmoca seydeli* gen. n., sp. n., ventrally, aedoeagus removed, Paratype, gen. prep. 2135

The new species is similar to *Clerogenes meledantis* MEYRICK, 1921, but the first pair of spots on the fore wing is oblique basad in this latter species, and its genital organ is quite dissimilar.

Type-material: Holotype: "Coll. Mus. Congo, Elisabethville, X-1949, CH. SEYDEL + gen. prep. 2135"; 1 Paratype: "Elisabethville, IV-V 1952, CH. SEYDEL". Holotype deposited in the Royal Museum of Central Africa, Tervuren, Paratype in the Hungarian Natural History Museum, Budapest.

The species seems to have two generations.

I dedicate the fine new species to the late CH. SEYDEL, zealous collector in Elisabethville for many decades.

#### *Afrosymmoca straminea* sp. n.

Alar expanse: 13–14 mm. — Head, labial palpi (second joint inside and third joint), scapulae, thorax, and fore wing ivory, pattern very small, fuscous blackish, two small dots at 1/3 and two on discocellular at 2/3, both pairs converging toward dorsum, some few dark scales on costa and in apical area, minute dots around apex and on termen, cilia concolorous; hind wing light whitish-grey, cilia yellowish-white.

Male genital organ: uncus, tegumen, and gnathos normal but gnathos rather small; valva rather narrow, slightly constricted in middle, evenly rounded apically, costal appendage long, dactyloid, transtillae small, blunt, removed from one another; sacculus extremely broad basally, long, narrow, dorsally sinuous, apically mucronate and recurving; anellus large; saccus rather long; aedoeagus long, very wide, tubular, without any observable cornuti (Fig. 3).

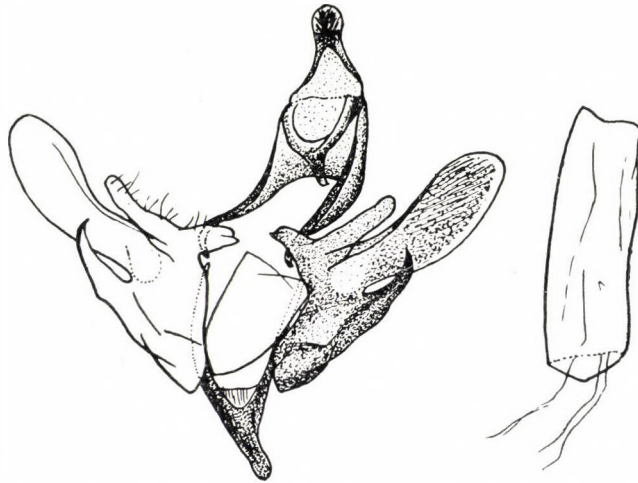


Fig. 3. Male genital organ of *Afrosymmoca straminea* sp. n., ventrally, aedoeagus removed, Paratype, gen. prep. 2506

I assign the new species with some doubts to the new genus described above; except for the highly similar coloration and pattern to *seydeli* sp. n., and the identical venation, its male genital organ rather resembles that of certain *Symmoca*-species from the Near East. The *Symmocid* species of the Ethiopian Region are as yet very imperfectly known, and their classification will need much future study.

Type-material: Holotype: "Coll. Mus. Congo, Elisabethville, X-1949, CH. SEYDEL + gen. prep. 2511"; 1 Paratype: ditto + "gen. prep. 2506". The Holotype is deposited in the Royal Museum of Central Africa, Tervuren; the Paratype in the Hungarian Natural History Museum, Budapest.

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Author's address: Budapest, VIII., Baross u. 13, Hungary

THE TAXONOMIC STATUS OF THE YELLOW-GREEN  
VIREO, *VIREO FLAVOVIRIDIS* (CASSIN),  
FROM THE TRES MARIAS ISLANDS, MEXICO,  
WITH ADDITIONAL NOTES

By

P. R. GRANT

DEPARTMENT OF BIOLOGY AND PEABODY MUSEUM OF NATURAL HISTORY,  
YALE UNIVERSITY, NEW HAVEN, CONNECTICUT, U. S. A.

(Received March 25, 1965)

In 1885 MADARÁSZ described a new subspecies of Yellow-green Vireo, *Vireo flavoviridis*, from the Tres Marias Islands, off the Pacific coast of Mexico, (lat. 21° 30' N: long. 106° 30' W.). He named it *V. flavoviridis forreri* in honour of the collector, ALPHONSE FERRER. The single male specimen which MADARÁSZ had was in the National Museum Budapest and is presumed to have been lost in 1956.

In my recent studies at the Department of Zoology, University of British Columbia, Vancouver, Canada, I have investigated the taxonomic status of the island form of this species. Large series of specimens, from both the Tres Marias Islands and the adjacent mainland of Mexico, were assembled and compared. I have used the criterion of MAYR *et al.* (1953) for assessing the subspecific status of the two populations from which the samples were drawn. The length of the wing, tail and tarsus was measured in the standard way (BALDWIN *et al.*, 1931); the length of the bill was measured from the anterior edge of the nostrils to the bill-tip. Plumage comparisons were made indoors, under uniform lighting conditions.

**Comparisons.** There are three plumage-differences between mainland and island populations, two of which are subject to seasonal variation. The results of comparing the two samples are shown in Table I. They suggest that in both regions, there is a tendency for the grey colour of the pileum to be converted to brown during the summer months. From the physical condition of the plumage it is apparent that feather wear alone is not responsible for this change, which may be produced instead by a chemical transformation of the pigment.

The black margin of the pileum, which also forms the border of the pale superciliary stripe, is more distinct in mainland than in island specimens. Perhaps associated with the change in pileum colour, it tends to become more obscure late in the summer, particularly in the island birds.

The most obvious difference between the two samples is the colour of the eye-stripe. Due to the preparation, the pre-orbital part is frequently obscure in Museum specimens, hence the colour of the post-orbital part has been registered in the Table. All island specimens have a dull, grey eye-stripe, whereas in the majority of mainland specimens the stripe is white. MADARÁSZ (1885) found that the chin, throat and chest of his single island specimen was grey, and not pure white as in mainland specimens, but no difference in ventral colouring was revealed in the present study.

Table I  
Plumage characteristics

	Mainland specimens						Island specimens					
	April	May	June	July	August	Sept.	April	May	June	July	August	Sept.
1. Pileum colour												
Grey .....	—	9	19	3	—	2	5	5	24	—	—	—
Brown .....	—	—	3	3	—	—	—	—	3	10	2	—
2. Eye-stripe colour												
White .....	—	7	19	5	—	2	—	—	—	—	—	—
Grey .....	—	2	3	1	—	—	5	5	25	7	2	—
Not determined .....	—	—	—	—	—	—	—	—	—	3	—	—
3. Black border to eye-stripe												
Distinct .....	—	6	14	5	—	—	2	1	2	—	—	—
Indistinct .....	—	3	6	1	—	2	1	2	9	—	1	—
Absent .....	—	—	2	—	—	—	2	2	13	7	1	—
Not determined .....	—	—	—	—	—	—	—	—	3	3	—	—

Table II gives the measurements of mainland and island samples. Island birds are larger in all four dimensions, but in each dimension there is considerable overlap with mainland measurements.

**Taxonomic Comments.** None of the characters analysed are sufficient to distinguish the two populations by the criterion proposed by MAYR *et al.* (1953), i. e. 90% of one sample separable from 90% of another. The taxonomic criterion is most closely approached by the colour of the eye-stripe (Table I). By this character 84% of the mainland sample is separable from 100% of the island sample. Thus the mainland sample is not sufficiently distinct from the island sample to warrant subspecific recognition, according to the available evidence. Therefore island birds should be considered consubspecific with mainland birds. Cautiousness is additionally merited by the difficulty of assigning some island specimens to the "grey" or to the "white" categories of eye-

stripe colour. The name *forreri* should be applied henceforward to both island and mainland specimens from western Mexico, since it has priority over the existing name *hypoleucus* for mainland specimens. As a result of the presumed loss of the Budapest specimen, the only other specimen collected by A. FORRER (British Museum No. 85. 3. 10. 29, adult male, Tres Marias Islands, May 4, 1881) should now be designated the type specimen of *forreri*.

Table II  
Measurements (in millimetres)

	Mainland specimens		Island specimens	
	♂	♀	♂	♀
<b>Wing</b>				
Sample Number .....	23	19	41	16
Range .....	76.4 — 83.8	75.0 — 79.8	78.8 — 87.6	76.8 — 82.8
Mean $\pm$ 2 Standard Errors .....	81.13 $\pm$ 0.90	77.45 $\pm$ 0.61	83.47 $\pm$ 0.48	79.31 $\pm$ 0.89
Coefficient of Variation .....	2.651	1.724	1.839	2.509
<b>Tail</b>				
Sample Number .....	22	19	41	15
Range .....	50.7 — 58.9	49.0 — 54.9	43.2 — 62.2	50.4 — 57.9
Mean $\pm$ 2 Standard Errors .....	55.85 $\pm$ 0.81	52.28 $\pm$ 0.72	58.52 $\pm$ 0.55	53.99 $\pm$ 1.01
Coefficient of Variation .....	3.411	3.014	3.026	3.623
<b>Tarsus</b>				
Sample Number .....	23	19	41	16
Range .....	17.2 — 20.0	18.1 — 19.8	19.1 — 20.9	19.0 — 21.2
Mean $\pm$ 2 Standard Errors .....	18.89 $\pm$ 0.30	18.78 $\pm$ 0.21	20.03 $\pm$ 0.16	20.00 $\pm$ 0.35
Coefficient of Variation .....	3.843	2.465	2.521	3.475
<b>Bill</b>				
Sample Number .....	23	19	40	16
Range .....	9.6 — 11.8	9.3 — 10.8	10.1 — 12.8	9.7 — 12.8
Mean $\pm$ 2 Standard Errors .....	10.59 $\pm$ 0.23	9.90 $\pm$ 0.17	11.00 $\pm$ 0.16	10.52 $\pm$ 0.39
Coefficient of Variation .....	5.231	3.737	4.564	7.395

**Conclusions and Discussion.** It has been shown that not all mainland specimens can be reliably distinguished from island specimens. Hence the identification of Tres Marias birds in South America in winter (PETERS, 1931; ZIMMER, 1941; and others) is dubious.

It is not surprising that a subspecies, originally described with reference to a single specimen, is found to be invalid by modern standards. Another Tres Marias subspecies, *Myadestes obscurus insularis*, was originally described on the basis of several plumage characteristics (STEJNEGER, 1882), some of which

were almost certainly not real, but were produced by grease leaking through the skin and soiling the feathers (GRANT, 1965 c). What is surprising is that the Tres Marias Yellow-green Vireo is so close to being subspecifically distinct, in view of the fact that it migrates southwards in winter at the same time as the mainland vireos do, and probably mixes with them on migration and on the winter grounds.

The island Yellow-green Vireos generally have a less defined facial plumage pattern than the mainland birds, thus conforming to the usual tendency for island birds to have a non-distinctive plumage (GRANT, 1965a). However, in this species the process of reduction has not proceeded very far. It is possible that the process has been partly inhibited by interbreeding with mainland birds (cf. MAYR, 1963; ch. 17), a few of which might accompany the island birds to the islands in spring and summer. Similarly some island birds may never return to the islands, but breed with mainland birds on the mainland, and this may account for the presence in the mainland population of individuals with a grey post-orbital eye-stripe. Unfortunately, scarcely anything is known about the migration of these birds, or how they separate on the return to their breeding grounds.

This species is unusual for two reasons. It is sympatric on the Tres Marias Islands with a relative, *Vireo hypochryseus* (Golden Vireo): and it is a migratory species. It has been noted previously by several workers that the presence of congeneric pairs of species on islands is a rarity (e. g. AMADON, 1953). On the Tres Marias Islands there are 32 genera of terrestrial birds of which only two are represented by more than one species, whereas in an equivalent area of the adjacent mainland it may be estimated that at least 12 of these genera are represented by two species, some of the 12 genera by even three species. Most of the congeneric pairs on the mainland are sympatric, therefore a segregation of the species into different habitats does not account for the difference in numbers of congeneric pairs of species between the mainland and islands. Possible reasons for this difference, involving "number of species to area" relationships and interspecific interactions, have been discussed elsewhere (GRANT, 1965b). What is of concern here is that the Yellow-green Vireo is a member of one of the two genera which are represented by two species on the Tres Marias. The other genus is *Myiarchus*, comprising *M. tyrannulus* (Wied's Flycatcher) and *M. tuberculifer* (Dusky-capped Flycatcher) (on the adjacent mainland both genera are represented by three species, those mentioned above and *Myiarchus nuttingi* and *Vireo gilvus*). Now, one species of each genus, *M. tyrannulus* and *V. flavoviridis*, is a summer visitor only. This is unusual since only one of the 15 other Tres Marias passerine species is a migrant. It is of ecological significance because interspecific competition between two species of the same genus is thus limited to the breeding season when, presumably, food resources are high (LACK, 1954: ch. 13). Gizzard analyses showed

that at this time the congeners were feeding mostly on identical types though not sizes of food (GRANT, 1964). In view of the comments made above on the degree of distinctiveness of the Tres Marias Yellow-green Vireo, it is interesting to find that both resident species, *M. tuberculifer* and *V. hypochryseus*, are more distinct from their mainland counterparts than are the migrant congeners from their mainland counterparts.

**Summary.** The taxonomic status of the Yellow-green Vireo from the Tres Marias Islands, Mexico, has been investigated with 57 specimens from the islands and 42 from the adjacent mainland. Described as an endemic subspecies 81 years ago from a single specimen, the island population is now considered to be consubspecific with the mainland population. The identification of island birds on their winter grounds in South America is therefore dubious.

Island birds show a partial reduction in contrasting plumage pattern which is not, however, as striking as it is in other forms from the Tres Marias. It is suggested that a certain amount of interbreeding between the two populations may occur, which would inhibit the process of morphological divergence. A resident congeneric species, *Vireo hypochryseus*, is more distinct from its mainland relative than *V. flavoviridis* is from its mainland counterpart.

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Author's address: Department of Zoology, McGill University, Montreal, Quebec, Canada



## THE APPLICABILITY OF PAPER CHROMATOGRAPHY IN THE TAXONOMY OF APHIDS (APHIDOIDEA)

By

L. HALMÁGYI

(Budapest)

(Received January 15, 1965)

### Introduction

Paper chromatography, since the year of its development (1943), gained ground to an unprecedented extent in numerous branches of chemical and biological disciplines. Since 1952, it was widely used also in zootaxonomy. Taxonomical works, based on paper chromatography are available for a number of systematic groups of animals. Several of the methods had been applied for this purpose. Thus the one-dimensional ascending and descending chromatography, two-dimensional and circular chromatographies. A number of various papers had been used, most frequently WHATMAN No. 1 chromatographic paper. Techniques also vary, according to the author in question. The comparison of ninhydrin positive patterns with those of fluorescent in ultraviolet light is also widely practised.

There is a wide diversity also in sampling. The examination of the body fluids, the placing of tissue and organ homogenates onto paper are equally employed. The simplest technique is the squashing of the entire animal on the paper. This latter method, though disparaged by biochemists, give excellent results in taxonomy.

For the taxonomist, it is not necessary to know the chemical composition of the factors involved in the development of the chromatograms. In the majority of investigations made until now, they are not or but superficially known. It is usually sufficient to obtain, within the taxonomic unit, constant and reproducible patterns, when these patterns more or less differ from those obtained by identical techniques from the units of a corresponding taxonomic value.

Patterns can only be compared if they be made by wholly identical techniques. Therefore, if the quality of the paper, the solvent, the volume of the development, its period and temperature all agree. It is also important that the chemical used for development, or, in the examination of the fluorescent patterns, the UV lamp and its filter be identical. The works of the various authors, and the chromatograms described by them, can rarely be compared

with each other, since the technique applied differ almost from author to author. It were desirable that research workers use, as far as conditions permit it, methods well proven for the animal group in question.

### Literature

Papers are grouped according to the taxonomical groups discussed. All works cited refer to the zoosystematical application of paper chromatography. The methods and techniques used are highly diverse.

LEE (1956) examined three, SESHACHAR and SAXENA (1963) six, Ciliates. SCHMIDT (1958), GÖSZWALD and SCHMIDT (1959, a, b) studied species groups of *Formica*. The paper of CLARK and BALL (1952), investigating four mosquito species, is chronologically the first taxonomic one based on paper chromatography. BALL and CLARK (1953), MICKS (1954), and LEWALLEN (1957) studied also mosquitoes. *Drosophila* and allied species were studied by chromatographic methods by RASMUSSEN (1954 a, b, 1955), RASMUSSEN and SCOSSIROLI (1954), SCOSSIROLI and RASMUSSEN (1954, 1957), FOX (1956), CORDEIRO (1960), and CORDEIRO, LEWGOY and TONDO (1960). GROSSBACH (1957) investigated 30 species of Lepidoptera.

Researches made on Hemiptera — Homoptera should be discussed in greater details. SHANG (1959) studied fresh and conserved specimens of 13 species of aquatic bugs belonging to six families. Both the fluorescent and ninhydrin-positive patterns were suitable to demonstrate specific differences. VARTY (1956) examined, by one-dimensional paper chromatography, three species of the genus *Adelges* and *Pineus pini* gall aphids. The chromatograms of the eggs strongly differed from those of the larvae and the imagos. In all species, the imagos gave constant fluorescent color patterns, regardless of the food plant species. By the help of the patterns obtained from the eggs or the imagos, the species could be distinguished. The patterns referred also to relationships, e.g. the highly similar patterns of *Adelges nüsslini* and *A. piceae* suggested the congeneric alliance by which BÖRNER relegated the two species to the genus *Dreyfusia*. According to MERKER's (1958) investigations, the fluorescent color patterns of the gall aphids *Dreyfusia piceae* do not show any essential difference, as to color spots and their arrangement, in American or European animals, even though they live on different fir species in the two continents. EICHHORN (1958) also studied the genus *Dreyfusia*, applying VARTY's method. The forms of the various developmental stages gave different patterns. The difference between the patterns of the egg and the first instar larva was greater than that between the developmental stages and the mature imagos. The patterns of the first, second, and third instar larvae were highly similar. By the help of the various and typical color combinations, the genera

*Dreyfusia*, *Pineus*, *Gilletteella*, *Sacciphantes*, and *Adelges* could be more or less sharply differentiated from each other.

The chromatographs of insect species belonging to a diversity of orders were compared by MICKS (1956), ROBERTSON (1957), MICKS and GIBSON (1957). These latter studied also three mite species. LEE, RENE and RODDY (1955) investigated four spider species.

In the taxonomical studies of mollusks, the method was used by KIRK, MAIN and BEYER (1954), WRIGHT, HARRIS and CLAUGHER (1957), WRIGHT (1959), MICHEJDA (1955, 1956, 1958, 1959), MICHEJDA and URBAŃSKI (1958), MICHEJDA and TURBANSKA (1958), COLLYER (1961), and HILLMAN (1964). CHEN and BALTZER examined the eggs and embryos of three echinoderms (1958).

Cyclostomata (Petromyzontidae) were studied by CARLSON (1961), fish by BUZZATI-TRAVERSO and RECHNITZER (1953), DANNEVIC (1955, 1956), RECHNITZER (1956), VISWANATHAN and KRISHNA PILLAI (1956), BARRY and O'ROURKE (1959), ENGE and MCKEE (1959), and MATSUMOTO (1960). All cited works justified the zootaxonomical applicability of the paper chromatography method.

A summary of the papers published in this theme was given by BUZZATI-TRAVERSO (1960).

#### Technique

The aphids used in my investigations were squashed mostly fresh, in a living state, on the paper. In some cases, I used also dry insects or materials conserved in alcohol for some days.

30×27 cm WHATMAN No 1 chromatography paper was used. The material to be studied was placed 3 cm from the shorter end of the paper, and also 3 cm removed from each other. The aphids were placed on the paper and squashed by a rough-tipped glass rod, possibly in a small place. I employed one-dimensional ascending chromatography. In the glass vessel used (volume about 25 liters), I developed two papers simultaneously, totalling 16 samples. For development, I used the upper phase of the mixture, made at laboratory temperature, of n-butylalcohol : acetic acid : water, at the ratio 4 : 1 : 5, widely used in chromatography. The papers were submerged to about 1 cm in the solvent, and they were not kept in the fumes of the solvent prior to development. The chromatograms were made at  $20 \pm 1^\circ \text{C}$ , in about 16 hours. Drying was effected at room temperature.

After desiccation, the spots fluorescing in ultraviolet (UV) light were marked in a dark room. The quartz-lamp had a 300 W bulb and a UG-2 filter. This filter mostly transmits 350 m $\mu$  wavelength rays, almost completely eliminating all visible ones. The different materials gave fluorescent absorbing spots of diverse colors and intensity.

The chromatograms can be stored and studied even after weeks; however, colors fade in different degrees with time. According to VARTY (1956), concentrated ammonia is then to be evaporated, and the papers studied above it. In my experience, the colors are not as excellent as originally. — I have not studied ninhydrin-positive samples, but, as an experiment, I sprayed some papers with an alcoholic solution of ninhydrin. These papers showed no fluorescence in UV light. This finding agrees with RECHNITZER's (1956) experiences concerning fish.

#### The species and system studied

In the following, I give the name of the species and their place in the system in accordance with BÖRNER's (1952) work.

## Fam. LACHNIDAE

*Lachnus roboris* L.

## Fam. CHAITOPHORIDAE

*Periphyllus villosus* HTG.

## Fam. CALLAPHIDIDAE

## Subfam. Phyllaphidinae

*Drepanosiphon platanoidis* SCHRK.

## Subfam. Callaphidinae

*Callaphis juglandis* WALK.*Eucallipterus tiliae* L.*Tuberculoides annulatus* HTG.

## Fam. APHIDIDAE

## Subfam. Aphidinae

## Trib. Rhopalosiphonini

*Hyalopterus amygdali* BLANCH.

## Trib. Aphidini

*Aphis sambuci* L.*Aphis fabae* SCOP.*Medoralis pomi* DEG.

## Subfam. Myzinae

*Myzus pruniavium* CB.

## Subfam. Dactynotinae

## Trib. Aulacorthini

*Metopolophium caraganae* CHOL.

## Trib. Macrosiphonini

*Macrosiphon rosae* L.

## Trib. Dactynotini

*Macrosiphoniella* sp.

## Fam. PEMPHIGIDAE

*Pemphigus spirothecae* PASS.**Results**

*Lachnus roboris* L. — Winged and apterous viviparous females, collected 25 July, 1964, in Tahitótfalu on young stems of *Quercus petraea*. From the point of view of comparison, it is worthy of note that a hardly fluorescent, greyish-brown, elongated spot was found on the lower part, of a low  $R_f$  value, of the chromatogram. The chromatograms of the winged and apterous females displayed an agreeing picture. Even the chromatogram of a single, mature specimen was easily evaluable. The same picture was given by chromatograms made from larvae of various ages, but even 8–10 larvae failed to give as intensive a fluorescence as a single mature one. Of course, this amount is strongly influenced and modified by the developmental stage and size of the larvae. — The chromatograms were studied also after the lapse of some weeks, and it was found that the lemon yellow spot had hardly fluoresced, and after some time again, there was an absorbing brown spot in its place. I have observed this phenomenon also in other species. Aside of the freshly squashed animals, I have made chromatograms also from specimens conserved in 70

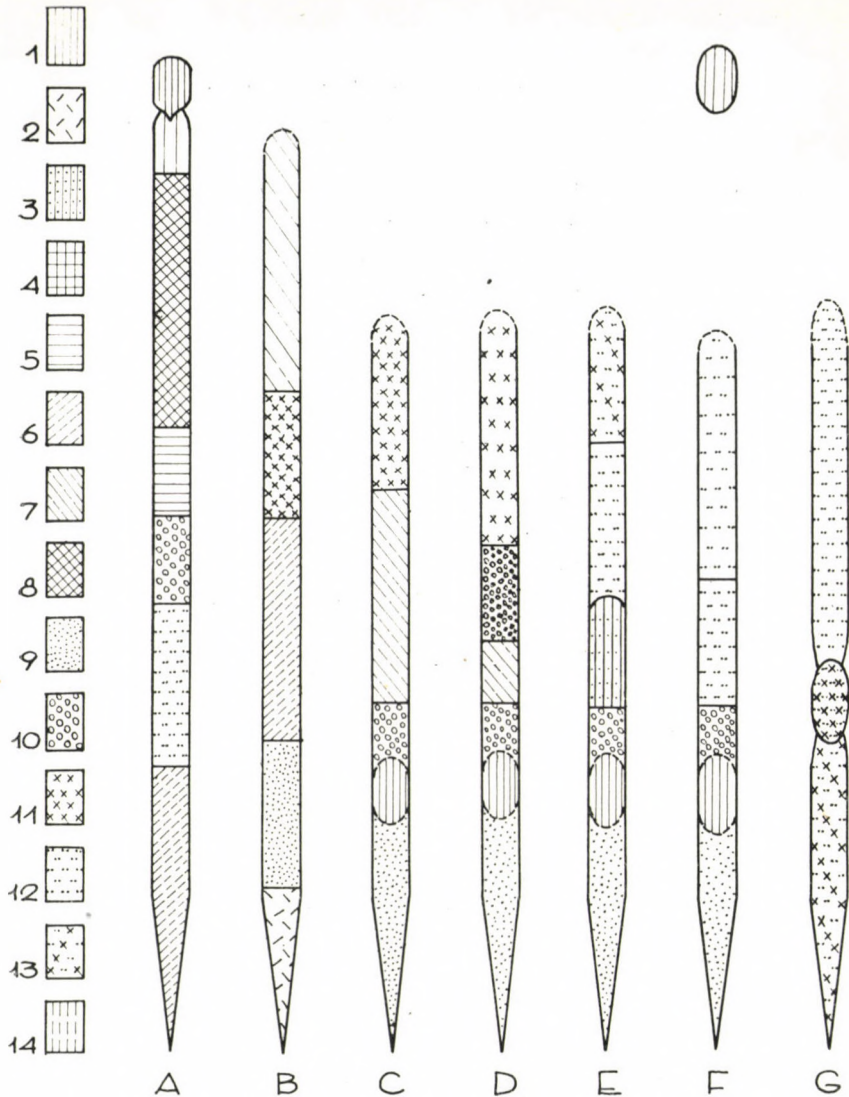


Fig. 1. Chromatographic fluorescent color patterns of parthenogenetic female aphid species belonging to diverse families. 1 = lemon yellow, 2 = ochreous yellow, 3 = dirty yellowish, 4 = orange red, 5 = reddish-brown, 6 = yellowish-brown, 7 = brown, 8 = dark brown, 9 = turquoise blue, 10 = blue, 11 = violet, 12 = greyish-blue, 13 = violet-blue, 14 = yellowish-green. Density of pattern within a given chromatogram expressing also intensity of color. Broken lines indicating indistinct border of spots.

A = *Lachnus roboris*, B = *Periphyllus villosus*, C = *Drepanosiphon platanoidis*, D = *Callaphis juglandis*, E = *Eucallipterus tiliae*, F = *Tuberculoides annulatus*, G = *Pemphigus spirothecae*

per cent ethylalcohol for one day. In this case, the yellow spot of a high  $R_f$  value was very slightly fluorescent, and the pale yellow section, otherwise visible below it, had completely disappeared. The yellow color was probably due to some material highly soluble in alcohol. With respect to the other spots, the chromatogram was the same.

*Periphyllus villosus* HRG. — Apterous viviparous females and larvae collected on 3 May, 1964, on the underside of *Acer platanoides* leaves, in Gödöllő. All specimens examined were yellowish-green.

The chromatogram made from the larvae showed a pattern similar to that of the mature ones. The yellow lower part of the chromatogram is characteristic, and the turquoise and violet spots are also vividly fluorescent. For a good chromatogram, one needs about 4 developed, apterous, viviparous females.

*Drepanosiphon platanoidis* SCHRK. — Winged, viviparous females collected on 3 May, 1964 (also in the inflorescence), 22 July, and 5 August, 1964, on the underside of *Acer pseudoplatanus* leaves, in Gödöllő. Also winged males and apterous, oviparous females, collected on 28 Oct., 1964, on leaves of *Acer pseudoplatanus*, in Gödöllő. — The long blue spot on the lower part of the chromatogram was the most intensely fluorescent. Among the parthenogenetic, viviparous females, a small number of specimens of a reddish color, differing from the typically pale greenish ones, were also studied. Their chromatographic patterns agreed with those of the pale green individuals. Nor was there any difference between the chromatograms of specimens collected on the leaves and in the inflorescences.

The chromatograms of the freshly squashed and developed, the freshly squashed and a day later developed, specimens as well as of those kept in 70 per cent alcohol for one day, were visibly identical. The intensity of the corresponding spots was also agreeing with each other. The spots, however, of the chromatograms deriving from specimens kept for two days in 70 per cent alcohol were discernibly less fluorescent, but the chromatogram was still easily interpretable. The spots of the chromatograms of animals kept dry for five days were also conspicuously weaker, but the chromatograms were still assayable. The spots of specimens conserved for about a week in 70 per cent alcohol were very weak, and they could not be used for evaluation.

The chromatograms of sexual females and males differed from one another and also from those of the viviparous females (cf. Fig. 3). The chromatogram of the last stage larvae of male individuals agreed with that of the mature males.

*Callaphis juglandis* WALK. — Winged viviparous females and larvae collected on 18 June, 1964, on the upperside of *Juglans regia*, in Gödöllő. The blue spots were the most fluorescent ones on the chromatograms. The larvae of different ages and developmental stages showed chromatographic

patterns similar to those of the mature animals. A single mature specimen was sufficient to make a good chromatogram.

*Eucallipterus tiliae* L. — Viviparous females, nymphae, and larvae collected on the underside of *Tilia platyphyllos* and *T. cordata* leaves, on 18 and 20 June, 1964, in Gödöllő. All examined developed specimens belonged to the typical form with a dark-spotted dorsal side. On the chromatogram, the blue spot of the lower part was the most intensely fluorescent. The chromatograms

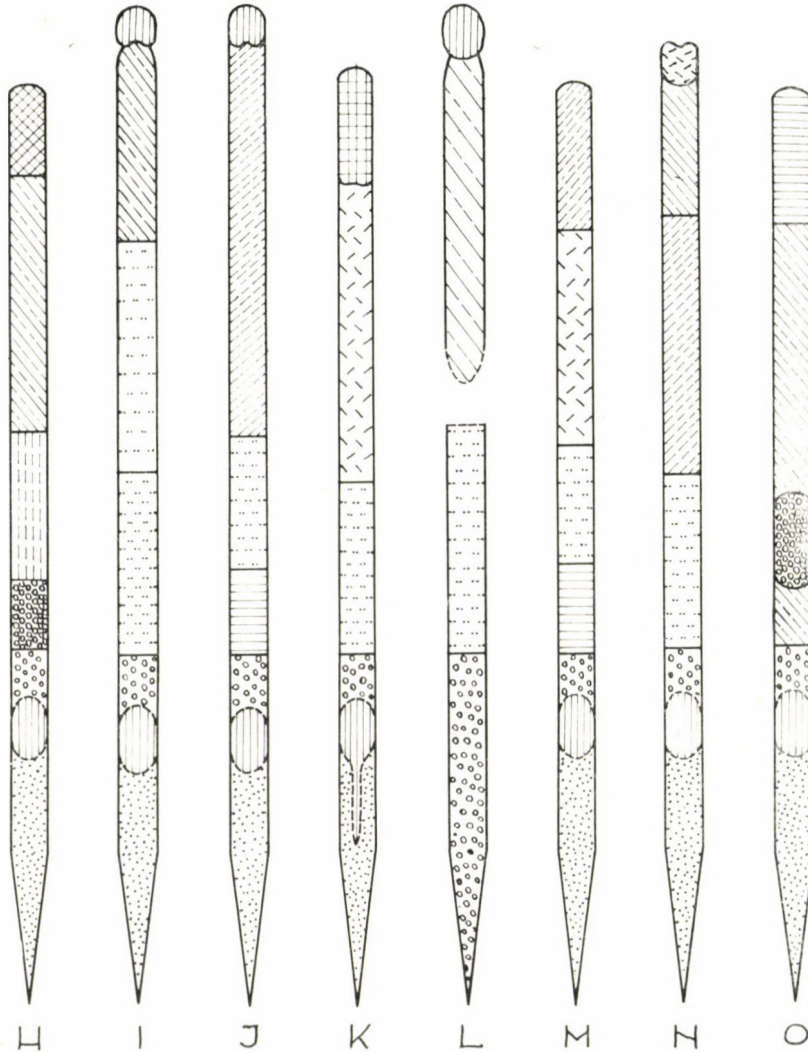


Fig. 2. Chromatographic fluorescent color patterns of parthenogenetic female aphid species belonging to the family Aphididae. H = *Hyalopterus amygdali*, I = *Aphis sambuci*, J = *Aphis fabae*, K = *Medoratis pomi*, L = *Myzus pruniavium*, M = *Metopolophium caraganae*, N = *Macrosiphon rosae*, O = *Macrosiphoniella* sp.

of the larvae and nymphae are very similar to those of the mature individuals. The chromatograms of the specimens living on the two lime tree species were identical. For a good chromatogram, 5–6 mature specimens are indispensable.

*Tuberculoides annulatus* HTG. — Viviparous females collected on the underside of *Quercus robur* leaves, on 10 July, 1964, Máriabesnyő. Blue colors are dominant on the chromatogram. The lower, partly yellowish, long spot is the most intensely fluorescent one. About 10–12 individuals are necessary for a good chromatogram.

*Hyalopterus amygdali* BLANCH. — Viviparous females collected on the underside of *Prunus persica* leaves, on 16 June, 1964, in Gödöllő. On the chromatogram, the 0.33  $R_f$  blue spot is the most striking one. Two or three mature exemplars are needed for a good chromatogram.

*Aphis sambuci* L. — Viviparous females and nymphae collected on the leaves and young stems of *Sambucus nigra*, on 2, 8, 17 July, 1964, Gödöllő. The lower, long blue spot, and the upper lemon colored one are strongly fluorescent. The chromatographic patterns of the developed apterous, viviparous females, and winged viviparous females as well as the nymphae showed an agreeing picture. In some cases, I have studied specimens which were feeding on the "willow-leaf" garden variety of the elder. The chromatograms of these specimens did not differ from those of the preceding ones. For a good chromatogram, two mature individuals are necessary.

*Aphis fabae* SCOP. — Winged, viviparous females collected from the young shoots and leaves of *Robinia pseudoacacia* and *R. viscosa*, on 29 June, 1964, Gödöllő. Also some oviparous, apterous females and winged males collected from the underside of *Euonymus europaeus* and *Deutzia crenata* leaves, on 28 Oct., 1964, Gödöllő. The blue and lemon yellow spots were the most vividly fluorescent ones. The chromatographic patterns of the winged, viviparous females living on the two locust tree species showed no appreciable differences. Nor were there any between the chromatographs of nymphae and mature, winged females. The chromatograms of the males and oviparous females had slightly differed. Thus the yellow spot on the upper part of the chromatogram, hence of a high  $R_f$  value, was larger in the females and of an intenser fluorescence (cf. Fig. 3). There was no difference in the chromatograms of the corresponding forms collected on *Euonymus* and *Deutzia*. Usually two mature specimens are necessary for a good chromatogram.

*Medoralis pomi* DEG. — Apterous, viviparous females and larvae collected on *Sorbus aucuparia* leaves, on 3 July, 1964, Gödöllő. The chromatogram of the larvae was very similar to that of the mature insects. Characteristical for the pattern is the strong yellow discoloration penetrating into the blue spot on the lower part, and the vividly brownish-red spot observable on the upper section. For a good chromatogram, 5–6 mature specimens are indispensable.



*Myzus pruniavium* Cb. — Apterous, viviparous females collected on *Prunus avium* leaves, on 16 June, 1964, Budapest: Sashalom. The lemon yellow spot on the upper part of the chromatogram, hence of a high  $R_f$  value, is the most intensely fluorescent. When examining a smaller amount of material (2–3 specimens), this showed as a weakly oval spot, but covered like a cap the absorbing brown spot situated below it in the case of a larger sample. It seems that the two compounds, causing the yellow and brown spots, do

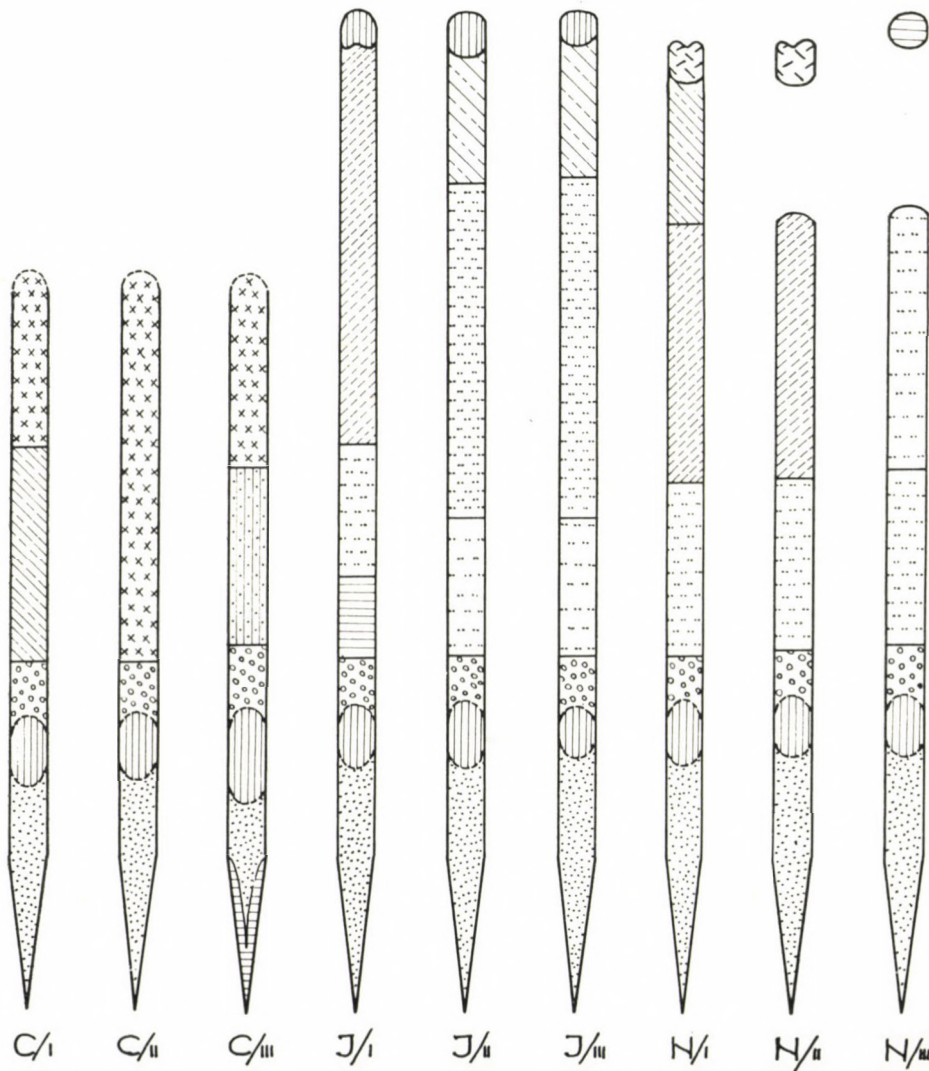


Fig. 3. Chromatographic fluorescent color patterns of parthenogenetic viviparous females, oviparous females and males. C = *Drepanosiphon platanoidis*, J = *Aphis fabae*, N = *Macrosiphon rosae*. I = viviparous female, II = oviparous female, III = male

not blend with one another. It is also worthy of note that there was no yellowish discoloration in the lower blue part.

*Metopolophium caraganae* CHOL. — Winged and apterous females and larvae collected on the underside of *Caragana arborescens* leaves, on 3 May, 1964, Gödöllő. The lower blue spot is the most fluorescent one on the chromatogram. The chromatograms of the winged and apterous, viviparous females were not discernibly different. The best chromatograms were received by the use of two mature specimens.

*Macrosiphon rosae* L. — Winged and apterous, viviparous females collected on the young shoots and leaves of shrub and high-stemmed roses of diverse flower colors, on 5 June, 1964, Gödöllő. Also oviparous females and males from the same plants, 28 Oct., 1964, Gödöllő. The chromatographic patterns of the winged and apterous, viviparous females agreed with each other. The hue of the yellow spot on the upper part of the chromatogram, hence of a high  $R_f$  value, was not identical with that of the spot derived from *Aphis fabae* or *Lachnus roboris*, but rather darker. The lower blue spot was vividly fluorescent on the chromatogram of also this species. The patterns of the oviparous females differed from those of the males (cf. Fig. 3). There were also greenish and fleshy red specimens among the females, but the fluorescent patterns of the two forms agreed with one another. Nor were there any differences between the patterns of the parthenogenetical or the bisexual generations, or those of the animals living on the shrub or high-stemmed rose forms. The chromatograms of specimens collected from variously colored flowers were also identical. Two mature specimens are necessary for a good chromatogram.

*Macrosiphoniella* sp. — Apterous, viviparous females collected from *Artemisia vulgaris* leaves, on 1 June, 1964, Gödöllő. A very nicely colored blue spot is observable in about the middle of the chromatogram. For a good chromatogram, 4–5 mature specimens are necessary.

*Pemphigus spirothecae* PASS. — Apterous virgos collected from the stalk galls of *Populus pyramidalis*, on 1 and 7 July, 1964, Gödöllő. The vividly fluorescent, slightly violet-blue spot is highly characteristic for the chromatogram of the species. Upward and downward of this spot, pale bluish discolorations are observable. Of the studied species, this is the poorest one in fluorescent substances. At least 10–12 animals are needed for a good chromatogram.

### Discussion

The purpose of my paper was not the solution of a given systematical or taxonomical problem. I attempted to obtain data on the applicability of the paper chromatography method in the taxonomy of aphids. The papers of VARTY (1956), MERKER (1958), and EICHHORN (1958) were positive in this

respect, but the insects studied by them belonged to the family Adelgidae, hence to the group Aphidina ovipara. On the other hand, the 15 species discussed in the present paper, belong to the group Aphidina viviovipara.

The advantage of the one-dimensional paper chromatography method used in this work lies in its simplicity. On the other hand, the segregation of the materials is here not as perfect as in the two-dimensional method. The spots of certain substances might cover one another on the chromatogram. If, however, this phenomenon occurs consistently for every individual of a specific form, hence an identical pattern develops, the method might be serviceable for taxonomy.

To place the material on the paper by squashing the entire animal on it is indubitably more primitive in contrast to the techniques based on the examination of a given organ or tissue. However, the extraction of organs and tissues of aphids, and especially those of minute species, is extremely difficult. An advantage again of the squashing method lies further in the possibility of identifying also damaged specimens which cannot be determined by the usual systematical processes, but obviously only if investigations had already been made, with the same techniques, on faultless exemplars of the species.

Invariably good chromatograms can be made of freshly killed specimens. No fluorescent spots appeared, however, in the case of materials preserved in alcohol for some time, hence the method is not suitable for the identification of museum materials. In certain cases assayable chromatograms could be made from materials kept for a few days in alcohol, or from dry specimens, but this has to be studied for every species to be investigated. For example, the chromatogram of *Lachnus roboris* specimens kept for a single day in alcohol had altered to such an extent that it could not be used, whereas that of *Drepanosiphon platanoidis* had not changed at all. These differences depend on the solubility, and/or decomposition, of the substances underlying the pattern. These same factors will determine the storage of the chromatograms without danger of fading. In any case, it is advisable to mark the spots shortly after drying, and to note the respective colors.

The chromatograms occasionally display colored spots also in ordinary light. However, there is no connexion between their color and that observed when the spots become fluorescent in UV light. Vividly fluorescent colored spots might be seen in places which are white in natural light. This seems to imply that it is not those colors constituting or participating in the development of the fluorescent patterns which give the characteristic coloration of the animal. The assumption seems to be further corroborated by the fact that the chromatograms of the different color varieties of *Drepanosiphon platanoidis* and *Macrosiphon rosae* agreed intraspecifically. This is advantageous for the taxonomic applicability of the selected method.

In the course of experiments, I also looked for information as to how far individual variation within the species might modify the developing fluorescent color patterns. I have compared 40 chromatograms each of *Drepanosiphon platanoidis* and *Aphis sambuci*, and 15 each of *Callaphis juglandis* and *Lachnus roboris*. Depending upon the size of the insects, some smaller deviations were found in the size of the area of the fluorescent spots constituting the color pattern. However, they were never of a rate which could have disturbed the development of the specifically characteristic pattern. The identity of the species causing the chromatogram could be established in every case.

The comparison of chromatograms made from individuals feeding on different plant hosts promised also interesting results. Although comparative material is still insufficient, the findings seem to be encouraging. The chromatograms were identical and characteristic for the aphid specimens of *Macrosiphon rosae* living on diverse rose forms, for *Aphis sambuci* individuals feeding on different elder varieties, and for the *Eucallipterus tiliae* exemplars infesting the two lime tree species, respectively the *Aphis fabae* specimens of the two locust tree species. The chromatograms of oviparous females and males of *Aphis fabae* collected on *Euonymus* and *Deutzia* were intraspecifically identical in spite of the fact that the two plant hosts belong to families removed rather far from one another (*Euonymus* = Celastraceae, *Deutzia* = Saxifragaceae). VARTY'S (1956) and MERKER'S (1958) similar results, discussed above, should be called to the mind again. Though, for a final decision of the problem, further investigations are needed, one might safely assume that the substances responsible for the development of the fluorescent color patterns are independent of the host species. Another useful point for insect taxonomy, since the chromatographic pattern is truly characteristic for the aphid species.

The results of investigations made on *Drepanosiphon platanoidis*, *Aphis fabae*, and *Macrosiphon rosae* seem to indicate that the chromatograms of the morphologically different generations of the species also differ among each other. This observation seems to justify the presumption that morphological differences invariably concur with biochemical ones. It also implies that any attempt to reveal relationships with the aid of the fluorescent color patterns will be successful and very similar only if the chromatograms made of corresponding forms only (e.g. parthenogenetic, viviparous females) be compared to each other.

For the comparison of the chromatograms of developmental stages and completely mature specimens investigated material is still insufficient. It only showed that the chromatograms of the developmental stages are similar to those of the mature forms. However, further studies are needed.

With respect to taxonomical points of view, it can be taken as established that there occurred in the examined material no species whose chromatogram —

— always comparing identical developmental stages — were identical with that of another taxon.

The number of the investigated species is also insufficient to draw inferences for establishing chromatographic features characteristic for supra-specific categories.

Further investigations may quite possibly modify the present picture, but it seems certain that paper chromatography can be a useful tool in the taxonomy of the aphids.

As was mentioned in the introduction, a taxonomist might employ chromatographic patterns even if he is incognizant of the chemical nature of the substances involved in the development of the patterns. I, too, desist from expounding these considerations. The pigment substances of aphids belong, from a chemical point of view, to compounds of intense and protracted studies. The preponderant portion of work is the merit of TODD and his collaborators (TODD, 1963, with further literature references). Although they have studied the pigments of species from which I have also made chromatograms, I cannot undertake the identification of the nature of the colored spots. Experimental technique is namely quite different, and a correct interpretation were possible only in the case of identical methods. Aside of the aphids, the special aphid pigments closely studied by TODD and his collaborators, obviously other substances had also influenced the development of the chromatographic color patterns.

It is my agreeable duty to express my thanks, also in this place, to Prof. Dr. E. DUDICH, Academician, who called my attention to this branch of investigation, and supported my work in every respect.

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Author's address: Budapest, VIII., Puskin u. 3, Hungary





ECOLOGICAL AND ETHOLOGICAL INVESTIGATIONS  
ON THE RIVER WARBLER  
(*LOCUSTELLA FLUVIATILIS* WOLF) POPULATION  
IN THE ALDERWOODS OF ÓCSA, HUNGARY

By

L. HORVÁTH and B. HÜTTLER

ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST  
(DIRECTOR: DR. Z. KASZAB)

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The River Warbler (*Locustella fluviatilis* WOLF) is not a far-ranging species, nor a frequent one. The centre of its range lies in Central Europe, whence it spreads, with a decreasing density, to the eastern parts of Central Europe and to Western Siberia. In Hungary, it can be found in rather great numbers in habitats suitable to its nature. Thus primarily in the gallery forests of the rivers Danube and Tisza, nor is it rare in the flood plain forests or the peaty marsh meadow copses of the Hanság and around Ócsa. Quite sporadically, it occurs also along the banks of brooks, fringed with alderwoods, in certain areas of the Central Range, especially near Sopron and in the Mts. Bakony.

At the first sight, it sounds rather astonishing that this bird, despite its relative frequency, is the least known one not only in the Hungarian avifauna but also in its entire range. This statement is corroborated by the fact that not a single communication discussed it for almost three-quarters of a century in the annals of the "Aquila". But the same holds for all of our zoological annals and periodicals containing also ornithological papers. Beyond the utter lack of scientific records, it is also striking that the clutch of this bird is missing from the collections of our home oologists, indeed it was not represented in the collection of 22 000 eggs, hence a truly egregious assemblage, of the Natural History Museum, destroyed in 1956.

It is perhaps less surprising now that data concerning the River Warbler is in general meagre even in the world ornithological literature. And there is no scientific paper, even of a summarizing nature, which would encompass the entire life history of this bird, or would at least submit detailed data on its ecology and ethology.

It is perhaps also superfluous to mention that our otherwise highly extensive bird photography, that consequently deals with very many species and is of an excellent standard, also entirely lacks photographs depicting this species.

The present paper is the first one not only in the respect that it gives an almost complete record of the life history of this bird, thus submitting wellnigh perfect informations concerning also its ecology and ethology, but the excellent photographs offered herein are also the first in literature, including also photography annuals or albums. The photos (Figs. 1, 2) reflect a true picture not only of the bird, but also its nest, the location and arrangement of the nests, as well as the eggs and fledgelings.

Now the question as to the defectiveness of our informations concerning this bird almost suggests itself. The explanation lies in the extremely hidden habits of the River Warbler, and the nature of its sites of occurrence. The home of the bird, the flood plain forests and marshy alderwoods stand in the greater part of the year under water, or are, at least during the incubational period, so swampy and treacherous as to be almost impassable. To this might be added the almost unbelievable swarms of mosquitos all but submerging the woods in May and June, together with the luxuriant mesh of the soft undergrowth. The great nettle and the clinging mass of cleavers, grown man-high, present almost unsurmountable barriers to investigation and observation. These sites are never mown, hence the lack of clutches in oological collections is readily understandable.

In places and circumstances like these does the River Warbler live. The nest is concealed in the densest sites, the bird never flies out directly from the nest but runs away below the undergrowth, and the male, with its song and behaviour, never gives the smallest suggestion to the watcher where its nest might be, indeed, it tries to deflect and mislead him.

In the cognizance of these facts should the task set to us be appraised, and the seemigly very few nests found, observed, and indeed, photographed, be evaluated. Because, though it is difficult to find the nest, to let the bird keep to it is an even more arduous task.

The River Warbler, aside of nesting in an extremely hidden place, is also excessively sensitive to every human interference. The discovery of the concealed nest is almost impossible without leaving the surrounding vegetation even relatively intact. And the bird immediately deserts its nest, even one containing eggs, if it finds any traces of disturbance.

Our intensive and systematical investigations were conducted in the years 1960—1963. Preceding this period, we had occasion to make casual observations in almost the entire area of the country, findings which had later satisfactorily supplemented our studies in the following four years. It is for this reason that we record here every fact deriving from our earlier experiences, to render a picture as true and universally valid as possible with respect to the conditions in Hungary of this species.

The intensive observations were made in April, May, June, 1960; June, July, August, 1961; May and June, 1962, and June, July, 1963. We have succeed-

ed, already in the first year, to obtain data concerning spring arrival, occupation of territory, nest building, egg laying, and incubational period. In the second year, our objective was the observation of the rearing of fledgelings, the action and movements subsequent to the leaving of the nest by the fledgelings, and autumnal departure. In the third year, we attempted to assess populations, with special regard to a survey of also the fellow breeders. Finally, the nests found in the fourth year gave excellent opportunities to complete our earlier ecological and ethological results.

**Spring arrival.** — In 1960, the first River Warbler arrived only on 3 May to the alderwoods near Ócsa. Two days later, its characteristically chirping note could be heard in several places, and, on 12 May, the entire forest was echoing to the voice of the many singing males. The cooler spring and the high groundwater in the major part of the woods might have been the causes of the late arrival. On the basis of rather regular observations, conducted since 1878, the species arrives in Hungary on the nationwide mean May 1.

**Courtship.** — Due to the extremely skulking habit of the female, the direct observation of the mating would be wellnigh impossible or at least a very fortuitous accident.

In several points of the area selected for nesting, the males begin singing immediately after arrival. The nuptial song differs from this in the circumstance that the bird sings always in exactly the same place, namely rather low and on a lateral branch or the tip of a shrub. On the other hand, the song designating the nesting site, or indicatory songs, are voiced frequently from very high. In the latter case, the male visits its trees selected for singing by flying always in the same direction, and there turning around and around it sings in every direction. On these occasions, its song resembles a kind of ventriloquation so that it is frequently very difficult to perceive, respectively observe, the singing bird. The nuptial song differs from the site-selecting one only in the frequent changes of its pitch, with the same deceiving results as in its constant turnabout. Its well-known bisyllabic, chirping song is introduced by a melodious but very soft strophe, audible only in the immediate vicinity of the bird. When, on 17 May, 1961, we have, together with GUY MOUNTFORT and ERIC HOSKING, recorded the song of the bird, and then replayed the amplified tape, this melodious, introductory theme was admirably discernible.

**Nest building.** — Owing to the extremely secretive habits of the bird, we succeeded only once to observe the building of the nest, and even then less the actual construction than the rate of building experienced from time to time. We found this nest on 10 June, 1960, perceiving it, after a protracted and very careful search, on the edge of a clearing overgrown with nettles in the alderwoods (the so-called Great Forest) near Ócsa. The exterior portion, that is, the beginnings of the nest were between five nettle stalks, and it consisted of 15–20 cm long and generally 1 cm wide sedge leaves. The bird constructed

the nest for four days, and it was observable only by the circumstance that we were able to watch the nest, spun on almost the outermost nettles densely covering the entire clearing, from a dense, dark, young alder forest without any undergrowth, and at very advantageous light effects. Otherwise the bird is extremely sensitive to disturbance, and we might safely state, on the basis of many previous and bitter experience, that merely by strolling about on the nesting area one can irrevocably scare the bird away, at least when there are no fledgelings yet. This holds doubly for the period of nest-building, and it is this very circumstance which further aggravates the difficult task of searching for the hidden nest for the sake of ethological observations. We shall not exaggerate when stating that, of all Hungarian species, this is by far the least observable bird.

The nest was completed in four days, on 14 June. Its outer, rather thick cover consisted of sedge (*Carex*) leaves, interwoven and also spun onto the buttressing nettle stalks. Inside, it was lined with 1 mm thick, nodeless stalks of a rush-like plant. Some decaying alder leaves of the previous year were also bound into the outer cover. Unfortunately, never once could we observe the bird during work. Apparently the most careful concealment was not enough to allay the wariness of the bird in this initial section of the reproductive period. We shall see, however, how its sensitiveness will abate with the progress of the breeding activities. With respect to its initial wariness or rather sensitiveness, we have to note that the River Warbler will invariably leave the eggless nest, respectively the one found prior to the incubating period, so that the observation of a nest under construction is one of the rarest occurrences, as stated also by other authors, and, as far as we know, none had as yet successfully performed it. The measurement data of the nest under discussion in Ócsa are as follows: inner diameter: 6.5 cm; outer diameter: 12.0 cm; depth of the cup: 5.0 cm; height of the nest: 11.5 cm; bottom of nest from ground level: 10.5 cm.

The nest found on 18 June, 1963, was made under, and situated in, slightly different conditions, inasmuch as it was affixed not to nettle stalks but to the loose trailers of the clematis. The clematis web grew at the base of a low alder bush, or rather young offshoots, frontally covered by a several meters deep, dense nettle stand. The construction and materials of the nest corresponded to those of the former one, with the exception that its inside contained relatively more decaying alder leaves. The bottom of the nest was 30 cm from the ground, otherwise its dimensions agreed with those of the former one.

The River Warbler nests found in 1960–62 in the alderwoods of Ócsa and earlier in the Hanság were made under highly similar circumstances, but none were in a place to allow direct observations.

The nest discovered in Ócsa in 1960, in a comparatively advantageous location, had also not shown the normal time of the nest building of the species,

since, in this year, groundwater was at an exceptionally high level, and subsided only very slowly. On experiences gained in Ócsa in 1960—63, and earlier in the Hanság, we can state that the nests are ready between 20 and 30 May. This is corroborated by Sz. CSERESNYÉS' verbal communication to the strength that he discovered, in the Béda woods of the gallery forest of the Danube south of Mohács on 21 May, 1951, a completely finished but still empty nest which the bird had left due to disturbances.

**Eggs.** — The nest, found on 10 June, 1960, and completed on 14 June, contained no eggs even on 15, indeed, the female itself failed to appear in its vicinity. Our sole hope that the bird had not left the nest was the voice of the male singing in the neighbourhood. The first egg must have been laid on the early morning of 16, since it was already there at 7 a. m., when we arrived at the scene. The entire clutch was laid on five successive days, but incubation began only after the laying of the third egg. From that time, the female sat the nest rather closely, and even if it left the nest at some suspicious noise, it very soon returned. The departing bird never flew directly away from the nest, but invariably stepped out, and, with an erect, straight carriage, resembling that of a nightingale, with wings closely appressed to its body, it went rapidly away among the nettle-stalks. Nor did it return in a zigzaggy way and hide-and-seek manners, a peculiar and striking contrast to the behaviour of the Grasshopper Warbler (*Locustella naevia* BODD.) and Savi's Warbler (*Locustella luscinioides* SAVI.).

The nest, already discussed in the chapter on construction, was found on 18 June, 1963, also a rather precipitous year. The clutch again consisted of five eggs, whose rate of incubation, according to the water test, could have been about medium, that is, the female must have been sitting them for about a week. Emergence on the 26th seemed to substantiate our deductions, since the period of incubation was known to be 13—14 days, on the basis of incubations observed in 1960 and 1961. The entire clutch, especially when it is already under incubation, is rarely left by the mother bird. At such times, its earlier mistrust is already dissipating, gradually losing its shyness with the progress of incubation. To cover our observations and photographing, we have made a canopy, 4 m from the nest. The incubating bird did not entirely leave the vicinity of its nest even during the construction of the canopy, but settled in the bush behind it and thence watched our activities. After the finishing of the canopy, and as soon as we hid ourselves in it, the female sprang to the ground and run beneath the nest, whence presently it climbed slowly and watchfully up along the loose clematis vines, and settled in it. Therefore it again desisted from flying to the nest, in spite of the fact that it could have done so, directly and in complete cover, from the shrub to the nest standing before and slightly below it (at a height of 30 cm), but first took to the ground and gained it by rather a devious way.

We have cleared the nettle away in front of the nest, respectively between the clematis, supporting the nest, and the canopy, in order to be able to take also pictures beyond mere observations. Experience showed that the soft click of the camera failed to flush it up from the nest, and it left it only when the bird observed some movements in the not quite un-transparent canopy. Then it carefully stepped out of the nest, climbed slowly down the clematis and stopped under the nest. With the cessation of movements in the canopy, the bird at once crept back into its nest.

During this time, the male sang now 50 now 80 m away from the nest, but the relief of the female had not been observed even during the entire day. The male had otherwise almost constantly chirped. Besides the unaltered direction of the song, the periodical changes in the pitch implied that it sang by turning around and about in the same place. A change of place, therefore the perceiving of the song from another direction, happened only seldom, and then too for a short time. We inferred therefore that the song is not claiming territory but a nuptial one.

The measurement of the eggs, — in cases when we had been able to establish the order of laying, hence those of the 1960 and 1961 clutches — showed that the first-laid egg was the smallest and the last-laid one the biggest. This regularity with respect to the size of avian eggs have hitherto been observed very rarely and by only very few, thus it seems worthwhile to note that the situation is similar with the Red-legged Falcon and the Lesser Great Shrike (The Life of the Red-legged Falcon, *Falco vespertinus* L., in the Ohat Forest, Acta XI Congr. Int. Orn. 1954, pp. 583—587; The Life of the Lesser Great Shrike, *Lanius minor* Gm., in the Great Plains, between the Villages Alsónémedi and Ócsa, near Budapest, Hungary, Proceedings of the XIIth International Ornithological Congress, Helsinki, 1958, p. 317—326). The measurements of the five eggs, in the order of laying, of the 1960 clutch are as follows:  $20.2 \times 14.8$ ;  $20.2 \times 15.0$ ;  $20.4 \times 14.9$ ;  $20.6 \times 15.0$ ;  $20.6 \times 15.1$  mm. A complete clutch was found to consist invariably of five eggs. Data, obtained from other observers with reference to 4-egg clutches either refer to incomplete clutches or eventually originate from young pairs breeding for the first time. According to literature, there are also clutches of 6 eggs, but we have never discovered one.

**Incubation.** — The eggs of the nest, discovered in 1960, hatched on the thirteenth day of the beginning of incubation, that is, from the day of the laying of the third egg (18 June). There were no addled eggs. During our observations, the incubating female was never relieved by the male, hence it is probable that only the female incubates (Fig. 1). By the way, the male sings also during incubation, which also corroborates the above assumption. Similar conditions prevailed also in the nest found in 1963. The male sang 50—80 m away from the female, changing its post rather frequently between the dis-



Fig. 1. Incubating River Warbler female (Photo: B. HÜTTLER)

tances mentioned, but never approaching the nest during the entire day of observation, so that there could hardly have been any relief of the incubating bird. This latter fact also substantiates our earlier presumption, namely that only the mother bird incubates.

**Fledgelings.** — The River Warbler again nested on the edge of the small, nettle-grown clearing in 1961, — surely the same pair as in 1960. The present nest was merely 4 m away from the earlier one. The dry spring of 1961 ensured normal breeding conditions and thus it was not striking that we found its complete but empty nest on 26 May. The clutch of five eggs was again laid on five consecutive days, and the measurements as well as the features of the pattern and coloration of the eggs evinced that they, too, originate from the pair of the previous year. The fledgelings hatched on 10 June, after incubation began on the laying of the third egg (Fig. 2). The old birds became then more skulky. The male sang less frequently, and further away from the nest than during incubation. Though we could use no colored rings, owing to the extreme sensitivity of the birds, we can safely assert that both birds participated in the feeding of the fledgelings. Food was taken by the old birds partly from the wet ground in the immediate vicinity of the nest, partly by flying out to the nearby forest edge, and thence, from one of the bordering bushes, to the adjoining meadows. The birds gathered their quarries not from single blades of grass, but from the base of the clumps. Hiding on one occasion in the edge of the forest, we saw that one of the parent birds left the border of the woods by some 50 m, and apparently hunted for grasshoppers. It can hold more than one insect simultaneously in its bill, returning well laden after a longer hunt to the fledgelings.

According to our observations made at the nest found in 1963, the mother bird took small insects and a rather large caterpillar to the fledgelings. A large-sized quarry, if still alive, is repeatedly beaten against a twig, and only then offered to the fledgelings. The conveying of food is periodical, recurring four-five times daily, and one period lasts for about half or three-quarters of an hour. At such times, food is brought in at an average of three-four minutes.

The 1963 clutch was also a fivesome, but three eggs fell out of the nest, and, when put back, became addled although the mother bird accepted them. The eggs were probably kicked out by the mother bird when startled from its sleep on a windy and rainy night.

The fledgelings of the 1961 nest flew out, that is, left the nest and its environment, on 27 June, after sixteen days of nesting, an unusually long period of incubation for so small a bird.

Immediately after hatching, the fledgelings are nearly naked, with some greyish down only on their head and back. With respect to the 1963 nest, we found that the coverts are well developed and similar to the brownish plumage of the old birds on the eleventh day after hatching, but the wing





Fig. 2. River Warbler female caring its nest and fledgelings (Photo: B. HÜTTLER)

feathers are still strongly sheathed. Nesting period was again sixteen days, though with reference to the two first-hatched fledgelings only.

Concerning the behaviour of the old birds, we have noted that, concurrently with the growth of the fledgelings, they successively lose their shyness. In the last days before the flying out of the fledgelings, we have frequently seen both parent birds together at the nest, indeed, they did not remove themselves too far even when we left our place of concealment. Even so, the male was again the more mistrustful one, and, flying a little further away, sang somewhat indignantly.

We have observed that the fledgelings do not leave the nest simultaneously, but successively. The mother bird diligently fed also those fledgelings which have already left the nest but, still tarrying in its vicinity.

With the 1963 nest we have observed also that, after the fledgelings had left the nest, the mother bird sat for a time the addled eggs which we have replaced into the nest as an experiment, though only for short periods, since in the meantime it was also feeding the fledgelings. On the next day, when the fledgelings were further away from the nest, the female sat the eggs no more.

**Fellow breeders.** — In the marshy alderwoods and galery forests, there are a number of birds which occur almost invariably together with the River Warbler. Of these, we point out the Icterine Warbler (*Hippolais icterina* VIEILL.), the Garden Warbler (*Sylvia borin* BODD.), the Blackcap (*Sylvia atricapilla* L.), and the Nightingale (*Luscinia megarhynchos* BREHM). If not in the immediate vicinity of the nest, yet not far from it, we have found the nests of the Blackbird (*Turdus merula* L.), the Song Thrush (*Turdus philomelos* BREHM), the Turtledove (*Streptopelia turtur* L.), and the Greenfinch (*Chloris chloris* L.).

**Autumnal departure.** — The autumnal departure of the River Warbler fell on the last days of August, as well in Ócsa as in the alderwoods of the Hanság. In the galery forests of the Danube, especially in its southern sections, thus in the Béda woods below Mohács and those of Bellye (now in Yugoslavia), the birds were still in their nesting territories even in the first days of September in earlier years. During their migration, they can be encountered also in larger gardens adjacent to dwelling houses.

**Summary.** — The River Warbler is a not infrequent breeding bird in habitats, marshy alderwoods and galery forests, suitable to its nature in Hungary. Due, however, to its skulky habits, the discovery of its nest and especially the observation of its life history is the most difficult as related to those of all other home birds.

Intensive and systematical investigations concerning the River Warbler had not yet been made, hence our observations and photographs made during a research work of four years complement with a number of unknown data the life history of this species.

Our investigations, conducted in the marshy alderwoods of Ócsa, 30 km S of Budapest, in the years 1960–63, covered spring arrival, occupation of territory, courtship, nest-building, time and rate of the laying of eggs, clutches, incubation period, sitting and feeding of the fledgelings, food, parental care after the leaving of the nest, and autumnal departure.

Aside of several valuable ethological observations, there are the following new data recorded: incubational period 13 days; incubation begins after the laying of the third egg; only the female incubates; the sitting of the nest lasts for 16 days; the staple food of the fledgelings consist of small insects, mainly grasshoppers and caterpillars, taken by the old birds partly from the immediate neighbourhood of the nest, partly from the meadows adjacent to the nearby forest edge. Captures are invariably made in concealed sites, in cover of the soft plant undergrowth.

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Authors' address: Budapest, VIII., Baross u. 13, Hungary



## NEUE TARDIGRADEN-ARTEN AUS UNGARN

(NEUERE BEITRÄGE ZUR KENNTNIS DER TARDIGRADEN-FAUNA  
UNGARNS, VI.)

Von

GY. IHAROS

(Balatonfenyves)

(Eingegangen am 7. Juni, 1965)

Die vorliegende Arbeit enthält die Beschreibung 8 neuer Tardigraden-Arten nebst Bemerkungen über einige Tardigraden-Eier. Die neuen Arten wurden am 9.—12. September 1964 an verschiedenen Orten des Bakony-Gebirges gesammelt.

Die Art benenne ich zu Ehren von Herrn Dr. JENŐ PAPP, stellv. Direktor des Bakonyer Museums, Veszprém.

1. *Hypsibus pappi* sp. n.

(Abb. 1, 4)

Die Länge des Tieres beträgt 170—400  $\mu$ . Körper hell-gelblichgrün. Augenpigment vorhanden. Cuticula auf und zwischen den halbkugeligen Buckeln feinwarzig und netzförmig gezeichnet. Die Dorsalbuckel sind in 10 Querreihen angeordnet (Qu=Querreihe, Z.d.B=Zahl der Buckel):

Qu.	Z.	d.	B.	Qu.	Z.	d.	B.
I.		2*		VI.		4	
					1		1
II.	1	4	1**	VII.	2	6	2
III.		6		VIII.	1	4	1
IV.	1	4	1	IX.		4	
V.	2	6	2	X.		2	

\* Über den Augen.

\*\* Kleinere Tuberkel zwischen den Querreihen.

Kleinere Papillen befinden sich zwischen den Reihen II—III, und von IV bis IX, lateral und manchmal auch dorsal; Zahl der Papillen 2 oder 4. An der Vorderhälfte des Kopfes, u. zw. in der Nähe der Mundöffnung, steht je eine kleine Papille.

Schlundkopf länglich oval ( $24,4 \times 18 \mu$  bei  $255 \mu$  Körperlänge) mit 2 Macrolacoiden, von denen das erste länger ist als das zweite. Komma

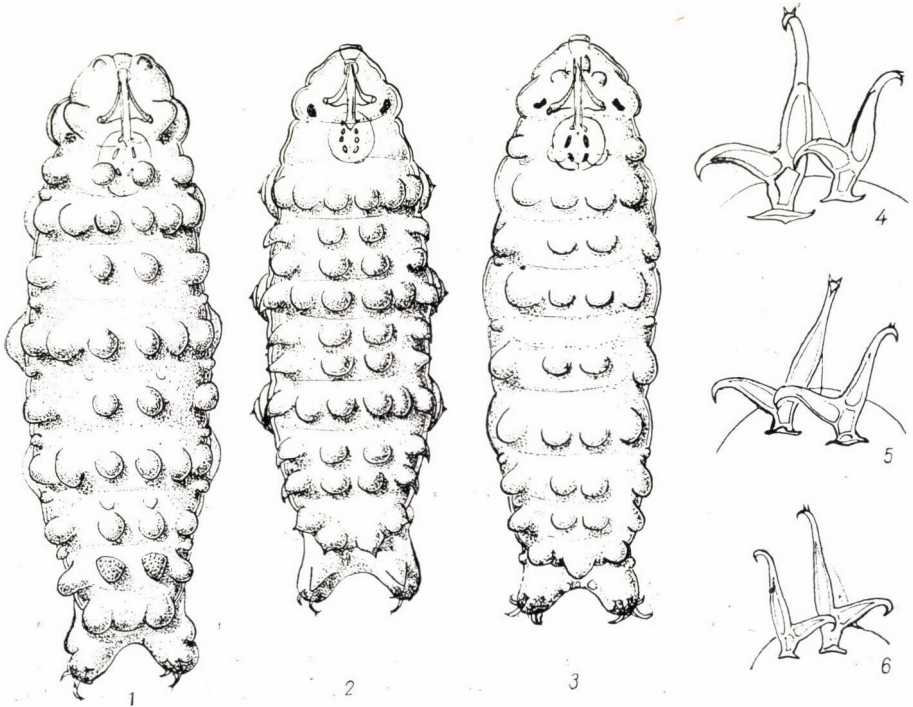


Abb. 1—6. 1 = Habitusbild von *Hypsibius pappi* sp. n., 2 = Habitusbild von *H. brevispinosus* sp. n., 3 = Habitusbild von *H. silvicola* sp. n., 4 = Krallen IV. von *H. pappi* sp. n., 5 = Krallen IV. von *H. brevispinosus* sp. n., 6 = Krallen IV. von *H. silvicola* sp. n.

fehlt. An der Dorsalseite der IV. Beinpaare sitzt je ein kleiner Buckel. Die Krallen eines Beines sind verschieden lang, relativ groß und breit: Hinterkralle IV  $12 \mu$ , Vorderkralle IV  $9,5 \mu$  lang.

In der alten Cuticula finden sich 4—6 glatte, ovale Eier.

Fundorte: Csót, wiederholt austrocknende Bodenmoose; Bánd (Essegburg), sonnenbestrahlte Bodenmoose; Herend, halbschattige Bodenmoose; Nemesvámos, sonnenbestrahlte Felsenmoose und Uzsabánya, Fallaub von Akazienbäumen.

Die neue Art fand ich mehrmals in Gesellschaft der Arten *Echiniscus testudo*, *Macrobiotus hufelandii*, *M. richtersi*, *Hypsibius schaudinni*, *H. oberhaeuseri*, *H. convergens*, *H. bako*

*nyiensis*, *H. latiunguis* und *Milnesium tardigradum*. *Hypsibius pappi* gehört gewiß in die *tuberculatus*-Artengruppe, unterscheidet sich aber von den übrigen hierher gehörenden Arten durch die Zahl der Buckel in den einzelnen Querreihen und durch die Form der Krallen.

In den Moosproben aus der Umgebung von Nemesvámos kam eine Varietät der *H. pappi* mit olivgrüner Färbung und fein granulierter Cuticula vor. Körnelung besteht aus gleich großen und regelmäßig dicht angeordneten sehr kleinen und lichtbrechenden Körnchen.

Die Holotype und die Paratypen der neuen Art befinden sich in der Zoologischen Sammlung des Bakonyer Museums, Veszprém.

## 2. *Hypsibius brevispinosus* sp. n.

(Abb. 2, 5)

Klein, Länge 110–150  $\mu$ , farblos; Augenzpigment vorhanden. Cuticula feinwarzig und netzförmig gezeichnet. Dorsalseite mit von vorn nach hinten an Größe zunehmenden Buckeln, die in 10 Querreihen angeordnet sind.

Qu.	Z.	d.	B.	Qu.	Z.	d.	B.
I.		6		VI.		4	
II.		4		VII.		6	
III.		4		VIII.		4	
IV.		6		IX.		4	
V.		4		X.		4	

Die Form der Buckel ist sehr verschieden: die dorsalen sind halbkugelig, die lateralen zugespitzt papillenförmig, die caudalen mamilläre, gerundete oder abgeflachte Höcker mit kleinen scharfspitzigen Dornen. Auch an der oberen Partie der Beine befinden sich abgeflachte Buckel mit einem kleinen Mitteldorn. An der Dorsalseite des IV. Beines sitzt ein spitziger, kegelförmiger Höcker.

Schlundkopf länglich-oval ( $15 \times 10 \mu$  bei  $110 \mu$  Körperlänge) mit 3 Macroplacoiden in Gestalt von Körnern, die von vorn nach hinten an Größe zunehmen. Komma fehlt. Krallen klein und im allgemeinen in der Länge wenig verschieden. Hinterkralle IV  $5 \mu$ , Vorderkralle IV  $3,5 \mu$  lang.

Abgelegte Cuticula mit Eiern wurde nicht gefunden.

Das Tier kommt in wiederholt austrocknenden Boden- und Felsenmoosen, sowie in Flechten vor, die der Sonnenstrahlung fast den ganzen Tag über ausgesetzt sind.

Fundorte: Bakonyjákó, Bodenmoose und Flechten auf Felsen; Uzsbánya, Bodenmoose.

Die neue Art kam zusammen mit den Arten *Echiniscus granulatus*, *Macrobiotus hufelandii*, *M. richtersi* und *Hypsibius bakonyiensis* vor. Sie gehört zweifellos der *tuberculatus*-Artengruppe an, unterscheidet sich aber von sämtlichen Arten dieser Gruppe durch die Zahl und Form der Buckel in den einzelnen Querreihen, ferner durch die stacheligen Höcker an den Beinen und durch die 3 Macroplacoiden.

Die Holotype und die Paratypen der neuen Art befinden sich in der Zoologischen Sammlung des Bakonyer Museums, Veszprém.

### 3. *Hypsibius silvicola* sp. n.

(Abb. 3, 6)

Der Körper ist 180—300  $\mu$  lang, farblos, Augenpigment vorhanden. Cuticula an und zwischen den Tuberkeln feinwarzig und mit netzförmiger Zeichnung. Die dorsalen Buckel sind halbkugelig und in 10 Querreihen angeordnet. Außerdem finden sich auch kleinere Lateralpapillen.

Qu.	Z. d. B.			Qu.	Z. d. B.		
I.	2			VI.	4	1	
II.	2	oder	4	VII.	4	1	
III.	4			VIII.	4		
IV.	4			IX.	4		
	1		1	X.	3		
V.	4	1					
	1	4	1				

Schlundkopf oval ( $24 \times 20 \mu$ ) mit 2 Macroplacoiden, von denen das vordere länger ist als das hintere ( $3,6 \mu$ ,  $2,4 \mu$ ); kein Komma. Die Krallen eines Beines sind verschieden lang und dünn; Hinterkralle IV  $11 \mu$ , Vorderkralle IV  $8,5 \mu$ . Die Beine des IV. Beinpaars besitzen je eine kleine Papille am Grunde und an der inneren Seite.

Eier wurden nicht wahrgenommen.

Die Tiere leben in schattigen Bodenmoosen, in Waldstreu und in Boden.

Fundorte: Csesznek, Felsenmoose in Buchenwald und Humusboden; Csót, Akazien-Fallaub.

Die neue Art wurde in Gesellschaft der Arten *Echiniscus granulatus*, *Macrobiotus hufelandii*, *M. richtersi*, *Hypsibius schaudinni*, *H. mihelcici* und *H. convergens* gefunden. Sie gehört der *tuberculatus*-Artengruppe an, unterscheidet sich aber von den übrigen hierher gehörenden Arten durch die Zahl der Buckel und durch die Form der Krallen.

Die Holotype und die Paratypen der neuen Art befinden sich in der Zoologischen Sammlung des Bakonyer Museums.



4. *Hypsibius rudescui* sp. n.

(Abb. 7, 8)

Ich benenne diese neue Art zu Ehren von Herrn DR. LUDOVIC RUDESCU.

Die Körpergröße schwankt zwischen 150 und 225  $\mu$ . Hell gelblichgrün gefärbt, Augenpigment vorhanden. Dorsale Körperwand mit 10 Querreihen von Buckeln, von denen die 2 dorsalen Buckel in der IV. Reihe und die lateralen Buckel in der VIII. und IX. Reihe höher sind als die anderen.

Schlundkopf oval ( $25 \times 20 \mu$ ) mit 2 Macroplacoiden, von denen das erste länger ist als das zweite. Komma fehlt. Die Krallen eines Beines sind verschieden lang und kräftig. Hinterkrallen IV 11  $\mu$ , Vorderkrallen IV 9,5  $\mu$ .

Eier unbekannt.

Die Tierchen leben in wiederholt austrocknenden Bodenmoosen, die der Sonne fast den ganzen Tag über ausgesetzt sind.

Qu.	Z.	d.	B.	Qu.	Z.	d.	B.
I.		2		VI.		4	
II.		2		VII.		4	
III.		4		VIII.		4	
IV.		2		IX.		4	
V.		4		X.		2	

Fundort: Bagó-Berg in der Umgebung des Dorfes Nemesvámos, sonnenbestrahlter Hügelhang.

Die neue Art wurde in Gesellschaft der Arten *Macrobotus hufelandii*, *Hypsibius oberhaeuseri*, *H. pappi*, *H. bakonyiensis* und *H. convergens* gefunden. *Hypsibius rudescui* gehört zur Verwandtschaft von *H. tuberculatus*, unterscheidet sich jedoch von sämtlichen Arten dieser Gruppe durch die Zahl der Buckel in den Querreihen.

Holotype und die Paratypen der neuen Art befinden sich in der Zoologischen Sammlung des Bakonyer Museums.

5. *Hypsibius lunulatus* sp. n.

(Abb. 9, 10)

Körperlänge 180–220  $\mu$ , farblos, im Alter hell violett gefärbt. Augenpigment vorhanden. Cuticula feinwarzig auch an den Buckeln, die in 10 Querreihen stehen und sehr groß sind. Die zwischen den Querreihen befindlichen lateralen Papillen sind klein.

Schlundkopf oval ( $28 \times 21 \mu$  bei  $220 \mu$  Körperlänge) mit 2 stabförmigen Macroplacoiden, ohne Komma. An der Dorsalseite des IV. Beines befindet

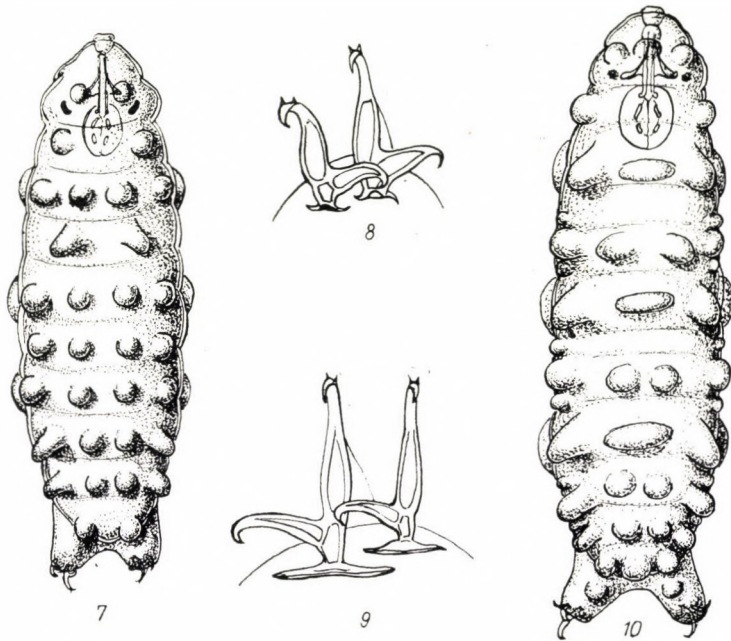


Abb. 7—10. 7 = Habitusbild von *Hysibius rudescui* sp. n., 8 = Krallen IV. von *H. rudescui* sp. n., 9 = Krallen IV. von *H. lunulatus* sp. n., 10 = Habitusbild von *H. lunulatus* sp. n.

Qu.	Zahl der Buckel			
	<i>H. lunulatus</i>		<i>H. cyrilli</i>	<i>H. mihelcici</i>
I.	3		3	3
II.	2	oder 4	2	4
III.	1	3	3	3
IV.	1	4	4	4
V.	1	3	3	3
VI.	1	4	4	4
VII.	1	3	3	2
VIII.	1	4	3	3
IX.	4		—	—
X.	3		—	—

sich je ein großer stumpfer Höcker. Die Krallen sind im allgemeinen dünn und lang; Hinterkrallen IV 10–13  $\mu$ , Vorderkrallen IV 8,5–11  $\mu$  lang. An der Basis der Krallen befindet sich eine 4–5  $\mu$  lange, transversale lunulaartige Verdickung.

Eier sind unbekannt.

Das Tier kam im Fallaub von *Pinus nigra* vor.

Fundort: Uzsabánya, Fallaub im Fichtenwald.

Die neue Art wurde zusammen mit folgenden Arten erbeutet: *Macrobotus hufelandii*, *M. richtersi*, *Hypsibius bullatus* und *H. recamieri*. Sie gehört der *tuberculatus*-Artengruppe an. Auf Grund der Zahl der Buckel in den einzelnen Querreihen ähnelt sie den Arten *H. cyrilli* und *H. mihelcici*; diese Arten haben jedoch nur 8 Querreihen von Buckeln und die Krallen sind von abweichender Form.

Die Holotype und die Paratypen der neuen Art befinden sich in der Zoologischen Sammlung des Bakonyer Museums.

### 6. *Hypsibius flavus* sp. n.

(Abb. 11–15)

Groß und plump, die Länge des Körpers beträgt 360–700  $\mu$ . Leibeshöhlenflüssigkeit orangerot, Mageninhalt dunkelbraun. Augenpigment vorhanden. Cuticula sehr fein punktiert und netzförmig gezeichnet. Dorsale Körperwand gewellt. Schlundkopf oval (56  $\times$  51  $\mu$  bei 560  $\mu$  Körperlänge), mit großen Apophysen und 2 stabförmigen Macroplacoiden (12  $\mu$ , 7,3  $\mu$ ). Komma fehlt. Mundröhre weit (7,6  $\mu$ ), ihr Durchmesser beträgt 14% der Schlundkopflänge. Die Stilette sind kräftig und stark gebogen, mit großer Furca. Krallen sehr groß, relativ breit, und in der Länge wenig verschieden.

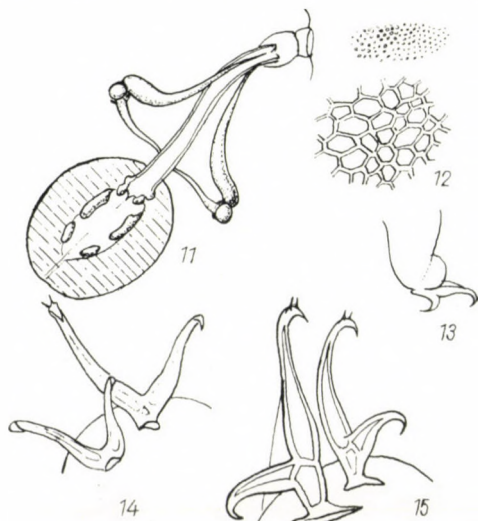


Abb. 11–15. *Hypsibius flavus* sp. n. 11 = Schlundkopf, 12 = Punktierung und die netzförmige Zeichnung der Cuticula, 13 = Bein mit Buckel, 14 = Krallen III, 15 = Krallen IV

Hinterkralle IV 28  $\mu$ , Vorderkralle IV 24  $\mu$ . Die Beine haben über den Krallen einen glatten Buckel.

Die Zahl der Eier beträgt in der alten Cuticula 6—8.

Das Tier lebt in wiederholt austrocknenden Moosen.

Fundort: Umgebung des Dorfes Eplény, Felsenmoose.

In Gesellschaft der neuen Art wurden noch *Echiniscus granulatus*, *Macrobiotus hufelandii* und *H. oberhaeuseri* gefunden. *Hypsibius flavus* gehört in die Untergattung *Isohypsibius* THULIN, u. zw. in die *tuberculatus*-Gruppe, und ist mehreren *Hypsibius*-Arten ähnlich. Durch die Querfaltung der dorsalen Körperwand erinnert er an die Arten *H. undulatus* THUL. und *H. arcuatus* BARTOŠ. Die erste Art ist aber klein, Kopf abgeflacht, Körper farblos. Cuticula ohne Punktierung, Krallen mit seitlich zusammengedrückten Ästen. Auch die zweite Art ist klein, Cuticula glatt, Leibesflüssigkeit rötlich-gelb, 3 Macroplacoide vorhanden. Krallen klein, mit seitlich zusammengedrückten Ästen. Durch die Punktierung der Cuticula erinnert die neue Art noch an folgende Arten: a) *Hypsibius baldii* RAMAZZOTTI, doch ist diese Art wasserbewohnend, klein, farblos mit 3 Macroplacoiden; die Cuticula und die Form der Krallen sind abweichend skulptiert. b) *Hypsibius calcaratus* BARTOŠ. Sehr klein, farblos. Cuticula des ganzen Körpers mit feinen, halbkugeligen Wärzchen bedeckt. Krallen dünn und verschieden groß. c) *Hypsibius hadzi* MIHELČIČ. Mittelgroß, farblos, oder graublau. Hat 3 Macroplacoide, Körnelung der Cuticula grob. d) *Hypsibius sculptus* RAMAZZOTTI. Klein und farblos, Cuticula nicht netzförmig gezeichnet.

Die Holotype und die Paratypen der neuen Art befinden sich in der Zoologischen Sammlung des Bakonyer Museums.

### 7. *Macrobiotus csotiensis* sp. n.

(Abb. 16—18)

Länge bis 475  $\mu$ . Körper farblos, Cuticula glatt. Augenpigment vorhanden. Schlundkopf länglich-oval ( $50 \times 40 \mu$ ), mit 3 Macroplacoiden, von denen das zweite immer kürzer ist als das erste und dritte. Das längste Pla-

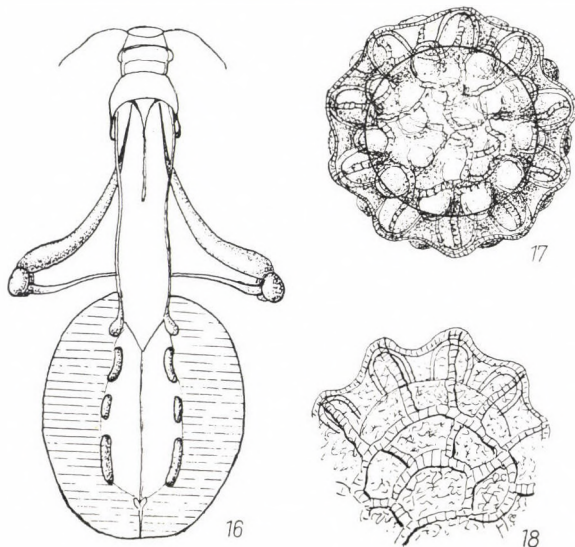


Abb. 16—18. *Macrobiotus csotiensis* sp. n. 16 = Schlundkopf, 17 = Ei, 18 = Netzförmige Zeichnung des Eies

coid ist immer das dritte (die Länge der Stäbchen bei 475  $\mu$ : 7—5—10  $\mu$ ). Komma fehlt. Mundröhre 9  $\mu$  weit. Stilette dick und stark gebogen. Krallen vom *hufelandii*-Typus.

Eier kugelig, mit halbkugeligen Ausschüssen; ihr Durchmesser mit den Ausschüssen 75—80  $\mu$ , ohne diese 60—65  $\mu$ . Die Eiausschüsse sitzen dicht nebeneinander, sie sind mit einer durchsichtigen Hülle überzogen, die zwischen den Ausschüssen eingezogen ist. Die Oberfläche der Eier ist fein granuliert und netzförmig gezeichnet, gelblichbraun gefärbt. Die ausgeschlüpften Jungtiere sind 120  $\mu$  lang. Da auch andere *Macrobotus*-Arten eine ähnliche Schlundkopfeinlagerung haben, sind die Eier zur Artdetermination sehr wichtig.

Die neue Art kommt in wiederholt austrocknenden Moosen vor.

Fundorte: Csót, Badacsonytördemic und Nyírád, Stroh- und Rohrdächer.

Mit *M. csotiensis* wurden noch *M. hufelandii*, *M. richtersi*, *M. areolatus*, *Hypsibius oberhaeuseri* und *H. novemcinctus* Arten gefunden. Die neue Art ähnelt den Arten *M. areolatus*, *M. carasicus*, *M. hibernicus*, *M. psephus*, *M. tonollii* und den jungen *M. richtersi*, unterscheidet sich aber von ihnen hauptsächlich durch die Eier.

Holotype und die Paratypen der neuen Art befinden sich in der Zoologischen Sammlung des Bakonyer Museums.

### 8. *Itaquascon ramazzottii* sp. n.

(Abb. 19—20)

Diese neue Art benenne ich zu Ehren des Herrn Prof. DR. ING. GIUSEPPE RAMAZZOTTI. Für seine Hilfe in der Bestimmung spreche ich ihm auch an dieser Stelle meinen besten Dank aus.

Körper wurmförmig, im ganzen langgestreckt, 450  $\mu$  lang, farblos. Augenpigment fehlt. Kopf länglich. Mundöffnung und Mundröhre breit, Mundring mit kleinen Lamellen. Schlundröhre glatt, ohne ringelartige Strukturen am Schlundkopfeingang; kaum kürzer, als der Schlundkopf, biegsam. Stilette dünn, nadelförmig und fast gerade, caudal nach innen gebogen. Furca gabelförmig. Die Längenverhältnisse des Buccalapparates sind bei 450  $\mu$  Körperlänge die folgenden: Mund- und Schlundröhre gleichmäßig weit, 4,8  $\mu$  breit; Länge der Mundröhre 20  $\mu$ , die der Schlundröhre 27  $\mu$ . Schlundkopf zylindrisch, 29  $\mu$  lang und 16  $\mu$  breit. Im Schlundkopf fehlen die Macro- und Microplacoide, die Apophysen sind schwach ausgebildet. Randleiste gerade und verdickt, aber nicht placoidenartig. Stilette 23  $\mu$  lang. Die Speicheldrüsen reichen über den Schlundkopf, jedoch nicht bis zum Magen. Die äußere und innere Krallen der Beine sind verschieden lang, die größere mißt 23  $\mu$ , die kleinere 11  $\mu$ . Die äußere Krallen trägt einen langen, dünnen, fast borstenförmigen Hauptast, der 17  $\mu$  lang ist. Basalpartie 6  $\mu$  lang. An der Basalpartie der äußeren Krallen, unmittelbar unter dem Hauptast, befindet sich ein kleiner Neben-

haken. Beide Krallen sind mit Nebenspitzen versehen, die am Hauptast der äußeren Krallen sehr schwach ausgebildet und kaum sichtbar, hingegen am Hauptast der inneren Krallen sehr kräftig sind.

Eier unbekannt.

Die neue Art kommt in Fallaub und Baummoosen vor.

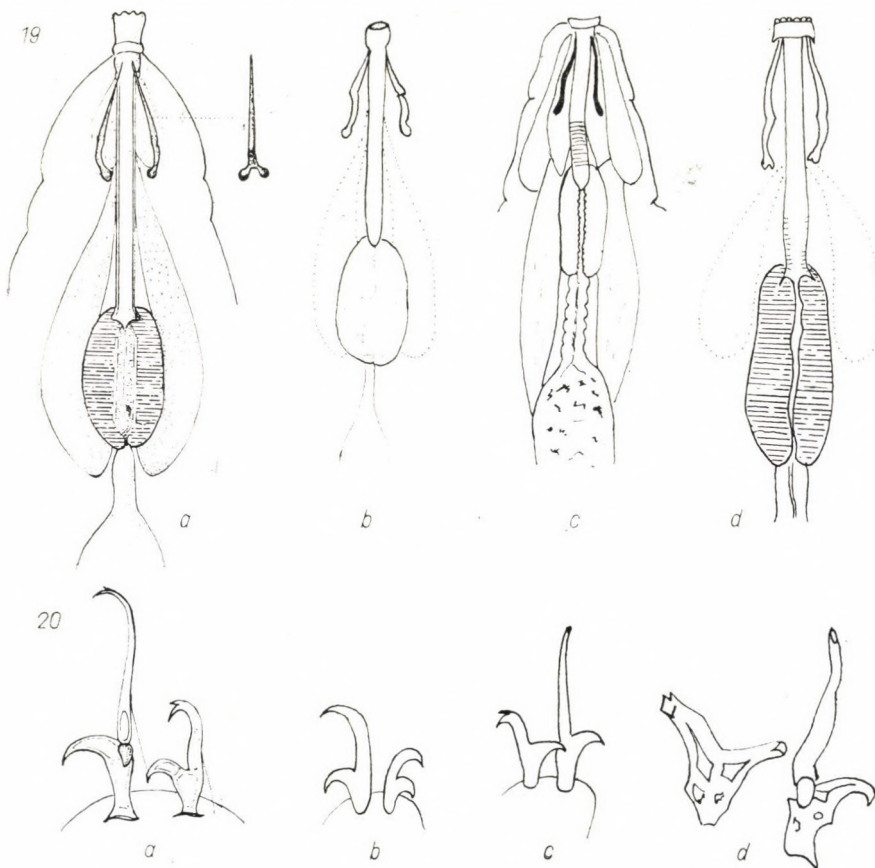


Abb. 19—20. *Itaquascon ramazzottii* sp. n. 19 = Schlundkopf von *I. ramazzottii* sp. n. (a), *I. umbellinae*, modifiziert; nach BARROS (b), *I. bartosi*, nach WEGLARSKA (c), *I. trinacriae*, modifiziert; nach ARCIDIACONO. — 20 = Krallen von *I. ramazzottii* sp. n. (a), *I. umbellinae*, nach BARROS (b), *I. bartosi*, nach WEGLARSKA, von einem Photo (c), *I. trinacriae*, nach ARCIDIACONO (d)

Fundorte: Umgebung Zirc, Fallaub eines Buchenwaldes. Im Fallaub wurden noch Individuen der Art *Macrobiotus richtersi* gefunden. Farkasgyepü, Baummoose von *Pinus nigra*. Die Population enthielt die Arten *Macrobiotus hufelandii*, *Hypsibius pallidus*, *H. schaudinni*, *H. pinguis*. Nagyvázsony, Fallaub eines Eichenwaldes. In der Fallaubprobe kam noch *M. richtersi* vor.

Die neue Art unterscheidet sich von den bisher bekannten *Itaquascon*-Arten durch folgende Merkmale:

1. Die Körperlänge erreicht bei *I. umbellinae* 311,6  $\mu$ , bei *I. bartosi* 420  $\mu$ , bei *I. trinacriae* 436  $\mu$ .

2. Die Form der Stilette. Bei diesen Arten sind die Stilette zweimal stark gebogen, bei *I. ramazzottii* fast gerade, nur caudal beugen sie sich nacheinander.

3. Die Struktur der Schlundröhre ist ringelartig bei *I. bartosi* und *I. trinacriae*, bei *I. umbellinae* und *I. ramazzottii* hingegen glatt.

4. Die Cuticula der Randleiste des Schlundkopfes ist bei *I. umbellinae* und *I. trinacriae* dünn, bei *I. bartosi* perlenförmig verdickt, bei *I. ramazzottii* gerade und verdickt.

5. Die Länge der Speicheldrüsen. Bei *I. umbellinae* reichen sie bis zur hinteren Wand des Schlundkopfes, bei *I. bartosi* bis zum Magen, bei *I. trinacriae* bis zur Mitte des Schlundkopfes, bei *I. ramazzottii* bis zur Mitte des Ösophagus.

6. Der Nebenhaken der äußeren Krallen fehlt bei *I. umbellinae* und *I. bartosi*, nur *I. trinacriae* hat ein ähnliches Tuberkel.

Die Holotype und die Paratypen der neuen Art befinden sich in der Zoologischen Sammlung des Bakonyer Museums.

### Bemerkungen über einige Varietäten und Tardigraden-Eier

Bei der Untersuchung der Moos- und Fallaubproben wurden ferner noch 2 Varietäten von früher beschriebenen Arten *Hypsibius theresiae* und *H. mihelcici* erbeutet.

1. *Hypsibius theresiae* var. **apapillosa**, var. n.

Die Varietät unterscheidet sich von der Stammart durch folgende Merkmale: Körperlänge größer, 170—365  $\mu$ ; Augenpigment und die lateralen wurstförmigen Papillen fehlen. Mehrere Stücke wurden in Fallaub gefunden.

Fundort: Hegyesd-Hügel in der Umgebung des Dorfes Hegyesd.

2. Zur Art *Hypsibius mihelcici* gehören die Tierchen, die 4 Buckel in der I. und VII. Querreihe haben, während die Stammart 3 in der I. und 2 in der VII. Reihe besitzt. Auch die Körperlänge ist größer, u. zw. 275  $\mu$ . Die Varietät kommt in häufig austrocknenden Moosen vor.

Fundort: Várvölgy, Strohdach.

In den Moos- und Fallaubproben fand ich mehrere Tardigraden-Eier, deren nähere Zugehörigkeit unsicher war.

1. Das Ei ist kugelig, graugelb, die Eioberfläche zwischen den Eiausschüssen glatt. Ihr Durchmesser beträgt einschließlich der Ausschüsse 56  $\mu$ . Die 4—5  $\mu$  langen Stacheln haben eine breite Basis.

Fundort: Umgebung des Dorfes Pécsely, Fallaub in einem Eichenwald. In der Fallaubprobe wurden *Macrobotus richtersi* und *Hypsibius tuberculatus* gefunden (Abb. 21).

2. Das ovale Ei ist hell gelbbraun und mißt im Durchmesser 30×80  $\mu$ . Die Eiausschüsse sind kleine zylindrische Stäbchen, die dicht nebeneinander angeordnet sind (Abb. 22).

Fundort: Felsenmoos am Ufer einer Quelle zwischen den Dörfern Alsó- und Felsőörs. In den Moosproben kamen noch *Hypsibius nodosus*, *H. tetradactyloides* und *Macrobotus dispar* vor.

3. Das kugelige Ei ist gelblichbraun, und hat einen Durchmesser von 80  $\mu$  einschließlich der Ausschüsse und 55  $\mu$  ohne diese. Die Eiausschüsse

sind hohe, stumpfe Kegel, ohne oder mit einer kleinen Spitze. Die Eioberfläche und die Ausschüsse sind fein granuliert. Diese Eier gehören wahrscheinlich der Art *Macrobotus richtersi* oder *M. harmsworthi* an (Abb. 24).

Fundort: Dorf Csót, Rohrdach. Aus den Moosproben wurden noch *M. hufelandii*, *M. richtersi*, *M. areolatus*, *M. harmsworthi* und *M. csotiensis* gesammelt.

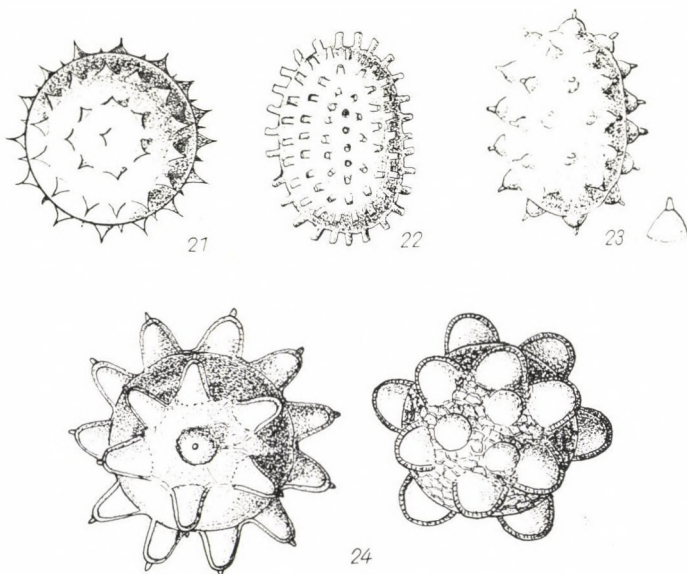


Abb. 21—24. Verschiedene Tardigraden-Eiern, deren nähere Zugehörigkeit bis jetzt unsicher ist. Nähere Erklärungen im Text

4. Das ovale Ei ist farblos, oder graugelb. Sein Durchmesser einschließlich der Eiausschüsse beträgt  $64 \times 42 \mu$ . Die Ausschüsse sind  $4,8 \mu$  hohe Kegel mit einer kleinen Spitze (Abb. 23).

Fundort: Homokbödöge, Baummoose von *Pinus silvestris*. Ich fand in der Moosprobe noch einige Exemplare von *M. richtersi*.

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Anschrift des Verfassers: Balatonfenyves, Komitat Somogy, Ungarn



## BEITRÄGE ZUR KENNTNIS DER TARDIGRADEN-FAUNA ÖSTERREICHS

Von

Gy. IHAROS

(Balatonfenyves)

(Eingegangen am 15. September 1965)

Bei der Untersuchung einiger Moos- und Laubstreu-Proben, die mir Prof. Dr. Ing. H. FRANZ aus Österreich zugesandt hat, fand ich 11 Tardigraden-Arten, von denen 4 für die Wissenschaft neu sind. Die Proben waren im Juni 1965 gesammelt worden.

Herrn Prof. DR. H. FRANZ sage ich an dieser Stelle für die Zusendung des Materials meinen herzlichsten Dank.

Bei Bestimmung der Arten bediente ich mich der Schlüssel von MARCUS (1936) und von RAMAZOTTI (1962).

### 1. *Macrobiotus pseudohufelandii* sp. n.

Körper 220—450  $\mu$  lang. Cuticula glatt. Leibeshöhlenflüssigkeit hellrosafarbe, Mageninhalt gelblich-braun. Die älteren Exemplare sind in Querbändern dunkelbraun pigmentiert. Augenpigment vorhanden. Schlundkopf länglich oval ( $35 \times 45 \mu$ ), mit großen Apophysen und 2 stabförmigen Macroplacoiden, von denen das 1. fast doppelt so lang, als das 2. Komma vorhanden. Krallen vom *hufelandii*-Typus.

Eier groß, kugelig (Abb. 1a); messen im Durchmesser mit den Ausschüßen 73—95  $\mu$ . Die Ausschüße sind 5  $\mu$  hoch und basal 5  $\mu$  breit abgestutzte Kegel, die an ihrem distalen Ende eine 1,5—2  $\mu$  breite, 1,5  $\mu$  dicke, glatte Scheibe haben (Abb. 1b). Diese Ausschüße ähneln den Eierzierden der *Macrobiotus richtersi*, die R. ARCIDIACONO beschrieben hat (3, p. 124, Fig. 1a), die aber viel kleiner sind. Im Umkreis der Eischale stehen 35—40 Ausschüße, zwischen ihnen ist die Eioberfläche glatt.

Ich benenne die neue Art *Macrobiotus pseudohufelandii*, weil sie mehrere Ähnlichkeiten mit *M. hufelandii* (Schlundkopf, Krallen, Körpergestalt) hat, und weil auch die Eier auf den ersten Blick als *hufelandii*-Eier erscheinen. Eine genaue Prüfung zeigt jedoch den wesentlichen Unterschied zwischen den Ausschüßen. *Macrobiotus hufelandii* hat Eiausschüße von 3—10  $\mu$  Höhe und die gleichen umgekehrten Eierbecher.

Standort: Moos von Kalkfelsen in Felsensteppe.

Fundort: Ruster Hugelzug.

Aus den Moosproben kamen viele Exemplare von den Arten *Pseudechiniscus cornutus* RICHT. und *Macrobiotus richtersi* J. MURR. hervor.

## 2. *Macrobiotus submorulatus* sp. n.

Korperlange bis 450  $\mu$ . Farblos; Augenpigment vorhanden. Cuticula glatt. Schlundkopf oval ( $22 \times 25 \mu$ ), mit 3 Macroplacoiden, die von vorn nach hinten an Lange zunehmen; Komma klein. Mundrohre 4  $\mu$  weit. Krallen vom *hufelandii*-Typus.

Eier gro, kugelig (Abb. 2a), im Durchmesser 95  $\mu$  messend u. zw. zusammen mit den Ausschussen, die 7,5  $\mu$  hoch und basal 17  $\mu$  breit sind (Abb.

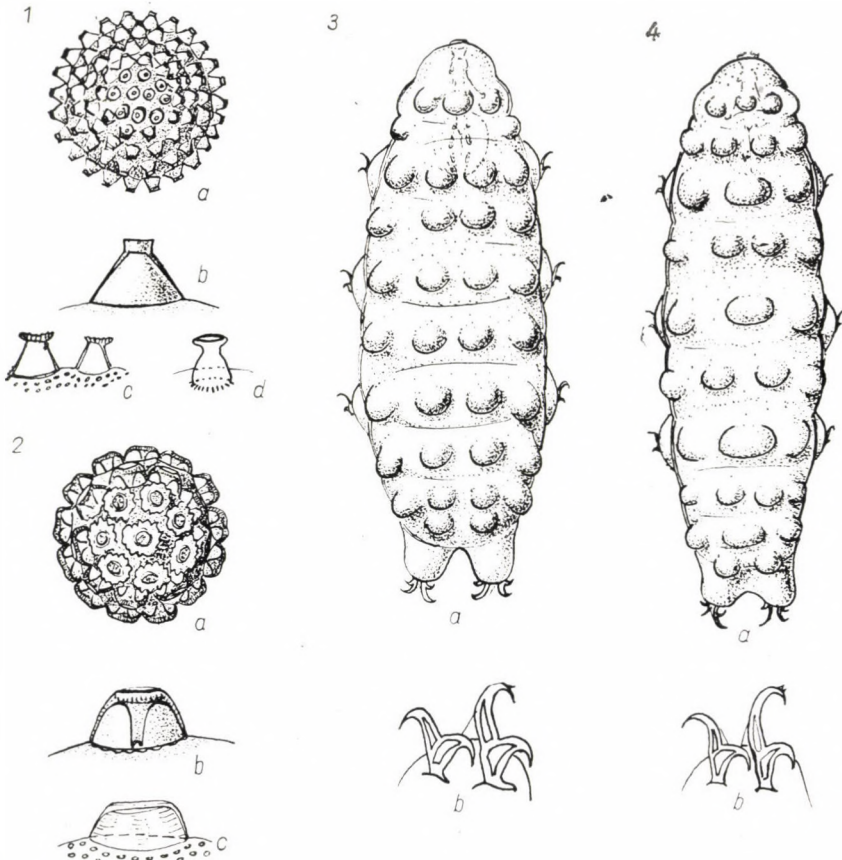


Abb. 1—4. 1. a = Ei von *Macrobiotus pseudohufelandii*, b—d = Eiausschusse von *M. pseudohufelandii* (b), *M. hibiscus* (c) und *M. hufelandii* (d); — 2. a = Ei von *M. submorulatus*, b—c = Eiausschusse von *M. submorulatus* (b) und *morulatus* (c); — 3. *Hypsibius austriacus* sp. n. a = Habitusbild, b = Krallen IV; — 4. *H. leithaicus* sp. n. a = Habitusbild, b = Krallen IV

2b). Die Oberfläche der Ausschüsse ist in der Mitte trichterförmig eingesunken. Rings an der Eischale stehen 12—14 Ausschüsse (Abb. 2c).

Die neue Art ähnelt mehreren *Macrobiotus*-Arten mit 3 Macroplacoiden, unterscheidet sich aber von diesen leicht durch die Form der Eiausschüsse. Die Eier ähneln jenen von *M. morulatus* MARCUS, doch sind diese letzteren niedriger und kleiner ( $1\ \mu$ ); ihre Oberfläche ist konkav, aber nicht trichterförmig eingesunken; Eischale bei *M. morulatus* zwischen den Ausschüssen granuliert. Wegen der Ähnlichkeit der Eier benenne ich die neue Art *M. submorulatus*.

Standort: Moos von Dolomithfelsen in lichtem Schwarzföhrenwald.

Fundort: Kalenderberg bei Mödling.

Zusammen mit der neuen Art wurden noch *Pseudechiniscus cornutus* RICHT. und *Macrobiotus richtersi* J. MURR. gefunden.

### 3. *Hypsibius austriacus* sp. n.

Mittelgroß: Länge des Körpers 190—350  $\mu$ . Farblos, ohne Augenpigment. Cuticula ist an und zwischen den Buckeln feinwarzig und netzförmig gezeichnet. Die dorsale Körperwand mit stumpfen Buckeln versehen, die in 10 Querreihen angeordnet sind (Abb. 3a).

Qu.	Zahl der Buckel	
	<i>H. austriacus</i>	<i>H. josephi</i>
I.	3	2
II.	2	4
III.	4	4
IV.	4	4
V.	4	4
VI.	4	4
VII.	4	4
VIII.	4	4
IX.	4	2
X.	2	—

Schlundkopf länglich oval ( $27,5 \times 32\ \mu$ ), mit 2 Macroplacoiden, von denen das vordere, längere in 2 aneinander stoßende Körner geteilt ist; Komma fehlt. Krallen ein und desselben Beines verschieden groß. Hinterkrallen IV  $10\ \mu$ , Vorderkrallen IV  $7\ \mu$  (Abb. 3b).

Gelege von 8—10 ovalen Eiern ( $43 \times 55\ \mu$ , oder  $45 \times 62\ \mu$ ).

Die neue Art gehört der *tuberculatus*-Artengruppe an. Ähnelt dem *Hypsibius josephi* IHAROS, doch hat diese Art Buckel in 9 Querreihen; je ein Tuber-

kel am Grunde und je ein spitzer Buckel an der dorsalen Seite des IV. Beinpaares; hat 3 Macroplacoiden, Augenpigment und dünnere Kralle.

Standort: Laubstreu unter Laubwald.

Fundort: Leitha-Gebirge bei Purbach nächst dem Gasthof Hölzl.

Die neue Art kam zusammen mit den Arten *Macrobiotus richtersi* J. MURR., *Hypsibius schaudinni* RICHT., *H. convergens* ÜRB., *H. dujardini* DOY. und *H. leithaicus* sp. n. vor.

#### 4. *Hypsibius leithaicus* sp. n.

Klein: Länge bis 150  $\mu$ . Farblos; Augenpigment fehlt. Cuticula netzförmig gezeichnet. Dorsalseite mit kleineren und größeren Buckeln versehen, die in 10 Querreihen sitzen (Abb. 4a).

Qu.	Zahl der Buckel			
	<i>H. leithaicus</i>	<i>H. mihelcici</i>	<i>H. cyrilli</i>	<i>H. lunulatus</i>
I.	3	3	3	3
II.	4	4	2	2
III.	3	3	3	3
IV.	4	4	4	4
V.	3	3	3	3
VI.	4	4	4	4
VII.	3	2	3	3
VIII.	4	3	3	4
IX.	3	—	—	4
X.	2	—	—	3

Schlundkopf oval ( $12 \times 15 \mu$ ), mit 2 Stäbchen von denen das 1. länger ist als das 2. Komma fehlt. Krallen ziemlich klein; Hinterkralle IV 7  $\mu$ , Vorderkralle IV 5,5  $\mu$  (Abb. 4b).

Sechs ovale Eier in der alten Cuticula.

Die neue Art gehört der *tuberculatus*-Artengruppe an. Ähnelt den Arten *H. mihelcici* IHAROS, *H. cyrilli* MIH., und *H. lunulatus* IHAROS, unterscheidet sich aber von diesen durch die Form der Krallen, durch die Zahl der Buckel in den Querreihen II, VII, VIII, IX, und X, und durch die Zahl der Querreihen; diese Arten haben Augenpigment.

Standort: Laubstreu.

Fundort: Leitha-Gebirge bei Purbach nächst dem Gasthof Hölzl.

Zusammen mit der neuen Art wurden noch folgende Arten erbeutet: *Macrobiotus richtersi* J. MURR., *Hypsibius schaudinni* RICHT., *H. convergens* ÜRB., *H. dujardini* DOY. und *H. austriacus* sp. n.

In Moosproben wurden überdies noch *Macrobotus hufelandii* C.A.S. SCHULTZE und *Hypsibius bullatus* J. MURR. gefunden. Fundort: Neusiedler Hutweide auf der Parndorfer Platte. In den Streuproben kamen noch *Hypsibius recamieri* RICHT., *H. scoticus* J. MURR., *H. bakonyiensis* IHAROS und *Itaquascon ramazzotti* IHAROS vor. Die zwei letzten sind neu für die Tardigraden-Fauna Österreichs. Fundort: Ein *Querceto-Carpinetum* bei der Kaisereiche im Leitha-Gebirge.

Die Typen der neuen Arten befinden sich in meiner Sammlung.

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Anschrift des Verfassers: Balatonfenyves, Komitat Somogy, Ungarn



## BEITRAG ZUR KENNTNIS DER NEMERTINEN-FAUNA UNGARNS

Von

G. J. MÜLLER

BIOLOGISCHES INSTITUT DER AKADEMIE DER WISSENSCHAFTEN DER R. V. R.,  
LABORATORIUM FÜR OZEANOLOGIE, CONSTANTA

(DIREKTOR: PROF. DR. M. BĂCESCU)

(Eingegangen am 24. Oktober, 1964)

Im Verlauf des Jahres 1962 habe ich von Herrn Kollegen DR. I. ANDRÁSSY (Budapest) ein Präparat erhalten, welches zwei, in Kanadabalsam in toto eingebettete *Prostoma*-Individuen enthielt. Das Präparat ist mit folgender Notiz versehen: »*Stichostemma*, Görömböly-Tapolca, leg. KESSELYÁK, 1935. IX. 23«. Dank der Liebenswürdigkeit von Herrn Prof. DR. E. DUDICH, der bei der Einsammlung dieser Tiere anwesend war, erhielt ich etwas später auch einige Angaben über den Fundort. Es handelt sich um eine Thermalquelle in der Umgebung von Miskolc, mit einer Temperatur von 32,1° C, mit 485,06 mg/Liter Gesamtmineralisation, 0,35  $\mu$ curie Radioaktivität und einem pH = 6,97. Herrn Prof. DR. E. DUDICH sowie Herrn DR. I. ANDRÁSSY danke ich auch an dieser Stelle für die Überlassung des Materials und für die wertvollen Informationen.

Aus der Süßwasserfauna Ungarns meldete erstmalig J. GELEI das Vorhandensein der Art *Prostoma graecense* (BÖHMIC) aus dem Balaton-See und aus der Theiß bei Szeged [6]. Diese faunistische Meldung enthält leider keine anatomischen Hinweise. Seinerzeit hat GELEI das Vorkommen dieser Art auch in der unteren Donau angenommen. Diese Voraussetzung von GELEI hat später BĂCESCU bestätigt [1], während MÜLLER und SCRIPCĂRU [8] die Art *P. graecense* auch im Brackwassergebiet der Donaumündungen vorgefunden haben. Auf diese Art und Weise ist die Verbreitung der Art entlang der Donau zweifelsfrei erwiesen.

Das Präparat, das mir zur Verfügung gestellt wurde, enthält zwei geschlechtsreife Weibchen, die 8 bzw. 11 mm. lang und 0,5 bzw. 0,6 mm. breit sind. Beide haben je 6 Augen; die zwei vorderen Augenpaare liegen dicht nebeneinander, während das hintere Augenpaar hinter den Cerebralorganen liegt. Die Kopffurchen sind ziemlich kurz, sie schneiden sich aber in das Epithel tief ein.

Was die innere Organisation der Tiere betrifft, konnte ich mit dem Phasenkonstrastmikroskop folgendes feststellen:

Das Epithel scheint im Vergleich mit der Dicke der Körpermuskulatur außerordentlich hoch zu sein; im vorderen Körperabschnitt 1,8—2mal, im hinteren bis dreimal höher als die Dicke beider Körperwandmuskelschichten. Die epithelialen Drüsenzellen entsprechen, soweit ich es beobachten konnte, den Typen, die von MONTGOMERY ausführlich beschrieben wurden [7]. Die Bewimperung des Epithels sowie die auffallend langen Wimpern an der Kopfspitze und Afteröffnung sind an den vorliegenden Präparaten leicht zu erkennen.

Die Körperwandmuskulatur bildet zwei Schichten, in denen die äußere Ringmuskelschicht außerordentlich dünn ist, nicht dicker als die Grundsicht des Epithels. Die verhältnismäßig dicke innere Längsmuskelschicht ist am mächtigsten in dem dem Rhynchocoelom entsprechenden Körperabschnitt entwickelt. Sie wird weiter hinten dünner und reicht vorn über das Praecerebral-septum bis an die Kopfspitze in die Praecerebralregion hinein. In dieser sind die Längsmuskelfasern etwas aufgelockert.

Die Muskulatur des Rhynchocoeloms ist sehr dünn. Das Rhynchocoelom selbst ist kurz; seine Länge bildet  $\frac{4}{5}$  der gesamten Körperlänge. Der vordere Rüsselabschnitt ist mächtig, der hintere drüsige Abschnitt dünn und kurz. Das Angriffsstilet liegt auf einer stark geschwellenen, fast kugelförmigen Basis. Die Reservestiletaschen enthalten je 3—4 Reservestilette. Die Rüsselöffnung liegt terminal.

Die Merkmale des Darmtraktes, soweit dieser an unseren Präparaten sichtbar ist, entsprechen MONTGOMERYS Beschreibung. Der Blindsack des Mitteldarmes schiebt zwei Taschen nach vorn, die bei unseren Tieren wahrscheinlich eingeschrumpft sind, weil sie nicht bis an die Dorsalganglien reichen.

Rings um das Rhynchodeum ist eine mächtige Kopfdrüse vorhanden, die aus zahlreichen durch Bindegewebe zusammengehaltenen Einzeldrüsen-elementen besteht. Die Ausmündungsöffnung der Kopfdrüse liegt frontal in der Kopfgrube. Das Epithel der Kopfgrube ist etwas dicker als in den übrigen Abschnitten des Kopfes, mit langen Wimpern versehen, dagegen fehlen hier die epithelialen Drüsen-elemente (= Frontalorgan).

Das Blutgefäßsystem und die Nephridien sind, mit Ausnahme der zahlreichen Exkretionssporen an der Körperseite, bei unseren Präparaten kaum zu sehen.

Die ovalen Cerebralorgane liegen dicht neben dem Gehirn in dorsolateraler Lage.

Die hier aufgezählten Merkmale und der Vergleich des Materials mit *Prostoma graecense*, erlauben es uns, die untersuchten Tiere der Art *Prostoma eilhardi* (MONTGOMERY, 1895) zuzuordnen. Die wichtigsten Differenzierungsmerkmale zwischen diesen zwei Vertretern der ungarischen Nemertinenfauna sind folgende: bei *P. graecense* ist die Längsmuskelschicht des Hautmuskelschlauches 3—4mal dicker als eine Ringschicht, während die Ringmuskels-



schicht bei *P. eilhardi* 6—7mal dünner ist als die Längsmuskelschicht; die Stiletbasis der ersten Art ist birnförmig, die der letzteren dagegen kugelförmig.

Wir sind der Ansicht, daß in oberflächigen Gewässern des Donaubeckens wenigstens zwei Süßwassernemertinen vorhanden sind, entgegen der Meinung von REISINGER [10] und BEKLEMYSCHEW [2], die sämtliche eurasiatischen Vertreter der Gattung *Prostoma* den Arten *P. graecense* bzw. *P. clepsinoides* anrechnen wollen. Damit schließen wir uns auch der Auffassung FRIEDRICHS an [5].

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NEW PHAENOCARPA FÖRSTER SPECIES  
FROM THE ETHIOPIAN REGION  
(HYMENOPTERA, BRACONIDAE)

By

J. PAPP

(BAKONY MUSEUM, VESZPRÉM)

(Received August 15, 1965)

The first Ethiopian species of *Phaenocarpa* FÖRST. was described by J. KRIECHBAUMER (1894, p. 66) as *Dapsilarthra nigriceps*. CH. T. BRUES (1926, p. 425) recognized the misplacement of that species in the genus *Dapsilarthra* FÖRST. and transferred it into *Phaenocarpa* FÖRST. After KRIECHBAUMER, the following 4 authors introduced new *Phaenocarpa*-species from the Ethiopian Region: P. CAMERON (1905), GY. SZÉPLIGETI (1911—1915), A. GRANGER (1949), and M. FISCHER (1963). The last author also compiled a key for the 10 species, facilitating their review. In my paper, I increase the number of the known Ethiopian *Phaenocarpa*-species to 15, giving a list and a key to all, and also a detailed description of each new species. The new types are deposited in the Hungarian Natural History Museum, Budapest.

The designations of the alar veins and cells are abbreviated according to FISCHER (1963, p. 204).

The list of the 15 Ethiopian species (5 of them new to science) is as follows (distribution in brackets):

- Phaenocarpa bicolor* GRANGER, ♀, 1949 (Malagasy)  
 ,, *citri* FISCHER, ♀♂, 1963 (Belgian Congo)  
 ,, *cristata* SZÉPLIGETI, ♀, 1914 (Belgian Congo)  
 ,, *errabunda* sp. n., ♀ (Ethiopia)  
 ,, *ghesquierei* FISCHER, ♀♂, 1963 (Belgian Congo)  
 ,, *kittenbergeri* sp. n., ♀ (Uganda)  
 ,, *kovacsi* sp. n., ♀ (Ethiopia, Uganda)  
 ,, *madagascarensis* SZÉPLIGETI, ♀♂, 1913 (Malagasy)  
 ,, *magna* sp. n., ♂ (Ethiopia)  
 ,, *nigriceps* (KRIECHBAUMER), ♀, 1894 (Liberia)  
 ,, *postfurcata* sp. n., ♀♂ (Ethiopia)  
 ,, *pulchricornis* SZÉPLIGETI, ♀, 1911 (Uganda)  
 ,, *seyrigi* GRANGER, ♀♂, 1949 (Malagasy)  
 ,, *subdentata* GRANGER, ♀, 1949 (Malagasy)  
 ,, *testaceipes* CAMERON, ♀, 1905 (Cape Province)

Key to species, ♀♀ and ♂♂<sup>1</sup>

- 1 (4) *N. rec. postfurcal* (Figs. 2–3) (subgenus *Misophthora* FÖRST.).
- 2 (3) Entire face smooth and shiny. Parapside distinct and of equal depth along its run. Antenna 37–41-jointed, almost twice as long as body. Head black, palpi brown. Antenna black but 3–5 joints of apical third testaceous. Legs testaceous. Length 4–5 mm. — Range: Malagasy  
1. **Ph. bicolor** GRANG., ♀
- 3 (2) Face along eyes rugulose, otherwise smooth with scattered hairs. Only proximal half of parapside distinct, distally effaced and in traces. Dimple deep. Antenna 26-jointed, nearly as long as body. Head reddish dark brown. Antenna without light joints. Legs yellow. Length 2.7–2.8 mm. — Range: Ethiopia 2. **Ph. postfurcata** sp. n., ♀♂
- 4 (1) *N. rec. antefurcal* (or interstitial).
- 5 (16) Brachial cell (= *B*) indistinct or almost indistinct (subgenus *Asobara* FÖRST.).
- 6 (9) 1st tergite as long as its hind width.
- 7 (8)  $Cu_2$  conspicuously long and narrow, ration of  $r_2 : r_3$  as 1 : 1.35 (Fig. 21). Antenna 28-jointed. All three teeth of mandible spiky (Fig. 9). *B* almost indistinct: anal vein only in traces, *n* postfurcal but very short. Propodeum rugose, with a centrally situated hind area. Head always somewhat darker than thorax or abdomen. Length 2.8–3 mm. — Range: Uganda, Ethiopia  
3. **Ph. kovaesi** sp. n., ♀
- 8 (7)  $Cu_2$  of normal size,  $r_3$  over twice as long as  $r_2$ . Antenna 20–22-jointed. Only middle tooth of mandible spiky, lower and upper ones rounded. *B* indistinct. Propodeum smooth, only along edges somewhat rugulose, with a medio-longitudinal carina. Head, thorax, and abdomen of similar dark colour. Length 1.7 mm. — Range: Belgian Congo  
4. **Ph. citri** FL., ♀♂
- 9 (6) 1st tergite aciculate, always longer than its hind width.
- 10 (13) Propodeum with median carina only, without area.
- 11 (12) Ovipositor very short, as long as 1st tergite. 1st tergite only slightly longer than posteriorly broad, finely striated. Body brownish-black, 1st segment brown, legs testaceous. Wing subhyaline. Length 1.75 mm. — Range: Malagasy  
5. **Ph. subdentata** GRANG., ♀
- 12 (11) Ovipositor longer than half abdomen. 1st tergite at least 1.5-times longer than its hind breadth, rugulose. Body black, 1st segment and legs yellow. Wing fuscous. Length 2 mm. — Range: Uganda  
6. **Ph. pulchricornis** SZÉPL., ♀
- 13 (10) Propodeum both with carina and area.

<sup>1</sup> The key is compiled after FISCHER (1963, p. 213–214).

- 14 (15) Length 5 mm.  $Cu_2$  long and narrowing apically. *N. rec.* interstitial. 1st tergite striated. Black. Palpi, legs, and abdomen testaceous, 1st segment and apex of abdomen dark. Antenna with white ring. —  
— Range: Belgian Congo 7. *Ph. cristata* SZÉPL., ♀
- 15 (14) Length 2 mm.  $Cu_2$  not long, *n. rec.* antefurcal. 1st tergite smooth. Blackish-brown. Palpi, tegulae, and legs yellow. At most apical joints of antenna whitish. — Range: Belgian Congo
- 16 (5) *B* always entirely distinct. 8. *Ph. ghesquierei* FL., ♀♂
- 17 (20) Parapside, at least partly, indistinct.
- 18 (19) Antenna very long, 3 times longer than body, 48–60-jointed. Parapside faintly distinct. 1st tergite rather aciculate, 3 times longer than its hind width. 2nd tergite elongate. Ovipositor about length of half abdomen. Head blackish, thorax and abdomen rather brown, legs testaceous. Length 3.5–4 mm. — Range: Malagasy  
9. *Ph. seyrigi* GRANG., ♀♂
- 19 (18) Antenna of normal length, about twice as long as body. Parapside present in traces only. 1st tergite elongate, twice as long as its hind width. 2nd tergite transverse. Ovipositor as long as abdomen. Body blackish-brown, sternum, legs, and sternites yellow. Length 3 mm. —  
Range: Malagasy 10. *Ph. madagascarensis* SZÉPL., ♀♂
- 20 (17) Parapside always conspicuously distinct, evenly deep throughout.
- 21 (22) Body conspicuously large and stout, length over 5 mm. A finely crenulated and narrow furrow along eye (Fig. 8). *N. rec.* interstitial (or antefurcal),  $Cu_2$  relatively short and broad (Fig. 4). Tempora bulging, width of head greater between tempora than between eyes (Fig. 1). 1st tergite trapezoidal (Fig. 12). Body blackish, legs reddish. Wings hyaline. Length (5.5–) 6 mm. — Range: Ethiopia  
11. *Ph. magna* sp. n., ♂
- 22 (21) Body at most large but not stout, length at most 5 mm.
- 23 (24)  $Cu_2$  very long and somewhat narrowing apically,  $r_2 : r_3$  as 1 : 1.75. Ratio of cephalic breadth and length as 2 : 1.1. Proportion of first 3 flagellar joints as 1 : 1.6 : 1.2. 1st tergite aciculate, finely striated on emergence (Fig. 19). Body dark brown, legs brown. Wings scarcely fuscous. Length 2.8 mm. — Range: Ethiopia  
12. *Ph. errabunda* sp. n., ♀
- 24 (23)  $Cu_2$  moderately long,  $r_3$  always (or over) twice as long as  $r_2$ .
- 25 (26) Ovipositor longer than abdomen, but somewhat shorter than body, about 4 mm. Parapside evenly deep in its entire length. Abdomen elongate, 1st tergite short. Body testaceous, smooth and shiny. Antenna black, apically with white ring. Length 5 mm. — Range: Liberia  
13. *Ph. nigriceps* (KRIECHB.), ♀
- 26 (25) Ovipositor shorter than abdomen.

27 (28) Propodeum smooth, with a medio-longitudinal carina. 1st tergite with some fine irregular longitudinal striae. Ovipositor shorter than half abdomen (1 mm). Black. Mandibles, palpi, scape, and legs yellowish testaceous. Length 4 mm. — Range: Cape Province (South Africa)

14. *Ph. testaceipes* CAM., ♀

28 (27) Propodeum rugose, except proximal third along metanotum, with traces of area. 1st tergite striated, posteriorly moderately broadening (Fig. 20). Ovipositor longer than half abdomen. Blackish-brown. Mandible, palpi, scape, tegulae, and legs somewhat light. Base of all tibiae white. Length 3 mm. — Range: Uganda

15. *Ph. kittenbergeri* sp. n., ♀

***Phaenocarpa errabunda* sp. n., ♀**

(Figs. 5, 15, 17, 19, 23)

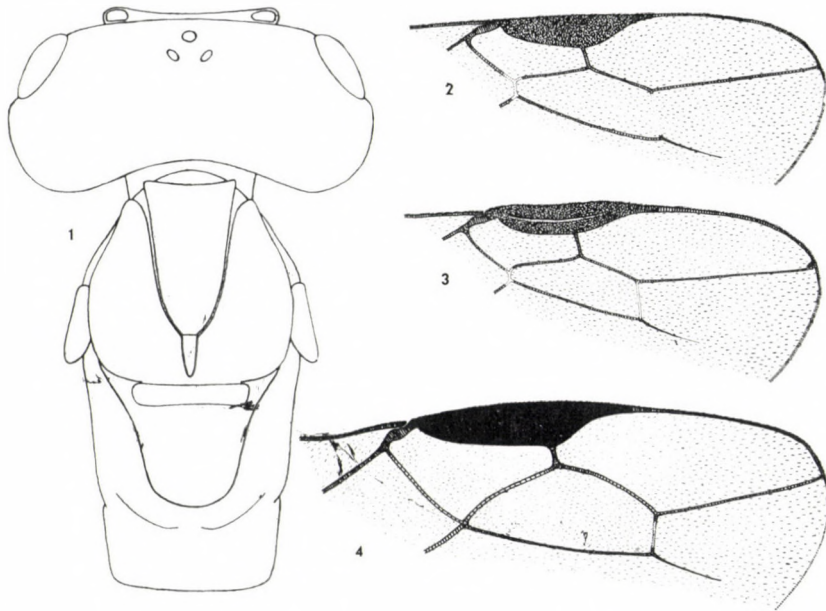
The new species stands nearest to *Ph. testaceipes* CAM. and *Ph. kittenbergeri* sp. n., but differs from both by the following marks: Length of body, outline of head and thorax, shape of  $Cu_2$ , sculpture of 1st tergite, length of ovipositor, and colour of body. From *Ph. madagascarensis* SZÉPL. it differs, besides the mentioned marks, by the deep parapside and the incision of the mandible.

♀. Head (Fig. 5) transverse, of normal form, smooth and shiny, ratio of its breadth and length as 2 : 1.1. Eye round, somewhat protruding. Width between eyes greater than that between tempora. Ratio of eye-diameter and temporal width as 1 : 0.55. Face, clypeus, and mandible clothed with long but scattered hairs. Ocelli before (or in) central axis connecting eyes. All three teeth of mandible somewhat spiky, meeting point of upper and median teeth incised (Fig. 15). Maxillary palpi as long as two-thirds of thorax. Antenna incomplete: left one of 20-, right one of 9-joints (on the lower part of card with L. BIRÓ's handwriting "25-art."). Proportion of first three joints of flagellum as 1 : 1.6 : 1.2 (Fig. 17). Antenna hairy.

Thorax (Fig. 5) of normal form, ratio of cephalic to thoracic width as 1 : 0.55, smooth and shiny except propodeum. Only sides of prescutellar furrow and metanotum with hairs. Parapside of normal course and equal depth, very finely crenulated. Dimple deeper than parapside. Prescutellar furrow deep, with five crenulae. Scutellum rounded. Propodeum rugose, with traces of area, along metanotum almost smooth. Sternauli curved and crenulated. Metapleure rugulose, linearly impressed. Legs slender, of normal form, hairy, 3rd tarsus somewhat longer than tibia.

Wing shorter than body (1 : 0.92). Stigma triangular,  $r_1$  arising from posterior third of stigma,  $r_2$  straight, shorter than  $r_3$  (1 : 1.75),  $r_3$  reaching apex of wing,  $Cu_2$  conspicuously long and narrowing apically (Fig. 23). Nerve  $n$  postfurcal, somewhat indistinct (but  $B$  distinguishable!),  $n. rec.$  antefurcal (Fig. 23),  $n. par.$  not interstitial. Abdomen as long as head and thorax, elon-

gate (narrower than thorax: 1 : 1.3). 1st tergite aciculate: over twice as long as posteriorly wide (2.1 : 1), broadening, spiracles before transverse median line, faintly protruding, with fine striae on emergence (Fig. 19). Further segments smooth and polished, all segments with dispersed hairs. Ovipositor as long as abdomen (1.4 mm).



Figs. 1—4. 1 = *Phaenocarpa magna* sp. n. ♂, outline of head and thorax; 2—4: Stigma and cubital part of right fore wing: 2 = *Ph. postfurcata* sp. n. ♀, 3 = *Ph. postfurcata* sp. n. ♂, 4 = *Ph. magna* sp. n. ♂

Colour of body: Head brownish-black, thorax and abdomen blackish-brown. Antenna brown, scape and pedicel yellowish-brown. Legs brown, end of femora and base of tibiae yellowish-brown. Tegulae yellowish-brown. Venation and stigma of wing brownish-yellow, wing scarcely fuscous.

Length 2.8 mm, alar expanse 5.5 mm.

♂ and host unknown.

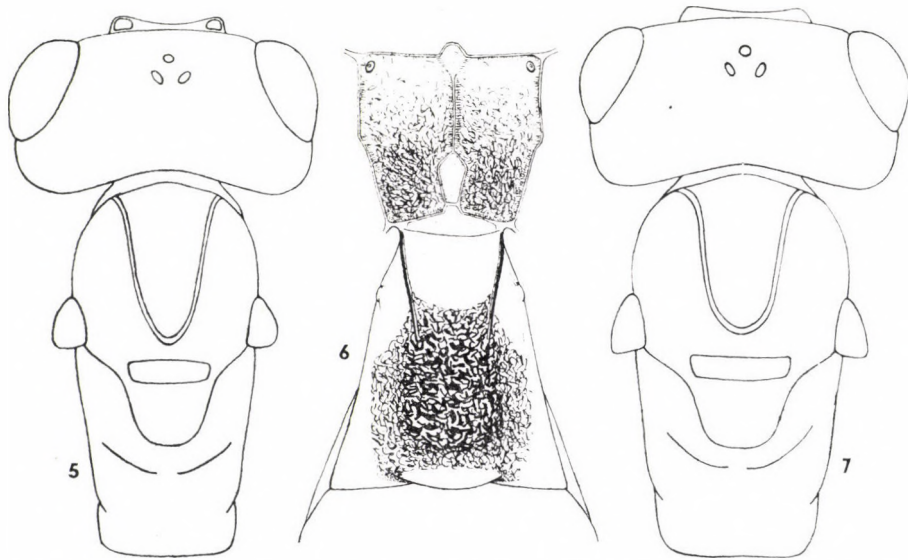
Locality: Maraquo, Ethiopia (on label "Abyssinia"), 27 March 1912, 1 ♀ (holotype, in the Hungarian Natural History Museum, Budapest), leg. Kovács.

#### ***Phaenocarpa kittenbergeri* sp. n., ♀**

(Figs. 7, 16, 18, 20, 22)

The new species stands nearest to *Ph. testaceipes* CAM. and *Ph. errabunda* sp. n. but differs from both by the following marks: Length of body, outline of head and thorax, dentation of mandible, ratio of first 3 flagellar joints, shape of  $Cu_2$ , shape and sculpture of 1st tergite. From *Ph. madagascarensis* SZÉPL. it differs, besides the mentioned features, by the deep parapside.

♀. Head transverse, ratio of its breadth and length as 2 : 0.95 (Fig. 7), glabrous and polished. Face, clypeus, and mandible with long hairs. Eye nearly round, scarcely protruding. Ocelli connecting eyes before central axis. Width between eyes greater than that between tempora. Ratio of eye-diameter and temporal width as 1 : 0.7. Upper and lower teeth of mandible rounded, middle tooth spiky (Fig. 16). Maxillary palpi about half length of thorax. Antenna incomplete: left one of 21, right one of 22 joints. Proportion of first 3 flagellar joints as 1 : 1.3 : 1.15 (Fig. 18). Antenna hairy.



Figs. 5—7. 5 = *Phaenocarpa errabunda* sp. n. ♀, outline of head and thorax; 6 = *Ph. kovacsi* sp. n. ♀, propodeum and 1st tergite; 7 = *Ph. kittenbergeri* sp. n. ♀, outline of head and thorax

Thorax (Fig. 7) somewhat stout, proportion of cephalic to thoracic width as 1 : 0.65, glabrous and polished except propodeum, with scattered hairs. Parapside evenly deep, with very fine crenulae. Dimple deep. Prescutellar furrow with three crenulae. Propodeum somewhat roughly rugose, area in traces, its proximal third along metanotum almost entirely smooth and shiny. Sternauli extending to two-thirds of mesopleura, distally widening, crenulated. Sculpture of metapleura similar to propodeum. Legs of normal form, hairy, 3rd tarsus somewhat shorter than tibia.

Wing shorter than body (1 : 0.95). Stigma triangular,  $r_1$  springing from posterior third of stigma,  $r_2$  straight, ratio of  $r_2$  and  $r_3$  as 1 : 2.8,  $r_3$  somewhat curved, ending before tip of wing,  $Cu_2$  relatively short (Fig. 22). Nerve  $n$  post-furcal (partly indistinct, but  $B$  distinguishable!),  $n. rec.$  antefurcal (Fig. 23),  $n. par.$  interstitial.



Abdomen as long as head and thorax, elongate (narrower than thorax: 1 : 1.35). 1st segment aciculate: twice as long as distally wide (2 : 1), proximal half almost smooth, distally striated, spiracles rather before transverse middle line, faintly protruding (Fig. 20). Further segments glabrous and shiny, all segments with dispersed hairs. Ovipositor longer than half abdomen (0.6 : 1).

Colour of body: Head brownish-black, thorax and abdomen reddish dark brown. Antenna brown, scape and pedicel yellowish. Mandible testaceous, palpi yellow. Tegulae brown. All coxae and trochanter yellowish, femora-tibiae-tarsi brown, base of all tibiae white. Wings faintly fuscous, veins and stigma yellowish-brown.

Length 3 mm, alar expanse 6.2 mm.

♂ and host unknown.

Locality: "Inter Marti et Arusha", Uganda (on label "Africa or."), without any date, 1 ♀ (holotype, in the Hungarian Natural History Museum, Budapest), leg. KATONA (= KITTENBERGER).

I named the new species after the famous Hungarian zoologist and hunter, K. KITTENBERGER.

### *Phaenocarpa kovacsi* sp. n., ♀

(Figs. 6, 9, 21)

The new species stands nearest to *Ph. citri* Fl., but differs from it by the following marks: Length and colour of body, spiky teeth of mandible, elongate stigma and  $Cu_2$ , sculpture of propodeum and 1st tergite, shape of legs.

♀. Head transverse, ratio of its breadth to length as 2 : 1.1, glabrous and polished. Face, clypeus, and mandible with long hairs. Face with fine and scattered punctation. Middle tooth of mandible long, together with upper and lower teeth spiky (Fig. 9). Maxillary palpi as long as two-thirds length of thorax. Eye nearly round. Tempora half as wide as diameter of eye. Width of head equal between eyes and tempora. Antenna longer than body (1 : 0.85), 28-jointed, hairy. Ratio of first 3 flagellar joints as 1 : 1.4 : 1.2.

Thorax of normal outline, ratio of cephalic to thoracic width as 1 : 0.6, smooth and shiny except propodeum. Dorsal side with sparse but long hairs. Parapside rather on edge of mesonotum, further section only in traces. Dimple deep. Prescutellar furrow short, with 3 crenulae. Scutellum rounded, wider than long. Rugosity of propodeum posteriorly and gradually rougher, a central area on hind surface (Fig. 6). Upper corner of mesopleura finely striated. Sternauli extending onto three-quarters of mesopleura, crenulated, posteriorly narrowing and becoming shallower. Legs relatively short, hairy. Femora short and thick (as on *Ph. postfurcata* sp. n.). 3rd tarsus as long as tibia.

Wing as long as body. Stigma elongately triangular,  $r_1$  arising from posterior of stigma,  $r_2$  somewhat arched,  $r_2 : r_3$  as 1 : 1.35,  $r_3$  almost reaching apex of wing, its end curved,  $Cu_2$  conspicuously long and narrow, *n. rec.* antefurcal

(Fig. 21). *B* almost indistinct: anal vein faint, *n* postfurcal and very short, *n. par.* interstitial (presumably this phase of evolvement is a transitional state between a distinct and indistinct *B*).

Abdomen elongated oval, shorter than head and thorax together (1 : 1.05), 3rd segment at hind margin almost as broad as thorax. 1st tergite trapezoidal: its posterior width and length equal. Spiracles near anterior end, faintly protruding. Posterior two-thirds of surface rugose (Fig. 6). Further segments smooth and shiny, hairy. Ovipositor short, as long as half length of abdomen.

Colour of body: Head blackish or dark brown. Mandible and antenna brown, scape and pedicel yellowish-brown. Palpi whitish-yellow. Thorax and abdomen brownish-yellow. On paratype, thorax yellow except metanotum and metapleura. Medio-longitudinal streak of sternites yellowish but without any sharp border towards brownish-yellow colour. Ovipositor reddish-brown, sheath dark. Legs brownish-yellow or yellow (paratype). Apex of last tarsal joints and claws dark.

Length 2.8–3 mm, alar expanse 6–6.4 mm.

♂ and host unknown.

Localities: 1. Mujenje, Uganda, Aug. 1913, 1 ♀ (holotype, in the Hungarian Natural History Museum, Budapest), leg. KATONA (= KITTENBERGER). 2. "Jerrer-völgy" (= valley of Jerrer or Djerrer) near Djigdjiga, Ethiopia (= "Abyssinia"), 10 July 1911, 1 ♀ (paratype, in the Hungarian Natural History Museum, Budapest), leg. KOVÁCS.

I named the new species after its collector, Ö. KOVÁCS.

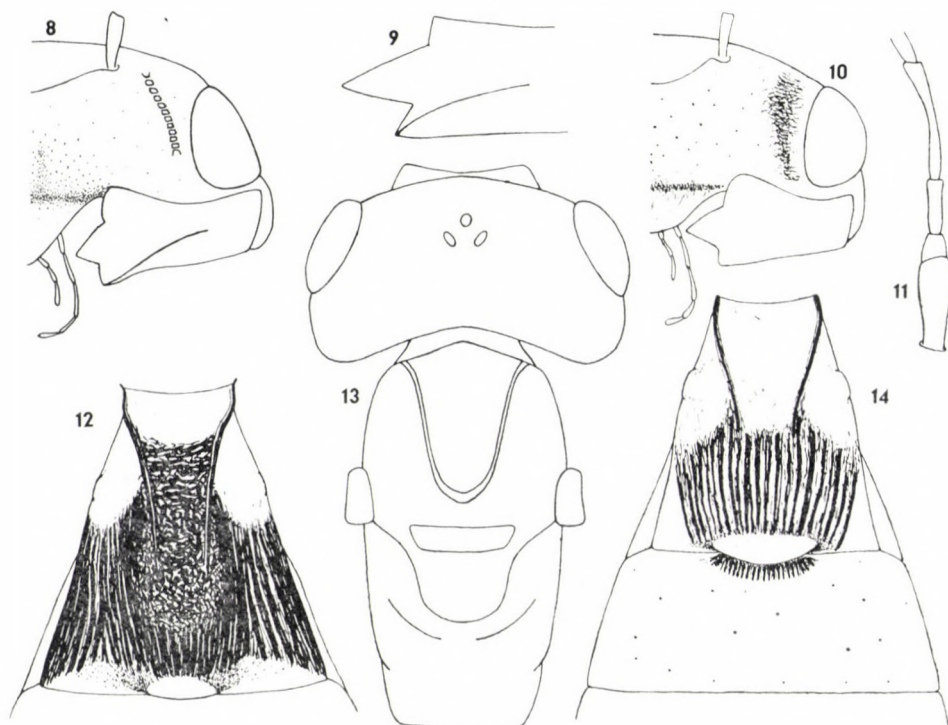
### *Phaenocarpa magna* sp. n., ♂

(Figs. 1, 4, 8, 11, 12)

The new species stands nearest to *Ph. testaceipes* CAM. (Ethiopic) and *Ph. ruficeps* (NEES) (Palearctic), but differs from both by the following marks: the stout size, form and outline of body, sculpture of face, depth of parapside, number of antennal joints, wing venation, shape and sculpture of 1st tergite, and colour of body.

♂. Head transverse, its width broader between tempora than between eyes (Fig. 1), proportion of its breadth and length as 4.5 : 2. Face sparsely punctate, along its medio-longitudinal line finely rugulose (Fig. 1). Besides eye, a finely crenulated and narrow furrow (Fig. 1). Vertex, occiput, and tempora glabrous, together with face polished. Mandible, clypeus, and face with long hairs, otherwise head with scattered pubescence. Mandible strong, with 3 blunt teeth (Fig. 8), rugose. Maxillary palpi almost as long as height of head. Eye nearly round, relatively small, viewed from above only slightly protruding laterally (Fig. 1). Ratio of eye-diameter and temporal width as 1 : 1. Ocelli in (or somewhat behind) central axis connecting two eyes. Antenna pubescent, much longer than body (1 : 0.7), of 42 joints (only left antenna of holotype complete, paratypes with more or less damaged antennae). Proportion of first 2 flagellar joints as 1 : 2.1, 2nd joint curved (Fig. 11).

Thorax (Fig. 1) of normal form. Ratio of cephalic to thoracic width as 1 : 0.6, smooth and shiny except propodeum. Upper corner of mesopleura, and prosternum, with long hairs. Parapside of equal depth throughout, finely crenulated. Beside proximal end of parapside, median and lateral lobes of mesonotum somewhat bulging (Fig. 1). Dimple linearly impressed. Prescutellar furrow with 5 crenulae. Scutellum rounded. Propodeum rugose, only along



Figs. 8—14. 8 = *Phaenocarpa magna* sp. n. ♂, left half of head in front; 9 = *Ph. kovacsi* sp. n. ♀, left mandible; 10 = *Ph. postfurcata* sp. n. ♀, left half of head in front; 11 = *Ph. magna* sp. n. ♂, first 4 joints of antenna; 12 = *Ph. magna* sp. n. ♂, 1st tergite; 13 = *Ph. postfurcata* sp. n. ♀, outline of head and thorax; 14 = *Ph. postfurcata* sp. n. ♀, 1st—2nd tergites

metanotum with fine rugosity, without any carina. Upper (short) and lower (long) furrows of mesopleura strongly crenulated. Lower half of metapleura rugose, but not so roughly as propodeum. Legs of normal form, hairy. 3rd tibia as long as 3rd tarsus.

Wing somewhat shorter than body. Stigma elongate,  $r_1$  springing from posterior third of stigma,  $r_2$  curved, shorter than  $r_3$  (1 : 1.3),  $r_3$  reaching apex of wing,  $Cu_2$  relatively short but broad (Fig. 4). Nerve  $n$  postfurcal,  $n. rec.$  and  $n. par.$  interstitial.

Abdomen as long as head and thorax, somewhat broader (at 3rd segment) than thorax. 1st tergite somewhat longer than distally wide (1 : 0.93),

considerably narrowing apically, distal two-thirds medially rugose, laterally striated, spiracles faintly protruding (Fig. 12). Further segments smooth and polished, all segments with dispersed hairs.

Colour of body: Head, thorax, and 1st tergite pitch-brown. Pedicel and distal third of mandible (except apex of teeth) reddish. Tegulae and abdomen (except 1st tergite) brownish-black. Legs brownish-black, reddish-brown or reddish. Wings hyaline. Venation and stigma dark (blackish-brown and brownish-black).

Length (5.5—)6 mm (the largest known species in the genus *Phaenocarpa*: “*magna*”), alar expanse 11—11.5 mm.

♀ and host unknown.

*L o c a l i t y*: Maraquo, Ethiopia (on label “Abyssinia”), 27 March 1912, 4 ♂ (1 holotype and 3 paratypes, in the Hungarian Natural History Museum, Budapest), leg. Kovács.

*Phaenocarpa magna* ab. *ruficincta* ab. n. ♂

Deviation from the nominate form: 1st sternite and 2nd segment of abdomen testaceous.

*L o c a l i t y*: Maraquo, Ethiopia (on label “Abyssinia”), 27 March 1912, 1 ♂ (paratype, in the Hungarian Natural History Museum, Budapest), leg. Kovács.

*Phaenocarpa postfurcata* sp. n. ♀♂

(Figs. 2, 3, 10, 13, 14)

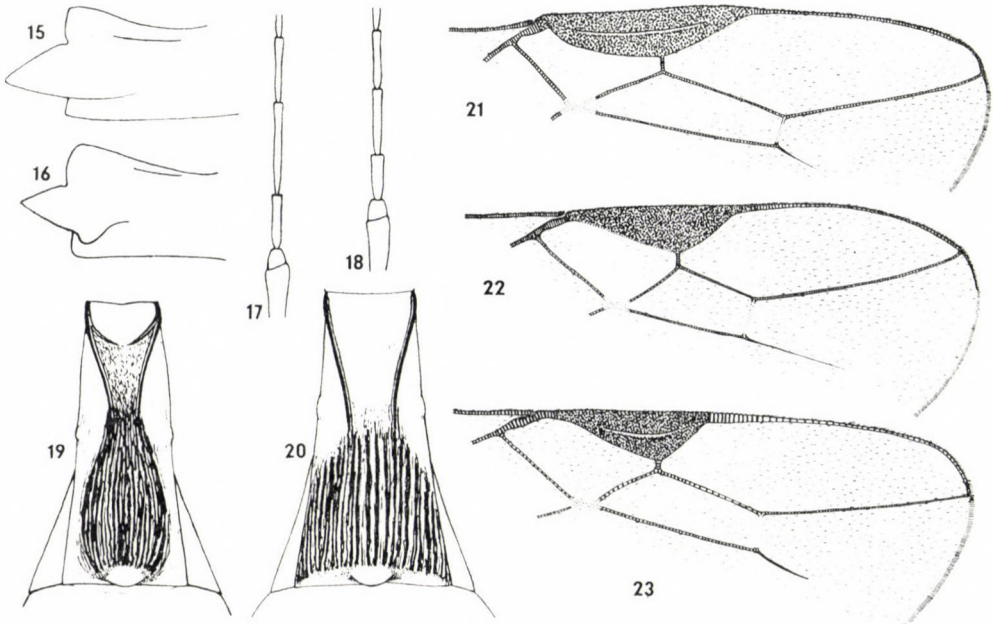
The new species stands nearest to *Ph. bicolor* GRANG., but differs from it by the following marks: Length and outline of body, sculpture of face, number of antennal joints, distally indistinct parapside, venation of wings, shape and sculpture of 1st tergite, and colour of body.

♀. Head transverse, proportion of its breadth and length as 2 : 1, anteriorly somewhat rounded, bulging (Fig. 13). Face along eye rugulose, otherwise with scattered punctures (Fig. 10). Vertex, occiput, and tempora polished and smooth. Face laterally, clypeus, and mandible with long hairs, otherwise head with dispersed pubescence. Eye nearly round, somewhat protruding. Ocelli in median transverse axis connecting eyes. Mandible of normal form, upper and lower teeth rounded, middle tooth spiky (Fig. 10). Maxillary palpi as long as height of head. Antenna 26-jointed (only right antenna of holotype complete), nearly as long as body. All joints hairy. Ratio of first 3 flagellar joints as 1 : 1.25 : 1.2.

Thorax relatively wide: proportion of cephalic to thoracic width as 1 : 0.72 (Fig. 13), smooth and polished without propodeum. Anterior edge of mesonotum, propodeum, sternal part, and metapleura hairy. Only proximal half of parapside distinct, evenly deep, with very fine crenulation. Dimple deep. Prescutellar furrow crenulated. Scutellum rounded. Propodeum rugose,

proximal half with very fine rugosity. Sternauli somewhat arched, crenulated, extended over proximal half of mesopleura. Metapleura almost smooth. Legs relatively short, femora short and thick (as on *Ph. kovacsi* sp. n.). 3rd tarsus longer than tibia (1 : 0.94).

Wing as long as body (or longer). Stigma elongate,  $r_1$  springing near middle of stigma, almost as long as width of stigma,  $r_2$  straight,  $r_2 : r_3$  as 1 : 2.2,  $r_3$  also straight and reaching tip of wing, *n. rec.* postfurcal ("postfurcata") (Fig. 2). Nerve *n* almost interstitial, *n. par.* not interstitial.



Figs. 15—23. 15 = *Phaenocarpa errabunda* sp. n. ♀, left mandible; 16 = *Ph. kittenbergeri* sp. n. ♀, left mandible; 17 = *Ph. errabunda* sp. n. ♀, first 5 joints of left antenna; 18 = *Ph. kittenbergeri* sp. n. ♀, first 5 joints of left antenna; 19 = *Ph. errabunda* sp. n. ♀, 1st tergite; 20 = *Ph. kittenbergeri* sp. n. ♀, 1st tergite; 21—23: Stigma and cubital part of right fore wing: 21 = *Ph. kovacsi* sp. n. ♀, 22 = *Ph. kittenbergeri* sp. n. ♀, 23 = *Ph. errabunda* sp. n. ♀

Abdomen shorter than head and thorax together (1 : 1.1), but longer than thorax (1 : 0.8). Abdomen (at 3rd segment) as broad as thorax. 1st tergite trapezoidal (Fig. 14), scarcely longer than distally wide, anteriorly narrowing, distally striated, spiracles before transverse medial line, faintly protruding. Fore median margin of 2nd tergite striated, otherwise together with all segments smooth and shiny. Hairs of abdomen in row before hind margin of all segments. Ovipositor as long as half length of abdomen, but hardly exerted.

Colour of body: Head, thorax, and abdomen reddish dark brown. Antenna brown, scape and pedicel yellowish. Mandible and base of tempora

yellow. Palpi whitish-yellow. Pronotum and mesopleura testaceous, 2nd and 3rd segments reddish-brown. Tegulae brownish-yellow. Legs yellow, tarsi dark. Ovipositor reddish, sheath dark brown. Wings hyaline, stigma and veins brownish-yellow.

Length 2.7–2.8 mm, alar expanse 5.8–6 mm.

♂. Deviation from female: outer margin of stigma convex,  $Cu_2$  narrower (Fig. 3). Pronotum and mesopleura brownish-yellow. Mandible and legs vivid yellow.

Host unknown.

Localities: 1. "Jerrer-völgy" (= valley of Jerrer or Djerrer) near Djigdjiga, Ethiopia (= "Abyssinia"), 10 July 1911, 2 ♀ and 1 ♂ (holotype and 2 paratypes, in the Hungarian Natural History Museum, Budapest), leg. Kovács. 2. Harrar, Ethiopia (= "Abyssinia"), June 1911, 1 ♂ (allotype, in the Hungarian Natural History Museum, Budapest), leg. Kovács.

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Author's address: Veszprém, Lenin-liget 5, Hungary

IDENTIFICATION KEY TO THE LEECH  
(HIRUDINOIDEA) GENERA OF THE WORLD,  
WITH A CATALOGUE OF THE SPECIES. II.

FAMILIES: SEMISCOLECIDAE, TREMATOBDELLIDAE, AMERICO-  
BDELLIDAE, DIESTECOSTOMATIDAE

By

Á. Soós

ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST  
(DIRECTOR: DR. Z. KASZAB)

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### I. Introduction

In the present part of the series of communications, begun in the preceding volume of this periodical, I propose to treat the four families, as indicated in the title, relegated to the Erpobdelloidea. Concerning these four families, discussions continued to the present day, nor is the issue settled as yet, first whether the species assigned to them constitute distinct and good families, secondly with respect to their correct systematical allocation. Owing to the aim of the present paper, I cannot expound these problems, but here refer to them, shortly, as follows: certain authors, e. g. CABALLERO (1956, 1959), or HARANT & GRASSÉ (1959), assign all four families to the order Pharyngobdellae, after the family Erpobdellidae, which is the richest in species. On the other hand, authors like MOORE (1946), or RINGUELET (1954), do not recognize the distinctness of the order Pharyngobdellae, and regard these taxa as merely the families of the order Arhynchobdellae. On the basis of my investigations, I tend to agree with these latter authors, that is, I also contend that the separation as a distinct order of Pharyngobdellae is unjustified, since in not a few of their species or groups the Gnathobdellid and Pharyngobdellid characters appear to be more or less mixed so that their relegation to one or the other group is highly subjective. Unfortunately, at the present state of our knowledge we cannot as yet decide how many natural, higher taxonomical units or families could, within the Arhynchobdellae, be recognized as distinct, nor assess their courses of formation during evolution. In short, we cannot as yet safely establish the natural, phylogenetical system of the leeches.

With regard to the four families, to be discussed below, I should like to make the following remarks.

As opposed to the usage of CABALLERO and HARANT & GRASSÉ, the genus *Potamobdella* CABALLERO should be removed from the family Semiscolecidae, since, due to the structure of the digestive and reproductive organs, the genus indubitably belongs to the family Hirudinidae, as was already demonstrated in detail by RINGUELET (49, p. 47–52), in a special paper dedicated to this problem. According to this author, the genus should be assigned to *Pintobdella*, established also by CABALLERO in 1937. If it were found that the two genera are truly identical, then, in accordance with the rules of priority, the valid designation for the type-species would be *Potamobdella* (= *Batrachobdella* CABALLERO) and not *Pintobdella*. It remains to be clarified, however, whether all four *Pintobdella* species are congeneric with the *Potamobdella* species. If not, the genus *Pintobdella* were still available for a part of them. Unfortunately, I had as yet occasion to study only the species *Potamobdella oaxacensis* (CABALLERO, 1931), hitherto failing in all my efforts to receive *Pintobdella* species for investigation. Hence I cannot decide the question.

Similarly, I cannot settle the problem of the correct relegation of the genus *Semiscolecides* AUGENER, again in want of material. By the incomplete description, covering only some of the essential points, — thus the position of the eyes and the pharyngeal structure — I would say that this genus were best transferred to the family Erpobdellidae. I had no occasion to examine the single type-specimen preserved in the Basel Museum. It is also questionable whether *Semiscolecides hondurensis* AUGENER in fact represents a new Erpobdellid genus, as contended by AUGENER himself at the end of the description (1, p. 313). It seems therefore that there will remain only three genera in the family Semiscolecidae, namely the type-genus, *Semiscolex* KINBERG, *Cyclobdella* WEYENBERGH, — formerly incorrectly synonymized with the preceding genus but rehabilitated by RINGUELET in 1953 (56, p. 261–271) — and the recently (1945) established *Orchibdella*, described also by RINGUELET (52, p. 122–131). The species of these three genera appear to form, as to morphology, habits and zoogeographical range, a natural systematic unit.

The family Trematobdellidae was established more or less on the basis of a single feature, the presence of the gastropore, by JOHANSSON (25, p. 32) in 1913. The ten species, described since then and assigned to five genera, constitute a rather heterogeneous group. There are indeed some, e. g. certain species of the genus *Barbronia*, which have no gastropore<sup>1</sup> at all, but accessory copulatory pores before, respectively behind, the male and female gonopores. Some again have vestigial jaws, others are in lack of them. The basic structure of their organism indubitably bear the features of the family Erpobdellidae.

Without the actual examination of the animal it cannot be definitely decided, but it appears from the description that the genus *Acrobdella* HAR-

<sup>1</sup> The genus *Barbronia* should certainly be relegated to the family Erpobdellidae, as was already done by MANN in 1961 (p. 151).



DING is identical with *Gastrostomobdella* MOORE. Collating HARDING's description (29, p. 221—223), unfortunately lacking certain essential data, with MOORE's diagnosis, I was unable to find any substantial generic differences. This case, too, is a typical example of the difficulties involved in adjudging a systematical problem in want of differentiating diagnoses in the descriptions of new taxa. And this is still — let alone the earlier! — usage in the major part of literature on leeches. It was very commendable that the new Code acted against the validity and availability of a new taxon described without a differential diagnosis [Article 13, (a) (i)].

RINGUELET (57, p. 10) does not accept Trematobdellidae as a distinct family and considers its species as relegable to the family Erpobdellidae. I agree with also this statement of RINGUELET, provided that at least part of these species be segregated within the Erpobdellidae, since it seems that there is between them a stronger phylogenetical connection. It is also worthy of note that their range lies in the Indo-Pacific area.

The family Americobdellidae (= Cardeidae), together with its single species, *Americobdella valdiviana* (PHILIPPI), takes a very special place within the class of leeches. Especially after MOORE's masterly treatment (32, p. 29—47), the species came into the focus of several discussions. According to my investigations, this animal is the sole living representative of an evolutionary line which branched off very early, soon after the separation of the Rhynchobdellae and Arhynchobdellae lines, and constituted a distinct phylogenetic line of its own. Its organism contains a mixture of the recent Piscicolid, Hirudinoid, and Erpobdelloid characters. A knowledge of the biology, and especially the reproductive biology, and mainly the investigation of its physiology and ontogenesis, will surely reveal many a new fact, bearing primarily on the evolution of the leeches.

The five species of the family Diestecostomatidae (= Xerobdellidae) inhabit two far removed areas. The species of the genus *Xerobdella* live in Europe, those of the genus *Diestecostoma* in the mountains of Central-America. Their basic structure and terrestrial habits entirely agree with the Haemadipsids, but they have drifted far from the range of the latter. There is not one Haemadipsid species inhabiting the Holarctic Region, and they are represented in the Neotropic Region only by a single, peculiar genus (*Mesobdella* E. BLANCHARD). Certain authors, e. g. SCRIBAN & AUTRUM (62, p. 341), RINGUELET (57, p. 9), or AUTRUM (3, p. 14), assign the genus *Xerobdella* to the family Haemadipsidae. For my part, in agreement with MOORE's (39, p. 186—190) arguments, I relegate the genus *Xerobdella* to the family Diestecostomatidae.

## II. Identification Key of the Genera of the World

### Familia: SEMISCOLECIDAE

- 1 (2) Four pairs of (2 labial and 2 buccal) eyes present, arranged as in *Eripobdella* species. Pseudognaths at cephalic end of pharynx. Gonopores separated by 3 annuli. Even external morphology hardly known, anatomically completely unknown. Length: 43 mm. ? Fresh-water species. — Type-species: *Semiscoleoides hondurensis* AUGENER, 1930. Only a single species known. Honduras **Semiscoleoides** AUGENER, 1930
- 2 (1) Five pairs of eyes present, arranged like a horseshoe, as in Hirudiniidae. Pseudognaths absent. Externally highly similar genera, distinguishable primarily by their reproductive organs.
- 3 (4) Female organs hirudiniiform: 2 small, sphaerical ovisacs, and short, distinct oviducts, bearing, after uniting, glandula albuminifera on initial section of common oviduct, vagina long, tubiform or fusiform. Male organs characterized by a long and throughout evenly tubiform ejaculatory duct, without bulbus ejaculatorius, epididymis compact, interlaced and looped, 8–10 pairs of testes, respectively *variabilis* BLANCHARD with 17 pairs (but in this latter case somite 8 with 2 pairs of testes each). 15–17 complete somites. Five pairs of eyes situated on annuli 2, 3, 4, 5, 7, or 2, 3, 4, 6, 8. Gonopores separated by  $2\frac{1}{2}$ –7 annuli. Length: 10–70 mm. Amphibious. — Type-species: *Semiscolex juvenilis* KINBERG, 1866. 7 species known. South America  
**Semiscolex** KINBERG, 1866
- 4 (3) Female organs erpobdelliform: ovisacs U-shaped, arcuately tubiform, oviducts throughout distinct, united only in extremely short, bulbiform vagina. Male organs with an ejaculatory bulb on ductus ejaculatorius, epididymis loose, consisting of only some distinct whorls.
- 5 (6) Somites XV–XXIV with 2 testes per somite, that is, with a total number of 20 testes (sometimes testes absent from somite XV or XXIV, then number of testes-pairs only 18). Ovisacs arched in U, situated behind, in somites XVI and XVII, oviducts long, at least twice longer than ovisacs, with a bag-like extrusion on their border. Ejaculatory ductus entering atrium asymmetrically and at different heights: left one near prostata, right one at proximal end of atrium. Bulbus ejaculatorius small, directly entering atrium. Number of complete somites 17 or 18 (VIII or IX–XXV). Five pairs of eyes situated on annuli 2, 3, 4, 5, 7. Gonopores separated by 5–6 annuli. Length: 30–40 mm. Amphibious. — Type-species: *Orchibdella pampeana* RINGUELET, 1945. Only a single species known. Argentina  
**Orchibdella** RINGUELET, 1945

- 6 (5) Somites XV—XXIV with 1 pair of testes per somite, that is, with a total number of 10 testes. U-shaped ovisacs situated in somite XIII, oviducts short, essentially shorter than ovisac, without a bag-like protrusion on their border. Ductus ejaculatorius entering atrium symmetrically. Ejaculatory bulb large, fusiform, far removed from atrium. Number of complete somites 16 or 17 (IX—XXIV or XXV). Five pairs of eyes on annuli 2, 3, 4, 5, 7. Gonopores separated by  $3\frac{1}{2}$ -4 annuli. Length: 20—30 mm. Amphibious. — Type-species: *Cyclobdella glabra* WEYENBERGH, 1879. Only a single species known. Argentina, Paraguay  
**Cyclobdella** WEYENBERGH, 1879

Familia: TREMATOBDELLIDAE<sup>2</sup>

- 1 (4) Three vestigial jaws present. Complete somite 5-annulate, last annulus ( $b_6$ ) distinctly more enlarged than others, mostly subdivided.
- 2 (3) Gastropore present in median line of dorsal side, between annuli  $b_5$  and  $b_6$  of somite XIII. One pair of larger, normal, and 8 pairs of considerably smaller, accessory eyes. Number of complete somites 18. Testiculi situated in somites XVIII—XXIII, about 55 on one side. 14 pairs of nephridia in somites X—XXIII. Length: 25—35 mm. Fresh-water form. — Type-species: *Salifa perspicax* (JOHANSSON, 1909). Only a single species known. Sudan  
**Trematobdella** JOHANSSON, 1913
- 3 (2) Gastropore absent. Usually one pair of labial and one (—2) pair of buccal eyes present. Some specimens (*delicata* MOORE) occasionally with another pair of labial eyes, indeed accessory eyes appearing on somites VI—IX. Number of complete somites 15—17. Testiculi situated in front, in somites XIV—XVI or XVII—XIX, numbering 5—8, 11—12, or 13—14 on one side. Except for *delicata* MOORE, accessory copulatory pores present on border of somites X/XI and XIII/XIV: anteriorly of male, and posteriorly of female gonopores. 14 pairs of nephridia in somites IX—XXII. Length: 10—35 mm. Fresh-water species. — Type-species: *Barbronia rouxi* JOHANSSON, 1918. 3 species and 1 subspecies known. SE. and E. Asia, New Guinea, New Caledonia, E. Africa  
**Barbronia** JOHANSSON, 1918<sup>3</sup>
- 4 (1) Jaws absent. Complete somite 6- or 7-annulate, exceptionally (*Gastrostomobdella quinqueannulata* MOORE) apparently only 5-annulate.

<sup>2</sup> I have retained the family Trematobdellidae as a distinct taxon only for the sake of practical considerations, namely to facilitate identification purposes. The respective species and genera must be allocated within the family Erpobdellidae.

<sup>3</sup> The genus *Barbronia* should certainly be relegated to the family Erpobdellidae, as was already done by MANN in 1961 (p. 151).

- 5 (6) Complete somite 7-annulate ( $b_1, b_2, a_2, b_5, c_{11}, d_{23}, d_{24}$ ). One pair of eyes present, gastropore situated in median line of dorsal side between somites XIV/XV. Number of complete somites 18. Gonopores separated by 7 annuli. Internal anatomy little known, but pharynx and atrium apparently as in *Dina*. Length: 40 mm. Fresh-water form, or amphibious. — Type-species: *Foraminobdella heptamerata* KABURAKI, 1921. Only a single species known. India

**Foraminobdella** KABURAKI, 1921

- 6 (5) Complete somite 6-annulate; exceptionally (*Gastrostomobdella quinqueannulata* MOORE) apparently 5-annulate, since, in this latter species, subdivision of annulus  $b_6$  always distinct.
- 7 (8) Complete somite formed by 2 narrower, 3 wider, and 1 narrower annuli ( $c_1, c_2, b_2, a_2, b_5, b_6$ , that is  $c_1 = c_2 = b_5 < b_2 = a_2 = b_5$ ). 3–4 pairs of eyes present: 2 labial pairs (on II), and 1 or 2 buccal pairs (on V). Place of gastropore not exactly defined: “a dorsal opening leading into the digestive tract immediately before the junction of the pharynx and stomach”. Gonopores separated by 6 annuli. Length: 170 mm. Amphibious. — Type-species: *Acrabdella sumatrensis* HARDING, 1931. Only a single species known. Sumatra **Acrabdella** HARDING, 1931
- 8 (7) Complete somite formed by 1 narrower, 3 wider, and 2 narrower annuli ( $b_1, b_2, a_2, b_5, c_{11}, c_{12}$ , that is,  $b_1 = c_{11} = c_{12} < b_2 = a_2 = b_5$ ). 4, rarely 3 pairs of eyes present: 2 or 1 labial pairs (on II or III), and 2 buccal pairs (on V). Gastropore on border between somites XIV/XV in one species, and on  $XIVa_2$ , respectively on  $XIVc_{11/12}$ , in two other known species. Gonopores separated by 3, 6–7, or 9 annuli. Length: 20–110 mm. Amphibious. — Type-species: *Gastrostomobdella monticola* MOORE, 1929. 3 species known. Malay Peninsula, Borneo, Sarawak, Hawaii **Gastrostomobdella** MOORE, 1929

Familia: AMERICOBDELLIDAE

Only a single genus known.

- — Complete somite 5-annulate (median annulus, namely  $a_2$ , slightly narrower than four other ones, that is,  $b_1 = b_2 > a_2 > b_5 = b_6$ ). Number of complete somites 14. Jaws, gastropore absent. Genital structure unique among Arhynchobdellidae: mainly characterized by oviducts being connected by a separate duct with female bulbus situated anteriorly of atrium. Male pore probably coincident with female one, since morphological female opening, as such, not functioning. Gonopores separated by 5 annuli. 9 pairs of testes present; strongly lobate, except for pairs 1 and 9, unique among leeches. Length: 100–220

mm. Terrestrial. — Type-species: *Macrobdella valdiviana* PHILIPPI 1872. Only a single species known. Chile

*Americobdella* CABALLERO, 1956

#### Familia: DIESTECOSTOMATIDAE

- 1 (2) Complete somite 5-annulate. Cephalic end with a small, tentacle-like appendix ("palps") on each side. 3 pairs of jaws present, each bearing about 18–35 coarse teeth. 4 pairs of eyes on annuli 4, 5, 6, 9. Gonopores separated by 3–4½ annuli; 2½–3½ annuli behind female pore, another opening medioventrally, of unknown function. 17, or more correctly, 16 pairs of nephridia present, since pairs 16 and 17 fused, their common, unpaired duct opening medioventrally into groove immediately anteriorly of caudal sucker. Genital structure unknown. Length: 30–65 mm. Terrestrial. — Type-species: *Xerobdella lecomtei* FRAUENFELD, 1868. 2 species known. Austria, Yugoslavia, Lithuania *Xerobdella* FRAUENFELD, 1868
- 2 (1) Complete somite 8-, 10- or 12-annulate. Cephalic end without tentacle-like appendix. Jaws either smooth (*octoannulatum* MOORE), or decidedly toothed. 4 or 5 pairs of eyes present, on annuli 4, 5, 6, 9, respectively on 3, 4, 5, 6, 9. Gonopores separated by 16–21 annuli; female pore without a further posterior, medioventral opening. Number and formation of nephridia corresponding with those of preceding genus. Female organs of type-species hirudiniform, namely with two spherical ovisacs, a short, distinct, and a longer, common oviduct (glandula albuminifera absent), their long vagina subdivided into a saccus and ductus vaginae. 10 pairs of testes present, epididymis compact. Genital structure of two other species unknown. Length: 30–120 mm. Terrestrial. — Type-species: *Heterobdella mexicana* BAIRD, 1869. 3 species known. Mexico, Guatemala *Diestecostoma* VAILLANT, 1890

### III. Catalogue of the Species

Familia: SEMISCOLECIDAE SCRIBAN & AUTRUM, 1934

#### 1. Genus: *Cyclobdella* WEYENBERGH, 1879

WEYENBERGH (1879): *Periód. Zoológico*, **3**, p. 122. — WEYENBERGH (1879): *Bol. Acad. Nac. Cienc. Argent.*, **3**, p. 242. — RINGUELET (1953): *Notas Mus. La Plata* **16**, Zool. No. 143, p. 261–262.

Type-species: *Cyclobdella glabra* WEYENBERGH, 1879

1. *glabra* WEYENBERGH (1879): *Bol. Acad. Nac. Cienc. Argent.*, **3**, p. 242. — BLANCHARD (1896): *Boll. Mus. Zool. Anat. comp. Univ. Torino*, **II**, No.

263, p. 13—16, Figs. 3—5. — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchatel, p. 96—98, Figs. 37a—d, 38a—c. — CORDERO (1941): Bol. Acad. Nac. Cienc. Argent., **35**, p. 211—212. — RINGUELET (1943): Rev. Mus. La Plata (N. S.), **3**, Zool. No. 22, p. 209. — RINGUELET (1944): Rev. Mus. La Plata (N. S.), **4**, Zool. No. 25, p. 79—80, Figs. 29d—e. — RINGUELET (1953): Notas Mus. La Plata, **16**, Zool. No. 143, p. 262—271, Figs. 1—5.

Localities: Argentina, Paraguay.

## 2. Genus: *Orchibdella* RINGUELET, 1945

RINGUELET (1945): Rev. Mus. La Plata (N. S.), **4**, Zool. No. 26, p. 122—124.  
Type-species: *Orchibdella pampeana* RINGUELET, 1945

1. *pampeana* RINGUELET (1945): Rev. Mus. La Plata (N. S.), **4**, Zool. No. 26, p. 124—131, Figs. 17—20. — RINGUELET (1949): Notas Mus. La Plata, **14**, Zool. No. 122, p. 155.

Locality: Argentina.

## 3. Genus: *Semiscolecides* AUGENER, 1930

AUGENER (1930): Zool. Anz., **90**, p. 311.

Type-species: *Semiscolecides hondurensis* AUGENER, 1930

1. *hondurensis* AUGENER (1930): Zool. Anz., **90**, p. 311—313.

Locality: Honduras.

## 4. Genus: *Semiscolex* KINBERG, 1866

KINBERG (1866): Öfv. Kongl. Vetensk. Akad. Förhand., **23**, p. 357. — BLANCHARD (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11**, No. 263, p. 10—11. — BLANCHARD (1900): Hirudineen. in: Ergebn. Hamb. Magalhaenis. Sammelr., **3**, p. 19. — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchatel, p. 93—94. — RINGUELET (1943): Rev. Mus. La Plata (N. S.), **3**, Zool. No. 22, p. 207—208. — RINGUELET (1944): Rev. Mus. La Plata (N. S.), **4**, Zool. No. 25, p. 61—63.

Type-species: *Semiscolex juvenilis* KINBERG, 1866

1. *congolensis* SCIACCHITANO (1939): Rev. Zool. Bot. Afr. Tervuren, **32**, p. 365—366, Fig. 18. — SCIACCHITANO (1952): Ann. Mus. Roy. Congo Belge, Sci. Zool., **16**, p. 38—41, Figs. 24—25. — MOORE (1958): Ann. Natal Mus., **14**, p. 336—338, Pl. IX, Fig. 25.

Localities: Congo, Mocambique.

2. **juvenilis** KINBERG (1866): Öfv. Kongl. Vetensk. Akad. Förhand., **23**, p. 357. — RINGUELET (1943): Rev. Mus. La Plata (N. S.), **3**, Zool. No. 22, p. 208. — RINGUELET (1944): Rev. Mus. La Plata (N. S.), **4**, Zool. No. 25, p. 64–71, Figs. 29h, 30–31.

Localities: Uruguay, Argentina.

3. **intermedius** RINGUELET (1942): Notas Mus. La Plata, **7**, Zool. No. 59, p. 225–226. — RINGUELET (1943): Rev. Mus. La Plata (N. S.), **3**, Zool. No. 22, p. 211. — RINGUELET (1944): Rev. Mus. La Plata (N. S.), **4**, Zool. No. 25, p. 82–88, Figs. 33–36.

Localities: Uruguay, Argentina.

4. **notatus** CORDERO (1937): Ann. Acad. Brasil. Sci., **9**, p. 24–25, Figs. 5–6. — RINGUELET (1943): Rev. Mus. La Plata (N. S.), **3**, Zool. No. 22, p. 210.

Locality: Brasil.

5. **similis** (WEYENBERGH, 1879): Bol. Acad. Nac. Cienc. Argent., **3**, p. 237 (*Nephelis*). — BLANCHARD (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11**, No. 263, p. 11–13, Figs. 1–2 (as *juvenilis* KINBERG). — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchâtel, p. 94–96, Figs. 35a–b, 36a–b (as *juvenilis* KINBERG). — DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32**, No. 724, p. 10 (as *juvenilis* KINBERG). — PINTO (1923): Rev. Mus. Paulist., **13**, p. 1063–1065, Fig. 80 (as *juvenilis* KINBERG). — CORDERO (1937): An. Mus. Argent. Cienc. Nat., **39**, p. 60–62. — CORDERO (1941): Bol. Acad. Nac. Cienc. Argent., **35**, p. 209–211. — RINGUELET (1943): Rev. Mus. La Plata (N. S.), **3**, Zool. No. 22, p. 208–209. — RINGUELET (1944): Rev. Mus. La Plata (N. S.), **4**, Zool. No. 25, p. 72–79, Figs. 29f–g, 32. — RINGUELET (1945): Rev. Mus. La Plata (N. S.), **4**, Zool. No. 26, p. 120–121. — RINGUELET (1948): Notas Mus. La Plata, **13**, Zool. No. 113, p. 239.

= *cinerea* (WEYENBERGH, 1879): Bol. Acad. Nac. Cienc. Argent., **3**, p. 236–237 (*Nephelis*).

= *coecus* RINGUELET (1936): Notas Mus. La Plata, **1**, Zool. No. 2, p. 381–388, Figs. 1–2.

Localities: Argentina, Paraguay, Uruguay, Brasil, Chile.

6. **variabilis** BLANCHARD (1900): Hirudineen. in: Ergebn. Hamb. Magalhaenis. Sammelr., **3**, p. 19–20, Figs. XIIIa–c, Pl. Fig. 3. — MOORE (1911): Rep. Princ. Univ. Exp., Patagonia, **3**, Zool. Pt. 7, p. 670–675, Pl. 50, Figs. 1–9, 12. — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchâtel, p. 98–100, Figs. 39a–c. — PINTO (1923): Rev. Mus. Paulist., **13**, p. 1065–1066. — CORDERO (1937): An. Mus. Argent. Cienc. Nat., **39**, p. 62. — RINGUELET (1943): Rev. Mus. La Plata (N. S.),

**3**, Zool. No. 22, p. 210. — RINGUELET (1944): Rev. Mus. La Plata (N. S.), **4**, Zool. No. 25, p. 80—82. — RINGUELET (1945): Rev. Mus. La Plata (N. S.), **4**, Zool. No. 26, p. 121—122, Figs. 15—16. — RINGUELET (1958): Acta Zool. Lilloana, **15**, p. 134—141, Figs. 11—16.

Localities: Argentina, Paraguay, Chile, Tierra del Fuego.

- 7. zonatus** OKA (1931): Proc. Imp. Acad. Tokyo, **7**, p. 323—326, Figs. 1—2. — OKA (1932): Ann. Mus. Zool. Polon., **9**, No. 20, p. 316—318, Pl. 44, Figs. 1A—B. — RINGUELET (1943): Rev. Mus. La Plata (N. S.), **3**, Zool. No. 22, p. 210.

Locality: Brasil.

Familia: TREMATOBDELLIDAE JOHANSSON, 1913

1. Genus: **Acrabdella** HARDING, 1931

HARDING (1931): Journ. Fed. Malay Stat. Mus., **7**, p. 222.

Type-species: *Acrabdella sumatrensis* HARDING, 1931

- 1. sumatrensis** HARDING (1931): Journ. Fed. Malay Stat. Mus., **7**, p. 222—223, Figs. 1—2.

Locality: Sumatra.

2. Genus: **Barbronia** JOHANSSON, 1918

JOHANSSON (1918): Hirudineen. in SARASIN & ROUX: Nova Caledonia. A. Zoologie, **2**, Lief. 4, p. 380—383. — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India including Ceylon and Burma, London, p. 135.

Type-species: *Barbronia rouxi* JOHANSSON, 1918

- 1. delicata** MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90**, p. 355—356, Pl. 28, Fig. 62.

Locality: Lake Tanganyika.

- 2. rouxi** JOHANSSON (1918): in SARASIN & ROUX: Nova Caledonia. A. Zoologie **2**, Lief. 4, p. 383—390, Figs. 3—5, Pl. XII, Figs. 2—4.

Localities: New Caledonia, ? New Guinea.

- 3. weberi** (BLANCHARD, 1897): Hirudinées. in WEBER: Zool. Ergebn. des Indes Néederlandaises **4**, p. 353—355, Fig. 10 (*Dina*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76**, p. 368—370, Pl. XXI, Fig. 26 (*Dina*). — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India including Ceylon and Burma, London, p. 135—140, Figs. 39—42.

= ? *hexoculata* (KABURAKI, 1921): Rec. Ind. Mus., **22**, p. 703—704, Fig. 3 (*Herpobdella*).



Localities: Java, Sumatra, Celebes, Borneo, Philippines, India.

- 3a. **weberi formosana** (OKA, 1929): Proc. Imp. Acad. Tokyo, **5**, p. 277—279, Figs. A—B (*Herpobdella*). — OKA (1930): Proc. Imp. Acad. Tokyo, **6**, p. 279—281, Figs. A—D (*Herpobdella*). — MOORE (1946): Occ. Pap. Bishop Mus. Honolulu, **18**, p. 174—177, Fig. li.

Localities: Taiwan, Hawaii, China.

### 3. Genus: *Foraminobdella* KABURAKI, 1921

KABURAKI (1921): Rec. Ind. Mus., **22**, p. 707—709. — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India including Ceylon and Burma, London, p. 149.

Type-species: *Foraminobdella heptamerata* KABURAKI, 1921

1. **heptamerata** KABURAKI (1921): Rec. Ind. Mus., **22**, p. 707—709, Fig. 6. — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India including Ceylon and Burma, London, p. 149—151, Pl. VI, Fig. 17. — MOORE (1945): Journ. Beng. Nat. Hist. Soc., **20**, p. 16—19.

Locality: India.

### 4. Genus: *Gastrostomobdella* MOORE, 1929

MOORE (1929): Proc. Acad. Nat. Sci. Philadelphia, **81**, p. 267—270. — MOORE (1946): Occ. Pap. Bishop Mus. Honolulu, **18**, p. 180—181.

Type-species: *Gastrostomobdella monticola* MOORE, 1929

1. **monticola** MOORE (1929): Proc. Acad. Nat. Sci. Philadelphia, **81**, p. 270—271, Figs. 1—2, Pl. 7, Figs. 1—5. — MOORE (1935): Bull. Raffl. Mus., No. **10**, p. 77.

Localities: Borneo, Sarawak.

2. **quinqueannulata** MOORE (1946): Occ. Pap. Bishop Mus. Honolulu, **18**, p. 177—180, Figs. 1a—b, 2a—d.

Locality: Hawaii.

3. **vagabunda** MOORE (1935): Bull. Raffl. Mus., No. **10**, p. 72—77, Pl. VII, Figs. 6—7.

Locality: Malay Peninsula.

### 5. Genus: *Trematobdella* JOHANSSON, 1913

JOHANSSON (1913): Hirudineen. in JÄGERSKIÖLD: Res. Swedish Zool. Exped. Egypt and the White Nile 1901, Pt. **5**, No. 24, p. 38—40. — AUGENER (1936):

SB. Ges. naturf. Freunde Berlin, Jahrg. 1935, p. 386. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90**, p. 350—351. — MEYER (1951): Hirudinea. in: Explor. Parc Nat. Albert, Mission G. F. de Witte (1933—1935), Fasc. **76**, p. 20—23.

Type-species: *Salifa perspicax* JOHANSSON, 1909

1. **perspicax** (JOHANSSON, 1909, nec BLANCHARD, 1897): Zool. Anz., **34**, p. 523 (*Salifa*). — JOHANSSON (1909): Zool. Anz., **35**, p. 1—5, Figs. 1—2 (*Salifa*). — JOHANSSON (1910): Zool. Anz., **36**, p. 405—408, Fig. 1 (*Salifa*). — JOHANSSON (1913): Hirudineen. in JÄGERSKIÖLD: Res. Swedish Zool. Exped. Egypt and the White Nile 1901, Pt. **5**, No. 24, p. 32—40, Figs. 10—13, Pl. I, Figs. 10—12. — JOHANSSON (1914): Res. Swedish Zool. Exped. Egypt and the White Nile 1901, Pt. **5**, No. 24a, p. 1—31, Figs. 1—21.

Locality: Sudan.

Familia: AMERICOBDELLIDAE CABALLERO, 1956

1. Genus: **Americobdella** CABALLERO, 1956

CABALLERO (1956): An. Inst. Biol. Mexico, **27**, p. 284. — PHILIPPI (1872): Zeitschr. f. gesamt. Naturwiss., N. F. **6**, p. 439—442 (*Macrobdella*). — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchatel, p. 111—112 (*Philippia*). — BLANCHARD (1917): Bull. Soc. Pathol. exot., **10**, p. 646 (*Cardea*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76**, p. 29—30 (*Cardea*). — MOORE (1931): Arch. Soc. Biol. Montevideo, Suppl. **5**, p. 1220—1225 (*Cardea*). — RINGUELET (1943): Rev. Mus. La Plata (N. S.), **3**, Zool. No. 22, p. 206 (*Cardea*).

#### SYNONYMY:

*Cardea* BLANCHARD (1917) (nec WHITEFIELD, 1885): Bull. Soc. Pathol. exot., **10**, p. 646, nom. praeocc.  
*Macrobdella* PHILIPPI (1872) (nec VERRILL, 1872): Zeitschr. f. gesamt. Naturwiss., N. F. **6**, p. 439, nom. praeocc.  
*Philippia* APÁTHY (1905) (apud WEBER, 1915) (nec GRAY, 1844, nec SIGNORET, 1869): Monographie des Hirudinées Sud-Américaines, Neuchatel, p. 111, nom. nud.

Type-species: *Macrobdella valdiviana* PHILIPPI, 1872

1. **valdiviana** (PHILIPPI, 1872): Zeitschr. f. gesamt. Naturwiss., N. F. **6**, p. 439—442, Pl. 3, Figs. 1—3 (*Macrobdella*). — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchatel, p. 112—113 (*Philippia*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76**, p. 31—48, Pl. III, Figs. 1—9 (*Cardea*). — MOORE (1931): Arch. Soc. Biol. Montevideo,

Suppl. 5, p. 1220—1225 (*Cardea*). — RINGUELET (1943): Rev. Mus. La Plata (N. S.), 3, Zool. No. 22, p. 206—207 (*Cardea*).

Locality: Chile.

Familia: DIESTECOSTOMATIDAE RINGUELET, 1953

SYNONYMY:

Xerobdellidae RINGUELET (1953): Notes Mus. La Plata, 16, Zool. No. 139, p. 192.

1. Genus: **Diestecostoma** VAILLANT, 1890

VAILLANT (1890): Hirudiniens (Hirudines) ou Bdelles. in: Histoire Naturelle des Annelés marins et d'eau douce, Paris, 3, (2), p. 515—516. — BAIRD (1869): Proc. Zool. Soc. London, 1869, p. 316 (*Heterobdella*). — CABALLERO (1940): An. Inst. Biol. Mexico, 11, p. 574 (*Hygrobdella*). — RINGUELET (1944): Notas Mus. La Plata, 9, Zool. No. 74, p. 166—167 (*Hygrobdella*). — MOORE (1946): Occ. Pap. Bishop Mus. Honolulu, 18, p. 186—190. — RINGUELET (1954): Notas Mus. La Plata, 17, Zool. No. 146, p. 9.

SYNONYMY:

*Diestecostoma* RINGUELET (1954): Notas Mus. La Plata, 17, Zool. No. 146, p. 9 (error).

*Heterobdella* BAIRD (1869) (nec van BENEDEN & HESSE, 1863): Proc. Zool. Soc. London, 1869, p. 316.

*Hygrobdella* CABALLERO (1940): An. Inst. Biol. Mexico, 11, p. 574.

Type-species: *Heterobdella mexicana* BAIRD, 1869

1. **magnum** MOORE (1945): Journ. Wash. Acad. Sci., 35, p. 261—265, Figs. 1—4.

Locality: Mexico.

2. **mexicanum** BAIRD (1869): Proc. Zool. Soc. London, 1869, p. 316 (*Heterobdella*).

= *pelaezi* CABALLERO (1940): An. Inst. Biol. Mexico, 11, p. 574—581, Figs. 1—7 (*Hygrobdella*). — CABALLERO (1941): An. Inst. Biol. Mexico, 12, p. 747—751, Figs. 1—5 (*Hygrobdella*). — RINGUELET (1944): Notas Mus. La Plata, 9, Zool. No. 74, p. 167—176, Figs. 1—2 (*Hygrobdella*).

Locality: Mexico.

3. **octoannulatum** MOORE (1946): Occ. Pap. Bishop Mus. Honolulu, 18, p. 184—190, Figs. 1f—h, 2c—g, 4.

Locality: Guatemala.

2. Genus: **Xerobdella** FRAUENFELD, 1868

FRAUENFELD (1868): Verh. zool.—bot. Ges. Wien, 18, p. 148—149. — BLANCHARD (1892): Mém. Soc. Zool. France, 5, p. 539—552. — MOORE (1946): Occ. Pap. Bishop Mus. Honolulu, 18, p. 188—190. — REISINGER (1951):

Carinthia II, Jahrg. **61**, p. 110—123. — RINGUELET (1953): Notas Mus. La Plata, **16**, Zool. No. 139, p. 190—192. — RINGUELET (1954): Notas Mus. La Plata, **17**, Zool. No. 146, p. 9. — AUTRUM (1958): Hirudinea. in: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 14, Figs. 44—45.

Type-species: *Xerobdella lecomtei* FRAUENFELD, 1868

1. **anulata** AUTRUM (1958): Hirudinea. in: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 14, Figs. 46—47.

Locality: Yugoslavia.

2. **lecomtei** FRAUENFELD (1868): Verh. zool.—bot. Ges. Wien, **18**, p. 149, Figs. 1—3. — BLANCHARD (1892): Mém. Soc. Zool. France, **5**, p. 539—552, Figs. 1—9. — REISINGER (1951): Carinthia II, Jahrg. **61**, p. 110—123, Figs. 1—6. — AUTRUM (1958): Hirudinea. in: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 14, Figs. 44—45. — ŠIVICKIS & LIKEVIČIENE (1961): Acta parasitol. lithuan., **3**, p. 33—34.

Localities: Austria, Lithuania.

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Author's address: Budapest, VIII., Baross u. 13, Hungary

NEW PROCTOTRUPOID GENERA AND SPECIES  
FROM THE NEOGAEA (HYMENOPTERA:  
PROCTOTRUPOIDEA)

FIRST REPORT ON SOUTH AMERICAN SCELIONIDAE  
AND PLATYGASTERIDAE

By

J. B. SZABÓ

STATE INSTITUTE OF HYGIENE, DEPARTMENT OF PARASITOLOGY  
(DIRECTOR: DR. T. BAKÁCS)

(Received January 25, 1965)

In the present paper I describe some new genera and species of the families Scelionidae and Platygasteridae, from the territory of South America. The first part of this material originated from the collectings of the late Hungarian dipterologist, DR. M. ACZÉL, who spent his last years in Tucumán (Argentina), and who kept sending me this material for systematic examinations. The second part is preserved in the collection of the Hungarian Natural History Museum, Budapest, the material having been collected by Hungarians who lived in South America in the last century. I shall work out this material continuously in the next future and shall publish my findings in Hungarian zoological periodicals.

Family: SCELIONIDAE

Subfamily: BAEINAE

Genus **Odontacolus** KIEFFER 1910

**Odontacolus macroceps** sp. nov. ♀

Black. Legs brownish-yellow, first segment of abdomen in its greater part yellow, antennal joints — except club — dark brownish. Horn of petiole blackish, second segment apically yellow, otherwise black. Mandibles yellow. Wings fumose.

Head transverse, about three times as wide as long, approximately three times as high as long, a bit broader than thorax. Occiput, vertex with fine reticulate punctures, fore head smooth and shining, in middle with a fine, sharp line extending from anterior ocellus to antennal insertion. Temples

with microscopically fine indistinct punctures, shining. Eyes bare, almost touching hind margin of occiput, connected with base of mandibles by a weak furrow. Ocelli forming a triangle, hind ones touching eye-margins. Mandibles bidentate, apical tooth longer than hind one. Scape a bit bending, about eight times as long as broad, basally and apically somewhat narrowed. Pedicel pyriform, as broad as scape, gradually thickened towards tip, more than three times as long as thick, approximately subequal to following joints. First antennal joint a little shorter than two following ones, about twice as thin as pedicel, cupuliform, second and third joints subequal in length and form, as long as wide. Fourth joint broader than preceding joint. Club longer and broader than preceding antennal joints together, ovate. Thorax shorter than abdomen. Mesoscutum finely reticulately-punctured, on distal half with two rudimental parapsidal furrows. Scutellum at its base two and a half times as wide as long, on upper part reticulately-striated, declining portion smooth and shining. Metascutum unarmed. Propodeum with two long parallel teeth, weakly excised at base in middle, laterally unarmed, with fine punctures. Pro-meso-metapleurae striated. Fore wings about three times as long as broad. Postmarginal vein a little longer than thickened stigmal one on its apex. Subcostal and marginal veins almost touching wing margin. Postmarginal vein hardly visible. Fore wings with short marginal cilia. Hind wings with two bending hooklets and with short, fine marginal cilia. Abdomen longer than head and thorax combined. Petiole striated, hornlet of petiole strongly projected, second tergite twice as long as petiole, striated in middle, smooth and shining laterally on both sides. Third tergite longer than second one, finely punctured, longest and broadest of all. Tergites 4—6 together twice as short as third one, finely punctured. Length: 1 mm. — Male and biology unknown.

The genus is new for South America, and it differs from *Odontacolus longiceps* KIEFFER (Africa) and from *Odontacolus australicus* DODD, by the pattern of the abdominal tergites.

Holotype (♀) preserved in the Hungarian Natural History Museum, Budapest.

Based on a single female specimen. Collected by E. HORVÁTH at Pernambuco (Brasilia), taken on 25 June, 1930.

### Genus *Ceratobaeus* ASHMEAD, 1893

#### *Ceratobaeus golbachii* sp. nov. ♀

Black. Legs, middle of antennae yellowish-brown. Head transverse, about three times as wide as long and twice as high as long, broader than thorax, very densely reticulately-punctured, except on upper half of front. Cheeks with flabelliform striae. Ocelli forming a triangle, hind ones almost touching eye-margins. Eyes with well defined hairs. Scape about eight times as long as



wide, slightly bending. Pedicel a bit longer and thicker than two following joints, about three times as long as wide. First antennal joint subequal to two following ones, almost cylindrical, a little broader at apex than at base, about twice as long as broad, second and third subequal, cupuliform, wider than long, fourth joint a little broader than third one, cupuliform. Club longer and much wider than antennal joints 1—4 combined, oval. Thorax longer than wide, with microscopically fine punctures. Mesoscutum apical with two rudimental parapsidal furrows. Scutellum more than two and a half times as wide as long, semicircular. Propodeum weakly excised in middle, with parallel striations. Pro- meso- metapleurae with regular striation. Fore wings infuscated, about three times as long as wide, with very short conspicuous marginal cilia at apex. Subcostal vein with long setiform hairs, more than three times as long as apically thickened stigmal one. Hind wings with a long subcostal vein and with two bending hooklets. Abdomen longer than head and thorax combined. Horn and hind surface of petiole with regular striation. Second tergite about twice as wide as petiole, with ramifying medial striation on apex, laterally smooth and shining on both sides. Third tergite longest, a bit shorter than two preceding tergites together, broadest in middle, smooth and shining, with inconspicuous, irregular striation; these striae wider on both sides, finely reticulately-punctured apically. Following tergites with fine punctures, gradually narrowing at their apices. Length: ca. 1.5 mm. — Male and biology unknown.

It differs from the other *Ceratobaeus* species by the pattern of the abdominal tergites.

Based on a single female specimen. Holotype preserved in the collection of the Instituto Miguel Lillo, Tucumán, Argentina.

Collected by R. GOLBACH. Taken at Embarcación, Provincia Salta (Argentina), on 2—6 February, 1950. Named in the honour of the collector, R. GOLBACH.

#### Subfamily: TELEASINAE

#### Genus *Teleas* LATREILLE, 1809

#### *Teleas unilineatus* sp. nov. ♂

Head about three and a half times as wide as long and twice as high as long, transverse, broader than thorax. Vertex between ocelli and on both sides striated, lateral striae not touching eye-margins. Occiput gradually rounded backwards, front and temples smooth and shining. Striation of cheeks flabelliform. Front without any ridge between anterior ocellus and antennal insertion. Ocelli forming a triangle, as far from eye-margins as from each other. Mandibles bidentate. Cheeks with a deep furrow, running from eye-margin to base of mandibles. Scape about seven times as long as wide, slightly bending, shorter than three following antennal joints combined. Pedicel one and a half

times as long as wide, pyriform. First funicle joint about five times as long as wide, cylindrical, a little more than one and a quarter times as long as following joint, second joint about four times as long as wide, cylindrical, third joint three times as long as wide, shorter than preceding joint, cylindrical, fourth joint subequal in length to third one, joints 5—6 subequal in length, about three and a quarter times as long as thick, cylindrical, ninth about four and a half times as long as broad, cylindrical. Terminal joint about one and a quarter times as long as preceding one, about five times as long as thick, gradually narrowing toward tip. Antennal joints with short, erect hairs. Praescutum, — viewed from above, — not visible. Mesoscutum irregularly reticulate, shining, without parapsidal furrows. Scutellum two and a half times as wide as long, semicircular, reticulate in basal  $2/3$ , with a transversal ridge running across both sides of scutellum, its distal  $1/3$  sloping, smooth and shining. Metascutum with an erect semicircular membrane, otherwise reticulate, with two small teeth on both sides. Propleurae smooth and shining in upper part, reticulate in under half, mesopleurae smooth and shining in middle, otherwise reticulately-striated. Metapleurae smooth and shining in greater part, otherwise reticulately-striated. Fore wings infuscated, subcostal vein about three and a half times as long as marginal one, stigmal vein oblique, about one third as long as marginal one. Subcostal and marginal veins with long bristles. Discoidalis, radialis, cubitalis, basalis faintly visible. Hind wings lighter than fore wings, with three curved hooklets and with long marginal cilia. Petiole striated, with fine, irregularly ramifying striae. Second tergite longer than petiole, about two and a half times as wide as long apically, striated with irregular fine striae. Third tergite longer and broader than preceding one, longest and broadest, finely striated, striae wanting distally in middle of tergite, but present on both sides, with shallow, sparse punctures apically. Tergite 4—7 half as long as third, with large sparse, distinct, deepened punctures, gradually narrowing toward apex. Body black, legs reddish-yellow. Joints 5—10 of left antennae missing. Length: 3 mm. — Female and biology unknown.

Collected by VEZÉNYI at Tucumán (Argentina), on November 1905.

The new species differs from the North American *Teleas canadensis* HARRING, by the shape of the antennae, the sculpture of the thorax and abdomen, and from other North American species by the sculpture of the thorax and abdomen.

Based on a single male specimen. Holotype preserved in the collection of the Hungarian Natural History Museum, Budapest.

#### Genus *Scutelliteas* gen. nov.

Head transverse. Antennae filiform in male. Ocelli forming a triangle. Eyes bare. Mandibles bidentate. Praescutum (in frontal aspect) without any triangular area, not visible from above. Mesoscutum wider than long, with two

shallow parapsidal furrows. Scutellum with a semicircular ridge running transversally between both sides. Scutellum sharply sloping in whole length of ridge, its hind margin lying much deeper than basally. Hind margin of scutellum forming a quadrangular membrane, this membrane projected over propodeum, with two membranous triangular teeth on both sides, two further hind teeth broader and longer than formers. Metascutum forming a semicircular, medially deeply excised membrane. Propodeum deeply excised in middle. Fore wings with subcostal, marginal, stigmal and postmarginal veins. Stigmal vein short, distally thickened, oblique, postmarginal vein a bit shorter than stigmal one. Abdomen with seven visible segments, third tergite largest. Femur of hind leg strongly thickened, as in *Teleas* LATR. Tarsi five-jointed, with two claws. Tibiae with a single spur apically. Female unknown.

Type species: *Scutelliteas laeviceps* sp. nov. ♂.

The new genus differs from *Teleas* LATR., and *Echinoteas* RISBEC, by the special form of the scutellum and the metascutum.

### *Scutelliteas laeviceps* sp. nov. ♂

(*Teleas laeviceps* L. BIRÓ, in litt.)

Black. Legs yellowish-brown, except blackish-brown femora. Mandibles reddish-yellow. Vertex, occiput with fine regular striae, with fine irregular striae between ocelli. Temples and front smooth and shining, cheeks smooth and shining near temples, otherwise with a flabelliform striation. Front with hardly visible ridge in upper half, extending from anterior ocellus to antennal socketlets, forming a shallow groove under half of front. Hind ocelli twice as far from each other as from eye-margin; ocelli in a triangle. Eyes bare, a bit more than two times as long as cheeks. Base of cheeks connected with eye-margins by a deep furrow. Antennae covered with fine arched hairs. Scape a little shorter than three following funicle joints together, gradually weakened distally, weakly excised at tip, slightly curved, six times as long as wide. Pedicel pyriform, a little longer than broad, first funicle joint more than twice as long as wide, gradually thickened at apex, second joint a bit shorter than first one, almost two times as long as wide, third joint subequal to fourth one, about one and a half times as long as thick, fifth joint shorter than fourth, almost one and a half times as long as broad, sixth as long as fourth joint, two times as long as wide, 7—9 subequal in length, last joint one and a half times as long as preceding one, three times as long as broad, gradually narrowed towards tip. Mesoscutum a little impressed in front, with sparse, weak punctures, striated on hind half, the striae running beside parapsidal furrows, middle part of mesoscutum with irregular, confused sculpture, smooth and shining on both sides. Scutellum with irregular, confused striae, with regular

punctures between striae. Metascutum with fine, irregular, confused striae, and finely punctured at apex. Propodeum deeply excised in middle. Propleurae with fine, horizontal striae, mesopleurae smooth and shining in middle, otherwise irregularly striated, metapleurae smooth and shining. Fore wings four times as long as wide, subcostal vein a little more than three times as long as marginal one. Marginal vein four times as long as oblique stigmal vein. Postmarginal vein a bit shorter than stigmal vein. Subcostalis and marginalis with long, sparse setiform hairs. Fore wings weakly infuscated. Hind wings with a long subcostal vein and with two bending hooklets. Abdomen sphaerical. Petiolus with fine dense striae, with dense, minute lines between striae. Second tergite with a distinct, transverse impression along basal margin, striated, with branching striae, hind  $1/8$  of second tergite smooth and shining, two and a half times as broad as long. Third tergite longest and broadest, almost as long as preceding two tergites together, with fine, dense coriaceous punctures, a little more than two and a half times as broad as long, longer than four following tergites combined. Tergites 4–7 with a cutaneous sculpture. Fourth tergite longer than fifth and sixth ones together. Spur of fore tibiae curved, almost  $1/3$  as long as first tarsal joint. First tarsal joint as long as four following joints combined. Second joint longer than third one, fourth tarsal joint shorter than second, fifth as long as third and fourth tarsal joints together, gradually broadened towards tip. Spurs of middle tibiae conforming to those of palaeartic *Teleas scutellaris* KIEFFER. First tarsal joint of middle legs shorter than four following tarsal joints together, gradually thickening apically. Second joint longer than third. Third tarsal joint longer than fourth. Fifth joint as long as second one. Femur of hind legs three times as long as wide, with a single spur apically. First tarsal joint longer than two following ones together, gradually thickened apically. Second tarsal joint as long as fifth joint, third joint a bit longer than fourth. Length: 2 mm. — Female and biology unknown.

Based on a single male specimen. Taken at Tucumán (Argentina), by VEZÉNYI, on 9 September, 1905.

Holotype, male, preserved in the Hungarian Natural History Museum, Budapest.

#### Subfamily: SCELIONINAE

#### Genus *Pseudoheptascelio* gen. nov.

Head transverse, broader than thorax. Forehead with a shallow, indeterminate impression. Eyes large, bare. Ocelli forming a triangle, hind ocelli much nearer to eye-margin than to each other. Mandibles bidentate. Antennae 12-jointed, club 6-jointed. Club hardly distinguishable from two preceding flagellar joints. Middle part of praescutum not visible when viewed from above.

Mesoscutum with two deep, divergent parapsidal furrows. Scutellum separated from mesoscutum by a deep furrow, connected with it by five longitudinal ridges. Scutellum with two small teeth on its apical side, well visible laterally. Metascutum forming a quadrangular membrane. Propodeum as in *Scelio* LATR., but weakly excised in middle. First coxae separated from middle coxae by double their length, hind coxae appressed to middle coxae. Fore wings with fully developed subcostal vein, marginal vein almost touching wingmargin, stigmal vein about four times as long as marginal one, terminally knobbed. Hind wings with subcostal vein. Abdomen much longer than head and thorax united, with six visible segments. First tergite broadest, third one longest. First tergite projected in middle in form of a quadrangular area, gradually oblique on both sides towards head. Second and third tergites with three longitudinal ridges, almost disappearing on fourth tergite, inconspicuous on fifth one, fully wanting from base of sixth tergite. Sternite 2-5 with a sharp ridge in middle, sternite 2-3 with a longitudinal ridge on both sides. Tibiae with a single spur on apex. Tarsi 5-jointed.

Type species: *Pseudoheptascelio muesebecki* sp. nov. ♀.

The new genus differs from *Odontoscielio* KIEFFER, 1905, by the short marginal vein, the lack of the postmarginal vein, the bare eyes, and by the sculpture of the abdomen; from *Dichoteleas* KIEFFER, 1907, by the form of the body, the lack of the postmarginal vein; from *Hadronotoides* DODD, 1913, by the form of the body and the lack of the postmarginal vein.

#### ***Pseudoheptascelio muesebecki* sp. nov. ♀**

Black. Legs reddish-yellow, except last tarsal joint of all legs; these blackish-brown. Scape, pedicel and funicle joint 1-2 yellow, third joint reddish-brown, fourth flagellar joint brownish-black. Mandibles black. Head punctured like a thimble, except indeterminate shallow impression of front showing fine, transverse striation. Between deep punctures of head, dense, even finer punctures. Eyes much longer than cheeks. Scape longer than three following antennal joints together, narrowed on both ends, weakly excised distally, about eight times as long as thick. Pedicel three and a half times as long as wide, pyriform, gradually thickened towards tip, longer than first funicle joint, this latter three times as long as broad, gradually broadened apically, about two times as long as second one. Second funicle joint cupulate, slightly longer than thick, longer than cupuliform, transverse, third flagellar joint. Third joint wider than second, fourth as long as cupuliform third, but wider than, transverse, almost as wide as six-jointed club. First club joint longer than second, 2-5 subequal in length and similar in form, sixth a bit longer than fifth, gradually weakened apically. Club joints with dense, fine punctures. Praescutum and mesoscutum with coarse, deep punctures. Mesoscutum

as long as wide, with two divergent parapsidal furrows, hind part of meso-scutum irregularly rugose. Scutellum pillow-shaped, oblique, punctured like a thimble. Propodeum irregularly punctured and striated. Pro- meso- and metapleurae punctured like a thimble. Fore wings three and a half times as long as wide, infuscated, with short, brown hairs, hind margin with short discal cilia. Radial and discoidal veins vestigial, hardly visible. Hind wings with two bending hooklets, hind margin also with short discal ciliae. Abdomen one and a half times as long as head and thorax combined, gradually narrowing apically. Petiole almost twice as wide as long, compressed from sides towards base, with a quadrangular area in middle of upper surface. On this area five longitudinal ridges, originating from a deep groove, with irregular striae on both sides, with fine, scarce, indistinct punctures in middle. Second tergite irregularly cutaneous, sculptured as following tergites, shorter but broader than following ones. Tergites 3—6 gradually narrowing towards tip. Last tergite a little more than half length of preceding tergite, gradually narrowing apically. Tibiae of fore legs with a strong, curved spur, first tarsal joint longer than three following ones together, second joint longer than third one, fifth as long as second and third tarsal joints united. Tibiae of middle legs with a single spur distally, first tarsal joint as long as three following ones together, second joint longer than third one, fourth tarsal joint shorter than third, fifth joint as long as tarsal joints 2—3 combined. First tarsal joint of hind legs as long as three following joints together, second joint a bit shorter than third and fourth joints combined, fifth shorter than second joint. Length: 6.5 mm. — Male and biology unknown.

Based on a single female specimen, taken at Belem (Para, Brasilia) on 25 July, 1930; collected by E. HORVÁTH.

Holotype in the collection of the Hungarian Natural History Museum, Budapest.

The four distal tarsal joints of the left hind legs and the fifth tarsal joint of the right middle leg are missing.

Named in honour of the American entomologist, C. F. W. MUESEBECK, for her kind help in my work.

## Genus *Psilanteris* KIEFFER, 1916

### *Psilanteris nitidulus* sp. nov. ♀

Black. Scape and following five antennal joints brownish-black. Legs yellowish-red, wings infuscated. Head transverse, twice as broad as long, almost two times as high as long, with fine cutaneous sculpture, except flabelliform striation of cheeks, shining. Hind ocelli touching eye-margins. Front with a very shallow, indeterminate depression and with a hardly visible line, running from anterior ocellus towards antennal socklets, but disappearing in middle of front. Mandibles tridentate, anterior tooth stronger than middle

tooth. Base of mandibles connected with eye-margin by a deep furrow. Scape eight times as long as wide, narrowing basally and apically, slightly arched, weakly excised distally. Pedicel longer than two following antennal joints together, two and a half times as long as broad, pyriform; first funicle joint pyriform, longer than wide, second joint transverse, longer than following joint, third joint cupuliform, transverse, fourth cupuliform, almost two times shorter than second, transverse. Pedicel and four following funicle joints combined shorter than five club joints together. First club joint cupuliform, two and a half times as wide as long, second joint longest, transverse, joints 3—5 subequal in length, sixth joint gradually weakened apically. Thorax narrower than head. Mesoscutum with a triangular specialized area in front, sculptured as in mesoscutum. Thorax cutaneous, punctured. Semicircular scutellum separated from mesoscutum by a deep furrow consisting of punctures, sharply determined by a weak carina apically. Metascutum with a small tooth. Propodeum weakly excised in middle, with two separated teeth and with fine, dense hairs at base. Propleurae cutaneous, punctured, mesopleurae irregularly striated on upper part, smooth and shining on lower part. Meta-pleurae smooth and shining, divided in two parts, in middle by a deep longitudinal furrow, lower half with fine hairs. Fore wings almost four and a half times as long as wide, infuscated, hind margin with long discal ciliae. Subcostal vein long, marginal vein three times as long as wide, shorter than stigmal, this latter slightly arched and clubbed apically. Hind wings lighter, subcostal vein with two bending hooklets. Abdomen a little longer than head and thorax together. Petiole more than two times as long as thick, striated. Second tergite more than two times as long as petiole, about two and a half times as wide as long, striated, not touching apical margin of third tergite, with a distinct transverse arcuate apical margin on second tergite. Third tergite longest and largest, leathery, punctured, longer than two preceding tergites together, a little shorter than following three tergites combined. Tergite 3—6 cutaneous, punctured, gradually narrowed apically. Fourth tergite almost as long as 5—6 combined. Tibiae of fore legs with a strong, curved spur, first tarsal joint shorter than four following joints combined, a bit arched, second joint a little longer than third one, fourth shorter than third one, fifth joint as long as preceding two joints together. Tibiae of middle legs with a small inconspicuous spur, first tarsal joint shorter than two following joints together, second joint longer than third, fourth smallest, fifth almost as long as two preceding joints together. Spurs of hind tibiae hardly visible, first tarsal joint shorter than four following joints together, second joint longer than third one, fifth joint twice as long as fourth one. Length: 1.5 mm. — Male and biology unknown.

Based on two female specimens, taken at Sao Paulo (Brasilia) in 1928; collected by J. GY. BURY. Holotype and paratype preserved in the Hungarian Natural History Museum, Budapest. The tarsal joints of the right middle legs of the holotype are missing.

This genus is new for the territory of the Neogaea. It differs from the European *Psilanteris bicolor* KIEFFER, 1916, by the form of the antennae, the colour of the body, the lack of the parapsidal furrows and the sculpture of the abdomen.

Genus **Espanoscelio** gen. nov.

Head almost transverse. Front between eye-margins covered with irregular, wart-shaped teeth, without any impression. Eyes bare, large. Ocelli forming a triangle, hind ones touching eye-margins. Antennae 12-jointed, with a 5-jointed club. Praescutum (viewed from above) visible on both sides. Mesoscutum with two deep parapsidal furrows. Scutellum trapezoid, transverse. Metascutum with an edge in middle. Hind margin of propodeum weakly excised in middle. Subcostal vein of fore wings long, marginal vein longer than oblique, apically curved, and club-like stigmal one. Abdomen clearly 6-segmented. Third segment largest and longest. Segments with a shallow, transverse impression proximally and distally. Tibiae with a single spur at tip. Tarsi 5-jointed.

Type species: *Espanoscelio ruber* sp. nov. ♀

The new genus differs from the other Scelionid genera by the form of the abdomen; from *Sceliacantha* DODD by the special form and sculpture of the head, from *Argentoscelio* gen. nov. by the form of the antennae and the abdomen.

**Espanoscelio ruber** sp. nov. ♀

Body, legs yellow, except last tergite of abdomen, this latter brown, club joints of antennae blackish-brown. Head (vertex, occiput, cheeks, on both sides of front) with sparse, deep, large punctures, finely striated between these punctures. Eyes about two times as long as cheeks. Front above antennal sockets smooth and shining, in middle with an indistinct transversal ridge, not touching eye-margins. Base of mandibles connected by a shallow furrow with eye-margins. Front smallest on papillate part. Scape longer than three following antennal joints together, almost eight times as long as broad, narrowed on both ends. Pedicel a little shorter than following joint, almost four times as long as thick, pyriform. First funicle joint about five times as long as wide, narrower than pedicel, second joint about one-fourth as long as first one, cylindrical, two times as long as thick. Third joint longer than wide, broader and shorter than second one. Fourth joint cupuliform, fifth similar in form to preceding one, broader than fourth joint. First club joint longer and broader than following joint. Second and third subequal in length, fourth thinner than third joint, fifth joint gradually narrowing towards tip. Thorax narrower than



head. Praescutum and mesoscutum with sparse, deep, large punctures, finely striated between punctures. Mesoscutum with two convergent parapsidal furrows. Scutellum irregularly cutaneous, coarsely striated, not longer than broad, with a deep punctured furrow, and a small tooth on tip. Spine of metascutum with a sharp ridge. Propodeum with sparse striae, on both sides with a small tooth at base. Pleurae striated with exception of a smooth and shining area in middle of mesopleurae. Fore wings hyaline, with discal cilia more than four times as long as wide. Hind wings with long discal cilia and with two bending hooklets. Abdomen longer than head and thorax together. Petiole one and a half times as wide as long, scarcely rugose. Second tergite wider than petiole, striated with semicircular, transverse, punctured impression at base, on both sides cutaneous, two times as broad as long at its apex. Third tergite longest, more than one and a half times as long as second, with a transversal impression at base, this impression striated, otherwise reticulately punctured. Fourth tergite more than twice as long as following one, reticulately punctured. Tergites 4—6 as long as third, punctured, gradually narrowing towards apex. Tibiae of fore legs with a strong curved spur. First tarsal joint shorter than four following ones together, a bit arched, second joint longer than third, fourth shorter than third joint, fifth joint almost as long as third and fourth ones together. Spur of middle tibiae hardly visible. First tarsal joint a bit longer than three following ones together, second joint longer than third, third and fourth joints as long as fifth. Tibiae of hind legs with a hardly visible spur. First tarsal joint longer than four following joints combined, second joint longer than third, this latter longer than fifth. Fourth joint shortest. Length: ca. 3 mm. — Male and biology unknown.

Based on four female specimens. One female was collected by E. HORVÁTH at Pernambuco (Brasilia) on 25 June, 1930; two females taken at Para (Rio Acra, on 25 August, 1930) the fourth female specimen taken at Surrubres (Costa Rica), collector unknown.

Holotype (♀) and paratypes preserved in the collection of the Hungarian Natural History Museum, Budapest.

The new species is closely related to *Espanoscelio molnari* sp. nov. ♀, from which it differs by the sculpture of the body, the form of the abdominal segments and the shape of the antennae.

#### *Espanoscelio molnari* sp. nov. ♀

Body black, scape, pedicel, funicle joints 1—3, and legs yellow, funicle joints 4—5 brown. Head almost transverse. Vertex and upper third of front with papillate, triangular projections, occiput, temples, cheeks with sparse, deep, large punctures, with fine, cutaneous striae between them. Lower part of front with fine, irregular striae, cutaneous, almost smooth and shining. Base of mandibles connected with eye-margin by a deep furrow. Eyes large, bare, about four and a half times as long as cheeks. Mandibles brown. Scape

longer than three following antennal joints combined, about six times as long as broad, thickest in middle. Pedicel about four times as long as wide, pyriform, gradually broadened towards apex. First funicle joint about six times as long as wide, gradually thickened towards tip, second joint much shorter than first, three and a half times as long as broad, third joint shorter than preceding joint, about two and a half times as long as wide, fourth joint shorter and wider than third one, about two times as long as wide, fifth shorter and thicker than preceding joint, about one and a half times as long as wide. First club joint longer than following joint, second joint subequal in length to third one, last joint longer than fourth one, gradually weakened towards apex. Praescutum and mesoscutum with fine cutaneous sculpture, with sparse, deep, large punctures. Scutellum irregularly rugose. Metascutum with a long ridged spine in middle. Propodeum with fine hairs, with a short tooth on both sides. Pleurae rugose. Fore wings infuscated, subcostal vein long, marginal vein twice as long as arched stigmal one, with short marginal cilia. Hind wings with three bending hooklets and with long marginal cilia. Abdomen about one and a half times as long as head and thorax together. Petiole a bit longer than wide, with seven longitudinal ridges, three ridges in middle stronger than those on sides. Second tergite wider than long, with a semicircular, shallow impression at base, rugose in middle, otherwise irregularly sculptured. Third tergite about twice as long as preceding, with a shallow impression at base, with a second shallow, rugose impression in middle, otherwise reticulate. Fourth tergite shorter than preceding one, with a shallow impression at base, impression rugose, punctured on hind surface. Tergites 5—6 half as long as fourth, with sparse, fine punctures. First tarsal joint of fore legs shorter than three following joints combined, second joint a bit longer than third, fourth much shorter than preceding joint, fifth joint slightly longer than second. Tarsal joints of middle legs similar in form to those of fore legs. First tarsal joint of hind legs longer than four following joints together, second joint longer than following one, third joint longer than fourth joint, last joint as long as fourth one. Length: 3 mm. — Male and biology unknown.

Based on three female specimens. Two individuals collected by G. MOLNÁR at Manaus (Brasilia) on 16 July, 1930; one specimen taken by E. HORVÁTH at Pernambuco (Brasilia) on 25 June, 1930.

Holotype and paratypes in the collection of the Hungarian Natural History Museum, Budapest.

The flagellar and club joints of the right antenna, and the last tarsal joint of the left hind leg are missing on the holotype.

Dedicated to its collector, G. MOLNÁR.

### Genus *Argentoscelio* gen. nov.

Head transverse. Frontal impression deep, small, delimited on all sides by a sharp ridge. Front with a very shallow transversal ridge, decurrent transversely above eye-margins. Eyes large, with dense, short conspicuous hairs.

Ocelli forming a triangle, hind ones touching eye-margins. Antennae 12-jointed, with a closely 4-jointed club in female, filiform in male. Mandibles bidentate. Praescutum indiscernible when viewed from above. Mesoscutum without parapsidal furrows. Scutellum semicircular. Metascutum with a small semicircular projection. Propodeum weakly excised in middle. Fore wings with a long subcostal vein, marginal vein shorter than arched and apically clavate stigmal vein. Postmarginal vein about five times as long as marginal vein, subcostal, marginal and postmarginal veins with long, erect, setiform hairs. Hind wings with a long subcostal vein and with two bending hooklets. Abdomen longer than head and thorax together. Tergites 2—5 with a transverse, shallow impression running across their bases. Legs slender, tarsi 5-jointed, tibiae with a single spur apically.

Type species: *Argentoscelio horvathi* sp. nov. ♀.

Closely related to *Baeoneura* FOERSTER, 1856, differing from it by the form of the antennae and the fore wing, and by the shape of the abdomen. It differs from other Scelionid genera by the form of the head and the body.

***Argentoscelio horvathi* sp. nov. ♀♂**

♀. Body black, antennae reddish-yellow, except dark club, legs yellow. Front, vertex, cheeks, temples, occiput covered with dense, microscopical, distinct, projecting punctures, with exception of a deep, sharply defined, smooth and shining frontal impression. Base of mandibles connected with eye-margins by a deep furrow. Mandibles tridentate, teeth subequal in length. Scape about five times as long as wide, about as long as four following antennal joints together. Pedicel a little longer than two following funicle joints combined, pyriform, three times as long as broad, gradually broadened towards apex. Funicle joints 1—2 strongly truncated, first slightly longer but narrower than second. Third joint shorter than two preceding joints combined, cylindrical, about two times as long as thick, longer than following one. Fourth funicle joint somewhat shorter than fifth, about one and a half times as long as wide, sixth transverse, about twice as wide as long, broader, but much shorter than preceding joint. Club 4-jointed, broadest in middle. First club joint largest and longest, oblique at its apex. Club joints 2—3 transverse, oblique, about three times as wide as long, subequal in length. Terminal joint one and a half times as long as preceding one, gradually narrowing towards apex. Antennal joints covered with short, erect hairs. Club joints with very fine, dense, small punctures. Praescutum not visible. Mesoscutum as long as wide, covered with dense, distinct punctures. Scutellum punctured with fine, dense, shining, distinct punctures. Propleurae with two shallow, punctured lines, running across fore coxae and tegulae. Mesopleurae smooth and shining. Metapleurae very finely striated on hind half, with two punctured, curved lines, surrounding

a small, shining, smooth area. Wings slightly infuscated. Abdomen longer than head and thorax combined. Petiole shorter than hind coxae, with a small horn-like projection on its base, as long as wide. Tergites 2—3 striated. Second and third largest and broadest, of equal length. Sixth tergite longer than preceding one, punctured, gradually narrowing towards apex.

♂. Metapleurae striated above, lower part smooth and shining. Pleurae reddish, except anterior half of propleurae. Length: cca. 3 mm. — Biology unknown.

Based on five females and a male. Two females collected by E. HORVÁTH at Pernambuco (Brasília) on 25 June, 1930. One female specimen collected by E. HORVÁTH at Pernambuco on 1 July, 1930. A female specimen (holotype) taken at Burruyacu (Prov. Tucumán, Argentina), Villa Padre Monti on 7—17 February, 1948, by R. GOLBACH. One female specimen collected by Prof. DR. M. L. ACZÉL at Lacavera (Prov. Tucumán, Argentina) on 23—28 November, 1951. One male specimen (allotype) taken at Embarcación (Prov. Salta, Argentina) on 2—6 February 1950, by R. GOLBACH.

Holotype (♀) and allotype (♂) preserved in the collection of the Instituto Miguel Lillo, Tucumán (Argentina). 3 ♀ paratypes preserved in the collection of the Hungarian Natural History Museum, Budapest. One paratype (♀) in my own collection in Budapest.

Dedicated to its collector E. HORVÁTH

### Duta NIXON, 1933

Key to the South American species of *Duta* NIXON.

- 1 (2) Scape, pedicel, and funicle joints 1—2 yellow, first funicle joint about two times as long as pedicel, second joint about two times as long as third one. Middle striae of second tergite almost touching hind margin of tergite. Body in greater part shining. 1. *Duta aczeli* sp. nov. ♀
  - 2 (1) Antennal joints black, first funicle joint one and a half times longer than third one. Middle striae of second tergite not touching hind margin of tergite. Body in greater part dull.
2. *Duta argentinica* sp. nov. ♀

### *Duta aczeli* sp. nov. ♀

Head and tergites 4—6 of abdomen black, thorax dark brown, petiole dark brown, second and third tergites reddish-brown in basal half, otherwise black, legs yellow, except tibiae and tarsal joints of hind legs, rest dark brownish. Head transverse, about two and a half times as high as long and twice as wide as long. Vertex, occiput punctured with small, dense, fine, distinct punctures. Front, temples, cheeks smooth and shining. Under part of front with a sharp middle keel. Eyes large, about two times as long as cheeks, hairy, with strong, conspicuous hairs. Ocelli forming a triangle, hind ones touching eye-margins. Mandibles tridentate, teeth of equal length. Base of mandibles connected by a deep furrow with eye-margins. Scape about eight times as long as wide, slightly bending, weakly excised on its apex. Pedicel pyriform, about twice as long as wide, gradually thickened at apex. First funicle joint about

four times as long as wide, and about two times as long as pedicel, cylindrical, thickest in middle. Second joint two and a half times as long as thick, thickest in middle, two times as long as following one. Third joint shorter than preceding one, almost two times as long as wide, fourth joint transverse, cupuliform, slightly wider than long. Club 6-jointed, thickest in middle. Antennal joints covered with short, erect hairs. Mesoscutum in front with a subtriangular specialized area, this latter smooth and shining, otherwise sculptured with dense, fine, irregular punctures and with two convergent parapsidal furrows. Scutellum semicircular, pillow-shaped, with irregular, distinct, dense punctures on basal half, smooth and shining, with small, indistinct punctures on apical half. Metascutum unarmed. Propodeum deeply excised in middle, with two membraneous teeth on its apical sides. Pro- and mesopleurae smooth and shining. Metapleurae striated on upper side, smooth and shining on lower side. Fore wings weakly infuscated, about three and a half times as long as wide, subcostal and marginal veins with long, strong, erect, setiform hairs. Post-marginal vein about four times as long as marginal one, stigmal one longer than marginal one, clubbed apically. Basal vein hardly visible. Fore wings with short marginal cilia. Hind wings with long marginal cilia and with three bending hooklets. Abdomen longer than head and thorax together. Petiole striated, shorter and narrower than second one. Second tergite striated in middle, striae almost touching hind margin of tergite, with short striae on sides, also a shallow transversal impression running across its base. Third tergite longest and broadest, smooth and shining. Tergite 4—6 punctured with great, dense punctures, all gradually narrowing towards tip. Length: cca. 2 mm. — Male and biology unknown.

The new species is closely related to *Duta tenuicornis* DODD, differing from it by the shape of the antennae, and the sculpture of the thorax; from *Duta longimarginatus* J. B. SZABÓ, by the shape of the antennae, the form of the wings, and from both species by the shape of the propodeum; from *Duta argentinica* sp. nov. by the form of the antennae and the sculpture of the petiole.

Based on a single female specimen, taken by Prof. DR. M. L. ACZÉL, at Tucumán, Lacavera on 800 m a. s. l., (Argentina) on 23—28 November, 1951.

Holotype (1 ♀) preserved in the collection of the Instituto Miguel Lillo, Tucumán (Argentina).

Named in honour of the late Hungarian dipterologist, Prof. DR. M. L. ACZÉL.

### *Duta argentinica* sp. nov. ♀

Body black; scape and pedicel brownish-black, legs yellowish-brown, petiole reddish-brown on both sides, base of second tergite reddish. Head transverse, covered, with very fine, microscopical punctures; front with a longitudinal ridge, running from anterior ocellus to antennal socklets. Cheeks with a

deep furrow, running from base of mandibles to eye-margin. Head broader than thorax, a bit more than two times as wide as long, and one and a half times as high as long. Ocelli forming a triangle, hind ones almost touching eye-margins. Mandibles tridentate. Eyes with erect, short, conspicuous hairs. Scape about eight times as long as thick, arched, weakly excised apically, longer than three following joints together. Pedicel almost three times as long as wide, gradually thickened towards apex. First funicle joint almost four times as long as broad, about one and a quarter times as long as pedicel, cylindrical, thickest in middle. Second joint one and a half times as long as preceding one, one and a half times as long as following joint, about two times as long as wide. Third joint about two times as long as wide, cylindrical, fourth one transversal, shortest, about one and a half times as wide as long. Club 6-jointed, thickest in middle. Antennae clothed with short, erect, silvery hairs. Club joints covered with dense, microscopical, fine punctures. Praescutum not visible. Mesoscutum with a specialized, subtriangular, dull area in front, with two convergent parapsidal furrows; dull, not shining, with dense, fine, microscopical punctures. Scutellum semicircular, pillow-shaped, smooth and shining. Metascutum unarmed. Propodeum deeply excised in middle, with a small spine on both sides apically. Propleurae smooth and dull, mesopleurae striated on upper half, smooth and dull on lower part, metapleurae smooth and shining. Hind coxae longer than petiole. Fore wings slightly infuscated, subcostal and marginal veins with long, erect, rare, setiform hairs, marginal one about one-fourth as long as postmarginal vein. Stigmal vein clubbed apically, longer than marginal one. Basal vein faintly visible. Fore wings with short, fine marginal cilia. Hind wings with three bending hooklets and with long marginal cilia. Petiole striated, except on hardly projecting base, this latter smooth and shining. Second tergite longer than petiole, with a few long striae in middle, striae not touching hind margin of tergite, this latter with short striae on sides, rest smooth and shining, with a shallow impression running across base of tergite. Third tergite longest and broadest, smooth and shining. Tergites 4—6 gradually narrowing towards tip, with very fine, indistinct punctures. Body scarcely clothed with short, erect hairs. Length: 2 mm. — Male and biology unknown.

Based on two female specimens; one female (holotype) collected by R. GOLBACH at Dique Cadillal, Prov. Tucumán (Argentina), on 16—25 January, 1957; one female (paratype) taken by Prof. DR. M. L. ACZÉL and R. GOLBACH at Lacavera, Prov. Tucumán on 23—28 November, 1951.

Holotype preserved in the collection of the Instituto Miguel Lillo, Tucumán (Argentina); the paratype preserved in my collection in Budapest.

The new species is closely related to *Duta aczeli* sp. nov. ♀, differing from it by the shape of the antenna, the sculpture of the head and thorax, and the sculpture of the second tergite.

## Family: PLATYGASTERIDAE

## Subfamily: PLATYGASTERINAE

Genus *Dolichotrypes* CRAWFORD & BRADLEY, 1911*Dolichotrypes reticulatus* sp. nov. ♀

Black; legs in greater part yellowish-brown, except hind legs. Apex of hind tibiae and femora dark brown. Pedicel yellowish-brown. Head transverse, about two and a half times as long as wide and one and a half times as high as long, coriaceous. Eyes large, with short, inconspicuous hairs. Ocelli forming a triangle, hind ones separated from eye-margins by double their diameter. Scape about eight times as long as wide, slightly arched, weakly excised apically, longer than five following antennal joints combined. Pedicel pyriform, about four times as long as thick, gradually broadening towards tip, almost as long as following two joints together. First funicle joint two times as long as wide, cylindrical, strongly connected with following joint. Second joint somewhat longer than first, about three times as long as thick, cylindrical. Third joint shorter than second, a little shorter than first joint, about one and a half times as long as broad, broader than first or second joints. Fourth joint cupuliform, as long as wide. Club longer than five preceding joints combined, 4-jointed. First club joint as long as following one, but narrower. Second and third similar in form and subequal in length. Last club joint one and a half times as long as third one, gradually weakened towards tip. Antennae with short, sparse, erect hairs. Thorax narrower than head, coriaceous. Mesoscutum with two parapsidal furrows, broadening and deepening on posterior half. Scutellum pillow-shaped, apically papillate. Propodeum small, with two small parallel ridges in middle. Pleurae smooth and shining. Wings hyaline, with short sparse, indistinct hairs. Abdomen a little more than four and a half times longer than thorax. First segment broadest, in greater part smooth and shining, leathery at hind margin. Second tergite smallest, longer than wide, also coriaceous. Third segment about eight times as long as thick, coriaceous. Fourth segment longer than tubuliform third, similar in form to third one, about twelve times as long as thick. Last segment slightly shorter than fourth, tubuliform, leathery. Length: cca. 2.5 mm. — Male and biology unknown.

The new species differs from *Dolichotrypes hopkinsi* CRAWF. & BRADL., 1911, by the shape of the antennae and the abdomen, and the sculpture of the thorax.

Based on a single female specimen, taken at Tucumán, Lacavera about 800 m a. s. l. on 23—28 November, 1951, by Prof. DR. M. L. ACZÉL.

Holotype (1 ♀) preserved in the collection of the Instituto Miguel Lillo at Tucumán, Argentina. The genus is new for the territory of the Neogaea.

Genus *Prosactogaster* KIEFFER, 1914*Prosactogaster ogloblini* sp. nov. ♀

Legs yellow, except brownish-yellow apex of femora of hind legs. Scape, pedicel and first funicle joint of antennae yellowish, second funicle joint brownish-yellow, similar to second one. Body black. Head transverse, about two and one-fourth times as broad as long and a little more than one and a half times as high as long, leathery, except smooth and shining front; occiput with irregular, sparse, longitudinal rugosities. Ocelli forming a triangle, hind one as far from eye-margin as both from each other. Eyes large, bare, about two and a half times as long as cheeks. Scape longer than five following joints together, slightly arched, weakly excised terminally, about eight times as long as broad. Pedicel pyriform, somewhat more than two times as long as wide, shorter than two following funicle joints combined. First funicle joint a bit longer than thick, gradually thickening towards tip. Second joint two and one-fourth times as long as wide, thickest at tip, a bit longer than third one. Third joint similar in form to fourth one, but broader, oblique at apex. Club 4-jointed, longer than five preceding joints together. First club joint smallest, two times as long as wide, smaller and shorter than second. Second club joint similar in form and subequal in length with third one, terminal joint about one and a half times as long as third, gradually narrowing towards tip. Praescutum, when viewed from above, deeply excised in middle, finely coriaceous, with dense, fine punctures. Mesoscutum with two deep, convergent parapsidal furrows. Scutellum pillow-shaped, semicircular, with coarse, deep, irregular punctures. Propodeum with two almost parallel small keels in middle, without remarkable hairs. Pleurae smooth and shining, except striated mesopleurae. Wings slightly infuscated, with short marginal cilia. Hind wings with two bending hooklets. Abdomen about two and a half times as long as head and thorax together. Petiole striated, with a long, broad furrow on each side. Second tergite at base with a shallow groove on both sides, striated, except smooth and shining middle part, about four times as long as finely and densely punctured third one. Fourth tergite three times as long as third, with fine punctures and striae, slightly shorter than following one. Fifth tergite similar in sculpture to fourth tergite, gradually narrowing towards apex, two and a half times as long as wide, similar in sculpture to preceding tergite. Abdomen without any process. Length: 5 mm. — Male and biology unknown.

The new species differs from the European *Prosactogaster umbraculi* KIEFFER, by the form and sculpture of the body. The genus is new for the territory of the Neogaea.

Based on a single female specimen. Taken at Tucumán, Lacavera (Argentina) on 23–28 November, 1951, by Prof. DR. M. L. ACZÉL.

Holotype (1 ♀) preserved in the collection of the Instituto Miguel Lillo, Tucumán (Argentina). The last club joint of the left antenna is missing.

Dedicated to honour Prof. DR. A. A. OGLOBLIN.



Genus *Piestopleura* A. FÖRSTER, 1856*Piestopleura maculipes* ASHM. ♀

Locality: Tucumán, Lacavera, 23—28 November, 1951, leg. DR. M. L. ACZÉL; Tucumán, Villa Padre Monti, Burreyacu, 17 January—7 February, 1948, leg. R. GOLBACH; Embarcación, Prov. Salta, 2—6 February, 1950, leg. R. GOLBACH.

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Author's address: Budapest IX., Gyáli út 2—6, Hungary



ERGÄNZUNGEN ZUR BLATTLAUS-FAUNA  
(HOMOPTERA: APHIDIDAE) VON UNGARN

Von

H. SZELEGIEWICZ

ZOOLOGISCHES INSTITUT DER POLNISCHEN AKADEMIE DER WISSENSCHAFTEN, WARSZAWA  
(DIREKTOR: PROF. DR. J. NAST)

(Eingegangen am 12. Juni 1965)

Die letzte zusammenfassende Liste der ungarischen Aphiden wurde von HORVÁTH (1897) in »Fauna Regni Hungariae« veröffentlicht. Diese Liste, die nur bloße Namen mit Fundortangaben enthält, bedarf dringend einer Revision und Ergänzung. Einige dieser Namen sind Sammelbegriffe, die man ohne Wirtspflanzenangabe nicht eindeutig interpretieren kann, andere müssen als Synonyme gestrichen werden und noch andere werden durch Revision der entsprechenden Belegstücken zu klären sein. Viele Arten wurden von HORVÁTH nur von Fundorten gemeldet, die außerhalb der heutigen Grenzen Ungarns (in der Slowakei, in Siebenbürgen, Kroatien und der Vojvodina) liegen. Bei Berücksichtigung jener Synonyme und Arten, deren Fundorte außerhalb der heutigen Grenzen Ungarns liegen, sinkt die Zahl der von HORVÁTH angegebenen Vertreter der Familie Aphididae<sup>1</sup> von 155 auf 107. Nach HORVÁTH wurden nur wenige Daten über die Aphiden Ungarns publiziert und die meisten beschäftigen sich nur mit der Biologie und der wirtschaftlichen Bedeutung einiger ausgewählter Arten. Neue faunistische Angaben bringt erst die Arbeit von PINTERA und SZALAY-MARZSÓ (1962), die die Aphidenfauna Ungarns mit 34 Arten bereicherte. Auch BÖRNER (1952) zählt 3 ungarische Arten auf, u. zw. *Protaphis dudichi* BÖRN., *Acyrtosiphon chelidonii* (KALT.) und eine *Paraprociophilus* sp. von *Acer* sp. aus Nagysalló — alle Funde von Prof. DR. E. DUDICH. Der letzte Fund bezieht sich vermutlich auf die Art *Paraprociophilus* (*Mimeuria*) *ulmiphila* (DEL GU.) (= *Paraprociophilus ucrainensis* MAMONT.).

Das Material zur vorliegenden Arbeit sammelte ich in den Monaten Juni—Juli 1964 während meiner Sammelreise nach Ungarn. Das Material umfaßt 140 Arten, von denen nicht weniger als 102 für die ungarische Fauna neu sind. Damit ist die Zahl der aus Ungarn bekannten Arten der Aphididen auf 245 gestiegen. Die nachfolgende Artenliste enthält nur Arten, die für die ungarische Fauna neu sind.

<sup>1</sup>In der vorliegenden Arbeit werden die Vertreter der Familie Phylloxeridae nicht berücksichtigt.

Das Belegmaterial zur vorliegenden Arbeit befindet sich in der Sammlung des Zoologischen Instituts der Polnischen Akademie der Wissenschaften in Warszawa und zum Teil auch in der Sammlung des Naturwissenschaftlichen Museums in Budapest.

Es ist mir eine angenehme Pflicht, den ungarischen Kollegen, die mich auf meinen Sammelexkursionen begleitet haben, u. zw. den Herren DR. Á. SOÓS (Naturwissenschaftliches Museum, Budapest), DR. G. SZELÉNYI, DR. B. NÁGY, DR. L. SZALAY-MARZSÓ (Forschungsinstitut für Pflanzenschutz, Budapest) und DR. A. PÉNZES, für ihre vorzügliche Gastfreundschaft und mannigfache Hilfe meinen verbindlichsten Dank aussprechen. Herrn DR. A. PÉNZES möchte ich fernerhin noch für die Bestimmung der Wirtspflanzen danken.

### Artenliste in systematischer Reihenfolge

#### PEMPHIGINAE

1. *Asiphum varsoviensis* (MORDV.) — Pótharasztpuszta, 19. VII. 1964, auf *Populus alba* L., an den Trieben in Blattnestern, 1 Fundatrix und mehrere geflügelte Fundatrigenien.

Aus Polen beschrieben, wurde diese Art später nur in Transkaukasien und Westsibirien sowie in Bulgarien festgestellt. Die sekundäre Wirtspflanze dieser Blattlaus ist unbekannt.

#### CALLAPHIDINAE

2. *Drepanosiphum aceris* KOCH — Keszthely, 2. VII. 1964, blattunterseits an *Acer campestre* L., 3 geflügelte vivipare Weibchen.

Diese Art wurde von HORVÁTH (1918) aus der Slowakei und aus Siebenbürgen unter dem Namen *D. acerinus* WALK. gemeldet. *D. acerinus* ist aber eine andere, mit *D. gracilis* BÖRN. identische Art, die nur auf *Acer pseudo-platanus* L. vorkommt.

3. *Tuberculatus eggleri* BÖRN. — Nagykovácsi: Nagyszénás, 17. VI. 1964, blattunterseits an *Quercus pubescens*.

Bisher nur aus Deutschland und Österreich bekannt, nach BÖRNER (1952) in Südeuropa verbreitet.

4. *Therioaphis dorycnii* (PINT.) — Nagykovácsi: Nagyszénás, 17. VI. 1964, auf *Dorycnium sericeum* (= *germanicum*), mehrere geflügelte vivipare Weibchen.

Bisher nur aus der Slowakei und Ukraine (Transkarpatskaja Oblast) bekannt; wohl eine südosteuropäische Art.

#### CHAITOPHORINAE

5. *Periphyllus hirticornis* (WALK.) — Keszthely, 2. VII. 1964, blattunterseits und an den Früchten von *Acer campestre*, einige ungeflügelte vivipare Weibchen.

Bisher nur aus England, Holland, Deutschland, Polen, Bulgarien und der Tschechoslowakei bekannt.

6. *Chaitophorus longisetosus* SZEL. — Pótharasztpuszta, 19. VI. 1964, blattunterseits an *Populus alba*; zahlreiche ungeflügelte vivipare Weibchen.

Aus Polen beschrieben, wurde diese Art nur noch aus der Ukraine und aus Bulgarien gemeldet; wohl eine südosteuropäische Art.

7. *Chaitophorus nassonowi* MORDV. — Pótharasztpuszta, 19. VI. 1964, an Kurztrieben von *Populus italica*, geflügelte und ungeflügelte vivipare Weibchen.

8. *Laingia psammae* THEOB. — Pótharasztpuszta, 19. VI. 1964, in eingerollten Blättern von *Calamagrostis epigeios*, ungeflügelte vivipare Weibchen.

#### APHIDINAE

9. *Pterocomma ?steinheili* (MORDV.) — Mátra-Gebirge: Sirok, 23. VI. 1964, an jüngeren Zweigen von *Rosa canina* (sic!), ungeflügelte vivipare Weibchen und Larven.

Es ist nicht ausgeschlossen, daß diese Exemplare der Art *P. ringdahli* WAHLGR. angehören. Das Material ist aber zu klein, als daß endgültige Schlüsse gezogen werden könnten. Beide Arten unterscheiden sich gut nur in der geflügelten Form, die ungeflügelten sind sehr schwer zu bestimmen. *Rosa canina* ist kein Wirt dieser Blattläuse, sie leben nur an *Salix*-Arten. Es ist interessant, daß in der nächsten Umgebung keine *Salix* sp. vorhanden war. Die Läuse waren dunkelbraun gefärbt und konnten im Leben mit *Maculolachnus submaculata* (WALK.) leicht verwechselt werden.

10. *Schizaphis scirpi* (PASS.) — Nagyhegyes, 25. VI. 1964, an *Typha* sp., von Ameisen besucht, ungeflügelte und geflügelte vivipare Weibchen.

11. *Aphis acetosae* L. — Keszthely, 3. VII. 1964, am Stengel von *Rumex acetosa*, von Ameisen besucht, ungeflügelte und geflügelte vivipare Weibchen.

12. *Aphis avicularis* (H. R. L.) — Keszthely, 2. VII. 1964, an den Blattachseln und Trieben von *Polygonum aviculare*, von Ameisen besucht, geflügelte und ungeflügelte vivipare Weibchen.

BÖRNER (1952) synonymisiert diese Art mit der aus Mittelasien beschriebenen »*Pergandeida*« *polygonata* NEVSKY, was aber noch einer Bestätigung bedarf.

13. *Aphis bupleuri* (BÖRN.) — Budapest: Sashegy, 21. VI. 1964, an *Bupleurum falcatum*, ungeflügelte und geflügelte vivipare Weibchen.

Wohl in ganz Mittel- und Südeuropa verbreitet, aber bisher wenig beobachtet.

14. *Aphis chloris* KOCH — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Hypericum* sp., geflügelte und ungeflügelte vivipare Weibchen.

15. *Aphis comensalis* STROYAN (Syn.: *Aphis steinbergi* SHAP.) — Pótharasztpusztá, 19. VI. 1964, in vergallten Blättern von *Rhamnus cathartica*; zahlreiche ungeflügelte und wenige geflügelte vivipare Weibchen.

Bisher aus England, Deutschland, Österreich und aus dem europäischen Teil der UdSSR bekannt. Die Art kann sowohl in den Gallen von *Trichohermes walkeri* (FÖRST.), wie auch in eigenen Gallen leben. In Ungarn in eigenen Gallen gefunden.

16. *Aphis corniella* H. R. L. — Bükk-Gebirge: Szanafő bei Szilvásvárád, 24. VI. 1964, blattunterseits an *Chamaenerion angustifolium*, ungeflügelte und geflügelte vivipare Weibchen.

17. *Aphis eryngiiglomeratus* BOZHKO — Nagykovácsi: Nagyszénás, 17. VI. 1964, *Eryngium campestre*, geflügelte und ungeflügelte vivipare Weibchen; Keszthely, 3. VII. 1964, *Eryngium campestre*, ungeflügelte vivipare Weibchen; beide Kolonien von Ameisen besucht.

Bisher nur aus der Ukraine und der Tschechoslowakei bekannt, wohl in ganz Südost-Europa vorkommend.

18. *Aphis esulae* (BÖRN.) — Mátra-Gebirge: Sirok, 23. VI. 1964, *Euphorbia* sp., ungeflügelte vivipare Weibchen; Pótharasztpusztá, 19. VI. 1964, *Euphorbia esula*, ungeflügelte und zwei geflügelte vivipare Weibchen.

Bisher nur aus Österreich und Bulgarien an *Euphorbia esula* festgestellt. Ein Teil der Funde in der BÖRNERschen Sammlung gehört nicht dieser Art, sondern *A. euphorbiae* KALT. an.

19. *Aphis galiiscabri* SCHRK. — Budapest: Sashegy, 15. VI. 1964, *Asperula glauca*, ungeflügelte vivipare Weibchen; Bükk-Gebirge: Kőhát, 24. VI. 1964, *Galium verum*, ungeflügelte und geflügelte vivipare Weibchen.

Von HORVÁTH (1897) aus Siebenbürgen unter dem Namen *Aphis galii* KALT. gemeldet. Lebt an jungen Sprossen und in den Blütenständen verschiedener *Galium*- und *Asperula*-Arten in ganz Europa.

20. *Aphis gerardiana* MORDV. — Budapest: Sashegy, 15. VI. 1964, *Euphorbia Sequieriana*, ungeflügelte vivipare Weibchen; Gyenesdiás bei Keszthely, 3. VII. 1964, *Euphorbia Sequieriana*; ungeflügelte vivipare Weibchen, von der Ameise *Plagiolepis pygmaea* besucht.

Bisher nur in der UdSSR mit Sicherheit festgestellt. Der im BÖRNERschen Katalog (1952) erwähnte Fund aus Berlin gehört nicht dieser Art an (die Belegstücke von BÖRNER konnte ich während meines Aufenthaltes in Berlin untersuchen). Die Art lebt nur an *Euphorbia Sequieriana* (= *Gerardiana*) und wird von Ameisen besucht.

21. *Aphis helianthemi* FERR. — Mecsek-Gebirge: Tubes, 29. VI. 1964, *Helianthemum obovatum*, ungeflügelte vivipare Weibchen; Gyenesdiás bei Keszthely, 3. VII. 1964, *Helianthemum obovatum*, ein geflügeltes und zahlreiche ungeflügelte vivipare Weibchen, von Ameisen besucht.

22. *Aphis intybi* KOCH — Keszthely, 3. VII. 1964, am Rosettengrund

von *Cychorium intybus*, zwei geflügelte und mehrere ungeflügelte vivipare Weibchen, von Ameisen besucht.

Von HORVÁTH (1897) aus der Slowakei und aus Siebenbürgen gemeldet.

23. *Aphis lambersi* (BÖRN.) — Nagykovácsi: Nagyszénás, 17. VI. 1964, am Stengelgrund von *Daucus carota*, zwei geflügelte und mehrere ungeflügelte vivipare Weibchen.

24. *Aphis lini* HOLMAN (in litt.) — Zamárdi am Balaton-See, 28. VI. 1964, am Stengelgrund und an den Wurzeln von *Linum ?austriacum*, ungeflügelte vivipare Weibchen, von Ameisen besucht.

Bisher nur aus der Slowakei bekannt (HOLMAN in litt.).

25. *Aphis origani* PASS. — Bükk-Gebirge: Kőhát, 24. VI. 1964, an *Origanum vulgare*, ungeflügelte vivipare Weibchen, von Ameisen besucht.

26. *Aphis proffti* (BÖRN.) — Mátra-Gebirge: Sirok, 23. VI. 1964, blattunterseits an *Agrimonia odorata*, ungeflügelte vivipare Weibchen.

Bisher nur aus Deutschland, Schweden und Österreich gemeldet.

27. *Aphis ruborum* (BÖRN.) — Mátra-Gebirge: Sirok, 23. VI. 1964, an den Stengeln und Blattstielen von *Rubus* sp., ein geflügeltes und zahlreiche ungeflügelte vivipare Weibchen.

28. *Aphis salviae* WALK. — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Salvia nemorosa*, ungeflügelte und geflügelte vivipare Weibchen, von Ameisen besucht.

29. *Aphis schilderi* (BÖRN.) — Pusztakocs: Ohat, 25. VI. 1964, an *Peucedanum officinale*, ungeflügelte vivipare Weibchen.

*Aphis schilderi* (BÖRN.) ist bisher nur aus Thüringen, Burgenland und Polen bekannt. Die Tiere aus Ungarn unterscheiden sich von denjenigen aus Thüringen und Polen durch die grüne Körperfärbung und das Vorhandensein von Marginaltuberkeln an allen abdominalen Segmenten; sonst stimmen sie fast völlig mit den erwähnten Tieren überein.

30. *Aphis sedi* KALT. — Pótharasztpuszta, 19. VI. 1964, an *Sedum maximum*, zahlreiche ungeflügelte vivipare Weibchen.

Von HORVÁTH (1897) aus Siebenbürgen gemeldet.

31. *Aphis serpylli* KOCH — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Thymus serpyllum*, ungeflügelte vivipare Weibchen, von Ameisen besucht.

32. *Aphis spiraephaga* MÜLL. — Budapest: Sashegy, 21. VI. 1964, an Treibspitzen von *Spiraea vanhouttei*, ungeflügelte und geflügelte vivipare Weibchen.

33. *Aphis stachydis* MORDV. — Budapest: Sashegy, 15. VI. 1964, an Stengeln von *Stachys recta*, ungeflügelte vivipare Weibchen.

34. *Aphis ?thomasi* (BÖRN.) — Nagykovácsi: Nagyszénás, 17. VI. 1964, *Scabiosa*, sp., ungeflügelte vivipare Weibchen und Nymphen.

Nach BÖRNER (1950) unterscheidet sich diese Art von *A. confusa* WALK. durch die strohgelbe Färbung, durch die hellen Siphonen mit gedunkelten

Enden, die sehr kurze Behaarung der Coxen und Trochantern sowie durch die Wirtspflanzen. *A. confusa* WALK. lebt an *Knautia arvensis* und *Dipsacus silvestris*, während *A. thomasi* (BÖRN.) an *Scabiosa*-Arten vorkommen soll. Die ungarischen Tiere entsprechen in bezug auf Körperfärbung und Wirtspflanze *A. thomasi* (BÖRN.), in der Behaarung der Extremitäten hingegen *A. confusa* (WALK.). Sie stimmen völlig mit Tieren aus Polen von *Scabiosa ochroleuca* überein. Ihre Zugehörigkeit zu *A. thomasi* (BÖRN.) ist fraglich.

35. *Aphis tormentillae* PASS. — Budapest: Sashegy, 15. VI. 1964, an *Potentilla recta*, zwei ungeflügelte vivipare Weibchen.

36. *Aphis verticillatae* (BÖRN.) — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Salvia verticillata*, ungeflügelte vivipare Weibchen.

37. *Aphis verbasci* SCHRK. — Villányer-Gebirge: Szársomlyó bei Villány, 30. VI. 1964, blattunterseits an *Verbascum lychnidis*, ungeflügelte und geflügelte vivipare Weibchen (unter ihnen viele parasitiert), von *Plagiolepis pygmea* besucht.

38. *Aphis violae* SCHOUT. — Pusztakocs: Ohat, 25. VI. 1964, am Stengelgrund, dicht am Grunde von *Viola* sp., besucht von Ameisen, ungeflügelte vivipare Weibchen.

Bisher nur aus England, Belgien, Thüringen und Steiermark bekannt, wohl über ganz Europa verbreitet.

39. *Brachyunguis tamaricophila* NEVSKY — Budapest, 18. VI. 1964, an *Tamarix* sp., geflügelte vivipare Weibchen.

Die Art ist neu für Mitteleuropa; bisher nur aus Mittelasien, Transkaukasien, aus dem Süden des europäischen Teiles der UdSSR, aus Rumänien und Bulgarien bekannt.

40. *Dysaphis (Pomaphis) pyri* (B. DE F.) — Gyenesdiás bei Keszthely, 3. VII. 1964, an den dünnen Wurzeln von *Linum* sp., ungeflügelte vivipare Weibchen; Keszthely, 2. VII. 1964, an den Wurzeln von *Asperula cynanchica*, ungeflügelte vivipare Weibchen.

41. *Brachycaudus ballotae* (PASS.) — Pusztakocs: Ohat, 25. VI. 1964, an *Ballota nigra*, ungeflügelte vivipare Weibchen.

Von PASSERINI (1860) aus Italien beschrieben, wurde diese sehr wenig bekannte Art neulich von HOLMAN (in litt.) in der Tschechoslowakei wiedergefunden. Der Name »*ballotae* PASS.« wurde von BÖRNER (1952) zu Unrecht auf eine *Aphis*-Art bezogen.

42. *Brachycaudus cerinthis* BOZHKO — Nagykovácsi: Nagyszénás, 17. VI. 1964, in Blütenständen von *Cerithe minor*, ungeflügelte vivipare Weibchen.

Die Art war bisher nur aus der UdSSR (Ukraine) bekannt, kommt aber auch in der Tschechoslowakei vor (HOLMAN in litt.).

43. *Brachycaudus mordvilkoii* H. R. L. — Keszthely, 2. VII. 1964, an *Echium* sp., von Ameisen besucht, ungeflügelte vivipare Weibchen.



Eine wenig beachtete, in Süd- und Mitteleuropa verbreitete Art; auch aus dem Süden der UdSSR gemeldet.

44. *Brachycaudus salicinae* BÖRN. — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Inula hirta*; Budapest: Sashegy, 21. VI. 1964, an *Inula salicina*; ungeflügelte vivipare Weibchen.

45. *Brachycaudus prunicola* (KALT.) — Nagyhegyes, 25. VI. 1964, in zusammengerollten Blättern von *Prunus spinosa*, ungeflügelte und geflügelte vivipare Weibchen.

46. *Brachycolus stellariae* (HARDY) — Bükk-Gebirge: Kőhát, 24. VI. 1964, in eingerollten Blättern von *Stellaria holostea*, ungeflügelte vivipare Weibchen.

47. *Semiaphis dauci seselii* BÖRN. — Nagykovácsi: Nagyszénás, an *Seseli dévényense*, 3 geflügelte und mehrere ungeflügelte vivipare Weibchen.

Aus Südf frankreich, Steiermark und der Tschechoslowakei bekannt. *Seseli dévényense* ist eine neue Wirtspflanze für diese Unterart, die bisher nur von *Seseli austriacum* bekannt war.

48. *Semiaphis pimpinellae* (KALT.) — Eger, 24. VI. 1964, *Pimpinella saxifraga*, ungeflügelte vivipare Weibchen.

49. *Lipaphis cardariae* KNECHTEL et MANOLACHE — Budapest: Sashegy, 21. VI. 1964, an *Lepidium campestre*, ungeflügelte vivipare Weibchen; Nagyhegyes, 25. VI. 1964, *Lepidium draba*, ungeflügelte vivipare Weibchen.

Bisher aus Rumänien und UdSSR bekannt, auch in der Tschechoslowakei vorhanden (HOLMAN in litt.).

50. *Lipaphis ruderalis* BÖRN. — Pusztakocs: Ohat, 25. VI. 1964, an *Lepidium ruderales*, ungeflügelte vivipare Weibchen.

Diese Art scheint in ganz Europa verbreitet zu sein, wurde aber bisher wenig beachtet.

51. *Lipaphis turritella* (WAHLGR.) — Mátra-Gebirge: Nagysástó bei Mátrafüred, 23. VI. 1964, an *Turritis glabra*; Bükk-Gebirge: Kőhát, 24. VI. 1964, an *Turritis glabra*, ungeflügelte vivipare Weibchen.

Bisher aus England, Schweden, Ostbayern, Polen, Österreich und der UdSSR bekannt. Scheint in ganz Europa vorzukommen.

52. *Spatulophorus incanae* MÜLL. — Budapest: Sashegy, 21. VI. 1964, an *Berteroa incana*; Gyenesdiás bei Keszthely, 3. VII. 1964, an *Berteroa incana* ungeflügelte vivipare Weibchen.

Diese Art wurde neulich aus Deutschland beschrieben. Sie scheint in ganz Europa vorzukommen.

53. *Staegeriella necopinata* (BÖRN.) — Budapest: Sashegy, 15. VI. 1964, an *Asperula glauca*, ungeflügelte vivipare Weibchen; an *Galium verum*, ungeflügelte und geflügelte vivipare Weibchen.

54. *Hydaphias helvetica* H. R. L. — Keszthely, 3. VII. 1964, in den Blütenständen von *Asperula glauca*, ungeflügelte vivipare Weibchen.

55. *Hydaphis hofmanni* BÖRN. — Keszthely, 2. VII. 1964, an *Galium verum*, ungeflügelte und geflügelte vivipare Weibchen.

56. *Hydaphis bupleuri* BÖRN. — Budapest: Sashegy, 21. VI. 1964, an *Bupleurum falcatum*, ungeflügelte vivipare Weibchen.

Diese wenig beachtete Art scheint in ganz Europa vorzukommen, ist aber bisher nur aus England, Frankreich, Deutschland, Österreich, Polen und der Tschechoslowakei gemeldet. Eine ähnliche Form wurde auch in der Mongolei gefunden (SZELEGIEWICZ in litt.).

57. *Hyadaphis foeniculi* (PASS.) — Bükk-Gebirge: Kőhát, 24. VI. 1964, an *Lonicera* sp., ungeflügelte vivipare Weibchen.

58. *Ammiaphis sii* (KOCH) — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Falcaria vulgaris*, ungeflügelte und geflügelte vivipare Weibchen.

59. *Coloradoa inodorella* OSSIANN. — Mátra-Gebirge: Nagysástó bei Mátrafüred. 23. VI. 1964, an *Matricaria inodora*, ungeflügelte vivipare Weibchen und Nymphen.

Bisher nur aus Norwegen, Schweden und der UdSSR bekannt.

60. *Coloradoa palmerae* BÖRN. — Mecsek-Gebirge: Tubes, 29. VI. 1964, an *Artemisia alba*, Villányer Gebirge; Szársomlyó, 30. VI. 1964, an *Artemisia alba*; nur ungeflügelte vivipare Weibchen.

Bisher nur aus Frankreich und Italien (Südtirol) bekannt. Diese Art lebt nicht an *Artemisia mutellina*, wie BÖRNER (1952) angibt, sondern an *Artemisia alba* (= *camphorata*). Sie scheint in Südeuropa recht häufig zu sein.

61. *Longicaudus trirhodus* (WALK.) — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Thalictrum pseudominus*, ungeflügelte vivipare Weibchen.

62. *Myzus (Nectarosiphon) ajugae* (SCHOUT.) — Mátra-Gebirge: Piszt-rángostó bei Paráđ, *Ajuga reptans*, eine ungeflügelte; Bükk-Gebirge: Kőhát, 24. VI. 1964, *Ajuga reptans*, 4 ungeflügelte; Keszthely, 4. VII. 1964, im Stadtpark an *Ajuga reptans*, 3 Larven.

63. *Myzus (Nectarosiphon) linariae* HOLMAN — Budapest: Sashegy, 15. und 21. VI. 1964, an den Blütenstengeln von *Linaria genistifolia*; zahlreiche ungeflügelte vivipare Weibchen.

64. *Galiobium langei* BÖRN. — Bükk-Gebirge: Kőhát, 24. VI. 1964, an *Galium verum*, ungeflügelte vivipare Weibchen; Keszthely, 2. VII. 1964, an *Galium verum*, ungeflügelte vivipare Weibchen.

65. *Silenobium schusteri* BÖRN. — Keszthely, 2. VII. 1964, an *Melandrium album*, ungeflügelte vivipare Weibchen.

66. *Aphidura ornata* H. R. L. — Budapest: Sashegy, 21. VI. 1964, an den Blütenstengeln von *Silene otites*, sehr zahlreiche geflügelte und ungeflügelte vivipare Weibchen.

Eine südeuropäische Art, die bisher nur aus Italien und aus dem Süden der UdSSR bekannt war.

67. *Nasonovia nigra* H. R. L. — Nagykovácsi: Nagyszénás, 17. VI.

1964, an *Hieracium umbellatum*, 3 geflügelte und mehrere ungeflügelte vivipare Weibchen.

68. *Hyperomyzus lampanae* (BÖRN.) — Mátra-Gebirge: Nagysástó bei Mátrafüred, 23. VI. 1964, an *Lapsana communis*, ungeflügelte vivipare Weibchen.

69. *Aulacorthum speyeri* BÖRN. — Pótharasztpuszta, 19. VI. 1964, an *Polygonatum multiflorum*, ungeflügelte vivipare Weibchen.

70. *Acyrtosiphon cyparissiae* (KOCH) s. str. — Budapest: Sashegy, 15. VI. 1964, an *Euphorbia* sp., eine Larve; 21. VI. 1964, an *Euphorbia* sp., 3 ungeflügelte vivipare Weibchen.

Von HORVÁTH (1897) aus der Slowakei gemeldet.

71. *Acyrtosiphon nigripes* H. R. L. — Pusztakocs: Ohat, 25. VI. 1964, an *Peucedanum officinale*, zahlreiche ungeflügelte vivipare Weibchen.

Bisher nur aus Norditalien und aus der Schweiz von *Laserpiter siler* bekannt.

72. *Acyrtosiphon superba* (BÖRN.) — Budapest: Sashegy, 21. VI. 1964, an *Seseli leucospermum*, zahlreiche ungeflügelte vivipare Weibchen.

Bisher nur aus Österreich bekannt. Lebt an *Seseli austriacum* und *Seseli leucospermum*. Von BÖRNER (1952) zu Unrecht zu *Acyrtosiphon nigripes* H. R. L. synonym gestellt.

73. *Corylobium avellanae* (SCHRK.) — Nagykovácsi: Nagyszénás, 17. VI. 1964, *Corylus avellana*, ungeflügelte vivipare Weibchen.

74. *Pleotrichophorus achilleae* HOLMAN — Pótharasztpuszta, 19. VI. 1964, an *Achillea Kitaibeliana*, ungeflügelte vivipare Weibchen.

75. *Pleotrichophorus duponti* H. R. L. — Mátra-Gebirge: Nagysástó bei Mátrafüred, 23. VI. 1964, an *Achillea millefolium*, ein ungeflügeltes vivipares Weibchen.

76. *Linosisiphon asperulophagus* HOLMAN — Bükk-Gebirge: Kőhát, 24. VI. 1964, an *Asperula odorata*, ungeflügelte vivipare Weibchen.

Bisher nur aus der Tschechoslowakei, von der Krim und aus Südpolen bekannt. Monophag an *Asperula odorata*, lebt vereinzelt an den Blüten und blattunterseits.

77. *Linosisiphon galii* (MAMONT.) — Mecsek-Gebirge: Zengő, 29. VI. 1964, an *Galium schultesii*, ungeflügelte vivipare Weibchen.

Diese Art, die von SCHAPOSCHNIKOW (1964) zu Unrecht als Synonym von *L. asperulophagus* HOLMAN angesehen wurde, ist bisher nur aus der UdSSR (Transkarpatskaja Oblast), Slowakei und Polen bekannt.

78. *Sitobion eqiseti* HOLMAN — Mátra-Gebirge: Pisztrángostó bei Paráđ, 23. VI. 1964, an *Equisetum silvaticum*, geflügelte vivipare Weibchen.

Bisher nur aus der Tschechoslowakei, Polen und Schweden bekannt. Scheint eine boreo-alpine Art zu sein.

79. *Macrosiphum daphnidis* BÖRN. — Bükk-Gebirge: Kőhát, 24. VI.

1964, an *Daphne mezereum*, ungeflügelte und geflügelte vivipare Weibchen.  
80. *Macrosiphum cerinthiacus* BÖRN. — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Cerithe minor*, ungeflügelte vivipare Weibchen.

Wenig beachtet, bisher nur aus Steiermark und der UdSSR bekannt.

81. *Macrosiphum funestum* (MACCH.) — Mátra-Gebirge: Pisztrángostó bei Parád, 23. VI. 1964, *Rubus* sp., zwei geflügelte und mehrere ungeflügelte vivipare Weibchen.

82. *Macrosiphum laseri* HOLMAN — Mecsek-Gebirge: Zengő, 29. VI. 1964, an *Laserpitium latifolium*, zahlreiche ungeflügelte vivipare Weibchen.

Die Art wurde vor kurzem von der Krim von *Laser trilobum* beschrieben (HOLMAN, 1962).

83. *Macrosiphum stellariae* THEOB. — Mecsek-Gebirge: Zengő, 29. VI. 1964, an *Stellaria holostea*, ein ungeflügeltes vivipares Weibchen und Larven.

Bisher nur aus England und der Tschechoslowakei (HOLMAN in litt.) bekannt. Vermutlich in ganz Europa verbreitet, aber wenig beachtet.

84. *Dactynotus (D.) achilleae* (KOCH) — Mátra-Gebirge: Nagysástó bei Mátrafüred, 23. VI. 1964, an *Achillea millefolium*, ungeflügelte vivipare Weibchen.

85. *Dactynotus (D.) inulicola* H. R. L. — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Inula salicina* und *I. hirta*, ungeflügelte vivipare Weibchen; Mecsek-Gebirge: Tubes, 29. VI. 1964, an *Inula spireifolia*, zwei geflügelte und zahlreiche ungeflügelte vivipare Weibchen.

86. *Dactynotus (D.) obscurus* (KOCH) — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Hieracium pilosella* und *H. umbellatum*; Mátra-Gebirge: Pisztrángostó bei Parád, 23. VI. 1964, an *Hieracium racemosum*, geflügelte und ungeflügelte vivipare Weibchen.

87. *Dactynotus (D.) pilosellae* BÖRN. — Villányer Gebirge: Villánykövesd, 30. VI. 1964, an *Hieracium pilosella*, ungeflügelte vivipare Weibchen.

88. *Dactynotus (U.) aeneus* H. R. L. — Nagykovácsi: Nagyszénás, 17. VI. 1964, an *Carduus nutans*; Bükk-Gebirge: Kőhát, 24. VI. 1964, an *Carduus glaucus*, ungeflügelte und geflügelte vivipare Weibchen.

89. *Dactynotus (U.) carthami* H. R. L. — Villányer Gebirge: Szársomlyó bei Villány, 30. VI. 1964, am Stengel von *Carthamus lanatus*; geflügelte und ungeflügelte vivipare Weibchen.

Eine mediterrane Art, die bisher nur aus Israel und von der Krim bekannt ist und die an *Carthamus*-Arten lebt.

90. *Dactynotus (U.) ensifoliae* HOLMAN — Budapest: Sashegy, 21. VI. 1964, an *Inula ensifolia*; Gyenesdiás bei Keszthely, 3. VII. 1964, an *Inula ensifolia*, ungeflügelte vivipare Weibchen.

Diese noch nicht beschriebene Art lebt monophag an *Inula ensifolia* und ist bisher nur von der Krim und aus der Slowakei bekannt (HOLMAN).

91. *Macrosiphoniella (A.) linariae* (KOCH) — Gyenesdiás bei Keszthely, 3. VII. 1964, an den Stengeln von *Aster linosyris*, ungeflügelte vivipare Weibchen.

92. *Macrosiphoniella (P.) chamomillae* H. R. L. — Pusztakocs: Ohat, 25. VI. 1964, an *Matricaria inodora*, ungeflügelte vivipare Weibchen.

Diese Art wurde bisher aus Schweden, Norwegen, England, Holland, Frankreich und aus der Schweiz gemeldet. Auch aus dem europäischen Teil der UdSSR und Mittelasien angegeben.

93. *Macrosiphoniella (P.) sejuncta* (WALK.) — Budapest: Sashegy, 21. VI. 1964, an *Achillea millefolium*, ein ungeflügeltes, Mátra-Gebirge: Nagysástó bei Mátrafüred, 23. VI. 1964, an *Achillea millefolium*, geflügelte und ungeflügelte vivipare Weibchen.

94. *Macrosiphoniella (P.) tapuskae* (HOTT. et FRISON) (= *ceratus* BÖRN.) — Budapest: Sashegy, 21. VI. 1964, an *Achillea millefolium*, ungeflügelte; Mátra-Gebirge: Nagysástó bei Mátrafüred, 23. VI. 1964, an *Achillea millefolium* und *A. nobilis*, ungeflügelte vivipare Weibchen.

95. *Macrosiphoniella (M.) abrotani* (WALK.) — Pusztakocs: Ohat, 25. VI. 1964, an *Matricaria inodora*, ungeflügelte vivipare Weibchen zusammen mit *M. chamomillae* H. R. L.

Die Tiere von *Matricaria* unterscheiden sich morphologisch nicht von jenen an *Artemisia abrotanum*. An *Matricaria* auch in Schweden und Polen festgestellt.

96. *Macrosiphoniella (M.) atra* (FERR.) — Mecsek-Gebirge: Tubes, 29. VI. 1964, an *Artemisia alba*, ungeflügelte; Villányer Gebirge: Szársomlyó bei Villány, 30. VI. 1964, an *Artemisia alba*, ungeflügelte vivipare Weibchen.

Eine südeuropäische Art, die bisher aus Italien und Frankreich bekannt war.

97. *Macrosiphoniella (M.) fasciata* DEL GÜ. (= *dimidiata* BÖRN.) — Pótharasztpuszta, 19. VI. 1964, an *Artemisia campestris*, zwei geflügelte und mehrere ungeflügelte vivipare Weibchen.

98. *Macrosiphoniella (M.) pulvera* (WALK.) — Nagyhegyes, 25. VI. 1964, an *Matricaria maritima*, ein ungeflügeltes vivipares Weibchen und zwei Larven.

99. *Macrosiphoniella (M.) staegeri* H. R. L. — Pótharasztpuszta, 19. VI. 1964, *Centaurea stoebe*, ungeflügelte vivipare Weibchen.

Bisher aus der Schweiz und aus Thüringen sowie aus Bulgarien bekannt.

100. *Macrosiphoniella (M.) usquertensis* H. R. L. — Mátra-Gebirge: Nagysástó bei Mátrafüred, 23. VI. 1964, an *Achillea millefolium*, ein ungeflügeltes vivipares Weibchen.

In ganz Europa verbreitet, aber wenig beachtet.

101. *Microsiphum nudum* HOLMAN — Nagykovácsi: Nagyszénás, 17. VI.

1964, am Stengel von *Achillea setacea*, zwei geflügelte und zahlreiche ungeflügelte vivipare Weibchen.

Scheinbar eine südosteuropäische Art; bisher aus der Slowakei und von der Krim sowie aus Bulgarien bekannt.

102. *Amphorophora (Amphorosiphon) pulmonariae* (BÖRN.) — Mecsek-Gebirge: Zengő, 29. VI. 1964, in zusammengerollten Blättern von *Pulmonaria officinalis*, ein parasitiertes ungeflügeltes vivipares Weibchen.

Wohl in ganz Europa verbreitet, aber wenig beachtet. Bisher nur aus Holland, Thüringen und der UdSSR bekannt.

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## THE ZOOLOGICAL SIGNIFICANCE OF ECOLOGICAL AND GEOGRAPHICAL BORDERLANDS

By

F. J. TURČEK

FOREST RESEARCH INSTITUTE, BANSKÁ ŠTIAVNICA, ČSSR.

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The use of the land in the widest sense of the word and the exploitation of its natural resources by Man, in other words, the continuous expansion of civilisation, affects not only the geographical and ecological distribution of animals (or generally all living beings), but also alters the spatial arrangement and spreading of their smaller to larger formations and communities, including their entire environment. From this arises what we call the changing face of the Earth.

Extensive, not infrequently homogeneous, formations, e.g., the taiga, prairies, or steppes, become disturbed and subdivided into smaller units, their several constituent parts and fragments will undergo diverse use and exploitation; deserts, steppes, and marshes subserve agricultural uses; roads, railways, wires and cables criss-cross them, cliffs and mountains are levelled, lakes and reservoirs called into being, rivers diverted into new channels, dams, power plants erected on them — all and sundry being Man's radical effects on Earth. We all know these phenomena: they are enacted before our very eyes. Less is known, however, about the manifold consequences of this action. Of these, I propose to discuss shortly a single one: the problem of the ecotones or borderlands.

Every change in our use of the world's surface evokes, adjoining the zoogeographical, natural ecological borders, new frontiers on which two or more formations and communities or their fragments meet and mix. These areas, as well as the spatial manifestations of the spatial meeting of all neighbouring, qualitatively and quantitatively different, formations are here called ecotones. They are created on the one hand by the abiotic environment and on the other by the living beings. Their changes, rise and fall, will obviously affect the animal world, namely the populations of animals.

### The ecotones

It was KENDEIGH (1961) who recently gave an intelligent definition of the ecotones. In English ecological literature, borderlands are usually defined as ecotone, transition zone, tension zone, marginal zone, edge, zone of inter-

mingling, or zone of transgression; in German as Kampfgebiet, Kampfzone, or Übergangszone; while BALOGH (1958) writes, in a coenological context, about Saumbiozönose, more or less corresponding to zonal community.

In general, two kinds of, qualitatively and quantitatively different, ecotones or their subgroups might be distinguished:

1. A transition between two biogeographical units, down to the bioma (the term of CLEMENTS and SHELFORD, 1939) or the sub-province (the term of MATVEYEV, 1961);

2. A transition or borderland between two ecological units or fragments. The first one is also an ecological concept, implying also the second or its multiple.

Probably the best known geographical borderland is the Wallacea (DARLINGTON, 1957), decurrent between the Oriental and the Australian faunal regions, or the rather deep transition in Central America and Mexico, between the Neotropic and the Nearctic Regions (PATTERSON, 1963). I should like to mention here that the most multilateral and also unique, fivefold borderland of the world (between the Palearctic, Nearctic, Neotropic, Australian, and Oriental Regions) lies, for the great disadvantage of the geography and ecology of terrestrial animals, in the Pacific Ocean, between the Hawaiian Archipelago, Southern Mexico, the Equator and the Tropic of Cancer.

There are many and numerous kinds of ecological borderlands, to mention only an almost 400 km wide forest-steppe, or the transition between deep woods and prairies, or the woody tundra, or a marshy swamp between open waters and forests, or the edge of a wood constituting the transitional area between a forest and an agricultural land.

Eco-geographical borderlands might be found in the horizontal and vertical zonation of ecological as well as geographical units. Especially worthy of interest are the high mountains — and mainly at lower latitudes where one may find, so to say, condensed borderlands, not only in an ecological but also in a geographical sense (MATVEYEV, 1961).

Although the main theme of my paper deals with the effects of borderlands on the fauna and animal communities, certain aspects of the borderlands proper should also be discussed.

There are essential differences between geographical and ecological borderlands. DARLINGTON (1957) defines the former ones as subtraction or depauperate zones, insofar as, according to him, they have fewer species than either one of the geographical units constituting their borders. Decrease should therefore be interpreted here qualitatively (species number and composition), whereas hardly anything is known today of the quantitative relationships. It should be noted that depauperation could hardly have been a general feature of geographical borderlands: one should expect its very opposite. True, the borderland between, e.g., the Ethiopian and the Palearctic Regions



had in fact become depauperized, but one should remember that its major part consists of the Sahara, being concurrently also a distributional barrier. On the other hand, the borderland between the Oriental and Palearctic Regions is not poorer: the faunas of the Tien Shan and Eastern Asia intermingle in a rich and wide zone from the Amur to the Malaysian Archipelago and India. Hence depauperation in geographical borderlands occurs only in areas which are concurrently also geographical, climatic, or ecological barriers (in these cases barriers for just this reason), as e.g., the Wallacea mentioned above, or the Sahara or the Gobi Desert. It should also be kept in mind that it were not correct to define depauperation or decrease, nor, as a matter of fact, enrichment, on a specific or racial basis, when intermingling or a mutual countereffect between two geographical units (regions) comes into being at a higher taxonomical — order, family, eventually genus — level (cf. PATTERSON, 1963), and attains specific or maybe racial levels mostly by the means of adaptive radiation.

Borderlands between ecological and life community units are generally rich in forms, accountable not only for the effects of two or more units but arising from the new environment: the summary effects of the borderland. It is not only the fauna which changes in a borderland, but also the flora, — as shown in the pioneering work of TRACZYK, Polish botanist (1960) — indeed, soil conditions and ecoclimate (FLEMMING, 1962) also change, as, in fact, and from an energetical point of view, also the amount of solar energy received. The faunas of ecological borderlands are composed of at least two, but most frequently of three or even more, ecological elements (valid also for the constituting elements of the flora!): those of the two neighbouring, meeting units of the transitional or borderland proper, then eventually of other elements having a wide ecological valency (e.g. ubiquitous), or those finding a new ecological niche created in the borderland (LUDWIG's vivid terms are *Einnischung*, *Einnisten*), discounting the guest-elements of certain animals not ecologically bound to a specific habitat. The fact that a borderland is formed by two adjacent communities allows the assumption of the transitional quality of the borderland, its separating and concurrently also connecting nature concerning the two communities, its very continuity (*natura non facit saltus*). Maybe this was the consideration which gave rise to the term continuum defining interrelated communities, and their discussion as such, by the new ecological school evolved around the University of Michigan. One might also presume that there occur — at least secondarily — contacts without resultant borderlands between two communities (or the dimensions of the borderland might be so small as to defy perception), which would require their consideration as discontinuities. This, however, would contradict logics, experience, and also all general laws. Even in the case of such abrupt, immediate, and direct contacts — if they really do exist at all — one could not consider these com-

munities as analogous — and even less generalized — with discontinuities as extant between, e.g. the cell, the living being, the individuum, the species, etc. It is from this point of view that JULIAN HUXLEY's (1948, p. 169) example is not quite successful for the drawing of parallels between the individual and the community concerning discontinuity, when, mentioning the alteration or zonation of communities observable in high mountains, he contends that the continuously changing factors, e.g., temperature, humidity, soil, etc. evoke abrupt and discontinuous changes in the communities affected. Had one toured, for instance, in the High Tatras or the Alps, one might have seen (and studied) that there wedges between the timberline of the forest (spruce and larch) and the subalpine or alpine zone a borderland or transition, namely the cembra and mountain pine association, with special features (scattered, grassy, isolated stocks, etc.) and communities. This is the vertical equivalent of the forest — taiga.

I should like to discuss shortly some other aspects of the borderlands. They are the width of the borderland, and the penetration or irradiation of the constituent elements.

As far as the width of the ecotones is concerned, it cannot be characterized or defined in general (owing also for the human interference), and the sole general rule is as follows: the width is proportional to the rank of the two bordering communities. It is wide at the meeting of regions, provinces, biomas, and narrow at the touching of communities, associations (biociations), and their fragments. With regard to width, there is no generally valid rule for the relationship or affinity of the two bordering communities. Very frequently the borderland of two ecologically far removed communities is wider than that of two closely related ones, e.g., the swamp or marsh between open water and the forest, or the forest-steppe mentioned above, between the forest zone and the steppe proper. However, it were not correct to study a borderland merely from a physiognomical point of view. If the mutual irradiation and intermingling of the particular elements within the borderland of the two meeting and allied communities be studied, we shall observe, if not physiognomically, that the oak-community will drive deep with its elements into the beech-community, and vice versa, thus both related communities creating a mutually very wide borderland. It should also be noted that, very frequently, the very borderlands are the most exposed ones to man's greatest impact (e.g. the destruction of forest edges, the depression of the timberline, the penetration of agricultural lands into the borderland of the meadows, etc.).

The situation is similarly intricate concerning the mutual penetration of the elements of meeting communities. In the discussion of the geographical borderlands I had already mentioned the fact that penetration happens on different taxonomical levels (DARLINGTON, 1957; PATTERSON, 1963), and this phenomenon should be considered not only in space but also in time, with respect

to the history of the two bordering units, especially from the end of the Tertiary. There is, however, also a general rule for both geographical and ecological units. There is namely a parallel in the observation that, for geographic units, penetration is usually stronger from the part of the richer, more saturated area, whereas, for ecological units, this holds for the higher, more organized communities. For both of them, an ecological explanation would be the most acceptable, namely that every natural unit, be it geographical or ecological, possess of a certain homeostasis, while propagation and spreading are features common to all living beings. Concerning ecosystems, SUKACHOV (1952) laid down the rule that every community endeavours to penetrate with its elements other communities, concurrently defending itself against the penetration of foreign elements. In this connection, the structure and mainly the role of the forest edge (as a borderland) is extremely interesting. There is really a tension here (not only man's privilege with respect to frontiers). I have shown it formerly that the elements of the forest edge are preponderantly sylvan, those of the other (bordering) unit are few, but it also has special, borderland elements. The forest edge functions as a sieve or a filter, both biotically and abiotically. Plants and animals intercept living beings tending inwards or outwards, e.g. small mammals, birds, insects, the floating seeds of plants, etc. — all this done by the forest edge as a whole, with its floral and faunal elements, as well as with its ecoclimatical or edaphic effects (cf. BALOGH, 1958: fremdregulative Einwirkung!). It is worthy of note that there penetrates through the forest edge a higher rate of sylvan than, for instance, meadow, aquatic, pasture, etc. elements (cf. the penetration of higher units into lower ones) into the forest, in spite of the fact that the forest edge does not belong to the forest proper (or to any other community), since it cannot originate and survive merely in the forest itself, the meeting with some other community being necessary for its evolvment.

We are still far from being at present able to draw general rules concerning the structure, functioning and manifold effects of the borderlands. These themes are most rarely encountered with in ecological works, — to the great loss of science, since the problems of transitions, borderlands, continua and discontinua are not only ecological (and still less merely zoological) ones, but should be regarded as also general biological problems.

Let us now consider the populations of animals.

We have stated that the populations of the borderlands are composed of the elements of the bordering units and/or eventually of special elements, further from ubiquists, or those of a great ecological valency. This statement was emphasized, in a geographical respect, already by DUDICH (1953), and also substantiated by a number of examples. It derives from this fact that there will arise between the faunas of the borderlands — since faunal intermingling cannot be referred to the entire animal kingdom, what with different

histories, movements, requirements, etc. being valid for every class — new faunal complexes until the attaining of a dynamically balanced state. Unfortunately, little is known about the faunal complexes, the animal (and plant) communities of the borderlands, and mainly with respect to their succession and changes in time and space, both geographically and ecologically.

What, in effect, are the characteristics and their consequences of the borderland animal populations?

1. A special structure — specific composition;

2. The development of new, mutual conditions and effects among the animals, respectively plants themselves, and between animals and plants (cf. SOUTHWOOD, 1962);

3. Alterations evoked (at least potentially) in the genetics of animal species and populations, insofar as the borderlands might become meeting points of taxonomical and ecological, formerly isolated, units. It should also be mentioned here that there might arise in the borderlands new niches (ecology) or empty, unoccupied sites, which, when filled up, might have great evolutionary significance (e.g. adaptive radiation). It was in this respect that JOHANSEN (1963) pointed out the importance of the subarctic transitional zone;

4. In the generally increasing edges the populations also increase due to the edge effect, namely proportionately with the length of the edge, respectively with the quantity and quality of the touching units (LINDUSKA, 1946);

5. A new dynamics, e.g. unexpected outbreaks, of the evolved faunal complexes or populations might occur;

6. New host — parasite, as well as plant — parasite (pest) conditions might arise, the chain of hosts subtending the parasites might alter, effecting the dissolution of an endemic focus and its eventual transformation into an epidemic one, etc.;

7. Borderlands might be entered or crossed (border-bridge) by faunal (or floral) elements which were formerly unable to advance or penetrate (cf. the role of cultivated lands as borderlands!). From this point of view borderlands are important also in acclimatization.

We cannot digress on all aspects of the borderland populations and effects; many of them are indeed unknown. One should, however, point out the great zoogeographical, ecological, research (e.g. the study of the ecological valency of the various elements, the investigation of the evolvement of new ecological niches, etc.), sanitary, and economical importance of the borderlands, as still open fields of biogeographical, zoogeographical, and ecological investigations.

Let us consider some instructive examples.

A forest, adjacent to a small provincial town, borders on cultivated fields, by a relatively narrow edge. During or after the war, a zone measuring some ten or more meters width was cut parallel with the fields. This zone

was later used as a pasture. Investigations subsequent to an epidemic of encephalitis in the town had shown that the pathogenic virus attacked by the medium of milk. The pasture was visited not only by cows and goats, but also by roes, foxes, hares, and many kinds of small mammals and birds. The exchange of ticks, mainly *Ixodes*, *Haemaphysalis*, and *Dermacentor* species, between the domestic and wild animals, happened in this site, concurrently with the transference of the virus infection. Until the pasture as a new borderland, was not wedged in, between the forest and the cultivated fields, domestic animals had no direct contact with the forest or rather its faunal elements. The problem would still remain, however, how long the endemic nest existed in the forest.

LAVROSKIY (1964) wrote about the subsiding of the level of the Caspian Sea, stating that the new coastal zone, arising after the receding of the water and representing a new borderland between the open water and the steppe, respectively the semidesert, had rapidly become populated by great numbers of small rodents, several of which constitute reservoirs of the pathogens of the plague. Consequently, the spreading of the plague is extensive in multi-specific populations of high individual numbers.

It is easily observable that a single hunting cabin for hunters or a camp for lumbermen in an extensive forest can effect wide-ranging changes in the fauna. Swallows, redstarts, domestic flies appear, the fat dormice, *Camponotus* ants move in, light attracts several moths, etc. There arise therefore not only small, new faunal complexes, but the camp, as it were, pulled in or introduced (GLADKOV's terminology, 1960) the swallow, the redstart, the flies, etc., into a community which, without the new object and the concomitant borderland, could not have penetrated. Similar effects are evoked in the plains or deserts by sheep-folds, barns, new roads, power and telegraph wires, and the manifold intrusions of man and his civilization. By this, we have finally arrived at one of the most important, and also the last, point of our present discussion, the cultivated land.

Defined as cultural areas are all those sites on which man exerts some kind of a direct influence. Such are e.g. fields, pastures, vineyards, gardens, plantations, parks, cemeteries, quarries, reservoirs and dams made by man, roads, railways and lines, as well as their environment, all kinds of buildings and artifacts, etc. Not unnaturally, there will come into being an extensive borderland between the cultivated land and the adjacent natural units (communities) touching on them. Indeed, a culture area in itself might also be considered as a borderland within which still newer borderlands among the constituent parts, the smaller formations (as listed above), will arise. From this derives the mosaic-like pattern, the ecological diversity of the culture area. All this is not without consequences on the fauna. By the constant advance of man's civilization, more and more cultural areas are created,

interspersed with and variegated by smaller and greater natural (or semi-natural) units. Thereby borderlands will also increase and multiply. Culture areas become the habitats (habitation, feeding, movements, or all together) of more and more animal species and populations, partly by the infiltration and occupation of the animals, partly by the penetration of the culture area into the natural habitat of the fauna. The more or less advantageous conditions of life in the culture area are offered by either the decreased or lacking homeostasis (resistance) or the manifold and diverse ecological niches, inhabiting and feeding possibilities, etc., evolved in these sites. In spite of the fact that many animal populations are eliminated (by the removal of some conditions essential for their life) by the cultural area, the number of species of these territories will still constantly increase, largely proportionately to the richness, the splitting and subdividing of the culture area. Some well-known examples will suffice to illustrate the point: the advance to and occurrence in towns (even in large cities, as, e.g. Warsaw) of the Raven, the frequent occurrence of the Turtle-dove, the Jay, and the Black-bird, the existence of the Squirrel, the Fox, the Roe-deer in such places, the penetration of the House-sparrow into the taiga (where it became disturbed), or the spreading of the Fall webworm and Ground-Squirrel along roads and railways. The examples of the last two animals species impinged also on a further feature of the culture areas, namely the communication and transgression, the vertical and horizontal movements of the animals, the intermingling of faunas through the culture areas. The advance and spreading of many animal species had presumably taken place also by way of the culture areas. This statement holds also for plants (cf. KEVE, 1963!).

Some few years ago I succeeded so to select my home that I live in a large and old culture area — borderland (Banská Štiavnica). I have studied it for many years. The borderland (culture area) is wedged in between deciduous and coniferous forest communities, for a length of about 20 km and a width of 5—8 km, and it also forms a transition between the plains, hills, and mountains. It embraces almost all formations of the culture area enumerated above, hence it is extremely rich in formations. Within this territory, the (often termo- and xerophilous) elements of the lower areas advance upwards, while — in a smaller rate — the montane, even boreo-alpine, elements descend; it is here that the elements of the coniferous communities intermingle with those of the deciduous ones, and vice versa. Thus there arrived here, to an elevation of nearly 800 m a. s. l., the Collared Turtle-dove, the Syrian woodpecker, the Wall lizard, the Green lizard, the Ground-Squirrel, the Field vole, the Praying mantis, etc., or descended to this level, and down to 300—400 m a. s. l., the Mountain lizard, the Nutcracker, etc. A great number of diverse faunal and ecological elements meet, intermingle, and communicate in this area, and a new faunal complex came into being. The consequences

of this and similar formations, with the exception of some ecological aspects, cannot yet be evaluated today.

In the above, rather random selection of examples, I endeavoured to show the existence of borderlands, these geographical and ecological tension zones, their actual and presumed effects on the populations of animals, as well as all implied problems influencing both theory and practice. I can only hope that I have contributed to awakening the interest of biogeographers and ecologists to the limitless research possibilities inherent in the study of ecotones.

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Author's address: Banská Štiavnica, Czechoslovakia





THE MAYFLIES OF HUNGARY,  
WITH THE DESCRIPTION OF A NEW SPECIES,  
BAËTIS PENTAPHLEBODES SP. N.  
(EPHEMEROPTERA)

By

S. ÚJHELYI

INSTITUTE OF MEDICAL PHYSICS, BUDAPEST

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Compared to that of the neighbouring states, relatively few data are available on the mayfly fauna of Hungary. Whereas more than 60 species are known from the territory of both Roumania and Czechoslovakia, literature demonstrated merely 38 mayfly species from Hungary. In fascicle 5 (Mayflies — Ephemeroptera), volume V, of our Fauna Hungariae, published in 1959, I have listed 46 species as shown from Hungary, based partly on literature, partly on my own collectings, but my own locality data had not yet been published in details. Since that time, there accumulated a number of supplementary data, and my observations concerning a new *Baëtis* species also became ripe for publication; I thus deem a summary of our recent knowledge of our Ephemeropteran fauna justified for publication.

In the list of species, I submit also references to literature by a serial number. If no such data are given, the species is new for our fauna. I omit the locality data of the more common species, giving only those which refer to sporadic occurrences. Earlier identifications cannot be controlled, since, unfortunately, the verificatory specimens had been annihilated in the Collection of the Hungarian Natural History Museum in 1956. All data listed below, refer, with two exceptions, to specimens preserved in my collection, regardless of the collector. The two exceptions are *Siphonurus aestivalis* EAT., and *Leptophlebia vespertina* L., which I have listed on the basis of data checked and recorded by me prior to the destruction of the Museum's collection. Concerning collector data, I mark my name with Ú., that of a light trap of the National Light Trap Network, by lt.

## List of species

## Family 1: PALINGENIIDAE

1. *Palingenia longicauda* OLIV. — 1, 2, 6, 10.

## Family 2: POLYMITARCIDAE

2. *Polymitarcis virgo* OLIV. — 1, 7; Kállósemjén, 19 July, 1960, leg. It; Paesa, 30 August, 1960; leg. It; Szederkény, 14 August, 1960, leg. It.; Tanakajd, 29 July, 1960, leg. It.

## Family 3: POTAMANTHIDAE

3. *Potamanthus luteus* L. — 1, 6, 8; Diósjenő, 2 July, 1944, leg. Ú.

## Family 4: EPHEMERIDAE

4. *Ephemera danica* MÜLL. — 1, 4, 5, 6. Everywhere frequent in June and July in the brooks of the Central Range.  
5. *Ephemera lineata* EAT. — 1, 3.  
6. *Ephemera vulgata* L. — 1, 2. The species occurs in many localities, in the slower moving brooks and rivers of the plains.

## Family 5: SIPHLONURIDAE

7. *Siphonurus aestivalis* EAT. — Budapest, 24 May, 1924, leg. GY. FEKETE; Hortobágy, 18 May, 1942, leg. Z. SZILÁDY; Kőszeg, 9 June, 1940, leg. VISNYA. The known specimens of this taxon were in the destroyed collection of the Natural History Museum, Budapest.  
8. *Siphonurus armatus* EAT. — 1, 2; Lenti, 11 May, 1960, leg. Á. KÁROLYI; Tard, 16 May, 1959, leg. Ú.  
9. *Siphonurus lacustris* EAT. — Garadna valley, Mts. Bükk, 31 May, 1941, leg. Ú.  
10. *Isonychia ignota* WALK. — 1.

## Family 6: BAËTIDAE

11. *Baëtis bioculatus* L. — 1, 2; Rómaifürdő, 6 Oct., 1943, leg. Ú; Veresegyház, 25 Oct., 1953, leg. Ú; Zebegény, 29 May, 1955, leg. Ú.  
12. *Baëtis pentapleobodes* sp. n. — Veresegyház, 22 April, 1956; 27 April, 1958; 11 April, 1965, leg. Ú.  
13. *Baëtis pumilus* BURM. — Aszófő, 29 Oct., 1957, leg. Ú; Mátrafüred, 29 May, 1954, leg. Ú.  
14. *Baëtis rhodani* PICT. — 2, 5, 6. Inhabiting most of the brooks of the Central Range.  
15. *Baëtis vernus* CURT. — Aszófő, 30 August, 1957, leg. Ú; Bernece, 29 July, 1958, leg. Ú; Veresegyház, 27 June, 1954, leg. Ú.  
16. *Cloëon dipterum* L. — 1, 2, 3, 6. Frequent in the whole country.  
17. *Cloëon inscriptum* BGTSS. — Szentmargitfalva, 20 August, 1958, leg. T. PÓCS.  
18. *Cloëon rufulum* MÜLL. — 1, 3; Bernece, 27 July, 1958, leg. Ú; Zebegény, 10 Oct., 1943, leg. Ú.  
19. *Cloëon simile* EAT. (= *praetextum* BGTSS.) — Csorna, 3 Sept., 1957, leg. H. STEINMANN; Iharosberény, 6 Sept., 1957, leg. H. STEINMANN; Veresegyház, 2 Oct., 1955, leg. Ú.  
20. *Procloëon bifidum* BGTSS. — Szakonyfalu, 18 August, 1957, leg. Ú.  
21. *Centroptilum luteolum* MÜLL. — 1; Tard, 30 April, 1959, leg. Ú; Zebegény, 10 Oct., 1943, leg. Ú.  
22. *Centroptilum pennulatum* EAT. — 6; Bernece, 29 July, 1958, leg. Ú; Királyháza, Mts. Börzsöny, 25 August, 1954, leg. Ú; Szentendre, 30 July, 1943; 18 Oct., 1953; 26 Sept., 1954, leg. Ú; Veresegyház, 12 Sept., 1954, leg. Ú.

## Family 7: OLIGONEURIIDAE

23. *Oligoneuriella rhenana* IMH. — 1; Nagytétény, 8 August, 1961, leg. It; Kállósemjén: 6 July, 1961, leg. It; Sopronhorpács, 7 July, 1960, leg. It; Tanakajd, 3 July, 14 August, 1961, leg. It.

## Family 8: AMETROPODIDAE

24. *Ametropus fragilis* ALBDA. — 1.  
 25. *Metreletus hungaricus* ÚJH. — 9; Erdőbénye, 6 June, 1962, leg. P. TALLÓS.

## Family 9: HEPTAGENIIDAE

26. *Epeorus assimilis* EAT. — It is highly interesting that this species, frequent in May—June, had not hitherto been captured by the earlier collectors. We have no data, though it is common in the Mts. Pilis, Börzsöny, Mátra, Bükk, Sátor, and it probably occurs also in other Hungarian mountains.

27. *Ecdyonurus forcipula* KOLLAR-PICT. — 3.  
 28. *Ecdyonurus helveticus* EAT. — 6. The author himself considers his own datum, from the Mts. Mátra, as uncertain.  
 29. *Ecdyonurus lateralis* CURT. (= *Heptagenia lateralis* CURT.). — Nor is this species recorded in literature, though it is frequent from the middle of April to the middle of May, in the Mts. Pilis and Börzsöny.  
 30. *Ecdyonurus subalpinus* KLP. — Aszófő, 29 August, 1957; 10 August, 1958, leg. Ú.  
 31. *Ecdyonurus venosus* F. — 3, 6. Common in our mountainous districts. The study of the biology, larval and subimaginal stages of the animals allegedly belonging to this species would probably reveal different taxa.  
 32. *Heptagenia coerulans* ROST. — 3.  
 33. *Heptagenia flava* ROST. — 1, 2; Baj, 13 August, 1960, leg. lt; Pacsa, 30 August, 1960, leg. lt; Romhány, 16 July, 1944, leg. Ú; Velence, 15 June, 1960, leg. lt.  
 34. *Heptagenia longicauda* STEPH. (= *flavipennis* DUF.). — 1, 4.  
 35. *Heptagenia sulphurea* MÜLL. — 1, 3, 7. Frequent along the Danube.  
 36. *Rhithrogena germanica* EAT. — 1. The datum is dubious.  
 37. *Rhithrogena semicolorata* CURT. — 3, 4, 6. Frequent in our mountainous districts.

## Family 10: LEPTOPHLEBIIDAE

38. *Leptophlebia marginata* L. — 3.  
 39. *Leptophlebia vespertina* L. — There were some specimens labelled "Cuha valley, Mts. Bakony" in the destroyed collection of the Natural History Museum.  
 40. *Paraleptophlebia cincta* RETZ. — 1; Kőkapu, Mts. Sátor, 10 June, 1958, leg. Ú.  
 41. *Paraleptophlebia submarginata* STEPH. — 1; Mátrafüred, 16 May, 1954, leg. Ú; Kemence brook, Mts. Sátor, 1 June, 1957, leg. Ú.  
 42. *Paraleptophlebia werneri* ULM. — 7; Tard, 1 May, 1959, leg. Ú; Tard, 16 May, 1959, leg. S. TÓTH.  
 43. *Habrophlebia fusca* CURT. — 5. Contrarily to the single known locality Pécs, it occurs probably in the entire Transdanubian area. Bakonybél, 15 July, 1958, leg. Ú; Cuha valley, 19 June, 1955, leg. Ú; Sopron, 10 July, 1954, leg. Ú; Szakonyfalu, 18 August, 1957, leg. Ú.  
 44. *Habrophlebia lauta* MC L. — 6; Bernece, 27 July, 1958, leg. Ú; Kemence brook, Mts. Sátor, 1 June 1957, leg. Ú; Kőkapu, Mts. Sátor, 10 June, 1958, leg. Ú; Szentendre, 16 June, 1944, 8 Oct., 1962, leg. Ú; Visegrád, 22 July, 1953, leg. Ú; Zebegény, 7 July, 1944, leg. Ú.  
 45. *Habroleptoides modesta* HAC. — Astonishingly, this species is not listed in literature, though it is frequent in early spring in our mountainous districts. My earliest datum is: 10 April, 1950, and the latest: 1 June, 1944 and 1955.

## Family 11: EPHEMERELLIDAE

46. *Ephemerella ignita* PODA — 1, 3; Bakonybél, 19 July, 1958, leg. Ú; Felsőtárkány, 9 July, 1961, leg. lt; Jósvalfő, 18—20 August, 1959, leg. Ú; Királyháza, Mts. Börzsöny, 25 August, 1954, leg. Ú; Sopronhorpács, 10 June, 1960, leg. lt; Szakonyfalu, 12 August, 1957, leg. Ú; Szentendre, 16 June, 1944, leg. Ú; Tanakajd, 17 June, 1960, leg. lt; Visegrád, 22 July, 1953, leg. Ú.  
 47. *Torleya major* KLP. — I collected only the larval stage of this species: Kőkapu, Mts. Sátor, 1, 11 May, 1958, leg. Ú.

## Family 12: PROSOPISTOMATIDAE

48. *Prosoptoma foliaceum* FOURC. — The larvae of this species were collected by DR. A. KESSELYÁK, in September, 1942, first in the mouth of the river Maros near Szeged, and later also in the Tisza. He gave a lecture on the occurrence of this animal in Hungary,

in the Zoological Section of the Hungarian Natural History Society, but his untimely death prevented the publication of his findings. I have 5 larvae of his material, collected in Szeged in 1943, in my collection.

Family 13: CAENIDAE

49. *Caenis horaria* L. — Barbacs, 9 August, 1953, leg. Ú; Hódmezővásárhely, 13 August, 1960, leg. lt; Kállósemjén, 11 July, 1960, leg. lt; Kenderes, 26 May, 1960, leg. lt; Kismegyer, 6 August, 1960, leg. lt; Kompolt, 15 August, 1960, leg. lt; Martonvásár, 4 June, 1960, leg. lt; Miskolc, 3 June, 1960, leg. lt; Tarhos, 6 August, 1960, leg. lt; Velence, 4 June, 1960, leg. lt.

50. *Caenis macrura* STEPH. — 1, 3; Bernece, 27 July, 1958, leg. Ú; Dömös, 8 Sept., 1957, leg. Ú; Királyháza, Mts. Börzsöny, 17 August, 1954, leg. Ú.

51. *Caenis robusta* EAT. — 1.

Of the 51 species listed above, and discounting the preliminary publication of some taxa mentioned above, 13 were not yet shown from our fauna. One of the thirteen, *Prosopistoma foliaceum*, had been discussed by KESSELYÁK in a lecture.

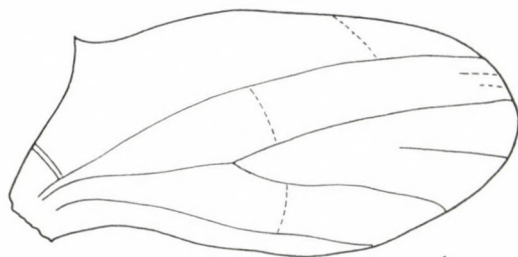
***Baëtis pentaplebodes* sp. n.**

(Figs. 1—3)

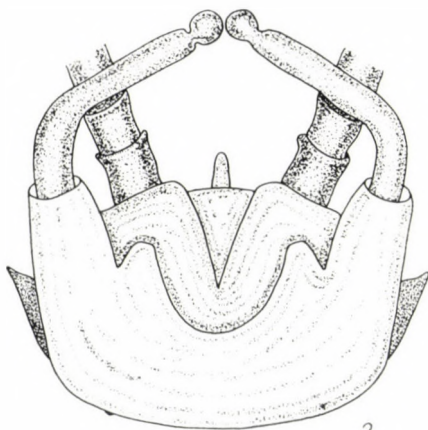
♂. — Head, dorsal side of meso- and metathorax chocolate brown. Compound eyes semispherical, black, ocelli oval, their diameter (parallel with corporeal axis) twice as long as transversal one. Ocelli dark brown in living animal, tending to orange red in those preserved in alcohol. Prothorax ventrally and meso- and metathorax laterally light brown. Legs, venation and dorsal side of median abdominal segments also light brown. All these light brown parts, however, becoming colourless in alcohol. Pinned animals retain their colour. On abdominal tergites, discoloured in alcohol, two comma-shaped spots followed by two dots medially; this pattern hardly discernible on pinned specimens. Fore wing of a shape and venation of *Baëtis* taxa. 9—10 cross veins between costa and subcosta in apex of wing. Shape of hind wing (Fig. 1) not differing from those of *Baëtis* species, resembling that of *B. rhodani*, but its venation characteristic and easily distinguishable from that of its known congeners. Three longitudinal veins present, with second vein branching. Usually a longitudinal vein also present in outer portion of wing, between longitudinal veins 2 and 3, terminating mostly blind proximally, or joining (in some specimens) longitudinal veins 2 or 3, or very rarely both. Wing with varying numbers of cross veins, best discernible in transmitted light: namely one between costa and longitudinal vein 1, one between longitudinal vein 1 and anterior branch of longitudinal vein 2, and one between posterior branch of longitudinal vein 2 and longitudinal vein 3. Occasionally another veinlet present between longitudinal veins 1 and 2. Fore leg rather short, not reaching apex of fore wing. Longest joint tibia, femur and tarsus about equally long. First tarsal joint longest, second shorter, third even

shorter, and fourth shortest. Last two abdominal segments of male dark brown above, colourless in alcohol. When seen from below, inner side of basal joint of gonopodium (Fig. 2) with a protuberance. Joint 2 curving inwards beyond a short, straight section, last joint almost spherical. First 3 joints of cerci brown, others gradually lightening to brownish-white.

Length of body: 7–9, length of fore wing: 7–8, length of cerci: 13–15 mm.



1



2

Figs. 1–2. *Baëtis pentaplebodes* sp. n. 1 = right hind wing, 2 = abdominal end of male from below

Holotype: male imago in alcohol, larva collected 11 April, 1965, Veresegyház, hatched from larva on 12 April, subimago molted 13 April. Paratypes: 2 male imagos in alcohol, bred from larvae collected as Holotype; 11 male and 1 female imagos, pinned, collected 22 April, 1956, Veresegyház; 5 male imagos, pinned, collected 27 April, 1958, Veresegyház. Types in my collection.

♀. — Highly resembling male, but colour slightly lighter brown, less discolouring in alcohol, also legs remaining brown. Longest joint of leg:

femur, tibia shorter, tarsus shortest. Shortest tarsal joint 3, joint 2 longer, joint 1 still longer, joint 4 longest.

Length of body: 8—9, length of fore wing 8—9, length of cercus: 15 mm.

Allotype: female preserved in alcohol, collected as larva on 11 April, 1965, Veresegyház, hatched from larva on 16 April, molted from subimago on 17 April.

**Subimago:** colour light brown, resembling that of female imago, wing unicolourous, intransparent greyish-brown. Length of body: 10, length of fore wing: 8, length of cerci: 11 mm. Two subimagos hatched from larvae collected together with type material.

**Larva:** Mature larva light brown, shape corresponding to that of other *Baëtis* larvae. Light brown colour tending to a darker shade on day preceding molting. On male larvae, ocelli appearing in dark brown colour, turning to reddish-brown in alcohol. Alar sheath of males becoming nearly black prior to molting. Prothorax, mesothorax, and on bases of alar sheaths an irregular darker pattern. Posterior margin of abdominal segments with a thin, dark line, disappearing during darkening before hatching. Medially of segments a slightly lighter stripe, interrupted by dark posterior margins of segments. Segments also with a light V-shaped pattern, open posteriorad, backed caudally also by two light dots; pattern discernible especially on first five tergites. Abdomen ventrally coloured as dorsally, segmental margins with a dark line each, decurrent parallel with longitudinal axis of body. Antennae and cerci coloured as body, terminal filum slightly lighter. Colour of legs also agreeing with that of body. Oral organs of larva shown on figure 3. Seven oval tracheal gills on first seven abdominal segments, not differing from usual gill-construction of *Baëtis* larvae.

Length of body: 9—12, length of cercus: 7, length of terminal filum: 5 mm.

**Occurrence and life habits.** I found the species only in Veresegyház, Hungary. Two brooks flow in wet meadows toward the lake of Veresegyház, confluent about 1 km before reaching the lake. Along this section, the brook is rather rapid and about 1 m deep in its middle in spring. I found the larvae in this reach of the brook, and invariably in the deep water, on *Typha* and *Phragmites* leaves floating in the direction of the current. These leaves are dead remnants of the vegetation of the preceding year, and are mostly covered with algae. It was only very rarely that I found specimens on the leaves of green plants, and then *Myosotis*, nearer to the banks of the brook. I found the imagos above the meadows surrounding this section, in the second half of April. They were swarming also in the forenoon on cloudy days. No imagos were found in May.

**Rearing of larvae.** I collected about 50 larvae on 11 April, 1965, in the above mentioned site, transporting them to Budapest in a vessel containing one liter of water taken

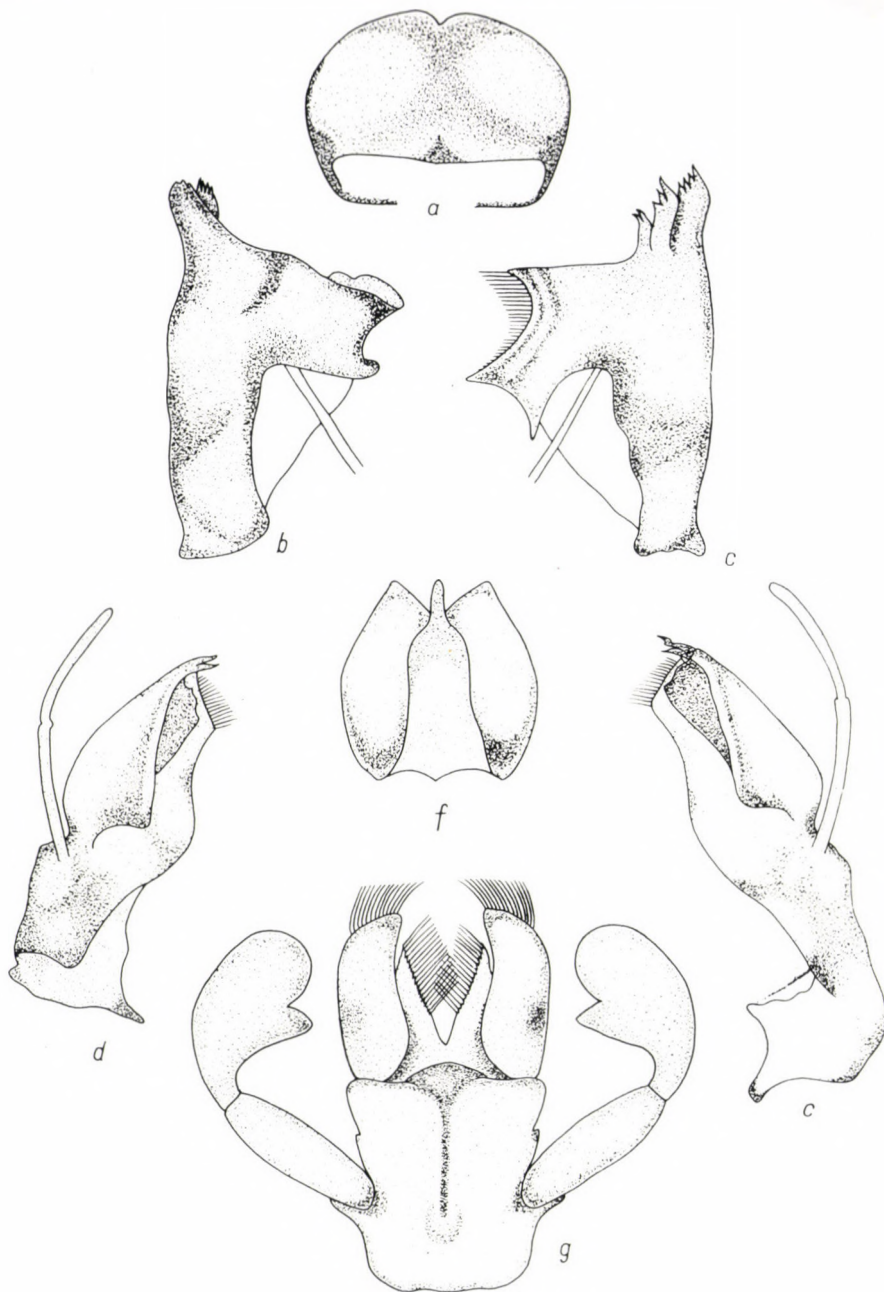


Fig. 3. *Baëtis pentaplebedes* sp. n., larval oral organs: a = labrum, b = mandibula sinistra, c = mandibula dextra, d = maxilla sinistra, e = maxilla dextra, f = hypopharynx, g = labium

from the brook, and also some decaying *Typha* and *Phragmites*, as well as green leaves, serving for the habitat of the larvae. The larvae tolerated the journey (3—4 hours) rather well. In the laboratory, I made three subgroups. One of them were placed in a 1 liter vessel with current tap-water, together with a portion of the reed and bulrush leaves. The temperature of the water was invariably 14.8 C°. These larvae died in 24 hours, probably due to the chlorine content of the water. A smaller part of the larva, about 10 specimens, were left in the original brook-water, among *Cabomba* and other green, aquatic plants. Also these larvae perished in 24 hours. I left the third subgroup, about 20 specimens, also in the original brook-water, but with a perfusion of a rather strong current of air rich in oxygen, through a capillary tube. The temperature of the water was constantly 20.4 C°. Of these larvae, there hatched 1 male subimago on 12 April, 4 males on 13 April, and 1 female on 16 April; the other larvae perished. The subimagos molted into imagos always within 24 hours. I preserved 2 subimagos in alcohol, and put the molted imagos also in alcohol.

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Author's address: Budapest, VIII., Puskin u. 9, Hungary



THE PHYLOGENY  
OF THE SUBFAMILY HETEROSTEGININAE  
(FORAMINIFERA: NUMMULITIDAE)

By

LIDIA VITÁLIS-ZILAHY

HUNGARIAN GEOLOGICAL INSTITUTE, BUDAPEST (DIRECTOR: DR. J. FÜLÖP)

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In the course of evaluating materials in 1961-1962, I studied the genera *Operculinella* and *Heterostegina* of the subfamily Heterostegininae. In my paper, I have deviated in the systematics of the subfamily from NEMKOV'S (1959) system in so far as I reallocated the genus *Operculinella* into the subfamily Heterostegininae. The considerable changes observed in the *Operculina* species made possible their tracing during their phylogeny. The differentiation of the species *Operculinella vughani* (CUSHMAN), found in the flis zone of the Carpathian Basin and the Carpathians, permitted to follow the unfolding of the mutation (ZILAHY, 1963) and the phylogeny of the subfamily.

The earliest *Heterostegina* fossils originate from the Upper Eocene; these strata yielded also the *Spiroclypeus* species and several transitional forms between *Heterostegina* and *Spiroclypeus*, introduced under the name *Grzybowskia* by BIEDA. Following these data, I have observed, from the line of the Lutetian and Priabona stages within the strata of the Esztergom Basin in Hungary, a deformation in the differentiation of the species *Operculinella vughani*. Curiously enough, those very characteristics changed in this deformation which served to segregate the several genera.

Studying the cause of the ionized mutation expounded in my first paper, a number of problems arose concerning the phylogeny of the subfamily Heterostegininae, as

1. Could the genera *Heterostegina*, *Grzybowskia*, and *Spiroclypeus* be regarded as distinct taxa in the Eocene?

2. Could they be made distinct at all, having originated from *Operculinella*s living in the Priabona, resp., Barton, stages of the same geological period?

3. If, at the bottom of the Priabona stage of the Upper Eocene, an ionized mutation yielded forms which show transitions and a great similarity toward *Heterostegina*, how should these forms be defined: as pathological deviations or phylogenetical members - the first unfolding of the Heterosteginas?

4. Finally, could a phylogenetical evolution start from an ionized mutation?

I rather believe that this last question will show us the way in the tracing of the evolutionary line of the subfamily *Heterostegininae*.

### The geographical range of the Eocene *Heterosteginas*

One can distinguish two *Heterostegina* forms with a secondary septum in the Upper Eocene. One of them displays distinct and strongly evolute septa between the chambers; the other shows involute, angular, secondary septa with an irregular reticulation. The evolute form proved to be older. In Hungary, it started in continuous sedimentation in the lower section of the Priabona stage; a similarly evolute form was described from the Upper Eocene Ocala limestone (Florida) by CUSHMAN as *Heterostegina ocalana* in 1929. From the Jackson stage GRAVELL and HANNA described the form *Heterostegina israelskyi* in 1937.

The first involute *Heterostegina* fossils, which are probably transitional forms between *Heterostegina* and *Spiroclypeus*, originate from Central Europe (Austria, Poland, Switzerland). OSIMO described the species *Heterostegina glabra* from Celebes in 1908. From Cuba, CIZANCOURT introduced *Heterostegina cubana* in 1948, and KEIJZER *Heterostegina nuda* in 1945.

The first worker to recognize these forms was SILVESTRI (1937), who proposed the name *Heterosteginella* for the involute forms belonging to the genus *Heterostegina*. In want of the description of the genus and the designation of the type-species, his name became invalid under the Rules of Zoological Nomenclature, and BIEDA (1950), entirely in agreement with SILVESTRI's view, described them under the name *Grzybowskiia* and designated also the type-species.

It is worthy of mention that the majority of the *Spiroclypeus* materials also originates from Europe, namely Austria, France, and Italy; and some were found in Borneo.

The geographical range of the evolute and involute "*Heterostegina*" forms raises a number of problems. The first is whether the Floridan *Heterostegina ocalana* CUSHMAN reached the Upper Eocene of Florida with a level displacement by maritime currents from Europe or originated by autogenesis under similar influences. It appeared accompanied by *Operculinella vauhani* on both continents. The same holds for the involute forms too.

The differentiation of the species *Operculinella vauhani* (CUSHMAN) might be explained by phylogeny, autogenesis, and pathological deformation.

The fact that merely a small per cent falls for the new forms in the calculus of probability speaks for the pathological causation, since by such small values the separation is not justified. It must be taken into consideration, however, that the range of our Upper Eocene layers is not complete, since it was destroyed by the infra-Oligocene denudation. Thus it is impossible to follow the evolution of the new form.

On the other hand, the fact that all transitional forms of two distinct genera within the same formation can be found speaks against the pathological explanation. Forms agreeing with ours are known from various parts of the world.

Eocene	Priabona lower	Priabona upper	Barton	Upper Eocene
Geographic occurrence	Hungary	Poland	Florida Texas	Cuba
Facies	Bryozoic marl	Barton flis; Numm. limestone	Lepidocyclinuous limestone	
Rocky material of denudation by sea; exam. of other chrom. elements concentrated in imbedding rocks	Marl, decayed biotitous tuffite, glauconitic clay	?	?	Calcareous, pebbly conglomerate, rough sandstone and imbeddings
Observed occurrence	Differentiation of <i>O. vaughani</i> (CUSHMAN)	Appearance of instabil genus <i>Grzybowskia</i>	Evolute <i>Heterostegina</i> forms; large <i>Operculinella</i>	"Involute <i>Heterostegina</i> " = = <i>Grzybowskia</i>
Cause	Volcanic activity	?	?	?

In the case of autogenesis, one has to imply that the species *Operculinella vaughani* (CUSHMAN) differentiated and brought forth similar forms in several places of the Upper Eocene sea. The cause of this phenomenon ought to be investigated, the more so as the species had originated in our Upper Eocene layers presumably by the effect of ionization, as in all other areas of the world. If, on the areas outlined above, there comes into being, by similar chemical actions and at concurrent times, an alteration of identical character (secondary septum), we have to do with autogenesis and not phylogeny. TAN SIN HOK's polyphyletic theory might be coupled also with this problem, since this author derives the genera *Heterostegina* and *Spiroclypeus* from the new *Operculina* branch in the Oligocene.

BANNINK (1948) raises the problem whether the organisms of the earth could be influenced by radioactive radiation. His second question asks whether TAN SIN HOK's theory is autogenesis or the localized effect of radioactivity on the Operculinas. According to BANNINK, the thorough and diverging examinations of materials might produce results which would advance the phylogeny of the *Operculina* species. Up to now, BANNINK regards TAN SIN HOK's iterative theory as the most acceptable.

There are certain facts which contradict the theory of autogenesis, e. g., some decided *Heterostegina* forms — among the fossils occurring in the American continent — which had to be derived from somewhere. Authors have identified evolute and involute *Heterostegina* species among the tests found there. The secondary septa of the *Heterosteginas* figured in the several communications deviate from those of the earlier Upper Eocene stages in Europe, no traces of irregularities and deformations can be found. And also those findings speak for phylogeny which show that, starting from *Operculinella*, three phylogenetical features display constant progressive development, namely

a) the series starts with an evolute character tending to become involute; its consequence is

b) the curvature in a stronger arch of the septa; and

c) the secondary septa appear simpler and in a more regular arrangement (*Heterostegina*, *Spiroclypeus*, *Cycloclypeus*). The irregularly angular arrangement and the erratic course of the septa in *Grzybowskiia* do not fit into the series. Its instable character also indicates the evolutionary phase of the genus. Its origin is not clarified; from what form does BIEDA derive it? This author only contends that it stands between *Heterostegina* and *Spiroclypeus*. It is also most interesting that BIEDA lists, from the accompanying fauna, the frequency of *Operculinella vaughani* (CUSHMAN), but fails to mention any deformed forms. He publishes *Grzybowskiia* from the nummulitiferous limestone, and emphasizes the importance of the *Spiroclypeus* species. This composition differs from the fauna of our bryozonic marl.

TAN SIN HOK indicates in the Eocene a *Heterostegina* branch, and from that a *Spiroclypeus* line. According to my own investigations, the gene centre of the Eocene "*Heterostegina*" forms was probably the Carpathian Basin, where the cause of its evolution can be connected with volcanic action and the changes in the pH value due to the formation of glauconite.

### The evolution of the secondary septa

At the extreme values of the deviation shown in the mutation there were found forms (Plate 6, Fig. 12) which justify their separation. The deviations from the original form (Plate 1, Figs 7, 8; to Plate 6, Fig. 12), that is, the stages of deformation, can be easily recognized. The winding of the spiral in the forms evolved during phylogeny is never deformed, but invariably normal, evolute or involute. The deformed spiral was always an intermediate stage and not a final development, since it resumes its original shape by the evolvement of the secondary septa. The deformed spiral was the result of a decrease in the calcareous secretion. Due to the deformation of the spiral, the test also weakened, so that the animal had to reinforce its shell for the sake of survival. A bulge was

produced on the septa of the chambers (Plate 6, Fig. 2). Later, the next septa were elevated higher, as if buttressed, from these slightly stronger bulges, during the subsequent stage of evolution (Plate 6, Fig. 4). By the gradually denser buttressing of the septa, the irregular curvature of the chambers became also arranged, incurring also the stabilization of the spiral (Plate 6, Fig. 5). By the construction of regular and relatively well-ordered secondary chambers, the test again received its original shape (Plate 6, Figs. 10–12). In my material these secondary chambers appear only as the inner supporting of the test; they cannot be detected on the outer surface as on the *Heterostegina* specimens of younger strata or on *Heterostegina ocalana* CUSHMAN, 1921, from the Upper Eocene of Florida.

In my opinion, the animal was able to form secondary chambers, concurrently with the decrease in calcareous secretion, only by transposing it onto the septa instead of burdening the spiral with any more secretory activity already showing a decreasing trend, and thus executed a secretory regrouping of the materials for the maintenance of its metabolic equilibrium. This feature can be traced through all subsequent phases. The role of the spiral on the external surface of the test was driven into the background, surviving only as an inner support of the shell.

In the species of the genus *Operculina*, belonging to the subfamily Nummulitinae, the spiral had an important role in the construction of the test, perceptible on both of its external sides. This very fact shows the reason for the changes in the spiral. Owing to the regression of the spiral, its stability weakened, and due to the lessened calcareous secretion, it became temporarily deformed. This feature indicated, in the study of the phylogeny of these animals, a regressive evolution; and this too explains the importance of the secondary septa. The reduction of the spiral advances from outside toward the centre of the test, while the secondary septum assumes the buttressing role from within and tends toward the outer surface of the shell.

I agree entirely with TAN SIN HOK's views in that *Heterostegina* has a polyphyletic origin and evolved iteratively, with the exception that I consider the deduction of the "Heterosteginid" forms appearing in different periods and the introduction of other names for these forms as wholly justified.

In the form *Operculina complanata* DEFRANCE var. *carpenteri*, described by SILVESTRI in 1905, some traces of the deformation outlined above can also be seen. The septa, and thus also the spiral, are slightly deformed. The less numerous chambers of SILVESTRI's specimen deviate from the deformed individuals of *Operculinella vaughani* (CUSHMAN) studied by me. The abnormal appearance as to form is not a distinct specific character, indeed, it does not justify even a subspecific separation. COLE (1945) emphasizes in the description of *Operculina mbalavuensis* that the rudimental secondary septa are discernible only in thin slides also in this species. COLE detects some similarity with the species *Oper-*

*culina complanata* (DEFRANCE) var. *heterostegina* SILVESTRI, 1907, and *Operculina heterosteginoides* HOFKER, 1933, due to the very rudimentality of the secondary septa. The deductions of this author are very important for us. In the course of my studies, I endeavoured to evaluate all these species with vestigial secondary septa, and the results support TAN SIN HOK's iterative phylogenetical theory. COLE's species might also derive from an *Operculina* with few chambers, similarly to the above *Operculina complanata* (DEFRANCE) var. *carpenteri*.

The secondary septa described in the diagnoses could only be called rudiments if their rudimentality were accepted as proven contrarily to its appearance as an evolutionary process. The listing of the above species is important also for the possibility that they serve for the differentiation of the Oligocene *Operculina* and an earlier and later form of the Oligocene — Miocene *Heterostegina* line.

For the earliest Eocene evolute forms, displaying secondary septa under evolvment, I hold the name *Anastegina* as the most acceptable one. These forms are systematically relegable between the Operculinellas and the typical Heterosteginas. They play an important role in the Eocene sediments, and their separation were fully justified together with *Grzybowskia*, a transitional form between *Heterostegina* and *Spiroclypeus*. It were also reasonable to relegate here those species from earlier ages which show a great similarity with the transitional forms studied by me. *Operculina complanata* (DEFRANCE) var. *heterostegina* SILVESTRI, 1907, displays a close affinity to my *Operculinella anasteginoides* sp. n., in the examined material, due to its densely spaced, ornamental secondary septa. The new species (Plate 6, Fig. 2) is a fine example of also the development of the secondary septa, showing, at the same time, the interconnection of the irregularly situated and local septa, resembling that of SILVESTRI's figure. It can be connected also with *Operculina heterosteginoides* HOFKER, 1933, where the last whorl has a strikingly evolute character and the lack of the secondary septa on the older chambers is strongly conspicuous (Plate 6, Figs. 10, 12). It must be noted, however, that the initial secondary septa of HOFKER's species are irregular (and they might be considered as ornaments, the same as with COLE's species *Operculina mbalavuensis*).

### The phylogenetical features of the test-construction of the subfamily Heterostegininae

In the study of the material, I have been looking for characteristics which appear in all genera of the subfamily Heterostegininae, displaying, at the same time, differences during the course of the geological epochs. They derive partly from the further evolvment of already existing features partly from the complications and reductions of the single characteristics.

The genus *Operculinella* of the subfamily Heterostegininae was probably derived from an *Operculina* species in which the arching of the septum was very strong, e.g., *Operculina angularis* CORNUEL, 1848, from the French Neokom, *Operculina baconica* nom. nud. SIDÓ, 1962, from the Hungarian Senonian, *Operculina thracensis* d'Archiac, 1866, from the Lower Tertiary of Greece, or *Operculina bericiensis* OPPENHEIM, 1896, from the Italian Middle Eocene. Of the *Operculina* species listed above and exhibiting similar characteristics, there was found only *Operculina baconica* in my material, hence I considered it the most suitable for the study of the characteristics. The changes of the features found during my studies might be classified on the basis of the following views:

A. Chronological phylogenetical features

1. Changes in the arc of curvature of the septa;
2. Involute spiral;
3. Changes in the spiral in the inner construction of the test;
4. Changes in the spiral in the outer surface of the test.

B. Taxonomical features

5. Evolute spiral;
6. Increase of the number of septa;
7. Increase of initial chambers;
8. Evolvement of secondary septa;
9. Appearance of greater number and denser spacing of septa.

1. In a chronological order, the oldest feature is the changing of the arc of curvature of the septa, showing a regressive tendency already in the species *Operculina baconica*. In the genera *Operculinella*, *Anastegina*, and *Heterostegina*, it is present only in a latent condition during the early stage of individual development, and it shows a gradually progressive evolvement in the genera *Grzybowskiia*, *Spiroclypeus*, and *Cycloclypeus* (Fig. 1).

2. The involute spiral starts with a regressive character in the species *Operculina baconica*, appearing, in agreement with the preceding feature, in the juvenile stage of the individual development in the genera *Operculinella*, *Anastegina*, and *Heterostegina*. It shows a progressive evolvement in the genera *Grzybowskiia*, *Spiroclypeus*, and *Cycloclypeus* (Fig. 1).

3. Starting with the species *Operculina baconica*, the changes of the spiral can be traced through the entire evolutionary series. Its evolvement is slow and of an evenly regressive character. From *Operculina baconica* to the genus *Spiroclypeus*, it can be recognized in the internal structure in all stages of the individual development. In the last genus of the phylogenetical series, it can be demonstrated only in the juvenile stage of the individual development.

4. The change of the spiral on the outer surface of the test starts with a regressive character on *Operculina baconica*, showing a gradually slower process on the genera *Operculinella*, *Anastegina*, and *Heterostegina*, and terminating in the genus *Grzybowskiia* (Fig. 1).

From the point of view of chronology and phylogeny the first two features do not prove either the origin or the age of the characteristics of the

subfamily, but the combined evaluation of all features yields the necessary explanation. The regressive features revealing the changes of the spiral refer to an origin from the species *Operculina baconica*. This characteristic displays a very slow, constant, unilinear, gradual regression.

5. The sine curve of the evolute spiral can also be assessed only together with the other features. Its value lies in the regressive features coinciding with its downward, and the younger progressive features with its upward, phase. The progressive development of these characteristics starts in the genus *Operculina* in the Lower Eocene, reaching its acme of evolvement in the genus *Anastegina* in the lower part of the Upper Eocene. The appearance of the secondary septa coincides with the consummation of the above short, progressive development. Concerning the taxonomical features, the evolvement of the initial chambers and the increase in numbers of the secondary septa concur with the regressive phase.

This feature covers all genera whose systematical relegation caused the most trouble. The first mistake in the generic allocation consisted of the authors having classified these genera by considering only one or two features, insufficient for their complete segregation. The fault, however, was the disregard of the progressive-regressive contemplation indispensable in the investigation of a phylogenetic series.

If the phylogeny of the evolute spiral is studied (Fig. 1), it becomes obvious that it appears in the downward phase of the phylogenetic features, and turns back with a slightly weaker line, its decline concurring with the progressive evolvement of the two older phylogenetic and taxonomical features. With the complete unfolding of the evolute spiral, the next young characteristic, the secondary septum evolves. If one traces the above phylogenetic features, one will find that there was ample time for their evolution from the Santonian stage of the Upper Cretaceous to the Miocene. On the other hand, the beginning, unfolding, and decline of the feature under consideration, namely the evolute spiral, took place within the scope of a single geological epoch. The explosive unfolding of this feature was caused by the  $p_H$  change occurring during the volcanic activity and the formation of glauconite. Due to the tufa dispersion, the K content of the sea-water increased. The combination of the above factors had such a physiological effect on the species *Operculinella vaughani* (CUSHMAN) that it reacted strongly and differentiated.

The physiological effect acting on the spiral tending towards regression evoked the explosive unfolding of the evolute feature. This feature reacted to the physiological effect by a rapid course of evolution, giving a complete sine curve.

From the *Operculina* species of the Cretaceous mentioned above, the *Operculinella* branch can be put to the Lower—Middle Eocene. The *Operculinella*s differentiated in the lower part of the Upper Eocene, attaining gi-



Fig. 1. The phylogenetical characteristics of the subfamily Heterosteginae

Varying features		Period Phylog. series	Upper Cret. Santonian	Lower Eocene Alluvium	Upper Eoc. Lower Priabona	Upper Eoc. Upper sect.	Upper Eoc. Upper sect.	Upper Eoc. Miocene	Oligocene Alluvium	Grouping of characters	
			<i>Operculina baconcia</i> nom. nud. SIDÓ 1962	<i>Oper- culinella</i>	<i>Anastegina</i>	<i>Hetero- stegina</i>	<i>Grzyboeskia</i>	<i>Spiroclypeus</i>	<i>Cyclo- clypeus</i>		
Progressive features	Increased appearance and denser arrangement of secondary septa									Taxonomical features	
	Evolution of secondary septa										bradytelic, slowly evolving feature
	Increase of initial chambers										
	Increase in numbers of septa										
Progressive-regressive	Evolute spiral									tachytelic, rapidly evolving feature	
Regressive features	Changes of spiral on outer surface of test									Chronological features	
	Changes of spiral in inner construction of test										
	Involute spiral within test										
Progressive feature	Changes in curvature of septa									bradytelic, slowly evolving feature	

Signs: ..... in young phase of ontogeny  
 - - - - - absent or weakly traceable  
 ..... only in inner structure in late phase of ontogeny, on last whorl of adult specimens

gantic sizes and then becoming extinct at the end of the Eocene. One or two species reached the Oligocene. The measurements of the "*Operculina*" species found on the American continent engaged the attention of several authors. BANNINK (1948) connected this phenomenon with the higher radioactivity of the American continent.

During this short time — within a single epoch — their flourishing, decline, and perishing is rather elucidating. As is to be seen from the above factors, their stratigraphical importance is great, they are suitable for the identification of strata having a very wide horizontal range within a short period of time (in spite of the fact that they were bottom inhabitants) and thus can be used also for distance correlation.

6. Increase in the numbers of septa. Of the four progressive features, the increase of the numbers of septa proved to be the oldest one. This appeared first in the last Eocene *Operculinella* species, and proceeded by a slow, even evolvement through all genera of the subfamily.

7. Increase of the initial chambers. Of the taxonomical features, the first one is the increase of the initial chambers. It is also an old characteristic, showing a slow development in the first phase of the phylogeny, up to the genus *Spiroclypeus*. In this last genus, it accelerates and displays throughout a progressive evolvement.

8. Evolvement of secondary septa. This young taxonomical feature appears at the highest value of the evolute spiral, being situated only in the inner portion of the shell in the genus *Anastegina*, and showing a continuous progressive evolvement in the genera *Heterostegina*, *Grzybowskia*, *Spiroclypeus*, and *Cycloclypeus*.

9. The appearance in greater numbers and denser arrangement of the secondary septa is the youngest feature. It shows an even, progressive development. Its appearance concurs with the ascending progressive phase of the old phylogenetic characteristics, and, of the taxonomical features, with the increased growth of the initial chambers (Fig. 1).

I have applied the slow bradytelic and the rapid tachytelic phylogenetic features on the basis of SIMPSON's work (1947). I have studied the inner structure only because this was the sole method by which I could follow the progressive-regressive evolvement of the several features through the whole series. I deemed important the grouping of the features, and thus separated them into chronological and taxonomical characteristics. Within these, I considered the segregation of the slow and rapid developmental features as justified.

## Descriptive part

Phylum:	Protozoa
Classis:	Rhizopoda
Ordo:	Foraminifera
Familia:	Nummulitidae
Subfamilia:	Heterostegininae
Genus:	Operculinella

*Operculinella* YABE, 1918

- 1908 *Verbeekia* SILVESTRI, A.: Sulla "Orbitolites complanata" Martelli. — Acad. Pont. Romana nuovici Lincei, Atti, Roma, Italia, **61**, p. 137. — Type-species: *Amphistegina cumingii* CARPENTER, 1859.
- 1918 *Operculinella* YABE, H.: Notes on Operculina-rocks from Japan, with remarks on "Nummulites" cumingii Carpenter. — Tohoku Imp. Univ., Sci. Repts., Sendai Japan, ser. 2 (Geol.) **4**, No. 3, p. 126. — Type-species: *Amphistegina cumingii* CARPENTER, 1859.
- 1937 *Pseudonummulites* SILVESTRI, A.: Foraminiferi dell' Oligocene a del Miocene della Somalia. In: Paleontologia della Somalia: V — Fossili dell' Oligocene e del Miocene. Paleontogr. Italica, Siena, Italia, **32**, suppl. 2, p. 149. — Type-species: *Amphistegina cumingii* CARPENTER, 1859.

To the characterization of the genus *Operculinella* YABE, 1918, I should like to add the following supplementary description, since HANZAWA (1939) revidid only the type-species, but not the genus.

The umbonal area of the test of the species relegated to the genus *Operculinella* is biconvex, excentrical, planispiral, with 3—5 whorls. The last whorl extends suddenly, hence the shape of the test frequently becomes oval. There is a depression between the umbo and the margins. The whorls cannot be discerned on the outer surface. The surface of the test is frequently undulating on the last whorl.

It differs from the genus *Operculina* by the following characteristics: 1. The bilateral convexity of the umbonal area, 2. The excentrically situated umbo, 3. The denser arrangement of the septa and their steeply arching curvature, 4. The rounded initial chamber followed by a reniform second chamber, 5. The subsequent septa pressing into the septa of the preceding whorl, 6. The spiral indiscernible on the surface.

In the microspherical forms, the number of whorls and chambers are greater, the initial chamber and the second chamber very small, and the subsequent chambers arranged very densely. The size of the initial chamber can be measured mainly in the macrospherical form.

**Literature referring to the genus.** The genus was first established under the name *Verbeekia* by SILVESTRI in 1908, designating *Amphistegina cumingii* CARPENTER, 1859, as the type-species. The name *Verbeekia*, however, was preoccupied, applied for a *Spatangus* by FRITSCH in 1877.

In 1918, YABE introduced the genus again under the name *Operculinella*, and thus SILVESTRI's action in changing it to *Pseudonummulites* was invalid. According to the rules of priority, YABE's name is valid.

The majority of the *Operculinella* forms have been relegated by most authors to the genera *Nummulites*, *Operculina*, and *Operculinoides*, since the description of our genus failed to give a clear picture of the distinguishing features. The description of the designated type-species, *Amphistegina cumingii*, was usually disregarded by the authors. Consequently, the recently established genus *Operculinella* became the mixture of a number of heterogeneous species.

It was HANZAWA (1939) who revided the species "*Amphistegina cumingii* (CARPENTER)" (Plate 15, Figs. 6a, b—8a, b; Plate 16, Figs. 1, 2, 10). Since CARPENTER, nobody studied the inner structure of the species. In 1859, CARPENTER described two different species under the name "*Amphistegina cumingii*". One of them is a small, lentiform, the other a large, excentrically umbonal, form. HANZAWA found in 1937, in the British Museum (Nat. Hist.) in London, a number of *Operculinella cumingii* specimens, identical with CARPENTER's Figures 16 and 17 on Plate 5, though the original specimens were not discovered. If the axial section of HANZAWA's Fig. 2 on Plate 16 is compared with CARPENTER's Fig. 5 of Plate 6, they will be found to be utterly alike. HANZAWA proposed that, of CARPENTER's figures, only the axial section of Fig. 5, Plate 6, and Figures 16, 17 Plate 5, be regarded as the type-species of the genus *Operculinella*. In the description of the species *Operculinella cumingii* (CARPENTER) he mentions yet that the test is typically oval, its length and breadth attaining 7 mm. It has an excentric umbonal area, 3 mm broad and 2 mm thick, its surface smooth. The septal sutures are in a plane and cannot be discerned on the umbonal area. The inner structure consists of involute whorls, the first two are strongly infurled, the two subsequent ones rather loosely. The last or fifth whorl expands suddenly, forming a rim. The septa are straight or slightly curved in the first four whorls, but widely arching in the last one, similarly to the septa of *Heterostegina*. The species is involute in its early stage, becoming later evolute, and its septa have a stronger curve than in *Operculina*.

*Operculinella vughani* (CUSHMAN, 1921) (Plate 5, Figs. 1—8)

- 1921 *Operculina vughani* n. sp. — CUSHMAN: U. S. Geol. Surv. Prof. Pap. no. 128-E, p. 128, pl. 19, figs. 6, 7.  
 1935 *Operculina vughani* CUSHMAN — CUSHMAN: U. S. Geol. Surv. Prof. Pap. no. 181, p. 32.  
 1935 *Operculina vughani* CUSHMAN — GRAVELL, D. W. et HANNA, M. A.: Journ. Pal., 9, p. 332—333, pl. 29, figs. 6, 9, 12, 16—21. Menasha, Wis.  
 1936 *Operculina* sp. cf. *Operculina vughani* CUSHMAN — VAUGHAN, T. W.: Journ. Pal., 10, no. 4, pp. 250, pl. 39, figs. 6-7, Menasha, Wis.  
 1938 *Operculina vughani* CUSHMAN — GRAVELL, D. W. et HANNA, M. A.: Amer. Assoc. Petr. Geol. Bull., 22, p. 1002, pl. 4, figs. 2, 8. Tulsa, Okla.  
 1944 *Operculinoides nassauensis* n. sp. — COLE, W. S.: Florida Geol. Surv. Geol. Bull. No. 26, p. 47, pl. 5, figs. 2, 3, 16. Tallahassee, Florida.  
 1944 *Operculinoides floridensis* (HEILPRIN) — COLE, W. S.: Florida Geol. Surv. Geol. Bull. No. 26, p. 43, pl. 5, figs. 15, 18, 19. Tallahassee, Florida.

- 1950 *Operculina canalifera* D'ARCHIAC n. subsp. *gomezi* — COLOM, G. et BAUZA, J.: R. Soc. Española Hist. Nat. Bol., 47, (1949), no. 3—4, p. 219—220. pl. 17, figs. 1—3, tfs. 1, 1a, 2, Madrid.
- 1957 *Operculinoides nassauensis* COLE — BIEDA, F.: Rocznik Pol. Tow. Geol. 25, z. 3, 1955, p. 209, Tabl. XIII. figs. 1—5.
- 1957 *Operculinoides vaughani* CUSHMAN — BIEDA, F.: Rocznik Pol. Tow. Geol. 25, z. 3, 1955, p. 210, Tabl. XIII. figs. 6, 7.

In our material, the spiral cannot be seen on the outer surface of the test, the surface is smooth. The umbo is excentrically situated, bi-convex. The umbonal elevation is surrounded by a fossa-like depression. The surface of the test is undulating, thinning out toward the margins. The densely arranged septa are directed toward the central elevation. The species corresponds entirely with CUSHMAN's description and figures (Plate 1, Figs. 2, 3). The spiral is well discernible in the inner structure.

	Macrospheric form	Microspheric form
Length	34 mm	56 mm
Breadth	21 mm	39 mm
Rate of evolution	15 mm	38 mm
Number of whorls	3	5
Number of chambers in last whorl	22—24	24—26
Total number of chambers	45	68
Initial chamber	165 $\mu$	17 $\mu$
Second chamber	83 $\times$ 205 $\mu$	10 $\times$ 22 $\mu$

Occurrence in Hungary: Upper Eocene bryozoic marl, Esztergom Basin, Mátyáshegy, Kissvábhegy, Szépvölgy, Budakeszi, Mogyorós, Tokod, Tát.

Occurrence abroad: Upper Eocene: Czechoslovakian Tatra, Bukovina, Italy, Georgia, Florida, Texas.

### *Operculinella transitia* n. sp.

(Plate 1, Fig. 6; Plate 2, Figs. 4, 6, 8)

Holotypus: Coll. Hung. Geol. Inst., thin section No. E 422, Plate 2, Fig. 8.

Locus typicus: Tokod, bore No. 350; 265.70—266.20 m.

Stratum typicum: Upper Eocene discocyclinous marl.

Derivatio nominis: Transiens = transitional toward a higher form in the phylogeny.

Diagnosis: Test oval, spiral whole, septa irregular.

Description of species: Spiral indiscernible on exterior surface; test smooth, thin, hyaline, central area bilaterally elevated; umbilicus excentrically situated; inner structure with only septa deformed, spiral whole. Shape, measurements, number of chambers corresponding to those of *Operculina vaughani*. — The first traces of differentiation are shown by this species.

The majority of the septa fail to connect the distance to the spiral. Several smaller chambers are connected and bent in a sharper arch by the next septum. The last whorl of the specimen thinned out completely and was thus broken away.

Differential diagnosis: The new species stands nearest to *Operculinella vaughani*, but differs by the disturbances in the septal arrangement. It is also highly similar to the Oligocene — Lower Miocene *Operculina complanata* DEFANCE var. *carpenteri*, but differs by the considerably smaller numbers of the chambers.

Geographical distribution: Esztergom Basin.

Stratigraphical occurrence: Upper Eocene dyscoeyclinous marl.

	Microspheric
	form
Length	58 mm
Breadth	35 mm
Rate of evolution	39 mm
Number of whorls	3.5
Number of chambers in last whorl	31
Total number of chambers	57
Initial chamber	18 $\mu$
Second chamber	11 $\times$ 22 $\mu$

### *Operculinella laxata* n. sp.

(Plate 3, Figs. 1—12; Plate 4, Figs. 1—14; Plate 5, Figs. 1—16)

Holotypus: Coll. Hung. Geol. Inst., thin section No. E 366; Plate 5, Fig. 3.

Locus typicus: Tokod, Bore No. 350; 221.50 m.

Stratum typicum: Upper Eocene bryozoic marl.

Derivatio nominis: Laxata = loosened, characteristic of its specific features.

Diagnosis: Shape and size of test varying; walls very thin, hyaline; septa and spiral loose and deformed.

Description of species: Spiral indiscernible on surface of smooth test; excentrically situated, biconvex, slightly elevated umbo; test thin, shining vitreous, hyaline; septa and spiral loose. — The differentiation of the original species can be best observed on these specimens. The septa are disconnected and divided into subgroups (Plate 5, Figs. 1—16). Due to the deformation of the spiral, there are both evolute and involute specimens. These individuals had the greatest mortality before attaining complete development, owing to the smallest amount of calcareous secretion and Sr uptake. The differences in size are great, varying between 1—6 mm.

Differential diagnosis: *Operculinella laxata* resembles *Operculinella transita*, but differs by the deformation of the spiral and the septa.

	Microspheric form
Length	45 mm
Breadth	33 mm
Rate of evolution	25 mm
Number of whorls	3,5
Number of chambers in last whorl	26
Total number of chambers	56
Initial chamber	17 $\mu$
Second chamber	10 $\times$ 21 $\mu$

Geographic occurrence: Esztergom Basin, Buda hills.

Stratigraphic occurrence: Upper Eocene bryozoic marl.

### *Operculinella anasteginoides* n. sp.

(Plate 6, Figs. 1–9)

Holotypus: Coll. Hung. Geol. Inst., thin section No. 385, Plate 6, Fig. 2.

Locus typicus: Tokod, Bore No. 352; 221.50 m.

Stratum typicum: Upper Eocene bryozoic marl.

Derivatio nominis: Formed by the suffix "ides" from the generic name *Anastegina*, since the taxon shows an evolutionary stage nearly allied to it.

Diagnosis: Test rounded, sizes varying, septa revealing traces of extruding secondary septa.

Description of species: Test rounded, surface smooth, umbo slightly elevating, biconvex; test shining vitreous, hyaline; inner construction with extrusions on septa for equilibril support of spiral, but disturbances in septa still extant. Shapes and measurements very different. — This species represents the essential connecting link of the transition toward the genera *Heterostegina* and *Grzybowski*.

Differential diagnosis: There is a certain similarity in the formation of the secondary septum with the Miocene form *Operculinella complanata* (DEFRANCE) var. *heterostegina*, but it also differs by the irregular construction of the septa.

Geographical occurrence: Esztergom Basin, Buda hills.

Stratigraphical occurrence: Upper Eocene bryozoic marl.

	Macrospheric form
Length	55 mm
Breadth	50 mm
Rate of evolution	20 mm
Number of whorls	4
Number of chambers in last whorl	25
Total number of chambers	69
Initial chamber	15 $\mu$
Second chamber	10 $\times$ 21 $\mu$

**Anastegina** n. gen.

Type-species: *Anastegina strigoniensis* n. sp.

Derivatio nominis: *ava* = forward; *στεγα* = chamber, box; referring to the secondary septa which appeared first here in the phylogeny of the group, to be differentiated later.

Description of genus: Test oval, umbo excentrically situated, biconvex; planispiral, with 3–5 whorls, involute in younger stage, third, resp. fifth whorl abruptly expanding and converting into an involute form; test smooth, extremely thin toward margins; whorls indiscernible on outer surface. In tangential section of internal structure, septa connected by transversal secondary septa on last whorl.

Differential diagnosis: The test is nearly allied, in external shape and inner construction, to the genus *Operculinella*, but differs from it in 1. its flatter umbonal area, 2. the more evolute character of the last whorl, and 3. the appearance of the secondary septa. This shows a strong relationship with also the genus *Heterostegina*, but differs from it by its stronger involute character and the more irregular and less dense arrangement of the secondary chambers.

**Anastegina strigoniensis** n. sp.

(Plate 6, Figs. 10–12)

1875 HANTKEN, M.: A Clavulina szabói-rétegek faunája I. K. p. 71, Plate 12, Fig. 3. (sub *Heterostegina reticulata* RUTIMEYER).

Holotypus: Coll. Hung. Geol. Inst., thin section No. E 431, Plate 6, Fig. 12.

Locus typicus: Tát, Bore No. 4; 358–358.30 m.

Stratum typicum: Upper Eocene bryozoic marl.

Derivatio nominis: From the Latin name of Esztergom (Strigonium) situated near the collecting locality.

Diagnosis: Test oval, septa of last whorl subdivided by secondary septa.

Description of species: Test oval, outer surface smooth, thin, shining vitreous, hyaline in xylol. Evolution indiscernible on outer surface; umbo flatly excentric; thin, smooth septa directed toward central elevation; 3–5 whorls, involute in younger stage of elevation, but abruptly expanding from last whorl and converting into evolute; spiral thicker in initial phase, later thinner; septa disconnected in younger stage (Plate 6, Fig. 12), later becoming more regular; transversal septa, resembling those of *Heterostegina*, developing on septa of last whorl.

Differential diagnosis: By the sudden evolution and the absent secondary septa on the young whorls, the species is similar to *Operculina heterosteginoi-*



des HOFKER, but differs from it in its higher secondary septa. The secondary septa are small in *Operculina heterosteginoides*, whereas they connect the two septa in the last whorl in *Anastegina strigoniensis*.

	Macrospheric form
Length	55 mm
Breadth	32 mm
Rate of evolution	30 mm
Number of whorls	3
Number of chambers in last whorl	25
Total number of chambers	45
Initial chamber	17 $\mu$
Second chamber	12 $\times$ 23 $\mu$

Geographical distribution: Esztergom Basin, Szépvölgy, Kissvábhegy, Budakeszi.

Stratigraphical occurrence: Upper Eocene bryozoic marl.

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Author's address: Budapest, XIV., Népstadion út 14, Hungary

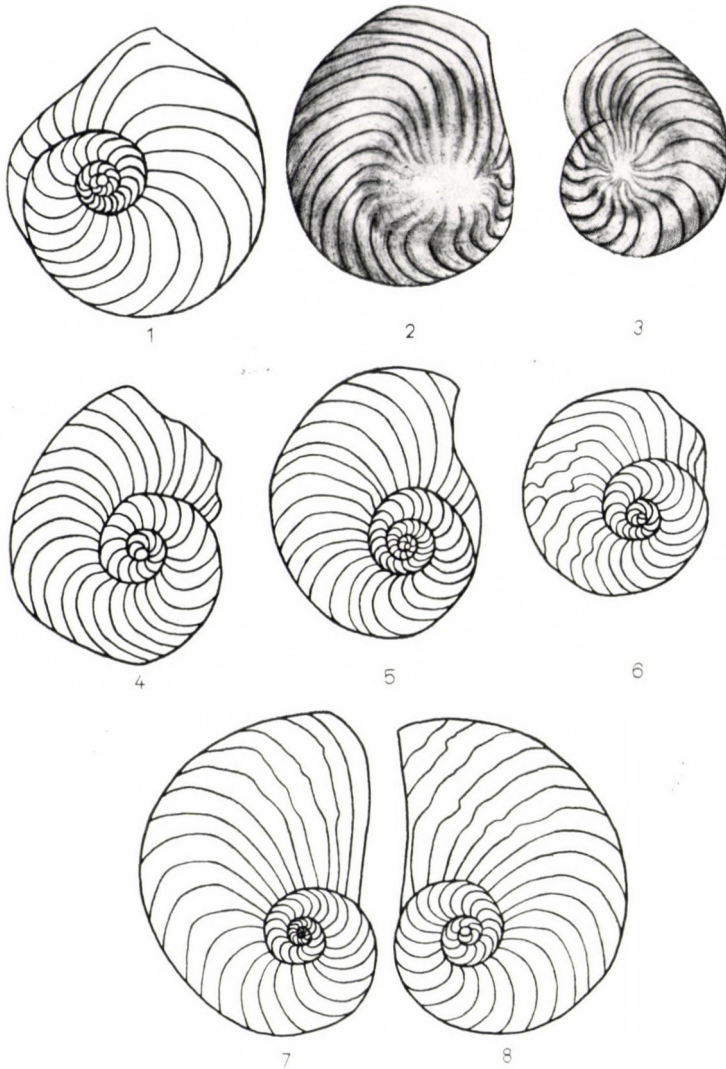


Plate I

Figs. 1-5 = *Operculinella vaughani* (CUSHMAN, 1921): 1 = Tokod, Bore No. 352, 221.50 m (E 378),  $\times 16$ ; 2-3 = Tokod, Bore No. 352, 221.50 m,  $\times 10$ ; 4 = Tokod, Bore No. 350, 258.63-258.90 m (E 420),  $\times 10$ ; 5 = Tokod, Bore No. 352, 201 m (E 359),  $\times 16$ ; — Fig. 6 = *Operculinella transita* n. sp., Tokod, Bore No. 350, 236.05-237.05 m (E 418),  $\times 10$ ; — Figs. 7-8 = *Operculinella vaughani* (CUSHMAN, 1921): 7 = Tát, Bore No. 4, 358-358.30 m (E 427),  $\times 10$ ; 8 = Tát, Bore No. 4, 358-358.30 m (E 426),  $\times 16$ . The data in brackets represent the inventory number of the thin section in Coll. Hung. Geol. Inst.

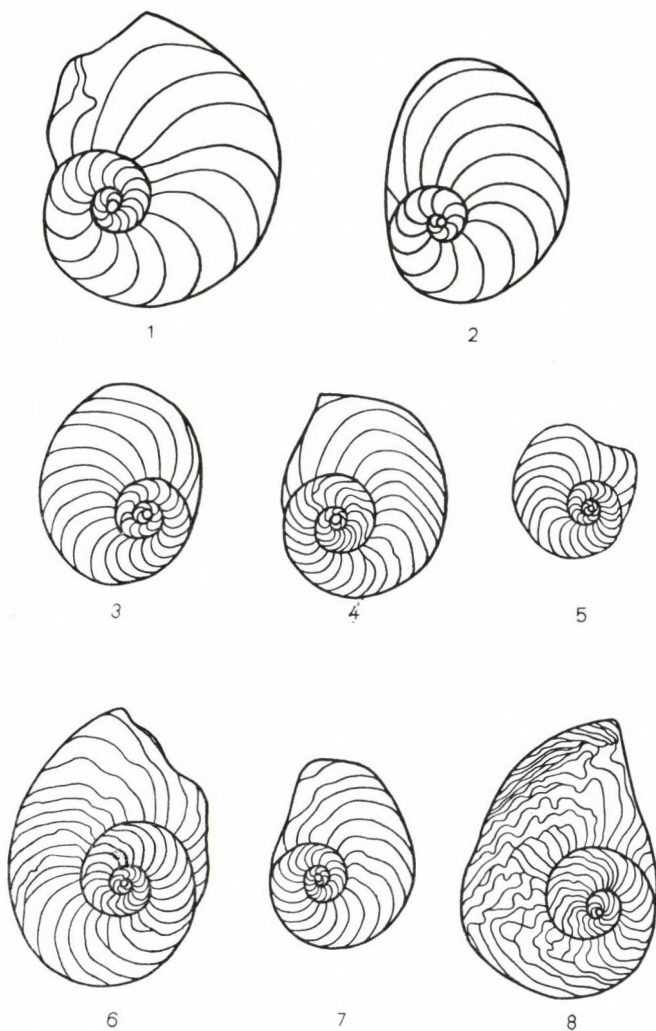


Plate II

Figs. 1–2 = *Operculinella* sp. ? : 1 = Tát, Bore No. 4, 358–358.30 m (E 433),  $\times 10$ ; 2 = Tát, Bore No. 4, 358–358.30 m (E 434),  $\times 10$ ; 3 = *Operculinella vaughani* (CUSHMAN, 1921): Tát, Bore No. 4, 358–358.30 m (E 428),  $\times 16$ ; 4 = *Operculinella transita* n. sp.: Tokod, Bore No. 352, 201.20 m (E 391),  $\times 10$ ; 5 = *Operculinella vaughani* (CUSHMAN, 1921): Tokod, Bore No. 352, 230.06–230.07 m (E 391),  $\times 10$ ; 6 = *Operculinella transita* n. sp.: Tokod, Bore No. 352, 201.20 m (E 362),  $\times 10$ ; 7 = *Operculinella vaughani* (CUSHMAN, 1921): Tokod, Bore No. 352, 230.06–230.07 m (E 392),  $\times 10$ ; 8 = *Operculinella transita* n. sp.: Tokod, Bore No. 352. The data in brackets represent the inventory number of the thin section in Coll. Hung. Geol. Inst.

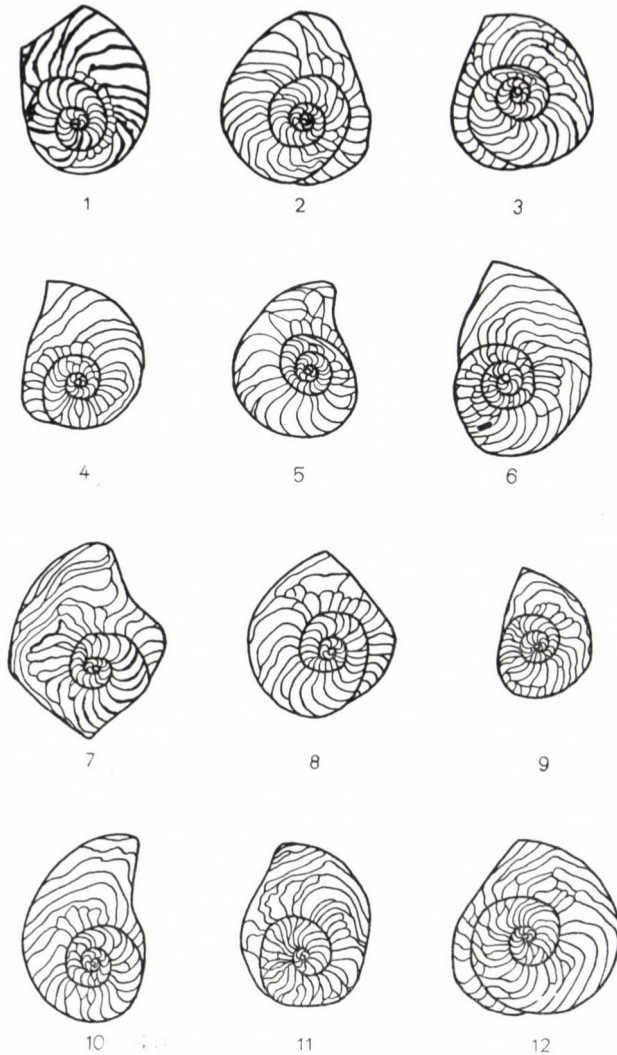


Plate III

Figs. 1–12 = *Operculinella laxata* n. sp.: 1 = Tokod, Bore No. 352, 230.06–230.07 m (E 393),  $\times 10$ ; 2 = Tokod, Bore No. 352, 201.20 m (E 361),  $\times 10$ ; 3 = Tokod, Bore No. 352, 201.20 m (E 363),  $\times 10$ ; 4 = Tokod, Bore No. 352, 201.20 m (E 374),  $\times 10$ ; 5 = Tokod, Bore No. 352, 230.06–230.07 m (E 394),  $\times 10$ ; 6 = Tokod, Bore No. 352, 230.06–230.07 m (E 395),  $\times 10$ ; 7 = Tokod, Bore No. 352, 221.50 m (E 379),  $\times 10$ ; 8 = Tokod, Bore No. 352, 230.06–230.07 m (E 396),  $\times 10$ ; 9 = Tokod, Bore No. 352, 201.20 m (E 364),  $\times 10$ ; 10 = Tát, Bore No. 4, 358–358.30 m (E 429),  $\times 10$ ; 11 = Tokod, Bore No. 352, 230.06–230.07 m (E 412),  $\times 10$ ; 12 = Tokod, Bore No. 352, 230.06–230.07 m (E 397),  $\times 10$ . The data in brackets represent the inventory number of the thin section in Coll. Hung. Geol. Inst.

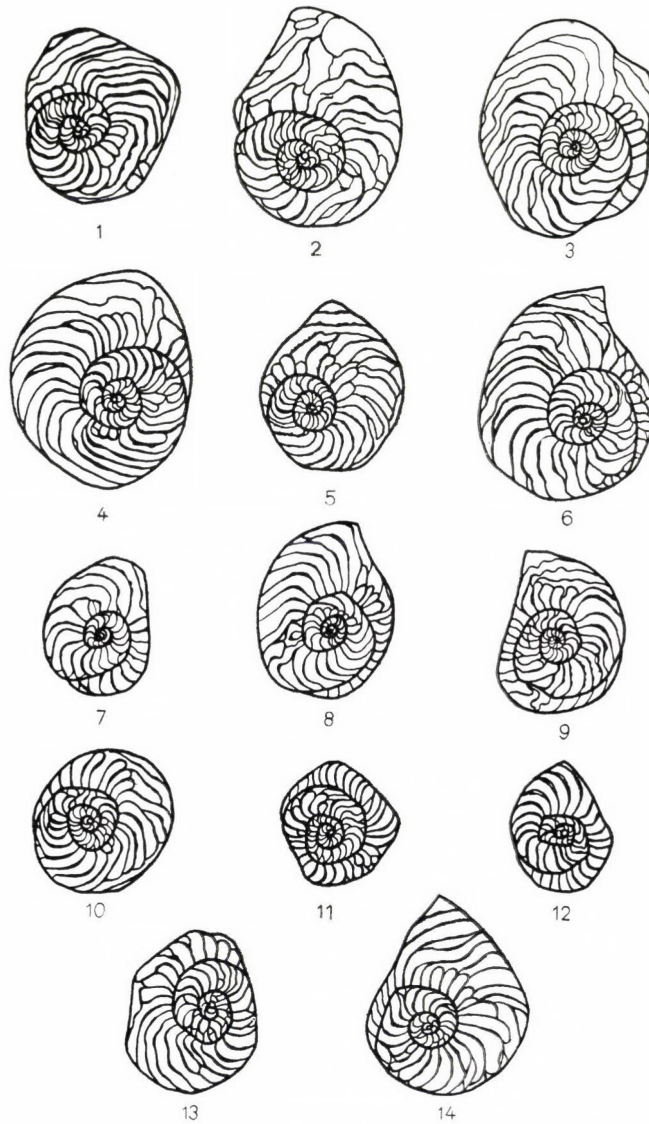


Plate IV

**Figs. 1—14 = *Operculinella laxata* n. sp., all from Tokod, Bore No. 352, all  $\times 10$ ; 1 = 230.06—230.07 m (E 411); 2 = 201.20 m (E 365); 3 = 221.50 m (E 381); 4 = 230.06—230.07 m (E 398); 5 = 230.06—230.07 m (E 399); 6 = 201.20 m (E 369); 7 = 221.50 m (E 380); 8 = 230.06—230.07 m (E 400); 9 = 230.06—230.07 m (E 401); 10 = 230.06—230.07 m (E 402); 11 = 230.06—230.07 m (E 403); 12 = 230.06—230.07 m (E 404); 13 = 201.20 m (E 375); 14 = 201.20 m (E 376). The data in brackets represent the inventory number of the thin section in Coll. Hung. Geol. Inst.**

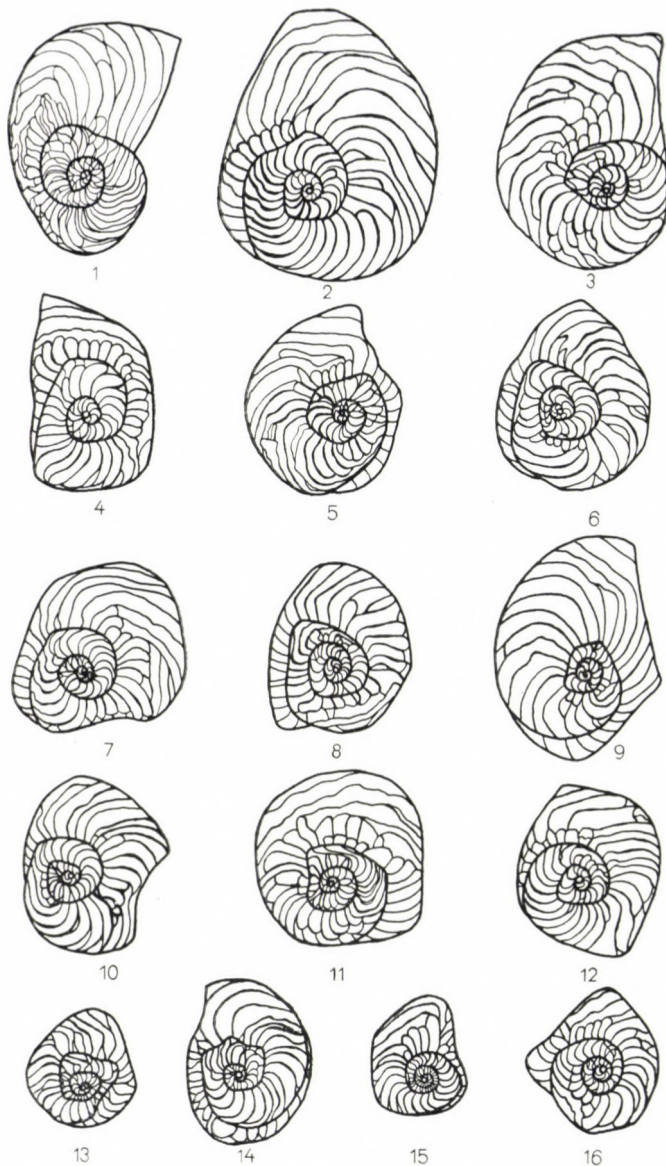


Plate V

Figs. 1–16 = *Operculinella laxata* n. sp., all from Tokod, Figs. 1, 14, 16 Bore No. 350, all others Bore No. 352, all  $\times 10$ : 1 = 265.70–266.20 m (E 421); 2 = 221.50 m (E 382); 3 = 230.06–230.07 m (E 405); 4 = 230.06–230.07 m (E 406); 5 = 221.50 m (E 383); 6 = 221.50 m (E 350); 7 = 266.80–267.20 m (E 414); 8 = 221.50 m (E 384); 9 = 230.06–230.07 m (E 409); 10 = 230.06–230.07 m (E 409); 11 = 201.20 m (E 366); 12 = 201.20 m (E 367); 13 = 201.20 m (E 368); 14 = 225.10–225.20 m (E 416); 15 = 230.06–230.07 m (E 408); 16 = 265.70–266.20 m (E 423). The data in brackets represent the inventory number of the thin section in Coll. Hung. Geol. Inst.

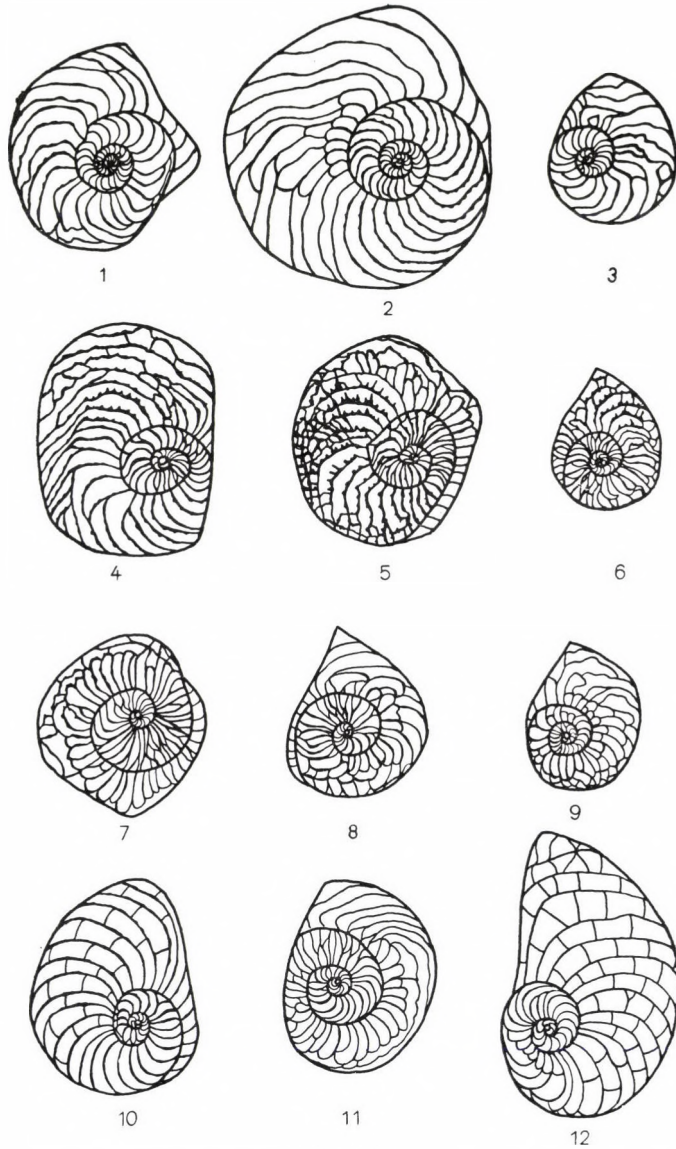


Plate VI

Figs. 1—9 = *Operculinella anasteginoides* n. sp.; all from Tokod, Bore No. 352, all  $\times 10$ ; 1 = 201.20 m (E 371); 2 = 221.50 m (E 385); 3 = 230.06–230.07 m (E 409); 4 = 221.50 m (E 386); 5 = 221.50 m (E 387); 6 = 221.50 m (E 388); 7 = 230.06–230.07 m (E 410); 8 = 221.50 m (E 389); 9 = 201.20 m (E 360). — 10 = *Anastegina strigoniensis* n. sp., Tát, Bore No. 4, 358–358.30 m (E 430),  $\times 10$ . — 11 = *Operculinella anasteginoides* n. sp., Tokod, Bore No. 352, 201.20 m (E 372),  $\times 10$ . — 12 = *Anastegina strigoniensis* n. sp., Tát, Bore No. 4, 358–358.30 m (E 431),  $\times 10$ . The data in brackets represent the inventory number of the thin section in Coll. Hung. Geol. Inst.



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# ACTA ZOOLOGICA

ТОМ XII ВЫП. 1—2

## РЕЗЮМЕ

### НОВЫЕ ТАКСОНЫ ORIBATIDAE (ACARI) ИЗ ЮЖНОЙ АФРИКИ

Й. БАЛОГ и Ш. МАХУНКА (Будапешт)

Сообщается описание новых таксонов, обнаруженных в материале *Oribatidae*, полученном для обработки из Наталя. Авторы намереваются написать подытоживающую работу об *Oribatidae* эфиопской зоогеографической области. Обработанный теперь материал оказывает им большую помощь в этой работе, так как из этой зоогеографической области ареала до сих пор *Oribatidae* еще не были описаны. В материале было обнаружено больше новых видов, чем это можно было ожидать, поэтому, авторы считают нужным опубликовать их описание в нескольких кратких сообщениях. Настоящая первая статья этой серии содержит описание 6 новых родов, 17 новых видов и 1 нового подвида.

### КЛЕЩИ ORIBATIDAE (ACARI) ИЗ БРАЗЗАВИЛЯ (КОНГО)

Й. БАЛОГ и Ш. МАХУНКА (Будапешт)

Статья содержит часть результатов классификации материала, собранного в окрестности Лудима в различных видах сельскохозяйственных почв. Сообщается описание 1 нового рода и 16 новых видов. Для некоторых родов дается полный ключ для определения, которые и служат одновременно для дифференциального диагноза отдельных видов.

### ЛИЧИНКИ CHIRONOMIDAE В ПЕРИФИТОНЕ ГАВАННЫХ ПОНТОНОВ ДУНАЯ НА УЧАСТКЕ МЕЖДУ СЕЛОМ РАЙКА И БУДАПЕШТОМ

А. БЕРЦИК (Будапешт)

Настоящая статья является продолжением и заключительной частью работы автора появившейся в предыдущем номере нашего журнала. В двух статьях дается результат классификации личинок *Chironomidae* обнаруженных в 77 образцах перифитона, собранных в 45 местностях 417 километровой участка Дуная в Венгрии. Все образцы перифитона взяты от пловучих на поверхности воды судов, в первую очередь от гаванных понтонов.

На исследуемом участке Дуная, простирающемся от села Райка до Будапешта, были обнаружены 279 личинок и 7 куколок *Chironomidae*, принадлежащих к 13 видам, видовым группам.

В отношении взаимосвязи между растительными сообществами, покрывающими отдельные места сбора, и богатством фауны выяснилось, что для макрофауны в большинстве случаев самым оптимальным оказался перифитон из водяной мхи (*Fontinalis antipyretica*, *Eurhynchium rusciforme*, см. табл. 1, места сбора № 16 и 25), в то время как чистые колонии *Cladophorae* меньше всего благоприятны (см. табл. 1 и места сбора № 1, 5, 14, 19, 21, 27).

Принимая во внимание фактор течения и большое количество взвешенного наноса весьма вероятно, что на основании морфологических отклонений двух видов растений эта разница имеет прежде всего физические причины.

## МОЛИ TINEIDAE (LEPIDOPTERA) ГОРНОГО МАССИВА: РУВЕНЗОРИ

Л. А. ГОЗМАНЬ (Будапешт)

Сообщается результат классификации материала *Tineidae* собранного на более низких зонах горы Рувензори в 1952 году Д. С. Флехтером, и полученного от Британского Музея. Было определено 23 видов, 4 из которых уже были описаны раньше, но остальные 19 видов оказались новыми для науки. Типичные экземпляры описанных новых таксонов хранятся в Британском Музее и в Будапештском Музее Естественного Знания. Особого внимания заслуживает род *Episcardia* Rag., представленный в материале весьма многочисленными экземплярами, а также своеобразные виды *Monopis* Z.

## ТРИ НОВЫХ ВИДА SYMMOSIDAE (LEPIDOPTERA) ИЗ ЗАПАДНОЙ И СРЕДНЕЙ АФРИКИ

Л. А. ГОЗМАНЬ (Будапешт)

Из гвинейской коллекции К. Ференца автор описывает новый вид рода *Aprominta* Gozm., а из материала Ш. Сейдела, собранного в Элизабетвиле, новый род (*Afrosymmoca* gen. n.) и его двух новых видов. Типичные экземпляры хранятся в Зоологическом отделении Будапештского Музея Естественного Знания и в Королевском Музее Центральной Африки (Тервурен, Бельгия).

## СИСТЕМАТИЧЕСКОЕ МЕСТО ВИДА VIREO FLAVOVIRIDIS (CASSIN), ЖИВУЩЕГО НА ОСТРОВАХ ЛАС-ТРЕС-МАРИАС (МЕКСИКА)

П. Р. ГРАНТ (Нью-Хейвен, США)

В ходе морфологического исследования вида *Vireo flavoviridis* (CASSIN) автор установил, что подвид, описанный Мадарасом в 1885 году на основании экземпляра, полученного из островов Лас-Трес-Мариас, нельзя обособить от подвида, живущего на соседнем материке в Мексике (*V. flavoviridis hypoleucus*). По его мнению эти два подвида конспецифические. Отклонения, выявленные в отношении оперения и размеров тела между двумя географическими группами не удовлетворяют современным критериям классификации, необходимым для описания нового подвида.

Уменьшение яркоокрашенного и противоположного узора оперения вообще характерно для филогенеза птиц, обитающих на островах. Однако гнездящиеся на островах Лас-Трес-Мариас популяции *Vireo flavoviridis* перелетные птицы и после окончания периода размножения они переселяются на континент, где они на местах перезимовки смешиваются с группами, живущими на континенте. Смешивание повидимому уменьшает полную изолированность спаривания двух географических групп во время полового влечения. Предположительно этим объясняется, почему вид *Vireo flavoviridis* показывает на островах Лас-Трес-Мариас лишь незначительные морфологические отклонения, в то время как другой вид (*V. hypochryseus*), пребывающий в течение всего года на островах, более резко обособляется от групп этого вида, живущих на материке в Мексике.

## ПРИМЕНЯЕМОСТЬ МЕТОДА БУМАЖНОЙ ХРОМАТОГРАФИИ В ТАКСОНОМИИ ТЛЕЙ (ARHIDOIDEA)

Л. ХАЛМАДЬИ (Будапешт)

Исследовались возможности применения метода бумажной хроматографии в таксономии тлей. Автор раздавил насекомое на бумаге. Для одномерного хроматографирования на бумаге № 1 Утмана (Wнатман) он использовал смесь: бутанола, уксусной кислоты и воды, в соотношении 4 : 1 : 5. Сравнивались образцы цвета веществ, полученных от 15 видов и флюоресцирующих при ультрафиолетовом освещении.

Метод оказался пригодным для исследования свежес убитых насекомых, но для исследования музейного материала метод неприменим. Хроматограммы, полученных от одного и того же вида оказались одинаковыми. Индивидуальные вариации не влияли на хроматограммы, характерные для данного вида. Хроматограммы характерны для исследуемого вида тлей, но независимы от растений хозяев. Каждый исследовавшийся вид обладал типичным хроматограммом. Исследовавшийся материал состоит из сравнительно незначительного числа видов, но несмотря на это удалось выявить хроматографические особенности, типичные для отдельных семейств.

На основании полученных результатов автор устанавливает, что метод бумажной хроматографии может оказаться полезным подсобным методом в таксономии тлей.

### ЭКОЛОГИЧЕСКИЕ И ЭТОЛОГИЧЕСКИЕ ИССЛЕДОВАНИЯ ПОПУЛЯЦИИ КАМЫШЕВКИ — РЕЧНОГО СВЕРЧКА (*LOCUSTELLA FLUVIATILIS* WOLF) ГНЕЗДЯЮЩИХ В ОЛЬХОВЫХ ЛЕСАХ ОКРЕСТНОСТИ С. ОЧА

Л. ХОРВАТ и Б. ХЮТТЛЕР (Будапешт)

Сообщается результат экологического и этологического исследований речного сверчка, ведущего исключительно скрытый образ жизни. Исследования проводились в период от 1960—1963 гг. в болотных ольховых лесах окрестности села Оча (простирающихся на 30 км к югу от Будапешта), и распространялись на наблюдение образа жизни этого вида птиц: их прибытия весной, занятия места гнездования, спарования, построения гнезда, времени и темпа откладывания яиц, выводки, времени насыживания, времени пребывания птенцов в гнездах и кормления птенцов родителями, корма, родительской заботы после вылета и времени осеннего перелета птиц.

Помимо ряда ценных экологических наблюдений новыми являются следующие результаты: Время высживания составляет 13 дней; самка начинает высживать после откладки третьего яйца; насыживают лишь самки, птенцы остаются в гнездах в течение 16 дней; основную пищу птенцов составляют мелкие насекомые, главным образом кузнечки, а также гусеницы, собираемые родителями отчасти в непосредственной окрестности гнезда, а отчасти на поле, простирающемся на опушке близкого леса. Птицы добывают пищу всегда на скрытых местах, под травянистыми растениями.

### НОВЫЕ ВИДЫ РОДА *TARDIGRADE* ИЗ ВЕНГРИИ (НОВЫЕ ДАННЫЕ К ФАУНЕ *TARDIGRADE* ВЕНГРИИ VI)

Дь. ИХАРОШ (Балатонфеньвеш)

В своей статье автор описывает 8 новых видов рода *Tardigradae*, собранных в различных местах гор Баконь. Результаты определения всего материала сбора были опубликованы в журнале «Зоологические Доклады» (*Állattani Közlemények*). После описания новых видов *Tardigradae* дается описание их яиц и сообщаются примечания автора к яйцам других видов.

### ДАННЫЕ К ФАУНЕ *TARDIGRADE* АВСТРИИ

Дь. ИХАРОШ (Балатонфеньвеш)

Сообщается описание 4 новых видов рода *Tardigradae* из коллекции др-а Х. Франца, собранных в образцах мха и лесной подстилки, происходящих из Австрии. Новые виды следующие: *Macrobotus pseudohufelandi* sp. n., *M. submorulatus* sp. n., *Hypsibius austriacus* sp. n., *H. leithaicus* sp. n. Типичные экземпляры хранятся в коллекции автора.

## ДАННЫЕ К ФАУНЕ NEMERTINEA ВЕНГРИИ

Г. Й. МЮЛЛЕР (Констанца)

Автор сообщает результат морфологического и анатомического исследования двух экземпляров Nemertinae, собранных др-ом А. Кешшеляком в селе Гёрёмбейтапольца (Северная Венгрия) и храняемых в препарате из канадского бальзама. Он устанавливает, что эти два вида не идентичны с видом *Prostoma graecense* (Вёнмиг), единственным известным до сих пор в Венгрии видом Nemertinae, а совпадают с новым видом венгерской фауны *Prostoma eilhardi* (МОНТГОМЕРУ).

## НОВЫЕ ВИДЫ РОДА PHAENOCARPA FÖRST. ИЗ ЭФИОПИИ (HYMENOPTERA: BRACONIDAE)

Й. ПАПП (Веспрем)

Сообщается описание 5 новых видов рода *Phaenocarpa* FÖRSTER, обнаруженных в коллекции Будапештского Музея Естественного, полученной из Эфиопии: *Ph. errabunda* sp. n., *kittenbergeri* sp. n., *kovacsi* sp. n., *magna* sp. n., *postfurcata* sp. n. Перед подробным описанием видов — пользуясь и данными работы Фишера — дается ключ для определения известных до сих пор 15 эфиопских видов рода *Phaenocarpa* FÖRST.

## КЛЮЧИ ДЛЯ ОПРЕДЕЛЕНИЯ ВСЕХ РОДОВ ПИЯВОК (HIRUDINOIDEA) МИРА И КАТАЛОГ ВИДОВ

II. Семейства: SEMISCOLECIDAE, TREMATOBDELLIDAE, AMERICOBDELLIDAE  
DIESTECOSTOMATIDAE

А. ШООШ (Будапешт)

Сообщается вторая статья серии статей автора, первая которых была опубликована в предыдущем номере нашего журнала. Настоящая статья посвящена описанию семейств, указанных в заглавии. В введении обсуждается вопрос систематического положения этих семейств и приводятся установления автора по вопросам систематики и номенклатуры. Затем даются ключи для определения родов, относящихся к этим четырем семействам, а также каталог видов. В заключении приводится список литературы данного вопроса.

## НОВЫЕ РОДЫ И ВИДЫ PROCTOTRUPOIDEA НЕОТРОПИЧЕСКОЙ ОБЛАСТИ (HYMENOPTERA)

Й. Б. САБО (Будапешт)

Сообщается описание 4 новых родов и 13 новых видов Proctotrupoidea, а также несколько новых фаунистических данных. Материал исследования происходит отчасти из института Instituto Miguell (Аргентина, Тукуман). Преобладающая часть коллекции была собрана др-ом М. Ацел (†). Остальная часть материала относится к коллекции Будапештского Музея Естественного, прежде всего к сбору Г. Мольнара. За исключением отдельных паратипов, находящихся в коллекциях указанного института и музея, типичные экземпляры хранятся в коллекции автора.

## ДАННЫЕ К ФАУНЕ ТЛЕЙ ВЕНГРИИ (НОМОПТЕРА: ARHIDIDAE)

Х. СЕЛЕГИЕВИЦ (Варшава)

Сообщается описание 102 видов тлей, собранных автором в 1964 г. и оказавшихся новыми для фауны Венгрии. Приводятся точные данные места обитания и растений хозяев отдельных видов, а также примечания автора к вопросам зоогеографии, биологии и подчас также синонимии. С этими видами число видов тлей, известных до сих пор в Венгрии составляет — без семейства Phylloxeridae — 245 видов.

## О ЗНАЧЕНИИ ЭКОЛОГИЧЕСКИХ И ГЕОГРАФИЧЕСКИХ ПРИГРАНИЧНЫХ ПОЛОС ДЛЯ ЗООЛОГИИ

Ф. Й. ТУРЧЕК (Банска Штиавница, ЧССР)

Переходные или приграничные полосы различной ширины возникают на стыках экологических (сообщества) и географических единиц по их горизонтальному и вертикальному распределению.

Эко-географические переходы характеризуются смещением абиотических и биотических элементов (в частности фауны). Зоны переходов пропорциональны величине (рангу) единиц, образующих переход. Вообще проникновение элементов более выраженное в направлении от более сложных по фауне областей или более организованных экосистем. Влияние переходов или экотон на фауну этих полос сложное: оно распространяется на видовой состав (структуру), возникновение новых взаимосвязей между животными и растениями, изменения генетики популяций, количественные изменения и динамику популяций, на проникновение животных в чужие ареалы или сообщества и т. д. — для выяснения экологических, зоогеографических и биогеографических отношений необходимо более глубокое изучение переходных зон.

## СПИСОК ФАУНЫ ПОДЕНОК ВЕНГРИИ И ОПИСАНИЕ НОВОГО ВЕНГЕРСКОГО ВИДА *BAETIS PENTAPHLEBODES* SP. N. (EPHEMEROPTERA)

Ш. УЙХЕЙИ (Будапешт)

Сообщается список видов Ephemeropterae, обнаруженных до сих пор в Венгрии, среди которых 10 видов оказались новыми для фауны Венгрии. После этого дается описание нового вида из Венгрии, оказавшегося новым и для науки и названного *Baëtis pentaphlebodes* sp. n., имаго которого автор выращивал из собранных им личинок.

## ФИЛОГЕНЕЗ ПОДСЕМЕЙСТВА HETEROSTEGININAE (FORAMINIFERA)

Л. ВИТАЛИШ-ЗИЛАХИ (Будапешт)

При обсуждении подсемейства Heterostegininae автор подробно занимается с филогенетическими признаками структуры раковины этого подсемейства и распределяет их на основании хронологии, генеалогии и таксономии в три группы. В пределах этих групп он считает обоснованным разграничение медленно и быстро развивающихся признаков.

Дифференциация вида *Operculinella vauhani* (Cushman) встречаемого в Карпатском бассейне и в зоне флиша Карпат — различные стадии развития которого автор наглядно иллюстрирует на основании описания и изображения новых видов — также предоставляет новые сведения о филогенезе подсемейства Heterostegininae.

Исследуемая коллекция была получена из материала глубоких бурений Тат № 4, Токод № 350 и Токод № 352 (Музей Венгерского Государственного Геологического Института).





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## ZUR POPULATIONSDYNAMIK DES ZOOBENTHOS EINES SEICHTEN SEES

Von

Á. BERCZIK

INSTITUT FÜR TIERSYSTEMATIK DER L. EÖTVÖS-UNIVERSITÄT, BUDAPEST  
(DIREKTOR: PROF. DR. E. DUDICH)

(Eingegangen am 15. Januar 1966)

Im Rahmen der hydrobiologischen Forschungen in Ungarn wurden bisher Serienuntersuchungen mit Registrierung der saisonmäßigen quantitativen und qualitativen Änderungen des Zoobenthos der Seen noch nicht vorgenommen. Der Grund hierfür liegt darin, daß einerseits die technische Durchführung und die Aufarbeitung des gesammelten Materials eine zeitraubende Arbeit erfordert, andererseits die systematische Bearbeitung des Chironomidenmaterials — der überwiegenden Mehrheit des Zoobenthos — mangels eines Spezialisten nicht möglich war. Die wenigen wertvollen Arbeiten, die in Verbindung mit der Berechnung der Biomasse über die Makrofauna des Benthos in unseren heimischen Gewässern publiziert wurden, enthalten lediglich die Daten von Stichproben sowie Schätzungswerte und die bei der Berechnung der Biomasse gebrauchten Multiplikationszahlen [10]. Auf dem ganzen Gebiet des Velencer Sees und des Öreg-Sees von Tata führte ich zwar selbst einige wiederholte Untersuchungen durch [4], doch wollten diese u. a. eben bloß klarstellen, inwieweit bei den populationsdynamischen Untersuchungen eine jährlich mehr als 2—3malige Wiederholung vermieden werden könnte.

Die Serienuntersuchung des Benthos eines heimischen seichten Sees erschien um so mehr der Mühe wert, als Angaben der ausländischen Fachliteratur eigentlich keine Grundlage zu Schlußfolgerungen für unsere Gewässer bieten. Zu Vergleichen eignen sich höchstens die in seichteren Seen durchgeführten Untersuchungen von BORUTZKY und LELLÁK [6, 13, 14]. Die Durchsicht der übrigen einschlägigen Fachliteratur führt zunächst zu folgenden Feststellungen: a) Es sind kaum einige, mehrjährige Zyklen umfassende Untersuchungen bekannt und auch diese beziehen sich auf Seetypen (z. B. wirkliche, tiefe Seen), die sich von unseren Seen in wesentlichen Zügen unterscheiden. b) Die Durchschnittswerte aus den oft in unregelmäßigen Zeitspannen durchgeführten Untersuchungen sind irreführend. c) In den Abhandlungen ist für gewöhnlich nicht angegeben, wie sich der Zeitpunkt der Einsammlungen zum Schwärmen verhält, eine Tatsache, die auch den Aussagewert der Durchschnitte herabmindert. Häufig ist statt des Datums der Untersuchung bloß die Jahreszeit angegeben. d) Unzureichend sind zumeist auch die systemati-

schen Bezeichnungen. e) Die Beschreibung der Methodik ist entweder mangelhaft oder weicht von der von mir angewandten wesentlich ab (Maschenweite des Siebes, Zahl der Probeentnahmen usw.). f) Zumeist sind auch die Beschreibungen der Physiographie des untersuchten Sees sowie der anderen Umweltfaktoren (hydrochemische Gegebenheiten, Qualität des Sediments, künstliche Einwirkungen usw.) sehr mangelhaft.

Meine vom November 1952 bis Juni 1955 im Cseke-See in Tata durchgeführten Serienuntersuchungen, über die im folgenden berichtet werden soll, setzten sich vor allem das Ziel festzustellen, ob es in diesem seichten See gut erkennbare Massenveränderungen in der benthonischen Makrofauna gibt, wenn ja, welche Gesetzmäßigkeiten sich in ihnen erkennen lassen, und welche Artenzusammensetzung die Fauna aufweist.

### Beschreibung des untersuchten Gebietes

Der in seiner Form unregelmäßige, künstlich angestaute Cseke-See liegt im Volkspark (früher Englischer Garten) von Tata. Zur Zeit meiner Untersuchungen wurde im See eine Karpfenteichwirtschaft betrieben. Der See liegt 138 m ü. d. M., er bedeckt eine Fläche von 19 ha. Seine größte Länge beträgt 750 m, die größte Breite 400 m. Mit Ausnahme des östlichen und südöstlichen Teiles ist das Ufer durch Ufermauern befestigt, es fällt also an diesen Stellen steil ab. Ähnlich ist auch das Ufer der kleinen Inseln an der Nordseite des Sees befestigt. Röhricht findet sich dementsprechend nur am östlichen und südöstlichen Ende des Sees, etwas größeren Umfang hat jedoch nur das südöstliche. Das Seeufer und die Inseln haben — von einigen kurzen Abschnitten abgesehen — einen schönen Bestand mächtiger Bäume, deren Laub zum Teile ins Wasser gerät. Die Durchschnittstiefe des Sees beträgt etwa 130 cm. Die tiefste Stelle befindet sich am NW-Ende des Sees vor der Schleuse.

Der Bestand der submersen Vegetation ist unterschiedlich stark ausgebreitet. Unter Einwirkung der mit der Teichwirtschaft verbundenen Düngung war der See vor allem im letzten Untersuchungsjahr (1955) vom Frühlingsommer bis zum Abfischen im Herbst von der submersen Vegetation (insbesondere von den *Potamogeton*-Arten) sozusagen völlig bedeckt, so zwar, daß selbst das Befahren des Sees mit dem Kahn fast unmöglich geworden war. Zeitweise wurde die Vegetation auch maschinell gemäht.

Der See hat keinen ständigen Durchfluß. Die überschüssigen Wassermengen, die sich aus dem Niederschlag usw. aufsammeln, werden durch die Schleuse am NW-Ende des Sees abgelassen. Anlässlich des Abfischens im Herbst wurde der See fast ganz entleert. Die Auffüllung geschah mit dem Wasser der Quellengruppe im Park. (Diese wasserreiche Quellengruppe ist vor einigen Jahren völlig versiegt, so daß die Teichwirtschaft eingestellt werden mußte. Derzeit wird hier nur noch geangelt.)

Es sei noch erwähnt, daß das Abwasser des benachbarten Trainingslagers der Sportler bedauerlicherweise zum Teil in den See abgelassen worden war. Die störende Wirkung, die sich hieraus ergab, trachtete ich in meinen Untersuchungen in der Weise auszuschalten, daß ich meine Sammelstellen weit von der Einflußstelle des Abwassers wählte.

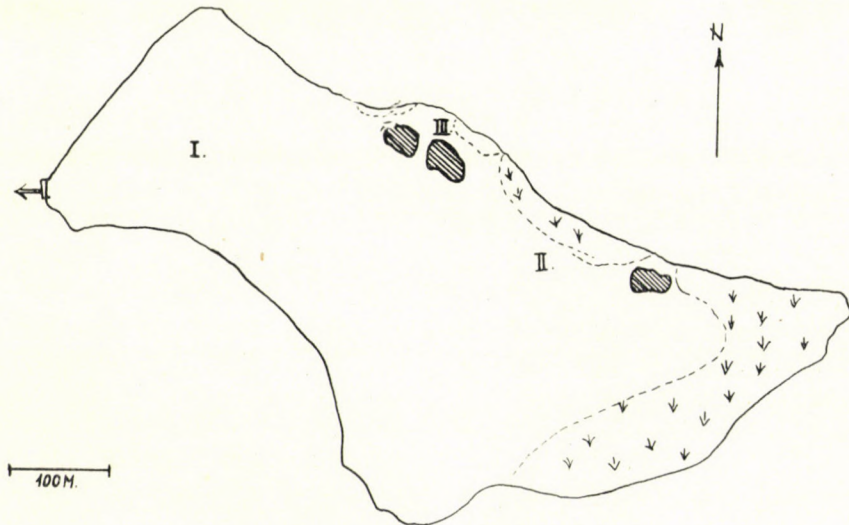


Abb. 1. Situationskizze des Cseke-Sees

### Untersuchungsmethoden

Meine Serienuntersuchungen führte ich zwischen dem 21. XI. 1952 und dem 5. XI. 1954 durch und ergänzte sie am 2. VI. 1955 noch durch eine Kontrolluntersuchung. Die Wintermonate und drei durch technische Ursachen vereitelte Sammelgelegenheiten abgerechnet, nahm ich im allgemeinen monatlich, insgesamt also 16 Untersuchungen vor, wobei ich 222 Bodensedimentproben nahm und 2765 Chironomidenlarven einsammelte. Überdies wurden in 5 Fällen chemische Untersuchungen vorgenommen.

Für die regelmäßig durchgeführten Untersuchungen bestimmte ich 3 ständige Sammelstellen auf dem See: eine Stelle im offenen Wasser (I.), eine Stelle am Rande des Röhrichts (II.) und eine kleinere offene Stelle, die von Inseln und Röhricht eingeschlossen war (III.) (Abb. 1—4). An der Sammelstelle II nahm ich die Probe in 1 m Entfernung vom Röhricht. Bei jeder Gelegenheit notierte ich die Temperatur der Luft, der Wasseroberfläche und des Schlammes und beobachtete die Qualität des Schlammes, die  $H_2S$ -Verhältnisse, auch ließ ich den Gehalt des Schlammes der für die Untersuchungen wichtigsten Sammelstelle I an organischen Stoffen feststellen. Den  $O_2$ -Gehalt und den pH-Wert des Bodenwassers der Sammelstellen bestimmte ich gleichfalls mehrere Male. Hier sei bemerkt, daß ich die Untersuchungen seinerzeit ganz allein durchgeführt habe, und da mir nur ein Ruderboot zur Verfügung stand, mußte ich auf manches, so z. B. auch auf systematische chemische Untersuchungen verzichten.

Die Temperatur wurde mit einem Wasserthermometer mit einer Skalenteilung von  $0,5^\circ C$ , die Lufttemperatur über dem Wasser im Schatten, die Oberflächentemperatur des Wassers in 10 cm Tiefe und die Temperatur des Schlammes im Bodengreifer mit einem Thermometer gemessen, das ich etwa 3 Minuten lang in der frisch herausgehobenen Probe 5—6 cm tief einsetzte. Auch den Zeitpunkt der Messungen registrierte ich fallweise.

Zur Bestimmung der Qualität des Schlammes untersuchte ich dessen Farbe, Korngröße und Geruch und beobachtete auch, ob sich an der Oberfläche pflanzlicher Detritus, Schnecken- und Muschelschalen, Algenüberzug befanden.

Die  $O_2$ -Proben aus dem Bodenwasser schöpfte ich mit einem etwas modifizierten WERESCHTSCHAGIN—MAUCHASCHEN Wasserschöpfer. Auch die pH-Proben entnahm ich mit



Abb. 2. Sammelstelle I



Abb. 3. Sammelstelle II

diesem. Die Bestimmung des Gehaltes an gelöstem  $O_2$  und der pH-Werte führte ich gleichfalls nach den MAUCHASCHEN Halbmikrofeldmethoden durch [16].

Die quantitativen Bodenfaunaprobe n entnahm ich mit dem Bodengreifer von EKMAN und BIRGE. Der Apparat nimmt  $15 \times 15 \times 15$  cm große Proben auf, die Grundfläche beträgt folglich  $225 \text{ cm}^2$ , d. i.  $1/44 \text{ m}^2$ . An einer Sammelstelle nahm ich im allgemeinen jeweils 5 Proben. Nach mehreren serienweise durchgeführten experimentellen Probeentnahmen erwies sich näm-



lich die Zahl von 5 Proben als jene untere Grenze, bei der der Durchschnittswert aus der Zahl der in je einer Probe gefundenen Organismen vom Durchschnitt aus den vielen Proben noch nicht wesentlich abweicht.

Die Sedimentproben siebte ich durch ein Bronzesieb von 0,32 mm Maschenweite. Alle Tiere, also auch die Nicht-Chironomiden, die im Sieb zurückblieben, fixierte ich je entnommener Probe in einzelnen Phiolen in 96<sup>o</sup>/<sub>o</sub>igem Alkohol.



Abb. 4. Sammelstelle III

Schließlich trachtete ich an Ort und Stelle auch jede Beobachtung festzuhalten, der, ökologisch gesehen, eine Bedeutung zukommen könnte (z. B. viele oder wenige Exuvien auf der Wasseroberfläche usw.).

Bei der Bearbeitung des Chironomidenmaterials untersuchte ich die einzelnen Sammlungen mit besonderer Aufmerksamkeit auf die mengenmäßigen Anteile der den gleichen Arten angehörigen, aber in verschiedenen Stadien befindlichen Larven. Die so ermittelten Daten erteilten oft guten Aufschluß über den Zeitpunkt und das Ausmaß des Schwärmens. Immer habe ich natürlich auch die Nicht-Chironomiden berücksichtigt.

### Physikalische, chemische Verhältnisse

Die mittlere Wassertiefe betrug an der I. Sammelstelle 190 cm, an der II. Sammelstelle 60 cm und an der III. Sammelstelle 70 cm.

Die an der Sammelstelle I (offenes Wasser) gemessenen Temperaturen enthält Tabelle 1. Der Unterschied zwischen der Schlamm- und der Wassertemperatur in der Oberflächenschicht beträgt im Durchschnitt nur 1,6 °C. Hierzu sei bemerkt, daß der beim Abfischen im Herbst abgelassene See im

**Tabelle 1**  
Temperaturen an der Sammelstelle I (°C)

Zeitpunkt	Luft	Wasser- oberfläche	Schlamm
21. XI. 1952. 12,00	10,00	8,5	—
25. III. 1953. 11,00	17,0	10,5	—
16. V. 1953. 12,00	21,0	15,0	—
18. VI. 1953. 11,00	25,0	23,0	19,0
24. VII. 1953. 13,00	27,5	25,5	23,0
31. VIII. 1953. 11,30	23,0	24,0	22,5
4. IX. 1953. 11,00	19,0	18,0	17,5
29. X. 1953. 10,30	12,0	13,0	12,0
21. IV. 1954. 10,40	16,0	14,5	11,0
8. V. 1954. 11,00	18,5	17,0	15,5
15. VI. 1954. 12,00	26,0	22,5	20,5
4. VII. 1954. 11,30	26,0	23,0	22,0
6. VIII. 1954. 12,00	28,0	26,5	26,0
20. IX. 1954. 12,30	17,0	16,0	15,5
5. XI. 1954. 12,00	10,0	8,8	8,0
2. VI. 1955. 12,00	19,2	18,0	16,5

**Tabelle 2**  
pH-Werte der Sammelstellen I—III

Datum	Sammelstelle					
	I		II		III	
24. VII. 53.	8,06	—	8,06	—	8,11	—
8. V. 54.	8,06	8,11	8,24	8,15	8,15	8,24
4. VII. 54.	8,01	8,06	7,79	8,01	8,06	8,20
20. IX. 54.	7,96	8,06	8,15	8,20	8,20	8,24
2. VI. 55.	7,79	8,01	8,15	8,24	8,01	8,06

**Tabelle 3**  
Die Werte des gelösten O<sub>2</sub>-Gehaltes im Bodenwasser der Sammelstelle I—III (mg/l)

Datum	Sammelstelle		
	I	II	III
8. V. 54.	5,66	3,36	3,10
4. VII. 54.	3,90	1,02	0,86
20. IX. 54.	6,08	3,12	2,94
2. VI. 55.	4,22	1,24	1,16

Winter im allgemeinen nur zur Hälfte aufgefüllt war, was zu Folge hatte, daß der See in Ufernähe an mehreren Stellen bis auf den Grund gefroren war.

Das Wasser des Cseke-Sees gehört chemisch zu den Gewässern von Kalziumhydrokarbonat-Typ, auch dem Kalksteincharakter der Gegend entsprechend. Den pH-Wert des Wassers (in zwei Tiefen) und seinen Gehalt an gelöstem  $O_2$  ermittelte ich in 5 bzw. 4 Fällen. Die betreffenden Werte sind in Tabelle 2 und 3 zusammengefaßt.

Der an den drei ständigen Sammelstellen gehobene Schlamm läßt sich kurz wie folgt beschreiben:

Sammelstelle I: grau, nur in den tieferen Schichten mit ganz leichtem  $H_2S$ -Geruch, ziemlich weich, fühlt sich fein an, ist ziemlich glitschig. An der Oberfläche mit wenigem pflanzlichem Detritus, hier und da mit Algenüberzug. Der Gehalt an organischen Stoffen im Prozenten des Trockengewichtes beträgt 14,21%. (Aus dankenswerter Gefälligkeit bestimmt durch Dr. G. CSAJÁGHY, Leiter der Chemischen Abteilung im Staatlichen Geologischen Institut.)

Sammelstelle II: Die obere Schicht besteht aus 6–8 cm dickem, schwarzem,  $H_2S$ -haltigem, weichem, sich fein anfühlendem, ziemlich glitschigem, in Verwesung befindlichem Schlamm. An der Oberfläche findet sich in geringerer Menge pflanzlicher Detritus, Algengespinnst. Unter der dünnen Schlammschicht liegt eine harte Sandschicht.

Sammelstelle III: Die obere 10–12 cm dicke Schicht ist schwarz-dunkelgrau, leicht  $H_2S$ -haltig, sich fein anfühlend, ziemlich glitschig. Die Oberfläche ist mit Laubblättern und mit dem Detritus von Wasserpflanzen bedeckt. Die folgende Schicht ist etwa 20 cm dick, hart, lehmig, die darunter befindliche sandig.

Bekanntlich sind in Seesedimenten, die organischen Stoffe in größeren Mengen enthalten, für die darin lebende Fauna die unter der Einwirkung der Abbauprozesse leicht kritisch werdenden Gasverhältnisse von ausschlaggebender Bedeutung. In diesem Zusammenhang spricht BRUNDIN von einer  $O_2$ -Mikroschichtung und CSAJÁGHY–TOLNAY von der Grenzfläche zwischen  $O_2$ – $H_2S$  [8, 9]. Auf gewisse angenommene Möglichkeiten in seichten Seen habe auch ich bereits hingewiesen [3].

Zur Situation hinsichtlich der  $O_2$ – $H_2S$ -Grenzfläche an den Sammelstellen am Cseke-See kann folgendes bemerkt werden.

An der Sammelstelle I liegt die  $O_2$ – $H_2S$ -Grenze etwa 10–12 cm tief. An den Sammelstellen II und III, an denen sich in der oberen Schicht schwarzer, an organischen Stoffen reicher Schlamm befindet, liegt die Grenzfläche wider aller Erwartung nicht ständig unmittelbar nahe an bzw. über der Schlammoberfläche. Die  $O_2$ – $H_2S$ -Grenze liegt hier meiner Beobachtung nach im allgemeinen 1–2 cm tief im Schlamm. Der Umstand, daß sich unter der ziemlich dünnen, schwarzen Schlammschicht eine an organischem Stoffe besonders arme Sand- bzw. Lehmschicht befindet, in der keine  $H_2S$  produzie-

rende anaerobe Abbauprozesse vor sich gehen, beeinträchtigt gewißermaßen die nachteilige ökologische Wirkung der für die obere Schicht charakteristischen Gasverhältnisse.

### Untersuchungsergebnisse

**Quantitative Verhältnisse.** Die Tatsache, daß unter den aufgefundenen Arten die Chironomidenlarven und insbesondere die Larven einer einzigen Art, nämlich die der *Chironomus plumosus* L. (»semireductus«-Typ) (98,5% der Chironomiden!) weitaus überwogen, gestaltete die Massenveränderungen in der Makrofauna des Bodensediments in hohem Maße übersichtlich. Vorweg sei bemerkt, daß gegen Ende der Untersuchungsperiode *Tanytus punctipennis* Mc. in größerer Zahl anzufallen begann, eine Erscheinung, auf deren Erklärung ich bei der Erörterung der qualitativen Verhältnisse noch eingehen werde. An jeder Sammelstelle und bei jeder Sammelgelegenheit ermittelte ich anhand der Angaben meiner Originaltabellen [1] die auf 1 m<sup>2</sup> berechneten durchschnittlichen Abundanzwerte, wobei ich die »jüngeren« (d. h. im Stadium 1—2 befindlichen) von den »älteren« (d. h. im Stadium 3—4 befindlichen) Larven voneinander absonderte (Tabelle 4). Die Werte trug ich auch graphisch auf (Abb. 5).

Die Daten für das Jahr 1953 sind von März bis August abwechselnd groß und klein, d. h. der Wechsel in den drei Schwärmezeiten und die Zeitspanne zwischen diesen kommen klar zum Ausdruck. Durch den Ausfall der Einsammlung im April entstand keine Störung in der Auswertung, da in diesem Jahre das erste Schwärmen im Mai stattfand. In der verhältnismäßig langen Zeitspanne zwischen den Untersuchungen am 4. September und 29. Oktober ereignete sich — in der zweiten Hälfte des Monats September — ein Schwärmen. Einen sicheren Anhaltspunkt zur Erkenntnis dieser Vorgänge bietet uns jedoch das Verhältnis der »jüngeren« zu den »älteren« Larven in den Daten der Oktobersammlung. (Am 4. September betrug der Anteil der »älteren« Larven 89%, am 29. Oktober hingegen nur noch 22%!)

Im Jahre 1954 ließ sich auch unter Berücksichtigung der in den verschiedenen Stadien befindlichen Larven — ähnlich wie im Jahr zuvor — ebenfalls ein dreimaliges Schwärmen nachweisen. Die niedrigen Werte im Juni und September sind ohne Zweifel die Folge eines im Gange befindlichen Schwärmens. Die Vermehrung in der Zeit zwischen Juli und August (1334 — 1474 St./m<sup>2</sup>) läßt ein Schwärmen vermuten, das sich in der Zwischenzeit abgespielt haben durfte. Einen unmißverständlichen Beweis hierfür liefern auch die Anteile der in verschiedenen Stadien befindlichen Larven im Monat August: der Anteil der »älteren« Larven betrug damals insgesamt 11,4%! Die verhältnismäßig kurze Zeit von 5 Wochen zwischen den beiden Untersuchungen setzt auch auf diese Weise schnellere Prozesse voraus, für die

**Tabelle 4**  
*Die Abundanzwerte der Chironomidenlarven (St./m<sup>2</sup>)*

Datum	Sammelstelle			Exuvien
	I	II	III	
21. XI. 52.	168,6*	17,7	0,0	
	2406,4	417,3	222,0	
	2575,0	435,0	222,0	
25. III. 53.	541,8	—	0,0	
	1767,2	—	115,0	
	2309,0	—	115,0	
16. V. 53.	293,0	17,7	8,4	
	213,0	80,3	79,6	
	506,0	98,0	88,0	
18. VI. 53.	195,0	35,7	17,6	
	1545,0	142,3	186,4	
	1740,0	178,0	204,0	
24. VII. 53.	186,5	17,5	8,6	
	204,3	17,5	115,4	
	391,0	35,0	124,0	
31. VIII. 53.	186,5	—	—	
	1438,5	—	—	
	1625,0	—	—	
4. IX. 53.	159,9	26,7	0,0	
	1403,1	214,3	186,0	
	1563,0	241,0	186,0	
29. X. 53.	914,5	26,7	17,4	
	257,5	133,3	177,6	
	1172,0	160,0	195,0	
21. IV. 54.	124,0	0,0	0,0	
	1021,0	106,0	80,0	
	1145,0	106,0	80,0	
8. V. 54.	186,7	8,8	0,0	
	799,3	106,2	142,0	
	986,0	115,0	142,0	
15. VI. 54.	150,8	0,0	0,0	
	124,2	18,0	35,0	
	275,0	18,0	35,0	
4. VII. 54.	1076,5	35,6	15,0	
	257,5	302,4	293,0	
	1334,0	338,0	308,0	
6. VIII. 54.	1305,3	26,6	0,0	
	168,7	195,4	195,0	
	1474,0	222,0	195,0	
20. IX. 54.	177,7	0,0	0,0	
	204,3	27,0	35,0	
	382,0	27,0	35,0	
5. XI. 54.	293,0	0,0	8,6	
	1376,0	62,0	44,4	
	1669,0	62,0	53,0	
2. VI. 55.	26,5	0,0	11,0	
	168,5	9,0	1,0	
	195,0	9,0	12,0	

\* Die ersten Angaben beziehen sich auf die jüngeren, die zweiten auf die älteren Larven, die dritten geben die Summe der beiden zusammen an. + = wenige, ++ = viele, +++ = sehr viele Exuvien, ++++ = massenhaftes Vorkommen.

jedoch zu dieser Zeit alle klimatischen Voraussetzungen vorlagen. Das abgelaufene Schwärmen beweisen im übrigen auch die im August in großer Zahl gefundenen Exuvien. Interessant für dieses Jahr ist die Tatsache, daß sich das erste Schwärmen infolge des außergewöhnlich kühlen Frühjahrs sowie der äußerst launischen Witterung ziemlich verspätet hatte (Juni!) und daß der Hauptschwärmzeit von Ende April an vereinzelte Ausschlüpfe vorausgegangen

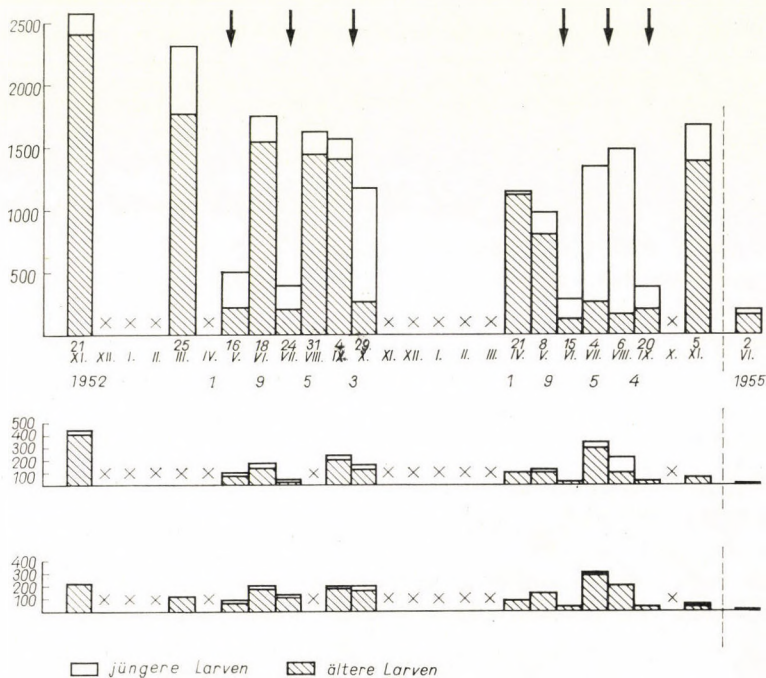


Abb. 5. Massenschwankungen der Chironomidenlarven (St./m<sup>2</sup>); Verhältnis der »jüngeren« und »älteren« Larven an der I, II., III. Sammelstelle

gen waren. Zwischen dem 21. April und 8. Mai, also in 18 Tagen, sank die Zahl der Larven pro m<sup>2</sup> z. B. von 1145 auf 986, und gleichzeitig erhöhte sich der Anteil der »kleineren« gegenüber dem der »älteren« Larven von 10,5 auf 18,5%.

Vergleicht man die Jahre 1953 und 1954, lassen sich für die Sammelstelle I in beiden Jahren je 3 Schwärmezeiten unterscheiden (s. Pfeile der Abb. 5). Im Jahre 1953 fielen sie in die Monate Mai, Juli und September, im Jahre 1954 in die Monate Juni, Juli, August und September. Die jährliche durchschnittliche Abundanzzahl der *Chironomus plumosus* Larven betrug an dieser Sammelstelle 1287 St./m<sup>2</sup>.

Die Werte der Sammelstelle II und III lassen — wie dies auch die Diagramme deutlich veranschaulichen —, keine sich wiederholende Prozesse erkennen. Dies erklärt sich daraus, daß beide Sammelstellen für die Chirono-

midenlarven ökologisch »Peius-Gebiete« darstellen, die überdies — im Gegensatz zur Sammelstelle I — auch unausgeglichene Lebensverhältnisse bieten. Wegen der Nähe der Makrovegetation (Röhricht, submerse Flora) ist die Lage des  $O_2$ — $H_2S$ -Grenze labil, auch ist es nicht ausgeschlossen, daß in bestimmten Zeitspannen im Bodenwasser ein völliger  $O_2$ -Mangel auftritt (Tabelle 3). Berücksichtigt man die Tatsache, daß die anteilmäßige Zahl der »jüngeren« Larven hier immer sehr niedrig liegt (Abb. 5), lohnt es sich den Gedanken BRUNDINS über die Wirkung der  $O_2$ -Mikroschichtung des Bodengewässers bzw. der Schlammoberfläche auf die verschiedenen Chironomidenlarven zu folgen [8]. Seiner Ansicht nach sind in Seen, in denen in der Oberflächenschicht des Schlammes absoluter  $O_2$ -Mangel herrscht, in erster Reihe die größeren Arten bzw. Exemplare imstande, sich die nötige  $O_2$ -Menge zu sichern. Die Erklärung hierfür ist darin zu suchen, daß die größeren Exemplare (also in diesem Falle die im späteren Stadium befindlichen!) in ihren senkrecht stehenden Gespinsten in höhere, an  $O_2$  reichere Schichten hinaufreichen. Es ist nicht ausgeschlossen, daß sich die Verhältnisse an den Sammelstellen II und III im Cseke-See auf diese Weise erklären lassen, Gewißheit hierüber könnte aber natürlich nur die (besonders heikle) eingehende Untersuchung der Mikroschichtung liefern.

Die Zahl der an den Sammelstellen II und III gefundenen Larven erreicht übrigens im Durchschnitt nicht einmal 10% der an der Sammelstelle I gefundenen.

Um die quantitativen Verhältnisse genauer beurteilen zu können, müssen noch zwei Umstände berücksichtigt werden. Der eine ist der Umstand, daß bei dem festgestellten jährlich dreimaligen großen Schwärmen vom Frühjahr bis zum Spätherbst unaufhörlich Chironomiden ausschlüpfen, wie dies auch die in dieser Zeitspanne ständig vorkommenden jüngeren Larven bezeugen. Einen anderen besonders wichtigen Faktor bildet der Verzehr von Larven durch die Fische. Er hängt natürlich in hohem Maße von der Zahl der Fische, von den Nährstoffverhältnissen, von der Freßlust der Fische usw. ab. Nach den überzeugenden Untersuchungen von LELLÁK [12] kann dieser Faktor unter den Verhältnissen einer Teichwirtschaft selbst eine 50%ige Minderung der Chironomidenpopulation ergeben.

**Prozentuale Anteile der Arten.** 98,5% der eingesammelten Chironomidenlarven gehörten — wie bereits festgestellt —, der *Chironomus plumosus* L. Art an, während sich die restlichen 1,5% auf 9 Arten, Artengruppen usw. verteilen.

Von besonderem Interesse ist, daß ich am 2. Juni 1955, also bei der nach dem Abschluß der Serienuntersuchung durchgeführten Kontrolluntersuchung an der Sammelstelle I ausschließlich Larven von *Tanytus punctipennis* Mc. fand, obwohl bis dahin an dieser Stelle (mit Ausnahme von 2 St.) ausschließlich Larven von *Chironomus plumosus* vorgekommen waren. Seine

Erklärung findet dies darin, daß die stärkere Düngung die submerse Vegetation, insbesondere die *Potamogeton*-Arten in so hohem Maße vermehrt hatte, daß im Sommer 1955 im See sozusagen keine freie Schlammfläche, ja selbst kein offenes Wasser mehr vorhanden war. Da sich die Larven von *Chironomus plumosus* L. an vegetationsfreien Schlammflächen halten, wurden sie durch die fortwuchernde Vegetation aus dem Benthos des Sees gänzlich verdrängt.

Bemerkenswert ist in der Makrofauna des Sedimentes der Anteil der Nicht-Chironomiden im Verhältnis zu den Chironomiden. Die betreffenden Zahlen enthält Tabelle 5. Die Nicht-Chironomiden sind in der Reihenfolge ihrer Häufigkeit wie folgt vertreten:

1. *Tubifex* sp.
2. Odonata-Larven
3. *Chaoborus crystallinus* und *Sphaeromias* sp.

**Gewichtsverhältnisse.** Da der Cseke-See zur Zeit meiner Untersuchungen ein Teich mit halb künstlichen Verhältnissen mit Fischzucht, mit submerser Vegetation von wechselnder Ausdehnung war, der ungleichen Verunreinigungswirkungen ausgesetzt war und wechselnden Wasserstand hatte, strebte ich keine Berechnung der Jahresproduktion des Makrozoobenthos an. Einige Male führte ich jedoch informative Messungen, Berechnungen zur Ermittlung der

Tabelle 5

Der prozentuale Anteil der Nicht-Chironomiden in der Makrofauna

Datum	Sammelstelle I					Sammelstelle II			III
	<i>Tubifex</i>	<i>Chaoborus</i>	<i>Sphaeromias</i>	Odonata	Insges.	<i>Chaoborus</i>	<i>Sphaeromias</i>	Insges.	Odonata
21. XI. 52.	5,5	0,9	0,0	0,0	6,4	0,0	4,0	0,0	0,0
25. III. 53.	0,0	0,0	0,8	0,0	0,8	—	—	—	31,5
16. V. 53.	0,0	0,0	0,0	0,0	0,0	0,0	15,3	15,3	33,3
18. VI. 53.	0,0	0,5	0,0	0,0	0,5	0,0	13,0	13,0	14,8
24. VII. 53.	4,3	0,0	0,0	0,0	4,3	0,0	50,0	50,0	12,5
31. VIII. 53.	7,3	1,0	0,0	0,0	8,3	—	—	—	—
4. IX. 53.	8,4	2,1	0,5	0,0	11,0	6,8	0,0	6,8	0,0
29. X. 53.	5,2	0,4	0,0	0,0	5,6	4,7	9,5	14,2	0,0
21. IV. 54.	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	35,7
8. V. 54.	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	30,4
15. VI. 54.	0,0	6,0	0,0	0,0	6,0	0,0	33,3	33,3	50,0
4. VII. 54.	1,5	0,0	0,5	0,0	2,0	0,0	9,5	9,5	2,3
6. VIII. 54.	0,0	1,7	0,0	0,0	1,7	6,6	10,0	16,6	0,0
20. IX. 54.	17,2	5,1	3,4	0,0	25,7	0,0	0,0	0,0	20,0
5. XI. 54.	4,0	1,0	0,0	0,0	5,0	0,0	12,5	12,5	0,0
2. VI. 55.	29,4	0,0	0,0	5,8	35,2	0,0	0,0	0,0	30,0



**Tabelle 6**  
Abundanz- und Gewichtsdatenwerte der Sammelstelle I

Larvenstadien		1-2	3-4	1-4	1-4
Datum		St./m <sup>2</sup> g/m <sup>2</sup>	St./m <sup>2</sup> g/m <sup>2</sup>	St./m <sup>2</sup> g/m <sup>2</sup>	kg/ha
18.	VI. 53.	195,0 0,78	1545,0 43,26	1740,0 44,04	440,4
29.	X. 53.	914,5 3,65	257,5 7,18	1172,0 10,83	108,3
8.	V. 54.	186,7 0,74	799,3 22,38	986,0 23,12	231,2
15.	VI. 54.	150,8 0,60	124,2 3,47	275,0 4,07	40,7

**Tabelle 7**

Überblick der Makrobenthosorganismen im Cseke-See

Systematische Einheit	Exemplar	Sammelstelle		
		I	II	III
<b>Tubificidae</b>				
<i>Tubifex</i> sp. ....	93	+	—	—
Odonata (larvae) ....	40	+	—	+
Diptera (larvae)				
<b>Culicidae</b>				
<b>Chaoborinae</b>				
<i>Chaoborus crystallinus</i> DEG. ....	26	+	+	—
<b>Heleidae</b>				
<i>Sphaeromias</i> sp. ( <i>candidus</i> LOEW.?) ....	26	+	+	—
<b>Chironomidae</b>				
<b>Tanypodinae</b>				
<i>Procladius choreus</i> MG. ....	3	—	+	—
<i>Tanytus punctipennis</i> MG. ....	22	+	—	—
<b>Orthoclaadiinae</b>				
<i>Allopsectrocladius obivus</i> WALK. ....	1	—	+	—
<b>Chironominae</b>				
<i>Chironomus plumosus</i> L. ....	2725	+	+	+
<i>Chironomus thummi</i> MG. ....	1	—	—	+
<i>Cryptochironomus rostratus</i> K. ....	1	+	—	—
<i>Glyptotendipes polytomus</i> K. ....	4	—	—	+
<i>Glyptotendipes</i> sp. ....	3	—	—	+
» <i>Polypedilum convictum</i> WALK.« ....	4	—	+	—
» <i>Pentapedilum</i> sp.« ....	1	—	+	—

Biomasse der Chironomiden an der Sammelstelle I durch. Der besseren Übersicht halber habe ich in der nachstehenden Tabelle 6 die in das 1. und 2. sowie in das 3. und 4. Stadium gehörenden Larven voneinander nicht abgesondert, sondern mit Gewichtsmittelwerten gerechnet.

Bei der Bewertung der Biomassenangaben ist das kontinuierliche vereinzelte Ausschlüpfen und die Wirkung des Verzehrs durch die Fische gerade so in Betracht zu ziehen, wie bei den Wertveränderungen der Abundanz (p. 245).

**Artenzusammensetzung der Fauna.** Die gesammelten Arten mit Angabe der gefundenen Mengen und der Sammelstellen sind in Tabelle 7 zusammengefaßt.

Wie aus der Tabelle hervorgeht, ist die Makrofauna des Benthos im Cseke-See recht ärmlich und zufolge der öfters erwähnten Alleinherrschaft von *Chironomus plumosus* eintönig, obwohl an drei voneinander ziemlich abweichenden Stellen des Sees und serienweise gesammelt wurde. Die außer dem *Chironomus plumosus* vorkommenden Chironomiden-Arten waren in sehr geringer Zahl vertreten; von 8 der gefundenen 9 Arten kamen kaum einige Exemplare zum Vorschein! Darin spiegelt sich getreu die allgemeine ökologische Erfahrung, daß die zunehmend eintönigere Umwelt einerseits eine Minderung der Artenzahl, andererseits — bei den 1—2 Arten, die die optimalen (oder nahezu optimalen) Lebensverhältnisse eben hier finden —, eine Vermehrung der Individuenzahl zur Folge hat.

Den Verhältnissen des Cseke-Sees kommen einigermaßen die Gegebenheiten jener Seen nahe, in denen LELLÁK seine beachtenswerten populationsdynamischen Serienuntersuchungen vorgenommen hat [13, 14]. Da die von ihm untersuchten Seen 2,5—3,5 m, also beinahe zweimal so tief sind wie der Cseke-See, ist die in jenen gefundene Fauna wesentlich artenreicher und die artenmäßige Verteilung der Gesamtmenge auch gleichmäßiger. Dem ist noch hinzuzufügen, daß der Unterschied zwischen den Ergebnissen beider Untersuchungsserien auf keinen methodischen Grund zurückzuführen sei, da ja LELLÁK nicht häufiger Untersuchungen durchgeführt hat als ich und das von ihm benutzte Sieb eine noch größere Maschenweite (0,5 bzw. 0,32 mm!) hatte. Der Vergleich der Untersuchungsergebnisse bekräftigt jedenfalls die Annahme, daß in den seichten Seen die Gestaltung des Benthos vor allem durch das Fehlen der Tiefengliederung und durch den geringen Gehalt des Bodenwassers an gelöstem O<sub>2</sub> bestimmt wird.

All diese Faktoren spiegeln deutlich die eigentümliche Lage, die die mehr oder weniger großen seichten Seen mit ihren produktionsbiologischen und seetypologischen Charakteristiken in limnologischer, hydrobiologischer Hinsicht einnehmen.

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A TINEID MATERIAL (LEPIDOPTERA) FROM BANGUI,  
CENTRAL AFRICAN REPUBLIC

By

L. A. GOZMÁNY

ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST  
(DIRECTOR: DR. Z. KASZAB)

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DR. P. E. L. VIETTE, of the Natural History Museum, Paris, had very kindly sent me a material of Tineid moths for identification. The major part of the material was collected by J. PRIMOT, in Bangui on the Ubangi, Central African Republic, between December 1951 and February 1952. A number of Tineid specimens from various other localities in Africa were also present in the dispatch; they will be discussed in an appendix to the present paper. I wish to thank DR. VIETTE for the loan of the material, and the authorities of the Natural History Museum, Paris, for the cession of certain specimens and Paratypes to the Natural History Museum, Budapest. The Holotypes and the majority of the Paratypes are deposited in the Paris Museum (abbreviated NHMP), and some Paratypes in the Budapest Museum (abbr. NHMB).

As was to be expected, there were found in the material a number of species known from the larger Congo area. It was in the spring of 1965 that I revisited the enormous Tineid material preserved in the Royal Museum of Central Africa, Tervuren, Belgium, and the rather bulky paper resulting thereof is at present in print [4], to be published in Belgium in 1966. The paper contains also the description of many new Tineid taxa, mainly of species which inhabit the savanna regions around Elisabethville (Katanga). Some of these species were found to occur also in Bangui, hence several times references shall below be made to the descriptions and data given in the above paper. Since I received the Bangui material while I was still at work in Tervuren, certain specimens could be included as Paratypes of the taxa described on the basis of the Tineid collection of Tervuren. On the other hand, the identification of the rest of the material happened too late to permit the inclusion of the respective Bangui specimens in the Tervuren type-series.

*Paraclystis* MEYRICK, 1915

(Exot. Microl., 1, p. 293)

Syn.: *Plastopolypus* SILVESTRI, 1920; Boll. Lab. Zool. Portici, 14, p. 297;  
*Emmetoeca* MEYRICK, 1921; Ann. Transvaal Mus., 8, p. 127;  
*Passalactis* MEYRICK, 1935; Proc. Ent. Soc. London, 10, p. 49.

*Paraclystis melipecta* MEYRICK, 1915 (l. c.)

Syn.: *Plastopolypus divisus* SILVESTRI, 1920 (l.c.);  
*Plastopolypus integer* SILVESTRI, 1920 (l.c.);  
*Emmetoeca melicosma* MEYRICK, 1921 (l.c.);  
*Passalactis tentatrix* MEYRICK, 1935 (l.c.).

Two, rather dark, specimens in which the yellow basic color is profusely covered by the extensive fuscous pattern. Data: January, 1952 (gen. preps. 2308, 2309).

*Ceratophaga* PETERSEN, 1957

(Beitr. Entom., 7, p. 130—131)

*Ceratophaga vastella* (ZELLER, 1852; Vetensk. Acad. Handl., p. 88).  
 A female specimen, from 25 Febr., 1952 (gen. prep. 2567).

**Miramonopis** gen. n.

[Derivation of generic name: miror (= to admire) + Monopis]

Very small species, with hyaline discal spot present. Male genital organ: uncus + gnathos beak-shaped, anellus + aedoeagus removed from between valvae toward tegumen, vinculum narrow but saccus very wide and short.

The new genus should be allocated between *Paratinea* PETERSEN, 1957 (Beitr. Entom., 7, p. 159) and *Monopis* HBN., 1825. The former taxon has a differently shaped uncus + gnathos complex, anellus between the valvae, and a usually wide vinculum; the latter disposes of an uncus with a widely articulating base, anellus between the valvae and a thin, rod-shaped saccus. Also, the construction of the aedoeagal apex is different in both latter genera.

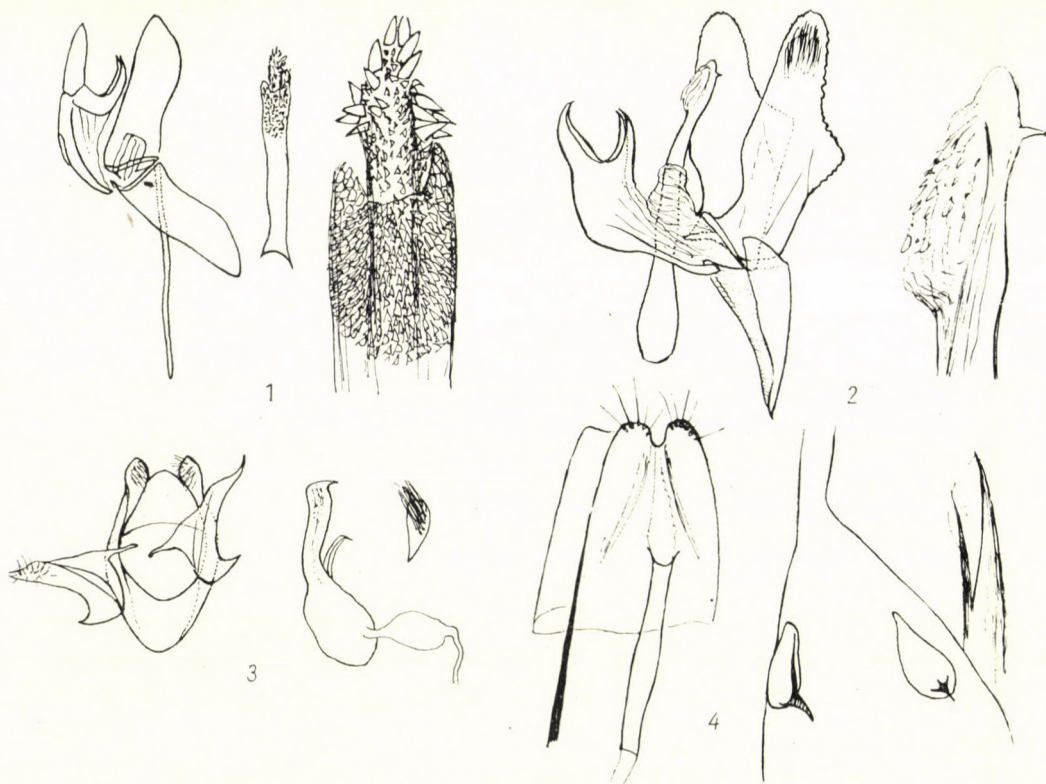
Type-species: *Miramonopis viettei* sp. n.

**Miramonopis viettei** sp. n.

Alar expanse: 9 mm. Head and thorax stramineous grey, antennae chalky grey, scapulae rather fuscous; fore wing stramineous with a strong grey suffusion; discal hyaline spot oval, in middle of wing, bordered by an equally large fuscous blackish spot apically; some few, long, fuscous scales in apical area, mostly in apex and along costa, this latter blackish at base, cilia concolorous; hind wing light sericeous grey, cilia light yellowish-grey.

Male genital organ: uncus and gnathos beak-shaped, opening caudad, vinculum narrow, bearing anellus and aedoeagus between its arms, saccus triangular, widely shield-shaped, short, dorsal margin of valva widely

concave basally, ventral margin with a large, subtriangular projection medially, margins sub serrate, valval apex widely rounded, bearing a batch of hairs, aedeagus long, tapering to a finely rounded apex, bearing a large ventral thorn, opening of duct on dorsal side, extruding vesica with irregular rows of small, triangular to scaly cornuti (Fig. 2).



Figs. 1—4. 1 = Male genital organ of *Monopis stenorrhoea* sp. n., laterally, valvae opened, aedeagus removed, and aedeagal apex also magnified, Paratype, gen. prep. 2594. 2 = Male genital organ of *Miramonopis viettei* gen. n., sp. n., laterally, aedeagus in situ, aedeagal apex also magnified, Holotype, gen. prep. 2583. 3 = Male genital organ of *Nannotinea simplex* gen. n., sp. n., ventrally, aedeagus removed and laterally, also one corema removed, Holotype, gen. prep. 2590. 4 = Female genital organ of *Monopis ubangi* sp. n., ventrally, genital plate and sclerotized section of ductus, also part of bursa showing two signa, Holotype, gen. prep. 2591, also magnified aedeagal apex of male Paratype, gen. prep. 2592

Female unknown.

The new species differs, by the complex of its specific features, from all known allies in the genera *Paratinea* PET., *Monopis* HBN., and *Tinea* L.

Holotype male: "8-2-1952 + gen. prep. 2583".

I dedicate the interesting new species to DR. P. E. L. VIETTE, of the Natural History Museum, Paris, in friendship and esteem.

*Monopis* HÜBNER, 1825  
(Verz. bek. Schmett., p. 401)

***Monopis ubangi* sp. n.**

Alar expanse: 12–14 mm. Head, thorax ochreous yellow, antennae dark fuscous grey, scapulae black; fore wing blackish fuscous, blackest at base and lightening (mixed with ever more fuscous) toward apex; a vivid yellow stripe on dorsum, twice indented above by two elongated black spots in fold, elongated hyaline spot above second black spot, in middle of wing, apical area also with some yellowish scales, especially on costa, cilia fuscous, with two shaded lines; hind wing whitish-grey with a sericeous sheen, cilia concolorous, with a yellowish-grey subbasal stripe.

Male genital organ: agreeing with that of *M. liberiella* Z., but valva slightly longer, tip of aedoeagus also without any cornuti (Fig. 4).

Female genital organ: upper section of ductus bursae sclerotized, long (much longer than in *liberiella* Z.), bursa with two large signa, phylli- or guttiform, each with a dorsal keel projecting into a sharp thorn (Fig. 4).

The new species belongs to the *liberiella*-group (with a yellow dorsal streak on the fore wing); *liberiella* Z. is, however, smaller, not as distinctly marked, with differences in the genital organs as given above, the signa of its female being also triangular; *addenda* GOZMÁNY 1965 [1, p. 258–259, Fig. 5] has a dense group of characteristic cornuti in the male aedoeagus.

Holotype female: "25-I-1952 + gen. prep. 2591"; Paratype male: "XII-1951—I-1951 + gen. prep. 2592"; deposited in the NHMP.

***Monopis stenorrhoea* sp. n.**

Alar expanse: 10–12 mm. Head, thorax light yellow, antennae blackish fuscous, scapulae blackish; fore wing fuscous mixed with black, mixture rather even; dorsum with a narrow, yellow streak, indented medially by a large, blackish spot reaching almost to dorsum, hyaline spot big, rounded, immediately above black spot, cilia concolorous; hind wing medium grey with some yellowish brassy shine.

Male genital organ: dorsal margin of valva slightly sinuous, apex finely pointed, aedoeagus about as long as saccus, apically densely covered with triangular, spiniform cornuti, apex of penis also with a cluster of large, denti- to spiniform teeth among small cornuti (Fig. 1).

Female unknown.

The new species also belongs to the *liberiella*-group; genitally, it stands nearest to *addenda* GOZMÁNY [1, p. 258–259, Fig. 5], but its aedoeagus is



longer and thicker, the apical cornuti more elongately spiniform; externally, *addenda* GOZM. is somewhat lighter, its antennae yellowish-grey.

Holotype male: "25-I-1952 + gen. prep. 2593"; two Paratype males: "12-1951-1-1952 + gen. prep. 2594" and "XII-1951 + gen. prep. 2595"; deposited in the NHMP and NHMB.

*Monopis immaculata* GOZMÁNY, 1966 [4, in print]. — Four Paratype specimens, from: "I-1952" (2 specimens); "XII-1952", and "8-2-1952 + gen. prep. 2433"; deposited in the NHMP and NHMB.

*Monopis meyricki* GOZMÁNY, 1966 [4, in print]. — A female specimen, from: "12-12-1952".

*Pachypsaltis* MEYRICK, 1914

(Supplementa Entomologica, No. 3, p. 60)

*Pachypsaltis morosa* sp. n.

Alar expanse: 15 mm. Head and thorax grey, mixed with some fuscous, antennae light grey, base of scapulae dark fuscous, otherwise grey; fore wing throughout mottled grey and fuscous, this latter color appearing in irregular spots without accumulating into consecutive striae: rather alternating with grey spots, especially along dorsum; cilia concolorous; entire wing with a slight yellowish sheen; hind wing grey, with a yellowish suffusion, cilia yellowish-grey.

Male genital organ: gnathos two ribbon-like appendages, uncus, tegumen and vinculum of normal design, valval apex wide, very intricate with a sinuous inner lobe or lamella and a sharply serrate outer margin; aedoeagus long, tubular, apically with some points (cornuti?) (Fig. 13).

The new species conspicuously differs, by reason of its patternless fore wings and the structure of the valval apex, from its sole known congener, *adecasta* MEYRICK, 1934 (Exot. Microl., 4, p. 516) (= *megalopa* MEYRICK, 1915; partim; Exot. Microl., I, p. 291; = *Myrmecozela pachystoma* MEYRICK 1920, Voyage de Ch. Alluaud et R. Jeannel en Afrique Oriental, II, Microlepidoptera, p. 98, **syn. n.**) [cf. also 4, in print].

Holotype male: "I-1952 + gen. prep. 2584".

*Phereoeca* HINTON et BRADLEY, 1956

(Entomologist, 89, p. 45-47)

*Phereoeca postulata* GOZMÁNY, 1966 [4, in print]. A male specimen, from February, 1952 (gen. prep. 2589). The species was described from Eala and Bambesa on the Congo, about 4.5° S of Bangui.

**Nannotinea** gen. n.

[Derivation of generic name: *nannos* (= dwarf) + *Tinea*]

Extremely small species. Antennae rather thick, 3/4; fore wing elongated, narrow; hind wing lanceolate.

Male genital organ characterized by pad-shaped unci on both sides of triangular tegumen, valvae subtriangular and deeply incised, hence roughly prong-shaped, vinculum annulate; no gnathos or saccus present; aedoeagus hooked apically, bulbous basally.

At the first glance, the new taxon resembles a small *Infurcitinea*-species, but the construction of the uncus and the tegumen as well as the shape of the rigid vinculum distinguish it sufficiently to warrant the establishment of a distinct genus. At present, no *Infurcitinea* SPULER species is known from the Ethiopian region.

Type-species: *Nannotinea simplex* sp. n.

**Nannotinea simplex** sp. n.

Alar expanse: 6 mm. Overall basic color chalky to ivory white: head with some admixture of grey hairs, antennae ringed white and fuscous to black, palpi very small, hardly discernible, hanging, white; base of thorax and scapulae also with some greyish scales; fore wing chalky white with a fine yellowish suffusion; pattern not too distinct, fuscous: 2 more or less entire, oblique, rather narrow striae at 1/2 and 2/3, interrupted in cell or constricted in fold, enclosed area with indication of 2 more striae but consisting rather of dispersed fuscous scales, apical area with 3—4 dots along margin (at termination of veins) and a larger blotch in exact apex, shoulder of costa at base and fold at base with a small, elongated spot each; cilia concolorous, with some fuscous scales; hind wing light pearl-grey, cilia whitish.

Male genital organ: unci 2 small, hairy pads on both sides of triangular tegumen rather removed from one another and not meeting caudad, vinculum narrow but extending into wide, hard, evenly arcuate ventral section, no gnathos or saccus present, valvae roughly triangular but deeply incised: upper prong long, apically mucronate and slightly recurving, hairy, lower portion small, pointed, anellus brachially affixed to aedoeagus (rather as in the smaller *Episcardia* taxa), aedoeagus hook-shaped apically, bulbous at base, penis with rows of dot-like cornuti (?), aedoeagus as long as, or slightly longer than, entire organ flattened dorso-ventrally; a pair of small coremata, consisting of hairs on a guttiform base (Fig. 3).

Female unknown.

The new species stands isolated among all known Tineid forms of the Ethiopian Region, and might only be compared to some *Infurcitinea* SPULER

species of the southern Palaearctic area. The new genus should also best be allocated near this latter taxon.

Holotype male: "8 - 2 - 1952 + gen. prep. 2590".

*Setomorpha* ZELLER, 1852

(Kongl. Vet. Akad. Handl., p. 94)

*Setomorpha rutella* ZELLER, 1852 (l. c.). — A female specimen of this well-known pest (Tropical Tobacco Moth), widely distributed also in the Ethiopian Region. From: XII-1951, gen. prep. 2571.



Figs. 5—6. *Perissomastix temptatrix* GOZMÁNY. 5 = Male genital organ laterally, gen. prep. 2569; 6 = Female genital organ latero-caudally, showing area of introitus and part of ductus, also removed bursa, gen. prep. 2568

*Perissomastix* ROTHSCHILD et WARREN, 1905

[Nov. Zool., 12, Nr. 1. p. (33)]

Syn.: *Malacyntis* MEYRICK, 1908; Proc. Zool. Soc. London, p. 738;  
*Catabola* DURRANT, 1913; Nov. Zool., 20, Nr. 1., p. (142);  
*Psolarcha* MEYRICK, 1933; Exot. Microl., 4, p. 412.

*Perissomastix temptatrix* GOZMÁNY, 1966 [4, in print]. — A series of 4 males and 1 female specimen, recently described from the other side of the Congo Basin, namely Katanga. I present also here the figure of the male genital organ (Fig. 5), a specimen showing an extremely arcuate (concave) dorsal margin and more sharply rounded base of the uncus than those of the Holotype. Of more interest is the figure of the female genital organ (Fig. 6, made after a better slide than that of the Paratype female of the description): ventral branches of apophyses interiores bent caudad, introitus vaginae of usual flange-like construction, its dorsal flap long and finely incised apically, ductus initially rather thick, then slightly constricted, bursa very large, elongately sacculiform, without any signa.

Data: from January to 8 February, 1952 [gen. preps.: 2549, 2569, 2570, 2572 (males) and 2568 (female)]. In the NHMP and NHMB.

*Perissomastix onyx* sp. n.

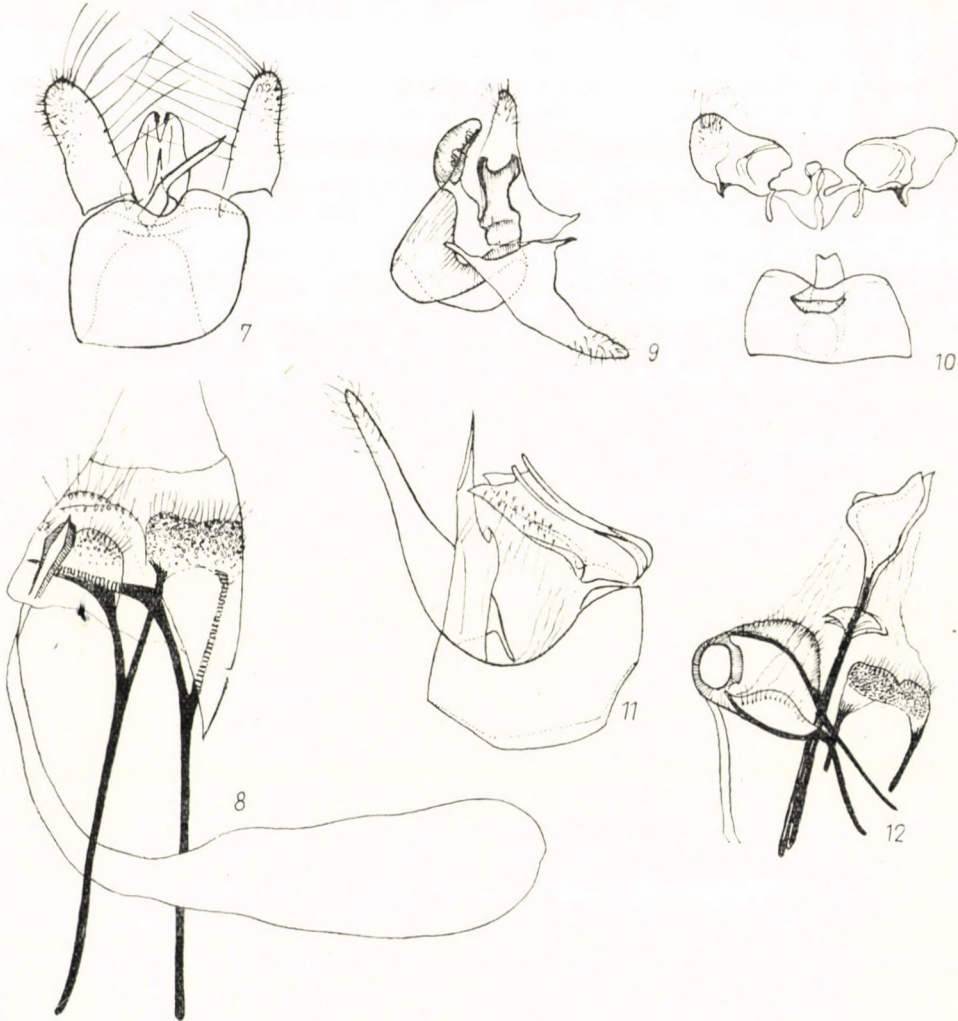
Alar expanse: 13—15 mm. Also a black-headed species of the “*othello*”-group. Head, scape of antennae, base of thorax and scapulae black, labial palpi dark rufous black, third joint blackish, thorax, scapulae light orange yellow with a strong stramineous to golden sheen, costa finely rufous to fuscous, cilia concolorous; hind wing medium grey with a coppery shine, cilia yellowish-grey.

Male genital organ: uncus-lobes elongated rectangular, inner lobe fine (like a narrow, unfurled flag), with very long hairs, apically sharp; dorsal “lobe” merely a rod-shaped process, as if dorsal margin were reinforced by a bar, dorsum very finely arched, almost straight, base finely rounded, also reinforced, entire uncus seemingly hardly articulated to tegumen, this latter dorsally relatively short, aedoeagus sharply pointed, valva narrow (Fig. 11).

Externally, the new species belongs, as was indicated above, to the “*othello*” or black-headed group of the genus, extremely rich in forms in the Ethiopian region. Within this group, it might be compared, as to genital structure, to *lucifer* GOZMÁNY, 1965 (Acta Zool., Hung., 11, p. 266—267, Fig. 15), whose uncus is, however, not “reinforced” dorsally, and is almost twice as big; and to *melanops* GOZMÁNY, 1966 [4, in print], with a dissimilarly

shaped inner lobe of the uncus, and being also twice as large. There is also a certain resemblance, as to genital structure, to *mili* GOZMÁNY, 1965 (Acta Zool. Hung., II, p. 269, Fig. 18), but this latter species belongs to the "red-headed"-group.

Holotype male: "XII-1951-I-1952 + gen. prep. 2551", and 6 male Paratypes, from XII-1951 to I-1952 (gen. preps. 2550, 2552, 2555, 2559, 2561, 2562). Deposited in the NHMP and NHMB.



Figs. 7—12. 7—8 = *Hyperbola primoti* sp. n. 7 = Male genital organ ventrally, Paratype gen. prep. 2556; 8 = Female genital organ laterally, gen. prep. 2553. 9 = Male genital organ of *Ectabola protracta* gen. n., sp. n., laterally, valvae opened, Holotype, gen. prep. 2563. 10 = Male genital organ of *Episcardia truncata* sp. n., ventrally, valval complex disattached, Holotype, gen. prep. 2565. 11 = Male genital organ of *Perissomatrix onyx* sp. n., laterally, Holotype, gen. prep. 2551; 12 = Female genital organ of *Ectabola protracta* gen. n., sp. n., laterally, introitus caudally, Paratype, gen. prep. 2564

**Ectabola** gen. n.

[Derivation of generic name: *εκτος* (= outside) + *Catabola*]

Small-sized species, externally resembling *Tineola* HS., or minute *Perissomastix* ROTHSCH. et WARR. species.

Genus defined by structure of genital organs: general resemblance to *Perissomastix* ROTHSCH. et WARR., 1905, but uncus of different and peculiar shape, usually compact, lobes apically invariably fused, aedoeagus small, also of different and curious shapes, often apically with a sausage-like appendage, valval margins usually emorse, occasionally very wide at base; female also resembling *Perissomastix* ROTHSCH. et WARR., but apophyses posteriores differently constructed caudally, introitus circular, without a characteristic dorsal flap.

Type-species: *Ectabola protracta* sp. n.

The new genus is best allocated between *Perissomastix* ROTHSCH. et WARR., and *Hyperbola* GOZMÁNY, 1965 (*Acta Zool. Hung.*, **11**, p. 269—271). It is, as far as known (the "*Tinea—Tineola*" species described by MEYRICK from the Oriental Region have not yet been revided), probably characteristic of the Ethiopian Region. I relegate the following species to the new genus: *pygmina* (GOZMÁNY, 1965; *Acta Zool. Hung.*, **11**, p. 269, Fig. 19); *deviata* (GOZMÁNY, 1966; *Acta Zool. Hung.*, **12**, p. 61—62, Fig. 10); *laxata* (GOZMÁNY, 1966; 4, in print); *perversa* (GOZMÁNY, 1966; 4, in print); and, probably, *phaeocephala* (MEYRICK, 1918; *Ann. Transvaal Mus.*, **6**, p. 44).

**Ectabola protracta** sp. n.

Alar expanse: 8 mm. Head, scapes rufous black, base of thorax and scapulae black, labial palpi sericeo-rufous, antennae thick, stramineous white, thorax, scapulae and basic color of fore wings shining sericeo-stramineous (male) or whitish stramineous (female), with a fine admixture, especially on costal area, of very light, rufous scales; no pattern, cilia concolorous; hind wing whitish pearl-grey, cilia stramineous.

**Male genital organ:** uncus straddling tegumen like a slightly bent sausage, fused apically, interoventrally with some hairs and indiscernible structure, aedoeagus erect, wide, comparatively large, constricted in middle and incised apically, here resembling a stout pincer, valvae roughly triangular, very wide at base and protracted into an unusual, pointed appendage ventrally, valval apex gradually tapering and with hairs, margins entire; vinculum very wide dorsally, gradually decreasing and narrow ventrally (Fig. 9).

**Female genital organ:** apophyses posteriores rounded apically only in ventral portion, elongately pointed dorsally, dorsal plates fused, short, hairy, ventral plates arcuate, their apophyses (ventral branch of

a. anteriores) short, introitus circular, large, simple, ductus very thin, bursa sacculiform, without signa (Fig. 12).

The new species, like nearly all of its congeners, also resembles externally a small *Tineola biselliella* HUMMEL specimen. However, the shape of the uncus, the aedoeagus, and especially that of the valvae place it in the subfamily Perissomasticinae, and also distinctly separate it from all related forms enumerated above.

Holotype male: "XII-1951 + gen. prep. 2563"; Paratype female: "2-2-1952 + gen. prep. 2564". Both type-specimens deposited in the NHMP.

### *Hyperbola* GOZMÁNY, 1965

(Acta Zool. Hung., II, p. 269—271)

*Hyperbola zicsii* GOZMÁNY, 1965 (l. c., p. 271, Figs. 20—21). A male specimen from: 8 Febr., 1952 (gen. prep. 2566). The species was described from the French Congo and Tanganyika, and is probably characteristic of secondary savannas.

### *Hyperbola primoti* sp. n.

Alar expanse: 13—14 mm. Head light orange yellow, antennae light ochreous white or pearly grey, base of thorax, scapulae, and costa of fore wing rufous, otherwise thorax, scapulae and fore wing light reddish ochreous with a stramineous suffusion or sheen, cilia concolorous; hind wing medium grey with some yellowish shine, cilia yellowish-grey.

Male genital organ: uncus-pads wide at base, gradually tapering to almost pointed apices, these latter with introrsely juxtaposed 4 black pegs, so near each other as almost coalescing, valvae of usual shape, characteristic of genus, with many, extremely long hairs on costa, vinculum very narrow dorsally but exceedingly wide ventrally, aedoeagus simple, slightly pistol-shaped, apically finely pointed (Fig. 7).

Female genital organ: characterized by ventrally projecting (like a beak) and caudally sharply pointed introitus, backed by its posterior frame, sloping dorsad, introitus also narrow and very elongated, entire structure strongly projecting when viewed laterally, ductus initially thin but gradually widening into a long, sacculiform bursa (Fig. 8).

The new species can be compared only to *phocina* (MEYRICK, 1908; Proc. Zool. Soc. London, p. 740), but its vinculum is narrow also ventrally, and the basic color of the fore wings is a fuscous bronze.

Holotype male: "25-I-1952 + gen. prep. 2557", and 5 Paratype males, from December, 1951 to 2 February, 1952 (gen. preps. 2553, 2556, 2558); deposited in the NHMP and NHMB.

*Episcardia* RAGONOT, 1895

(Bull. Soc. Ent. France, p. CV)

Syn.: *Cylicobathra* MEYRICK, 1920; Voyage de Ch. Alluaud et R. Jeannel en Afrique Oriental, II, Microlepidoptera, p. 100.

*Episcardia truncata* sp. n.

Alar expanse: 9 mm. Head deep orange yellow, antennae whitish-grey, thorax, scapulae and fore wings dark purplish fuscous with a strong purplish to bronzy sheen, cilia concolorous; hind wing grey with a strong coppery shine, cilia dark dusty grey.

**M a l e g e n i t a l o r g a n:** uncus-arms low, triangularly fungiform, basally (attachment to vinculum) triangular, valva slipper-shaped (characteristical for a special group of taxa), apically rounded, medially nearly bisected (conspicuous mainly on lower margin) by an elevated ridge, projecting on margin into a pyramidlike tooth, inner section of valva delimited by some wrinkles into a circular area; vinculum very narrow dorsally and wide ventrally, aedoeagus short, stout, apically wide, slightly incised, attached by usual elbow articulation to ventral wall of vinculum (Fig. 10).

The new species might be compared, as regards genital structure, to *jansei* GOZMÁNY, 1965 (Acta Zool. Hung., 11, p. 272, Fig. 22), *sinuosa* GOZMÁNY, 1966 (Acta Zool. Hung., 12, p. 66, Fig. 15), and to *decipiens* GOZMÁNY, 1966 [4, in print]. Their common feature is the slipper-shaped valva; but they all differ in the construction of the uncus and all lack the central ridge and tooth of the valvae.

Holotype male: "8-2-1952 + gen. prep. 2565".

*Hapsifera* ZELLER, 1847

(Isis, p. 32)

*Hapsifera pseudoglebata* GOZMÁNY, 1966 [4, in print]. A series of 5 specimens, mostly in very good state. The species seems to be characteristic of the peripheral regions of the Congo Basin (Katanga, Burundi). From: XII-1951 to II-1952 (gen. preps. 2577, 2578, 2579, 2580, 2586).

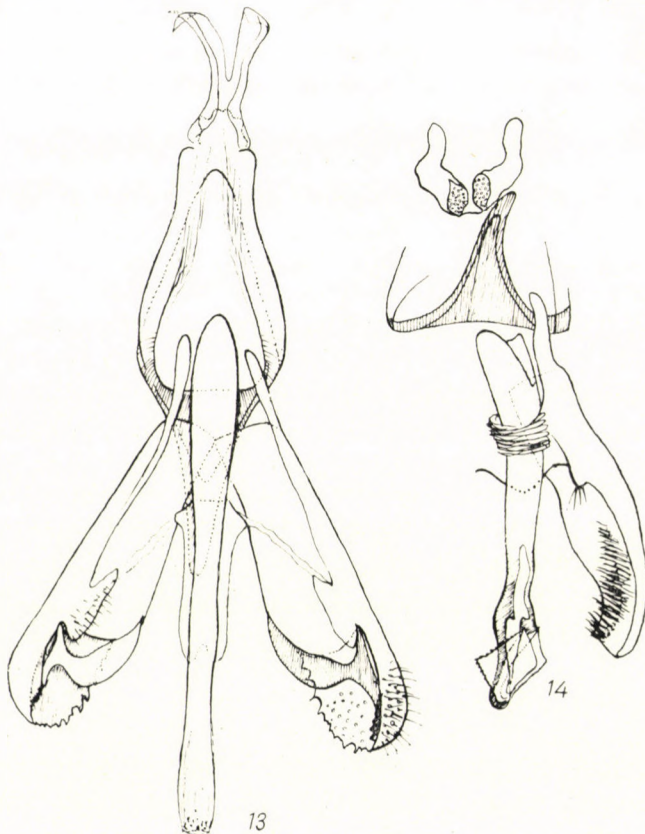
*Hapsifera refalcata* GOZMÁNY, 1966 [4, in print]. A series of 7 specimens; all slightly worn, but the dark coloration (rather dense fuscous irroration) is still conspicuous. The species was based on a single male type-specimen, from the Belgian Congo: Uele: Paulis. I submit herewith a figure, more detailed in the essential points than that given of the type: gnathos-arms not so much intricately conduplicate (refalcated) structures medially as ending in a scrobiculate pad each, and conjoined by a rugulose membrane; tip of aedoeagus flanked on both sides by an oblong membrane, bent into two



triangular portions, outer portion with serrate edges, lobes of membrane embracing (below recurving tip of aedoeagus) elongated aperture of penis; anellus densely rugose like folds of an accordion (Fig. 14).

The material contained no females.

The series originated from January to middle of February, 1952 (gen. preps. 2575, 2576, 2581, 2582, 2585, 2587, 2568).



Figs. 13—14. 13 = Male genital organ of *Pachypsaltis morosa* sp. n., ventrally, valval complex everted. Holotype, gen. prep. 2584. 14 = Male genital organ of *Hapsifera refalcata* GOZMÁNY, ventrally, only gnathos and recurved sacculus shown, valval complex represented only by everted right valva, anellus, and aedoeagus, gen. prep. 2575

### *Pitharcha* MEYRICK, 1908

(Proc. Zool. Soc. London, p. 751)

*Pitharcha latriones* (MEYRICK, 1917; Exot. Microl., 2, p. 88). A series of 5 specimens: 3 males and 2 females. From: 15 January to 12 February, 1952 (gen. preps. 2574, 2597). The female genital organ, with its

characteristically shaped introitus and the oval, scrobiculated areas on the dorsal plate, is distinct and differing from that of the type-species of the genus, *chalybea* MEYRICK, 1908 (l. c.) (Fig. 16).

As was indicated in the introduction, a number of species, originating from diverse localities in the Ethiopian region, were also submitted for identification, together with the material from Bangui. They are identified and listed as follows:

*Ceratophaga vastella* (ZELLER, 1852); a female specimen from Nairobi, leg. PONCINS et LAMBERTYE, 1912 (gen. prep. 2607).

*Ceratophaga ethadopa* (MEYRICK, 1938; Inst. Parcs Nat. Congo Belge, fasc. 14, p. 27); a dark-colored female specimen, also from Nairobi, April 1913, leg. BABAULT (gen. prep. 2608). The type-specimen was described, based on two males, from the Belgian Congo; I was able to find a large series in the collection of the Royal Museum of Central Africa, Tervuren [4, in print], originating from the localities Elisabethville, Lushambo, and Ruthshuru. Now also the environs of Nairobi can be added to the range of the species.

*Silosca licziae* GOZMÁNY, 1966 [4, in print]. The specimen, originating from the Ivory Coast (Adipodoumé, April, 1964, leg. PIART et GRIVEAUD + gen. prep. 2217), is a Paratype female. The Holotype and one Paratype derive from the rain forests of the Belgian Congo: Uele: Paulis.

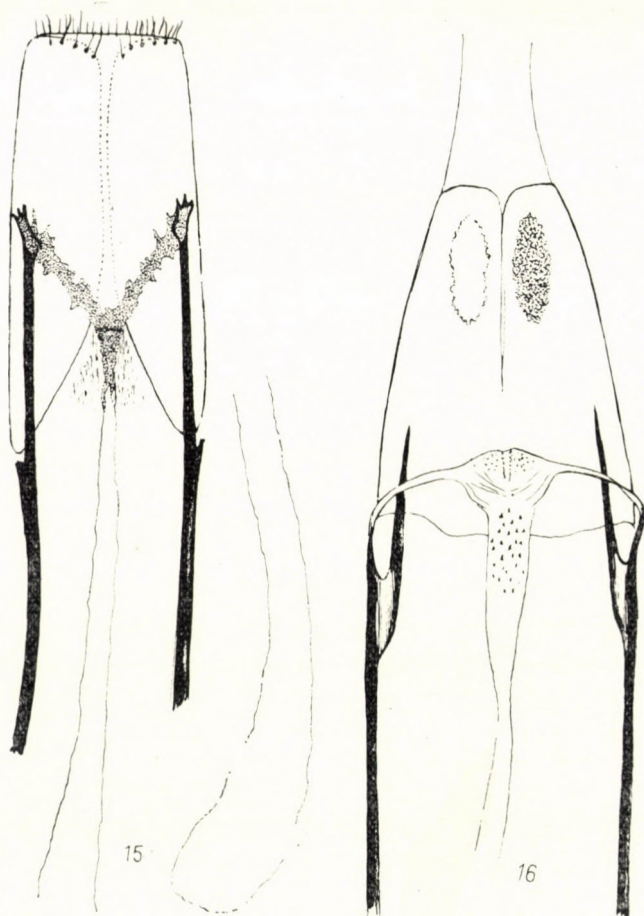
*Scalidomia horridella* (WALKER, 1863; Cat. Lep. Het., 28, p. 474). A series of 4 male specimens from Dongo, Angola (29—31 Dec., 1912, leg. R. CHABOT; gen. preps. 2599, 2600, 2601, 2602).

*Scalidomia fetialis* (MEYRICK, 1917; Exot. Microl., 2, p. 88). 2 female specimens from the Ivory Coast (localities: Azaguié, Daloa; Sept. and Nov., 1964, leg. GRIVEAUD, gen. preps. 2604 and 2605), and 1 female specimen from the French Sudan (Bamako, gen. prep. 2606).

*Scalidomia efformata* GOZMÁNY, 1965 (Acta Zool. Hung., 11, p. 282, Fig. 34). The species was based on a single male exemplar, captured on the French Congo-Gabon border. I drew it in later, as a junior synonym of *S. horridella* (Wlk.), since I was unable to detect distinct differences between the genital structures of their male genital apparatuses [4, in print]. However, the female specimen found in the material under discussion (Ouama, Abyss., 15 Juin 1925 + Museum Paris coll. UNGEMAH + gen. prep. 2603), fully justified my previous judgement: the species is truly distinct and must thus again be elevated to its specific rank. The specific features of the *Scalidomia*-taxa, at least those of the *horridella*-subgroup, are best shown by the female genital organs. I submit here the following description: dorsal branch of apophyses posteriores straight (as in *estimata* GOZMÁNY, 1965; and *texturata* GOZMÁNY, 1966, in print), but with a palmate termination, here covered by a deeply V-shaped, narrow, marginally emorse, scrobiculated band on dorsal side of

genital plate; introitus small and narrow, situated in a finely aciculated, triangular area on ventral side, ductus long, narrow, ending in an equally narrow bursa (Fig. 15).

The female genital organ can be likened only to that of *texturata* GOZMÁNY, 1966 [4, in print], but the scrobiculated, V-shaped band of this latter is much



Figs. 15—16. 15 = Female genital organ of *Scalidomia efformata* GOZMÁNY, dorsally, introitus and its acicular area on ventral side also shown, bursa disattached, gen. prep. 2603. 16 = Female genital organ of *Pitharcha latriodes* (MEYRICK), ventrally, scrobiculated areas on dorsal side also shown, gen. prep. 2597

more flat and slightly wider, besides the insect being very light-colored, and with a distinct, striated pattern. On the other hand, *efformata* GOZM. is almost as dark as *platyloxa* (MEYRICK, 1930), and its most distinctive feature is the light, oblong, pretornal spot, like a mirror, on the fore wing.

The species, as far as known, is the rarest of all of its congeners, probably preferring mountainous forests with a high precipitation.

*Hapsifera revoluta* MEYRICK, 1914 (Bull. Mus. Hist. Nat. Paris, **20**, p. 122). Three specimens of this taxon rather common in East Africa, originating from Birbir, Ethiopia (14 June, 1926, coll. UNGEMACH), Nairobi (April, 1913, leg. BABAULT), and Lumbwa, British East Africa (1906, leg. ROTHSCHILD).

*Pitharcha chalineae* MEYRICK, 1908. A female specimen from the Ivory Coast (Adiopodoumé, June, 1964, leg. PIART).

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Author's address: Budapest, VIII., Baross u. 13, Hungary.

## TAXONOMIC INVESTIGATIONS OF FRESH-WATER FISH SPECIES BY PAPER CHROMATOGRAPHY

By

L. HALMÁGYI and J. TÓTH

SMALL ANIMAL BREEDING RESEARCH INSTITUTE, GÖDÖLLŐ

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In the classification and identification of fish species, the same as in all other groups, primarily the morphological and anatomical differences are used. For the exposition of relationship, other biological disciplines had contributed a number of data.

In the last 12 years, taxonomy made also use of the chromatographic method. It is mainly employed to find comparatively simple and well distinguishable, constant characteristics, resting on biochemical differences, in the several systematic units. Investigations in this respect were, as far as we are informed from literature, successful in fish and other animal groups.

In our work, we have attempted to obtain data on whether the paper chromatographic patterns, fluorescing in UV light, are characteristic of the fresh-water fish species, and applicable in their taxonomy.

One of the first paper-chromatographic zootaxonomical works by BUZZATI-TRAVERSO and RECHNITZER (1953) indeed dealt with fish. Samples were taken from the muscles, liver, and crystalline lens of the eye of freshly killed fish, and investigated by unidimensional paper chromatography. Samples fluorescing in UV light, as well as ninhydrin positive ones, were equally studied. The individual samples were found to be identical intraspecifically. Satisfactorily recognizable differences between the species were found, independent of the size or age of the specimens studied. The ninhydrin positive patterns of the fish species *Paralabrax clathratus*, *P. maculatofasciatus*, and *Hystero-carpus traski* were figured in the publication. DANNEVIC (1955) studied 23 marine fish species, corroborating BUZZATI-TRAVERSO's and RECHNITZER's results. It was also DANNEVIC (1956) who found differences in the ninhydrin positive chromatograms of the codfish populations deriving from the waters of the Skagerrak and the Lofoten. With the aid of the chromatographic method, subgroups within the codfish populations of these two main research areas could be demonstrated and delimited. RECHNITZER (1956) studied, in *Sardinops caerulea*, the chromatograms of materials fluorescent in, or absorbing, UV light, as well as ninhydrin positive substances. He was able to show constant differences between the subspecies. According to that author, the

method is suitable to differentiate between subspecies difficult to separate. VISWANATHAN and KRISHNA PILLAI (1956) compared the circular and unidimensional chromatographic patterns of *Sardinella*, *Hemirhamphus*, *Atherina*, *Leiognathus*, and *Caranx* fish species. In studying the *Gadus* and *Sebastes* fish species, BARRY and O'ROURKE (1959) contended that, for a satisfactory separation of the species, divers investigations with the chromatographic method should be made. ENGE and MCKEE (1959) made chromatograms from the muscles of *Coregonus* species. They have studied the temperature range of fish conserved for the purpose of chromatographic examinations. They have found different chromatographic patterns in the various forms of whitefish. MATSUMOTO (1960) investigated the free amino-acids of the muscles, by uni- and two-dimensional methods and using diverse solvents, in the fish species *Parathunnus*, *Thunnus*, *Neothunnus*, *Katsuwonus*, *Euthynnus*, and *Auxis*. He found the paper chromatographic method suitable for the taxonomic examination of mature specimens; for larvae, however, no unequivocal results were received.

### Technique

For examination, fish, either freshly killed or preserved for 3—4 days at  $-10^{\circ}\text{C}$  in refrigerators, were used. A sample was taken from the cephalic skin, possibly from the interocular area, and mechanically cleaned. A thorough cleaning of the skin was found to be unnecessary, because practice had shown that the bits of different tissues eventually adhering to the skin had not disturbed the evolution of the fluorescent pattern. For one sample, we took generally a 12—16 mg skin strip from one specimen. In some cases, we were compelled, due to the small size of the fish, to take skin samples from several specimens for the preparation of one chromatogram.

For the chromatography, we used  $30 \times 27$  cm WHATMAN No. 1 papers, and applied the unidimensional ascending process, with  $3 \times 12$  hours of development. Seven skin samples were placed on one paper, so that the cleaned and weighed skin strip was simply pressed to its predetermined place on the paper. Starting line was 3 cm from the lower margin of the paper. Prior to development, the paper was not exposed to the fumes of the solvent. Development was made in a 25 liter glass vessel, at  $20 \pm 1^{\circ}\text{C}$ . The solvent consisted of the upper phase of a 4 : 1 : 5 mixture of butanol, acetic acid, and water.

Chromatograms were studied in the UV light of an analytical quartz lamp, in a dark-room. The lamp was 300 W, the applied filter a UG 2 violet filter, transmitting mainly 350  $m\mu$  wave length rays. The fluorescent, colored spots on the paper were marked in pencil. Color hues were recorded as compared to the previously made chromatograms.

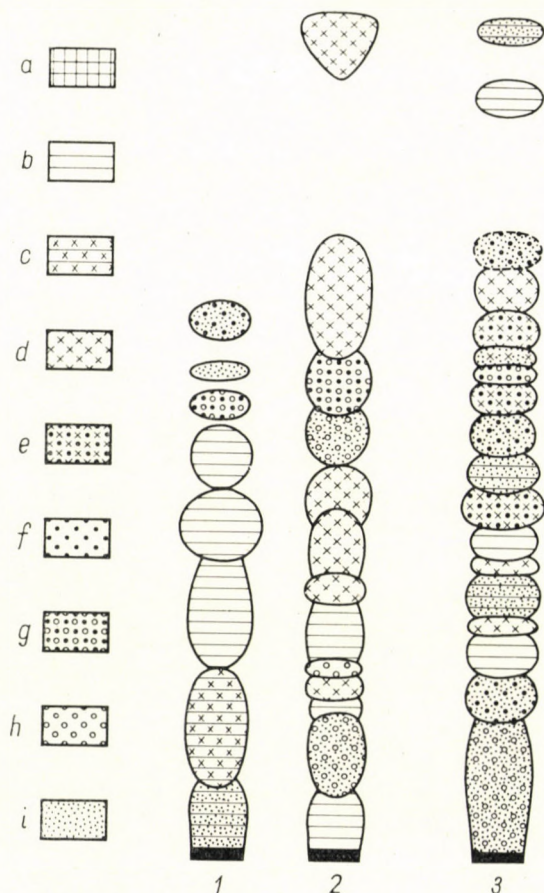
The evaluation of the chromatograms were in every case made 1—2 days after drying. At the closing of the present work, even our oldest chromatograms are not older than half a year, and they are still vividly fluorescent.

### Research Material and Results

In the course of investigations, 172 specimens of 32 fish species belonging to 9 families had been studied. The system and the name of the species are given after BERG (1948—49). In listing the several species, we also submit data concerning the locality of the investigated material, the number of exemplars studied, and the extreme values of the body length. The chromatograms are presented in schematic figures.

## SALMONIDAE

1. *Salmo trutta* L. morpha *fario* L. — Szilvásvár, 12 specimens, 125—225 mm. A highly complex chromatogram of many spots. The violet spots predominate (Fig. 1).



Figs. 1—3. The chromatograms of 1 = *Salmo trutta* L. morpha *fario* L., 2 = *Salmo irideus* GIBBONS, 3 = *Esox lucius* L. a = reddish-violet, b = violet, c = bluish-violet, d = blue, e = greenish-blue, f = green, g = yellowish-green, h = yellow, i = grey. In the schemes, the thicker or denser lines or markings represent a more intensive fluorescence. Dots have been used not only for grey, but also to denote the greyish shade of other colors

2. *Salmo irideus* GIBBONS. — Szilvásvár, 8 specimens, 77—221 mm. A complex chromatogram, of many spots, consisting of light blue, medium blue, and light greenish-blue spots. The triangular, blue spot on the upper portion of the chromatogram is very characteristic (Fig. 2).

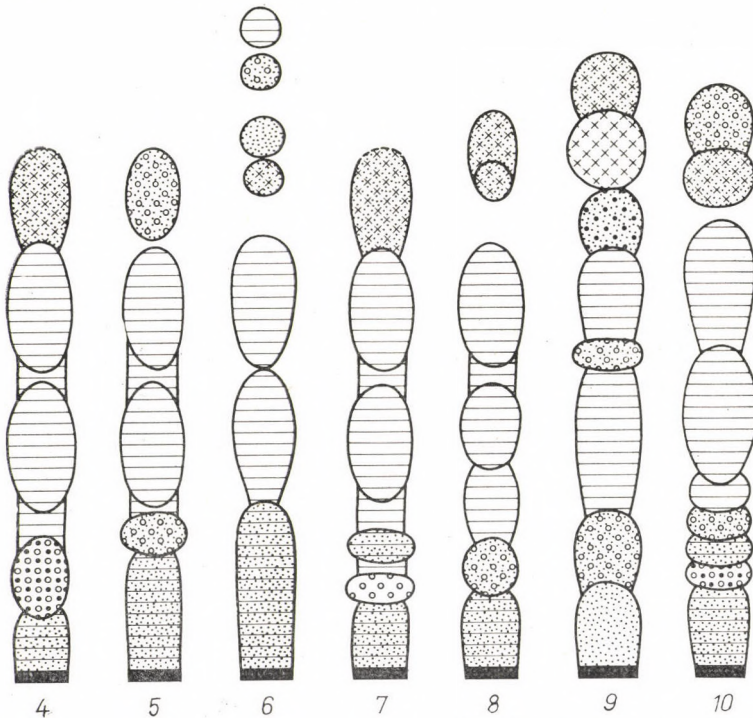
## ESOCIDAE

3. *Esox lucius* L. — Tisza, 4 specimens, 158—350 mm. The chromatogram is very complex, of many spots, displaying violet, blue, greenish-blue, and yellowish-green components (Fig. 3).

## CYPRINIDAE

4. *Rutilus rutilus* (L.) — Lake Velence, the rivers Körös, Tisza, 7 specimens, 56—185 mm.

The two large violet spots fluoresce the most vividly, with a very pale, indistinct violet spot above them. Below, a pallid violet spot is transitional to the large, dirty yellowish blotch (Fig. 4).



Figs. 4—10. The chromatograms of 4 = *Rutilus rutilus* (L.), 5 = *Leuciscus idus* (L.), 6 = *Phoxinus phoxinus* (L.), 7 = *Scardinius erythrophthalmus* (L.), 8 = *Aspius aspius* (L.), 9 = *Tinca tinca* (L.), 10 = *Chondrostoma nasus* (L.)

5. *Leuciscus idus* (L.) — Lake Balaton, Tisza, 7 specimens, 154—230 mm.

The two large violet spots are the most vivid. Above them, a very pale, indistinct, yellowish-grey spot can be discerned, and a similar one below them (Fig. 5).

6. *Phoxinus phoxinus* (L.) — Malomtó, in Tapolca, 11 specimens, 42—73 mm.



The cephalic skin strips of several exemplars were used for one chromatogram. Two large, violet spots are the most vividly fluorescent, with smaller grey and bluish spots differentiated above them (Fig. 6).

7. *Scardinius erythrophthalmus* (L.) — Lake Balaton, Tisza, 8 specimens, 58—238 mm.

The two violet spots are the most vividly fluorescent; the chromatogram of this species is very similar to that of *R. rutilus*. The differences lie in the narrower but more vivid yellow stripe in the lower part of the chromatogram. In that of the specimens originating from the Balaton, the yellow spot is more vivid than in the chromatogram of fish from the Tisza (Fig. 7).

8. *Aspius aspius* (L.) — Körös, 5 specimens, 115—370 mm.

Two large, vividly violet spots are differentiated in the middle of the chromatogram. Above them, a greyish-blue, vivid spot can be discerned, transitional into a less vivid spot. Below, a dirty yellowish spot is distinct (Fig. 8).

9. *Tinca tinca* (L.) — Dombóvár (fish-pond), Tisza, 4 specimens, 133—245 mm.

The two large violet spots are the most vivid, with an enclosed greyish-blue blotch. There are three vivid spots above the large violet ones, the middle one light blue, the other two dirty bluish (Fig. 9).

10. *Chondrostoma nasus* (L.) — Tisza, 3 specimens, 220—315 mm.

Of the two large violet spots, the lower one fluoresces more intensively, and has a bluish hue. On the lower part of the chromatogram, yellowish-green, greyish-yellow, and dirty violet spots can be seen. There are, above the big violet spots, two large greyish blotches: the lower is more vivid and of a bluish hue, the upper is tinted yellowish (Fig. 10).

11. *Alburnus alburnus* (L.) — Galga brook, Körös, 10 specimens, 44—125 mm.

Several specimens were used for a chromatogram. The lower one of the two large violet spots has a more bluish hue. The violet spots on the lower part of the chromatogram are less vivid, while the greyish-blue spot on the upper part of the chromatogram is the most strongly fluorescent in its centre. Above this latter one, there is yet a pale violet spot (Fig. 11).

12. *Blicca bjoerkna* (L.) — Lake Balaton, 3 specimens, 165—185 mm.

As compared to the chromatogram of the other species of the family Cyprinidae, that of this form is comparatively pale, but still interpretable. The two large violet spots are present also here. Above them, two greyish-blue spots can be seen; the lower one is relatively more vivid. On the lower part of the chromatogram, pale, dirty yellowish spots are differentiated (Fig. 12).

13. *Abramis brama* (L.) — Lake Velence, Tisza, 5 specimens, 166—225 mm.

The two large violet spots are the most vividly fluorescent. There are above them a paler and a stronger yellowish-grey spot. On the lower part of the chromatogram, a vivid and a pallid yellowish-grey spot can be seen (Fig. 13).

14. *Abramis sapa* (PALLAS) — Tisza, 3 specimens, 170–200 mm.

The chromatogram differs insofar from that of *A. brama* that the two upper yellowish-grey spots are absent (Fig. 14).

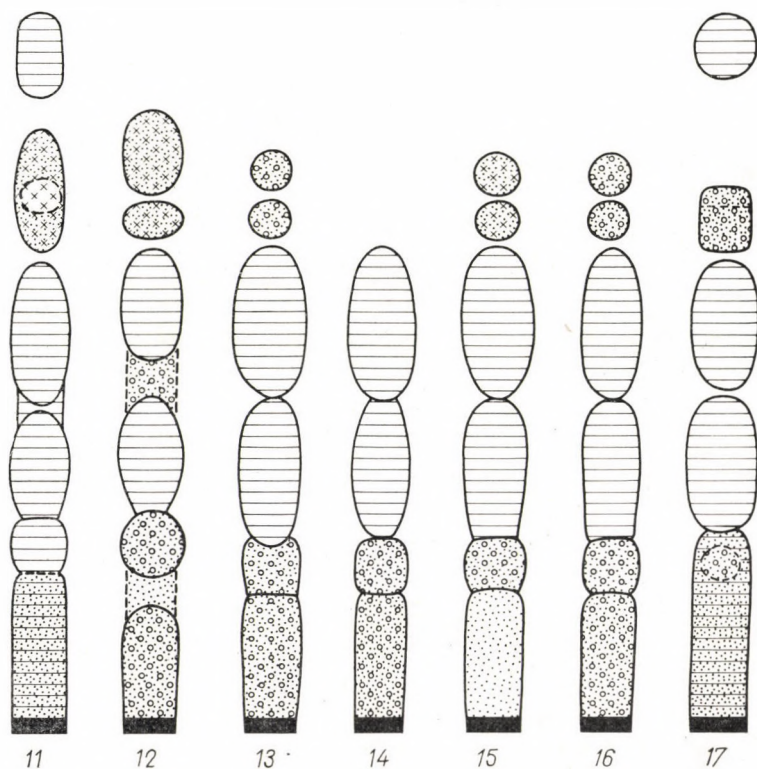
15. *Abramis ballerus* (L.) — Tisza, 4 specimens, 170–193 mm.

The two upper spots have a vivid greyish-blue color. Otherwise, the chromatogram agrees with that of *A. brama* (Fig. 15).

16. *Vimba vimba* (L.) — Tisza, 3 specimens, 165–235 mm.

The chromatogram is strikingly similar to that of *A. brama*. The difference lies in the stronger fluorescence of the greyish-yellow spot below the large violet ones (Fig. 16).

17. *Pelecus cultratus* (L.) — Lake Balaton, Tisza, 5 specimens, 175–330 mm.

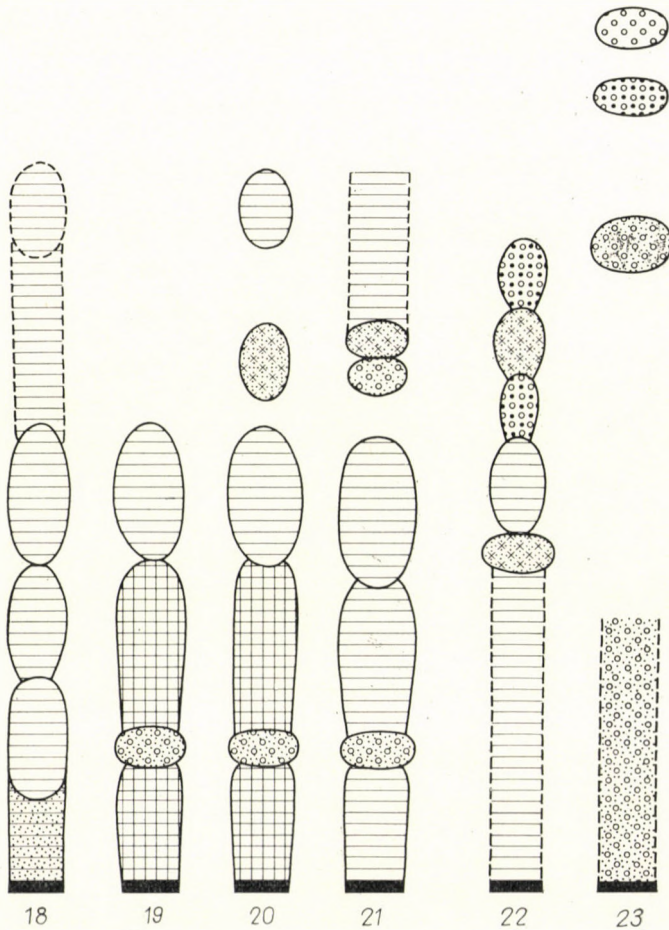


Figs. 11–17. The chromatograms of 11 = *Alburnus alburnus* (L.), 12 = *Blicca bjoerkna* (L.), 13 = *Abramis brama* (L.), 14 = *Abramis sapa* (PALLAS), 15 = *Abramis ballerus* (L.), 16 = *Vimba vimba* (L.), 17 = *Pelecus cultratus* (L.)

The two large violet spots are the most vividly fluorescent. Below them, there is a large dirty violet blotch, emitting a smaller, dark yellow spot. Above the large violet spots, there is a yellowish-grey, and above this, a violet spot (Fig. 17).

18. *Rhodeus sericeus amarus* (BLOCH) — Galga brook, 13 specimens, 25—54 mm.

The cephalic skins of several exemplars had been used for one chromatogram. The two large violet spots are the most vividly fluorescent. Below them, paler violet spots can be discerned. Above the large violet spots, there is an extremely pallid violet suffusion, of which a comparatively more vivid violet spot can be differentiated (Fig. 18).



Figs. 18—23. The chromatograms of 18 = *Rhodeus sericeus amarus* (BLOCH), 19 = *Carassius carassius* (L.), 20 = *Carassius auratus gibelio* (BLOCH), 21 = *Cyprinus carpio* L., 22 = *Cobitis taenia* L., 23 = *Misgurnus fossilis* (L.)

19. *Carassius carassius* (L.) — Gödöllő (fish-pond), Lake Velence, 14 specimens, 80—165 mm.

Of the two large violet spots, the lower one has a reddish hue. There is a similarly reddish-violet spot also on the lower part of the chromatogram (Fig. 19).

20. *Carassius auratus gibelio* (BLOCH) — Hódmezővásárhely (fish-pond), Darvas (fish-pond), 9 specimens, 100—170 mm.

The chromatogram differs insofar from that of *C. carassius* that there is a greyish-blue and a pale violet spot above the large violet spots (Fig. 20).

21. *Cyprinus carpio* L. — Gödöllő (fish-pond), Dombóvár (fish-pond), 6 specimens, 120—195 mm.

We investigated scaled specimens. Of the two large violet spots, the upper one fluoresces more vividly. Below them, greyish-yellow and dirty violet spots can be seen. On the upper part of the chromatogram, an extremely pale violet spot can be discerned, with a smaller greyish-blue and a greyish-yellow spot below it (Fig. 21).

#### COBITIDAE

22. *Cobitis taenia* L. — Dombóvár (fish-pond), 1 specimen, 85 mm.

A complex chromatogram. There is a very pale violet suffusion on its lower part, and above it, greyish-blue, vivid violet, greenish-yellow, vivid greyish-blue, and pale greyish-blue spots are differentiated (Fig. 22).

23. *Misgurnus fossilis* (L.) — Dombóvár (fish-pond), 2 specimens, 114 and 165 mm.

There is a very pale, dirty yellowish suffusion in the lower part of the chromatogram; in its upper third, three spots are visible (from below to above): a greyish-yellow, a greenish-yellow, and an ochreous yellow one (Fig. 23).

#### SILURIDAE

24. *Silurus glanis* L. — Tisza, 2 specimens, 140 and 145 mm.

No fluorescent chromatogram could be obtained.

#### AMIURIDAE

25. *Amiurus nebulosus* LE SUEUR — Tisza, 5 specimens, 118—162 mm.

No fluorescent chromatogram could be obtained.

#### ANGUILLIDAE

26. *Anguilla anguilla* (L.) — Lake Balaton, 1 specimen, 390 mm.

No fluorescent chromatogram could be obtained.

## GADIDAE

27. *Lota lota* (L.) — Tisza, 1 specimen, 280 mm.  
No fluorescent chromatogram could be obtained.

## PERCIDAE

28. *Lucioperca lucioperca* (L.) — Tisza, 1 specimen, 177 mm.  
Very pale, indistinct yellowish and bluish spots appear. No taxonomically usable, fluorescent chromatogram could be obtained.
29. *Lucioperca volgensis* (GMELIN) — Lake Balaton, 4 specimens, 212 — 415 mm.  
Of the species belonging to the family Percidae, this one gives the comparatively best chromatogram. However, this is also extremely pale and indistinct, and cannot be used for taxonomical purposes.
30. *Perca fluviatilis* L. — Lake Balaton, 1 specimen, 210 mm.  
No taxonomically interpretable chromatogram could be obtained.
31. *Acerina cernua* (L.) — Lake Balaton, Tisza, 7 specimens, 100 — 142 mm.  
Only an extremely pale, indistinct fluorescence appears. No interpretable chromatogram had been obtained.
32. *Acerina schraetser* (L.) — Tisza, 3 specimens, 183 — 199 mm.  
No evaluable chromatogram had been obtained.

We have endeavoured to investigate specimens originating from different localities. Thus we have studied fluvial and lacustrine exemplars of many species. In general, the chromatograms of specimens deriving from divers localities were agreeing. *S. erythrophthalmus* forms an exception, as was already mentioned above, because the chromatograms of the Tisza and Balaton specimens differed from one other. To arrive at safe deductions, however, one would need the examination of larger series.

We have also endeavoured to select our material so as to include fish of divers size and thus of different ages. Size and age had, however, not influenced the chromatographic pattern of any given species.

In the case of a number of species (*S. trutta* m. *fario*, *S. irideus*, *R. rutilus*, *A. brama*, *C. carassius*, *C. carpio*), we have taken into consideration also the sexual differences. However, the chromatograms of the sexes were identical within the species.

**Discussion**

As was already stated, the aim of our work was to obtain data for the usability of paper chromatography in the taxonomy of fresh-water fish. The authors cited in the References all commend the taxonomic applicability of the method for Pisces. The fish species, indeed genera, examined by us had

not yet been investigated in the respective literature. Accordingly, pending our studies, we could not consider the usability of the method for the involved fresh-water fish as proved.

First of all, we have studied the different organs of some fish species with identical techniques, e.g., muscles, liver, brain, the crystalline lens and the iris of the eye. An evaluable, fluorescent chromatogram was received only from the iris. Its preparation, however, implies a long work of dissection, and the fish must be killed. The skinning of the head is incomparably simpler, and to take a strip of skin from the head does not necessarily mean the destruction of a larger fish specimen. After the preliminary examinations, we have thus decided on studying the cephalic skin.

WHATMAN No. 1 paper and the solvent mixture are the most widely used in paper chromatography. Our method was relatively simple. Any involved, two-dimensional, or other chromatographic process would have been indicated only if at least two of the investigated species had shown entirely identical chromatograms.

By this method, we had not attained the complete separation of the materials. Nor had that been our purpose. For the taxonomist, it is not indispensable to separate the substances composing the chromatographic pattern in their entirety, and to know their chemical composition. Still, we deem it necessary to remark that the fluorescent substances visible on the paper belong to the pteridines. Of their chemical nature and occurrence in fish, ZIEGLER-GÜNDER's (1956) comprehensive treatise gives all basic information.

After development, we have never seen colored spots in normal light on the paper. This implies that it is not the substances which are responsible for the natural color of the body that fluoresce. Whether the two groups of substances are interconnected or not, was not within the scope of aim of the present taxonomic paper.

As an experiment, we have sprayed several chromatograms also with ninhydrin solution. Fluorescence had then entirely stopped. This result corroborates RECHNITZER's (1956) similar findings. Therefore, if the fluorescent and ninhydrin-positive samples are both studied, one must first mark always the fluorescent spots.

The two trout species of the family Salmonidae agree in the highly complex nature of their chromatograms. No similarities were found in the color and arrangement of the spots. — The chromatogram of *Esox lucius* is the most complex one of all investigated species. With its 18 spots and their coloration, its taxonomic distinctness from all other fish species is strikingly revealed.

Of the family Cyprinidae, 18 species had been studied. The chromatograms of the species are similar to each other and satisfactorily demonstrate the systematic homogeneity of the family. The presence of the two large

violet spots is characteristic of every species. Of these, only the lower one has a reddish hue in the *Carassius* species. The chromatograms of *C. carassius* and *C. auratus gibelio* are very similar. The chromatogram of *Cyprinus carpio* also rather resembled those of the *Carassius* taxa. Again, the chromatograms of the three *Abramis* species and *Vimba vimba* are very similar to each other, especially in the case of *A. brama* and *V. vimba*. This implies the close relationship of the four fish species.

*Rutilus rutilus* and *S. erythrophthalmus* are morphologically and ecologically also similar. According to the investigations of Sz. M. FERENCZ (1962), this resemblance is also displayed by the scales. Their chromatograms are also very similar.

The two examined species of the family Cobitidae have very peculiar and specific chromatograms; they are also rather different from one another.

Aside of the family Cyprinidae, the number of species was too small to allow the inference of chromatographic features characteristic of the given families. Still, one might state as follows: The family Salmonidae can be characterized by the vividly fluorescent, complex chromatograms. The family Esocidae has the most involved chromatogram. The family Cyprinidae is distinct by the large violet spots and, dissimilarly to the other families, the fundamental similarities displayed in the chromatograms. There are no fluorescent spots on the lower part of the chromatograms of the family Cobitidae. The families Siluridae, Amiuridae, Anguillidae, and Gadidae fail to give fluorescing chromatograms. The family Percidae shows some fluorescence, but no evaluable chromatograms could be obtained. Hence the presence or absence of fluorescence is also connected to systematical units — in the present case, at the family level.

The patterns are well suitable for the separation and characterization of the families and species. Our investigations had thus justified the usability of the paper-chromatographic method in the taxonomic investigation of several fresh-water fish families, thus in the majority of the fish species of Hungary.

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Authors' addresses: Kisállattenyésztési Kutatóintézet, Gödöllő, Hungary.



## REVISION DER TENEBRIONIDEN-GATTUNG MICRODERA ESCHSCH. (COLEOPTERA)

Von  
Z. KASZAB

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

(Eingegangen am 14. Januar 1966)

Die Gattung *Microdera* ESCHSCHOLTZ 1831 enthält eine Anzahl ausschließlich asiatischer Arten. Die erste Revision der Gattung schrieb im Jahre 1897 E. REITTER; seine Tabelle enthält 26 Arten. Die zweite Revision, ebenfalls von E. REITTER, erschien im Jahre 1900 in seinen »Bestimmungstabellen«, in denen er seine frühere Bearbeitung der Gattung fast ohne Änderung übernommen hat. In seiner Tabelle behandelt er fast alle bis dahin bekannten Arten. Es fehlten nur 2 Arten von BATES sowie einige Arten von MOTSCHULSKY, FISCHER VON WALDHEIM, FALDERMANN und BAUDI.

Seit dieser Zeit wurde eine Anzahl neuer Arten von den Herren E. REITTER, SCHUSTER, BLAIR, KOCH, SKOPIN, MEDVEDEV und von mir selbst beschrieben, so daß sich die Artenzahl der Gattung bis heute reichlich verdoppelt hat. Seit der zweiten Revision der Gattung bei REITTER ist keine neue Bearbeitung oder Bestimmungstabelle erschienen, die REITTERSche, grundlegende Arbeit ist also völlig veraltet, so daß man bei der Bestimmung der in Mittelasien meist weit verbreiteten und oft häufigen *Microdera*-Arten auf große Schwierigkeiten stößt.

Die Arten der Gattung *Microdera* ESCHSCH. sind vom Osten in der chinesischen Provinz Ordos nach Westen hin über die aride Zone von chinesisch Turkestan, Kasachstan, Afghanistan und dem Iran bis nach Arabien verbreitet. Der Schwerpunkt ihrer Verbreitung liegt jedenfalls in Kasachstan, wo eine Anzahl Arten vorkommen. Die Zahl der Arten vermindert sich nach dem Südwesten und Süden zu allmählich, so daß aus dem Iran nur einige, aus Arabien hingegen nur eine einzige Art bekannt geworden ist.

Für meine Untersuchungen stand mir ein sehr reiches Material zur Verfügung. Besonders wertvoll ist die eigene Sammlung von E. REITTER, im Besitze des Ungarischen Naturwissenschaftlichen Museums in Budapest, sowie die Typen von SCHUSTER, BOGATSHEV, SKOPIN, MEDVEDEV, BATES, usw. Für die Zusendung wertvollen Materials bin ich Kollegen in verschiedenen Museen zu großem Dank verpflichtet.

In unserem Material fand ich weitere 9 Arten resp. Unterarten, die ich nachstehend beschreibe. Mit diesen sowie mit den mir unbekanntem 2 Arten von MOTSCHULSKY erhöht sich die Artenzahl auf 68.

Auf Grund der Typenuntersuchungen sind auch einige synonymische Bemerkungen nötig, u. zw.:

1. *Microdera* (s. str.) *scythiformis* REITTER 1915 gehört nicht zur Gattung *Microdera*, sie ist vielmehr ein echter *Scythis*. Die Art muß in diese Gattung übertragen werden. Die Synonymie:

*Microdera scythiformis* REITTER 1915 = *Scythis scythiformis* (REITTER 1915), KASZAB **comb. nov.**

2. *Microdera* (s. str.) *transversicollis* REITTER var. *parvicollis* REITTER 1897 ist eine eigene Art und muß umbenannt werden, da eine *parvicollis* schon früher von F. BATES im Jahre 1879 beschrieben wurde. Die Synonymie lautet:

*Microdera transversicollis* REITT. var. *parvicollis* REITTER 1897 = *Microdera* (s. str.) *reitteri* nom. nov., nec F. BATES 1879, **comb. nov.**, **nom. nov.**

3. *Tentyria Przewalskyi* REITTER 1887, die REITTER selbst später in die Gattung *Microdera* eingeteilt hat, ist mit der von F. BATES früher beschriebenen Art *Microdera laticollis* synonym. Die Synonymie lautet:

*Tentyria Przewalskyi* REITTER 1887 = *Microdera Przewalskyi* REITTER 1897 = *Microdera laticollis* F. BATES 1879, **syn. nov.**

4. *Tentyria Przewalskyi* REITT. var. *basalis* REITTER 1887 ist auch schon nach REITTER eine eigene Art und keine Varietät, nach meinen Untersuchungen jedoch mit der von F. BATES beschriebenen *Microdera parvicollis* synonym. Die Synonymie lautet:

*Tentyria Przewalskyi* REITT. var. *basalis* REITTER 1887 = *Microdera basalis* REITTER 1897 = *Microdera parvicollis* F. BATES 1879, **syn. nov.**

5. *Microdera* (s. str.) *Semenowi* REITTER 1897 ist ebenfalls synonym, die Synonymie lautet:

*Microdera Semenowi* REITTER 1897 = *Microdera parvicollis* F. BATES 1879, **syn. nov.**

6. *Microdera halophila* SKOPIN 1961 = *Microdera schusteriana* KASZAB 1957, **syn. nov.**

7. *Microdera subfoveolata* SKOPIN 1964 = *Microdera subseriata* REITTER 1889, **syn. nov.**

8. Die Gattung *Adordanea* REITTER 1897 unterscheide ich nicht von der Untergattung *Dordanea* REITTER 1887, weshalb ich sie einziehe.

Im folgenden gebe ich vorerst die Bestimmungstabelle der Arten, in der nur 2 Arten von V. MOTSCHULSKY fehlen (*convexicollis* MOTSCH. und *excavata* MOTSCH.), und sodann die Beschreibung der neuen Formen.

#### Bestimmungstabelle der Arten der Gattung *Microdera* Eschscholtz

- 1 (8) Basis der Flügeldecken vollständig dick gerandet. Prosternum hinter den Vorderhüften etwas eckig

1. Subgen.: **Tentyrodera** KOCH 1943

- 2 (7) Flügeldecken mit Spuren nicht ganz regelmäßiger Punktreihen oder gestreift oder mit kaum erkennbaren Reihenpunkten, die Zwischenräume meist fein und spärlich punktiert, eine feine Punktierung jedoch stets erkennbar.
- 3 (4) Seiten des Kopfes zwischen Wangen und Epistom, wo die gebogene Stirnlinie einmündet, stark ausgeschnitten. Halsschild breit scheibenförmig, Seiten stark gerundet. Zwischenräume der Flügeldecken ziemlich grob und dicht punktiert, wesentlich größer als die Halsschildmitte, verdichtete Punktierung zwischen der verworrenen Grundskulptur wahrnehmbar. Länge: 12—12,5 mm. Süd-Iran (Bushire)
1. **marginata marginata** BAUDI 1874
- 4 (3) Seiten des Kopfes zwischen Wangen und Epistom ohne ausgesprochenen Ausschnitt. Flügeldecken feiner punktiert.
- 5 (6) Kleiner. Basalrand der Flügeldecken scharf, jedoch nicht wulstförmig gehoben. Flügeldecken in feinen, leicht furchig vertieften Streifen unregelmäßig, doppelt punktiert, die Streifen jedoch gegen die Seiten hin völlig verloschen. Zwischenräume kaum etwas feiner und spärlicher punktiert als die Reihen. Halsschild breiter, glänzender. Länge: 11—11,5 mm. Irak (Bagdad) (= *Rhytinota evansi* BLAIR)
2. **marginata evansi** (BLAIR 1923)
- 6 (5) Größer. Basalrand der Flügeldecken wulstförmig gehoben. Flügeldecken fein skulptiert, auf der distalen Mitte mit 5—6 Reihenrudimenten, jedoch nicht streifig, die Zwischenräume vorn stärker, hinten erloschen punktiert. Länge: 13—17 mm. Zentral- und Ost-Arabien (Dibba, Rub'al Khali, Al Rimal, Tuwairifa, Jafura, Hidba Hafair, W. Thesiger) (= *Rhytinota deserticola* BLAIR; *M. marginata* PEREZI KOCH 1943)
4. **marginata deserticola** (BLAIR 1933)
- 7 (2) Flügeldecken mit je 8 tief eingeschnittenen, aus unregelmäßig doppelt gestellten Punkten bestehenden Punktreihen, die vorn und hinten erloschen sind, Zwischenräume scheinbar unpunktiert. Halsschild äußerst fein punktiert, Kopf größer. Länge: 12 mm. Iran: Belutschistan (Bender Tchahbahar)
3. **marginata brandti** KOCH 1943
- 8 (1) Basis der Flügeldecken ungerandet oder nur beiderseits neben den Schultern entwickelte Randung, manchmal an den Schultern erloschen oder unterbrochen.

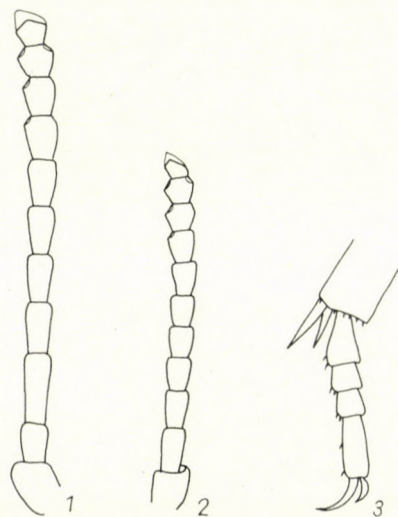


Abb. 1—2. Fühler von *Microdera tscharynensis* sp. nov. (1) und *M. lindbergi* sp. nov. (2). —  
Abb. 3. Hintertarsus von *M. lindbergi* sp. nov.

- 9 (10) Beine und Fühler kurz. Das 2. Fühlerglied so lang wie das 3. und länger als das 4. (Abb. 2); 1. Glied der Hintertarsen kürzer als das Klauenglied (Abb. 3). Vorderrand des Clypeus asymmetrisch, mit zwei stumpfen Ecken. Basis der Flügeldecken beiderseits gerandet. Vorderrand des Halsschildes gerandet

## 2. Subgen.: *Amicrodera* subgen. nov.

Halsschild breit trapezförmig, zur Basis hin stark verengt, die Randung fein, auch der Vorderrand fein und vollständig (Abb. 12). Die feine Seitenrandung der Flügeldecken bis zur Basalmittte erweitert, Schultern vollkommen abgerundet, ohne Ecke. Oberseite fein und spärlich punktiert. Propleuren glatt, kaum sichtbar und äußerst spärlich mit raspelartigen Punkten. Vorderschienen am Außenrand scharfkantig. Länge: 7—9 mm. West-Afghanistan

5. *lindbergi* sp. nov.  
 10 (9) Beine und Fühler länger, das 2. Fühlerglied kürzer als das 3. und nicht länger als das 4. (Abb. 1); 1. Glied der Hintertarsen mindestens so lang wie das Klauenglied, meist aber bedeutend länger. Vorderrand des Clypeus mit einem scharfen oder stumpfen Zahn, manchmal stumpf abgerundet.  
 11 (118) Basis der Flügeldecken fein oder scharf gerandet, die Randung an den Schultern nicht unterbrochen, eine Schulterecke mehr oder weniger ausgebildet, die Basis vor dem Rand steil abfallend.  
 12 (117) Zwischen den nach vorn verengten Wangen und Basis des Clypeus ohne deutliche Ausrandung; Wangen in einer ununterbrochenen, fast geraden Linie in den Clypeus übergehend (Abb. 4—10). 1. Glied der Mittel- und Hintertarsen seitlich nicht oder nur schwach komprimiert

## 4. Subgen.: *Microdera* s. str., REITTER 1897

- 13 (16) Augenfalten hoch oder sehr hoch aufgewölbt. Letztes Abdominalsegment stark gewölbt, in den Seitenansicht gebogen. Halsschild flach, scheibenförmig, viel breiter als lang, grob und einzeln punktiert. Propleuren und Seiten des Bauches grob längsrundlich punktiert. Sehfläche der Augen schräg nach vorn gerichtet.  
 14 (15) Augenfalten plötzlich und sehr hoch aufgewölbt, ohrförmig, von oben betrachtet, den größten Teil der Augen bedeckend. Seiten des Halsschildes vor der Basis plötzlich und gerade verengt, Basalrand breit gerundet. Länge: 11—13 mm. China: Kanssu (= *Dordanea aurita* REITTER)

9. *aurita* (REITTER 1889)

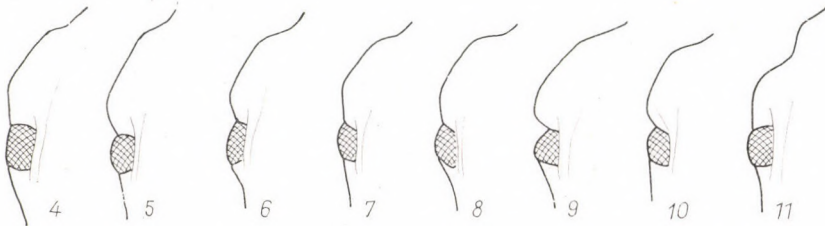
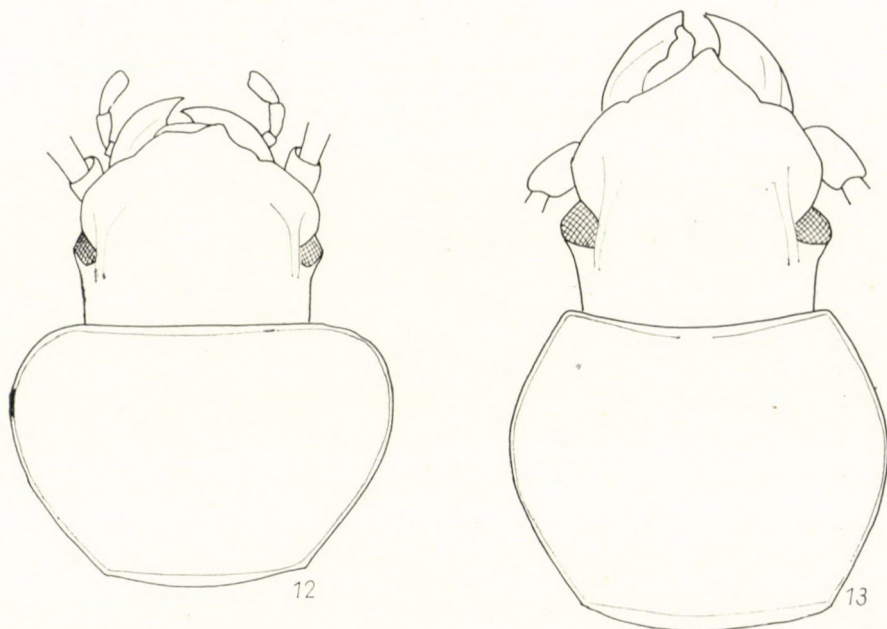


Abb. 4—11. Linke Seite des Kopfes von *Microdera hybrida* SKOPIN (4), *M. convexa* TAUSCHER (5), *M. interrupta* REITTER (6), *M. balchaschensis* SKOPIN (7), *M. kaszabi* SKOPIN (8), *M. thoracica* sp. nov. (9), *M. iliensis* SKOPIN (10) und *M. desertoides* SKOPIN (11)

- 15 (14) Augenfalten nicht ohrförmig, von oben betrachtet, die Augen nicht bedeckend, schräg nach vorn gerichtet, einfach gebogen. Halsschild vor der Basis stark, aber gerundet verjüngt, Basalrand weniger stark gebogen. Länge: 9—12,5 mm. China: Kanssu; Sandzhou; Nord-Thibet (= *Dordanea mongolica* REITTER)  
 10. *mongolica* (REITTER 1889)

- 16 (13) Augenfalten niedrig oder ganz verflacht, manchmal etwas höher, in diesem Falle aber der Halsschild stark gewölbt oder die Sehfläche der Augen nach den Seiten hin gerichtet. Letztes Abdominalsternit in Längsrichtung nicht oder undeutlich gewölbt.
- 17 (20) Augen sehr klein, fast rundlich, aus den Seitenkonturen des Kopfes konisch stark hervortretend. Halsschild kugelig.
- 18 (19) Propleuren grob und spärlich, jedoch etwas erloschen punktiert. Halsschild trapezförmig, Seiten nach hinten viel stärker verengt als nach vorn; Kopf und Halsschild grob punktiert, der Grund zwischen den Punkten an der Stirn und an den Halsschildseiten nahe der Basis enger als die Punkte selbst. Halsschild kaum schmaler als die Flügeldecken, letztere mit stumpfwinkligen Schulterecken, Basalrand dick aufgebogen. Länge: 9,5—11 mm. Transkaukasus (Liaki)
- 19 (18) Propleuren glatt. Halsschild rundlich, nach hinten kaum stärker als nach vorn verengt, Vorderecken mehr verrundet (Abb. 13). Kopf und Halsschild feiner punktiert, weshalb der Grund zwischen den Punkten überall viel breiter ist als die Punkte selbst. Halsschild beträchtlich schmaler als die Flügeldecken, letztere ohne Schulterecken, vorn vollkommen abgerundet und der Basalrand ganz fein. Länge: 10 mm. Iran: Kerman (Tahrud)
- 20 (17) Augen flach oder einfach leicht gewölbt, nicht oder wenig aus der Seitenwölbung des Kopfes hervorstehend.
- 21 (50) Der erhabene Teil der Mittelbrust in der Mitte quergewölbt, ohne Längsfurche.
- 22 (39) Propleuren grob längsrundlich oder stark punktiert.
- 23 (26) Halsschild kugelig, d. h. auch in der Längsrichtung stark gewölbt. Propleuren gerunzelt-punktiert.

7. *ocularis* REITTER 19158. *kermanica* sp. nov.Abb. 12—13. Vorderkörper der *Microdera lindbergi* sp. nov. (12) und *M. kermanica* sp. nov. (13)

- 24 (25) Flügeldecken sehr grob punktiert. Vorderrand des Halsschildes vollständig gerandet. Brust und Abdomen grob, jedoch einfach punktiert, die Punktierung nicht längsrundlich. Der erhabene Teil der Mittelbrust in Längsrichtung stark gewölbt, nicht schräg abgeflacht. Halsschildscheibe, ausgenommen die Mitte, mit längsrundlicher Punktur. Länge: 10 mm. Ost-Kasachstan (Saissan)

13. *fortepunctata* REITTER 1915

- 25 (24) Flügeldecken fein punktiert. Vorderrand des Halsschildes in der Mitte unterbrochen. Brust und Abdomen seitlich längsrissig punktiert. Halsschild stark gewölbt, die Quer- und Längswölbung etwa gleich, die Punktierung sehr dicht und längsrissig, stellenweise in Längsrichtung zusammenfließend. Propleuren sehr grob längsrunzelig, bis zum Seitenrand gleichstark tief gerunzelt. Körper größer. Länge: 11 mm. China: Chinesisch Turkestan (Lob nor, zwischen Otun-Kosi und Tschogen-tschai)
14. *strigiventris* REITTER 1900
- 26 (23) Halsschild scheibenförmig, nicht kugelig, die Längswölbung nicht stark, Propleuren einfach grob punktiert, nahe der Hüften stärker und dichter, gegen den Rand hin feiner.
- 27 (30) Seiten des Halsschildes oben gelegen. Halsschild nach hinten stärker verengt als nach vorn, die Scheibe ziemlich flach.
- 28 (29) Basalrand der Flügeldecken verdickt und aufgewölbt, die Scheibe zwischen Basalrand und Schulter oben flach eingedrückt, weshalb der dicke Basalrand noch mehr aufgewölbt erscheint. Halsschild feiner punktiert, breiter, die Basis vor den Hinterecken beiderseits leicht verflacht. Augen schmaler, die Sehfläche schräg nach vorn gerichtet. Länge: 11—13 mm. China: Chinesisch Turkestan (Oasen Lob nor, Nia, Keria, Aksu); Kasachstan (Taschkent) (= *Tentyria Przewalskyi* REITTER 1887)
11. *laticollis laticollis* F. BATES 1879
- 29 (28) Basalrand der Flügeldecken fein, nicht dicker aufgewölbt, die Scheibe an den Schultern nicht eingedrückt, an den umgeschlagenen Seiten vorn leicht verflacht und die Epipeuren gewölbt. Halsschild gröber punktiert, schmaler, neben den Hinterecken nicht eingedrückt. Augen breiter, gewölbt, die Sehfläche nach den Seiten hin gerichtet. Länge: 10—12,5 mm. Mongolei (Orog nur); China: Zentral-Gobi (Etzingol)
12. *laticollis kozlovi* ssp. nov.
- 30 (27) Seiten des Halsschildes bis zum Rand gewölbt, seitlich steil abfallend, der feine Rand seitlich gelegen. Halsschild rundlich, nach hinten und nach vorn fast gleichstark gerundet verengt, die Vorderecken ganz abgerundet. Augen größer und rundlich, die Sehfläche nach den Seiten hin gerichtet, etwas gewölbt.
- 31 (36) Augen aus der Wölbung des Kopfes stark hervortretend, gewölbt, Schläfen hinter dem Hinterrand der Augen plötzlich eingeschnürt. Basis der Flügeldecken allmählich abgeflacht, nicht abfallend, beiderseits sehr fein, oft an den Schulterwinkeln unterbrochen.
- 32 (35) Vorderrand des Halsschildes ungerandet, Seiten steil abfallend und der feine Rand seitlich gelegen.
- 33 (34) Flügeldecken in der Mitte am breitesten, schmaler oval. Augen stark gewölbt. Beine dünn, länger, Schienen oben fein punktiert oder erloschen raspelartig punktiert. Fühler gestreckt. Hierher: 63. *ordossica* SCHUSTER 1940 (siehe unter Nr. 131).
- 34 (33) Flügeldecken vor der Mitte am breitesten, breit eiförmig. Augen viel flacher. Beine kürzer und dicker, Mittel- und Hinterschienen rau skulptiert. Fühler dick, kürzer. Hierher: 62. *interrupta* REITTER 1897 (siehe auch unter Nr. 132).
- 35 (32) Vorderrand des Halsschildes gerandet. Seitenrand nicht steil und der Rand oben gelegen. Hierher: 61. *globata* (FALDERMANN 1835) (siehe auch unter Nr. 124).
- 36 (31) Augen aus der Wölbung des Kopfes kaum hervortretend, flach, hinter den Augen parallel, kaum verengt. Basis der Flügeldecken neben den Flügeldecken beiderseits dick gerandet, die Basis steil nach vorn abfallend. Propleuren längsrissig punktiert, etwas längsgerunzelt, die Punktierung jedoch neben den Hüften nicht gröber und seitlich fast bis zum Rand gut ausgebildet.
- 37 (38) Seiten des Halsschildes steil abfallend und neben dem feinen, an der Seite gelegenen Rand, besonders hinter der Mitte, furchenartig vertieft. Die Punktierung der Scheibe besonders in der Mitte fein und spärlich, auch an den dichtesten und am stärksten punktierten Stellen sind die Zwischenräume zwischen den Punkten breiter als die Punkte selbst. Abdomen an den Seiten so stark punktiert wie die Mitte des Halsschildes. Der erhabene Teil der Mittelbrust hoch, jedoch schräg nach vorn abfallend und die Mitte flach gefurcht. Länge: 11—11,5 mm. Kasachstan (Saissan), Siberia (= *Tentyria globithorax* STEVEN)

15. *globithorax* (STEVEN 1829)

Hierher gehört auch die mir unbekannt Art: 17. *scyta* BAUDI 1875 aus Buchara.

- 38 (37) Seiten des Halsschildes zwar stark gewölbt, jedoch nicht steil abfallend und neben dem dickeren, von oben her gut sichtbaren Rand befindet sich auch hinten keine

Furche. Die Punktierung der Scheibe viel gröber, besonders neben den Seiten, wo die Zwischenräume viel enger sind als ein Punkt. Abdomen auch an den Seiten sehr fein und spärlich punktiert, viel feiner als die Halsschildmitte. Der erhabene Teil der Mittelbrust sehr hoch, fast abgerundet rechtwinklig hervortretend und die Mitte leicht gefurcht. Länge: 11—12 mm. Kasachstan (Dschungarisches Tor)

16. *dzhungarica* G. MEDVEDEV 1964

- 39 (22) Propleuren glatt oder sehr fein und spärlich, kaum erkennbar und raspelartig punktiert. Halsschild nicht kugelig, sondern scheibenförmig.
- 40 (41) Vorderrand des Halsschildes auch in der Mitte gerandet. Der erhabene Teil der Mittelbrust in der Längsrichtung hoch erhaben und die Basis gerinnt. Hintertarsen kurz, das 1. Glied wesentlich kürzer als die gemeinsame Länge der 2 folgenden Glieder und so lang wie das Klauenglied. Hierher: 36. *afghanica* GRIDELLI 1954 (siehe auch unter Nr. 84) aus Afghanistan.
- 41 (40) Vorderrand des Halsschildes in der Mitte breit unterbrochen. Der erhabene Teil der Mittelbrust stärker abgeflacht. Hintertarsen länger, das 1. Glied fast so lang oder länger als die beiden folgenden Glieder zusammen.
- 42 (43) Der umgeschlagene Teil des Prosternums hinter den Hüften mit einer ausgesprochenen Ecke. Halsschild sehr breit verkehrt trapezförmig, die Vorderecken breit abgerundet, Hinterrand auffallend breit, in der Mitte etwa so breit wie die Vorderschienen, stark gebogen. Flügeldecken mit stumpfen, abgerundeten Humeraecken, die Naht der Länge nach flach eingedrückt. Letztes Abdominalsegment in beiden Richtungen gewölbt. Augen sehr klein und flach, Augenfalten kaum angedeutet. Oberfläche äußerst fein punktiert und ziemlich glänzend. Die Basis der Propleuren stärker, zum Rand hin fein und spärlich, erloschen punktiert, der Grund nicht glänzend. Länge: 12 mm. China: Chinesisch Turkestan (Lobnor) (= *Tentyria Przewalskyi* REITT. var. *pleuralis* REITTER)

18. *pleuralis* (REITTER 1887)

- 43 (42) Der umgeschlagene Teil des Prosternums hinter den Hüften völlig abgerundet. Wenn es stumpfwinklig ist, haben die Hinterschienen sehr lange Enddorne; der Hinterrand des Halsschildes schmaler als die Breite der Vorderschienen.
- 44 (45) Der längere Enddorn der Hinterschienen nur halb so lang wie das langgestreckte Basalglied der Hintertarsen. Halsschild ziemlich flach und trapezförmig, sehr fein punktiert, mit breitem Hinterrand. Augen etwas gewölbt. Fühler gestreckt, das 3. Glied doppelt so lang wie das 2. Schulterwinkel fast ganz abgerundet, Basalrand an den Schultern kurz und etwas verdickt. Länge: 10—12 mm. China: Chinesisch Turkestan (Lob nor, Nia, Keria, Polu, Kogyar); Sandzhou; Kasachstan (Taschkent) (= *Tentyria Przewalskyi* REITT. var. *basalis* REITTER 1887; *M. Semenowi* REITTER 1897)

19. *parvicollis* F. BATES 1879

- 45 (44) Der längere Enddorn der Hinterschienen fast so lang wie das 1. Hintertarsusglied. Schulterwinkel stärker ausgebildet. Das 3. Fühlerglied viel kürzer.
- 46 (47) Augen größer, stärker gewölbt, aus der Seitenwölbung des Kopfes mehr hervortretend. Wangen vor den Augen gerade erweitert. Propleuren ziemlich gleichmäßig, jedoch zum Rand hin allmählich feiner und spärlich, erloschen punktiert. Die Punktierung der Oberseite, besonders des Halsschildes etwas stärker und dichter. Länge: 10—11,5 mm. Gebiet des Kaspischen Meeres (Halbinsel Mangischlak) (= *Rhostax Menetriesi* FISCHER VON WALDHEIM; *M. macrops* REITTER 1915)

20. *menetriesi* FISCHER VON WALDHEIM 1844)

- 47 (46) Augen kleiner und flach, aus der Wölbung des Kopfes kaum hervortretend. Wangen kurz und parallel, ohne Erweiterung nach vorn gerundet verengt. Oberseite feiner punktiert. Flügeldecken längs der Naht abgeflacht.
- 48 (49) Halsschild breit trapezförmig, nach hinten viel stärker verengt als nach vorn, Seiten sehr breit gerundet und vor der Mitte am breitesten; die Oberfläche fein und spärlich, der Grund meist erloschen chagriniert oder glänzend. Basis der Flügeldecken hinter dem dick aufgewölbten Basalrand quer eingedrückt, weshalb der Rand stärker emporsteht. Länge: 9,5—12,5 mm. Kasachstan, vom Ostufer des Kaspischen Meeres bis zum Balchaschsee (= *Tentyria deserta* TAUSCHER; *M. deplanata* GEBLER 1841)

21. *deserta deserta* (TAUSCHER 1812)

- 49 (48) Halsschild schmaler, weniger trapezförmig, Seiten in einem einfachen Bogen gerundet, nach hinten kaum stärker als nach vorn verengt, fast in der Mitte am breitesten, Oberfläche fein punktiert, der Grund chagriniert und matt. Basalrand der Flügeldecken dick, die Basis hinter dem Rand an den Seiten ohne Eindruck. Länge:

9,5—11,5 mm. Ost-Kasachstan, südl. vom Balchaschsee (Ili, Alma Ata, Wernoye, Semiretschie)

22. *deserta skopini* ssp. nov.

- 50 (21) Der erhabene Teil der Mittelbrust in Längsrichtung mehr oder weniger stark längsgerunzelt.  
 51 (64) Propleuren sehr grob längsgerunzelt und punktiert.  
 52 (61) Halsschild kugelig, d. h. auch in Längsrichtung stark gewölbt. Basalrand der Flügeldecken nicht verdickt, Schultern ohne Ecke.  
 53 (58) Flügeldecken stärker punktiert, die Punkte fast so grob wie die Punkte der Halsschildmitte und der Stirn, nach hinten am Absturz werden sie feiner, jedoch bis zur Spitze gut erkennbar.  
 54 (55) Augen leicht gewölbt und aus den Seitenkonturen des Kopfes herausragend. Halsschild schmaler, Seiten nach hinten viel stärker als nach vorn verengt, weshalb die Vorderecken weniger abgerundet sind. Kopf und Halsschild fein punktiert, die Punktierung bildet keine ausgesprochene Längsrünzeln. Propleuren zur Seite hin einfach punktiert, nur weit vor dem Rand längsrünzlig. Länge: 11 mm. Ost-Kasachstan (Fluß Tscharyn: Kurtogai)

23. *tscharynensis* sp. nov.

- 55 (54) Augen flach, aus der Seitenwölbung des Kopfes nicht hervortretend. Halsschild stärker und dichter punktiert, Seiten längsrünzlig.  
 56 (57) Halsschild fast kugelig, kaum breiter als lang (wie 9 : 8), bei Betrachtung von vorn ist die Wölbung sehr hoch und am Seitenrand zwischen Oberseite und Propleuren fast kontinuierlich gewölbt. Die Punktierung des Kopfes und des Halsschildes feiner, weniger längsrissig, Stirn nur seitlich längsrünzlig. Propleuren längsrünzlig, die Skulptur jedoch nicht grob. Länge: 10—11 mm. Ost-Kasachstan (Lepsinsk, Ala-Kul)

24. *aciculata aciculata* REITTER 1897

- 57 (56) Halsschild wesentlich breiter als lang (wie 10,5 : 8), bei Betrachtung von vorn ist zwischen Oberseite und Propleuren am Seitenrand ein ausgesprochener, stumpfereckiger Winkel zu sehen, weshalb die Oberseite weniger gewölbt ist. Die Punktierung des Kopfes und Halsschildes sehr grob, die Stirn auch in der Mitte längsrünzlig. Propleuren sehr grob längsrünzlig punktiert. Länge: 9—9,7 mm. Ost-Kasachstan (Dschungarisches Tor: nordöstl. von Ala-Kul)

25. *aciculata penkinae* ssp. nov.

- 58 (53) Flügeldecken feiner punktiert als die Halsschildmitte und der Kopf, am Ende erloschen und am Absturz keine Punktierung erkennbar. Augen flach (Abb. 7).  
 59 (60) Mitte des Halsschildes sehr hoch gewölbt, fast buckelig, in Seitenansicht in hohem Bogen gerundet. Augenfalten sehr niedrig (Abb. 7). Die Punktierung des Vorderkörpers etwas feiner. Hintertarsen lang, jedoch das 2. und 3. Glied gemeinsam kaum länger als das 1. Länge: 10 mm. Ost-Kasachstan: Balchaschsee

26. *balchaschensis* SKOPIN 1960

- 60 (59) Halsschild weniger hoch gewölbt, in Seitenansicht in einem flachen Bogen gebogen. Augenfalten viel kürzer, stärker aufgebogen und am Innenrand der Augen steil abfallend. Die Punktierung des Vorderkörpers stärker. Hintertarsen lang, die Glieder 2 und 3 gemeinsam viel länger als das 1. Länge: 9—11 mm. Ost-Kasachstan (Wernoye)

27. *balchaschensis wernoyensis* ssp. nov.

- 61 (52) Halsschild breit scheibenförmig, ziemlich flach. Flügeldecken mit stumpfwinkligen Schultern.  
 62 (63) Vorderschienen am Außenrande scharfkantig, breit. Kopf und Halsschild grob, Flügeldecken feiner punktiert, die Punktierung am Absturz aber viel feiner. Prosternum bis zum Rand längsrünzlig, sehr grob punktiert, die Punktierung von Brust und Abdomen einfach. Basalrand der Flügeldecken seitlich dicker, der Basalrand und Seitenrand bilden an den Schultern eine ganz stumpfe, abgerundete Ecke. Halsschild in der Mitte am breitesten, Seiten nach vorn und hinten gleichstark leicht gerundet und plötzlich vor der Basis abgerundet verengt. Länge: 10—13 mm. Ost-Kasachstan (Semirjetschensk, Ili-Tal) (= *M. halophila* SKOPIN 1961)

28. *schusteriana* KASZAB 1957

- 63 (62) Vorderschienen am Außenrand nicht scharf. Kopf feiner, Halsschild größer, Flügeldecken wieder viel feiner punktiert. Halsschild quer, in der Mitte am breitesten, Seiten gerundet, nach hinten jedoch viel stärker verengt. Seitenrand der Epipleuren der Flügeldecken mit dem Basalrand keinen Winkel bildend. Unterseite der Propleuren, Seiten der Brust und Abdomen sehr grob, längsrünzlig punktiert. Hierher:



11. *laticollis* F. BATES 1879 aus China und Kasachstan (siehe auch unter Nr. 28) und 15. *globithorax* (STEVEN 1829) (siehe auch unter Nr. 37).
- 64 (51) Propleuren einfach stark punktiert oder glatt, manchmal glatt aber erloschen längsgerunzelt, ohne Punktierung.
- 65 (72) Propleuren einzeln grob punktiert.
- 66 (67) Augen klein und schmal, vollkommen flach und aus der Seitenwölbung des Kopfes nicht vortretend, Wangen so breit wie die Augen und parallel. Stirn gleichmäßig ziemlich grob und dicht punktiert, Halsschildscheibe viel feiner und spärlich, ebenfalls gleichmäßig, Flügeldecken vorn so fein und spärlich punktiert wie der Halsschild, nach hinten am Absturz viel feiner und erloschen. Vorderrand des Halsschildes vollkommen scharf gerandet. Basalrand der Flügeldecken seitlich dick aufgewölbt. Größte Art der Gattung. Länge: 16 mm. Kasachstan (Dschungarisches Tor)
- 67 (66) Augen gross, manchmal gewölbt, in diesem Fall sind sie aus der Wölbung des Kopfes hervortretend, manchmal flach, dann ist die Sehfläche schräg nach vorn gerichtet. Vorderrand des Halsschildes meist ungerandet. Körper kleiner, höchstens 12 mm.
- 68 (69) Halsschild kugelig gewölbt, dicht und scharf punktiert, Flügeldecken viel feiner und spärlicher, ungleich punktiert, die Punktierung hinten am Absturz ganz erloschen. Augen groß und gewölbt, aus den Seitenkonturen des Kopfes etwas hervortretend (Abb. 8). Schultern der Flügeldecken ohne Ecke, der Basalrand beiderseits scharf und kurz, etwas dicker. Länge: 7,2—10 mm. Süd-Kasachstan (Ili-Tal); Gebiet des Balchaschsees (Tschulah Espe)
45. *kaszabi* SKOPIN 1961
- 69 (68) Halsschild breit und scheibenförmig, die Mitte nicht hoch kugelig aufgewölbt. Augen flacher, Wangen vor den Augen parallel.
- 70 (71) Halsschild breiter, die Punktierung grob und dicht, etwas längsrissig. Der erhabene Teil der Mittelbrust in der Mitte leicht eingedrückt. Länge: 9,8—12 mm. Afghanistan (Kuschke); Kasachstan (Buchara, Sefir Kuh, Mujun kum); Transkaspien (Repetek)
29. *minax* REITTER 1897
- 71 (70) Halsschild schmaler, die Punktierung feiner, in der Mitte spärlich, gegen die Seiten größer und dichter, jedoch nicht längsrissig. Der erhabene Teil der Mittelbrust nur an der Basis längs eingedrückt. Länge: 9—10,5 mm. »Südrußland«; Kasachstan (Mihailowo, Kuldja, Ili-Tal)
30. *subsulcata* KRAATZ 1865
- 72 (65) Propleuren glatt oder fein gerunzelt, jedoch nicht punktiert oder fein und erloschen punktiert.
- 73 (76) Prosternum hinter den Vorderhüften mit einer mehr oder weniger vorspringenden Ecke oder Zahn. Clypeus vorn mit einem sehr scharfen mittleren paralleseitigen Zahn.
- 74 (75) Hinterrand des Halsschildes in der Mitte mit einer scharfen, stumpfwinkligen, ausgesprochenen Ecke. Wangen vor dem Augenvorderrand eingeschnürt, deshalb nach vorn breit gerundet erweitert (Abb. 9). Prosternum glatt, Oberseite äußerst fein punktiert. Basalrand der Flügeldecken beiderseits kurz, kaum verdickt. 1. Glied der Hintertarsen länger als die beiden folgenden Glieder zusammen. Länge: 11,5 mm. Süd-Iran (Yezd)
49. *thoracica* sp. nov.
- 75 (74) Hinterrand des Halsschildes einfach leicht gebogen. Wangen vor den leicht gewölbten Augen wenig eingeschnürt, deshalb schwach erweitert. Oberseite stärker punktiert, Propleuren glatt, Abdomen und die Brustseite ebenfalls glatt. 1. Glied der Hintertarsen nicht länger als die beiden folgenden Glieder zusammen. Länge: 11—11,7 mm. Süd-Tadshikistan (Wachsh-Tal, Schwartuz)
31. *wachshiana* SKOPIN 1964
- 76 (73) Prosternum hinter den Hüften einfach niedergebogen; selten mit einer Ecke, in diesem Falle besitzt aber der Clypeus keinen parallelen, gut abgeordneten Zahn.
- 77 (88) Vorderrand des Halsschildes vollständig gerandet, manchmal in der Mitte kurz unterbrochen oder etwas erloschen. Flügeldecken ohne Schulterecken, der Basalrand nicht oder kaum verdickt.
- 78 (79) Propleuren erloschen längsgestrichelt. Kopf und Halsschild dicht punktiert, die Punktierung etwas längsrunzelig. Halsschild hoch gewölbt. Basalrand der Flügeldecken bis zur Mitte entwickelt, kaum verdickt, Schultern ohne Ecke. Flügeldecken etwas gereiht punktiert. Länge: 8,2—9 mm. Nord-Iran
32. *strigipleuris* REITTER 1897

- Hierher gehört auch die mir unbekannt Art: 33. **karelini** FISCHER VON WALDHEIM 1844 aus der Songarei. Nach der Beschreibung haben die Propleuren Längsstreifen, Kopf am Scheitel mit Längsrnuzeln und Halsschild hoch, kugelig.
- 79 (78) Propleuren glatt.
- 80 (81) Endglied der Hintertarsen nicht länger als das 1. Kopf und Halsschild ziemlich grob punktiert, Flügeldecken fein und weitläufig, unregelmäßig gereiht punktiert, die Punktierung des Abdomens fein und spärlich, erloschen. Basalrand der Flügeldecken fein, bis zur Mitte entwickelt. Länge: 10 mm. Iran (Sabzawaran; Meshed)
34. **chan** KASZAB 1963
- Hierher gehört auch die Art: 51. **subglobosa** KRAATZ 1865 aus dem Gebiet des Kaspischen Meeres (siehe auch unter Nr. 110), wenn der Vorderrand ihres Halsschildes völlig gerandet ist, bei dieser ist aber die Unterseite, auch das Abdomen glatt.
- 81 (80) Endglied der Hintertarsen länger als das 1. Oberseite feiner punktiert, Abdomen glatt.
- 82 (85) Der erhabene Teil der Mittelbrust in Längsrichtung flach eingedrückt, das Ende ungefurcht.
- 83 (84) Halsschild sehr breit, stark gewölbt, Seiten in einem breiten Bogen gerundet und fast ohne Ecke mit dem Hinterrand verrundet. Flügeldecken äußerst fein, Halsschild beträchtlich gröber und der Kopf noch gröber punktiert. Länge: 8—9 mm. Nord-Iran (Kerman, Meshed)
35. **pulla** REITTER 1897
- 84 (83) Halsschild schmaler, weniger gewölbt, Seiten ebenfalls nicht so stark nach hinten verengt, so daß der Seitenrand und Basalrand einen stumpfen Winkel bilden. Die ganze Oberseite sehr fein punktiert. Länge: 8—10 mm. Afghanistan (Pirzada)
36. **afghanica** GRIDELLI 1954
- 85 (82) Der erhabene Teil der Mittelbrust in Längsrichtung tief, bis zum Ende eingedrückt.
- 86 (87) Clypeus mit sehr scharfem, parallelem Zahn. Halsschild breiter, Flügeldecken nur ungef. anderthalbmal so breit wie der Halsschild. Die Punktierung des Vorderkörpers feiner. Länge: 8—9 mm. Turkmenien (Aschabad, Penschdeh); Transkaspien (Dortkuj); Afghanistan (Kuschke); Iran (Große Kawir, Meshed)
37. **transversicollis** REITTER 1887
- 87 (86) Clypeus nur mit einem stumpfen, gekerbtem Zahn. Halsschild kleiner, gewölbter, Flügeldecken ungef. 1,7mal so breit wie der Halsschild. Vorderkörper erloschen, jedoch etwas gröber punktiert. Länge: 7,2 mm. Kaukasus (Baku) (= *M. transversicollis* REITT. var. *parvicollis* REITTER 1897, nec. F. BATES 1879)
38. **reitteri** nom. nov.
- 88 (77) Vorderrand des Halsschildes in der Mitte breit ungerandet.
- 89 (98) Seitenrand der Flügeldecken mit dem Basalrand an den Schultern einen ausgesprochenen Winkel bildend, der Basalrand kaum und nur an den Schulterwinkeln verdickt.
- 90 (91) Propleuren und Prosternum, sowie die ganze Brust und Abdomen vollkommen glatt, ohne Spur einer Runzelung oder erloschener Punktierung. Clypeus mit scharfem, an der Basis parallelem Zahn. Fühler und Beine gestreckt. Kopf und Halsschild mäßig fein und spärlich, Flügeldecken äußerst fein und unregelmäßig gereiht punktiert. Körper gestreckt. Länge: 7,5—10,8 mm. Turkmenien (Aschabad); Uzbekistan; Kasachstan
44. **extabesa** SKOPIN 1961
- 91 (90) Propleuren mit erloschener Punktierung oder mit schwacher Runzelung. Prosternum ebenfalls erloschen punktiert-gerunzelt. Seiten von Brust und Abdomen mit mehr oder weniger erkennbarer, feiner und erloschener Punktierung.
- 92 (97) Die Augen sind schmal und flach, hinten durch die stärker vorspringenden Schläfen begrenzt und die Sehfläche schräg nach vorn gerichtet.
- 93 (94) Clypeus am Vorderrand ohne stumpfen Zahn in der Mitte, abgerundet. Halsschild sehr breit, etwa 1,3mal so breit wie lang, 1,7mal so breit wie der Kopf und die Flügeldecken nur 1,1mal so breit wie der Halsschild. Propleuren mit erloschener Punktierung. Halsschildseiten sehr stark gebogen, die Vorderecken abgerundet. Die Punktierung des Vorderkörpers sehr fein und erloschen. Augen wenig aus der Wölbung des Kopfes hervortretend, zwischen Stirn und Clypeus ohne Quereindruck. Länge: 11—12,5 mm. Turkmenien; Südost-Kasachstan (Margelan, Chodschent); Tadshikistan (Syr Darja Gebiet)
40. **heydeni** KRAATZ 1882
- 94 (93) Clypeus am Vorderrand mit mehr oder weniger schärferem Zahn. Halsschild verhältnismäßig schmaler, etwa nur 1,2mal so breit wie lang, etwa 1,4mal so breit

- wie der Kopf und die Flügeldecken nur etwa 1,2mal breiter als der Halsschild. Vorderkörper bedeutend stärker punktiert. Augen stärker hervorragend, zwischen Stirn und Clypeus leicht eingedrückt.
- 95 (96) Propleuren gut erkennbar, spärlich und erloschen punktiert, nicht längsrundlich. Seiten der Brust und Abdomen ebenfalls erkennbar, Oberseite gröber und dichter punktiert. Länge: 10,8—13,5 mm. Afghanistan (Badakschan); Kasachstan (Pamir) und Tadshikistan (= *badakschanica* KASZAB 1959)
- 96 (95) Propleuren an der Basis erloschen längsgerunzelt. Seiten der Brust und Abdomen kaum punktiert. Die Punktierung der Oberseite ebenfalls feiner. Länge: 10—12 mm. Süd-Tadshikistan (Shartuz); Nordost-Afghanistan (= *M. semenovi* BOGATSHEV 1946, nom. praecoccup., nec REITTER 1897)
- 97 (92) Die Augen sind breit und gewölbt, seitenständig, die Sehfläche nach den Seiten gerichtet. Propleuren und Prosternum erloschen gerunzelt und mit Spuren von spärlich stehenden Punkten. Seiten der Hinterbrust sehr fein, das Abdomen kaum erkennbar punktiert. Vorderkörper fein und dicht punktiert. Habitus ähnlich wie bei den beiden vorigen Arten. Länge: 9,8—12 mm. Südost-Kasachstan (Ferghana)
- 98 (89) Zwischen Basalrand und Seitenrand der Flügeldecken an den Schultern ohne Winkel, der Seitenrand mit dem Basalrand in gleichem Bogen gerundet, der meist verdickt ist.
- 99 (100) Hintertarsen mit langen, gelben Borstenhaaren, das Endglied am Ende mit fast so langen Haaren wie die Krallen. Längerer Enddorn der Hinterschienen fast so lang wie das 1. Glied, auch der kürzere halb so lang. 1. Glied der Mitteltarsen so lang wie das 5. Die Basalglieder der Fühler äußerst grob und dicht punktiert. Wangen vor den Augen gerade und erweitert. Augen groß und leicht gewölbt, die Sehfläche nach den Seiten hin gerichtet. Kopf grob, Halsschild und Flügeldecken sehr fein punktiert. Halsschild ziemlich ründlich und stark gewölbt. Propleuren und der ganze Bauch glatt. Länge: 8,8—9,7 mm. Kasachstan (Balchaschsee) (= *M. kazenasi* SKOPIN ab. *castanea* SKOPIN 1960)
- 100 (99) Tarsen mit normalen, kurzen Haaren. Auch der längere Enddorn der Hinterschienen nur halb so lang wie das 1. Glied. 1. Glied der Mitteltarsen kürzer als das Klauenglied.
- 101 (102) Wangen vor den Augen etwa um eine Augenzahl verlängert und erweitert, fast genau so breit wie die Augen, am Vorderrand der Augen ist die Seitenkontur des Kopfes tief und winklig ausgeschnitten (Abb. 10). Clypeus mit scharfem Winkel am Vorderrand in der Mitte. Halsschild verhältnismäßig schmal, die Vorderecken wenig abgerundet. Propleuren nur mit Spuren sehr spärlich stehender Punkte. Basalrand der Flügeldecken beiderseits kaum dicker. Die Punktierung des Vorderkörpers fein. Länge: 9,5—11,2 mm. Südost-Kasachstan (Tscharyn-Tal, Ulkun kum, Ili-Tal)
- 102 (101) Wangen vor den Augen parallel und schmaler als die Augen oder kurz gerundet erweitert, jedoch schmaler als die größte Breite der Augen. Basalrand der Flügeldecken nicht verdickt.
- 103 (116) Der erhabene Teil der Mittelbrust in der Mitte normal vertieft, die Basis beiderseits nicht zusammengedrückt.
- 104 (107) Halsschild äußerst fein punktiert, Propleuren glatt.
- 105 (106) Augen groß, die Sehfläche nach den Seiten hin gerichtet. Die größte Breite des Halsschildes liegt in der Mitte, nach vorn weniger, nach hinten stärker verengt, Hinterecken sehr stumpfwinklig. Scheibe des Halsschildes flacher. Clypeus mit großem Zahn. Länge: 10—11 mm. Iran (Iranshar, Kuh-i-Taftan)
- 106 (105) Augen kleiner und flacher, die Sehfläche schräg nach vorn gerichtet. Halsschild breiter, vor der Mitte am breitesten, nach hinten stark verengt, Hinterwinkel vollkommen abgerundet, die Scheibe höher gewölbt. Clypeuszahn stumpfwinklig. Länge: 8—9,8 mm. Transkaspien; Afghanistan; Iran (Kerman: Bampur)
- 107 (104) Halsschild gröber punktiert, die Punktierung dichter und die Propleuren entweder gut sichtbar erloschen punktiert oder auch etwas gerunzelt, manchmal vollkommen glatt.

41. *grandicollis* BOGATSHEV 194642. *semenoviniana* BOGATSHEV 194743. *ferghanensis* KASZAB 195746. *kazenasi* SKOPIN 196047. *iliensis* SKOPIN 196148. *iranica* sp. nov.39. *laevigatula* REITTER 1915

- 108 (109) Mittel- und Hinterschienen glatt, ohne raue Skulptur, dick und gerade. Unterseite sammt Propleuren glatt. Kopf und Halsschild gleichförmig, mäßig fein punktiert. Basalrand der Flügeldecken etwas verdickt. Augen leicht gewölbt. Länge: 9,5—12 mm. Turkmenien (Aschabad); Kasachstan (Margelan) (= *Tentyria campestris* STEVEN; *M. margelanica* KRAATZ 1882; *M. globulicollis* MÉNÉTRIÉS 1849)  
50. *campestris* (STEVEN 1812)
- Hierher könnte man 34. *chan* KASZAB 1963 aus dem Iran nochmals einreihen, das Abdomen ist aber punktiert (siehe auch unter Nr. 80).
- 109 (108) Mittel- und Hinterschienen rau skulptiert, gerunzelt und mit raspelartigen Körnchen bedeckt.
- 110 (111) Propleuren glatt. Basalrand der Flügeldecken scharf, jedoch nicht wulstförmig verdickt, bildet mit dem Seitenrand einen einheitlichen Bogen. Basis der Flügeldecken steil nach vorn abfallend. Halsschild hoch gewölbt, zur Basis hin stark verengt. Kopf und Halsschild ziemlich grob punktiert. Länge: 8,2—11 mm. Gebiet des Kaspischen Meeres; Transkaspien  
51. *subglobosa* KRAATZ 1865
- 111 (110) Propleuren gut erkennbar, mehr oder weniger fein oder gröber, erloschen punktiert. Basis der Flügeldecken nicht auffallend steil nach vorn abfallend, Basalrand wulstförmig.
- 112 (113) Augen schmal und flach, kaum aus der Wölbung des Kopfes hervortretend, Wangen fast parallel, etwas schmaler als die Augen (Abb. 4). Halsschildscheibe — besonders in der Seitenansicht — flach. Seitenrand gerundet, zur Basis hin stark verengt. Hinterrand breit gebogen, deshalb ohne gut ausgebildete Hinterecken. Kopf deutlich gröber punktiert als der Halsschild, der Grund chagriert und matt (Abb. 14). Länge: 8,7—11 mm. Kasachstan (Gebiet des Balchaschsees)  
52. *hybrida* SKOPIN 1966
- 113 (112) Augen breiter und stärker gewölbt, aus der Wölbung des Kopfes hervortretend, Wangen nicht parallel (Abb. 5). Halsschildscheibe — besonders in der Seitenansicht — stärker aufgewölbt. Kopf und Halsschild etwa gleichgrob punktiert.
- 114 (115) Propleuren gröber punktiert, auch die Seiten des Abdomens und der Hinterbrust gut erkennbar, erloschen punktiert. Länge: 8,5—11 mm. »Südrußland«; Kirghisensteppe (Uralsk); West-Kasachstan (Gebiet des Kaspischen Meeres)  
53. *gracilis* ESCHSCHOLTZ 1831
- 115 (114) Propleuren feiner und spärlicher punktiert, Seiten der Hinterbrust kaum, das Abdomen nicht punktiert. Länge: 8—10,5 mm. »Südrußland«; Transkaukasus (Baku); West-Kasachstan (Gebiet des Kaspischen Meeres); Turkmenien (Yolotani) (= *Tentyria convexa* TAUSCHER; *Tentyria globosa* BESSER 1832)  
55. *convexa* (TAUSCHER 1812)
- 116 (103) Der erhabene Teil der Mittelbrust der Länge nach sehr tief furchenartig vertieft, an der Basis sind die Buckeln beiderseits komprimiert. Kopf stärker, Halsschild viel feiner, sehr fein punktiert, Flügeldecken ohne sichtbare Punktierung. Unterseite sammt Propleuren fast glatt. Halsschild trapezförmig, mit gut ausgebildeten, stumpfwinkligen Hinterecken. Schultern abgerundet, Basalrand seitlich breit, jedoch nicht verdickt. Länge: 8—10 mm. Gebiet des Kaspischen Meeres (Krasnowodsk)  
56. *fausti* KRAATZ 1888
- 117 (12) Zwischen den nach vorn verengten Wangen und dem Clypeus beiderseits mit einer starken Ausbuchtung, die Basis des Clypeus parallel, dann gerade und mit dem parallelen Teil einen stumpfen Winkel bildend, nach vorn verengt (Abb. 11). Das 1. Glied der Mittel- und Hintertarsen an der Basis stark komprimiert.

### 5. Subgen.: *Iliodera* SKOPIN 1961

Robust, Vorderrand des Halsschildes in der Mitte unterbrochen, Hinterecken etwas nach hinten ausgezogen erscheinend, weil der gebogene Hinterrand beiderseits ausgebuchtet ist. Propleuren fein und zerstreut punktiert. Basalrand der Flügeldecken deutlich wulstförmig. Prosternum hinter den Hüften etwas buckelig hervortretend. Brust und Abdomen sehr fein punktiert. 1. Glied der Hintertarsen länger als das 2. und 3. gemeinsam und länger als das Klauenglied. Kopf stärker, Halsschild feiner punktiert. Länge: 11,5 mm. Kasachstan (Ili-Tal)

57. *desertoides* SKOPIN 1961

- 118 (11) Basis der Flügeldecken ungerandet oder die feine Randung an den Schultern unterbrochen, in diesem Fall ist der Seitenrand vor der Basis erloschen; manchmal kurz und fein gerandet, aber die Basis vor dem Rand nicht steil abfallend.
- 119 (120) Seitenrand der Flügeldecken endet an den Schultern plötzlich und scharf, Schulterecke vorhanden, Basis steil herabgewölbt, die Epipleuren der Flügeldecken an den Schultern durch einen Querkiel begrenzt. Kopf mit erhabenen, gewölbten Augenkielen. Augen mit nach vorn gerichteten Sehflächen, klein und flach. Basis der Flügeldecken ohne Spur einer Randleiste, Flügeldecken an der Basis viel breiter als die Halsschildbasis

### 3. Subgen.: *Falsomicrodera* subgen. nov.

Kopf und Halsschild stark, jedoch nicht zusammenfließend punktiert, Flügeldecken äußerst fein und spärlich punktiert. Prosternum und die Seiten des Bauches längsrundlich grob punktiert. Halsschild scheibenförmig, flach, Vorderrand breit unterbrochen, Basalrand strichförmig und fein. Außenseite der Vorderschienen nicht scharf gekantet. Länge: 11—11,5 mm. China: Chinesisch Turkestan (Barkul-Chami)

6. *turkestanica* SCHUSTER 1915
- 120 (119) Seitenrand der Flügeldecken vor den Schultern erloschen, ohne Schulterecke, die Basis genau so breit wie die Halsschildbasis, d. h. die Flügeldecken mit halsartig eingeschnürter Basis und die Flügeldecken eiförmig oder langoval. Epipleuren der Flügeldecken vorn ohne Spur eines Querkiels, Basis entweder ganz ungerandet oder seitlich mit Spuren einer feinen und kurzen Querfalte, die jedoch mit dem Seitenrand meist nicht verbunden ist. Kopf mit niedrigen Augenfalten oder ohne solche. Augen größer und gewölbter, die Sehfläche nach den Seiten hin gerichtet (Abb. 6) (= *Adordanea* REITTER 1897)

### 6. Subgen.: *Dordanea* REITTER 1887

- 121 (128) Halsschild scheibenförmig, bis zum feinen Seitenrand einfach gewölbt, gleich neben dem Rand ist die Scheibe nicht stärker herabgewölbt, der Rand von oben überall gut übersehbar.
- 122 (123) Augenfurchen vorhanden und bis hinter dem Hinterrand der Augen reichend. Augenkieme hoch und gebogen, nach vorn etwas konvergierend, hinter den Augen erloschen. Halsschild scheibenförmig und sehr flach, vom hinteren Drittel bis zur Basis fast gerade verengt, Seiten stark gerundet, nach vorn weniger als nach hinten verengt. Vorderrand des Halsschildes gerandet. Propleuren äußerst spärlich und fein punktiert, nahe der Basis jedoch runzlig und grob. Basis der Flügeldecken ohne Spur einer Querfalte an den Seiten. Länge: 9—11 mm. Nord-Thibet (Zaidam, Burchan Budda Gebirge, Neimeng) (= *Dordanea elegans* REITTER)
58. *elegans* (REITTER 1887)
- 123 (122) Augenfurchen zwischen den Innenrändern der Augen und den Augenfalten fehlend, Augenkieme schwach entwickelt und nach hinten divergierend, am Hinterrand der Augen erloschen. Halsschild gewölbter, Seitenrand ziemlich gleichmäßig nach vorn und hinten gebogen, Vorderrand manchmal ungerandet. Propleuren bis zum Rand grob, jedoch spärlich punktiert oder an den Seiten erloschen und glatt.
- 124 (125) Vorderrand des Halsschildes gerandet. Halsschild schmaler, an den Seiten stark gerundet, die Hinterecken völlig abgerundet, die Basis breit und dick gerandet, die Basalfurche tief, die Basalrandung weit nach hinten gebogen. Basis der Flügeldecken beiderseits neben den Schultern meist mit Spuren einer Querfalte, die jedoch mit dem erloschenen Seitenrand keine Verbindung haben. Oberseite grob punktiert, Propleuren meist sehr grob punktiert, die Punktierung meist nicht gerunzelt. Länge: 8—9,5 mm. Mongolei (Zentrale Provinzen); China: Kanssu (= *Tentyria globata* FALDERMANN)

61. *globata* (FALDERMANN 1835)
- 125 (124) Vorderrand des Halsschildes meist ungerandet. Halsschild breiter, Seiten gerundet, an der breiten Basis bilden sie eine abgerundete, stumpfe Ecke. Basalrand weniger dick und fast gerade, kaum nach hinten gebogen, Basalfurche schmal. Basis der Flügeldecken ohne Spur einer Querfalte neben den Schultern. Körper grob punktiert, Propleuren nahe der Basis manchmal längsrundlich.

- 126 (127) Halsschild und Flügeldecken grob und dicht punktiert, neben den Seiten stärker gewölbt. Halsschildvorderrand in der Mitte breit unterbrochen (*forma typica*) oder der Rand vollständig (var. *elegantoides* KASZAB 1964). Länge: 8,5—11 mm. Mongolei (Südgobi und die Senken der Großen Seen); China: Kanssu (= *Dordanea Kraatzi* REITTER)
59. *kraatzi kraatzi* (REITTER 1889)
- 127 (126) Halsschild und Flügeldecken fein punktiert, Halsschildseiten abgeflacht. Vorderrand des Halsschildes in der Mitte breit unterbrochen. Länge 9 mm. China (Gobi, Alashan)
60. *kraatzi alashanica* SKOPIN 1964
- 128 (121) Halsschild schmal und stark gewölbt, die Wölbung neben den Seiten besonders auffallend, so daß der Rand wegen der steil herabgewölbten Seiten von oben oft schwer erkennbar ist. Die Punktierung meist grob. Vorderrand des Halsschildes in der Mitte ungerandet.
- 129 (136) Flügeldecken einfach feiner oder gröber punktiert, die Punkte sind jedoch nicht in unregelmäßige Doppelreihen geordnet.
- 130 (133) Basalrand der Flügeldecken beiderseits neben dem Schulterwinkel kurz und entwickelt, meist jedoch ohne Verbindung mit dem Seitenrand. Die Punktierung des Halsschildes neben dem Seitenrand feiner als beiderseits auf der Scheibe.
- 131 (132) Flügeldecken in der Mitte am breitesten, schmal oval. Augen stark gewölbt. Beine und Fühler dünn und lang, Mittel- und Hinterschienen oben fein punktiert oder erloschen runzelig. Länge: 9,5 mm. China: Ordos (Oulan Cheula)
63. *ordossica* SCHUSTER 1940
- 132 (131) Flügeldecken vor der Mitte am breitesten, breit eiförmig. Augen viel flacher. Beine und Fühler kürzer und dicker, Mittel- und Hinterschienen rauh skulptiert. Halsschild feiner punktiert. Länge: 7—8,5 mm. Mongolei (Mittel- und Ost-Mongolei, in der Steppenzone)
62. *interrupta* REITTER 1897
- 133 (130) Basis der Flügeldecken ohne Spur einer Basalfalte beiderseits neben den Schultern. Die Punktierung des Halsschildes sehr grob, neben dem Seitenrand so grob oder noch gröber, manchmal längsrunzeliger als die Scheibe beiderseits neben der Mitte. Flügeldecken eiförmig, in der Mitte oder hinter der Mitte am breitesten.
- 134 (135) Die grobe Punktierung des Halsschildes oval, nach den Seiten hin wird sie längsrunzelig zusammenfließend. Halsschild breiter und die Scheibe flacher. Propleuren grob längsrunzelig scharf punktiert, auch die Seiten dicht punktiert. Flügeldecken breiter eiförmig, vor der Spitze etwas ausgeschweift, etwas hinter der Mitte am breitesten. Länge: 10,8 mm. China: Kanssu (Liangchow)
64. *kanssuana* KASZAB 1957
- 135 (134) Die grobe Punktierung des Halsschildes rund, sehr dicht, besonders beiderseits in der Scheibe, jedoch nicht zusammenfließend. Halsschild schmaler und gewölbter. Propleuren äußerst grob und regelmäßig, einzeln punktiert. Flügeldecken schmal oval, in der Mitte am breitesten, vor dem Ende nicht ausgeschweift. Länge: 8,1—9,4 mm. Nordwest-Mongolei (Senke der Großen Seen)
65. *jurganovae* SKOPIN 1964
- 136 (129) Flügeldecken fein punktiert, dazwischen mit annähernden überzählig punktierten, groben Punktreihen. Elliptisch. Vorderbrust und Propleuren einfach tief punktiert. Basis dicht, seitlich grob punktiert. Kopf und Halsschild stark und dicht punktiert, letztere kugelig gewölbt, schwach herzförmig, vor der Mitte am breitesten. Länge: 13 mm. China: Kanssu (= *subfoveolata* SKOPIN 1964)
66. *subseriata* REITTER 1889

### Amicrodera subgen. nov.

Wie aus der Bestimmungstabelle ersichtlich, ist diese Untergattung durch die Bein- und Fühlerform gekennzeichnet und von allen anderen Untergattungen wesentlich verschieden. Das 2. Glied der Fühler so lang wie das 3. und länger als das 4., während bei den übrigen Arten der Gattung das 2. Fühlerglied immer kürzer ist als das 3. und nirgends länger als das 4. Beine

kurz und kräftig, das 1. Glied der Hintertarsen kürzer als das Klauenglied; bei den anderen Arten ist das 1. Glied mindestens so lang wie das Klauenglied. Basis der Flügeldecken außen bis zur Mitte gerandet. Vorderrand des Halsschildes völlig fein gerandet. Vorderrand des Clypeus asymmetrisch und mit zwei ganz stumpfen Ecken versehen.

Hierher gehört eine einzige, in West-Afghanistan vorkommende Art, die die Untergattung repräsentiert und den Untergattungstypus darstellt:

**Microdera (Amicrodera) lindbergi** sp. nov.

Schwarz, fettglänzend, die Fühler und Palpen sowie die Beine, vor allem die Tarsen heller braunschwarz. Kopf rundlich, am Hinterrand der Augen am breitesten; Schläfen gerade und nach hinten leicht verengt, Wangen schmaler als die Augen, nach einer Augenlänge abgerundet verengt. Augen schmal und klein, die Sehfläche etwas nach vorn gerichtet. Clypeus wenig asymmetrisch, mit zwei abgerundeten stumpfen Ecken, die rechte Seite ein wenig länger, der Rand gekerbt. Stirn breit und gewölbt, Augenfalten nur neben dem Innenrand gut entwickelt, schräg nach vorn gerichtet. Fein und gleichmäßig punktiert. Fühler dick und schnurförmig, die Basis des Halsschildes nicht erreichend; das 2. Glied das längste, fast doppelt so lang wie breit (wie 11 : 6,5), die folgenden 3 Glieder allmählich kürzer (das 3., 4., 5. wie 10 : 9 : 8), vom 5. bis 8. gleichlang, die 3 letzteren wieder etwas kürzer (das 8. und 9. wie 8 : 7); die Glieder 5—8 etwas länger als breit (wie 8 : 7), die letzten 2 Glieder so lang wie breit, das Endglied schmal (wie 7 : 5), das Ende schräg abgestutzt. Halsschild doppelt so breit wie lang (wie 26 : 13) und mehr als doppelt so breit wie der Kopf (wie 26 : 12), in der Mitte am breitesten, Seiten stark gebogen, nach vorn und hinten gleichstark gerundet, die Vorderecken ganz breit abgerundet, Hinterecken ebenfalls verrundet, ringsum fein gerandet, auch der Vorderrand nicht unterbrochen. Die Punktierung so fein und spärlich wie die des Kopfes, an den Seiten noch feiner. Der Grund zwischen den Punkten erloschen chagriniert und fettglänzend, die Punkte etwas oval und weiter voneinander abgehend als ihre Größe. Die Querwölbung, besonders an den Seiten und die Längswölbung an ihrer Basis auffallend. Flügeldecken langoval, die Seiten ziemlich parallel, etwas breiter als der Halsschild (wie 29 : 26) und 1,5mal so lang wie die gemeinsame Breite (wie 44 : 29), 2,6mal so lang wie der Halsschild (wie 44 : 13). Schultern ganz abgerundet, die feine und scharfe Randung auf die Basis aufgebogen und bis zur Mitte entwickelt. Die Basis nicht plötzlich abfallend, nur stärker herabgebogen. Oberfläche einfach gewölbt, äußerst fein und spärlich punktiert, viel feiner und spärlicher als die Halsschildseiten. Beine kurz und kräftig, Schienen dick und gerade, Vorderschienen außen scharfkantig, und die Unterseite am Ende außen etwas ausgehöhlt, die Außenecke etwas vorgezogen.

Mittel- und Hinterschienen erloschen punktiert, die Basis der Mittelschienen an ihrer Oberseite etwas rauh skulptiert. Tarsen kurz, Endglied der Hintertarsen länger als das 1., Unterseite der Basalglieder gerinnt. **U n t e r s e i t e** sowie die Propleuren unpunktiert, der erhabene Teil der Mittelbrust schräg abgeflacht und die Mitte kaum längs eingedrückt. Länge: 7—9 mm.

West-Afghanistan: Kahadistan, 10 km de Hérat, 3. IX. 1957, leg. DR. K. LINDBERG (Holotypus und 1 Paratypus); Gholam Batcha (entre Obéh et Tounian), 28. VIII. 1957, leg. DR. K. LINDBERG (1 Paratypus); Khvadjah, Tehechar Chambeh, 1650 m, 16. VI. 1959, leg. DR. K. LINDBERG (3 Paratypen), in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Die Art sei dem verdienstvollen Forscher der afghanischen Insektenfauna, Herrn DR. K. LINDBERG gewidmet.

Diese Art unterscheidet sich durch die charakteristische Fühler- und Beinbildung von allen bisher bekannten Arten der Gattung.

#### **Falsomicrodera** subgen. nov.

Diese Untergattung ist durch die Basisform der Flügeldecken und durch die Beinform gekennzeichnet. Basis der Flügeldecken in der inneren Hälfte schwächer, in der äußeren Hälfte stärker steil abfallend, ganz ungerandet, Schultern hoch aufgebogen und seitlich stumpfwinklig, da der Seitenrand der Flügeldecken vorn an den Schultern plötzlich endet und die Epipleuren vorn durch einen Kiel von der Basis der Flügeldecken abgegrenzt sind. Dieser Kiel ist auch von oben her sichtbar. Vorderschienen am Ende im Querschnitt rundlich, Außenseite ohne scharfe Kante, ganz stumpf. Vorderrand des Halsschildes in der Mitte unterbrochen. Der erhabene Teil der Mittelbrust nicht hoch gewölbt, die Mitte sehr flach eingedrückt. Das 3. Glied der Fühler das längste; das 1. Glied der Hintertarsen etwas länger als das Klauenglied. Propleuren längsrundlich.

Untergattungstypus: *Microdera turkestanica* SCHUSTER 1915.

#### **Microdera** (s. str.) *kermanica* sp. nov.

Einfarbig schwarz, fettglänzend. **K o p f** an den konisch vorspringenden Augen am breitesten, Schläfen gerade und nach hinten verengt. Wangen und die Augenhälfte schmaler, leicht erweitert und an der Insertionsstelle der Fühler abgerundet verengt. Zwischen Clypeus und Wangen beiderseits ziemlich tief ausgerandet, Clypeus nach vorn gerade stark verengt. Augenfalten schräg nach vorn gerichtet, niedrig und gerade. Die Punktierung am Scheitel dichter, an der Stirn spärlicher, die Punkte rundlich, die Zwischenräume zwischen den Punkten überall viel breiter als die Punkte selbst. **F ü h l e r** fehlen an dem von mir untersuchten Exemplar. **H a l s s c h i l d** etwas breiter als lang (wie 26 : 20), deutlich breiter als der Kopf (wie 26 : 18),



in Längsrichtung wenig, in Querrichtung stark gewölbt, an den Seiten steil abfallend, der feine Rand jedoch von oben her überall gut erkennbar. Vorder-  
rand in der Mitte kaum unterbrochen; vorn ist der Halsschild stark quer  
gewölbt, so daß die rechtwinkligen Vorderecken von oben sehr breit abgerun-  
det stumpfwinklig erscheinen, um so mehr als die Seiten zur Mitte hin stark  
erweitert und zur Basis hin ebenfalls stark verengt sind. Hinterecken breit  
stumpfwinklig abgerundet, Oberfläche seicht und so grob und dicht punktiert  
wie der Kopf. Flügeldecken etwas verkehrt eiförmig, die Mitte parallel,  
gleich hinter den Schultern stark erweitert, etwa 1,4mal so breit wie der Hals-  
schild (wie 37 : 26), mehr als doppelt so lang wie der Halsschild und mehr  
als 1,4mal so lang wie die gemeinsame Breite (wie 54 : 37). Schultern völlig  
abgerundet, der bis zur äußeren Hälfte entwickelte Basalrand nicht dicker  
als der Seitenrand. Die Scheibe an der Naht abgeflacht, die Basis vorn geneigt,  
der vor dem Basalrand vorhandene Rand-Teil schräg abfallend, jedoch nicht  
vertikal. Oberseite spärlich und fein, etwas raspelartig punktiert, der Grund  
chagriniert und matt. Beine kräftig, Schenkel gröber punktiert, Vorder-  
schienen am Außenrand ohne scharfe Kante, ganz stumpf. Mittelschienen  
ziemlich rauh skulptiert. Hinterschienen fehlen an dem von mir untersuchten  
Exemplar. Unterseite sowie Propleuren glatt, chagriniert und matt.  
Letztes Abdominalsternit bei seitlicher Betrachtung ganz gerade. Länge:  
10 mm.

Iran: Tahrud, zwischen Bam und Kerman (Holotypus), in der Sammlung des Ungari-  
schen Naturwissenschaftlichen Museums in Budapest.

Die einzige nahe verwandte Art ist *M. ocularis* REITT. aus dem Trans-  
kaukasus. Diese besitzt aber grob punktierte Propleuren, ein fein punktiertes  
Abdomen, einen scharf stumpfwinkligen Humeralwinkel an den Flügeldecken,  
deren Basalrand dick aufgewölbt ist, in der Quere und in der Länge einen  
fast gleichstark gewölbten Halsschild, weshalb die Vorderecken weniger tief  
gelegen und auch von oben her sichtbar, schärfer stumpfwinklig sind; schließ-  
lich ist die Punktierung des Vorderkörpers viel gröber. Beide Arten sind an  
der auffallenden Augenform leicht zu erkennen.

***Microdera* (s. str.) *laticollis kozlovi* ssp. nov.**

Steht der Stammform sehr nahe, von ihr durch den Basalrand der  
Flügeldecken, durch die Form des Halsschildes und durch die Skulptur ver-  
schieden. Basalrand der Flügeldecken kurz, nicht dicker als der Seitenrand  
und nicht höher aufgewölbt, zwischen Basalrand und Schulter nicht einge-  
drückt, nur die Schulterecke selbst am Seitenrand etwas verflacht und die  
Epileuren vor der Basis gewölbt. Seiten des Halsschildes einfach gebogen,  
nach hinten stärker als nach vorn verengt, an den ganz stumpfen Hinter-

ecken stärker niedergebogen, die Scheibe kaum gewölbt, die Wölbung reicht bis zum feinen Seitenrand. Die Punktierung des Halsschildes etwas gröber als bei der Stammform. Augen stärker gewölbt und hinten wenig hervorragend. Länge: 10–12,5 mm.

Mongolei: Bajanchongor Aimak, Iche Bogd ul (= Gebirge) am Südrand des Sees Orog nur, 14.—24. VI. 1926, leg. KOZLOV (Holo- und Paratypus); China: Zentral Gobi, Fluß Etzingol, 30. VI. 1926, leg. KOZLOV (Paratypus). — Holo- und Paratypus befindet sich in der Sammlung des Zoologischen Instituts und Museums der Akademie der Wissenschaften in Leningrad, 1 Paratypus auch in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Herrn P. K. KOZLOV, dem erfolgreichen Entdeckungsreisenden Zentral-Asiens gewidmet.

*Microdera* (s. str.) *deserta skopini* ssp. nov. (Abb. 15)

Diese Unterart unterscheidet sich von der Stammform durch den schmälern Halschild (bei der forma *typica* Breite : Länge = 30 : 23; bei ssp. *skopini* m. = 28 : 23); Seiten in einfachem Bogen gerundet und nahe der

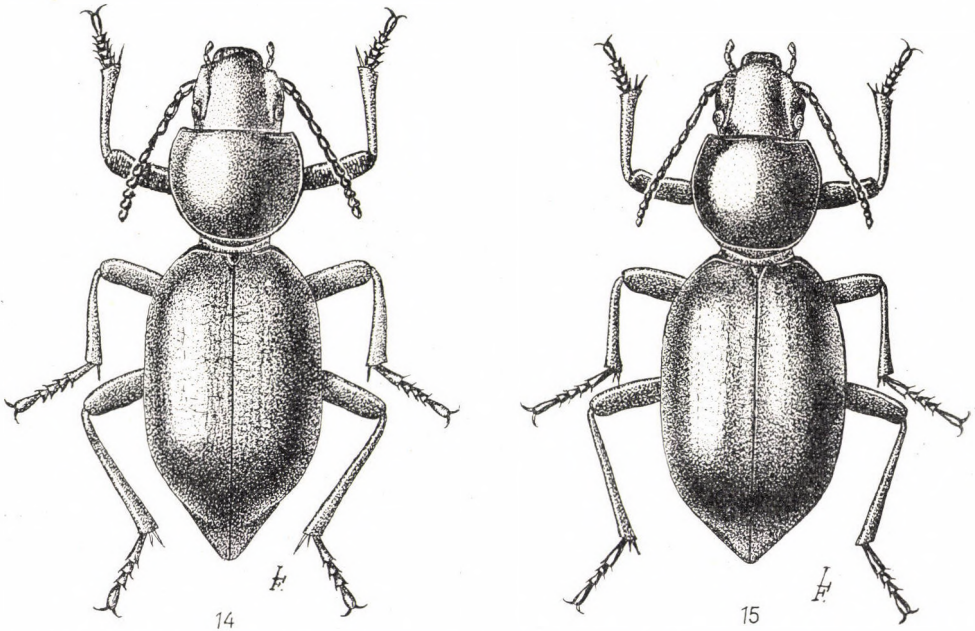


Abb. 14—15. Habitus von *Microdera hybrida* SKOPIN (14) und *M. deserta skopini* ssp. nov. (15)

Mitte am breitesten, nach hinten kaum stärker verengt als nach vorn. Oberfläche punktiert, ihr Grund chagriniert und matt. Bei der forma *typica* ist der Halschild auf dem Grund erloschen chagriniert oder glänzend, viel feiner punktiert, die Seiten vor der Mitte am breitesten und nach hinten viel stärker verengt als nach vorn. Flügeldecken bei ssp. *skopini* m. mit dickem Basal-

rand, die Basis jedoch hinter dem Rand nicht eingedrückt, dagegen bei der forma *typica* stärker eingedrückt, deshalb der Basalrand stärker emporstehend. Länge: 9,5—11,5 mm.

Südost-Kasachstan: Ili Tal, rechtes Ufer, Landmassiv Ulku-Kalkan, 28. VII. 1962, leg. N. G. SKOPIN (Holotypus und 20 Paratypen); Alma-Ata, 14. V. 1930, leg. VERIGINA (1 Paratypus); Wernyi, ex coll. E. REITTER (1 Paratypus); Turkestan, Ili, ex coll. E. REITTER (1 Paratypus); Semiretschie, Djarkent, rivière Ili, IV. 1901, ex coll. E. REITTER (2 Paratypen), alle in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Die neue Unterart soll als Anerkennung der erfolgreichen Forschungen von N. G. SKOPIN, nach dem Entdecker benannt werden.

**Microdera (s. str.) tscharynensis sp. nov.**

Glänzend schwarz, Fühler und Tarsen braun. Kopf am breitesten an den regelmäßig gewölbten Augen, die aus der Seitenwölbung des Kopfes hervortreten. Wangen auf dem Grund schmaler als die Augen, nach vorn aber gerundet erweitert und fast augenbreit. Schläfen gerade, nach hinten verengt, am Hinterrand der Augen ohne Kante. Augenfalten scharf, etwas schräg nach vorn gerichtet, Oberfläche grob punktiert, die Stirn und Scheitel hinten mit ganz kurzen Längsrünzeln. Fühler gestreckt, die Basis des Halsschildes erreichend, schnurförmig. Das 2. Glied länger als breit (wie 10 : 8), das 3. fast doppelt so lang wie das 2. (wie 19 : 10) und 2,5mal so lang wie breit, das 4. fast um ein Drittel kürzer als das 3. (wie 11 : 19), die Glieder 5—7 gleichlang und kürzer als das 4. (wie 12 : 14), alle diese Glieder 1,5mal so lang wie breit, das 8. noch kürzer und merklich breiter (Länge : Breite = 11 : 9), das 9. so lang wie das 2. aber breiter, das 10. und 11. merklich kürzer, das Endglied am Ende schräg abgestutzt. Halsschild nur wenig breiter als lang (wie 26 : 23), in der Mitte am breitesten, Seiten nach vorn und hinten gerundet verengt, die Hinterecken ganz abgerundet, die Vorderecken sehr stumpf. Wie der Kopf punktiert, seitlich nur stellenweise und schwach längsrünzelig. Die größte Breite ist nur etwa 1,3mal so breit wie der Kopf. Flügeldecken langoval, mit vollkommen abgerundeten Schultern, etwa 1,6mal so lang wie die gemeinsame Breite und mehr als 2,3mal so lang wie der Halsschild. Basalrand sehr kurz und tief gelegen, so daß die Basis zwischen Rand und der halsartigen Einschnürung der Mittelbrust sehr schmal ist. Oberfläche fast so grob punktiert wie die Mitte des Halsschildes, am Absturz aber viel feiner. Beine gestreckt, Außenrand der Vorderschienen ohne scharfe Kante. Mittel- und Hinterschienen fein punktiert, mit sehr kurzen und spärlichen Stachelborsten. 1. Glied der Hintertarsen wesentlich länger als das Klauenglied. Unterseite und Propleuren grob längsrissig punktiert, Propleuren weit von den Seiten mit groben Längsrünzeln. Der erhabene Teil der Mittelbrust hoch und die Mitte tief eingedrückt. Letztes Abdominalsternit bei Betrachtung von der Seite her fast gerade. Länge: 11 mm.

Ost-Kasachstan: Fluß Tscharyn, Kurtogaj, VII. 1959, leg. N. G. SKOPIN (Holo- und Paratypus) in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Nächstverwandt mit *M. aciculata* REITT., von welcher Art sie jedoch durch die gewölbten Augen und durch die etwas abweichende Skulptur unterscheidet.

***Microdera* (s. str.) *aciculata penkinae* ssp. nov. (Abb. 16)**

Sie unterscheidet sich von der Stammform in erster Linie durch die Halsschildform sowie durch die Skulptur des Vorderkörpers. Halsschild wesentlich breiter als lang und weniger hoch gewölbt, Seiten nicht steil abfallend, so daß

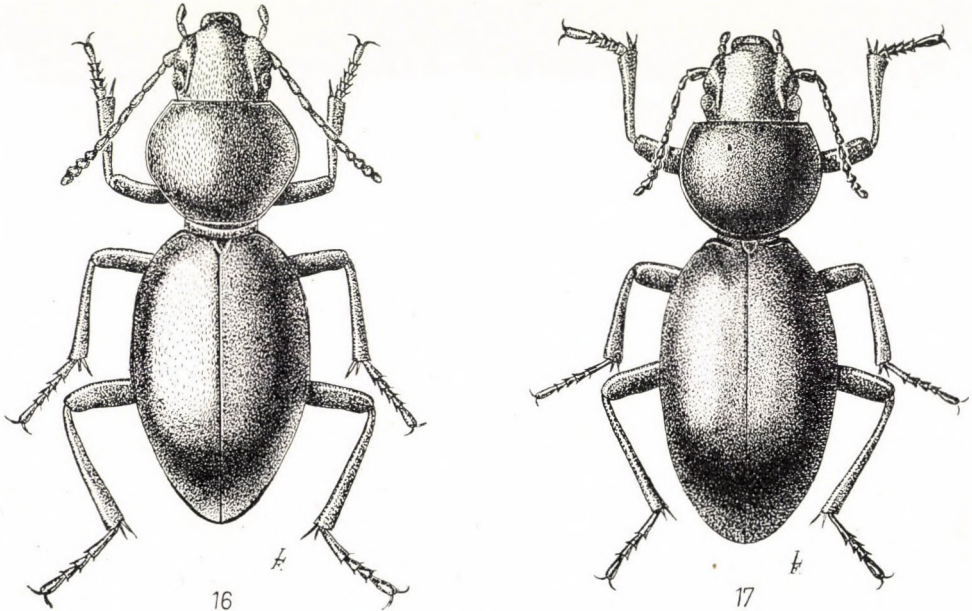


Abb. 16—17. Habitus von *Microdera aciculata penkinae* ssp. nov. (16) und *M. iranica* sp. nov. (17)

bei Betrachtung von vorn zwischen Oberseite und Propleuren am Seitenrand ein deutlicher Winkel entsteht. Die Skulptur des Vorderkörpers äußerst grob und dicht, Stirn auch in der Mitte, Halsschild an den Seiten grob längsgerunzelt, Propleuren ebenfalls bis zum Rand grob längsgerunzelt. Länge: 9—9,7 mm.

Ost-Kasachstan: Dschungarisches Tor, St. Bachtj, nordöstlich von Ala-Kul, VII. 1959 leg. A. PENKINA (Holotypus und 3 Paratypen), in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Diese Form benenne ich zu Ehren von Frau A. PENKINA, die in Kasachstan erfolgreiche entomologische Forschungsreisen durchgeführt hat.

***Microdera* (s. str.) *balchaschensis wernoyensis* ssp. nov.**

*M. balchaschensis* SKOPIN ist durch den hochgewölbten und längsrissig punktierten Halsschild sowie durch die längsgerunzelten Propleuren und durch

die fein punktierten Flügeldecken gekennzeichnet. Die Stammform aus dem Gebiet des Balchaschsees besitzt einen sehr hoch gewölbten Halsschild und einen etwas feiner punktierten Vorderkörper, außerdem ein langes 1. Hintertarsenglied. Die ssp. *wernoyensis* m. hat einen flacheren Halsschild (dies ist besonders in der Seitenansicht auffallend), auch ist die Skulptur des Vorderkörpers gröber punktiert. Hintertarsen lang, auch das 1. Glied lang, jedoch das 2. und 3. zusammen länger als das 1. Augenfalten viel höher und kürzer, etwas gebogener als bei der Stammform. Propleuren stärker längsrissig. Länge: 9—11 mm.

Ost-Kasachstan: Wernoye, Semiretschie, 27. VI. 1907, ex coll. E. REITTER (Holotypus); Turkestan, ex coll. E. REITTER (Paratypus), in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

***Microdera* (s. str.) *iranica* sp. nov. (Abb. 17)**

Schwarz oder dunkel braunschwarz, Tarsen und Fühler etwas heller, der Körper fettglänzend. Kopf breit, an den flachen Augen am breitesten, Augen ganz seitenstehend und die Sehfläche nach den Seiten hin gerichtet, Hinterrand ohne scharfe Kante. Schläfen einfach nach hinten verengt. Wangen fast in einer Augenlänge parallel, kaum schmaler als die Augen, dann nach einem stumpfen, abgerundeten Winkel gerade verengt. Zwischen Clypeus und Wangen nicht ausgerandet. Augenfalten scharf, schräg nach vorn gerichtet. Stirn beiderseits leicht eingedrückt. Oberfläche sehr fein und spärlich, erloschen punktiert, dazwischen ist der Grund chagriniert und matt. Fühler gestreckt, die Basis des Halsschildes erreichend, schnurförmig. Das 2. Glied um ein Viertel länger als breit, das 3. Glied das längste, etwas mehr als doppelt so lang wie breit (wie 19 : 9), etwas mehr als um ein Drittel länger als das 2. (wie 19 : 12); 4.—6. untereinander gleichlang, kaum länger als das 2. (wie 13 : 12), vom 7. an allmählich etwas kürzer, doch sind die Glieder alle länger als breit, das 9. kaum länger als breit (wie 10 : 9), das 10. ein wenig breiter (wie 9 : 9,5) und das Endglied schmaler als die übrigen, unregelmäßig lang eiförmig zugespitzt und schräg abgestutzt. Halsschild merklich breiter als lang (wie 31 : 25) und etwas mehr als 1,6mal breiter als der Kopf. In der Mitte am breitesten, Seiten breit gerundet, nach vorn etwas weniger als nach hinten verengt. Vorderrand in der Mitte breit unterbrochen, Vorderecken bei Betrachtung von oben abgerundet stumpfwinklig, Hinterecken fast ganz verundet. Oberfläche nicht hoch und nicht kugelig aufgewölbt, die Seiten aber steil abfallend und der feine Rand seitlich gelegen. Oberfläche äußerst fein und spärlich, erloschen punktiert und chagriniert. Flügeldecken langoval, etwa 1,6mal so lang wie breit und 1,2mal so breit wie der Halsschild, in der Mitte am breitesten. Schultern ohne Ecke, abgerundet und in flachem Bogen erweitert. Basalrand scharf und etwas gewölbt, jedoch nicht viel höher

als der Seitenrand, nach vorn schräg abfallend, nicht vertikal. So fein und spärlich, erloschen punktiert wie der Halsschild. Der Grund erloschen chagriniert, matt. *Beine* lang, gestreckt, Schienen gerade, Vordersehnen am Außenrand ohne Kante, das Ende etwas stärker erweitert. Mittel- und Hintersehnen dick und erloschen punktiert, die Skulptur jedoch nicht rauh. Das 1. Glied der Hintertarsen etwa so lang wie das Klauenglied. Das 2. und 3. Glied zusammen länger als das 1. Glied. *Unterseite* und Propleuren glatt, unpunktiert, erloschen chagriniert und matt. Letztes Abdominalsternit in Seitenansicht gerade. Der erhabene Teil der Mittelbrust hoch, die Mitte etwas längs eingedrückt und in breitem, flachem Bogen gerundet. Länge: 10—11 mm.

Iran: Sangun (Holotypus); Iranchar (Paratypus), in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Nächstverwandt mit *M. laevigatula* REITT., die schmalere Augen und eine etwas nach vorn gerichtete Sehfläche besitzt; außerdem ist der Halsschild höher gewölbt, hat einen etwas gröber punktierten Kopf, dickere Fühler und Beine, spärlich punktierte Schienen. Steht auch der *M. pulla* REITT. nahe, die jedoch einen trapezförmigen Halsschild besitzt und bei der die Augen aus der Seitenwölbung stärker hervorragen, während die Augenfalten niedrig und innen weniger scharf abgegrenzt sind.

#### *Microdera* (s. str.) *thoracica* sp. nov.

Oberseite schwarz, fettglänzend, Unterseite braunschwarz, Fühler und Beine heller braun. *Kopf* mit etwas gewölbten Augen, die Sehfläche nach den Seiten hin gerichtet, Schläfen nach hinten kaum merklich ausgeschweift verengt. Wangen vor den Augen am Grund eingeschnürt, dann stark gebogen erweitert und breit abgerundet, an der breitesten Stelle kaum schmaler als die Augen. Zwischen Wangen und Clypeus kein Ausschnitt vorhanden. Clypeus vorn etwas asymmetrisch, mit einem großen Zahn versehen, der parallele Seiten hat. Augenfalten kurz und niedrig, schräg nach vorn gerichtet. Stirn leicht gewölbt, vorn beiderseits etwas eingedrückt, mit sehr feiner, seichter, erloschener und spärlicher Punktierung, der Grund fein chagriniert und fettglänzend. *Fühler* gestreckt, das 2. Glied länger als breit (wie 11 : 8,5), das 3. mehr als doppelt so lang wie breit (wie 20 : 9) und fast doppelt so lang wie das 2. (wie 20 : 11); das 4. und 5. gleichlang, mehr als um ein Drittel kürzer als das 3. (wie 20 : 13), etwa um ein Drittel länger als breit (wie 13 : 8,5). Die übrigen Glieder fehlen bei dem von mir untersuchten Exemplar. *Halsschild* scheibenförmig, 1,2mal so breit wie lang, etwas mehr als 1,6mal breiter als der Kopf, in der Mitte am breitesten, Seiten einfach gerundet, nach vorn weniger als nach hinten verengt. Vorderecken, von oben betrachtet, abgerundet rechtwinklig, Hinterecken stumpfwinklig, Vorderrand in der

Mitte breit unterbrochen, Hinterrand scharf gerandet, die Mitte nach hinten länger scharf eckig vorgezogen, deshalb erscheint die Basis als beiderseits ausgebuchtet. Oberseite einfach sehr fein und spärlich, erloschen punktiert, der Grund chagriniert. Flügeldecken gestreckt oval, etwas mehr als 1,8mal so lang wie die gemeinsame Breite, wesentlich breiter als der Halsschild (wie 37 : 30) und fast 2,7mal so lang wie der Halsschild (wie 67 : 25). Basalrand scharf, die Basis vor dem Rand vertikal abfallend, mit ganz stumpfen, fast verrundeten Schultern, die an der Basis kaum breiter sind als die halsartige Einschnürung der Mittelbrust. Oberseite kaum punktiert, grob chagriniert und matt. Zwischen Seitenrand und Basalrand befindet sich an den Schultern eine sehr stumpfe Ecke. Beine lang, Außenrand der Vorder-schienen ohne Kante. Mittelschienen an ihrer Oberfläche wegen Punktierung und wegen kurzer Stachelborsten uneben, Hinterschienen fast glatt, aber nicht glänzend, kaum punktiert. 1. Glied der Hintertarsen so lang wie das 2. und 3. zusammen und länger als das Klauenglied. Unterseite und Propleuren glatt, chagriniert und matt, letztes Abdominalsternit in der Seitenansicht etwas gebogen. Der erhabene Teil der Mittelbrust hoch, die Mitte gefurcht. Länge: 11,5 mm.

Süd-Iran: Yezd (Holotypus), in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Diese Art ist durch die Form der Halsschildbasis gekennzeichnet und kann mit keiner anderen Art der Gattung verwechselt werden. Systematisch steht sie in der Nähe von *M. iranica* m. und *M. laevigatula* REITT., die aber einen einfachen Halsschildhinterrand haben.

### Systematische Reihenfolge der Arten der Gattung *Microdera* Eschscholtz 1831

*Microdera* ESCHSCHOLTZ: Zool. Atlas, 4, 1831, p. 6.

*Rhostax* FISCHER VON WALDHEIM: Bull. Mosc., 17, 1844, I, p. 67.

#### 1. Subgen.: *Tentyrodera* KOCH 1943

KOCH: Mitt. Münchn. Ent. Ges., 33, 1943, p. 572.

- |   |                        |
|---|------------------------|
| 1. <i>marginata marginata</i> BAUDI 1875: Bull. Soc. Ent. Ital., 6, 1874, p. 278.   | Süd-Iran               |
| 2. <i>marginata evansi</i> (BLAIR 1923): Ent. Mo. Mag., III, 9, 1923, p. 121. ( <i>Rhytinota</i> )  | Irak                   |
| 3. <i>marginata brandti</i> KOCH 1943: Mitt. Münchn. Ent. Ges., 33, 1943, p. 573.   | Iran:<br>Belutschistan |
| 4. <i>marginata deserticola</i> (BLAIR 1933): Ent. Mo. Mag., 69, 1933, p. 5. ( <i>Rhytinota</i> )<br>= <i>perezi</i> KOCH: Mitt. Münchn. Ent. Ges., 33, 1943, p. 573. | Arabia                 |

#### 2. Subgen.: *Amicrodera* KASZAB, subgen. nov.

- |                                      |                  |
|--------------------------------------|------------------|
| 5. <i>lindbergi</i> KASZAB, sp. nov. | Nord-Afghanistan |
|--------------------------------------|------------------|

3. Subgen.: **Falsomicrodera** KASZAB, subgen. nov.

6. **turkestanica** SCHUSTER 1915: Ent. Blätter, **11**, 1915, p. 86. China

4. Subgen.: **Microdera** s. str.

REITTER: Deutsche Ent. Zeitschr., **1897**, p. 229.

7. **ocularis** REITTER 1915: Ent. Blätter, **11**, 1915, p. 95. Transkaukasus  
 8. **kermanica** KASZAB, sp. nov. Iran  
 9. **aurita** (REITTER 1889): Horae Soc. Ent. Ross., **23**, 1889, p. 686. China  
 (*Dordanea*)  
 10. **mongolica** (REITTER 1889): Horae Soc. Ent. Ross., **23**, 1889, p. 686. (*Dordanea*) China  
 11. **laticollis laticollis** F. BATES 1879: Cist. Ent., **2**, 1879, p. 470. China, Kasachstan  
 = *przewalskyi* (REITTER 1887): Horae Soc. Ent. Ross., **21**, 1887, p. 359. (*Tentyria*)  
 12. **laticollis kozlovi** KASZAB, ssp. nov. Mongolei, China  
 13. **fortepunctata** REITTER 1915: Ent. Blätter, **11**, 1915, p. 94. Kasachstan  
 14. **strigiventris** REITTER 1900: Best.-Tab. **42**, 1900, p. 157. China  
 15. **globithorax** (STEVEN 1829): Nouv. Mém. Mosc., **1**, 1829, p. 93. Kasachstan,  
 (*Tentyria*) Siberia  
 = *convexa* BESSER 1832: Nouv. Mém. Mosc., **2**, 1832, p. 14.  
 16. **dzhungarica** G. MEDVEDEV 1964: Trudi Zool. Acad. Nauk SSSR, **34**, 1964, p. 161. Kasachstan  
 17. **scyta** BAUDI 1875: Deutsche Ent. Zeitschr., **19**, 1875, p. 55. Buchara  
 18. **pleuralis** (REITTER 1887): Horae Soc. Ent. Ross., **21**, 1887, p. 360. (*Tentyria*) China  
 19. **parvicollis** F. BATES 1879: Cist. Ent., **2**, 1879, p. 470. China,  
 Kasachstan  
 = *basalis* (REITTER 1887): Horae Soc. Ent. Ross., **21**, 1887, p. 360. (*Tentyria*)  
 = *semenowi* REITTER 1897: Deutsche Ent. Zeitschr., **1897**, p. 231.  
 20. **menetriasi** (FISCHER VON WALDHEIM 1844): Bull. Mosc., **17**, 1844, I, p. 68. (*Rhostax*) Gebiet des  
 = *macrops* REITTER 1915: Ent. Blätter, **11**, 1915, p. 93. Kaspischen Meeres  
 21. **deserta deserta** (TAUSCHER 1812): Mém. Mosc., **3**, 1812, p. 38, Kasachstan  
 Taf. III, Fig. 7. (*Tentyria*)  
 = ? *deplanata* GEBLER 1841: Bull. Acad. Petrogr., **8**, 1841, p. 373.  
 22. **deserta skopini** KASZAB, ssp. nov. Kasachstan  
 23. **tscharynensis** KASZAB, sp. nov. Kasachstan  
 24. **aciculata aciculata** REITTER 1897: Deutsche Ent. Zeitschr., **1897**, p. 232. Kasachstan  
 25. **aciculata penkinae** KASZAB, ssp. nov. Kasachstan  
 26. **balchaschensis balchaschensis** SKOPIN 1960: Ann. Hist.-nat. Mus. Nat. Hung., **52**, 1960, p. 297. Kasachstan  
 27. **balchaschensis wernoyensis** KASZAB, ssp. nov. Kasachstan  
 28. **schusteriana** KASZAB 1957: Ann. Hist.-nat. Mus. Nat. Hung., S. n. **8**, 1957, p. 292. Kasachstan  
 = *halophila* SKOPIN 1961: 1. c., **53**, 1961, p. 392.  
 29. **minax** REITTER 1897: Deutsche Ent. Zeitschr., **1897**, p. 233. Afghanistan,  
 Kasachstan,  
 Transkaspien  
 30. **subsulcata** KRAATZ 1865: Revis. Tenebr., Berlin, **1865**, p. 186. Kasachstan,  
 »Südrubland«  
 31. **wachshiana** SKOPIN 1964: Ann. Hist.-nat. Mus. Nat. Hung., **56**, 1964, p. 411. Tadshikistan  
 32. **strigipleuris** REITTER 1897: Deutsche Ent. Zeitschr., **1897**, p. 232. Nord-Iran



33. **karelini** FISCHER VON WALDHEIM 1844: Bull. Mosc., **17**, 1844, I, p. 67. »Songarei«
34. **chan** KASZAB 1963: Anzeiger math.-naturw. Kl. Österr. Akad. Wien, Nr. **5**, 1963, p. 70. Iran
35. **pulla** REITTER 1897: Deutsche Ent. Zeitschr., **1897**, p. 234. Nord-Iran
36. **afghanica** GRIDELI 1954: Atti Mus. Trieste, **19**, 1954, p. 198. Afghanistan
37. **transversicollis** REITTER 1887: Deutsche Ent. Zeitschr., **1887**, p. 517. Turkmenien,  
Transkasprien,  
Afghanistan,  
Iran
38. **reitteri** KASZAB, nom. nov.  
= *parvicollis* REITTER 1897 (nec F. BATES 1879): Deutsche Ent. Zeitschr., **1897**, p. 235. Kaukasus
39. **laevigatula** REITTER 1915: Ent. Blätter, **II**, 1915, p. 95. Transkasprien,  
Afghanistan,  
Iran
40. **heydeni** KRAATZ 1882: Deutsche Ent. Zeitschr., **26**, 1882, p. 82. Turkmenien,  
Kasachstan,  
Tadschikistan
41. **grandicollis** BOGATSHEV 1946: Dokl. Akad. Nauk Azerb. SSR, **2**, Nr. 5, 1946, p. 211. Tadschikistan,  
Kasachstan,  
Afghanistan
- = *badakschanica* KASZAB 1959: Ent. Arb. Mus. Frey, **10**, 1959, p. 390, Taf. II, Fig. 15.
42. **semenovianiana** BOGATSHEV 1947: Dokl. Akad. Nauk Azerb. SSR, **3**, Nr. 10, 1947, p. 263. (nom. nov.) Tadschikistan,  
Afghanistan
- = *semenovi* BOGATSHEV 1946: I. c., **2**, Nr. 5, 1946, p. 210 (nec REITTER 1897)
43. **ferghanensis** KASZAB 1957: Ann. Hist.-nat. Mus. Nat. Hung., S. n. **3**, 1957, p. 290. Kasachstan
44. **extabesa** SKOPIN 1961: Ann. Hist.-nat. Mus. Nat. Hung., **53**, 1961, p. 393. Turkmenien,  
Usbekistan,  
Kasachstan
45. **kaszabi** SKOPIN 1961: Trudi n.-i. Inst. Shanshts. Rast., **6**, 1961, p. 79. Kasachstan
46. **kazenasi** SKOPIN 1960: Ann. Hist.-nat. Mus. Nat. Hung., **52**, 1960, p. 297. Kasachstan
- = *castanea* SKOPIN 1960: I. c., p. 297.
47. **iliensis** SKOPIN 1961: Ann. Hist.-nat. Mus. Nat. Hung., **53**, 1961, p. 394. Kasachstan
48. **iranica** KASZAB, sp. nov. Iran
49. **thoracica** KASZAB, sp. nov. Iran
50. **campestris** (STEVEN 1829): Nouv. Mém. Mosc., **1**, 1829, p. 93. Turkmenien,  
Kasachstan
- = *globulicollis* MÉNÉTRIÉS 1849: Mém. Acad. Petr., **6**, 1849, p. 230, Taf. 4, Fig. 1.
- = *margelanica* KRAATZ 1882: Deutsche Ent. Zeitschr., **26**, 1882, p. 81.
51. **subglobosa** KRAATZ 1865: Revis. Tenebr., Berlin, **1865**, p. 187. Gebiet des  
Kaspischen  
Meeres,  
Transkasprien
52. **hybrida** SKOPIN (im Druck) Kasachstan
53. **gracilis** ESCHSCHOLTZ 1831: Zool. Atlas, **4**, 1831, p. 6. »Südrußland«,  
Kirghisensteppe,  
Kasachstan
54. **gigas** MEDVEDEV 1964: Trudi Zool. Inst. Akad. Nauk SSSR, **34**, 1964, p. 162. Kasachstan
55. **convexa** (TAUSCHER 1812): Mém. Mosc., **3**, 1812, p. 39, Taf. 3, Fig. 8. (*Tentyria*) »Südrußland«,  
Transkaukasus,  
Kasachstan
- = *globosa* BESSER 1832: Nouv. Mém. Mosc., **2**, 1832, p. 14.
56. **fausti** KRAATZ 1888: Deutsche Ent. Zeitschr., **1888**, p. 294. Gebiet des  
Kaspischen Meeres

5. Subgen.: *Iliodera* SKOPIN 1961SKOPIN: Ann. Hist.-nat. Mus. Nat. Hung., **53**, 1961, p. 396.57. *desertoides* SKOPIN 1961: l. c., p. 396.

Kasachstan

6. Subgen.: *Dordanea* REITTER 1887REITTER: Horae Soc. Ent. Ross., **21**, 1887, p. 357.*Adordanea* REITTER: Deutsche Ent. Zeitschr., **1897**, p. 229.58. *elegans* (REITTER 1887): Horae Soc. Ent. Ross., **21**, 1887, p. 358. (*Dordanea*)

China

59. *kraatzi kraatzi* (REITTER 1889): Horae Soc. Ent. Ross., **23**, 1889, p. 685. (*Dordanea*)

China, Mongolei

var. *elegantoides* KASZAB 1964: Acta. Zool. Hung., **10**, 1964, p. 380.60. *kraatzi alashanica* SKOPIN 1964: Trudi n.-i. Inst. Shanshts. Rast., **8**, 1964, p. 384.

China

61. *globata* (FALDERMANN 1835): Mém. Acad. Petr. sav. étrang., **2**, 1835, p. 402. (*Tentyria*)Mongolei,  
China62. *interrupta* REITTER 1897: Deutsche Ent. Zeitschr., **1897**, p. 230.

Mongolei

63. *ordossica* SCHUSTER 1940: Kol. Rundschau, **29**, 1940, p. 21.

China

64. *kanssuana* KASZAB 1957: Ann. Hist.-nat. Mus. Nat. Hung., S. n., **8**, 1957, p. 292.

China

65. *jurganovae* SKOPIN 1964: Trudi n.-i. Inst. Shanshts. Rast., **8**, 1964, p. 385.

Mongolei

66. *subseriata* REITTER 1889: Horae Soc. Ent. Ross., **23**, 1889, p. 685.

China

= *subfoveolata* SKOPIN 1964: Trudi n.-i. Inst. Shanshts. Rast.,**8**, 1964, p. 386.

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67. *convexicollis* (MOTSCHULSKY 1870): Bull. Mosc., **43**, 1870, I, p. 379. (*Rhostax*)

Kirghisien

68. *excavata* MOTSCHULSKY 1870: Bull. Mosc., **43**, 1870, I, p. 382.

Kirghisien

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ÜBERSICHT ÜBER DIE ARTEN DER GATTUNG  
MELANESTHES LACORDAIRE 1859  
(COLEOPTERA, TENEBRIONIDAE)

Von  
Z. KASZAB

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

(Eingegangen am 15. Januar 1966)

In der Bestimmungstabelle der ersten, grundlegenden Arbeit REITTERS (1904) finden sich 14 Arten der Gattung *Melanesthes*. Bei REICHARDT (1936) liegt die Zahl der Arten nur um 3 höher. Ich selbst kenne nun schon fast doppelt so viele wie REICHARDT (insgesamt 33 Arten), so daß es zweckmäßig erscheint, über die Gattung eine neue Übersicht zu geben. In den letzten 10 Jahren wurde von KONTKANEN (1956) 1 Art, von SKOPIN (1961, 1964, 1966) 6 Arten und von mir (1962, 1964, 1966) 7 Arten resp. Unterarten beschrieben.

Die Gattung enthält ausschließlich zentralasiatische Arten, u. zw. finden sie sich nur in der Steppen- und Wüstenzone. Sie leben versteckt im Sand oder zwischen Pflanzenwurzeln, vorwiegend bei *Caragana*, wo der Boden meist sandig ist. Einige Arten sind manchmal sehr häufig, trotzdem sind sie in den europäischen Sammlungen äußerst selten, da bisher nur von wenigen Arten Exemplare in größerer Zahl erbeutet wurden.

Für die vorliegende Arbeit lag mir die sehr reichhaltige Sammlung des Ungarischen Naturwissenschaftlichen Museums vor, in welcher mit Ausnahme zweier Arten (*M. opaca* REITTER und *M. monatroides* REICHARDT) alle bisher bekannte Arten vertreten sind. Von einigen Arten habe ich selbst in der Mongolei sehr große Serien gesammelt. Für die Zusendung der Paratypen seiner Arten bin ich Herrn G. SKOPIN (Alma-Ata) zu großem Dank verpflichtet.

**Bestimmungstabelle der Arten der Gattung *Melanesthes Lacordaire***

- 1 (6) Fühler kurz, das 3. Glied nicht länger als das 2., vorletzte Glieder stark quer (Abb. 6). Seiten des Halsschildes mit scharfen Kerbzähnen. Seiten des Körpers lang bewimpert. Vorderschienen außen mit großem Mittel- und Endzahn (Abb. 8—9)

6. Untergattung: ***Mongolesthes* REITTER 1904**

- 2 (3) Basis des Halsschildes fein strichförmig gerandet, die Randung jedoch in der Mitte weit unterbrochen und beiderseits ohne Spur eines

gekerbten Randes, mit sehr stumpfwinkligen Hinterecken. Vorderschienen am Endzahn abgerundet und deutlich schmaler als die Vordertarsen lang (Abb. 8), Mittelzahn ebenfalls abgerundet. Mittelzahn nur halb so lang wie die Breite der Vorderschienen zwischen den Zähnen. Mittel- und Hinterschienen außen sehr breit und gekrümmt, mit ganz kurzen Stachelborsten, Innenseite mit langen, dünnen Haaren. — Länge: 6 mm. Mongolei (Provinz Chovd: Erdeneburen)

31. *altaica* KASZAB 1966

- 3 (2) Basis des Halsschildes ungerandet, auch seitlich ohne Randung, wogegen die Basis beiderseits mit einer Reihe feiner und stumpfer Kerbzähnchen, mit völlig abgerundeten Hinterecken. Endzahn der Vorderschienen so breit wie die Vordertarsen und spitzwinklig ausgezogen (Abb. 9), Mittelzahn ebenfalls spitzwinklig und lang ausgezogen,

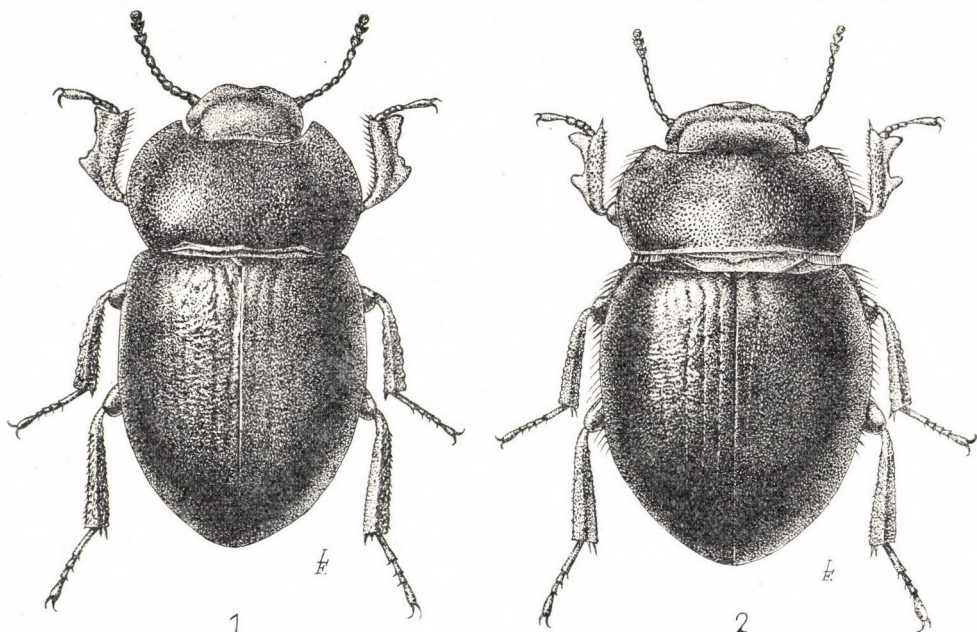


Abb. 1. *Melanesthes bielawskii* KASZAB; — Abb. 2. *Melanesthes davadshamsi* KASZAB

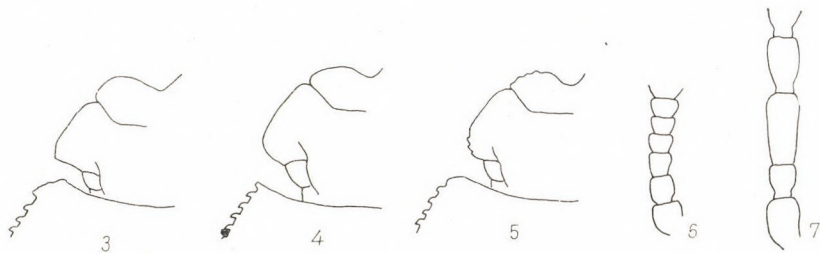


Abb. 3—7. Kopf von *Melanesthes altaica* KASZAB (3), *M. heydeni* CSIKI (4) und *M. csikii* KASZAB (5). — Fühlerbasis von *M. altaica* KASZAB (6) und *M. simplex* REITTER (7)

so lang wie die Breite der Vorderschienen zwischen den 2 Zähnen. Mittel- und Hinterschienen viel schmaler, die Mitte nicht oder kaum erweitert, Außenseite mit längeren Stachelborsten.

- 4 (5) Wangen vor den Augen breit gerade erweitert und viel breiter als die Augen, die größte Breite so breit wie die Halsschildvorderecken (Abb. 4). Vorderecken des Halsschildes scharf rechtwinklig vorgezogen. Seiten des Halsschildes neben dem Seitenrand etwas abgeflacht, die Körnelung des Randes dichter, etwa 20 Zähne am Rand. Das 2. Fühlerglied knopfförmig. Die ganze Oberfläche gröber gekörnelt. Schienen von Mittel- und Hinterbein weit dicker, Oberseite der Schienen flacher und die Borsten der Körnchen am Außenrand viel kürzer und dicker. — Länge: 5—6,5 mm. Mongolei (Zentral-Provinz: Burgaltai; Provinz Mittelgobi: Bain-belki)

32. **heydeni** CSIKI 1901

- 5 (4) Wangen vor den Augen breit abgerundet, kaum breiter als die Augen und schmaler als die Vorderecken des Halsschildes (Abb. 5). Halsschildvorderecken stumpfwinklig, Seiten des Halsschildes gar nicht abgeflacht und die Körnelung des Randes spärlicher, etwa 13—16 Zähnchen am Rand. Das 2. Fühlerglied trapezförmig. Die ganze Oberfläche feiner und spärlicher, matter gekörnelt. Schienen von Mittel- und Hinterbein dünner, Oberfläche der Schienen stärker gewölbt, Außenrand der Schienen mit langen Stachelborsten. — Länge: 4,5—4,9 mm. Mongolei (Provinz Südgobi: die Umgebung von Bulgan)

3. **csikii** KASZAB 1965

- 6 (1) Fühler lang, das 3. Glied gestreckt, viel länger als das 2. (Abb. 7). Seiten des Halsschildes nicht gekerbt, ohne Zähne am Rand. Basis des Halsschildes entweder gerandet oder ungerandet.
- 7 (14) Kopf und Halsschild mit längsrundlicher Punktierung. Halsschildbasis ganz ungerandet. Flügeldecken mit rechtwinkligen Schulterecken. Seiten des Körpers unbewimpert. Der große Endzahn der Vorderschienen auf der Vorderseite mehr oder weniger ausgerandet (Abb. 10—11). Mittelzahn näher an der Basis gelegen und stumpf

5. Untergattung: **Opatronesthes** REITTER 1904

- 8 (9) Zwischenräume der Flügeldecken einfach erloschen seicht punktiert, auch am Absturz ohne Körnchen, der Grund chagriniert und ganz matt. Halsschild mit längsrissiger Punktur, die Punkte beiderseits in Längsrichtung zusammenfließend. Seitenrand der Flügeldecken sehr schmal abgesetzt. — Länge: 7,5—9,5 mm. China (Provinz Kanssu; Chingan, Lianghow)

27. **punctipennis** REITTER 1889

- 9 (8) Zwischenräume der Flügeldecken gekörnelt.  
 10 (11) Zwischenräume der Flügeldecken fein, etwas raspelartig gekörnelt, vorn auch grob punktiert und der Grund unregelmäßig erloschen quengerunzelt. Halsschild gröber, dichter, länglicher punktiert, die Punkte bilden kurze Längsrünzel, so daß der Halsschild einfach längsgestrichelt erscheint. — Länge: 8—9 mm. China (Provinz Kanssu)  
 28. **rugipennis** REITTER 1889  
 11 (10) Zwischenräume der Flügeldecken grob gekörnelt, am hinteren Teil jedes Körnchen mit einer kurzen, gelben Borste an der Basis.  
 12 (13) Flügeldecken an den inneren Zwischenräumen mit 2—3 unregelmäßig stehenden, an den äußeren Zwischenräumen mit 1—2 Reihen größeren

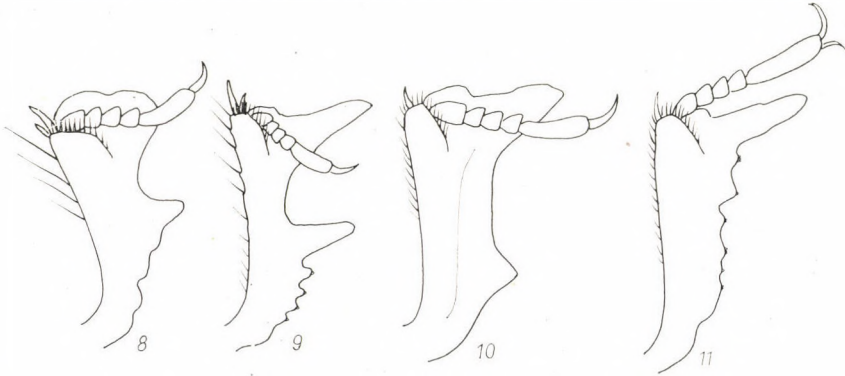


Abb. 8—11. Vorderbein von *Melanesthes altaica* KASZAB (8), *M. csikii* KASZAB (9), *M. punctipennis* REITTER (10) und *M. monatroides* REICHARDT (11)

Körnchen, am Absturz meist einreihig gekörnelt. Die Zwischenräume sind vorn durch grobe Punkte uneben. Halsschild mit groben, langen, geschwungenen Längsriefen dicht besetzt, die Mittellinie fein erhaben. Stirn längsgerunzelt. Kopf und Halsschild ohne Spur einer Körnelung. Endzahn der Vorderschienen breit, dreieckig, Mittelzahn nahe der Basis scharf stumpfwinklig, der Außenrand zwischen beiden ist gekerbt. — Länge: 10,5 mm. China (Provinz Kanssu)

29. **tuberculosa** REITTER 1889

- 13 (12) Flügeldeckenzwischenräume mit je einer scharfen Körnchenreihe. Halsschildoberfläche grob granuliert, die Graneln kaum zusammenfließend, inzwischen mit Längsrünzeln, die Skulptur jedoch in der Mitte feiner. Kopf unregelmäßig gekörnt, Clypeus grob punktiert. Vorderschienenendzahn sehr schmal, fast parallel und lang, Außenrand nahe der Basis etwas erweitert, jedoch ohne ausgesprochenen Mittelzahn, Außenrand stark gekerbt (Abb. 11). — Länge: 8—9 mm. China (Provinz Kanssu: Pa-pa-gyn, Sinin) (nach REICHARDT)

30. **monatroides** REICHARDT 1936



- 14 (7) Kopf und Halsschild einfach punktiert oder granuliert, die Punkte rundlich, sie bilden weder Längsrisse noch Längsfalten. Basis des Halsschildes entweder gerandet oder ungerandet.
- 15 (40) Hinterrand des Halsschildes ungerandet, bis zum Basalrand gewölbt, in der Mitte stets ohne Spur einer Randung, manchmal beiderseits strichförmig fein und sehr schmal gerandet; die Basis beiderseits ausgebuchtet und der Mittellappen weiter nach hinten ausgezogen als die Hinterecken.
- 16 (25) Vorderschienen mit scharfem Mittelzahn und mit scharf vorgestrecktem Endzahn, der Außenrand glattrandig. Das 1. Glied der Hintertarsen viel kürzer als das Klauenglied (Abb. 12). Seitenrand der Flügeldecken mit einer Reihe langer Stachelborsten. Halsschildseiten nicht bewimpert. Oberseite dicht granuliert, der Grund matt chagriert

#### 4. Untergattung: *Lesbidana* REITTER 1904

- 17 (18) Die Hinterecken des Halsschildes scharfwinklig, fast rechtwinklig, da die Basis beiderseits neben den Hinterecken fast ausgerandet (Abb. 14). Die Vorderwinkeln ragen scharfwinklig vor. Seitenrand breit abgesetzt. Hinterkörper oval, Seitenrand breit abgesetzt, aber nicht aufgebogen, Oberseite dicht und fein granuliert, die Zwischenräume mit je einer größeren, haartragenden Körnchenreihe. Die Körnelung des Halsschildes grob und dicht, etwas raspelartig. — Länge: 6—7 mm. China (Chingan Gebirge), Mongolei (Provinz Čojbalsan: Bujr nur; Provinz Suchebaator: Ongon elis)

#### 22. *chinganica* REICHARDT 1936

- 18 (17) Hinterecken des Halsschildes vollkommen abgerundet oder höchstens mit einer ganz stumpfen Ecke (Abb. 15—17).
- 19 (22) Hinterecken des Halsschildes ganz breit abgerundet, ohne Spur von Hinterecken (Abb. 15—16).

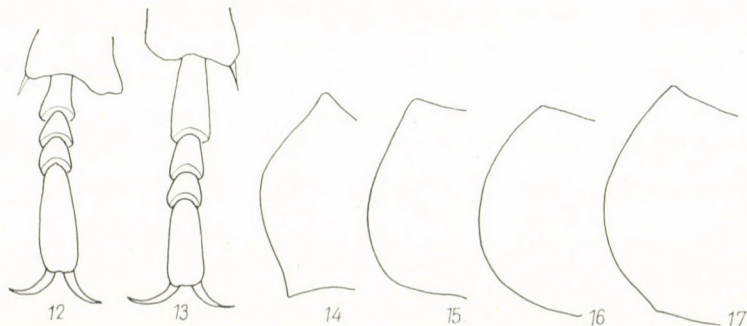


Abb. 12—17. Hintertarsus von *Melanesthes punctipennis* REITTER (12) und *M. iliensis* SKOPIN (13). — Halsschildseitenrand von *M. chinganica* REICHARDT (14), *M. simplex* REITTER (15), *M. kazachstanica* KASZAB (16) und *M. coriaria* REITTER (17)

- 20 (21) Halsschild weit hinter der Mitte am breitesten, nach vorn viel stärker verengt als nach hinten, die hintere Ecke in einem breit verrundeten und sehr breit verflachten, abgesetzten Teil plötzlich verengt (Abb. 15). Scheibe des Halsschildes punktiert, die Seiten gekörnelt. Flügeldecken ziemlich parallel, Seitenrand kaum gekörnt, an den Schultern sehr schwach verengt; Oberseite fein und spärlich, meist erloschen granuliert, besonders innen. Oberseite schwach beborstet. — Länge: 7—8 mm. Kasachstan (Issyk-kul, Fluß Tschu), China (Provinz Sinkiang: Aksu, Tianshan, Tauschkan-darja, Kara-teke, Takla-Makan)  
23. **simplex** REITTER 1897
- 21 (20) Halsschild etwa in der Mitte am breitesten, Seitenrand breit gerundet, nach vorn kaum etwas stärker verengt als nach hinten, der hintere Teil in einem sehr flachen Bogen gerundet und in einer Flucht in den Hinterrand übergehend (Abb. 16). Scheibe des Halsschildes nicht punktiert, mit doppelter Körnelung, am Grund feine, dicht stehende Körnchen, inzwischen mit gröberen, spärlicher stehenden Körnchen. Flügeldecken kurzoval, Seitenrand gut sichtbar gezahnt, Schulter zur Basis hin stärker verengt, weshalb die Schulterecken mehr stumpf sind; Oberseite ebenfalls doppelt granuliert, zwischen den dicht stehenden Körnchen befinden sich etwas größere, manchmal in Reihen stehende, borstentragende Körnchen. — Länge: 9 mm. Kasachstan (Issyk-kul: Przhewalsk), China (Provinz Sinkiang: NW Tianshan, Susamyr-Tal)  
24. **kazachstanica** KASZAB 1962
- 22 (19) Hinterwinkel des Halsschildes stumpfwinklig. Seiten des Halsschildes einfach gerundet, in der Mitte am breitesten, nach vorn und hinten ungef. gleichfalls verengt (Abb. 17).
- 23 (24) Größer. Flügeldecken sehr dicht und fein gekörnelt, dazwischen mit gröberen, borstentragenden Körnchen besetzt. Körper gedrunken, Schulter ziemlich scharf stumpfwinklig und die Basis in Querrichtung, besonders an den Schultern flacher. Seitenrand mit spärlich stehenden Kerbzähnchen, die die langen Borstenhaare tragen. Halsschildseiten abgesetzt und etwas aufgebogen. — Länge: 7,5—9,5 mm. Tadshikistan (Tscharvah, Karagai-Tau, Alexander Gebirge, Alai, Ferghana, Narin, Tokmak), Kasachstan (Issyk-kul, u. sw.)  
25. **coriaria** REITTER 1904
- 24 (23) Kleiner. Flügeldecken, besonders innen, erloschen fein granuliert und inzwischen mit ebenfalls nicht scharf vortretenden, gröberen, borstentragenden Körnchen. Körper schmaler, gewölbter, Flügeldeckenbasis auch an den Schultern quer gewölbt und die Schulterbeulen abgerundet stumpfwinklig. Seitenrand kaum abgesetzt und von oben nur ganz vorn sichtbar, weil der Seitenrand stärker niedergebogen ist; die Kerbzähnchen am Seitenrand fein, jedoch scharf. Halsschild

ungleich gekörnelt, Seitenrand abgesetzt, hinten stärker aufgebogen. — Länge: 6—7,5 mm. Kasachstan (Issyk-kul, Ton Fluß), China (Provinz Sinkiang: Tianshan, Fluß Eniltshuk)

26. *subcoriaria* REITTER 1897

- 25 (16) Vorderschienen nur mit scharfem oder stumpfem Endzahn, Mittelzahn am Außenrand fehlt vollkommen oder nur ganz stumpf, Außenseite oft scharf gekerbt (Abb. 18—22). Körper parallel. Seitenrand der Flügeldecken lang bewimpert oder kahl. 1. Glied der Hintertarsen ungef. so lang wie das Klauenglied.

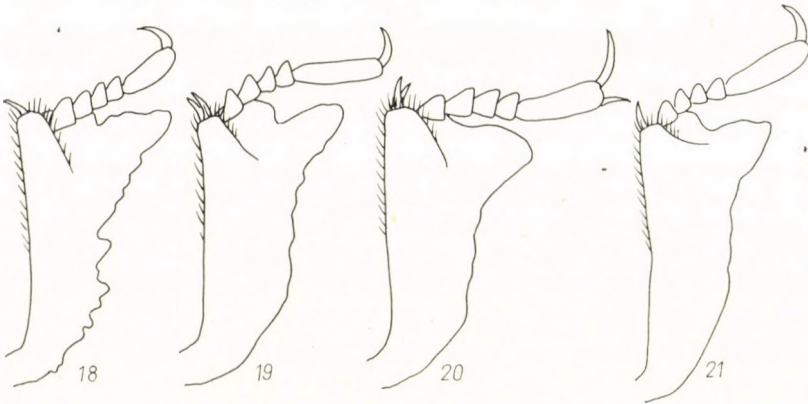


Abb. 18—21. Vorderbein von *Melanesthes iliensis* SKOPIN (18), *M. hirsuta* REITTER (19), *M. fortidens* REITTER (20) und *M. kalidii* SKOPIN (21)

- 26 (33) Seitenrand der Flügeldecken lang bewimpert. Außenseite der Vorderschienen meist stark krenuliert, Vorderseite des Endzahnnes ausgeschnitten (Abb. 18—19). Halsschildseiten grob gekörnelt

2. Untergattung: **Hemitrichestes** REITTER 1904

- 27 (28) Seitenrand des Halsschildes vor den Hinterecken etwas ausgeschweift, die hintere Ecke mithin scharf, fast rechtwinklig. Halsschildmitte auf glattem, glänzendem Grund mit spärlichen, rundlichen Körnchen; seitlich wird diese Körnelung allmählich gröber, die Körnchen stehen aber überall vollkommen voneinander separiert und sind auch seitlich rundlich. Die Reihenpunkte der Flügeldecken tragen je ein kleines, borstentragendes Körnchen, außerdem die Zwischenräume mit ebensolchen feinen Körnchen besetzt. Die Beborstung lang und abstehend. Körper rostbraun. — Länge: 8,3—9,7 mm. Kasachstan (Ili Fluß: Ajak Kalkan)

5. *iliensis* SKOPIN 1966

- 28 (27) Seitenrand des Halsschildes vor den Hinterecken nicht ausgeschweift, deshalb stumpfwinklig. Halsschild erloschen granuliert oder die Mitte punktiert, seitlich ist der Grund der Granulierung gerunzelt. Körper schwarz.
- 29 (30) Zwischenräume der Flügeldecken mit genauso groben Punkten wie die Reihenpunkte, wodurch die Oberfläche scheinbar überall grob punktiert und der Grund uneben ist; außerdem noch mit feinen, vorn, besonders seitlich mit gröberen Körnchen. Die Borstenhaare der Flügeldecken lang und abstehend, Halsschild in der Mitte sehr dicht raspelartig punktiert-gekörnelt, seitlich ist die Körnelung sehr dicht. Endzahn der Vorderschienen breit und der Vorderrand mit tiefem Ausschnitt (Abb. 19). — Länge: 7,5—9 mm. Kasachstan (westl. Gebiet des Balchaschsees: Halbinsel Mangyschlak, Busatschi, Fluß Emba, Maj-Zharylgan-Berge) (= *Lobodera hirsuta* REITTER)

6. *hirsuta* (REITTER 1896)

- 30 (29) Zwischenräume der Flügeldecken ohne Punktierung, eine Reihenpunktur ist ebenfalls kaum erkennbar, die Zwischenräume sind fein gekörnelt, die Borsten ganz kurz. Die Körnelung des Halsschildes auch seitlich spärlicher.
- 31 (32) Stirn gleichmäßig scharf gekörnelt. Die Körnelung der Flügeldecken in den inneren Zwischenräumen, wenn auch fein, jedoch gut erkennbar. Mitte des Halsschildes dicht und grob punktiert-gekörnelt, die seitliche Körnelung seichter und stärker gerunzelt. Endzahn der Vorderschienen groß, Vorderrand des Endzahnes tief ausgeschnitten. — Länge: 8—9,3 mm. Kasachstan (Nord-Ufer des Balchaschsees: Balchasch)

7. *hirsuta balchaschense* SKOPIN 1966

- 32 (31) Stirn nur nahe an den Augen deutlich gekörnelt, in der Mitte runzelig oder raspelartig punktiert. Flügeldeckenkörnelung in den inneren Zwischenräumen sehr fein, erloschen. Mitte des Halsschildes spärlich und seicht, erloschen raspelartig punktiert; seitlich ist die Körnelung grob und spärlicher, dazwischen weniger gerunzelt. Endzahn der Vorderschienen schmaler, vorn abgeschrägt, ohne deutlichen Ausschnitt. — Länge: 7,9—9,9 mm. Kasachstan (Nordufer des Balchaschsees: Balchasch)

8. *seminuda* SKOPIN 1966

- 33 (26) Seitenrand der Flügeldecken kahl oder höchstens mit ganz kurzen Borsten. Außenseite der Vorderschienen glatt und der Endzahn groß, dreieckig (Abb. 20—22). Halsschildscheibe auch an der Seite ohne ausgesprochene Körnelung. Flügeldecken mit groben Punktreihen

1. Untergattung: *Myladanesthes* SKOPIN 1961

34 (35) Stirn beiderseits neben den Augen mit längsrundlicher Punktierung, die Mitte einfach länglich punktiert, nicht gekörnelt. Halsschildscheibe einfach punktiert; in der Mitte sind die Zwischenräume größer als die Punkte selbst, seitlich wird die Punktierung gröber, hie und da sind einige Punkte in Längsrichtung verbunden, der mehr oder weniger abgesetzte Seitenrand ist quengerunzelt. Zwischenräume der Flügeldecken grob punktiert und gekörnelt, uneben. Endzahn der Vorderschienen breit (Abb. 20). — Länge: 9–11,2 mm. Kasachstan (Fluß Tscharyn, Kalkan-Berge, Dsungarisches Tor, Semirjetschie), China (Provinz Sinkiang: Kaschgar) (= *Myladina fortidens* REITTER)

1. **fortidens** (REITTER 1915)

35 (34) Stirn beiderseits granuliert.

36 (37) Endzahn der Vorderschienen am Vorderrand tief ausgeschnitten (Abb. 21). Scheibe des Halsschildes sehr fein und spärlich auf vollkommen mattem, grob chagriniertem Grund punktiert; neben den Seiten wird die Punktierung gröber und raspelartig, der abgesetzte Seitenrand etwas gerunzelt. Der Grund der Flügeldecken grob chagriniert, matt, die Körnelung ist in den inneren Zwischenräumen feiner, seitlich gröber. Die Punktreihen sehr grob. — Länge: 8,4–9,2 mm. Kasachstan (Guriew, Halbinsel Busatschi)

2. **kalidii** SKOPIN 1964

37 (36) Endzahn der Vorderschienen am Vorderrand nicht ausgerandet (Abb. 22). Scheibe des Halsschildes grob und dicht punktiert, der Grund meist erloschen chagriniert oder glatt, deshalb glänzender.

38 (39) Zwischenräume der Flügeldecken sehr scharf und dicht gekörnelt; die Körnchen sind nicht in Reihen angeordnet, im Querschnitt jedes Zwischenraumes sind aber etwa 3 Körnchen vorhanden. In der Quere stark gewölbt und auch an den Schultern nicht abgeflacht. Seiten des Halsschildes nicht abgeflacht, ohne Runzeln, Scheibe seitlich gröber granuliert und etwas gerunzelt. Die Körnchen der Stirn beiderseits neben den Augen bilden in Längsrichtung kurze Fältchen, die Mitte dicht raspelartig. — Länge: 7,5–8,8 mm. Kasachstan (nördl. Balchaschsee Gebiet: Fluß Karatal)

3. **karatalica** SKOPIN 1966

39 (38) Zwischenräume der Flügeldecken spärlich und fein granuliert, mit je etwa 2 Körnchenreihen, die ziemlich gut angeordnet sind. Oberfläche der Flügeldecken weniger stark gewölbt, vorn an den Schultern abgeflacht. Seiten des Halsschildes schmal abgeflacht und etwas aufgebogen, dort ist der Grund erloschen gerunzelt, die Scheibe seitlich gröber und dicht punktiert, jedoch ohne ausgesprochene Granulierung. Die Körnchen der Stirn beiderseits neben den Augen länglich und etwas raspelartig, sie bilden jedoch keine Längsfältchen. — Länge: 7,7–10

mm. Kasachstan (nördl. Balchaschsee Gebiet: Balchasch; Gebiet westl. vom Balchaschsee: Min-Aral)

4. **kazenasi** SKOPIN 1961

- 40 (15) Hinterrand des Halsschildes beiderseits wenigstens bis zu einem Drittel seiner Breite dick und scharf gerandet, meist ist die Basis beiderseits tief grubig vertieft. Die Basis des Halsschildes gerade oder in der Mitte schwach ausgebuchtet. 1. Glied der Hintertarsen ungef. so lang wie das Klauenglied. Seiten der Flügeldecken mit langen Wimperhaaren (= *Miglica* REITTER 1904)

3. Untergattung: **Melanesthes** s. str., REITTER 1904

- 41 (50) Vorderschienen breit, am Außenrand grob sägeartig gezähnt, ohne vorspringenden Endzahn und ohne vorragenden Mittelzahn (Abb. 23—24).  
42 (45) Basis des Halsschildes in der Mitte breit, ganz ungerandet, in der Mitte ohne Querfurchen. Kleinere Arten, bis höchstens 10 mm.

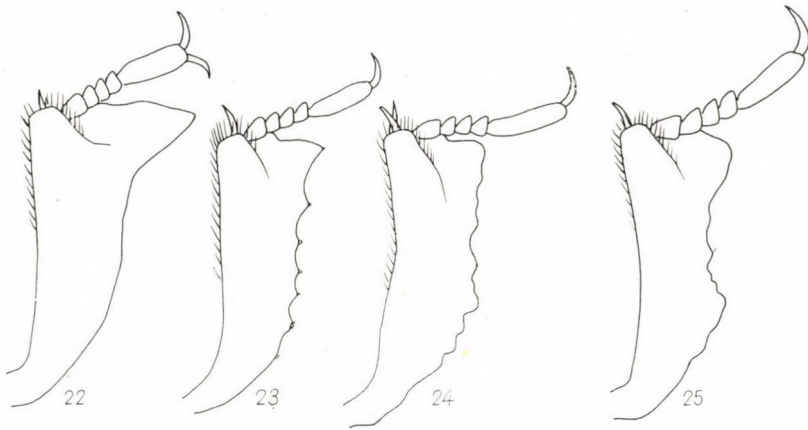


Abb. 22—25. Vorderbein von *Melanesthes kazenasi* SKOPIN (22), *M. laticollis* GEBLER (23), *M. jenseni* SCHUSTER (24) und *M. bialewskii* KASZAB (25)

- 43 (44) Oberseite ziemlich glänzend. Hinterschienen im Querschnitt rundlich. Kopf und Halsschild punktiert, Flügeldecken fein granuliert, etwas matt. — Länge: 8—10 mm. Kasachstan (nördlich vom Aralsee und östlich vom Balchaschsee) (= *Pedinus laticollis* GEBLER)

9. **laticollis** (GEBLER 1830)

- 44 (43) Oberseite ganz matt. Kopf und Halsschild gedrängt rugulos punktiert. Flügeldecken dicht lederartig gekörnelt, kleiner und länglicher. —

Länge: 8—9 mm. China (Provinz Ordos: Chaljutensume) (nach REITTER)

10. *opaca* REITTER 1889

- 45 (42) Basis des Halsschildes dick, wulstförmig gerandet und in der Mitte mit breiter Querfurche. Meist größer als 10 mm.
- 46 (47) Seiten des Halsschildes stark gerundet, vor den Hinterecken nicht oder undeutlich ausgeschweift, die Hinterecken also breit stumpfwinklig. Seitenrand sehr breit abgesetzt und quengerunzelt, die Scheibe ebenfalls ziemlich flach, mit seitlich länglicher Punktierung, einige Punkte manchmal in Längsrichtung zusammenfließend. Schultern breit gerundet, der Seitenrand dort breit abgeflacht. Flügeldecken erloschen fein und spärlich granuliert, dazwischen chagriniert und fettglänzend. — Länge: 10—12 mm. Mongolei (Provinz Bajanchongor: Orog nur, Žhinst, Bogd; Provinz Chovd: Kemtschik), Siberia (Altai, Tuwa)

11. *jenseni* SCHUSTER 1922

- 47 (46) Seiten des Halsschildes vor den Hinterecken stark ausgeschweift, weshalb die Hinterecken scharf rechtwinklig sind.
- 48 (49) Seiten des Halsschildes sehr stark im Bogen gerundet, nach vorn und hinten fast gleich stark verengt, sehr breit verflacht und abgesetzt; Scheibe ziemlich fein punktiert, die Basis beiderseits vor dem Basalrand nur kaum aufgewölbt und die Basalgrübchen nicht tief. Basis der Flügeldecken auffallend flach, Schultern abgeflacht, Epipleuren der Flügeldecken vorn auffallend erweitert, an der breitesten Stelle wesentlich breiter als der Mittelschenkel. Fühler sehr gestreckt, das 3. Glied etwa 3mal so lang wie das 2. — Länge: 11—11,5 mm. China (Provinz Sinkiang: Fuhai)

12. *conica* KASZAB 1965

- 49 (48) Seiten des Halsschildes weniger stark gerundet, nach vorn stärker verengt als nach hinten, Seitenrand schmaler verflacht und abgesetzt, die Scheibe gröber punktiert, die Basis beiderseits vor dem Rand höher gewölbt. Flügeldecken gewölbt, die Basis nicht flach, Epipleuren der Flügeldecken vorn allmählich stärker erweitert, die breiteste Stelle etwa so breit wie der Mittelschenkel. Fühler kürzer, das 3. Glied kaum etwa 2,5mal so lang wie das 2. — Länge: 9—10 mm. Mongolei (Provinz Zavchan: Santmargaz sum, Mongol elis; Provinz Chovd: Kemtschik), Sibirien (Jenissei, Soldan)

13. *furvus* KONTKANEN 1956

- 50 (41) Vorderschienen mit breitem Endzahn, außerdem mit mehr oder weniger großem Mittelzahn (Abb. 25—26).
- 51 (60) Basis des Halsschildes am Hinterrand breit und scharf quergefurcht, beiderseits mit scharfen Gruben.

- 52 (53) Die Grube der Basalfurche des Halsschildes beiderseits sehr seicht, kaum tiefer als die innere Hälfte der Furche. Die basale Wölbung neben dem Hinterrand beiderseits nicht hoch. Scheibe des Halsschildes grob und dicht punktiert, seitlich berühren sich die Punkte fast. Seitenrand des Halsschildes in einem einfachen, flachen Bogen gerundet, etwas aufgebogen, schmal abgesetzt (Abb. 27). Flügeldecken ziemlich matt, vorn und innen erloschener und glänzender, am Absturz ungleich erloschen granuliert, der Grund schuppenartig feiner granuliert und dazwischen chagriniert, matt. — Länge: 9—11 mm. Mongolei (Provinz Suchebaator, Ostgobi, Mittelgobi, Südgobi)
14. **mongolica** CSIKI 1901
- 53 (52) Die Grube der Basalfurche des Halsschildes beiderseits scharf und tief, die Beule am Hinterrand stärker geschwungen und viel höher gewölbt.
- 54 (55) Kopf gekörnelt-gerunzelt. Scheibe des Halsschildes dicht oder dicht raspelartig punktiert, neben den Seiten meist lederartig gerunzelt, der Grund matt, Seiten breit abgeflacht und aufgebogen. Flügeldecken auf mattem Grund mit feiner Körnelung und inzwischen mit größeren, glänzenden Körnchen besetzt. — Länge: 8—9,5 mm. Sibirien (Transbaikalien) (= *Opatrum sibiricum* FALDERMANN; *Opatrum alutaceum* MÉNÉTRIÉS 1836; *M. Faldermanni* REITTER 1904, nec MULSANT & REY 1859)
15. **sibirica** (FALDERMANN 1833)
- 55 (54) Kopf in der Mitte einfach dicht punktiert, nicht gerunzelt. Scheibe des Halsschildes einfach dicht oder spärlich punktiert, die Seitenpunktierung gröber, jedoch nicht lederartig gerunzelt.
- 56 (57) Endzahn der Vorderschienen abgerundet stumpfwinklig, Außenrand zwischen Endzahn und Mittelzahn mit einigen stumpfen Zähnen (Abb. 25). Seiten des Halsschildes sehr breit gerundet, vor den Hinterecken ausgeschweift, die Hinterecken also scharf rechtwinklig (Abb. 28); Scheibe grob und dicht, rundlich punktiert. Kopf einfach fein punktiert. Vorderrand in der Mitte kurz unterbrochen, Basalgrübchen tief, die Seitenbeule an der Basis hoch gewölbt. Grund der Flügeldecken erloschen gerunzelt, inzwischen seicht punktiert und granuliert. Größte Art der Gattung. — Länge: 11—13 mm. Mongolei (Provinz Ostgobi)
16. **bielawskii** KASZAB 1964
- 57 (56) Endzahn der Vorderschienen entweder recht- oder spitzwinklig und scharf, Außenseite zwischen Endzahn und Mittelzahn einfach breit ausgerandet, ohne Zähne (wie Abb. 26).
- 58 (59) Halsschildgrübchen an der Basis sehr tief, die Innenseite der basalen Beule abgerundet rechtwinklig und die Furche seitlich sehr mar-



kant begrenzend (Abb. 29). Halsschildscheibe spärlich punktiert und der Grund nicht glänzend. Flügeldeckenkörnelung meist fein und spärlich, der Grund nicht gerunzelt. Seitenrand des Halsschildes vor den Hinterecken ausgeschweift, Hinterecken deshalb rechtwinklig. Basis an der Seite schräg abgestutzt, die Mitte aber zwischen beiden Basalgrübchen gerade. — Länge: 9—11 mm. Mongolei (Changaj-, Chentej-Gebirge, ostmongolische Ebene), Sibirien (Transbaikalien) (= *Melanesthes laticollis* FALDERMANN 1835, nec GEBLER 1830; *M. maxima* REITTER 1904, nec MÉNÉTRIÉS 1854)

17. **faldermanni** MULSANT & REY 1859

- 59 (58) Halsschildgrübchen an der Basis weniger tief und die basalen Beulen beiderseits innen schräg abgerundet, die Grübchen weniger scharf begrenzt. Scheibe des Halsschildes dicht punktiert, auch die Mitte an der Basis; seitlich berühren sich die Punkte fast. Flügeldecken dicht und fein gekörnelt, dazwischen auch mit größeren, spärlicher stehenden Körnchen. — Länge: 9,8—11,5 mm. Mongolei (Provinz Südgobi, Uburchangaj)

18. **maxima** MÉNÉTRIÉS 1854

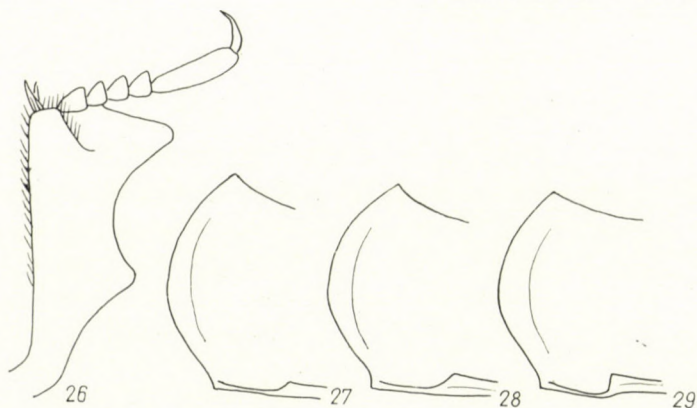


Abb. 26—29. Vorderbein von *Melanesthes mongolica* CSIKI (26) — Halsschildseiten von *M. mongolica* REITTER (27), *M. bialewskii* KASZAB (28) und *M. faldermanni* MULSANT & REY (29)

- 60 (51) Die Basalfurche des Halsschildes in der Mitte breit unterbrochen und auch meist ungerandet, die Basalgrübchen beiderseits sehr seicht und die Seitenbeulen der Basis kaum gewölbter als die Halsschildscheibe.
- 61 (62) Grund der Flügeldecken grob chagriniert und gerunzelt, deshalb matt, mit etwas raspelartigen Körnchen besetzt, ohne erkennbare Punktierung. Halsschild stärker gewölbt, Seiten kaum abgeflacht, die Scheibe dicht punktiert, der Grund fettglänzend, neben dem Seitenrand dicht gerunzelt. Kopf dicht punktiert-granuliert und gerunzelt. Manchmal ist die Basis des Halsschildes auch in der Mitte fein strichförmig

gerandet (var. *basimarginata* KASZAB 1964). — Länge: 7,5—9 mm. Mongolei (Provinz Ostgobi)

19. *davudshamsi* KASZAB 1964

62 (61) Der Grund der Flügeldecken glänzend, durch grobe Punktierung uneben, außerdem dicht und scharf gekörnelt, besonders am Absturz. Halsschild auch glänzend.

63 (64) Die Punktierung des Halsschildes in der Mitte feiner und spärlicher, die Zwischenräume zwischen den Punkten größer als die Punkte selbst; seitlich wird die Punktierung kaum größer und nur wenig dichter; neben dem Seitenrand ist die Punktierung runzelig und unregelmäßig. Halsschild auffallend flach, Seiten sehr stark gerundet und sehr breit abgeflacht. Basalrand des Halsschildes beiderseits tiefer eingedrückt. Halsschild verhältnismäßig länger, etwa 2,1mal so breit wie lang. Manchmal ist die Basis des Halsschildes in der Mitte fein strichförmig gerandet (var. *basalis* KASZAB 1964). — Länge: 8,8—10,7 mm. Mongolei (Provinz Ostgobi, Südgobi), China (Provinz Sinkiang: Umgebung Gatun nur)

20. *ciliata* REITTER 1889

64 (63) Die Punktierung auch in der Mitte viel gröber, die Zwischenräume zwischen den Punkten meist schmaler als die Punkte selbst. Nach den Seiten hin wird die Punktierung noch gröber und dichter, die Punkte stoßen eng, jedoch nicht längsrunzelig aneinander. Neben dem Seitenrand ist die Punktierung in einem schmalen Streifen unregelmäßig gerunzelt. Halsschild viel gewölbter, Seitenrand weniger gerundet und die Seiten schmal abgesetzt, die Wölbung der Scheibe reicht fast bis zum Rand. Basalrand des Halsschildes beiderseits weniger tief. Halsschild verhältnismäßig breiter, etwa 2,3mal so breit wie lang. Manchmal ist die Basis fein strichförmig gerandet (var. *marginalis* KASZAB 1964). — Länge: 8,8—10 mm. Mongolei (Provinz Ostgobi, Südgobi, Uburchangaj)

21. *psammophila* KASZAB 1964

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## COLLEMBOLEN AUS CHILE, NORTE GRANDE I.

Von

I. LOKSA und I. RUBIO

INSTITUT FÜR TIERSYSTEMATIK DER L. EÖTVÖS-UNIVERSITÄT, BUDAPEST  
(DIREKTOR: PROF. DR. E. DUDICH) UND  
INSTITUT FÜR HYGIENE UND ERHÖHUNG DER TIERPRODUKTION, ÖKOLOGISCHE SEKTION  
DER UNIVERSITÄT VON CHILE, SANTIAGO (DIREKTOR: PROF. DR. F. DI CASTRI)

(Eingegangen am 1. Februar 1966)

Vom Institut für Hygiene und Erhöhung der Tierproduktion der Universität Chile wurden in den letzten Jahren in verschiedenen Teilen des Landes ausgedehnte Untersuchungen zur Erschließung der Bodenfauna durchgeführt. Das zur Bestimmung vorliegende Collembolen-Material, das mit Hilfe von BERLESE —TULGREN- und WINKLER —MOCZARSKY-Apparaten gewonnen wurde, stammt aus zwei Provinzen des Norte Grande (Atacama und Antofagasta).

An dieser Stelle ergreifen die Verfasser die Gelegenheit, den leitenden Persönlichkeiten der Universität Chile und der L. Eötvös-Universität, Budapest, ihren aufrichtigen Dank dafür auszusprechen, daß sie den Kulturtausch, in dessen Rahmen die Arbeit zustande kam, ermöglicht haben. Ihr verbindlicher Dank für die Terrainarbeiten sowie für die Auslese und Separation des Materiales gilt ferner Herrn Prof. DR. F. DI CASTRI, den Herrn Kollegen DR. W. HERMOSILLA, DR. R. COVARRUBIAS, DR. E. HAJEK und DR. F. SÁIZ.

Die Typen befinden sich in der Sammlung des Institutes für Hygiene und Erhöhung der Tierproduktion der Universität Chile.

Familia: PODURIDAE

### *Brachystomella parvula* SCHÄFF., 1896

Cerro del Pajonal, 20. VIII. 1963, 3750 m. Wiese mit Tolar, unter Sträuchern. 1 Ex. — Cerro del Pajonal, 20. VIII. 1963, 3750 m, unter Kakteen. 2 Exx. — Guatin, 21. VIII. 1963, 3150 m, unter Kakteen. 1 Ex. — Paposo, 25. VIII. 1963, 600 m, am Grund von Felsenritzen. 1 Ex. — Paposo, 25. VIII. 1963, unter Kakteen in der Bodenstreu. 7 Exx.

### *Hypogastrura (Ceratophysella) communis* FOLS., 1898

Guatin, 21. VIII. 1963, 3150 m, im Humus unter hygrophylen Sträuchern. 2 Exx. — Guatin, 21. VIII. 1963, 3150 m, auf Inundationswiesen an Flüssen. 20 Exx. — Conchi, 22. VIII. 1963, 2900 m, unter Sträuchern am Ufer des Flusses Loa. 54 Exx. — Lasana, 23. VIII. 1963, 2550 m, auf gepflegten Luzernebeständen, unter Steinen. 2 Exx.

### *Xenylla grisea* AXELSON, 1900

Guatin, 21. VIII. 1963, 3150 m, in gepflegten Luzernebeständen. 41 Exx. — Conchi, 22. VIII. 1963, 2900 m, unter Sträuchern am Ufer des Flusses Loa. 46 Exx. — Paposo, 25. VIII. 1963, 600 m, unter großen Kakteen. 2 Exx.

*Xenylla welchi* FOLSOM, 1916

Paposo, 25. VIII. 1963, 600 m, unter großen Kakteen. 1 Ex.

## Familia: ONYCHURIDAE

*Tullbergia krausbaueri* BÖRNER, 1901

Guatin, 21. VIII. 1963, 3150 m, im Boden von gepflegten Luzernebeständen. 3 Exx.  
— Paposo, 25. VIII. 1963, 600 m, unter Kakteen. 1 Ex.

**Onychiurus (Onychiurus) bunsteri** sp. nov.

(Abb. 1)

Fundorte des männlichen Holotypus und des weiblichen Allotypus: Copuertas rio San Pedro, 3230 m, am Ufer des Flusses San Pedro, unter Steinen.

Weitere Fundorte: Vallenar, 16. VIII. 1963, 470 m, unter Steinen in der Nähe des Flusses Huasco. 2 Exx. — Lasana, 23. VIII. 1963, 2550 m, am Boden von gepflegten Luzernefeldern. 10 Exx. — Conchi, 22. VIII. 1963, 2900 m, am Ufer des Loa-Flusses unter Sträuchern. 4 Exx. — Conchi, 22. VIII. 1963, 2900 m, am Ufer des Loa-Flusses unter hygrophylen Sträuchern. 6 Exx. — Calama, 24. VIII. 1963, 2200 m, am Ufer des Loa-Flusses unter hygrophylen Sträuchern. 4 Exx. — Guatin, 21. VIII. 1963, 3150 m, am Ufer des Loa-Flusses unter hygrophylen Sträuchern. 25 Exx.

B e s c h r e i b u n g: Länge 1,4 mm. Das ganze Tier ist weiß, Dorsal-seite gleichmäßig, jedoch grob granuliert, mit Ausnahme der Antennenansätze, die fein granuliert sind.

Anzahl der dorsalen Pseudocellen: 32/022/33343. Ihre Anordnung ist aus Abb. 1 ersichtlich. Ventral auf dem Kopf, neben dem Ventraltubus sowie auf dem IV. Segment befindet sich je 1 Pseudocelle. An den Subcoxen befindet sich ebenfalls je 1 Pseudocellus.

Das Postantennalorgan besteht aus 14 Primärhöckern, die zwar nahe aneinander liegen, sich jedoch nicht berühren. Das Antennalorgan III besteht aus vier kaum gebogenen Papillen, aus zwei traubenförmigen Sinneskolben und aus 5 Schützborsten.

Die Kopfdiagonale verhält sich zur Antennenlänge wie 1 : 1,9. Das Männchen besitzt kein gesondertes Bauchorgan. Auf dem distalen Ende des Ventraltubus stehen je 4, auf dem Rumpf, u. zw. auf dessen Unterseite je 3 Borsten. Neben dem Ventraltubus befinden sich keine Borsten.

Analdorn fehlt. Krallen schwach gebogen, am Ansatz viermal so lang wie breit. Empodium verschmälert sich gleichmäßig, entspricht 2/3 der Krallenlänge.

Morphologisch steht die neue Art der Art *O. (O.) pseudogranulosus* GIS. am nächsten, sie unterscheidet sich jedoch von dieser einerseits durch die Formel der dorsalen Pseudocellen [bei *O. (O.) pseudogranulosus* 33/133/33333], anderseits fehlt bei *pseudogranulosus* auf dem IV. Segment ventral die Pseudocelle. Das Längenverhältnis der Kralle zum Empodium ist bei den beiden Arten ebenfalls verschieden.

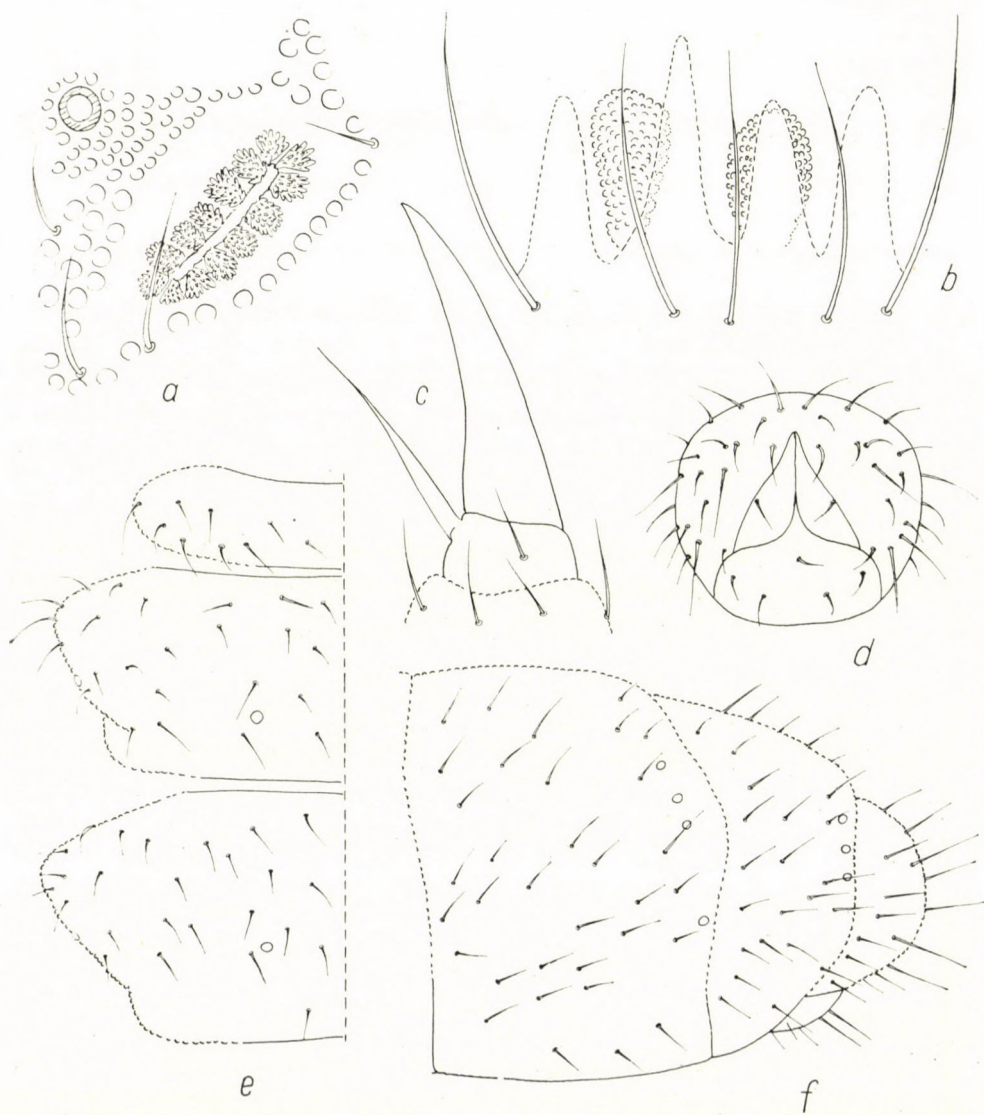


Abb. 1. *Onychiurus (O.) bunsteri* sp. nov. a = Postantennalorgan; b = Antennalorgan III; c = Klaue III; d = Analplatte; e = Thorax I-III; f = Abdomen IV-VI

***Onychiurus (Protaphorura) fimatus chilensis* subsp. nov.**  
(Abb. 2)

Fundort des männlichen Holotypus und des weiblichen Allotypus sowie der 2 Paratypen: Guatin, 21. VIII. 1963, 3150 m, Überschwemmungsgebiet am Flußufer.

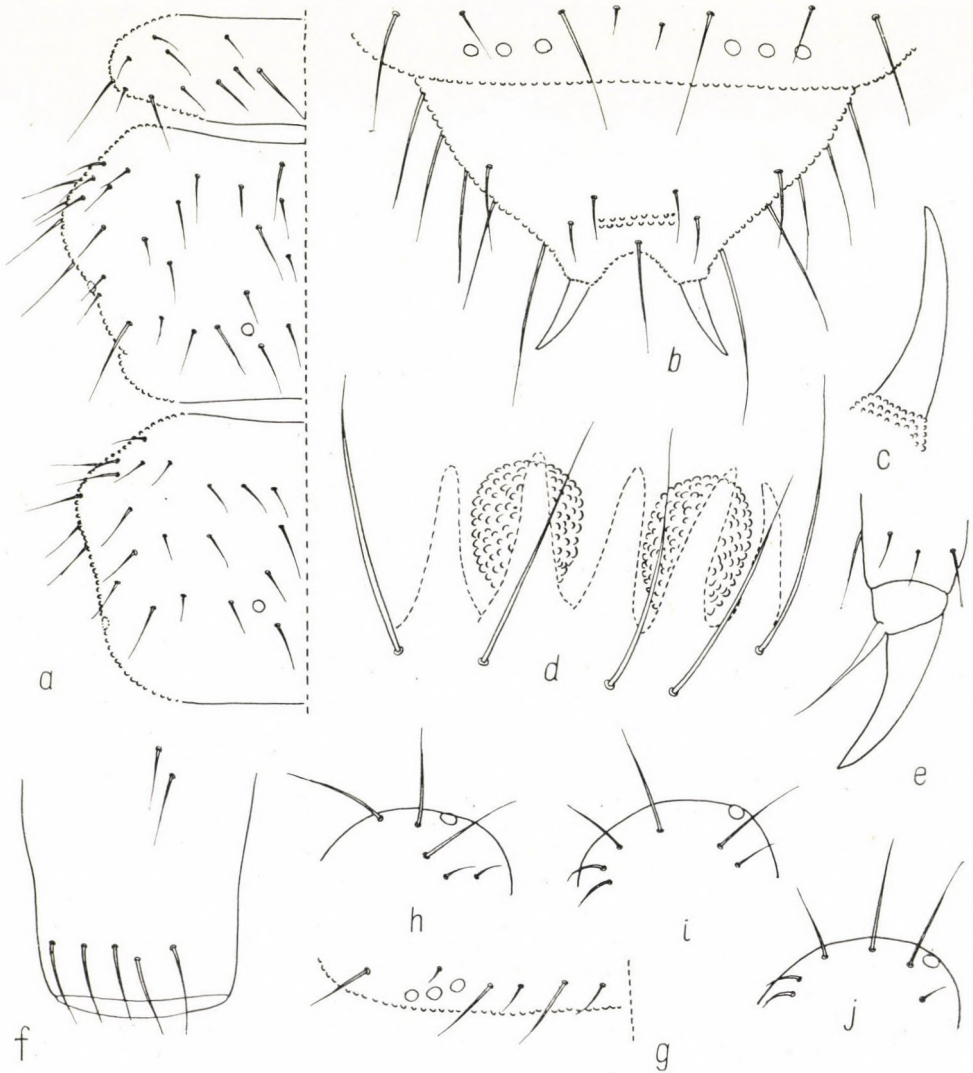


Abb. 2. *Onychiurus (Protaphorura) fimatus chilensis* subsp. nov. a = Thorax I—III, Dorsalansicht; b = Abdomen VI und Hinterrand Abd. V; c = Analdorn, Seitenansicht; d = Antennalorgan III; e = Klaue III; f = Ventraltubus; Seitenansicht; g = Kopfhinterrand; Hälfte; h = Subcoxa I; i = Subcoxa II; j = Subcoxa III



Weitere Fundorte: Guatin, 21. VIII. 1963, 3150 m, im Humus unter hygrophylen Sträuchern. 25 Exx. — Conchi, 22. VIII. 1963, 2900 m, unter hygrophylen Sträuchern, neben dem Loa-Fluß. 5 Exx. — Conchi, 22. VIII. 1963, 2900 m, unter Sträuchern am Ufer des Loa-Flusses. 84 Exx. — Lasana, 23. VIII. 1963, 2900 m, am Ufer des Loa-Flusses, unter Sträuchern. 5 Exx. — Compuertas rio San Pedro, 23. VIII. 1963, 3230 m, am Ufer des San-Pedro-Flusses, unter Steinen. 8 Exx. — Vallenar, 16. VIII. 1963, 470 m, unter Steinen am Ufer des Flusses Huasco. 1 Ex.

Beschreibung: Länge 2—2,5 mm. Weiß. Granulation des Körpers gleichmäßig fein. Dorsale Pseudocellen: 33/033/33333. Kopfunterseite und Subcoxa mit je 1 Pseudocelle.

Thorax I ohne Borsten *m*. Jederseits zwei laterale Macrochaeten mit einer Microchaete zwischen den Lateralen, außerdem 3 Microchaeten am Hinterrand des Segmentes.

Das Postantennalorgan ist vom Typ »armatus« und besteht aus 36—44 quergestellten Höckern. Antennalorgan III besteht aus 5 gekrümmten Papillen, zwei traubenförmigen Sinneskolben und 5 Schützborsten.

Analdorn schlank, 3,5—3,9mal länger als an der Basis dick. Abdomen V: *M/s* 13/7 (Analdorn 10); ohne Borsten *s*. Am Grunde des Ventraltubus beiderseits 2 Borsten. Die Einfügungsstellen der 4 Kurzborsten vor den Analdornen bilden zwei konvergierende Linien.

Diese neue Unterart unterscheidet sich wesentlich von der Stammform durch das Fehlen der Borsten *m* auf Thorax I. Außerdem sind die Borsten *s* auf Abdomen V wesentlich länger.

#### Familia: ISOTOMIDAE

##### *Folsomides americanus* DENIS, 1931

Guatin, 21. VIII. 1963, 3150 m, auf Wiesen im Inundationsgebiet. 14 Exx.

##### *Isotomina thermophila* (AXELSON), 1900

Guatin, 21. VIII. 1963, 3150 m, auf Wiesen im Inundationsgebiet. 3 Exx. — Guatin, 21. VIII. 1963, 3150 m, unter nassen Steinen. 1 Ex. — Monte Amargo, 26. VIII. 1963, in gepflegtem Luzernebestand. 9 Exx.

##### *Varisotoma alticola* sp. nov.

(Abb. 3)

Fundort des etwas verletzten männlichen Holotypus: Cerro del Pajonal, 4750 m, 20. VIII. 1963. Ein anderes juveniles Exemplar wurde bei Guatin, unter hygrophylen Sträuchern 3150 m hoch am 21. VIII. 1963 erbeutet.

Beschreibung: Länge 0,26 mm. Schwach hellbraun pigmentiert. Auf einer Seite mit 6 Augen. Die Ocellen stehen beinahe in einer Reihe, sind

schwarz pigmentiert, sondern sich von der Umgebung stark ab. Neben den Ocellen ist eine schwache dunkle Pigmentation zu beobachten.

Postantennalorgan ellipsenförmig, 1,3mal so lang wie Mucro und 1,4mal so lang wie die Breite des I. Antennengliedes.

Das II.—IV. Antennenglied der Antenne des Holotypus fehlt. Das IV. Antennenglied des juvenilen Exemplars ist im Verhältnis zu den übrigen äußerst lang, 1,1mal länger als die übrigen drei; 1,7mal länger als, in der Mitte gemessen, breit.

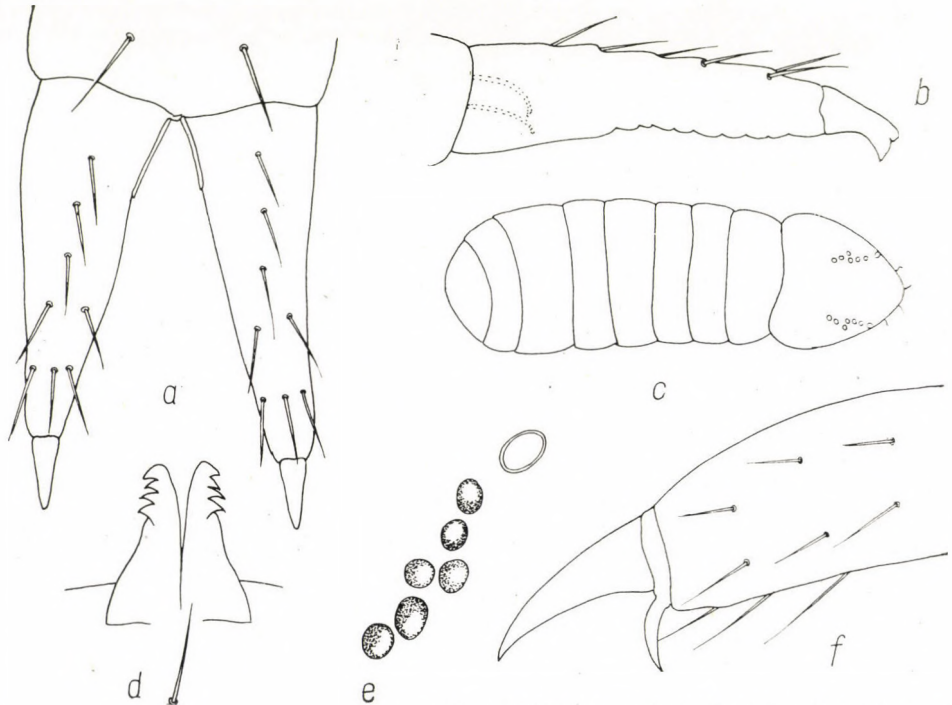


Abb. 3. *Varisotoma alticola* sp. nov. a = Dens und Mucro; Ventralansicht; b = Dens und Mucro; c = Habitusbild; d = Tenaculum; e = Augen und Postantennalorgan; f = Tibio-tarsus und Klaue III

Die Behaarung des ganzen Körpers ist einfach, die Haare sind nahezu gleich lang, ihre Anordnung größtenteils unregelmäßig. Die hintere Haarreihe der Segmente reicht etwas über den Segmentrand hinaus.

Furca gut entwickelt. Verhältnis Manubrium, Dens und Mucro wie 3,6 : 5,0 : 1. Auf dem distalen Ende der Ventralseite des Manubrium steht ein Paar kräftiger Borsten. Auf dem Dens befinden sich 8 ventrale Borsten, sie sind verhältnismäßig kurz und stark. Mucro zweizählig, mit einem großen subapikalen und einem ganz kleinen apikalen Zahn. Tenaculum vierzählig.

Die neue Art unterscheidet sich von allen übrigen *Varisotoma*-Arten durch die Zahl der Ocellen und durch deren Anordnung.

**Proisotoma pajonalica** sp. nov.

(Abb. 4)

Fundort des männlichen Holotypus, des weiblichen Allotypus und der 3 Paratypen: Cerro del Pajonal, 3750 m. 20. VIII. 1963.

Beschreibung: Länge 0,7 mm. Cuticula glatt. Grundfarbe helllila, an den Segmentgrenzen hellgelb gefärbt. Beiderseits 8 schwarze Ocellen, die in einem gemeinsamen Augenfleck sitzen. Postantennalorgan ellipsen-

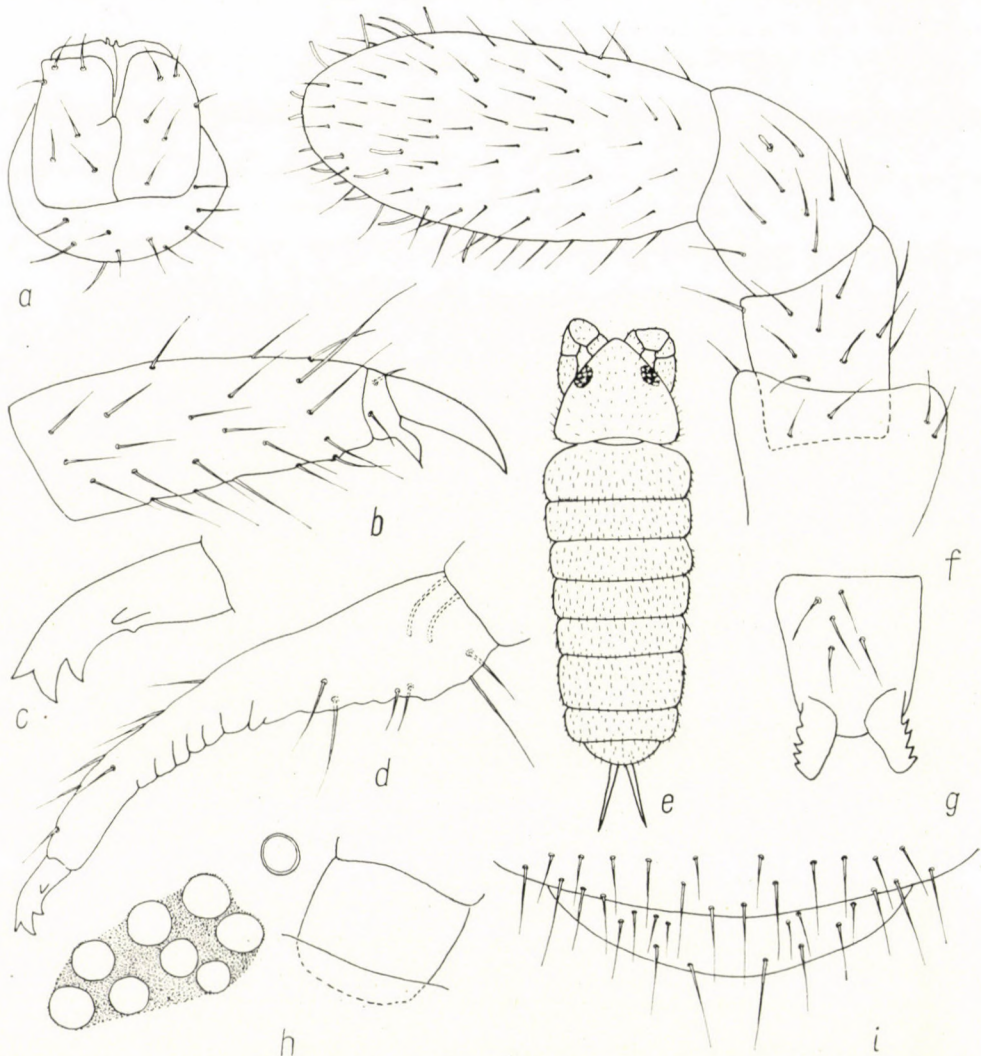


Abb. 4. *Proisotoma pajonalica* sp. nov. a = Ventraltubus; Ventralansicht; b = Tibiotarsus und Klaue III; c = Mucro; d = Dens und Mucro; Seitenansicht; e = Habitusbild; f = Antenna; g = Tenaculum; h = Augen, Postantennalorgan und Antenna I; i = Abdomen VI und Hinterrand des Abdomen V

förmig, ebensolang wie der Durchmesser einer Ocelle. Antenne 1,4mal länger als die Kopfdiagonale. Auf dem III. Glied befinden sich 2 kurze Sensillen.

Behaarung nahezu homogen, mit Ausnahme des V. und VI. Abdomensegmentes, wo kleinere und größere Haare abwechselnd angeordnet sind, wie dies in Abb. 4 veranschaulicht ist.

Furca gut entwickelt. Ventralseite des Manubrium unbeborstet. Verhältnis Manubrium, Dens, Mucro wie 5 : 7 : 1. Mucro vierzählig. Die 3 sagitalen Zähne sind gut entwickelt und deutlich zu sehen, der Lateralzahn ist klein und schwer wahrzunehmen. Auf der Außenseite ist bei einigen Exemplaren ein kleines Tuberculum zu sehen, das als rudimentärer Zahn zu betrachten ist. Diese Erscheinung ist aber nicht beständig. Auf der Subcoxa befindet sich je eine auf der einen Seite »rauchige« Borste.

Die Krallen sind kurz, zahnlos, am Ansatz sind sie zweimal so lang wie breit. Empodiumlänge entspricht 1/3 der Krallenlänge.

Tenaculum mit 4 Zähnen versehen, am Ansatz befinden sich auf dem Körper 5 Borsten.

Morphologisch steht diese Art der *P. americana* MILS am nächsten, unterscheidet sich jedoch von ihr in der Farbe, in der Behaarung des Körpers und durch die großen Borsten der Subcoxa. Ebenso ist das Verhältnis Antennenlänge zur Kopfdiagonale sowie das der Furcateile verschieden.

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Anschrift der Verfasser: Dr. I. Loksa, Budapest, VIII., Puskin u. 3, Ungarn;  
Dr. I. Rubio, Santiago de Chile, Casilla 5539.

## FLIES VISITING FRUIT AND MEAT IN AN OPEN-AIR MARKET IN BUDAPEST

By  
F. MIHÁLYI

ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST  
(DIRECTOR: DR. Z. KASZAB)

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To clear the role of flies as carriers of germs of enteric diseases it is essential to know which species visit human faeces lying in the open or in the cesspits (where the flies become infected), and which ones human food (which the flies may infect). The author have reported in a previous paper (MIHÁLYI, 1965), on the flies breeding in faeces and meat infected under natural conditions, and now an account is given of investigations carried out on the flies of a food-market in Budapest.

F. LŐRINCZ and his co-workers, GY. MAKARA, GY. SZAPPANOS (1936) and the author (LŐRINCZ & MIHÁLYI, 1938), have studied the food-visiting flies as early as in the thirties. At that time their aim was to clear the life-history of the house-fly. As a result they proved for the first time in Europe that the house-fly visits faeces but rarely, hence it cannot play as essential role in the transmission of germs as was assumed. On the other hand, the collecting of fruit-visiting flies showed that the house-fly heads the list in this respect. In Hódmezővásárhely, 82.4% of fruit-visiting flies were *Musca domestica* L., and flies caught on fruit and meat in stalls of open-air markets in Budapest showed a 73.7% participation of the house-fly. This latter number evidently reflects the selective collecting aspect of fly-paper.

Already these investigations showed that other species than the house-fly may be of an even greater importance. The fly material collected in Hódmezővásárhely was identified only superficially, mostly down to genera, nor were the flies from the Budapest market named as to species. The cause: at that time the chief taxonomic works on synanthropic flies had not yet been written, and we had no comparative material for precise naming. Since then the taxonomic problems have been solved by European specialists (STACKELBERG, 1956, etc.), and identification can now be made on a safe basis.

### METHODS

The method to collect food-visiting flies is not without importance. In our early investigations, we used baited traps and fly-papers. As pointed out in our paper (LŐRINCZ & MIHÁLYI, 1938), neither of them proved to be good on markets. The bait under the trap was not visited by the flies, because there was plenty of food around it and they were not attracted by smell

stimuli into the trap. The fly-paper was found to be very selective, only *Musca domestica* L. and *Fannia canicularis* L. were captured in numbers, most other species avoided it. Due to the resentment of the marketeers it was out of the question to catch the flies directly from the foodstuffs. Thus we could only ascertain that the percentage of flies on the various kinds of food and on the fly-paper differed essentially.

GREGOR and POVOLNY (1960) gave the first taxonomically correct data about the synanthropic fly fauna of Hungary. They investigated the flies visiting faeces and meat, but not those feeding on fruits.

In my fly investigations, concerning the whole country, traps baited with faeces and meat and during the fruit season also with fruit, were used in villages and in the field in the years 1959—1961. Fruit baits caught generally only a few flies. Even small quantities of faeces and meat attract flies, but fruit only if present in mass. The results of these investigations will be reported in a future paper.

The present investigations were carried out in the market of Újpest, a suburb of Budapest. The rows of fruit and vegetable stalls are backed by the railing of the church garden. The actual collecting was made on the other side of the railing, where the collector could work undisturbed and without interfering with the sale. The baits were laid on five plates of synthetic material, each with a different bait: watermelon, pear, plum, grape and beef. The plates were placed some meters apart from each other and at certain intervals suddenly covered with a butterfly-net. The flies were taken out of the net by a killing bottle. The collectings were made on three successive days, from 9—14 hours on September 1—3, 1965. The weather was sunny, windy, and cool.

In organizing the collectings, I was greatly assisted by the Hygienic and Epidemiologic Station of Budapest, represented by DR. M. P. ARADI, for whose help I am greatly obliged. The collectors and preparators of the material were Mrs. J. GALLATZ, J. KOCSIS, Mrs. E. VAJDA and Miss G. ZSIRKÓ, to whom I express my thanks also in this place.

## Results

The total number of collected flies was 595, belonging to 36 species (see Table I).

The water-melon, cut into slices, was visited by the greatest number of flies. In three days 239 flies, belonging to 25 species, were caught on it. *Muscina stabulans* FALL. (28.9%) was the most abundant, followed by *Lucilia sericata* MEIG. (16.7%), *Muscina assimilis* FALL. (13.0%), *Paregle radicum* L. (7.1%), *Bellieria melanura* MEIG., and *Bercaea haemorrhoidalis* FALL. (both 6.3%), *Lucilia illustris* MEIG. (3.3%); the remaining 18 species gave together 18.3%.

The other kinds of food were visited by much less flies. On the sliced pears 67 flies of 16 species were caught. This bait was most frequently visited by *Lucilia sericata* MEIG. (32.8%), and *Bellieria melanura* MEIG. (23.4%); there were also *Bercaea haemorrhoidalis* FALL. (in 6.0%). Five other species: *Lucilia caesar* L., *L. silvarum* MEIG., *Parasarcophaga aegyptica* SALEM. (= *parkeri* ROHD.), *P. jacobsoni* ROHD. and *Muscina assimilis* FALL. totalled only 4.5%. Only one or two specimens of the remaining species were caught. Also many wasps visited the pears and hindered the collecting of flies.

The bait of halved plums was visited in equal numbers (34.7%) by *Lucilia sericata* MEIG. and *Bellieria melanura* MEIG., making nearly 70% of the flies caught on it. Neither one of the remaining 9 species exceeded 3 specimens (6.1%).

Table 1. Flies caught on food in the open air market of Újpest

Name	Water-melon		pear		plum		grape		fruit total		meat		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<i>Lucilia sericata</i> .....	40	16.7	22	32.8	17	34.7	4	12.9	83	21.5	166	79.4	249	41.8
<i>Lucilia caesar</i> .....	7	2.9	3	4.5	—	—	1	3.2	11	2.8	1	0.5	12	2.0
<i>Lucilia illustris</i> .....	8	3.3	1	1.5	—	—	—	—	9	2.3	2	1.0	11	1.8
<i>Lucilia silvarum</i> .....	1	0.4	3	4.5	2	4.1	—	—	6	1.6	1	0.5	7	1.2
<i>Lucilia richardsi</i> .....	—	—	—	—	—	—	—	—	—	—	2	1.0	2	0.3
<i>Calliphora erythrocephala</i> .....	6	2.5	1	1.5	1	2.0	—	—	8	2.1	12	5.7	20	3.4
<i>Calliphora uralensis</i> .....	1	0.4	—	—	—	—	3	9.7	4	1.0	3	1.4	7	1.2
<i>Protocalliphora azurea</i> .....	—	—	—	—	—	—	1	3.2	1	0.3	—	—	1	0.2
<i>Pollenia varia</i> .....	4	1.7	—	—	—	—	—	—	4	1.0	—	—	4	0.7
<i>Pollenia rudis</i> .....	1	0.4	—	—	1	2.0	—	—	2	0.5	—	—	2	0.3
<i>Pollenia vespillo</i> .....	2	0.8	—	—	—	—	—	—	2	0.5	—	—	2	0.3
<i>Bellieria melanura</i> .....	15	6.3	16	23.4	17	34.7	3	9.7	51	13.2	1	0.5	52	8.7
<i>Bercaea haemorrhoidalis</i> .....	15	6.3	4	6.0	2	4.1	5	16.1	26	6.7	14	6.7	40	6.7
<i>Parasarcophaga aegyptica</i> .....	5	2.1	3	4.5	1	2.0	4	12.9	13	3.4	1	0.5	14	2.4
<i>Parasarcophaga jacobsoni</i> .....	—	—	3	4.5	1	2.0	—	—	4	1.0	—	—	4	0.7
<i>Parasarcophaga barbata</i> .....	—	—	1	1.5	—	—	1	3.2	2	0.5	1	0.5	3	0.5
<i>Parasarcophaga tuberosa</i> .....	—	—	—	—	—	—	1	3.2	1	0.3	—	—	1	0.2
<i>Sarcophaga carnaria</i> .....	1	0.4	—	—	—	—	—	—	1	0.3	—	—	1	0.2
<i>Sarcophaga</i> sp.? ♀♀ .....	—	—	2	3.0	3	6.1	—	—	5	1.3	—	—	5	0.8
<i>Musca domestica</i> .....	—	—	—	—	—	—	1	3.2	1	0.3	1	0.5	2	0.3
<i>Muscina stabulans</i> .....	69	28.9	2	3.0	1	2.0	2	6.5	74	19.2	1	0.5	75	12.6
<i>Muscina assimilis</i> .....	31	13.0	3	4.5	—	—	1	3.2	35	9.1	1	0.5	36	6.1
<i>Muscina pabulorum</i> .....	4	1.7	—	—	—	—	—	—	4	1.0	—	—	4	0.7
<i>Helina duplicata</i> .....	3	1.3	—	—	—	—	—	—	3	0.8	—	—	3	0.5
<i>Helina anceps?</i> .....	—	—	—	—	—	—	1	3.2	1	0.3	1	0.5	2	0.3
<i>Atherigona varia</i> .....	—	—	1	1.5	—	—	—	—	1	0.3	—	—	1	0.2
<i>Paregle radicum</i> .....	17	7.1	—	—	—	—	2	6.5	19	4.9	—	—	19	3.2
<i>Phorbia platyura</i> .....	3	1.3	1	1.5	3	6.1	—	—	7	1.8	—	—	7	1.2
<i>Phorbia brassicae</i> .....	1	0.4	—	—	—	—	—	—	1	0.3	—	—	1	0.2
<i>Phorbia antiqua</i> .....	—	—	1	1.5	—	—	—	—	1	0.3	—	—	1	0.2
<i>Phorbia pullula</i> .....	1	0.4	—	—	—	—	—	—	1	0.3	—	—	1	0.2
<i>Sepsis punctum</i> .....	1	0.4	—	—	—	—	—	—	1	0.3	—	—	1	0.2
<i>Piophilina nigrimana</i> .....	—	—	—	—	—	—	—	—	—	—	1	0.5	1	0.2
<i>Eristalomyia tenax</i> .....	1	0.4	—	—	—	—	—	—	1	0.3	—	—	1	0.2
<i>Eristalis arbustorum</i> .....	1	0.4	—	—	—	—	1	3.2	2	0.5	—	—	2	0.3
<i>Dilophus febrilis</i> .....	1	0.4	—	—	—	—	—	—	1	0.3	—	—	1	0.2
Total .....	239	99.9	67	99.7	49	99.8	31	99.9	386	100.3	209	100.2	595	100.2

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Astonishingly few flies (31) — but many wasps — visited the grapes. Here *Bercaea haemorrhoidalis* FALL. (16.1%), *Lucilia sericata* MEIG. (12.9%) and *Parasarcophaga aegyptica* SALEM. (12.9%) were the most frequent visitors. The other percent half of the flies belonged to 12 different species.

Summarizing the 386 flies caught on different fruits, the most common species proved to be *Lucilia sericata* MEIG. (21.5%), closely followed by *Muscina stabulans* FALL. (19.2%), and *Bellieria melanura* MEIG. (13.2%). Neither one of the remaining species amounted to more than 10%.

Many flies were attracted by fresh beef. A total of 209 flies, belonging to 16 species, were caught on it. As was expected, *Lucilia sericata* MEIG. appeared on it in the highest number, its 79.4% made nearly four-fifth of all flies. Two other species were also abundant: *Bercaea haemorrhoidalis* FALL. (6.7%) and *Calliphora erythrocephala* MEIG. (5.7%). Neither one of the other species exceeded 1.4%.

It was surprising how few house-flies visited the market. No more than 2 specimens were caught, one each on fruit and on meat. They represented only 0.3% of all flies! Comparing this number with the equally low one of the house-flies among the faeces-visitors, one can conclude that at present the house-fly is to be regarded as quite an insignificant factor in the transmission of infectious diseases. Only under special conditions (in infectious wards in hospitals, public nurseries etc.) can it be dangerous as a man to man carrier. The state of affairs was quite different in the thirties, prior to the extensive use of contact poisons. Now even the village kitchens are usually destitute of the earlier mass of flies.

All the more dangerous are the other species, visiting food-markets. They seldom enter human dwellings and are nearly unaffected by house-spraying with contact poisons.

The harmful role of food-visiting flies depends on how closely they come into contact with infectious media. Let us examine from this point of view the flies enumerated above.

The green bottles, *Lucilia sericata* MEIG., was caught in the greatest numbers: 21.5% on fruit and 79.4% on meat. Our investigations also proved that this is one of the frequent species visiting faeces lying free or in the open cesspits. They fill their abdomen with it till it is ready to burst, staining afterwards everything with their regurgitated food and excretions. But in our experiments they never laid eggs on faeces, or developed in it. The gravid females look for meat, carcasses, fostering wounds, and dead insects for egg-laying. They feed also on sweet fruit and flowers. This species is today regarded by most specialists as the most dangerous infection-carrier in the temperate zone.

Its near relatives, *Lucilia caesar* L., *illustris* MEIG., *silvarum* MEIG., and *richardii* COLL. were visiting fruit in 6.7%, meat in 3.0%. Their



life-history is similar to that of *sericata*, but they prefer more shaded places.

The other group of flies are the Sarcophaginae. Two species were caught in greater numbers: *Bellieria melanura* MEIG. (13.2% on fruit, and 0.5% on meat), and *Bercaea haemorrhoidalis* FALL. (6.7% equally on fruit and meat). Both "flesh flies" develop not in meat but in excrement, and show a preference to human faeces. In earlier experiments (MIHÁLYI, 1965) *Bellieria melanura* MEIG. (22.4%), and *Bercaea haemorrhoidalis* FALL. (6.4%) were reared from naturally infected stool. The other Sarcophagid species, mainly *Parasarcophaga aegyptica* SALEM., and *P. jacobsoni* ROHD., also visited the market and represented 6.8% of the flies visiting fruit and 1.0% of those visiting meat. These species also develop mainly in faeces.

The third dangerous group is formed by *Muscina* species. *Muscina stabulans* FALL. and *assimilis* FALL. were caught in 19.2% and 9.1%, respectively, on fruit (mainly on water-melon), and only 1 specimen each on meat. Both develop in manure and dung-heaps, but the former one prefers human faeces. It is one of the most common flies in city markets and village courtyards.

The *Paregle* species went for a long time unnoticed, due to their smallness. Hungarian research workers were the first to call attention on them (LÓRINCZ & MIHÁLYI, 1938). In rural conditions, they are usually the most numerous visitors of faeces and fruit. In the Újpest market, *Paregle radicum* L. was caught in 4.9% on fruit, but none on meat.

The blue-bottles were represented by two species: *Calliphora erythrocephala* MEIG. and *C. uralensis* VILL. On fruit, they were caught in 2.1% and 1.0% respectively, on meat in 5.7% and 1.4%. The life-history of *C. erythrocephala* resembles that of the *Lucilia* species; it feeds on faeces, but oviposits on meat. It is a constant visitor of markets, often enters houses, especially when meat is kept uncovered in the kitchen. The Soviet specialists regard *C. uralensis* VILL. as an even more dangerous species. It does not develop in meat, but in the cesspits of the villages. The species is rare in Hungary, and the 7 specimens caught in Újpest came as a surprise.

Summarizing the main visitors of fruit, they represent a total of 84.4%, and all are habitually feeding and developing on faeces. The remaining 15.6% belong to many species, some of which also develop in faeces (*Sepsis punctum* FABR., *Eristalomyia tenax* L.), or are accidental visitors.

Of the meat visitors, 97.7% belong to species frequently visiting faeces.

### Discussion

The results of these investigations are in accord with those established for the few other European countries where the fly-problem has been thoroughly investigated, they hold also for Kirghisia (SYTSHEVSKAJA, 1957), the northern

states of the United States (SCHOOF & SAVAGE, 1955), and Japan (BUÉI, 1959; OGATA et coll., 1961). Conditions in the subtropical part of the temperate zone might be quite different, partly because of the dissimilar behaviour of the house-fly in warmer countries, partly for the differences in the fly fauna.

In Hungary, the house-fly has lost its importance, even though fly-control measures are made almost without exception against this species, and nearly nothing has been done to reduce the numbers of the really dangerous species, or to prevent their transmission of germs.

Three methods can be suggested for the reduction of the harm caused by flies: 1. The reduction of the number of flies by a control of their breeding places and by poisoning the adults; 2. Hindering the flies of getting in contact with faeces, mainly by constructing fly-proof cesspits and taking other sanitary measures; 3. Protecting fruit and other food from flies.

### Summary

In the open-air market of the suburb Újpest in Budapest, flies visiting fruit (water-melon, pear, plum and grape) and meat (beef) were collected on 1—3. September 1965. The 595 flies captured by netting belonged to 36 species, and presented a good picture of the fly fauna of the market.

Most flies (239 specimens) were caught on water-melon. 28.9% of them were *Muscina stabulans* FALL., 16.7% *Lucilia sericata* MEIG., 13.0% *Muscina assimilis* FALL., 7.1% *Paregle radicum* L., 6.3% *Bellieria melanura* MEIG., 6.3% *Bercaea haemorrhoidalis* FALL., and some other species.

On pear, 67 flies were caught, mostly *Lucilia sericata* MEIG. (32.8%), and *Bellieria melanura* MEIG. (23.4%). The same species were the most frequent on plum, both in 34.7%. Of the 31 flies caught on grapes, there were 16.1% *Bercaea haemorrhoidalis* FALL., 12.3% *Lucilia sericata* MEIG., and *Parasarcophaga aegyptica* SALEM. (= *parkeri* ROHD.), 9.7% *Calliphora uralensis* VILL., and *Bellieria melanura* MEIG.

On meat, 209 flies of 16 species were caught: 79.4% *Lucilia sericata* MEIG., 6.7% *Bercaea haemorrhoidalis* FALL., and 5.7% *Calliphora erythrocephala* MEIG.

*Musca domestica* L. was caught in two specimens only (0.3%). As they very rarely visit faeces, this species can be regarded as generally harmless, but it can also become dangerous under special circumstances. All the common species of the food-market belonged to faeces-eaters (*Lucilia* species, *Calliphora erythrocephala* MEIG.), or breeders in faeces (*Calliphora uralensis* VILL., *Bellieria melanura* MEIG., *Bercaea haemorrhoidalis* FALL., *Muscina* and *Paregle* species).

As measures against flies three means are recommended: 1. Reduction of the number of flies (antilarval, anti-imago measures); 2. Building of fly-proof cesspits, and 3. protecting food from flies.

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Author's address: Budapest, VIII., Baross u. 13, Hungary.



REMARKS ON KIEFFER'S AND MARSHALL'S TYPES  
 (HYMENOPTERA, BETHYLIDAE) IN THE  
 HUNGARIAN NATURAL HISTORY MUSEUM

By  
 L. MÓCZÁR

ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST  
 (DIRECTOR: DR. Z. KASZAB)

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In my previous paper (MÓCZÁR 1965), I have discussed the Dryinini and Gonatopodini types, to be found in our museum, of KIEFFER, MARSHALL, SZÉPLIGETI and MÓCZÁR. In the following, I wish to treat the type-specimens according to the title, while the *Mesitius* and *Epyris* types will be discussed in a subsequent essay. As in the other papers, the proportions given in the descriptive text were obtained, if not stated otherwise, at a magnification of 40 by a binocular microscope. In view of the fact that quite often highly unrelated species are examined, I consider it enough to summarize only the most important characters after each description, instead of giving a key.

Fam.: BETHYLIDAE

*Allobethylus multicolor* KIEFFER

*Allobethylus multicolor* KIEFFER, 1908, Bull. Soc. Hist. nat. Metz, 25, p. 1 ♀

*Allobethylus multicolor*: 1908, KIEFFER, Gen. Insect., 76, p. 39

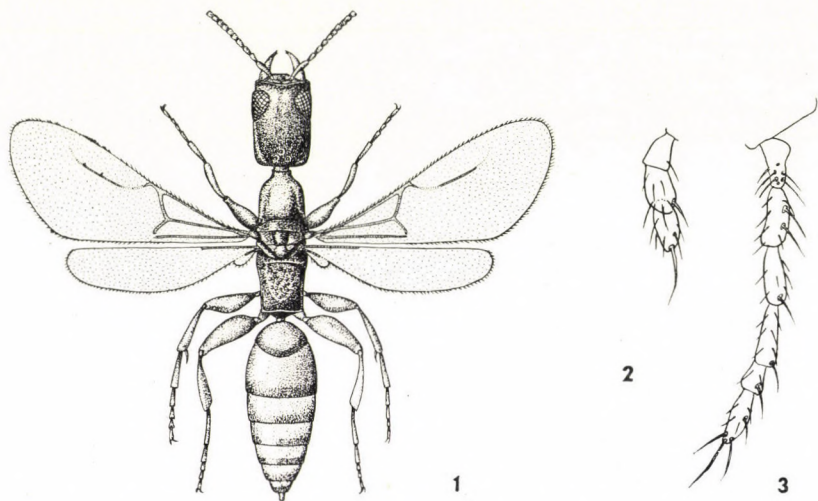
*Allobethylus multicolor*: 1914, KIEFFER, Das Tierreich, 41, p. 285 ♀

According to the original description, the locality of this species is as follows: "Nouvelle-Guinée: Marega. (Type au Musée de Budapest)". The specimen in Coll. Hung. Nat. Hist. Mus. (= Mus. Budapest) can therefore be regarded as the holotype, carrying the following data: "N. Guinea BIRÓ 1901", "Marega BIRÓ 1901" (printed labels); "18", very probably in KIEFFER's writing; "*Allobethylus multicolor*", in BIRÓ's writing (red label; segment 13 of antennae missing, mouth parts mounted on celluloid plate on pin of specimen), Hym. Type No. 29.\*

Certain parts of KIEFFER's diagnosis and later descriptions (1914, p. 285) are to be corrected as follows: "Tête rectangulaire, deux fois aussi longue que large" in reality: only one and a half times as long as broad (18 : 12); "Ocelles peu distincts; les postérieurs aussi près du bord occipital que l'un de l'autre" correctly: hind ocelli nearer to one another than the length between an ocellus and the occipital margin (2.5 : 3.5) (magnified  $\times 62$ ); "Palpes maxillaires ayant au moins 4 articles, les labiaux au moins 3" in reality: maxillary palpi with 6, labial palpi with 3 segments (Figs. 2-3); "Mandibules minces . . .

\* A list of the types No. 1-28 is to be found in the appendix of the present paper.

sommet qui est tronqué obliquement et finement denticulé" correctly: mandibles tridentate, ventral tooth large, the two dorsal ones minute; "Antennes . . . plus courtes que la tête" correctly: longer than head; "Scape . . . aussi long que les 3 articles suivants réunies, 2<sup>e</sup> article un peu plus long que gros, 3<sup>e</sup>—12<sup>e</sup> transversaux" in reality: scape longer than the 3 following



Figs. 1—3. 1 = *Allobethylus multicolor* KIEFFER, 2 = labial and 3 = maxillary palpi

segments together, segment 2 one and three-fourths as long as broad, segments 3—4—5 rectangular, and only segments 6—12 transverse; "Thorax lisse" correctly: thorax finely but distinctly alutaceous; "Taille: 1.5 mm" in reality: 2.2 mm. According to KIEFFER (1914, p. 284): "Auge behaart" in reality: eyes with very sparse and short hairs.

The diagnosis needs other additions, namely: Hind angles of head rounded, occipital margin not emarginate, head considerably broader than thorax (Fig. 1), alutaceous; eyes unusually narrowed towards hind angles of head; length of eyes: distance of eyes from mandibles = 11 : 3, broadest part of eyes about two-thirds its length (7 : 11); clypeus transverse, with a longitudinal, ventrally bifurcate, inverted Y-shaped keel raised very distinctly; antennal sockets very deep; length (and breadth) ratios of antennal segments 1—12 = 8 (3) : 3.5 (2) : 1.5 (1.5) : 1.5 (1.5) : 1.5 (1.5) : 1.5 (2) : 1.5 (2) : 1.5 (2.5) : 2 (2.5) : 2 (2.5) : 2 (2.5) : 2 (2.5) : — (magnified  $\times 62$ ). Segment 5 of maxillary palpi remarkably short (Fig. 3). Thorax alutaceous, slightly shining. Length of pronotum (with collar): mesonotum : scutellum : postscutellum : propodeum (up to hind margin) = 18 : 5 : 5 : 2 : 16 (magnified  $\times 62$ ). Pronotum rounded in front, broader behind, sinking in a regular curve to anterior deeper collar, slightly longer than posterior width, with a small, slightly

arched, deeper posterior margin; mesonotum very short, of the same length as scutellum with deep parapsidal suture dividing mesonotum into two more or less equal parts; cuneoli distinct laterally between mesonotum and scutellum; in front of scutellum with two very shallow impressions, scutellar pit well developed; postscutellum shorter than half of scutellum; dorsal surface of propodeum quadrate, sharply margined posteriorly, its declivous part shining, rather smooth, laterally also sharply margined; episternum<sub>2</sub> smooth with a circular pit in middle; lateral side of propodeum very slightly striated. Legs stout, fore femora as long as fore tarsi (with basitarsus) (14 : 14); mid tarsal segments twice as long as mid femora (18 : 9) hind femora slightly longer than hind tarsal segments (13 : 11); fore tibiae about as long as mid tibiae (11 : 10); breadth of fore, mid, and hind femora about equal (6 : 5 : 6); fore metatarsus very strongly curved, mid tibiae with strong spurs. Abdomen with seven visible tergites, surface shining, microscopically alutaceous, segments 6 and 7 with scattered hairs posteriorly.

Easily recognizable by its wings without pterostigma, yellowish legs, mostly yellowish-red thorax and abdomen, hyaline wings, and head considerably broader than thorax.

#### *Holepyris erythroderes* MARSHALL

*Holepyris erythroderes* MARSHALL, 1906, Spec. Hym., 9, p. 346 ♀

*Holepyris erythroderes*: 1908, KIEFFER, Gen. Insect., 76, p. 29

*Holepyris erythroderes*: 1914, KIEFFER, Das Tierreich, 41, p. 374 ♀

*Holepyris erythroderes*: 1928, BERLAND, Faune de France, 19, p. 120

According to the diagnosis: "Patrie: Corse: Bonifacio (FERTON)." The specimen is to be found in Mus. Budapest, and regarded as the holotype. There are the following data on its label: "Bonifacio", "*erythroderes* Coll. MARSHALL", "*erythroderes* MARSH." in MARSHALL's writing, "107", "*Holepyris erythroderes* ♀ MARSH." in BIRÓ's writing (mouth parts on celluloid plate), Hym. Type No. 30.

The following parts of the original description should be corrected: "tête au moins de moitié plus longue que large" in reality: head about one-quarter longer than broad,\* length and breadth of head = 26 : 19 (magnified ×40); "Antennes presque deux fois aussi longues que la tête" correctly: antennae, if reclinate, one and three quarters as long as head (46 : 26). According to KIEFFER (1914, p. 374): "Mediansegment 1 1/2mal so lang, wie breit" correctly: propodeum longer than one and a half of its breadth (18 : 11).

The diagnosis needs further additions: head densely alutaceous, strongly elongate, sides behind eyes moderately convergent, posterior angles rounded, distinctly broader than thorax, eyes only slightly convex, oval, separated from mandibles by the width of antennal segment 12, from occiput by length of scape; ocelli rather small, in an equilateral triangle, posterior ocelli separated from occiput by a distance hardly less than ocelli from one another

\*Measured from the clypeus to the occiput and across the eyes.

(2 : 2.5), median ocellus far behind line drawn through hind margin of eyes; anterior margin of clypeus nearly straight, slightly produced in a very obtuse angle in middle, central clypeal area raised into a high acute keel, subsequently produced into a fine keel between antennal sockets; antennal sockets lying beneath slight tubercles at edge of a depression each, distance between sockets shorter than their distance from eyes; apex



Figs. 4—5. *Holepyris erythroderes* MARSHALL, 4 = maxillary and 5 = labial palpi

of mandibles broad, with 2 minute teeth, maxillary palpi with 6, labial palpi with 3 segments (Figs. 4—5); length (and breadth) of antennal segments 1—13 = 11 (3.5) : 3 (2.5) : 2.5 (2.5) : 3 (3) : 3 (3) : 3 (3) : 3 (3) : 3 (3) : 3 (2.5) : 3 (2.5) : 2.5 (2) : 5 (2), antennae from segment 10 becoming slender. Scutellum with transverse furrow in front; mesonotum without notaulices, length of pronotum (except collar) : mesonotum : scutellum : propodeum (with distal part) = 14 : 4 : 7 : 18; propodeum with almost parallel sides, its breadth : length = 11 : 18, lateral edges without spines or teeth. Body with erect, yellowish, long hairs. Fore and hind femora of equal length (and breadth) (17 : 7 resp. 8), fore and mid tibiae (12 : 12), fore, mid, and hind tarsi gradually lengthening (15 : 20 : 21), mid femora only slightly longer than mid tarsi (13 : 12), hind tibiae only slightly shorter than hind femora (16 : 17).

In our collection, there are further females from "Süd-Spanien, Algeciras, SIMON", 2 ♀, and from "Süd-Spanien, Malaga, SIMON", 1 ♀, the latter differing in colour from holotype as follows: head, pronotum and abdomen more reddish, legs partly more yellowish.

The species is recognizable by the short wings, the yellowish hairs, the length of segments 2 and 3 of the antennae, the densely alutaceous head, pronotum, mesonotum and scutellum, the remarkably long propodeum, the short eyes, the reddish colour of at least the antennae and legs, and the long rectangle on the dorsal part of the propodeum.

#### *Holepyris ruficollis* KIEFFER

*Holepyris ruficollis* KIEFFER, 1906, Spec. Hym., **9**, p. 345 ♀

*Holepyris ruficollis*: 1908, KIEFFER, Gen. Insect., **76**, p. 30

*Holepyris ruficollis*: 1914, KIEFFER, Das Tierreich, **41**, p. 374 ♀



KIEFFER wrote from the original material as follows: "Patrie. Egypte: Memphis; Caire (Type au Musée national de Budapest)." The data of the specimen, to be found in Mus. Budapest, are as follows: "Aegyptus SCHMKN. 97", "Memphis", "97", "*Holepyris* ♀ *ruficollis* KIEFF. det. J. B. SZABÓ 1960" (fore right leg and right antenna missing), Hym. Type Nr. 31; "Aegyptus SCHMKN. 97", "Cairo", "39", "*Holepyris ruficollis*" in BIRÓ's writing (red label), Hym. Type Nr. 32. I designate the specimen from "Memphis" as the lectotype, and the specimen from "Cairo" as paralectotype.

According to KIEFFER's description: "mandibules . . . avec 2 ou 3 dents" in fact: mandibles very acute ventrally and with two minute teeth obliquely and dorsally; "Metanotum . . . finement rugeux, avec trois arêtes médiane, dont les deux latérales également distances de la médiane et de celle qui forme le bord latéral et un peu convergentes en arrière"; in fact: propodeum rough rather than rugulose, with a fine, complete, longitudinal keel centrally and with one longitudinal keel on each side, extending at most to two-thirds distance over dorsal surface and converging only to a small extent; there are, on each side, one other fine keel or wrinkles between central and above-mentioned keels, but they extend only to one-third distance over the surface; "Segment 3<sup>e</sup> de l'abdomen un peu plus long que le 2<sup>e</sup> ou que le 3<sup>e</sup>" in reality: longitudinal ratios of the rather curved segments 1—4 of holotype are as follows = 10 : 13 : 11 : 10 (measured in a lateral view along the dorsal surface of abdomen!).

In addition to the description, the following characterization can yet be given: body sparsely hairy; head densely alutaceous, suboval, lateral sides converging towards front and backwards to collar, ventral sides of eyes almost straight, other ones convex, surface moderately convex and about one and a half times broader than their distance from occiput (8.5 : 6, 10 : 7 in the "Cairo" specimen); length of eyes: distance from occiput = 14 : 5 (18 : 6 in the "Cairo" specimen); ocelli in an acute angle, anterior ocelli slightly nearer to posterior ones than posterior ones to one another (3 : 4); clypeus rounded anteriorly, raised in the middle longitudinally (like the roof of a house); scape rather strongly curved, length and breadth ratios of segments 1—13 = 8 (3) : 4 (2) : 3.5 : 3 : 3.5 : 3.5 : 3.5 (3) : 3.5 : 3 : 3 : 3 : 2.5 : 4. Pronotum smooth, shining, microscopically alutaceous, hind margin of pronotum slightly emarginated like an arch, with a fine but distinctly transverse keel; about two-thirds of mesonotum convex, in front with two fine keels in place of notaulices, hind one-third of mesonotum flattened, distinctly separated from convex part and slightly turning towards tegulae; a remarkably deep crenate furrow between mesonotum and scutellum; dorsal surface of propodeum margined with a fine furrow laterally and distally; length (and breadth) of pronotum (+ collar) : mesonotum, scutellum (with transverse furrow) : postscutellum : propodeum (+ declivous part) = 17 + 4 (16) : 7 : 5.5 : 1 : 13 + 5 (12); lateral side of pronotum concave, episternum<sub>2</sub> with a small circular impression immediately behind tegulae. Fore tibiae as long as mid femora, slightly longer than mid tibiae (13 : 13 : 12), fore tarsi, hind tibiae, fore femora, and hind

femora respectively longer (15 : 16 : 17 : 19), mid tarsi about one-quarter shorter than hind ones (22 : 28).  $R_s$  on holotype remarkably short, hardly longer than  $M$ . Due to the fine keels on the mesonotum, and the short  $R_s$ , I consider this species only provisionally as a *Holepyris* taxon.

### *Holepyris maculipennis* MARSHALL

*Holepyris maculipennis* MARSHALL, 1906, Spec. Hym., 9, p. 364 ♀

*Epyris maculipennis*: 1906, KIEFFER, l. c. Pl. II, fig. 13 ♀

*Holepyris maculipennis*: 1908, KIEFFER, Gen. Insect., 76, p. 30

*Holepyris maculipennis*: 1914, KIEFFER, Das Tierreich, 41, p. 378 ♀

*Holepyris maculipennis*: 1928, BERLAND, Faune de France, 19, p. 120 ♀

This species was described on the basis of the following specimen: "Patrie. Corse (Collection de MARSHALL)." The data of the specimen, to be found in Mus. Budapest, are as follows: "Corsica", "*maculipennis* Coll. MARSHALL", "81", "*Holepyris maculipennis*" in BIRÓ's writing (red label). It is therefore to be regarded as the holotype. Hym. Type No. 33. The other specimens from "Bonifacio" and "Balears (F. DE MORAGUES)", with the labels "*maculipennis* Coll. MARSHALL", are not conspecific with this taxon.

Between the short description and the above mentioned specimen, the following differences are to be found: (in key, 1906 p. 344): "Prothorax noir, sauf parfois le col" in fact: posterior margin of pronotum narrowly but distinctly reddish-brown; (l. c. p. 364): "sillon de scutellum élargie non seulement aux deux extrémités mais encore au milieu" in reality: transverse furrow arched, widening only at both ends.

Additions to the diagnosis: head trapezoid, remarkably broader at mandibles than at vertex, sides diverging towards mandibles, length : breadth of head = 30 : 36, frons convex, slightly concave only along central lines, falling down in a precipitous slope to mandibles; clypeus between lower margins of eyes; head alutaceous, shining and densely punctured, eyes nearly circular, only a little longer than broad (14 : 11), separated by nearly their length from occiput (13), eyes meeting mandibles in front; ocelli in an acute angle, anterior ocellus separated from posterior ones by a length about equal as that between posterior ones (3.5 : 4); occipital margin complete; clypeus very small, triangular, with an acute, erect tooth in middle of its lower margin; antennal sockets lying in the depression between clypeus and basis of mandibles; mandibles stout, broader apically than basally, with at most 7 teeth gradually becoming smaller dorsally on its obtuse apex; antennae rather short, reaching only to scutellum, scape remarkably long and strongly curved downwards, length (and breadth) of segments 1—13 = 12 (5) : 6 (3) : 4.5 (3) : 4.5 (3) : 4 : 4 : 4 (3.5) : 4 (4) : 4 : 4 : 3.5 : 3.5 (3) : 3 : 5. Pronotum smooth, shining, locally very finely alutaceous, more sparsely punctured than frons, two-third length (except collar) as broad posteriorly (19 : 30), remarkably narrower in front, here more rounded than behind, sinking rather steeply to anterior collar; mesonotum without notaulices and with a similar sculpture to the pronotum; scutellum with curved furrow in front and more sparsely punctured

and more shining, postscutellum hardly visible; dorsal surface of propodeum distinctly broader than long (23 : 17), with three complete, straight longitudinal keels and two finer irregular wrinkles on its surface, outer straight keels slightly divergent towards abdomen, inner, finer wrinkles (situated near central keel) converging especially terminally also some other incomplete longitudinal and irregular wrinkles present among above mentioned keels. Length of pronotum : mesonotum : scutellum : postscutellum : propodeum = 19 + 6 : 7 : 10 : 1 : 17 + 5. Fore femora of equal length as tarsi and longer than tibiae (19 : 20 : 17); mid femora and tibiae of equal length (15), no great differences between lengths of mid tarsi, hind femora, and tibiae (24 : 25 : 23); hind tarsi longest (32). Tergites 1 and 2 very shiny, without punctures, tergites 3—7 alutaceous, less shining, hind margins of tergites, especially second one, small, reddish, transparent. Body sparsely hairy.

Recognizable by the trapezoid head, the very wide mandibles with a row of teeth, the hyaline band of the dark wings, the propodeum, the transverse scutellar furrow, and the shining tergites 1—2.

### *Holepyris crenulatus* KIEFFER

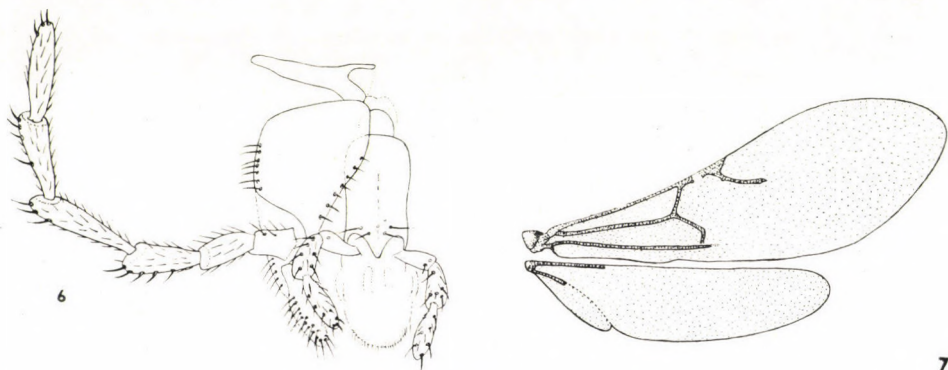
- Holepyris crenulatus* KIEFFER, 1906, Spec. Hym., 9, p. 348 ♀  
 ? *Holepyris breviscutellatus* KIEFFER, 1906, l. c., p. 352 ? syn. n.  
*Holepyris crenulatus*: 1908, KIEFFER, Gen. Insect., 76, p. 29  
*Holepyris crenulatus*: 1914, KIEFFER, Das Tierreich, 41, p. 380  
*Holepyris crenulatus*: 1928, BERLAND, Faune de France, 19, p. 119 ♀

According to KIEFFER's diagnosis: "Patrie. Italie: environs de Rome (DR. MAGRETTI): Corse: Ajaccio (MARSHALL) sous écorce d'olivier en octobre." There are the following specimens in Mus. Budapest: 1. "Ajaccio", "corsica MARSHALL in MARSHALL's writing, "corsica M. Coll. MARSHALL" in KIEFFER's writing, "96", "*Holepyris crenulatus* KIEFF." in BIRÓ's writing, ♀, Hym. Type No. 34; 2. "Ajaccio", "corsica M. Coll. MARSHALL" (mouth parts on celluloid plate), Hym. Type No. 35; 3. As before, Hym. Type No. 36; 4—11 specimens with the following data: "Ajaccio", "corsica M. Coll. MARSHALL" Hym. Type No. 37—44; 12. The same data as before (left eye damaged and left hind leg from trochanter missing) Hym. Type No. 45; 13. "Angles 25. X. 1890", "Sous écorce d'olivier", "*pustulatus* Coll. MARSHALL", "*pustulatus* MARSH." in MARSHALL's writing, "105", "*Holepyris crenulatus*" in KIEFFER's writing, "*Epyris crenulatus*" in BIRÓ's writing (mouth parts on celluloid plate), Hym. Type No. 46; 14. "Bonifacio", "corsica M. Coll. MARSHALL" (right hind leg from femur, and antennae missing). The specimens numbered 1—12 represent the original material (of the 13<sup>th</sup> specimen only one datum refers to the description), therefore I designate the first specimen of the above species (Hym. Type No. 34) as lectotype, while Nos. 2—13 as paralectotypes.

According to KIEFFER (l. c. p. 347): "Tête plus large que le mesonotum" on the lectotype: head as broad as mesonotum; "une carène . . . entre les antennes, et est réunie à l'ocelle antérieur par un sillon" in reality: the fine longitudinal impression falls short of, thus not reaching, ocellus and more or less distinctly only on paralectotypes No. 36 and 39; "yeux . . . deux fois aussi longs que larges" correctly: eyes usually about two-third times as broad as long; "articles (antennes) 2—4 egaux, deux fois aussi long que gros" in reality: antennal segment 2 and 4 a little shorter than segment 3 and only

third segment twice as long as wide, length (and breadth) of segments 2 : 3 : 4 = 7 (3) : 8 (3) : 6 (3); "Palpes maxillaires ayant au moins 5 longs articles" in reality: with 6 segments (Fig. 6); mandibles with 3 teeth; "Taille ♀: 4—5 mm" on lecto- and paralectotypes: 4.5—5.5 mm.

To be added to KIEFFER's diagnosis are: head granulate, almost coriaceous; eyes three and a half times longer than distance from occiput; eyes: distance from occiput = 22 : 6 on lectotype, 15 : 6 especially short on para-



Figs. 6—7. 6 = *Holepyris crenulatus* KIEFFER, mouth parts. — 7 = *Lytepyris biscrensis* (KIEFFER), wings

lectotype No. 35 (this is an exceptionally small specimen: 4.5 mm), the mean of 13 specimens 21.6 : 5.7 (3.78 times longer than distance from occiput). Length and breadth of eyes = 22 : 15 on lectotype, 15 : 10 on paralectotype No. 35, average 21.2 : 13.1; length and breadth of head = 42 : 40 (32 : 30 on paralectotype No. 35); ocelli arranged in triangle with posterior side a little longer than other sides (7 : 5); posterior ocelli separated from occiput by about diameter of one ocellus (6 : 7); length (and breadth) of antennal segments 1—13 = 16 (4.5) : 7 (3) : 8 (3) : 6 (3) : 6 : 6 : 5.5 : 5.5 : 4 : 4 : 4 : 3.5 : 5.5. Pronotum with a transverse, crenate furrow before hind margin; mesonotum with two very fine and short notaulices, not reaching over one-third of mesonotum; length of pronotum (except collar) : mesonotum : scutellum : propodeum (only dorsal part) = 25 : 15 : 10 : 20; breadth of mesonotum between tegulae: 27 (with tegulae 40) and pronotum (in front): 25. Fore femora about as long as fore basitarsus and tarsal segments together (30 : 12 + 17), mid femora, tibiae and tarsal segments of equal lengths (23), as long as fore tibiae (23), hind femora, tibiae and tarsal segments gradually lengthening (32 : 33 : 39), fore and hind femora of equal breadths (10). Body, with sparse, white hairs, especially ventrally.

This is a *Holepyris* species also "sensu" RICHARDS (1939, p. 299); recognizable by the normally developed wings, granulate and almost coriaceous head-pronotum-mesonotum, and especially the punctate state of the head

and the pronotum, the hairy eyes, the fine, darker spots distally on the wing, the propodeum with its 5 dorsal and double marginal keels, the two spines on the lateral edge of propodeum, and the length and breadth of eyes averaging 21.2 : 13.1.

*Lytepyris biscrensis* (KIEFFER)

*Trachepyris Biscrensis* KIEFFER, 1906, Spec. Hym., 9, p. 414 ♀

*Trachepyris biscrensis*: 1908, KIEFFER, Gen. Insect., 76, p. 37

*Lytepyris biscrensis*: 1913, KIEFFER, Boll. Labor. Zool. Gen. Agr. Portici, 7, p. 108

*Lytepyris biscrensis*: 1914, KIEFFER, Das Tierreich, 41, p. 416 ♀

According to KIEFFER: "Patrie. Algérie: Biskra (Collection de MARSHALL, sous le nom de *Epyris biscrensis*). It is to be found in Mus. Budapest, and to be regarded as the holotype; there are the following data on its labels: "Biskra 25/IV/97", "*Biskrensis* M. Coll. MARSHALL", "*Biskrensis* MARSH" in MARSHALL's writing, "104", "*Trachepyris biskrensis*" and "*Lytepyris biscrensis* KIEFF." in BIRÓ's writing (red, resp. pink label), "*Lytepyris biscrensis* KIEFF. ♀ det. J. B. SZABÓ 1960" in SZABÓ's writing (hind right tarsi missing, middle of mesonotum damaged), Hym. Type No. 47.

KIEFFER's description corresponds with the holotype; the following supplementary remarks might yet be added: length and width of eyes = 21 : 13, distance from occiput and mandibles = 5 : 1.5; head densely alutaceous, nearly as broad as long (35 : 37); ocelli at a right angle, anterior ocellus nearer to POL = 3 : 5; hind margin of head rounded laterally; clypeus with only median lobe developed; length (and breadth) ratios of antennal segments 1-13 = 13 (5) : 5 (2.5) : 5 : 5 : 4.5 : 4.5 : 4.5 : 4 : 4 : 4 : 4 : 5; length (and breadth) of pronotum : mesonotum : scutellum : propodeum = 20 + 6 with collar (29) : about 8 : 10 : 16 + 6 with declivous part (23). Mid femora remarkably shorter than fore and hind ones (18 : 24 : 26), valid also for mid, fore and hind tibiae (16 : 21 : 29), mid tarsi three quarters as long as hind one (30 : 40). Wings with very short  $R_s$ , only a little longer than  $M$  (Fig. 7).

This species is recognizable by  $R_s$  being not longer than  $M$ , the propodeum margined posteriorly, the scutellum with two minute impressions proximally, the antennae with 13 segments, the propodeum with 5 distinct, longitudinal keels, 3 of which are complete.

*Bradepyris inermis* (KIEFFER)

*Rhadepyris inermis* KIEFFER, 1906, Spec. Hym., 9, 375 ♀

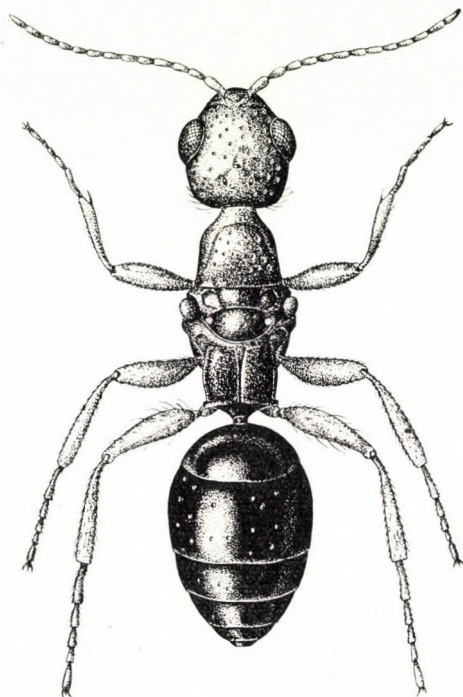
*Bradepyris inermis*: 1908, KIEFFER, Gen. Insect., 76, p. 37

*Bradepyris inermis*: 1914, KIEFFER, Das Tierreich, 41, p. 427 ♀

According to the original description: "Patrie. Maroc: Casablanca (REITTER); Musée de Budapest." The data of the specimen found in Mus. Budapest are as follows: "Marocco: Casablanca, REITTER", "*Bradepyris inermis* KFF." in BIRÓ's writing, "56", (mouth parts and genitalia on celluloid plate), Hym. Type No. 48 (♂ !); therefore this specimen represents the holotype.

KIEFFER's diagnosis is to be corrected as: "Angles postérieurs du metanotum inermes;" in reality: lateral edge of dorsal part of propodeum with a

stout tooth, directed laterally; "Tête luisant à bord parallèles en arrière des yeux" in fact: head densely alutaceous, slightly shiny, lateral sides slightly converging behind eyes; „antennes d'un brun roux" — colour of antennae reddish-brown. It is worth mentioning that, on account of the remounting, the pronotum has been displaced and is now on the anterior part of the mesonotum; this part is transparent, except at this portion; the mesonotum

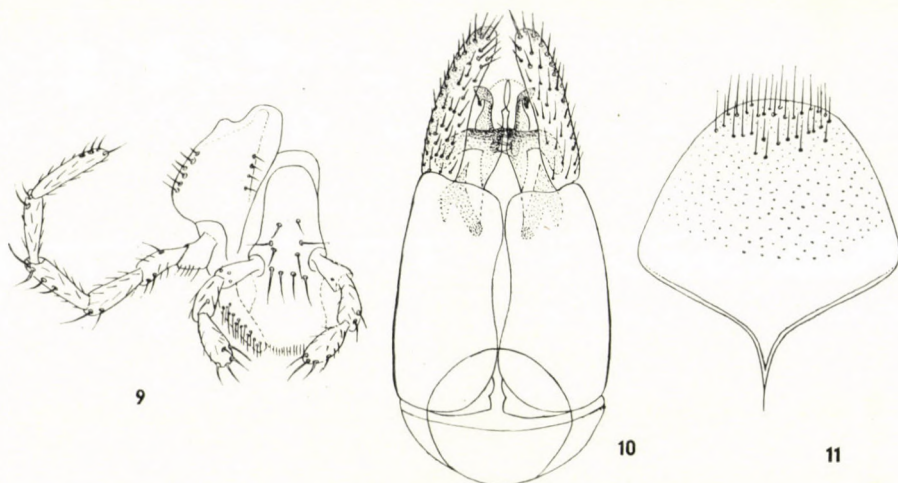


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Fig. 8. *Bradepyrus inermis* (KIEFFER)

is very short, about one-fifth of pronotum; the species is represented by a ♀, according to KIEFFER, but is in reality a ♂ (see Fig. 10 of male genitalia). To be added to the description are: head remarkably broadened behind eyes (Fig. 8), temple about as long as breadth of eyes (7 : 7); eyes remarkably convex, protruding above level of head, its width two-thirds of its length (7 : 11), malar space rather small (2); ocelli in an equilateral triangle, mandibles stout, at apex with a longer tooth ventrally and with three oblique, minute teeth dorsally above it; maxillary palpi with 6, labial palpi with 3, segments (Fig. 9); reclinate antennae extending almost over propodeum; scape curved, at most twice as long as broad (7 : 3), length (and breadth) of antennal segments 2—13 = 3.5(2) : 4.5 : 4 : 4 : 4(2.5) : 4 : 4 : 4 : 4 : 3.5 : 3.5 : 5.5. Pronotum alutaceous, broader than long, propodeum transverse, broader than long; length (and breadth) of pronotum : mesonotum : scutellum : propodeum =

12 + 4 (19) : ? 7 : 7 : 10 + 3 (15). Fore femora, tibiae, as well as mid ones of equal length (13); hind femora only slightly longer than fore tarsi (17 : 16); mid tarsi, hind tibiae, and tarsi becoming longer (19 : 20 : 23). Tergites 1—4 of abdomen granulate. Last abdominal sternite about as long as broad, rounded, and with some bristles posteriorly, otherwise narrowed and acute anteriorly (Fig. 11); inner sides of ventral parameres, reverse cordiform, emargi-



Figs. 9—11. *Bradepyrus inermis* (KIEFFER), 9 = mouth parts, 10 = genitalia, ventral view, 11 = ninth sternite

nated; penis valvae shorter than paramere, of about equal length to digitus; lamina volsellaris with a strongly curved, short process; digitus with a projecting, dark, chitinized, acute apex (Fig. 10).

Easily recognizable by the wingless specimens, the granulate propodeum as well as the tergites of the abdomen, the central furrow of the propodeum, the very small transverse deepening in front of the scutellum, and the remarkably enlarged hind-head.

### *Pseudisobrachium pubescens* KIEFFER

*Pseudisobrachium pubescens* KIEFFER, 1906, Spec. Hym., 9, p. 305 ♀

*Pseudisobrachium pubescens*: 1908, KIEFFER, Gen. Insect., 76, p. 24

*Pseudisobrachium pubescens*: 1914, KIEFFER, Das Tierreich, 41, p. 476 ♀

This species was described on the basis of the following specimen: "Patrie. Grèce. Type au Musée national de Budapest." It is to be found in Mus. Budapest and to be regarded as the holotype; there are the following data on its labels: "Graecia", "19", "*Pseudisobr. pubescens*" in BIRÓ's writing (red label) (mouth parts on a celluloid plate), Hym. Type No. 49.

Between the description and the holotype, the following differences are to be found. According to KIEFFER: "Tête et thorax pubescents" in fact:

head, thorax and abdomen with short hairs; KIEFFER (1906, p. 304, 1914, p. 477): "Kopf 1 1/2mal so lang wie breit" incorrect, in reality: broadest part of head: length of head = 25 : 29, slightly broader than 3/4 of its length; "Pronotum de moitié plus long que large" in reality: length of pronotum : breadth of pronotum (at tegulae) = 25 : 14, more than 1 1/2 longer than broad; "Taille ♀: 4 mm" in fact: 4.5 mm (Fig. 12).

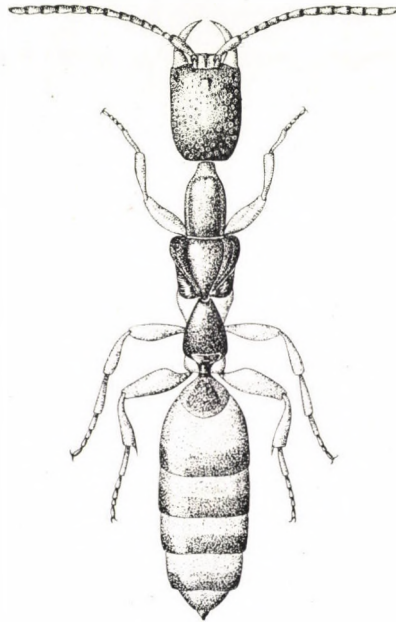


Fig. 12. *Pseudisobrachium pubescens* KIEFFER

To be added to the description are: head subrectangular, smooth, shiny, punctured, sides somewhat convergent before posterior angles, these latter obtusely rounded; antennal sockets very deep, separated by a knife-like keel; clypeus truncate, slightly concave; maxillary palpi with 5, labial palpi with 3, segments (Fig. 13), mandibles with 2 larger and 2 smaller teeth; antennae thick, nearly as long as head and pronotum together, segment 1 very thick, curved, nearly 3 times as long as broad (14 : 5), breadth of segments 2—5 as their length, quadrate, from 6<sup>th</sup> transverse, slightly broader than their length, ratios between segments 1—13 = 14 : 3 : 3 : 2.5 : 3 : 3 : 3 : 3 : 3 : 3 : 3 : 3 : 7. Pronotum flat, only slightly depressed in front to receive head, sides converging only anteriorly in depression, otherwise parallel; pronotum : mesonotum + scutellum : propodeum = 25 : 15 : 20; pronotum, mesonotum very sparsely and finely punctured, surface shining; mesonotum trapeziform, in front broader than long (22 : 15), or less broad than length



of pronotum with collar (22 : 25), with emarginated margin in front, narrowing behind where joined to propodeum, with two furrows converging towards propodeum; pronotum, mesonotum rounded towards their sides, propodeum with a sharp lateral margin, scutellum, postscutellum not visible; propodeum triangular, narrowing gradually on both sides to stalk of mesothorax and to orifice, overhanging sides, so that dorsal surface much broader than ventral one; propodeum with slightly arched lateral margins, deeply emarginated in front, its flat, shining surface about three times longer than its declivous portion (15 : 5), this latter slightly and transversely striated; mesopleuron convex, finely and transversely striated, elsewhere finely alutaceous (above two coxae). Legs short and stout, middle coxae as broad as, and a little shorter

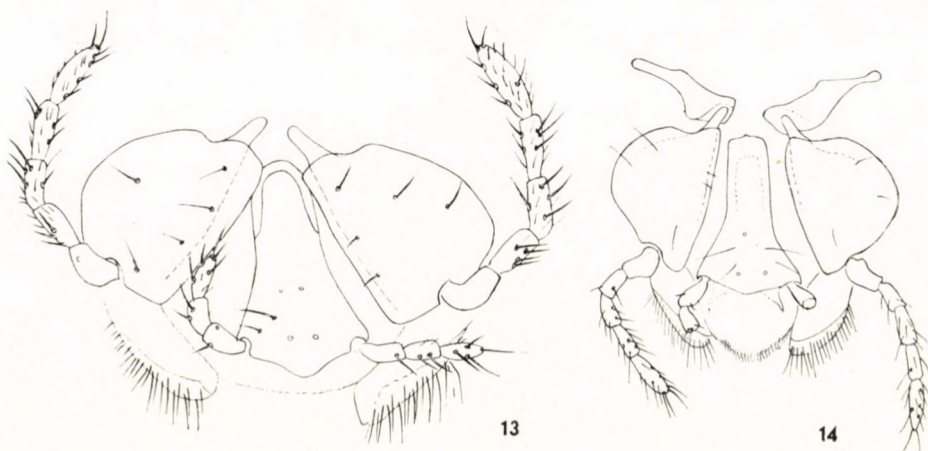


Fig. 13—14. Mouth parts of 13 = *Pseudisobrachium pubescens* KIEFFER. — 14 = *P. concolor* KIEFFER

than, femora; fore femora about two and a half times (18 : 7), hind femora about twice (15 : 8), as long as broad, rather flattened; fore tibiae about as long as hind femora (14 : 15), four times as long as greatest tibial diameter (14 : 3.5), fore tarsal segments together as long as tibiae (22 : 22); basitarsus curved, as long as other tarsal segments together, ending in at least four stout spines; mid and hind tibiae with stout spines, a little shorter than femora (13 : 15), hind tibia distinctly longer than femur (26 : 18). Abdomen with seven visible tergites (last one very small), about as long as head + pronotum + mesonotum together, tergites 2—3—4 of equal size, 3—5 with posterior impressions, hardly round, dilated in centre; tergites 2—5 with sparse punctures.

Recognizable by the thorax without wings, the mandibles with four teeth, the first antennal segment being nearly three times as long as broad, the breadth and length of segments 2—5 being also the same and also quadrate,

the fore tarsal segments together being as long as fore tibiae, the fore basitarsus being so long as the other tarsal segments together, and the hind tibiae being distinctly longer than the femora.

*Pseudisobrachium concolor* KIEFFER

*Pseudisobrachium concolor* KIEFFER, 1906, Spec. Hym., 9, p. 305 ♀

*Pseudisobrachium concolor*: 1908, KIEFFER, Gen. Insect., 76, p. 24

*Pseudisobrachium concolor*: 1914, KIEFFER, Das Tierreich, 41, p. 477 ♀

According to KIEFFER: "Patrie. Simont (= Simontornya), le 2. septembre; Karascs (= Karancs), le 12 septembre. Type au Musée national de Hongrois." The data of the specimen to be found in Mus. Budapest are as follows: "Karancs. Baranya m. BIRÓ, 12. IX. 1881" in BIRÓ's writing, "101" and "*Pristocera* n. sp." in MOCSÁRY's writing, "36" probably in KIEFFER's writing, "*Pseudisobr. concolor*" in BIRÓ's writing (red label) (mouth parts on celluloid plate; left fore leg, 12—13 segments of right antenna and flagellum of left antenna missing). It is designated hereby as the lectotype, Hym. Type No. 50.

KIEFFER's diagnosis is to be corrected as follows: "Corps glabre" correctly: body sparsely hairy; "thorax à punctuation indistincte, à peine perceptible" in reality: thorax in centre flat, shining, towards sides sparsely and slightly punctured; "Article du funicule distinctement transversaux" correctly: segments 1 and 2 of flagellum quadrate, others transverse.

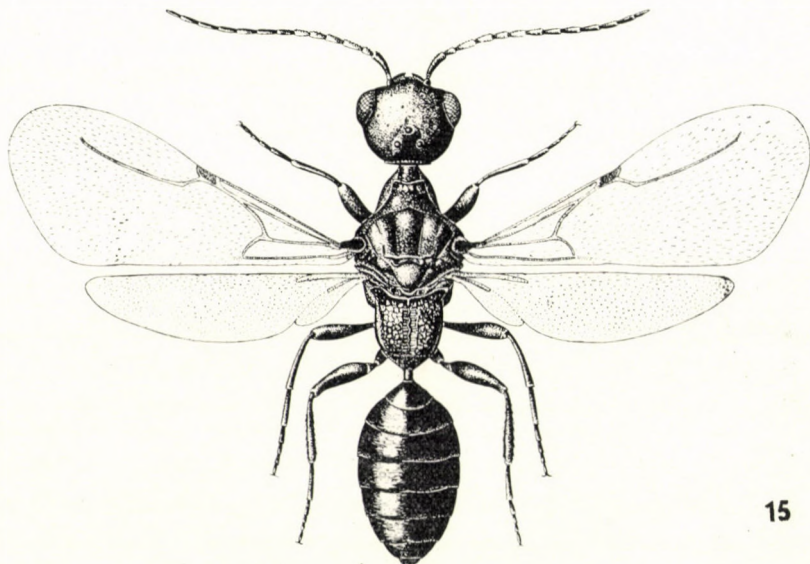
The following additions can be made to the description: head subrectangular, smooth, shining, punctured, its breadth and length = 17 : 22, nearly three-fourth times as broad as long; mandibles with 4 teeth, maxillary palpi with 5, labial palpi with 3 segments (Fig. 14). Otherwise very similar to *P. pubescens* KIEFFER, but differing in following characters: colour (given in original diagnosis), proportions of antennal segments, punctures of thorax, proportions of thorax, fore tibiae, and tarsi, size of fore basitarsi and proportion of hind tibiae and hind femora, in details as follows. Length (and breadth) ratios of antennal segments 1—11 = 11 (3) : 2 (2) : 2 (2) : 2 (2.5) : 2 (2.5) : 2 (2.5) : 2 (3) : 2.5 (3) : 2.5 (3) : 2.5 (3) : 3 (3.3). Pronotum : mesonotum : propodeum = 19 : 11 : 15. Length and breadth of pronotum = 19 : 10, pronotum nearly twice as long as broad. Length (and breadth) of fore and hind femora: 13 (5) : 11 (5.5); fore tarsi together longer than fore tibia = 12 : 10; basitarsi of fore legs strongly curved, broadened distally, only with thin spines, slightly shorter than other tarsal segments (5 : 6); length (and breadth) of mid tibiae and mid femora = 9 (3) : 11 (5); length (and breadth) of hind tibiae and femora = 11 (3) : 11 (5); hind tibiae as long as hind femora; mid tibiae strongly spinose.

Whether these characters are good enough (and to what extent they might be varying within the genus) to afford the establishment of species, can only be decided after a more exhaustive comparative examination.

*Ceratepyris claripennis* sp. n.

♂. — Length 4.25–5 mm. Closely resembling *C. fuscipennis* KIEFFER but differing as follows: antennae darker, at most segments 1–4 partly reddish-brown, wings hyaline, not infuscated (Fig. 15).

Frons rather convex, with a longitudinal fine furrow well developed especially between eyes; frons very smooth, shining, with very sparse punctures, and alutaceous only near antennal sockets and ocelli; inner and outer margins



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Fig. 15. *Ceratepyris claripennis* sp. n.

of eyes rugulose, but only to a very small extent; eyes nearly as long as broad (13 : 12), separated from occipital margin with three-quarters of their length (10 : 13, both aspects measured from same view-point); eyes not reaching over edge of mandibles, a malar space about half as long as breadth of basis of mandibles; antennal sockets even closer to eyes than to one another (4.5 : 7); segments 1–3 of maxillary palpi stout, 3–6 slender, labial palpi with 3 segments; occipital carina, ocelli, antennae as in *C. fuscipennis*. Pronotum (except collar) : mesonotum : scutellum : postscutellum : propodeum (with declivous part) = 10 : 17 : 11 : 4 : 23; horizontal part of pronotum with irregular longitudinal wrinkles only in its two-third surface proximally, distally rather smooth, shining, with traces of alutaceous sculpture; mesonotum and scutellum smoother and more shining, with very few sparse punctures, laterally finely alutaceous; postscutellum longer, separated from scutellum by a deep semicircular impression; propodeum roughly rugose, as in *C. fuscipennis*; episternum<sub>2</sub> rugose only at proximal edge, elsewhere almost smooth, shining,

with a smaller but deeper oval impression. Relations among joints of legs generally resembling that of *C. fuscipennis*, fore femora, tarsi, and hind femora of equal length (24); fore tarsi shorter than hind ones (24 : 29); mid femur shortest joint of leg (18); length of fore : mid : hind tibiae = 19 : 20 : 27. Ninth abdominal sternite and genitalia resembling that of *C. fuscipennis*, but penis valvae not so concave on inner side of apex, and digitus not so sharply bifurcated, as in *C. fuscipennis*.

Specimens examined: holotype ♂ "Ruma" leg. DR. HENSCH (mouth parts and genitalia on celluloid plate), Hym. Type No. 52; paratype: 2 ♂ with same data, Hym. Type Nos. 53—54; 1 ♂ "DR. HENSCH, Ruma, Slav." Hym. Type No. 55.

The species is easily recognizable by the pronotum with its sharp edges laterally, the hyaline wings, and the finer sculpture, especially on pronotum, frons, and mesonotum.

#### *Ceratepyris fuscipennis* KIEFFER

*Ceratepyris fuscipennis* KIEFFER, 1905, Spec. Hym., 9, p. 287 ♂

*Ceratepyris fuscipennis*: 1908, KIEFFER, Gen. Insect., 76, p. 21

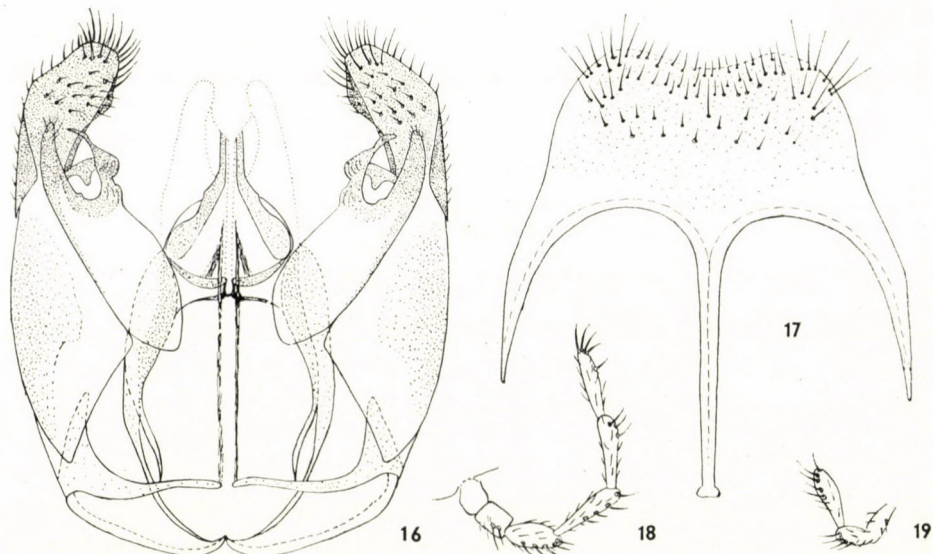
*Ceratepyris fuscipennis*: 1914, KIEFFER, Das Tierreich, 41, p. 506 ♂

This species was described on the basis of the following specimen: "Patrie. Hongrie: Novi (HORVÁTH)." It is to be found in Mus. Budapest and to be regarded as the holotype; there are the following data on its labels: "Novi, HORVÁTH, 1899 jul.", "37", "*Ceratepyris fuscipennis*" in BIRÓ's writing (red label), (genitalia and mouth parts on celluloid plate, mid right leg missing), Hym. Type No. 51.

The following parts of KIEFFER's diagnosis should be corrected: "radius . . . distant de l'extrémité alaire du tiers de sa longueur" correctly:  $R_5$  separated from margin by one-quarter of its length; "ailes inférieures avec les nervures sous-costales et radiale brunes", KIEFFER (1914, p. 506): "Fig. 178" hind wings with a single *C* and *1A* (RICHARDS 1956, p. 30 Fig. 60) distinct, other veins only in traces; „métatarse postérieur égal aux deux articles suivants réunis" in reality: hind basitarsi slightly longer than two following segments together (10 : 9); "ocelles en arc, les postérieurs aussi près du bord que l'un de l'autre" correctly: hind ocelli one quarter nearer to occipital margin than distance between them (4.5 : 6); "article antennaires 5 à 13 bruns" correctly: no remarkable differences in colour between antennal segments, only last 4—5 segments darker.

In addition to the original description: frons rather flat in middle, slightly convex at inner margin of eyes, its surface above level of eyes, smooth and shining, sparsely punctate, except alutaceous middle part; inner and outer margins of eyes broadly rugulose; eyes not much longer than broad, length and breadth of eyes = 15 : 12, eyes separated from occipital margin by about half their length (8 : 15), eyes reaching upper edge of mandibles, no malar space; occipital carina well distinguished; ocelli remarkably developed,

in an obtuse angle, lateral ones separated from occiput by three and a quarter distance of POL (4.5 : 6), distance between anterior ocellus and posterior ones half as long as distance between latter ones (3 : 6), or mid ocelli as far from lateral ones as diameter of one; lower margin of clypeus almost straight, surface smooth, shining, with a very slight longitudinal keel, sides of clypeus sloping into deep impressions of antennal sockets; sockets slightly nearer to eyes than to one another (5 : 6); apex of mandibles very large, with 5 teeth, among them two larger ones in lower part and three remarkably smaller ones



Figs. 16—19. *Ceratepyris fuscipennis* KIEFFER, 16 = genitalia, 17 = ninth sternite, 18 = maxillary and 19 = labial palpi

in upper part; maxillary palpi with 6, labial palpi with 3, segments (Figs. 18—19); length (and breadth) of antennal segments 1—13 = 9 (4) : 2.5 (2.5) : 5.5 (3) : 5.5 : 5.5 : 5.5 : 5.5 : 5.5 (2.5) : 5.5 : 5.5 : 5.5 : 4.5 : 6; antennae thicker in middle, more slender from segment 8. Pronotum coarsely rugulose on whole horizontal surface; length of pronotum (except collar) : mesonotum : scutellum : postscutellum : propodeum = 11 : 16 : 11 : 2 : 20 (with decliving part); a deep transversal furrow between mesonotum and scutellum; postscutellum small, separated from scutellum by a short transverse concave furrow; episternum<sub>2</sub> rugose to shallow, oval impression; lateral sides of horizontal part of propodeum broadened in middle, distinctly convergent anteriorly and posteriorly; declivous part of propodeum coriaceous. No essential differences between length of femora and tarsi; fore and hind femora of equal length and breadth (22 : 9), fore tarsi slightly shorter than hind ones (21 : 23); mid femora shortest segment of legs (17); tibiae gradually lengthening distally;

fore : mid : hind tibiae = 18 : 19 : 22. Ninth abdominal sternite with three proximal stalks (basally broad, attenuating apically), its margin excavated, distally with many bristles and hairs (Fig. 17); genitalia with rounded paramere and penis valvae, latter distinctly widening in middle and with bifurcate digitus with special structures (Fig. 16), genitalia membranous, only apex of paramere, digitus, and trunk of penis valvae more darkly chitinized.

The species is easily recognizable by the pronotum with its sharp lateral edges and rugose surface dorsally, the infuscated wings, the rounded head, and the convex propodeum.

### *Bethylus cephalotes* (FÖRSTER)

*Perisemus cephalotes* FÖRSTER, 1860, Verh. Ver. Rheinl., **17**, p. 111 ♂

*Bethylus fuscicornis* var. *tibialis* KIEFFER, 1905, Spec. Hym., **9**, p. 280 ♀ syn. n.

*Bethylus fuscicornis* var. *tibialis*: 1908, KIEFFER, Gen. Insect., **76**, p. 17

*Bethylus fuscicornis* var. *tibialis*: 1914, KIEFFER, Das Tierreich, **41**, p. 514 ♀

*Bethylus fuscicornis* ab. *tibialis*: 1919, HELLÉN, Medd. Soc. Fauna et Flora Fenn., **45** (1918—1919) p. 280

*Bethylus cephalotes*: 1928, BERLAND, Faune de France, **19**, p. 99 ♂ ♀

*Bethylus cephalotes*: 1939, RICHARDS, Trans. Roy. ent. Soc. Lond., **89**, p. 298, 306

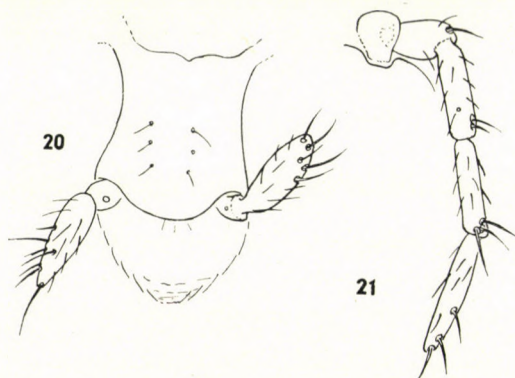
According to KIEFFER's original description of var. *tibialis*: "Patrie. Hongrie: Mt-Meszes et Gafsa (BIRÓ); Tunisie: Sfax (BIRÓ)". The data of the specimens, found in Mus. Budapest, are as follows: "Mt. Meszes II. V. 1904. leg. BIRÓ", "57", "*Bethylus fuscicornis* var. *tibialis*" in BIRÓ's writing (red label) (mouth parts on celluloid plate), Hym. Type No. 56; "Gafsa III. 1903 Tunis, BIRÓ" (segments 10—12 of antennae missing, mouth parts on celluloid plate) Hym. Type No. 57; "Sfax III. 1903", "Tunis, BIRÓ", "60", Hym. Type No. 58. I designate the specimen from the "Mt. Meszes" as the lectotype (Hym. Type No. 56), and the others as paralectotypes.

The following parts of KIEFFER's diagnosis are to be corrected: KIEFFER (1905, p. 278) "13 — Mesonotum au moins aussi long, que le scutellum" mesonotum slightly shorter than scutellum (6 : 8) on lectotype; (l. c. p. 280) "17 — Tibias et tarsi rous" correctly: fore tibiae, partly mid tibiae, generally posterior apex of mid and hind tibiae and tarsi yellowish-red; "moitié apicale du scape et les trois articles suivants d'un roux bruns" at least underside of segments 2—6 reddish-brown; "Taille ♀: 3 mm" in reality: 3—4 mm.

In addition to the description I submit: head densely alutaceous; length and breadth of head = 30 : 29; length of eyes: and distance of one from occiput 13 : 10; mandibles broadened at apex with 4 small teeth; maxillary palpi with 5 (Fig. 21), labial palpi with 2 segments; second segment of labial palpi unusually long (Fig. 20). Length (and breadth) ratios of antennal segments 1—12 = 9 (4) : 4 (1.5) : 4 (1.5) : 4 : 4 (2) : 4 (2) : 4 : 3.5 : 3.5 : 3 : 3 : 2.5 : 3. Length (and breadth) of pronotum : mesonotum : scutellum : propodeum = 16 (20) : 7 (18) : 9 : 1 : 8. Pronotum alutaceous.

This variety resembles *B. cephalotes* (FÖRSTER), except for the following details: vertex without a slight longitudinal impression in front of ocelli, on paralectotype from Sfax with a trace of a minute impression; distance

between posterior ocelli equal to that between one of them and median ocellus; posterior ocelli separated from occiput by 1.50—1.75 times more than from one another (1.50 on lectotype, 1.62 on paralectotype from Gafsa, and 1.75 on paralectotype from Sfax); mesonotum more than twice as broad as long (18 : 7); radial vein  $R_5$  not 5—6 times, but only 4 times longer than ptero-



Figs. 20—21. *Bethylus fuscicornis* var. *tibialis* KIEFFER, 20 = labial and 21 = maxillary palpi

stigma. Among the smaller differences, there is the narrow mesonotum as a remarkable character, but its length depends greatly on the method of preparation (unfortunately, all three types had been pinned through the mesonotum); hence too much importance cannot be attributed to this character, which would otherwise refer to *B. gestroi* KIEFFER. These differences are not worthy of a distinct taxonomical treatment, consequently I suggest that this variety be synonymised with *B. cephalotes* (FÖRSTER).

#### *Bethylus hyalinus* (MARSHALL)

*Perisemus hyalinus* MARSHALL, 1874, Ent. Annual., p. 133 ♀

*Bethylus hyalinus*: 1905, KIEFFER, Spec. Hym., 9, p. 274 ♀

*Bethylus hyalinus*: 1908, KIEFFER, Gen. Insect., 76, p. 17

*Bethylus hyalinus*: 1914, KIEFFER, Das Tierreich, 41, p. 509 ♀

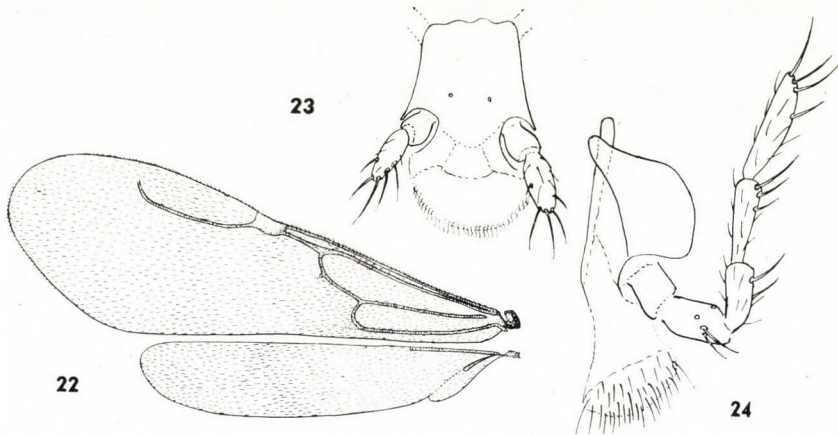
*Bethylus hyalinus*: 1939, RICHARDS, Trans. Roy. ent. Soc. Lond., 89, p. 317 ♀

According to MARSHALL: "Taken near St. Albans June 1873." The data of the specimen to be found in Mus. Budapest are as follows: "St-Albany" in BIRÓ's writing; "St. A.", "St. Albany MARSHALL" in BIRÓ's writing; "hyalinus M. Coll. MARSHALL" in KIEFFER's writing, "hyalinus MARSH." in MARSHALL's writing, "80", "*Bethylus hyalinus*" in BIRÓ's writing (red label) (mouth parts on celluloid plate); this specimen must indubitably be the holotype, Hym. Type No. 59.

RICHARDS (1939, p. 317) believed that: "The type of *P. hyalinus* seems to be lost", and he reiterates only the original description. To be added to the diagnosis are the following remarks:

♀. Length 3 mm. — Black, antennae with segment 1 distally and segments 2—6 (except for their dorsal, distal tips), fore tibiae, both ends of mid and

hind tibiae, all tarsi (except claws), pale testaceous. Wings hyaline, pterostigma, radial vein,  $R_s$ ,  $M$  brown, other veins pale (Fig. 22). Head subquadrate, longer than broad (26 : 20, measured just behind eyes), hind angles slightly rounded, nearly twice broader than thorax, fore margin of pronotum: breadth of head 12 : 20, surface flattened from short keel above clypeus to median



Figs. 22—24. *Bethylus hyalinus* (MARSHALL), 22 = wings, 23 = labial and 24 = maxillary palpi

ocellus, and closely alutaceous, with sparse, shallow punctures (separated generally by 2—4 diameters), with white, short, reclinate hairs; eyes oval, as long as temple, almost meeting mandibles in front; ocelli in an isosceles triangle, distance between posterior ocelli a little longer than that of one of them from median ocellus (9 : 8), posterior ocelli separated from occiput by nearly twice its diameter; clypeus transverse, with a convex central keel extending back to line connecting hind margins of deep antennal sockets; mandibles with 3 very short, sharp teeth, and with 1 distinctly broad and rounded tooth; maxillary palpi with 5 segments (3 segments after bending), labial palpi with 2 segments (Figs. 23—24); antennae with short segments, and fine, white, short hairs, reclinate antennae extending to about posterior margin of pronotum, segment 1 thick, slightly curved, about twice as long as broad (15 : 8), a little shorter than 3+4, segments 2—3 twice longer than broad (9 : 4, resp. 8 : 4), 4—9 about one and a half times longer than broad, 10—11 nearly twice longer than broad (7 : 4), 12 clavate, twice longer than broad; length of antennal segments 1—12 = 15 : 9 : 8 : 8 : 8 : 8 : 8 : 7 : 7 : 7 : 7 : 8 (magnified  $\times 100$ ). Pronotum rounded in front, broadened behind, nearly as long as broad anteriorly, alutaceous; mesonotum (between tegulae) more than twice as broad as long (14 : 6 magnified  $\times 40$ ), shorter than scutellum; length of pronotum : mesonotum : scutellum : propodeum = 12 : 6 : 8 : 12; surface of pronotum—scutellum slightly shining, finely alutaceous, with very



sparse fine punctures; propodeum (from hind margin of scutellum) about three-quarters as long as its anterior width (12 : 16), with a special character: propodeum bisected by a carina, curving from both sides of base of petiole and forking not far from three-quarters of its length, thus enclosing in middle a smooth, shining, triangular area rising slightly to meet postscutellum; carina also enclosing a small oval dimple at top behind origin of hind wings. Surface of propodeum slightly shining, alutaceous, slightly stronger than on other parts of notum, except in glabrous central triangle areas. Leg stout, especially fore femora, mid and hind femora flattened beneath to receive tibiae, hind coxae with a pointed top dorsally, segment 1—2 and 3—5 of mid tarsi of equal lengths (except claws). Claw strongly bifurcate. Fore femora half as broad as long, mid and hind femora narrower than half of their length; mid femora shorter (13) than fore (16) or hind femora (17); fore and mid tibiae about equally long (13 : 14), hind tibiae longer (20); tarsi posteriorly gradually longer, fore : mid : hind tarsi = 15 : 17 : 25. Wings narrow, *M* shorter than distance from its origin to pterostigma, latter rather broad and concave dorsally, *R*<sub>s</sub> nearly four times as long as pterostigma, its end strongly curved towards, but not reaching, *C*; hind wings with a short thick *C*; wings a little longer than head and thorax together. Abdomen with seven clearly visible tergites, surface smooth and shining, hairs very scattered.

Easily recognizable by the peculiar structure of its propodeum.

### *Goniozus maurus* MARSHALL

*Goniozus maurus* MARSHALL, 1905, Spec. Hym., 9, 266 ♀

*Goniozus maurus*: 1908, KIEFFER, Gen. Insect., 76, p. 15

*Goniozus maurus*: 1914, KIEFFER, Das Tierreich, 41, p. 524 ♀

According to the original description: "Patrie. Algérie: Type conservé au Musée national de Budapest". The data of the specimen examined in Mus. Budapest are: "Algeria", "*maurus* M. Coll. MARSHALL", "*Goniozus*" and "*maurus* MARSH. (Algeria)" in MARSHALL's writing, "92", "*Goniozus maurus*" in BIRÓ's writing (red label) (10—13 segment of right antennae missing). This specimen is doubtless the holotype, Hym. Type No. 60.

The following differences can be found between the description and the holotype: "Appendix de la nervure basale arquée" correctly: the outer branch of *R*<sub>s</sub> + *M* very slightly curved, nearly straight (Fig. 25); "yeux deux fois aussi longs que leur distance du bord occipital" in reality: eyes two and a half times longer than their distance from occiput (15 : 6); "ocellus postérieurs à peine plus éloignés des yeux que l'un de l'autre" in fact: hind ocelli separated by more than one and a half times of POL from eyes (6 : 10); "Scape aussi long que les articles 2 et 3 réunis, ceux-ci aussi longs que gros" exact length (and breadth) ratios of antennal segments 1—13 = 5 (3) : 3 (2) : 3 (2) : 3.5 (2.5) : 3 : 3 : 3 : 3 : 2.5 : 2.5 : 2.5 : 2 : 3.

Further additions to the description: head slightly longer than broad (30 : 27), densely alutaceous and with rather shallow punctures, rounded

posteriorly; eyes nearly two-thirds as broad as long (9 : 15), bare, meeting mandibles in front; ocelli in an obtuse angle, anterior ocellus nearer to posterior ones than from one another (4 : 6), hind ocelli situated on border of vertex; clypeus acute in middle; mandibles with about equally long four teeth in front. Pronotum, mesonotum gradually finely alutaceous than head; pronotum more finely punctured, parapsidal furrows of mesonotum developed; scutellum without punctures, propodeum one-quarter broader than long

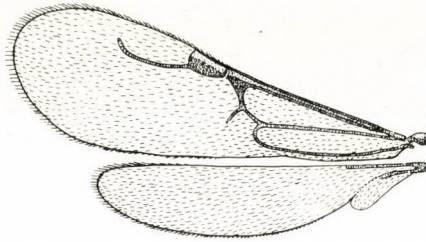


Fig. 25. *Goniozus maurus* MARSHALL, wings (Orig.)

(20 : 15), length of pronotum : mesonotum : scutellum : postscutellum : propodeum = 14 + 5 : 9 : 9 : 1 : 15 + 4. Fore tibiae, tarsi, mid femora and tibiae of about equal lengths (14 : 16 : 15 : 15), as in fore femora, mid tarsi, hind femora and tarsi (18 : 18 : 19 : 20); hind tarsi remarkably longer (28). Abdominal tergites smooth, very shining, only basally slightly alutaceous.

Easily recognizable by the characteristic, central, brilliant, smooth triangle, and by the mostly red tibiae and tarsi.

#### APPENDIX

In addition to my first publication (1965) on KIEFFER's types in the Coll. Hung. Nat. Hist. Mus. (= Mus. Budapest), I submit herewith the serial numbers of the respective Dryinid type-specimens (Data of localities are given according to original descriptions, resp. labels, of type-specimens):

- Hym. Type No. 1. *Richardsidryinus* (= *Dryinus*) *corsicus* (MARSHALL), 1874, Corsica: Campoloro, holotype  
 ,, 2. *Dryinus trifasciatus* KIEFFER, 1906, India: Matheran, lectotype  
 ,, 3. *Dryinus trifasciatus* KIEFFER, 1906, India, paralectotype  
 ,, 4. *Dryinus szépligetii* KIEFFER, 1905, Hongrie: Novi, holotype  
 ,, 5. *Dryinus tarraconensis* MARSHALL, 1868, Spain: Torla, holotype  
 ,, 6. *Platygonatopus* (= *Gonatopus*) *horváthi* (KIEFFER), 1906, Hongrie: Krassova, holotype  
 ,, 7. *Chalcogonatopus* (= *Gonatopus*) *polychromus* (MARSHALL), 1905, France: Cette, holotype  
 ,, 8. *Chalcogonatopus* (= *Gonatopus*) *maurus* (KIEFFER), 1906, Hinterindien: Malakka, holotype  
 ,, 9. *Haplogonatopus* (= *Gonatopus*) *bifarius* (KIEFFER), 1906, Corse, holotype  
 ,, 10. *Dicondylus* (= *Gonatopus*) *dichromus* (KIEFFER), 1906, Corsica, holotype  
 ,, 11. *Dicondylus* (= *Labeo*) *pusillus* (SZÉPLIGETI), 1901, Rossia: Kasan, holotype  
 ,, 12. *Agonatopoides* (= *Gonatopus*) *striatus* (KIEFFER), 1905, Hongrie: Körtvélyes, neotype

- Hym. Type No. 13. *Pseudogonatopus* (= *Gonatopus*) *distinctus* (KIEFFER), 1906, Angleterre: New Forest, holotype
- „ 14. *Pseudogonatopus* (= *Gonatopus*) *ortholabis* (KIEFFER), 1906, Ucciani, holotype
- „ 15. *Gonatopus marshalli* KIEFFER, 1905, Angleterre: Swanage, lectotype
- „ 16—17. *Gonatopus marshalli* KIEFFER, 1905, Angleterre: Swanage, paralectotypes
- „ 18. *Gonatopus marshalli* KIEFFER, 1905, Corsica, paralectotype
- „ 19. *Gonatopus gracilipes* KIEFFER, 1906, Hongrie: Szomotor, lectotype
- „ 20. *Gonatopus gracilipes* KIEFFER, 1906, Hongrie: Kecskemét, paralectotype
- „ 21. *Gonatopus gracilipes* KIEFFER, 1906, Hongrie: Farkasd, paralectotype
- „ 22. *Gonatopus gracilipes* KIEFFER, 1906, Hongrie: Körtöltés, paralectotype
- „ 23—25. *Gonatopus gracilipes* KIEFFER, 1906, Hongrie: Budapest, paralectotypes
- „ 26. *Neogonatopus* (= *Gonatopus spectrum* var.) *albidus* (KIEFFER), 1906, Hongrie: Sveto Brdo, holotype
- „ 27. *Neogonatopus* (= *Gonatopus*) *distinguendus* (KIEFFER), 1905, Angleterre: Weymouth, lectotype
- „ 28. *Neogonatopus* (= *Gonatopus*) *distinguendus* (KIEFFER), 1905, Angleterre: Weymouth, paralectotype

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Author's address: Budapest, VIII., Baross u. 13, Hungary.



A PROPOS DES LIMITES DE LA ZONE PALÉARCTIQUE  
DANS L'HIMALAYA  
ou  
LES LIMNOPHILINES EN INDE  
(TRICHOPTERA)

Par

F. SCHMID

INSTITUT DE LA RECHERCHE ENTOMOLOGIQUE, SERVICE DE LA RECHERCHE,  
MINISTÈRE FÉDÉRAL DE L'AGRICULTURE OTTAWA, ONTARIO, CANADA

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Plusieurs années de recherches trichoptérologiques dans les montagnes du Nord de l'Inde m'ont permis de réunir une très large collection que j'évaluerai à 150.000 spécimens. A l'étude, il s'est révélé que sur ce nombre, cinq exemplaires seulement se trouvent être des éléments incontestablement paléarctiques. Ces insectes appartiennent à trois espèces et un seul d'entre eux a été capturé vivant, les autres ayant été trouvés à l'état de cadavres à demi-décomposés. Ces informations présentent chacune un intérêt que nous allons dégager de l'analyse des faits. Mais, auparavant, étudions les insectes dont il est question ici.

*Limnophilus fuscovittatus* MATS.

L'unique ♀ à ma disposition montre une coloration intermédiaire entre celle de spécimens du Japon et des Iles Kouriles que j'ai sous les yeux. Le corps est brun assez foncé, les ailes antérieures rousses, avec de très petites taches sombres le long des nervures et l'aire post-costale est brune. Les ailes postérieures sont faiblement teintées de roux clair à leur extrémité. Les deux ailes sont sensiblement plus larges et plus arrondies à leur extrémité que celles des insectes susmentionnés et de longueurs presque égales. La nervulation, par contre, est semblable chez tous les spécimens. Envergure 33 mm.

G é n i t a l i a ♀ (Fig. 3): angles latéraux apicaux du IX<sup>me</sup> segment droits et non proéminents comme chez les insectes d'Asie orientale (Fig. 1-2). Pointes apicales du X<sup>me</sup> segment assez larges. Bord inférieur de la cavité anale droit, mais non échancré. Les sclérites endo-anaux que montrent les spécimens extrême-orientaux sont ici absents.

Le spécimen décrit ici provient du Sikkim: Donkung, 15.750 ft. 22-VI-1959. Il a été trouvé à la lumière, parmi de nombreux *Pseudostenophylax*, au bord de la Tista, assez gros torrent glaciaire, aux eaux turbides, très froides et assez agitées.

En dépit des différences notées ci-dessus, je ne considère pas cet insecte comme appartenant à une espèce distincte de *fuscovittatus* ou même à une sous-espèce de cette dernière. Ces différences sont faibles, l'espèce semble être assez peu constante et nous ne connaissons pas les caractères du ♂ des populations du Sikkim. De même, *L. fuscovittatus sibiricus* MART. auquel j'ai accordé un statut spécifique (SCHMID 1955, p. 143) ne mérite probablement pas ce rang. Mais il est possible que *fuscovittatus* soit un jour divisé en plusieurs sous-espèces.

La présence du *Limnophile* à bandes brunes au Nord du Sikkim est fort intéressante et montre que l'espèce a une très large répartition en Sibérie et en Asie centrale et orientale.

### ***Limnophilus tibeticus* sp. n.**

L'unique spécimen connu a été trouvé mort sur une pierre. Il est partiellement recouvert d'une croûte limoneuse et n'a pu être étalé.

Hanches antérieures rousses, hanches médianes et postérieures brun noir, à pilosité argentée. Pattes jaune roux. Eperons ♀ 1, 3, ? Ailes antérieures grandes, très longues et étroites, quoique légèrement arrondies à leur extrémité. Elles sont brun gris pâle, avec des taches brunes minuscules le long des nervures. Ptérostigma assez fortement teinté. Cellule discoidale très étroite et 2,5 fois plus longue que son pétiole; anastomose peu brisée et oblique vers l'extérieur et l'arrière. Aux ailes postérieures, cellule discoidale courte et large; anastomose fortement et régulièrement brisée. Bifurcations médianes très divergentes et débutant un peu avant le niveau de la pointe de la cellule discoidale. Longueur de l'aile antérieure 16 mm.

**Génitalia** ♀ (Fig. 4—6): IX<sup>me</sup> tergite mal distinct du sternite qui forme deux lobes très obtus et séparés par un sillon médian peu profond. Appendices praeanaux assez bien distincts, plus longs que larges, à peu près côniques et portant une zone fortement chitineuse en position apicale inférieure et dominant la cavité anale; ils sont séparés l'un de l'autre dorsalement par un étroit espace. X<sup>me</sup> segment réduit, peu chitineux et fortement intégré aux appendices praeanaux; son bord dorsal apical n'est pas libre et apparaît échancré en vue dorsale; son bord ventral apical est subrectiligne. Plaque supra-vaginale large, obtuse et saillante à son extrémité. Ecaille vulvaire de taille moyenne, avec le lobe central plus long et plus large que les lobes latéraux.

En l'absence de ♂, il me paraît impossible de classer cette espèce dans un des groupes existant du genre *Limnophilus*. Sans doute se place-t-elle dans le voisinage des groupes d'*affinis*, *incisus* ou d'*asiaticus*.

Holotype ♀: Inde, Pauri Garhwal, Phurunda, 15.000 ft. 24-VI-1958 (C. N. C. No. 8899).

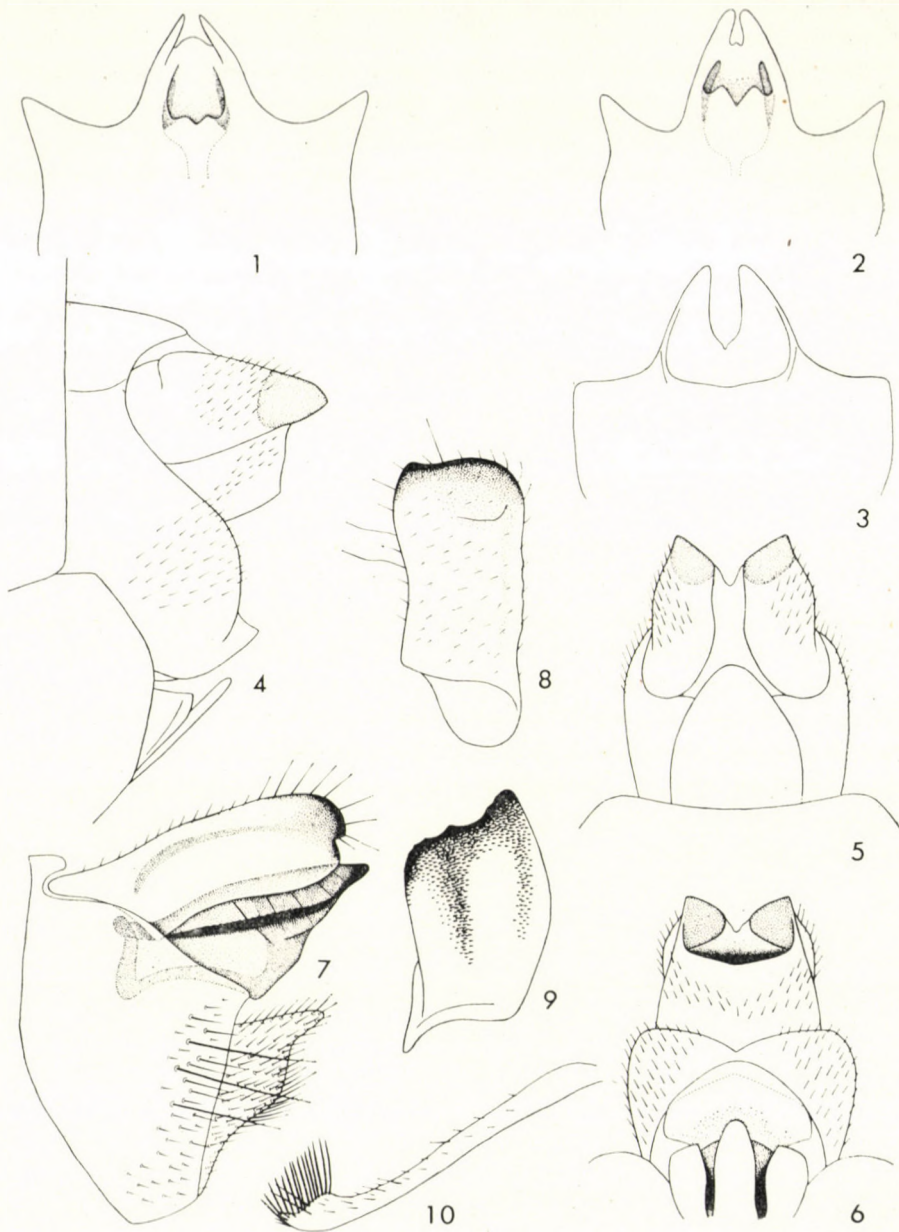


Fig. 1—3. Pièce tubulaire de la ♀ de *Linnophilus fuscovittatus* MATS. 1 = spécimen des Kouriles 2 = spécimen du Japon, 3 = spécimen du Sikkim. — Fig. 4—6. Armature génitale de la ♀ de *Linnophilus tibeticus* sp. n., vue de profil, 5 = vue de dessus, 6 = vue de dessous. — Fig. 7—10. Armature génitale du ♂ de *Asynarchus tibeticus* sp. n. 7 = vue de profil, 8 = appendice supérieur, vue interne, 9 = appendice intermédiaire, vue de dessus, 10 = paramère, vue de profil

*Asynarchus tibetanus* sp. n.

Je n'ai devant moi que quelques débris appartenant sans doute à trois individus et trouvés à demi-pourris sous les plaques de végétation recouvrant les pierres, au bord d'un lac glaciaire peu profond.

Téguments du corps très noirs. Nervures des ailes antérieures fines et bicolores. *R1* assez fortement courbé au niveau du ptérostigma; cellule discoïdale très large et deux fois plus longue que son pétiole; anastomose peu brisée et assez régulièrement arquée contre le corps; *f1* très large à sa base; *f5* pointue. Aux ailes postérieures, cellule discoïdale très grande et anastomose assez fortement brisée. La coloration des ailes antérieures est caractéristique du genre *Asynarchus*. La membrane est brune et porte de petites macules claires irrégulièrement réparties; certaines zones de l'aile sont assez unies alors que d'autres sont fortement granulées. Ptérostigma assez foncé. Il y a de grandes taches claires à la base des cellules apicales 4, 5 et 6, à l'apex de la cellule apicale 7 et de part et d'autre de la nervure médiane, avant ses bifurcations. Longueur de l'aile antérieure 14—15 mm.

Génitalia ♂ (Fig. 7—10): j'ai vu les génitalia de deux spécimens seulement, dont la plupart des pièces se sont détachées du IX<sup>me</sup> segment. Il n'est donc pas certain que la figure 7 montre l'armature génitale en exacte vue de profil, comme elle le paraît. Toutes les pièces sont très noires. Appendices supérieurs allongés, régulièrement concaves et inermes. Appendices intermédiaires grands, forts et épais, accolés l'un à l'autre sur la ligne médiane, très larges et formant deux grandes concavités à fond granulé, tournées vers le haut et l'extérieur. Appareil phallique long et grêle. Aedéage sans particularité, alors que les paramères sont armés d'une rangée de fortes épines apicales précédées par de plus courtes épines, mêlées de soies. ♀ inconnue.

Holotype ♂ et 2 ♂♂ paratypes: Sikkim, Goma Sechen, 16.730 ft. 3-VI-1959 (C. N. C. No. 8900)

*Asynarchus tibetanus* est certainement voisin de *Anabolia oculata* MART. du Tibet oriental, que je transporte ici dans le genre *Asynarchus*. A vrai dire, il est difficile de classer ces deux espèces de façon satisfaisante. Leur coloration les range sans conteste parmi les *Asynarchus* tandis que leurs genitalia sont ceux d'*Anabolia* peu orthodoxes. Évaluer l'importance relative des caractères à disposition et classer les espèces selon les plus importants serait une façon de faire, mais elle ne m'apparaît pas valide, parce que statistique. Le seul moyen d'assigner une place à ces espèces serait de considérer la phylogénie des genres *Asynarchus* et *Anabolia*, c'est-à-dire la façon dont ces derniers se sont différenciés de leurs ancêtres et dans quel ordre leurs espèces sont apparues. Peut-être trouverions-nous alors un stade de développement auquel correspondent les deux formes en question. Malheureusement, la chose est impossible à réaliser dans le cas qui nous occupe ici. La plupart des genres limnophilines ne montrent



pas de stades de développement graduels, mais sont très homogènes, leurs espèces représentant des variations sur un thème commun.

Si je classe *tibetanus* et *ocultus* avec les *Asynarchus* c'est sur la base de leur coloration qui, si elle ne constitue pas l'ensemble des caractères les plus importantes, est du moins la particularité la plus appante.

### Zoogéographie

Si la faune et la flore des basses altitudes de l'Himalaya sont typiquement orientales, il est bien connu que celles des moyennes et hautes altitudes sont franchement paléarctiques. Ceci est le cas pour quantités de groupes des deux règnes. Je ne citerai en exemple que ce passage des «Himalayan Journals» de HOOKER qui se rapporte à la flore des environs de Lachen, au Sikkim central et cité par GAMMIN (1894): «At first sight, it appears incredible that such a limited area, buried in the depths of the Himalayas, should present nearly all the types of the flora of the north temperate zone; not only, however, is this the case, but place is also found for the intercalation of types of the Malayan flora». Les naturalistes s'accordent donc pour situer la limite de la zone paléarctique dans le cœur de la chaîne, quelque part en-dessous de la zone tempérée froide, à ce que je puis imaginer.

Or, dans le cadre de la faune trichoptérologique de l'Himalaya de l'Inde, une telle limite est inexistante et les seules discontinuités que l'on y constate, lorsque l'on s'élève des basses aux hautes altitudes, sont celles du remplacement de lignées orientales par d'autres lignées, plus monticoles, mais d'origine également orientale. Ce n'est que sur le Plateau tibétain ou aux abords immédiats de celui-ci, dans les hautes vallées où la topographie apparaît au voyageur comme une prémonition de celle du Tibet, que l'on commence à rencontrer des espèces d'affinité paléarctique et, à ma connaissance, celles-ci appartiennent toutes à la sous-famille des Limnophilines. *Phurunda* et *Goma Sechen*, localités dont il est question plus haut, peuvent être situées aux confins du plateau tibétain, alors que *Dongkung* se trouve déjà sur ce dernier. Mais il apparaît certain que les trois espèces décrites ici vivent principalement sur le Plateau tibétain — d'où le nom de mes deux nouvelles espèces — et que les localités où je les ai récoltées se trouvent en bordure méridionale de leur aréal. *L. tibeticus* et *As. tibetanus* ont été trouvés en juin, sous les pierres, à l'état de cadavres d'insectes qui certainement volaient durant la fin de la saison de l'année précédente, en septembre ou en octobre. Ce sont donc des espèces tardives, comme le sont tant d'autres Limnophilines en Europe. Le seul exemplaire de *L. subfuscus*, capturé à fin juin, pourrait être un individu du début de la saison de vol, qui aurait lieu en juillet et août. A cause de leur éloignement et de leur climat, je n'ai pas visité les abords du Plateau tibétain tard en automne, mais bien certains hauts massifs du centre de l'Himalaya, où j'ai constaté l'absence

de Limnophilines, non seulement en automne, mais aussi au printemps et en été. Ceci indique que la présence de Limnophilines dans l'Himalaya central n'est pas conditionnée par l'altitude seulement, mais aussi par la situation de cette dernière.

Pour les Trichoptères de l'Himalaya de l'Inde, les limites de la zone paléarctique ne se situent donc pas à l'intérieur de la chaîne, mais au Nord de celle-ci.

Pour l'Himalaya du Pakistan, la situation est un peu différente. La faune trichoptérologique de ce dernier est maintenant assez bien connue par mes explorations de 1953 et 1954, mais mon analyse de celle-la devra être révisée (SCHMID 1958, p. 217). En effet, je ne connaissais alors rien de la faune de l'Inde et je n'ai pu que me livrer à des comparaisons statistiques avec les espèces des pays avoisinants. Depuis, j'attribue une origine orientale à certaines lignées que j'ai eu qualifiées d'angariennes et de touraniennes, tels, *Rhyacophila* groupe de *obscura*, *Glossosoma dentatum* McL., *Agapetus* groupe de *kirghizorum*, etc. et l'origine de certaines espèces, comme *Psychomyia usitata* McL. et *Hydropsyche kaznakovi* MART. m'apparaît plus indéterminable que jamais.

Néanmoins, ne retenant que les espèces de caractère paléarctique certain, il se trouve que *Hydroptila angulata* Mos., *Oxyethira falcata* MORT., *Limnophilus kaumarajiva* SCHM. et *incisus* CURT., ce dernier à l'état de relique glaciaire boréo-alpine, sont présentes dans l'Himalaya du Pakistan. *Hydroptila maclachlani* KLAP., *Oxyethira falcata* MORT., *Philarctus przewalskii* McL., *Micropterna indica* Mos., *Psilopterna eukratida* SCHM. et *Mesophylax aspersus* RAMB. vivent dans les montagnes situées immédiatement au Nord de cette chaîne, Karakoram, Indou-Kouch et Pamir.

Au Pakistan septentrional, quoique en faible proportion, les espèces paléarctiques sont donc nettement plus nombreuses que dans l'Himalaya de l'Inde et elles s'avancent jusque dans les basses altitudes du versant méridional de l'Himalaya. L'importance de cette «injection» à partir du Nord de formes paléarctiques dans la Province de la Frontière du Nord-Ouest et dans la principauté de Cachemire et Jammou est sans doute due à la continuité tectonique entre l'Himalaya et les Tien-Shan par le Pamir, continuité absente au Nord du Tibet. Cette situation est du reste générale en Zoologie et en Botanique. La présence de l'*Ibex* de Sibérie dans l'Himalaya du Pakistan en est un bon exemple.

S'il est nécessaire, pour les études zoogéographiques, de tenir compte de l'existence des zones paléarctique et orientale c'est que ces entités sont assez fortes pour s'imposer d'elles-mêmes aux zoogéographes. Mais il n'en est pas de même des limites de ces zones qui sont imprécises, varient considérablement selon les groupes et présentent un caractère fortement subjectif. Mais, puisque la nature ne peut être pensée que si elle est conceptualisée, poussons le jeu jusqu'à essayer de situer, sur des bases trichoptérologiques seulement, la limite de la zone paléarctique en Asie centrale. Pour cela, il nous faut analyser et imaginer la composition de la faune du Plateau tibétain. Celle-ci nous est

vaguement connue par quelques éléments épars dans l'oeuvre de MARTYNOV et résumés par ce dernier (1930, p. 110). Mais nous aurons soin d'éliminer les citations de la vallée de Chumbi (Yatung), politiquement tibétaine, mais située sur le versant méridional de l'Himalaya. J'ajouterai à ces données mes connaissances, encore inédites, de la faune des abords du Plateau tibétain. La faune de ce dernier m'apparaît composée de nombreux *Rhyacophila* des groupes de *obscura*, *naviculata* et *hingstoni*, d'*Himalopsyche*, de *Lipoglossa*, de *Dolophilodes*, peut-être de quelques *Stenopsyche*, d'Arctopsychides, surtout de nombreux *Pseudostenophylax* et de quelques Lépidostomes, tous éléments orientaux. Quelques *Hydropsyche* et *Apatania* torrenticoles et limnicoles et *Brachycentrus kozlovi* MART. sont certainement présents mais d'origine ambiguë. Les seuls éléments paléarctiques que je puisse citer sont peut-être *Oxyethira falcata* MORT. au Tibet occidental et un certain nombre de Limnophilines, en plus des trois décrites ci-dessus, *Limnophilus*, *Asynarchus*, *Philarctus*, *Anabolia*, *Anabolioides*, quelques Phryganéides et peut-être *Micropterna* et *Psilopterna*, formes que j'imagine prédominer dans les lacs et marais d'eau douce des Chang Tang. J'évaluerai la composition de la faune de ce pays à 2/3 d'éléments orientaux ou d'origine non encore déterminable et 1/3 de formes paléarctiques.

La faune des Trichoptères du Tibet montrant une prédominance de lignées orientales, je n'hésiterai pas à placer la limite sud de la zone paléarctique en bordure méridionale des arcs montagneux du Nord du Plateau, Nan Shan et Kouen Lun. Mais toute la partie nord-orientale du pays, les marais du Tsaidam et du Kuku Nor, de même que la région de Kham, me paraissent devoir être incluses dans la région paléarctique. Plus à l'Ouest, la limite se place sûrement en bordure méridionale du Pamir. La faune des Tien Shan est surtout paléarctique et du même type que celle de l'Elbourz, par l'abondance relative des éléments orientaux.

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IDENTIFICATION KEY TO THE LEECH  
(HIRUDINOIDEA) GENERA OF THE WORLD,  
WITH A CATALOGUE OF THE SPECIES. III.  
FAMILY: ERPOBDELLIDAE

By

Á. Soós

ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST  
(DIRECTOR: DR. Z. KASZAB)

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**I. Introduction**

In the present part of the series of communications, commenced in the preceding two volumes of this periodical (**11**, p. 417-463; **12**, p. 145-160), I propose to discuss the family Erpobdellidae. Although there belongs, on the basis of my investigations and the summarising of the relevant literature data, no more than 17 genera into this family, the construction of the key of identification for these taxa and the compiling of the respective catalogue caused graver difficulties than was expected, and I have to point out already in this place that both shall have to undergo further modifications, supplementary remarks, and amendments in the future.

Thus, already at the delineation of the identification key, severe obstacles and uncertainties were encountered in the circumstances, that, whereas the species of a number of genera might be considered as rather well-known, there are hardly any information available on those of certain other genera, indeed, the anatomical construction and organisation of not a few species are still entirely unknown. Due to these considerations, I had used, in the key given below, and as far as possible, primarily the external morphological characteristics of the available distinguishing features, even in cases where it is known that they vary within the genus or even intraspecifically (e.g. eyes, annulation, annular distance between genital pori). Immediately thereafter, however, I attempted, in the light of our present knowledge, to enumerate features — and as many as possible — which would assist in the correct and exact recognition of the genus. When using the key therefore, the entire thesis and antithesis should in every case be “read” onto the specimen to be identified, and to decide only then on the necessity of further proceedings.

After these preliminary remarks, the following observations have to be made with respect to certain genera:

\*1. The species *esmonti* GRIMM of the monotypical genus *Archaeobdella* GRIMM is rather well-known since LUKIN's investigations (1962), even though several of its more important features are still not entirely established. Thus we do not know the complete annulation of the body, being informed only so far that it consists of 90—95 rings, hence of much less than in the nearly related genus *Dina*. LUKIN considers that the complete somite is 5-annulated, emphasizing (1962, p. 173) that "one of the rings (obviously the central one) is longer than the other ones of the somite", and then goes on to state that "in other words, with respect to the segmental annulation of *A. esmonti*, it might stand near to the subgenus *Dina* of the genus *Herpobdella*". This would imply that it is not the central ring,  $a_2$ , which is longer, but  $b_6$ , being either undivided or divided ( $c_{11} + c_{12}$ ). Accordingly, the entire somite is 5- or 6-annulate. It is to be regretted that LUKIN did not publish, in the figure (Fig. 112) depicting the place of the genital pori, the complete somite, because one would think, at the first glance, that the complete somite is merely 4- or 5-annulate. The fresh-water forms of the species had hitherto not been studied with any thoroughness, and what we know, from STSHEGOLEV's work (1949), is that they are smaller (20 mm) than those living in salt-water. — However, the genus *Archaeobdella* can, even without a painstaking study of the annulation, be safely recognized by its rudimentary, thin, lamelliform posterior sucker, and the characteristic configuration of the body extremities.

2. I gave a detailed account of the genus *Barbronia* JOHANSSON already in my previous paper (1966, p. 146, 149), and remarked that it be reallocated to the family Erpobdellidae, as was already done by MANN in 1961. Since I quite agree with MANN's statements, I shall again discuss the genus in this place, listing it both in the key and the catalogue, completing them with some of SCIACCHITANO's communications with reference to new data on the distribution of the species which had at that time escaped my attention.

3. There is hardly anything known of the anatomical structure of the generally montane *Blanchardiella* WEBER, of very characteristic habits and geographical distribution. I had no occasion as yet to study any one of the species, hence I had to rely merely on the data of WEBER (1913, 1915), DEQUAL (1916, 1917), AUGENER (1930), and RINGUELET (1961), which refer purely to external morphological characters. — Some remarks should, however, be made on nomenclatorial problems concerning the name of the genus. According to the rules of nomenclature namely, the name given originally by WEBER cannot be emended or changed, if validly given. In 1917, WEBER changed, on the advice of BLANCHARD, the generic name *Blanchardiella* into *Blanchardibdella*, since, according to BLANCHARD, MONIEZ's name *Blanchardella*

\* This and the following numbers agree with the serial number of the genus within the catalogue of species.

(established for a Cestod genus) and WEBER's *Blanchardiella* are highly similar. At the same time, BLANCHARD himself (1917) changed the name *Blanchardiella* WEBER, 1913, into *Bibula* BLANCHARD, 1917, writing (1917, p. 646) no more than "*Bibula* R. BL., nomen novum (nomen prope romain) = *Blanchardiella* WEBER 1913 (non *Blanchardella* MONIEZ, 1895, Cestode du Saumon)". In 1930, AUGENER used, respectively accepted, WEBER's second name, *Blanchardibdella*, while RINGUELET, in 1961, that of *Bibula*. According to the rules of nomenclature, "Even if the difference between two genus-group names is due to only one letter, these two names are not to be considered homonyms" [XII, Article 56 (a)]. Hence I use WEBER's 1913 name.

4. The type-species of the genus *Cylicobdella* GRUBE is well-known since RINGUELET's detailed redescription (1944). MOORE's (1944) and RINGUELET's (1948) treatises had clarified also the nomenclatorial problems concerning the use of the valid generic name (*Liostomum* versus *Cylicobdella*). RINGUELET, in his paper cited above, listed three further species of the genus among the species dubiae. The "bona species"-status of these taxa will be decided upon in future treatises; I listed them in my catalogue among the good species, since they can more or less be distinguished from one another. Otherwise the genus *Cylicobdella*, highly resembling the *Semiscollex* species in external morphology and habits, can be easily distinguished, by its characteristic genital organs, from every other genus of the family.

5. There is a drawn-out dispute also about the distinctness of the generic rank of the genus *Dina* BLANCHARD. Although the majority of authors tend to accept it, there are still students who regard it as but a subgenus of the genus *Erpobdella*. I have already stated my views in this respect in an earlier paper (1963). I merely remark here that I still consider it as a distinct genus, but also find it necessary to distinguish two subgenera within the genus, namely *Dina* s. str., and *Mooreobdella* (PAWLOWSKI, 1955). Into the former subgenus belong all those species in which the vasa deferentia form a preatrial loop extending anteriorad to the XI ganglion, whereas the vasa deferentia of the latter fail to produce the preatrial loop. Into the subgenus *Dina* s. str. belong all European species, and, of the North American ones, *anocolata* MOORE, *dubia* MOORE & MEYER, *lateralis* (VERRILL), and *parva* MOORE, whereas the species *bucera* MOORE, *fervida* (VERRILL), and *microstoma* (MOORE) are to be assigned to the subgenus *Mooreobdella*. Among the species inquirendae are to be placed, besides *aethiopica* SCIACCHITANO, also the species *sinica* OKA, not only because — in want of informations concerning its internal anatomy — we cannot establish whether it has a preatrial loop or not, but also because, by the arrangement of the characteristic hirudinid pair of eyes, it stands out rather sharply not only from the genus *Dina* but also from the entire family Erpobdellidae. Finally, I should like to note that MOORE (1959) lists the subgenus *Mooreobdella* as a distinct genus.

6. The monotypical genus *Dineta* GODDARD was based on a single specimen by GODDARD. Since then, nobody had seen or collected the species. Even GODDARD's type-specimen is probably lost, since it appears from his description that he had dissected it. Hence it is impossible to discuss, interesting also from a phylogenetical point of view, what the "peculiar proboscis-like outgrowth from the oesophagus or from the base of the pharynx" (p. 364) might be.

7. The literature of the family is by far the richest with respect to the genus *Erpobdella* DE BLAINVILLE (= *Herpobdella* AGASSIZ). The many hundreds, or possibly thousands, of mainly faunistical, ecological, and hydrobiological papers caused such a chaos in the systematical interpretation of the species, and especially with regard to the infraspecific categories, that there is hardly any hope of an intelligent orientation. I have attempted to master, and put some semblance of an order into, this huge material, at least in what was available to me. By no means do I state that I was wholly successful in this task, but maybe the necessary foundation for classification had still been established. Obviously, I could list but a fragment of the enormous amount of literature data in the catalogue, and probably not always the most important ones, — although I attempted to retain only those, as was done also in my preceding papers, which contain something new for the systematics, taxonomy, anatomy, distribution, or published figures of the species. Considering the aims of the present catalogue, I could obviously not discuss every country in the case of widely ranging Palaearctic species.

8. The establishment in 1962 of the genus *Fadejewobdella* by LUKIN had greatly contributed to the homogeneity of the genus *Trocheta*, since the type-species, *quinqueannulata* LUKIN, was hitherto a constant exception, due to its many external morphological and anatomical peculiarities, with respect to the other species in the genus *Trocheta*. With its definite *Trocheta*-habits and characteristics, the species seems to be a connecting form between the species of the genera *Dina*, *Erpobdella*, and *Trocheta*. Indubitably, besides its complete 5-annulate somite, it very justifiably represents a distinct genus by the twice coiled apex of the atrial cornua, the vas deferens without a preatrial loop, and the peculiar configuration of the caudal section of the ovisac.

9. The single species of the genus *Hypsobdella* WEBER, highly similar in construction, habits, and distribution to the *Blanchardiella* species, is very imperfectly known. There is only the single type-specimen known, whose inner anatomy had not been studied. From *Blanchardiella*, indubitably its nearest ally, it differs primarily by the number of ocelli-pairs and the flattened body.

10. Within the family Erpobdellidae, it is only in the genus *Lumbri-cobdella* KENNEL that the number of annuli per complete somite is unknown in the respective species. This is an extremely rare case in Hirudinology today.



KENNEL did not discuss the annulation of the type-species, *schaefferi*, and writes only "262 Körperringel, auf der Ventralseite gezählt" (1886, p. 62). In view of the contemporary state of information with regard to the annulation of the leeches, one cannot be surprised at this. It is the more astonishing, however, what DEQUAL writes (p. 15) in 1917 on the number of annuli with respect to the other known species of the genus: "Somiti: lo studio dei somiti in questa specie è molto interessante: essendo ben visibili le aperture dei nefridi e le papille, ho potuto riconoscerne i limiti precisi:", and this is as follows: I—III: 1, IV: 2, V: 3, VI: 4, VII—XII: 5, XIII: 7, XIV: 8, XV: 10, XVI: 10 or 11, XVII: 11 or 12, XVIII: 12, XIX: 13, XX: 16, XXI—XXII: 13, XXIII: 10, XXIV: 7, XXV—XXVI: 4. This annulation is indeed very interesting, but there is simply no leech whose complete somites would vary to this extent. DEQUAL's analysis of the annuli must obviously be erroneous. Unfortunately, the two species had not been studied since their authors described them, nor have they been collected since. I, too, was unable to obtain for study a specimen of either taxon. In any case, they must be extremely specialized forms, living entirely like earthworms, and either having completely lost their posterior sucker (*schaefferi*), or retaining it as a mere rudiment (*chamensis*).

11. With the exception of *africana* MOORE, the three other species of the genus *Mimobdella* BLANCHARD are less known. It is especially the number of annuli per complete somite which have not been clarified, varying as they are, according to the several analyses made hitherto, between 7 and 10. Unfortunately, no anatomic studies have been made, and there are known merely one, or at most two, specimens of all four species.

12. The genus *Nematobdella* KABURAKI had been drawn in by MOORE in 1927 to the genus *Herpobdelloidea* KABURAKI, 1921. Although MOORE himself had stated already in 1939 that his synonymization was erroneous, since the *Herpobdelloidea* and *Nematobdella* species are generically different, it is generally listed in later literature, thus also in CABALLERO's generic lists (1956, 1960), as a junior synonym of the genus *Herpobdelloidea*. The almost complete disappearance of the genus *Nematobdella* was further promoted by the circumstance that *Herpobdelloidea laterocolata* KABURAKI, the single known species of the genus, was in the meantime assumed to be identical with *Salifa perspicax*, described by BLANCHARD in 1897. I was able to ascertain, in studying the two latter species (unfortunately I had no occasion to dissect *H. laterocolata*, thus its internal anatomy remains still unknown), that *Herpobdelloidea laterocolata* completely agrees with *Salifa perspicax* on the basis of their external morphological characters, hence the former is indeed a synonym of the latter.

13. The genus, causing the least systematical troubles in the family, is the monotypical *Nephelopsis* VERRILL. Although its author, VERRILL,

named its type-species *obscura* in 1872, it became very clear, since MOORE described its structural features (1912), that the genus is sharply distinct, by reason of the characteristic, once coiled atrial cornua, and the longer and divided state ( $c_{11} + c_{12}$ ) of the last annuli ( $b_6$ ) of the complete somites, from the nearly related and also fresh-water *Dina* and *Erpobdella* species.

14. The also monotypical genus *Odontobdella* was based by OKA on the species *blanchardi* OKA, removed from the genus *Scaptobdella* of an uncertain systematical value. His interpretation proved to be correct, since the genus is satisfactorily delimitable, due to its 9-annulate complete somites and 3 pairs of pharyngeal stylets, from its nearest ally, the genus *Trocheta*.

15. The correct inclusion into the key of the three species of the genus *Orobdella* OKA was rather problematic, because no one, since OKA's detailed description (1895), had nearer investigated these species, and thus it is not known whether the annulation of the complete somites of the several taxa really agrees with OKA's descriptions and figures. Certain features of the three species are divergent from each other to such mathematically exact and expressible differences as are almost never to be found in nature. I had occasion, in the Berlin Museum, to study only the species *O. ijimai* OKA, and found that its complete somites are truly composed of 6 nearly equally long rings. In how far the annulation of the two other species conforms with this pattern, I was unable to find out. This is the reason why there are three ways in the key to arrive at the genus *Orobdella*.

16. One of the most disputed genus in the family is *Salifa* BLANCHARD (nec JOHANSSON). I waive here the discussion concerning the involved nomenclatorial problems deriving from the confusion of the type-species, *S. perspicax* BLANCHARD, with the species *Trematobdella perspicax* JOHANSSON, since it is available to everyone in the detailed analyses of MOORE (1939) and MEYER (1951). Aside of its 5-annulate complete somites, the genus can safely be distinguished, by three pairs of pharyngeal stylets, lateral accessory pairs of eyes, and the number of testicular sacs, from all other genera of the family.

17. The species of the genus *Trocheta* DUTROCHET can, despite the variation between 6 and 11 annuli of the typically 8-annulated complete somites, invariably be safely distinguished, besides their size by the absence of the pharyngeal stylets, the 4 pairs of eyes (though their numbers and arrangement are highly varying), the presence of the preatrial loop of the vas deferens, and the single coil of the atrial cornua, from the nearly related genera *Odontobdella*, *Fadejewobdella*, and *Orobdella*.

The description of the two other genera of the family, namely *Hylacobdella* SCIACCHITANO, 1935, and *Pinacobdella* DIESING, 1850, is so short, respectively containing no more than generalities, that, pending a thorough investigation by some worker in a situation to do so, I list them among the genera inquirendae.

In recent times, MANN (1961) reallocated the genus *Ornithobdella* BENHAM, 1909, from the family Hirudinidae to the family Erpobdellidae. Having had no occasion to study this animal, and since no recent, meritorious paper had been published since BENHAM's rather detailed description, I am unable to take a decisive stand in this problem. I had not included the genus in the key and the catalogue, because, on the basis of BENHAM's description (the arrangement of the 5 pairs of eyes as well as the teethless jaws and the presence of the intestinal caeca), one still feels convinced that it belongs to the family Hirudinidae.

As is to be seen from the above short survey, a knowledge and the establishment of the specific anatomy and complete annulation of the following genera were, for the sake of a more correct classification and delimitation of the genera of the family, the most important: *Archaeobdella* GRIMM, *Blanchardiella* WEBER, *Dineta* GODDARD, *Hypsobdella* WEBER, *Lumbricobdella* KENNEL, *Mimobdella* BLANCHARD, *Nematobdella* KABURAKI, and *Orobdella* OKA. A thorough investigation of these taxa would advance to a considerable extent the systematics of the family Erpobdellidae.

## II. Identification Key of the Genera of the World\*

- 1 (16) Complete somite consisting of 5, and quite exceptionally only of 4 (*Orobdella whitmani* OKA), approximately equally long rings; if, very seldom (*Dineta* GODDARD), last, fifth ( $b_6$ ) ring longer than preceding four, then ring  $b_6$  without even traces of tertiary furrows.
  - 2 (3) Complete somite 4-annulate, but "the 3rd and the last rings present peculiarities, in so far as the former is divided on the dorsal surface by a furrow into two unequal parts, and the latter is distinct only on the dorsal side" (OKA, 1895, p. 283). One pair of eyes on ring 2, a pair of small pigment dots, representing rudimentary eyes, on ring 4. Gonopores separated by 4 rings. Length: 80—110 mm (*O. whitmani* OKA). Terrestrial (cf. No. 31)
15. *Orobdella* OKA, 1895 (partim)
- 3 (2) Complete somites 5-annulate.
  - 4 (5) Eyes absent. Number of complete somites 16 (IX—XXIV). No pseudognaths and postcaeca. Testes situated per somites, their numbers varying between 10 and 14 pairs, with also incomplete pairs, that is, some absent from one side of body. Vasa deferentia first advancing far anteriorad, then curving posteriorad in somite XII, describing an extensive loop with epididymes. Apex of atrial cornua twice coiled. Ovisac thin, long, tubiform, extending posteriorad to somite XVI,

\* Before using the key, it were advisable to peruse at least the second paragraph of the Introduction.

no recognizably differentiated oviduct and vagina. Both dorsal and ventral sides of living animal vivid carmine-maroon reddish (Venetian red), only saddle conspicuous by its dark maroon color. Length: 70–100 mm. Terrestrial. — Type-species *Centropygos joseensis* GRUBE & ØRSTED, 1859. 5 species known. Central and South America

#### 4. *Cylicobdella* GRUBE, 1871

- 5 (4) Eyes invariably present, usually 4 (3–6) pairs.
- 6 (9) 4 pairs of eyes, situated characteristically of family, namely, 2 pairs of labial eyes on II (external pair occasionally shifted to III), and 2 pairs of buccal eyes on buccal ring, either on IV or on V. Lateral accessory eyes always absent.
- 7 (8) Species mostly smaller than, or only seldom exceeding (*E. punctata* LEIDY), 70 mm. Genital pores separated mostly by  $2\frac{1}{2}$ –5 rings, exceptionally (*E. punctata* LEIDY) by 2 rings. Atrium deeply cleft, atrial cornua simply curved but not spirally coiled. Vasa deferentia forming long preatrial loops reaching to ganglion XI. Both ovisacs long, slender and double, caudal section not tortuously tangled, and generally 4–5 somites (XIII–XVI or XVII) long. Of a highly varying color or pattern, or entirely patternless and unicolorous. Length: 30–70 mm (*E. punctata* 80–100 mm). Fresh-water species. — Type-species: *Hirudo octoculata* LINNAEUS, 1758. Eight known species and numerous described varieties, apparently of little taxonomic value. Holarctic Region

#### 7. *Erpobdella* DE BLAINVILLE, 1818

- 8 (7) Species larger than 70 mm (immature specimens below 70 mm, with atrium and other portions of genital organs undeveloped). Genital pores separated by two rings. Atrial cornua twice spirally coiled. Both ovisacs double, caudal ends looped and intertwined, only 2 somites (XIII–XIV) long. Basic color brown or dark grey; in median line of dorsal side a light stripe, always conspicuous in juvenile animals, but discernible only at cephalic section of adults. All rings with small, yellowish spots on dorsal side. Length: 80–135 mm. Fresh-water or amphibious forms. — Type-species: *Trocheta quinqueannulata* LUKIN, 1929. Only a single species known. On the southern parts of the European section of the Soviet Union

#### 8. *Fadejewobdella* LUKIN, 1962

- 9 (6) 1–6 pairs of eyes present; if exceptionally 4 pairs of eyes present, then arranged not characteristically of family.
- 10 (11) Three pairs of pharyngeal stylets: two pairs usually of equal, or nearly equal, size, both functional on each jaw, arranged “in tandem” in median plane of dorsal jaw, but somewhat obliquely on paired jaws. In some cases, only anterior stylets appearing to be functional,

posterior one being smaller or held in reserve; occasionally only one present. A single pair of large cephalic eyes on IV, and 6 pairs of lateral accessory eyes on sensory annulus ( $a_2$ ) of somites V to X. Testicles arranged along vas deferens, in a length of  $6-6\frac{1}{2}$  somites (from ganglion XVII to caudal end of somite XXIII). Number of testicular sacs on each side varying from 34 to 42. Length: 10-75 mm. Fresh-water species. — Type-species: *Salifa perspicax* BLANCHARD, 1897. 2 species known. Ethiopian Region, SE Asia

16. *Salifa* BLANCHARD, 1897

- 11 (10) Neither pharyngeal stylets, nor lateral accessory eyes present.  
 12 (13) Last (fifth) ring ( $b_6$ ) of complete somite conspicuously longer than preceding four, but this longer one never divided. Annular formula:  $b_1 + b_2 + a_2 + b_5 + b_6$ , namely  $b_1 = b_2 < a_2 = b_5 < b_6$ . Three pairs of eyes on rings 1, 3, 6. Body cylindrical. Genital pores separated by 5 rings. Length: 25 mm. Fresh-water species. — Type-species: *Dineta cylindrica* GODDARD, 1908. Only a single species known. Australia

6. *Dineta* GODDARD, 1908

- 13 (12) All five rings of complete somite of nearly equal length, last ( $b_6$ ) ring never conspicuously longer than other four. Terrestrial, South American species.  
 14 (15) More than 5 pairs of eyes present: 2 pairs each on rings 3 and 4, 1 pair on ring 7, and, laterally of leftside pair, another one, and 1 pair again on ring 10, that is, a total of 13 eyes present on single known specimen of monotypical genus. Genital pores separated by 3 rings. Ventral side of body flat, dorsal side slightly convex, body conspicuously narrowing toward extremities. Living animal yellowish, with a highly characteristic, black longitudinal stripe in median line of dorsal side. Length: 95 mm. Terrestrial. — Type-species: *Macrobella columbiensis* WEBER, 1913. Only a single species known. Columbia

9. *Hypsobdella* WEBER, 1913

- 15 (14) Mostly 3, exceptionally 4 (*octoculata* WEBER), or 5 (*decemoculata* DEQUAL), pairs of eyes present. Of 3 pairs of eyes, first and second pairs situated mostly on two adjacent rings (usually on rings 3 and 4, respectively on 4 and 5, only exceptionally on 5 and 6); third pair separated from preceding ones by one, or rarely two, eyeless rings. If 4 pairs of eyes present, then situated on rings 3, 4, 5, 7; in case of 5 pairs of eyes, appearing on rings 2, 4, 6, 9, 12. Genital pores separated by 2-3 rings. Body almost cylindrical, only slightly flattened in a dorso-ventral direction. Anterior extremity of body conspicuously tapering. Color generally unicolorous grey, dorsal side invariably darker. Occasionally ornamented with black dots and spots, eventually with a dark longitudinal stripe in median line of dorsal side (*tamboen*).

sis WEBER). Length: 25—105 mm. Terrestrial. — Type-species: *Blanchardiella fuhrmanni* WEBER, 1913. 11 species known. South and Central America

### 3. *Blanchardiella* WEBER, 1913

- 16 (1) Complete somite consisting of more than five rings, if, rarely, division ( $c_{11} + c_{12}$ ) of last ring ( $b_6$ ) not expressed, then apparently 5-annulate, but in this latter case ring  $b_6$  always conspicuously longer than preceding four.
- 17 (20) Posterior sucker rudimental or entirely absent. Eyes absent. Annulation of body unknown or erroneously interpreted.
- 18 (19) Complete somite 6-annulate, occasionally division ( $c_{11} + c_{12}$ ) of ring  $b_6$  indistinct, hence somite apparently only 5-annulate, but then ring  $b_6$  conspicuously longer than preceding four. Both extremities of body compressed, flattened, anterior extremity elongated, probosciform. Posterior extremity even more compact, with a rudimentary, thin, lamelliform sucker. Living specimens dirty whitish in salt-water, but pink or reddish in fresh-water. Atrium deeply cleft, atrial cornua straight, neither curved nor coiled. Length: 20—35 mm. Fresh- and salt-water species. — Type-species: *Archaeobdella esmontii* GRIMM, 1876. Only a single species known. Sea of Azov and Caspian Sea, also in lower reaches of rivers emptying into southern seas of Soviet Union

### 1. *Archaeobdella* GRIMM, 1876

- 19 (18) Number of annuli of complete somite as yet unknown, but surely at least 12. Complete number of annuli of body about 180—262 (cf. remarks under 10. of Introduction). Posterior sucker either entirely absent (*schaefferi* KENNEL), or very rudimentary, hardly discernible (*chamensis* DEQUAL). Body cylindrical, anterior extremity shortly attenuate. Genital pores separated by  $2 - 2\frac{1}{2}$  rings from one another. Living animals brick-red, or light yellowish. Length: 40—175 mm. Terrestrial. — Type-species: *Lumbricobdella schaefferi* KENNEL, 1886. 2 species known. Trinidad, Venezuela

### 10. *Lumbricobdella* KENNEL, 1886

- 20 (17) Posterior sucker well developed. Eyes always present, except for two *Dina* species (*absoloni* JOHANSSON, *anoculata* MOORE).
- 21 (24) Three pairs of pharyngeal stylets present. Complete somite 9- or 6—7-annulate.
- 22 (23) Complete somite 9-annulate. Annular formula:  $c_1 + c_2 + b_2 + a_2 + c_9 + c_{10} + c_{11} + d_{23} + d_{24}$ . Accessory copulatory pores never present. Number of complete somites 14. One pair of eyes (immature animals with occasionally 3 pairs of accessory eyes). Genital pores separated by  $6 - 8\frac{1}{2}$  rings. Length: 80—225 mm. Terrestrial. —

Type-species: *Scaptobdella blanchardi* OKA, 1910. Only a single species known. China, Japan, Taiwan

14. *Odontobdella* OKA, 1923

- 23 (22) Complete somites 6–7-annulate. Occasionally apparently only 5-annulate, but then at least ring  $b_6$ , and usually also  $a_2$ , longer and finely divided. Annular formula:  $b_1 + b_2 + a_2 + b_5 + b_6 (c_{11} + c_{12})$ ,  $b_1 + b_2 + a_2 (b_3 + b_4) + b_5 + b_6 (c_{11} + c_{12})$ . Except for *delicata* MOORE, accessory copulatory pores at X/XI and XIII/XIV. Number of complete somites 15–17. Usually one pair of labial and two pairs of buccal eyes present; some specimens (*delicata* MOORE) occasionally with another pair of labial eyes, as well as lateral accessory eyes on VI to IX. Genital pores separated by  $4\frac{1}{2}$ –5 annuli. Length: 10–35 mm. Fresh-water species. — Type-species: *Barbronia rouxi* JOHANSSON, 1918. 3 species and 1 subspecies known. SE and E Asia, New Caledonia, E and C Africa, ? New Guinea

2. *Barbronia* JOHANSSON, 1918

24 (21) Pharyngeal stylets absent.

25 (30) Complete somites 8–10-annulate.

26 (27) Complete somite (7–) 9–10-annulate. Annular formula:  $b_1 + c_3 + c_4 + a_2 (b_3 + b_4) + d_{17} + d_{18} + c_{10} + c_{11} + c_{12}$ . Sometimes (*afri-cana* MOORE) apparently only 7-annulate ( $c_1 + c_2 + b_2 + a_2 + c_{11} + c_{12}$ ), but also then at least two, or indeed usually all three, of rings  $b_2$ ,  $a_2$ ,  $b_5$  larger and faintly subdivided. 0–1 pair of eyes (immature specimens eventually with 1–2 pairs of accessory eyes). Length: 35–165 mm. Terrestrial or amphibious. — Type-species: *Mimobdella japonica* BLANCHARD, 1897. 4 species known. SE Asia, Japan, E Africa

11. *Mimobdella* BLANCHARD, 1897

27 (26) Complete somite 8-annulate.

28 (29) All 8 rings of complete somite nearly equally long, no conspicuously longer ones present. One pair of eyes. Gonopores separated by 10 rings. One of longest known leeches. Length: 80–270 mm (*O. octonaria* OKA) Terrestrial (cf. No. 31)

15. *Orobdella* OKA, 1895 (partim)

29 (28) Eight rings of complete somite not equally long; somite consisting usually of 2 shorter, 3 longer, and again 3 shorter, rings. Annular formula:  $c_1 + c_2 + b_2 + a_2 + b_5 + c_{11} + d_{23} + d_{24}$ . Also specimens known with complete somite consisting of 11 or merely 6 rings. Generally 4 pairs of eyes (characteristic of family) present, but their numbers and arrangement highly varying. Gonopores separated by 2–8 rings. Vasa deferentia forming long preatrial loops. Atrium deeply cleft, atrial cornua often (but not always!) spirally coiled. Length: 80–220 mm. Amphibious or fresh-water forms. — Type-

species: *Trocheta subviridis* DUTROCHET, 1817. 4 species known. Europe, India, SE Asia

7. *Trocheta* DUTROCHET, 1817

30 (25) Complete somite 6—7-annulate.

31 (32) Complete somite consisting of 6, nearly equally long, rings. Annular formula:  $b_1 + b_2 + b_3 + b_4 + b_5 + b_6$ . One pair of eyes present; no accessory eyes. Gonopores separated by 7 rings. Length: 70—80 mm (*O. ijimai* OKA). Terrestrial (cf. also 2. and 28.). — Type-species: *Orobdella whitmani* OKA, 1895. 3 species known. Japan

15. *Orobdella* OKA, 1895 (partim)

32 (31) Complete somite consisting of 6 or 7, not equally long, rings. Fresh-water forms.

33 (34) One pair of eyes on somite II, and 5 pairs of lateral accessory eyes on sensory rings of somites IV—VIII. Complete somite 6- or 7-annulate. Annular formula:  $b_1 + b_2 + a_2(b_3 + b_4) + b_5 + c_{11} + c_{12}$ . Gonopores separated by 5 (6) rings. Length: 30—45 mm. Fresh-water form. — Type-species: *Nematobdella indica* KABURAKI, 1921. Only a single species known. India

12. *Nematobdella* KABURAKI, 1921

34 (33) No, or 2—4 pairs of, eyes present; lateral accessory eyes always absent. Complete somite 6-annulate. Annular formula:  $b_1 + b_2 + a_2 + b_5 + c_{11} + c_{12}$ . Not infrequently apparently 5-annulate, because division of  $b_6$  not expressed, but then ring  $b_6$  conspicuously longer than other four rings. Gonopores separated by  $2-3\frac{1}{2}$  rings.

35 (36) Atrial cornua once spirally coiled, "like ram's horn". Preatrial loops reaching to ganglion XI. Basic color generally grey or brownish, frequently entire dorsal area densely spotted with black. Spots finely branching and ramifying, with usually anastomosed terminal branches, hence forming a more or less conspicuous and continuous network. Length: 80—120 mm. Fresh-water species. — Type-species: *Nephelopsis obscura* VERRILL, 1872. Only a single species known. N America

13. *Nephelopsis* VERRILL, 1872

36 (35) Atrial cornua simply curved, but not spirally coiled. Vasa deferentia occasionally (subgenus *Dina* s. str.) or not (subgenus *Mooreobdella* PAWLOWSKI) forming long preatrial loops. Length: 10—80 mm. Fresh-water species. — Type-species: *Hirudo lineata* O. F. MÜLLER, 1774. 11 species known. Holarctic Region

5. *Dina* BLANCHARD, 1892



## III. Catalogue of the Species

Familia: ERPOBDELLIDAE

1. Genus: *Archaeobdella* GRIMM, 1876

GRIMM (1876): Trudy Aralo-Kaspisk. Expedit., Pétersbourg, Lief. 2, p. 88.  
 — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, 30, p. 173.  
 Type-species: *Archaeobdella esmontii* GRIMM, 1876

1. *esmonti* GRIMM (1876): Trudy Aralo-Kaspisk. Expedit., Pétersbourg, Lief. 2, p. 88—94. — KOWALEVSKY (1898): C. R. Trav. Soc. Natur. St. Péters., 28, p. 310—314, 332. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, 30, p. 173—177, Figs. 111—113.

Distribution: Sea of Azov, Caspian Sea, lower reaches of rivers emptying in the southern seas of the Soviet Union (Volga, Dnieper, Dniester).

2. Genus: *Barbronia* JOHANSSON, 1918

JOHANSSON (1918): Hirudineen. in SARASIN & ROUX: Nova Caledonia. A. Zoologie, 2, Lief. 4, p. 380—383. — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 135.  
 Type-species: *Barbronia rouxi* JOHANSSON, 1918

1. *delicata* MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, 90, p. 355—356, Pl. 28, Fig. 62. — SCIACCHITANO (1954): Ann. Mus. Congo Belge (4), Zool. 1, p. 282.

Distribution: Lake Tanganyika, Belgian Congo.

2. *rouxi* JOHANSSON (1918): in SARASIN & ROUX: Nova Caledonia. A. Zoologie, 2, Lief. 4, p. 383—390, Figs. 3—5, Pl. XII, Figs. 2—4.

Distribution: New Caledonia, ? New Guinea.

3. *weberi* (BLANCHARD, 1897): Hirudinées. in WEBER: Zool. Ergebn. des Indes Néerlandaises, 4, p. 353—355, Fig. 10 (*Dina*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, 76, p. 368—370, Pl. XXI, Fig. 26 (*Dina*). — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 135—140, Figs. 39—42. — SCIACCHITANO (1960): Libro homenaje al doctor Eduardo Caballero y Caballero 1930—1960, Mexico, No. 24, p. 538.

= ? *hexoculata* (KABURAKI, 1921): Rec. Ind. Mus., 22, p. 703—704, Fig. 3 (*Herpobdella*).

Distribution: Java, Sumatra, Celebes, Borneo, Philippines, India, Afghanistan.

3a. *weberi* subsp. *formosana* (OKA, 1929): Proc. Imp. Acad. Tokyo, 5, p. 277—279, Figs. A—B (*Herpobdella*). — OKA (1930): Proc. Imp. Acad.

Tokyo, **6**, p. 279—281, Figs. A—D (*Herpobdella*). — MOORE (1946): Occ. Pap. Bishop Mus. Honolulu, **18**, p. 174—177, Fig. li.

Distribution: Taiwan, Hawaii, China, Korea.

### 3. Genus: *Blanchardiella* WEBER, 1913

WEBER (1913): Mém. Soc. neuchât. Sci. Nat., **5**, p. 738—739. — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 116—117. — DEQUAL (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31**, No. 717, p. 10. — BLANCHARD (1917): Bull. Soc. Path. Exot., **10**, p. 646 (*Bibula*). — WEBER (1917): Zool. Anz., **48**, p. 122 (*Blanchardibdella*). — AUGENER (1930): Zool. Anz., **90**, p. 310—311 (*Blanchardibdella*). — RINGUELET (1961): Actas Trab. I. Congr. sudamer. Zool. 1959, 2, (3), p. 255—256 (*Bibula*).

#### SYNONYMY:

*Bibula* BLANCHARD (1917): Bull. Soc. Path. Exot., **10**, p. 646.

*Blanchardibdella* WEBER (1917): Zool. Anz., **48**, p. 122.

Type-species: *Blanchardiella fuhrmanni* WEBER, 1913

1. *biolleyi* DEQUAL (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31**, No. 717, p. 13—15, Figs. 14—16.

Distribution: Ecuador, Costa Rica.

2. *bogotaensis* WEBER (1913): Mém. Soc. neuchât. Sci. Nat., **5**, p. 742, Fig. 9. — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchâtel, p. 121—122, Pl. V, Fig. 45.

Distribution: Columbia.

3. *cameliae* WEBER (1913): Mém. Soc. neuchât. Sci. Nat., **5**, p. 740—742, Figs. 7—8. — WEBER (1915): Monographie des Hirudinées Sud-Américaines, Neuchâtel, p. 119—121, Pl. V, Fig. 4.

Distribution: Columbia.

4. *decemocolata* DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32**, No. 724, p. 13—14. — AUGENER (1930): Zool. Anz., **90**, p. 310—311 (*Blanchardibdella*).

Distribution: Costa Rica.

5. *ecuadoriensis* DEQUAL (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31**, No. 717, p. 12—13, Figs. 11—13.

Distribution: Ecuador.

6. *festae* DEQUAL (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31**, No. 717, p. 10—12.

Distribution: Ecuador.

7. **fuhmanni** WEBER (1913): Mém. Soc. neuchat. Sci. Nat., **5**, p. 739—740, Figs. 2—6. — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 117—119, Pl. V, Figs. 42—43.  
Distribution: Columbia.
8. **octocolata** WEBER (1913): Mém. Soc. neuchat. Sci. Nat., **5**, p. 745, Fig. 13. — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 125—126, Pl. V, Fig. 48.  
Distribution: Columbia.
9. **paramoensis** WEBER (1913): Mém. Soc. neuchat. Sci. Nat., **5**, p. 742—744, Figs. 10—11. — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 122—124, Pl. V, Fig. 46.  
Distribution: Columbia.
10. **peruana** (RINGUELET, 1961): Actas Trab. I. Congr. sudamer. Zool. 1959, **2**, (3), p. 253—255 (*Bibula*).  
Distribution: Peru.
11. **tamboensis** WEBER (1913): Mém. Soc. neuchat. Sci. Nat., **5**, p. 744, Fig. 12. — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 124—125, Pl. V, Fig. 47.  
Distribution: Columbia.

#### 4. Genus: *Cylicobdella* GRUBE, 1871

GRUBE (1871): Arch. f. Naturg., **37**, p. 101. — GRUBE & ÖRSTED (1859): Vidensk. Medd. naturf. For. Kjobenhavn, **1858**, p. 115 (*Centropygos*). — BLANCHARD (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11**, No. 263, p. 17—20 (*Liostomum* BLANCHARD nec WAGLER). — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 101—103, 107—108. — RINGUELET (1944): Rev. Mus. La Plata, N. S. **4**, Zool. No. 25, p. 55. — MOORE (1944): Ann. Mag. Nat. Hist., (11) **11**, p. 407—408 (*Liostomum* MOORE, nec WAGLER). — NONATO (1946): Bol. Fac. Fil. Cienc. Letr., Zool., **11**, p. 288—293 (*Liostoma* NONATO nec WAGLER). — RINGUELET (1948): Not. Mus. La Plata, **13**, Zool. No. 109, p. 185—190.

#### SYNONYMY:

*Centropygos* GRUBE & ÖRSTED (1859): Vidensk. Medd. naturf. For. Kjobenhavn, **1858**, p. 115.  
*Centropygos* GRUBE & ÖRSTED (1859): in WEBER (1913): Mém. Soc. neuchat. Sci. Nat., **5**, p. 737. — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 101. — DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32**, No. 724, p. 11.  
*Liostomum* BLANCHARD nec WAGLER (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11**, No. 263, p. 17—20.  
*Liostomum* MOORE nec WAGLER (1944): Ann. Mag. Nat. Hist., (11) **11**, p. 407—408.

Type-species: *Centropygos joseensis* GRUBE & ÖRSTED, 1859

1. **aurantiaca** DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32**, No. 724, p. 12—13 (*Centropygus*). — RINGUELET (1944): Rev. Mus. La Plata, N. S. **4**, Zool. No. 25, p. 61.

Distribution: Paraguay

2. **coccinea** KENNEL (1886): Zool. Jahrb. Syst., **2**, p. 62, Pl. III, Figs. 1—2, 5—7, 14—16, 19—20, Pl. IV, Figs. 22—23, 30—32. — WEBER (1913): Mém. Soc. neuchât. Sci. Nat., **5**, p. 737—738 (*Centropygus*). — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 105—107 (*Centropygus*). — DEQUAL (1916): Boll. Mus. Zool. Anat. comp. Univ. Torino, **31**, No. 717, p. 7—9 (*Centropygus*). — RINGUELET (1944): Rev. Mus. La Plata, N. S. **4**, Zool. No. 25, p. 60—61. — MOORE (1944): Ann. Mag. Nat. Hist., (11) **11**, p. 406—407, Pl. IV, Fig. 7 (*Liostomum*).

Distribution: Trinidad, Ecuador, British Guiana, Columbia, Peru.

3. **costaricae** PLOTNIKOW (1905): Ann. Mus. Zool. Acad. Imp. Sci. St. Pétersbourg, **10**, p. 155—156 (*Centropygos*). — DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32**, No. 724, p. 11—12 (*Centropygus*). — RINGUELET (1944): Rev. Mus. La Plata, N. S. **4**, Zool. No. 25, p. 61.

Distribution: Costa Rica.

4. **intermedia** (NONATO, 1946): Bol. Fac. Fil. Cienc. Letr., Zool., **11**, p. 293—299, Pls. 1—7, Figs. 1—13 (*Liostoma*).

Distribution: Brasilia, Argentine, Uruguay.

5. **joseensis** (GRUBE & ØRSTED, 1859): Vidensk. Medd. naturf. For. Kjobenhavn, **1858**, p. 115 (*Centropygos*). — BLANCHARD (1896): Boll. Mus. Zool. Anat. comp. Univ. Torino, **11**, No. 263, p. 20—22, Figs. 6—9 (*Liostomum*). — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 103—105, Pl. V, Fig. 4 (*Centropygus*). — RINGUELET (1944): Rev. Mus. La Plata, N. S. **3**, Zool. No. 22, p. 201—202. — RINGUELET (1944): Rev. Mus. La Plata, N. S. **4**, Zool. No. 25, p. 56—61, Figs. 27—28.

= *lumbricoides* GRUBE (1871): Arch. f. Naturg., **37**, p. 101—103, Pl. III, Fig. 6.

= *tergestina* BLANCHARD (1892): Bull. Soc. Zool. France, **17**, p. 172, Fig. 5 E (*Nepheleis*).

Distribution: South America.

##### 5. Genus: **Dina** BLANCHARD, 1892

- BLANCHARD (1892): Atti Soc. ligust. Sci. Nat. Geogr., **3**, No. 4, p. 432. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. **5**, p. 125. — HARANT (1929): Arch. Soc. Sci. Médic. Biol. Montpellier, **10**, p. 629—636. — MOORE & MEYER (1951): Wasmann Journ. Biol., **9**, p. 72—73. — MANN

(1952): Proc. Zool. Soc. London, **122**, p. 398. — PAWLOWSKI (1955): Bull. Soc. Sci. Łódź, Cl. III, **6**, No. 3, p. 1—12. — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. **9**, p. 253—257.

## SYNONYMY:

*Mooreobdella* PAWLOWSKI (1955): Bull. Soc. Sci. Łódź, Cl. III, **6**, No. 3, p. 5 (as subgenus of *Erpobdella*).

Type-species: *Hirudo lineata* O. F. MÜLLER, 1774

A. Subgenus: **Dina** s. str.

1. **absoloni** JOHANSSON (1913): Zool. Anz., **42**, p. 80. — MRÁZEK (1913): Zool. Anz., **43**, p. 239—240. — MOORE (1944): Ann. Mag. Nat. Hist., (11) **11**, p. 402—406. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 16, Fig. 53h. — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. **9**, p. 257.  
Distribution: Yugoslavia, Bulgaria.\*
2. **anoculata** MOORE (1898): Proc. U. S. Nat. Mus. Washington, **21**, p. 558—559. — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. **9**, p. 257.  
Distribution: U. S. A.
3. **apathyi** GEDROYĆ (1916): Rozpr. Wiad. Muz. Dzied. Lwów, **2**, p. 82—85, Fig. 23. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polska, Warszawa, **26**, p. 153—154 (*Herpobdella*). — PAWLOWSKI (1936): Ann. Mus. Zool. Polon., **11**, p. 353—355, Fig. 4. — SANDNER (1954): Bull. Soc. Sci. Lettr. Łódź, Cl. III, **5**, No. 3, p. 11—12, Fig. 1 (*Erpobdella*). — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiev, **30**, p. 165—167, Figs. 105—106 (*Herpobdella*). — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. **9**, p. 258.  
Distribution: Poland, Ukraine, Hungary, ? Italy.
4. **dubia** MOORE & MEYER (1951): Wasmann Journ. Biol., **9**, p. 70—72, Pl. IX, Figs. 6—7.  
Distribution: Canada.
5. **lateralis** (VERRILL, 1871): Amer. Journ. Sci. Arts, **2**, p. 451 (*Nephelis*). — VERRILL (1872): Amer. Journ. Sci. Arts, **3**, p. 133—134 (*Nephelis*). — VERRILL (1874): Rep. Commis. Fish and Fisheries 1872/1873, p. 675 (*Nephelis*). — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245**, p. 3, 6—7. — MEYER & MOORE (1954): Wasmann Journ. Biol., **12**, p. 92.  
Distribution: North America.

\* An unpublished datum; found in the material (sent by DR. V. B. GUÉRGUEV, Sofia), collected by V. BESCHKOV and S. ANDREEV in the cave "Dineva pest" near Linci, on 18. Nov., 1965.

6. **lineata** (O. F. MÜLLER, 1774): Vermium terrestrium et fluviatilium. Havniae et Lipsiae, 1, Pars 2, p. 49 (*Hirudo*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, 9, No. 192, p. 60—63, Figs. 23—24. — JOHANSSON (1910): Zool. Anz., 35, p. 706—713, Fig. 1—2. — JOHANSSON (1910): Zool. Anz., 36, p. 379 (*Herpobdella*). — JOHANSSON (1914): SB. mat.-naturw. Cl. Akad. Wiss. Wien, 132, Abt. I, p. 848—851, Figs. 3—4, Pl. Figs. 4—6. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, 26, p. 150—153, Figs. 112—114 (*Herpobdella*). — BENNICKE (1943): Fol. Limnol. Scand., No. 2, p. 88—90 (*Herpobdella*). — MANN (1952): Proc. Zool. Soc. London, 122, p. 399—401, Figs. 7—8, 11—13. — NAGAO (1957): Journ. Fac. Sci. Hokkaido Univ., Ser. VI, Zool., 13, p. 192—196, Figs. 1—7 (*Herpobdella*). — AUTRUM (1958): Hirudinea. in: BROHMER: Die Tierwelt Mitteleuropas, Leipzig, 1, Lief. 7b, p. 15—16, Figs. 52, 54 (*Erpobdella*). — SCIACCHITANO (1958): Monitora Zool. Italiano, 76, No. 1, p. 5—6. — MANN (1959): Proc. Zool. Soc. London, 132, p. 373—374, Fig. 3. — SCIACCHITANO (1960): Libro homenaje al doctor Eduardo Caballero y Caballero 1930—1960, Mexico, No. 24, p. 537—538. — SCIACCHITANO (1961): Bol. Mus. Municipal Funchal, 14, Art. 42, p. 5—6. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiev, 30, p. 162—165, Figs. 101—104 (*Herpobdella*). — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. 9, p. 260.
- = *bistriata* BRANDES (1900): Zeitschr. f. Naturw., 72, 450—451 (*Nepheleis*). — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süßwasserfauna Deutschlands, 13, II, p. 81 (*Herpobdella*).
- = *gallica* BLANCHARD (1892): Bull. Soc. Zool. France, 17, p. 172, Fig. 5 C—D (*Nepheleis*).
- = *grandis* APÁTHY (1888): Mitt. Zool. Stat. Neapel, 3, p. 154 (*Nepheleis*), nomen nudum.
- = *lineata* var. *notata* JOHANSSON (1927): Abh. Senckenb. naturf. Ges., 39, p. 230—231, Fig. 6.
- = *lineata* var. *punctata* JOHANSSON (1927): Abh. Senckenb. naturf. Ges., 39, p. 229—230, Fig. 5.
- = *mexicana* DUCÈS (1876): An. Asoc. Larrey, México, 2, p. 166 (*Nepheleis*). — DUCÈS (1888): La Naturelèse, México, 1, p. 60, Pl. VII (*Nepheleis*).
- = *quadristriata* GRUBE (1850): Die Familie der Anneliden. Berlin, p. 100, 149 (*Nepheleis*). — Blanchard (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, 9, No. 192, p. 60—63, Figs. 23—24.

Distribution: Palaearctic Region.

- 6a. **lineata** subsp. **concolor** (ANNANDALE, 1913): Journ. Asiat. Soc. Bengal, N. S. 9, p. 211—214 (*Herpobdella*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, 76, p. 367—368. — MOORE (1944): Ann. Mag. Nat. Hist., (11) 11, p. 188—189. — MANN (1952): Proc. Zool. Soc. London, 122, p. 400.

= *blaisei* BLANCHARD (1892): Atti Soc. ligust. Sci. Nat. Geogr., 3, No. 4, p. 28.

Distribution: Palestine, Syria.

7. **parva** MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. 5, p. 125—127, Pl. V, Figs. 33—34, Pl. VI, Figs. 41, 43. — MATHERS (1948):

Proc. Iowa Acad. Sci., **55**, p. 415—416. — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. **9**, p. 259.

Distribution: U. S. A.

8. **stschegolewi** (LUKIN & EPSTEIN, 1960): Zool. Journ., **39**, p. 1429—1432, Figs. 1—7 (*Herpobdella*). — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiev, **30**, p. 167—171, Figs. 107—109 (*Herpobdella*). — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. **9**, p. 258.

Distribution: Soviet Union (Crimean Peninsula).

B. Subgenus: **Mooreobdella** (PAWLOWSKI, 1955)

9. **bucera** MOORE (1949): in KENK: Miscell. Publ. Mus. Zool. Univ. Michigan, No. **71**, p. 38. — MOORE (1953): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **250**, p. 9—12, Figs. 2, Pl. I, Fig. 4. — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. **9**, p. 259.

Distribution: U. S. A.

10. **fervida** (VERRILL, 1871): Amer. Journ. Sci. Arts, **2**, p. 451 (*Nephelis*). — VERRILL (1874): Rep. Commis. Fish and Fisheries 1872/1873, p. 676—677 (*Nephelis*). — MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5**, p. 535—537, Pl. XLVII, Fig. 36. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser. **5**, p. 127—128, Pl. VI, Fig. 42. — MATHERS (1948): Proc. Iowa Acad. Sci., **55**, p. 414—415, Pl. III. — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. **9**, p. 260.

Distribution: North America.

11. **microstoma** MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5**, p. 537—542, Pl. XLVII, Fig. 37. — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. **9**, p. 259.

Distribution: U. S. A.

SPECIES INQUIRENDAE:

1. **aethiopica** SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26**, p. 458.

Distribution: Belgian Congo.

2. **sinica** OKA (1925): Annot. Zool. Jap., **10**, p. 327—330, Figs. 1—3. — Soós (1963): Acta Univ. Szegediensis, Acta Biol., N. S. **9**, p. 259.

Distribution: China.

6. Genus: **Dineta** GODDARD, 1908

GODDARD (1908): Proc. Linn. Soc. N. S. Wales, **33**, p. 855.

Type-species: *Dineta cylindrica* GODDARD, 1908.

1. **cylindrica** GODDARD (1908): Proc. Soc. N. S. Wales, **33**, p. 855—865, Pls. XXXII—XXXIII, Figs. 1—9.

Distribution: Australia (New South Wales).

7. Genus: **Erpobdella** DE BLAINVILLE, 1818

DE BLAINVILLE (1818): Hirudinea, in LAMARCK: Histoire naturelle des animaux sans Vertèbres, Paris, **5**, p. 296. — OKEN (1815): Lehrbuch der Naturgeschichte, **3** (2), p. 367 (*Helluo*). — SAVIGNY (1822): Système des Annelides, principale de celles des côtes de l'Égypte et de la Syrie, Paris, p. 117 (*Nephelelis*). — AGASSIZ (1846): Nomaclatoris zoologica, index universalis, Soloduri, p. 179 (*Herpobdella*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9**, No. 192, p. 51—52 (*Herpobdella*). — MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5**, Art. XII, p. 532. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, **26**, p. 150 (*Herpobdella*). — MANN (1952): Proc. Zool. Soc. London, **122**, p. 395—397. — PAWLOWSKI (1955): Bull. Soc. Sci. Łódz, Cl. III, **6**, No. 3, p. 1—12. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 15. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 148—151 (*Herpobdella*).

## SYNONYMY:

*Helluo* OKEN (1815) (nec BONELLI, 1813): Lehrbuch der Naturgeschichte, **3**, (2), p. 367.  
*Herpobdella* AGASSIZ (1846): Nomaclatoris zoologica, index universalis, Soloduri, p. 179.  
*Nephelelis* SAVIGNY (1822): Système des Annelides, principale de celles des côtes de l'Égypte et de Syrie, Paris, p. 117.

Type-species: *Hirudo octoculata* LINNAEUS, 1758.

1. **monostriata** (GEDROYĆ, 1916) PAWLOWSKI (1948): GEDROYĆ (1916): Rozpr. Wiad. Muz. Dzied. Lwów, **2**, p. 95, 98 (*Herpobdella*). — LISKIEWICZ (1927): Arch. f. Naturg., Abt. A, **91**, p. 279 (*Herpobdella*). — LISKIEWICZ (1934): Prace Zakl. Anat. Porówn., Wilno, **8**, p. 29 (*Herpobdella*). — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, **26**, p. 159—160, Fig. 123 (*Herpobdella*). — PAWLOWSKI (1937): Trav. Ass. Limnol. Congr., VIII, **2**, p. 193 (*Herpobdella*). — PAWLOWSKI (1948): Bull. Soc. Sci. Łódz, Sect. III, No. **8**, p. 49—51. — SANDNER (1954): Bull. Soc. Sci. Lettr. Łódz, Cl. III, **5**, No. 3, p. 13—14. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 160—161, Fig. 100 (*Herpobdella*). — SOÓS (1963): Ann. hist.-nat. Mus. Nat. Hung., **55**, p. 288—291, Figs. 3—4, 6—7.

= *atomaria* var. *monostriata* GEDROYĆ (1916): Rozpr. Wiad. Mus. Dzied. Lwów, **2**, p. 95, 98 (*Herpobdella*).

= *octoculata* f. *monostriata* PAWLOWSKI (1937): Trav. Ass. Int. Limnol. Congr. VIII, **2**, p. 193 (*Herpobdella*).

= *octoculata* subsp. *vilnensis* LISKIEWICZ (1927): Arch. f. Naturg., Abt. A, **91**, p. 278 (*Herpobdella*).

= *octoculata* f. *monostriata* PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, **26**, p. 159—160 (*Herpobdella*).

= *vilnensis* LISKIEWICZ (1934): Prace Zakl. Anat. Porówn., Wilno, **8**, p. 30—33, Pl. I, Figs. 19—21, Pl. II, Fig. 38, Pl. III, Figs. 51—55 (*Herpobdella*).

Distribution: Poland, Soviet Union, Hungary, Czechoslovakia, Roumania.



2. **nigricollis** (BRANDES, 1900): Ztschr. f. Naturwiss., **72**, p. 451—452 (*Nephe-  
lis*). — O. F. MÜLLER (1774): Vermium terrestrium et fluviatilum. Havniae et Lipsiae, **1**, Pars 2, p. 40 (*Hirudo*). — LINDENFELD & PIETRUSZYSKI (1890): Pam. Fizjograf., Warszawa, **10**, p. 401, Pl. VIII, Fig. 1 (*Nephe-  
lis*). — JOHANSSON (1909): Hirudinea. in BRAUER: Die Süsswasserfauna Deutschlands, H. **13**, II, p. 80 (*Herpobdella*). — JOHANSSON (1910): Zool. Anz., **36**, p. 372—374, 378—379 (*Herpobdella*). — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, **26**, p. 163—164, Figs. 127—128 (*Herpobdella*). — SANDNER (1954): Bull. Soc. Sci. Lettr. Łódz, Cl. III, **5**, No. 3, p. 14—15, Fig. 2. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 154—156, Figs. 96—97 (*Herpobdella*). — Soós (1963): Ann. hist.-nat. Mus. Nat. Hung., **55**, p. 285—288, Figs. 1—2, 5.
- = *octocolata* var. *normalis* LINDENBERG & PIETRUSZYSKI (1890): Pam. Fizjograf., Warszawa, **10**, p. 401 (*Nephe-  
lis*).
- = *testacea* f. *nigricollis* BRANDES, 1900, PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, **26**, p. 163—163, Figs. 127—128 (*Herpobdella*).
- = *testacea* var. *nigricollis* BRANDES, 1900, JOHANSSON (1929): Hirudinea. in DAHL: Die Tierwelt Deutschlands, T. **15**, p. 152, Fig. 52 (*Herpobdella*).
- = *vulgaris* O. F. MÜLLER (1774) (partim): Vermium terrestrium et fluivatilum. Havniae et Lipsiae, **1**, Pars 2, p. 40 (*Hirudo vulgaris* var.  $\beta$ ).
- Distribution: Europe.
3. **ochoterenai** (CABALLERO, 1932): An. Inst. Biol. Mexico, **3**, p. 33—39, Figs. 1—6 (*Herpobdella*).
- Distribution: Mexico.
4. **octocolata** (LINNAEUS, 1758): Systema naturae, Ed. 10, p. 649 (*Hirudo*). — O. F. MÜLLER (1774): Vermium terrestrium et fluviatilum. Havniae et Lipsiae, **1**, Pars 2, p. 40 (partim) (*Hirudo*). — BRAUN (1805): Systematische Beschreibung einiger Egelarten, Berlin, p. 39—42, Pl. III, Figs. 4—11 (*Hirudo*). — DE BLAINVILLE (1818): in LAMARCK: Histoire naturelles des animaux sans Vertebres, Paris, **5**, p. 296. — CARENA (1820): Mém. Acc. Sci. Torino, **25**, p. 296, Pl. XII, Fig. 16 (*Hirudo*). — MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 128, Pl. VI, Fig. 6 (*Nephe-  
lis*). — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, p. 302—307, Pl. III, Figs. 1—33 (*Nephe-  
lis*). — DIESING (1850): Systema Helminthum, Vindobonae, **1**, p. 456—458 (*Nephe-  
lis*). — MALM (1863): Göteborgs Kongl. Vetensk. Vitt. Samh. Handl., **8**, p. 190—194 (*Nephe-  
lis*). — BLANCHARD (1892): Bull. Soc. Zool. France, **17**, p. 165—172, Figs. 1—4 (*Nephe-  
lis*). — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8**, No. 146, p. 4—8, Figs. 1—2 (*Nephe-  
lis*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9**, No. 192, p. 56—60, Figs. 18—22 (*Herpobdella*). — JOHANSSON (1910): Zool. Anz., **36**, p. 367—371, 376—377 (*Herpobdella*). — HARDING (1910): Parasitology, **3**, p. 180—

182, Fig. 15 (*Herpobdella*). — GEDROYĆ (1916): Rozpr. Wiad. Muz. Dzied. Lwów, **2**, p. 87—95, Figs. 25—30 (*Herpobdella*). — OKA (1917): Mem. Asiat. Soc. Bengal, **6**, p. 165—166 (*Herpobdella*). — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76**, p. 363—367. — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 130—135, Pl. VI, Fig. 12. — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, **26**, p. 154—161, Figs. 116—122 (*Herpobdella*). — BENNICKE (1943): Fol. Limnol. Scand., No. **2**, p. 90—91 (*Herpobdella*). — PAWLOWSKI (1948): Bull. Soc. Sci. Łódź, Sect. III, No. **8**, p. 1—48. — VERRIEST (1950): Biol. Jaarb. Dodonaea, Gent, **17**, p. 211—212, 239. — MANN (1952): Proc. Zool. Soc. London, **122**, p. 397, 403, Figs. 1—2. — MANN (1953): Journ. Animal Ecol., **22**, p. 199—207, Figs. 1—4. — HOFFMANN (1955): Arch. Inst. Grand-Ducal, Luxembourg, N. S. **22**, p. 207—208, Fig. 13 A—E (*Herpobdella*). — LUKIN (1957): Izvest. Biol.-Geogr. Nautsh. Iszledovat. Inst., Moscow—Irkutsk, **17**, p. 274—277, Figs. 1—4 (*Herpobdella*). — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 15, Figs. 4, 6d, 7, 11, 49b—c, 50, 53c—f. — MANN (1959): Proc. Zool. Soc. London, **132**, p. 373—374, Fig. 3. — DRESSCHER & ENGEL (1960): Wetensch. Meded. Konink. Nederl. Natuurh. Ver., No. **39**, p. 46—47, Figs. 40, 41 A, 42 (*Herpobdella*). — SCIACCHITANO (1960): Libro homenaje al doctor Eduardo Caballero y Caballero, 1930—1960, Mexico, No. **24**, p. 536—537. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 157—160, Figs. 98—99 (*Herpobdella*). — WOJTAS (1962): Bull. Soc. Sci. Łódź, Sect. III, No. **78**, p. 7—17. — *crassipunctata* SCHNEIDER nom. nud. in BLANCHARD (1893): Bull. Soc. Zool. France, **18**, p. 197 (*Nepheleis*). — *octomaculata* PAWLOWSKI (1935) in FUDAKOWSKI: Rozpr. i Spraw. Inst. Badawcz. Los Panstw., Ser. A, No. **8**, Warszawa, p. 35—36 (*Herpobdella*) (misprint). — *scripturata* SCHNEIDER (1885): Zool. Beitr., **1**, p. 129, Fig. 1 (*Nepheleis*). — BLANCHARD (1893): Bull. Soc. Zool. France, **18**, p. 195—196, Fig. 1 (*Nepheleis*). — *sexoculata* SCHNEIDER (1883): Das Ei und seine Befruchtung, Breslau, p. 21—22, Pl. IV, Fig. 2 (*Nepheleis*). — BLANCHARD (1893): Bull. Soc. Zool. France, **18**, p. 194—195 (*Nepheleis*).

Distribution: Palaearctic Region, U. S. A., Mexico.

4a. **octoculata** subsp. **japonica** PAWLOWSKI (1962): Zeszyty Nauk. Univ. Łódź Ser. II, No. **12**, p. 131—132, 135—136.

Distribution: Japan.

\*4b. **octoculata** var. **atomaria** (CARENA, 1820): Mem. Acc. Sci. Torino, **25**, p. 295, Pl. XII, Fig. 16 (*Hirudo*).

= *reticulata* MALM (1863): Göteborgs Kongl. Vetensk. Vitt. Samn. Handl., **8**, p. 190—194, Pl. III, Fig. 7 (*Nepheleis*).

Distribution: Europe, Japan.

\*Literature referring to varieties are listed in the references of the nominate form; not given separately here.

4c. *octoculata* var. *meyeri* (BLANCHARD, 1892): Bull. Soc. Zool. France, **17**, p. 170, Fig. 4 A—B (*Nephelis*). — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 29, Fig. 53e.

Distribution: Germany, France.

4d. *octoculata* var. *pallida* (JOHANSSON, 1910): Zool. Anz., **36**, p. 377 (*Herpobdella*).

Distribution: Europe.

4e. *octoculata* var. *vulgaris* (O. F. MÜLLER, 1774): Vermium terrestrium et fluviatilum. Havniae et Lipsiae, **1**, Pars 2, p. 40 (*Hirudo vulgaris* var.  $\delta$ ).

Distribution: Europe.

5. *punctata* (LEIDY, 1870) MOORE (1901); LEIDY (1870): Proc. Acad. Nat. Sci. Philadelphia, **1870**, p. 89—90 (*Nephelis*). — MOORE (1901): Bull. Illinois State Labor., Nat. Hist., **5**, Art. XII, p. 532—535, Pl. XLVII, Fig. 35. — MOORE (1906): Bull. Bureau Fisheries, **25**, p. 163, Pl. XXXII, Fig. 1. — MOORE (1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. **5**, p. 121—123, Pl. IV, Fig. 39 (on colored plate F). — MOORE (1922): Canad. Field. Nat., **36**, p. 37—38. — MEYER (1937): Canad. Field. Nat., **51**, p. 118. — CABALLERO (1941): An. Inst. Biol. Mexico, **12**, p. 752—753. — RICHARDSON (1942): Canad. Field. Nat., **56**, p. 68—69. — PAWLOWSKI (1948): Fragm. Faun. Mus. Zool. Pol., **5**, p. 336—338. — MATHERS (1948): Proc. Iowa Acad. Sci., **55**, p. 402—412, Pls. 3—4. — MOORE & MEYER (1951): Wasmann Journ. Biol., **9**, p. 68—69. — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245**, p. 3, 6—7. — BECK (1954): Utah Acad. Proc., **31**, p. 76. — MEYER & MOORE (1954): Wasmann Journ. Biol., **12**, p. 92.

= *vermiformis* NICHOLSON (1873): Canad. Journ. Sci. Hist., **13**, p. 493—498 (*Nephelis*).

Distribution: North America, Mexico.

5a. *punctata* subsp. *annulata* MOORE (1922): Canad. Field. Nat., **36**, p. 68—69.

Distribution: Canada.

6. *quaternaria* (MOORE, 1930): Proc. Acad. Nat. Sci. Philadelphia, **82**, p. 181—183, Pl. 8, Figs. 13—15 (*Dina*).

Distribution: China.

7. *testacea* (SAVIGNY, 1822): Système des Annelides, principale de celles des côtes de l'Égypte et de la Syrie, Paris, p. 107 (*Nephelis*). — O. F. MÜLLER (1774): Vermium terrestrium et fluviatilum. Havniae et Lipsiae, **1**, Pars 2, p. 40 (*Hirudo*). — MOQUIN-TANDON (1826): Monographie de la famille Hirudinées, Montpellier, p. 125, Pl. VI, Figs. 4—5 (*Nephelis*).

— MALM (1863): Göteborgs Kongl. Vetensk. Vitt. Samh. Handl., **8**, p. 186—190 (*Nepheles*). — BLANCHARD (1893): Boll. Mus. Zool. Anat. comp. Univ. Torino, **8**, No. 146, p. 8—11, Figs. 3—5 (*Nepheles*). — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9**, No. 192, p. 51—55, Figs. 15—17 (*Herpobdella*). — JOHANSSON (1910): Zool. Anz., **36**, p. 378 (*Herpobdella*). — HARDING (1910): Parasitology, **3**, p. 177—180, Fig. 14 (*Herpobdella*). — ROUSSEAU (1912): Ann. Biol. Lacustre, **5**, p. 284—285, Figs. 26—27 (*Herpobdella*). — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, **26**, p. 161—163, Figs. 124—125 (*Herpobdella*). — BERG (1938): Kongl. Danske Vid. Selsk. Skrift. Afd. Naturw. Math. **9**, Raekke, 8, p. 57—61, Figs. 40—42, 44 (*Herpobdella*). — BENNICKE (1943): Fol. Limnol. Scand., No. 2, p. 91—92. — VERRIST (1950): Biol. Jaarb. Dodonaea, Gent, **17**, p. 212, 240—241. — MANN (1952): Proc. Zool. Soc. London, **122**, p. 397—398, Figs. 3—4. — SANDNER (1954): Bull. Soc. Sci. Lettr. Łódz, Cl. III, **5**, No. 3, p. 14, Fig. 2. — AUTRUM (1958): Hirudinea. in BROHMER: Die Tierwelt Mitteleuropas, Leipzig, **1**, Lief. 7b, p. 15, Figs. 49a, 51, 53a. — MANN (1959): Proc. Zool. Soc. London, **132**, p. 373—374, Fig. 3. — MANN (1961): Oikos, **12**, p. 164—169, Figs. 1—4. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiev, **30**, p. 151—154, Figs. 94—95 (*Herpobdella*).

Distribution: Europe.

- 7a. *testacea* var. *monostriata* (LINDENBERG & PIETRUSZYNSKI, 1890): Pam. Fizjograf., Warszawa, **10**, p. 401 (*Nepheles*). — LISKIEWICZ (1927): Arch. f. Naturg., Abt. A, **91**, p. 279 (*Herpobdella*). — LISKIEWICZ (1934): Prace Zakl. Anat. Porówn., Wilno, **8**, p. 29, Pl. II, Fig. 37 (*Herpobdella*).

Distribution: Northeast Europe.

8. *triannulata* MOORE (1908): Publ. Field. Mus. Nat. Hist., Chicago, Zool. Ser., **7**, p. 199—201.

Distribution: Guatemala, Mexico, South California.

#### SPECIES INQUIRENDAE:

1. *areolata* SCIACCHITANO (1939): Rev. Zool. Bot. Afr., **32**, p. 366 (*Herpobdella*). — SCIACCHITANO (1952): Ann. Mus. Congo Belge, Sci. Zool., **16**, p. 72.  
Distribution: Belgian Congo.
2. *galla* SCIACCHITANO (1939): Boll. pesca, piscicult. idrobiol., **15**, p. 10—11, Figs. 6—7 (*Herpobdella*). — SCIACCHITANO (1941): Riv. Biol. Colonial, Roma, **4**, p. 168 (*Herpobdella*).  
Distribution: East Africa.
3. *octoculata* var. *urundiensis* SCIACCHITANO (1937): Rev. Zool. Bot. Afr., **29**, p. 429 (*Herpobdella*).  
Distribution: Belgian Congo.

8. Genus: **Fadejewobdella** LUKIN, 1962

LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 177.

Type-species: *Trocheta quinqueannulata* LUKIN, 1929.

1. **quinqueannulata** (LUKIN, 1929): Trav. Soc. Nat. Charkov, **52**, p. 62—64, Fig. 1 (*Trocheta*). — PAWLOWSKI (1936): Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, **26**, p. 171, Fig. 134 (*Trocheta*). — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 177—180, Figs. 114—116.

Distribution: Southern Region of the European part of the Soviet Union.

9. Genus: **Hypsobdella** WEBER, 1915

WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 113—114.

## SYNONYMY:

*Macrobella* (misprint) WEBER (1913): Mém. Soc. neuchat. Sci. Nat., **5**, p. 745.

Type-species: *Macrobella columbiensis* WEBER, 1913.

1. **columbiensis** (WEBER, 1913): Mém. Soc. neuchat. Sci. Nat., **5**, p. 745—747, Figs. 14—17 (*Macrobella*). — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 114—116, Pl. V, Fig. 41.

Distribution: Columbia.

10. Genus: **Lumbricobdella** KENNEL, 1886

KENNEL (1886): Zool. Jahrb. Syst., **2**, p. 62. — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 108—109.

Type-species: *Lumbricobdella schaefferi* KENNEL, 1886.

1. **chamensis** DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32**, No. 724, p. 14—17.

Distribution: Venezuela.

2. **schaefferi** KENNEL (1886): Zool. Jahrb. Syst., **2**, p. 62, Pl. III, Figs. 4, 9—13, 17—18, 21, Pl. IV, Figs. 26—27, 34. — WEBER (1915): Monographie des Hirudinées Sud-Américaines. Neuchâtel, p. 109—111. — DEQUAL (1917): Boll. Mus. Zool. Anat. comp. Univ. Torino, **32**, No. 724, p. 17.

Distribution: Trinidad.

11. Genus: *Mimobdella* BLANCHARD, 1897

BLANCHARD (1897): Not. Leyden Mus., **19**, p. 92—94. — OKA (1923): Annot. Zool. Jap., **10**, p. 234—244.

Type-species: *Mimobdella japonica* BLANCHARD, 1897.

1. **africana** MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90**, p. 356—358, Pl. 27, Figs. 39—40.

Distribution: East Africa.

2. **buettikoferi** BLANCHARD (1897): Not. Leyden Mus., **19**, p. 95—96, Fig. 18. — MOORE (1935): Bull. Raffl. Mus., **10**, p. 77—78.

Distribution: Borneo.

3. **japonica** BLANCHARD (1897): Not. Leyden Mus., **19**, p. 94—95, Pl. 6, Figs. 16—17. — OKA (1923): Annot. Zool. Jap., **10**, p. 245—247, Figs. 1—7.

Distribution: Japan.

4. **thienemanni** AUGENER (1931): Arch. f. Hydrobiol., Suppl. **8**, p. 754—757, Fig. 1a—c.

Distribution: Sunda Islands.

12. Genus: *Nematobdella* KABURAKI, 1921

KABURAKI (1921): Rec. Ind. Mus., **22**, p. 706—707. — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 140—141 (*Herpobdelloidea*). — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90**, p. 530.

Type-species: *Nematobdella indica* KABURAKI, 1921.

1. **indica** KABURAKI (1921): Rec. Ind. Mus., **22**, p. 706—707, Fig. 5. — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 144—148, Figs. 43—45, Pl. III, Fig. 3, Pl. VI, Figs. 15—16 (*Herpobdelloidea*).

Distribution: India.

13. Genus: *Nephelopsis* VERRILL, 1872

VERRILL (1872): Journ. Amer. Sci. Arts, **3**, p. 135. — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. **245**, p. 3.

Type-species: *Nephelopsis obscura* VERRILL, 1872.

1. **obscura** VERRILL (1872): Journ. Amer. Sci. Arts, **3**, p. 135. — VERRILL (1874): Rep. Commis. Fish and Fisheries 1872/1873, p. 674. — MOORE

(1912): Geol. Nat. Hist. Surv. Minnesota, Zool. Ser., No. 5, p. 123—125, Pl. V, Figs. 35—36, Pl. VI, Fig. 40. — MATHERS (1948): Proc. Iowa Acad. Sci., 55, p. 413—414, Pl. IV. — PAWLOWSKI (1948): Fragm. Faun. Mus. Zool. Polon., 5, No. 20, p. 338—339, Fig. 5. — MOORE (1952): Not. Nat. Acad. Nat. Sci. Philadelphia, No. 245, p. 3, 6—7.  
 Distribution: North America.

14. Genus: **Odontobdella** OKA, 1923

OKA (1923): Annot. Zool. Jap., 10, p. 248.

Type-species: *Scaptobdella blanchardi* OKA, 1910.

1. **blanchardi** (OKA, 1910): Annot. Zool. Jap., 7, p. 179 (partim) (*Scaptobdella*). — OKA (1923): Annot. Zool. Jap., 10, p. 248—252, Figs. 8—13, 15. — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, 76, p. 371—372 (*Scaptobdella*). — MOORE (1930): Proc. Acad. Nat. Sci. Philadelphia, 82, p. 183.

Distribution: China, Japan, Taiwan.

15. Genus: **Orobdella** OKA, 1895

OKA (1895): Journ. Coll. Sci. Univ. Tokyo, 8, p. 278—281.

Type-species: *Orobdella whitmani* OKA, 1895.

1. **ijimai** OKA (1895): Journ. Coll. Sci. Univ. Tokyo, 8, p. 284—285, Pl. XXVIII, Figs. 2, 9—10, Pl. XXIX, Fig. B, Pl. XXX, Figs. 2, 5, 8.  
 Distribution: Japan.

2. **octonaria** OKA (1895): Journ. Coll. Sci. Univ. Tokyo, 8, p. 286—288, Pl. XXVIII, Figs. 3, 11—14, Pl. XXIX, Fig. C.  
 Distribution: Japan.

3. **whitmani** OKA (1895): Journ. Coll. Sci. Univ. Tokyo, 8, p. 282—284, Pl. XXVIII, Figs. 1, 4—8, Pl. XXIX, Fig. A, Pl. XXX, Figs. 1, 3.

Distribution: Japan.

16. Genus: **Salifa** BLANCHARD, 1897

BLANCHARD (1897): Hirudinea. in: Die Tierwelt Ost-Afrikas, Berlin, 4, p. 7.

— MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, 90, p. 350—351. — MEYER (1951): Explor. Parc Nat. Albert, Fasc. 76, p. 20—21.

SYNONYMY:

*Herpobdelloidea* KABURAKI (1921): Rec. Ind. Mus., 22, p. 704—705. — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 140—141.

Type-species: *Salifa perspicax* BLANCHARD, 1897.

1. **elongata** MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90**, p. 351—354, Pl. 27, Fig. 37.

Distribution: Lake Tanganyika.

2. **perspicax** BLANCHARD (1897): Hirudineen. in: Die Tierwelt Ost-Afrikas, Berlin, **4**, p. 7—8, Figs. I—III, 10. — JOHANSSON (1913): Results of the Swedish Zoological Expedition Egypt and the White Nile 1901, No. **24**, p. 38—40. — MOORE (1924): Proc. Acad. Nat. Sci. Philadelphia, **76**, p. 370—371 (*Herpobdelloidea*). — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 141—143, Pl. VI, Figs. 13—14 (*Herpobdelloidea*). — AUGENER (1936): SB. Ges. natuf. Fr. Berlin, **1935**, p. 386—388. — MOORE (1939): Proc. Acad. Nat. Sci. Philadelphia, **90**, p. 347—351, Pl. 27, Fig. 38. — BHATIA (1942): Proc. Ind. Sci. Congr., **28**, p. 175. — MEYER (1951): Explor. Parc Nat. Albert, Fasc. **76**, p. 21—24. — MOORE (1958): Ann. Natal Mus., **14**, p. 338—339, Pl. IX, Fig. 26.

= *laterocolata* KABURAKI (1921): Rec. Ind. Mus., **22**, p. 705—706, Fig. 4 (*Herpobdelloidea*).

Distribution: East and South Africa, Belgian Congo, ? Madagascar, India.

#### SPECIES INQUIRENDA:

1. *cambouei* BLANCHARD (1897): Not. Leyden Mus., **19**, p. 102. Nomen nudum.

Distribution: Madagascar.

#### 17. Genus: **Trocheta** DUTROCHET, 1817

DUTROCHET (1817): Bull. Sci. Soc. philomat., Paris, 1817, p. 130—131. — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, p. 308—309. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9**, No. 192, p. 63—64. — BLANCHARD (1897): Not. Leyden Mus., **19**, p. 96—97 (*Scaptobdella*). — OKA (1922): Rec. Ind. Mus., **24**, p. 533—534. — PERRET (1952): Bull. Soc. neuchat. Sci. Nat., **75**, p. 127—129.

#### SYNONYMY:

*Blanchardia* GEDROYĆ (1916): Rozpr. Wiad. Muz. Dzied. Lwów, **2**, p. 73—75.

*Geobdella* DE BLAINVILLE (1828) (nec WHITMANN, 1886): Dict. Sci. Nat., **59**, p. 559.

*Nepheleis* MOQUIN-TANDON (1826) (partim): Monographie de la famille des Hirudinées, Montpellier, p. 129.

*Scaptobdella* BLANCHARD (1897): Not. Leyden Mus., **19**, p. 96—97.

*Trochetia* DE BLAINVILLE (1818): in LAMARCK: Histoire naturelle des animaux sans Vertebres, Paris, **5**, p. 291—292.

Type-species: *Trocheta subviridis* DUTROCHET, 1817.

1. **bykowskii** GEDROYĆ (1913): Bull. inter. Acad. Sci. Cracovie, Sér. B, **1913**, p. 32—36, Figs. 1—5. — GEDROYĆ (1916): Rozpr. Wiad. Muz. Dzied., Lwów, **2**, p. 75—79, Figs. 17—20. (*Blanchardia*). — PAWLOWSKI (1936):



Hirudinea. in: Fauna Slodkowodna Polski, Warszawa, **26**, p. 166—170, Figs. 130—133. — PAWLOWSKI (1936): Ann. Mus. Zool. Polon., **11**, p. 347—353, Figs. 1—3 (*Blanchardia*). — PAWLOWSKI (1937): Trav. Assoc. Intern. Limn. Théor. Appl. VIII<sup>e</sup>, **2**, p. 194—196. — PERRET (1952): Bull. Soc. neuchât. Sci. Nat., **75**, p. 129—137, Figs. 9—15, Pl. III, Figs. 1—3. — Soós (1958): Ann. hist.-nat. Mus. Nat. Hung., **50**, p. 173—177, Fig. 1. — MANN (1959): Proc. Zool. Soc. London, **132**, p. 369—375, Figs. 1—3. — PAWLOWSKI (1959): Soc. Sci. Lodziensis, Sect. III. No. **55**, p. 7—13. — SCIACCHITANO (1960): Libro homenaje de doctor Eduardo Caballero y Caballero 1930—1960, Mexico, No. **24**, p. 537. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 184—187, Figs. 121—123. = *cylindrica* ÖRLEY (1886): Math. és term.-tud. Közlem., **22**, p. 91—92.  
 Distribution: Europe (except N Europe), Afghanistan.

2. **horsti** (BLANCHARD, 1897): Not. Leyden Mus., **19**, p. 97—101, Figs. 19—20 (*Scaptobdella*). — KABURAKI (1921): Rec. Ind. Mus., **22**, p. 709 (*Scaptobdella*). — HARDING (1931): Journ. Fed. Malay Stat. Mus., **8**, p. 221—222 (*Scaptobdella*).

Distribution: Java, Sumatra, Borneo.

3. **quadrioculata** KABURAKI (1922): Rec. Ind. Mus., **24**, p. 530—533, Figs. 5—7. — HARDING & MOORE (1927): Hirudinea. in: The Fauna of British India, including Ceylon and Burma, London, p. 151—153.

Distribution: India, Burma.

4. **subviridis** DUTROCHET (1817): Bull. Sci. Soc. philomat., Paris, 1817, p. 130—131. — MOQUIN-TANDON (1846): Monographie de la famille des Hirudinées, Paris, p. 309—312, Pl. IV, Figs. 1—5. — BLANCHARD (1892): Atti Soc. ligust. Sci. Nat. Geogr., **3**, No. 4, p. 1—31, Figs. 1—8. — BLANCHARD (1894): Boll. Mus. Zool. Anat. comp. Univ. Torino, **9**, No. 192, p. 64—68, Figs. 25—30. — HARDING (1910): Parasitology, **3**, p. 183—186, Fig. 16, Pl. XV, Figs. 46—47. — MANN (1952): Proc. Zool. Soc. London, **122**, p. 401—402, Figs. 5—6. — LUKIN (1962): Hirudinea. in: The Fauna of Ukraine, Kiew, **30**, p. 180—184, Figs. 118—119. — HARTLY (1962): Journ. Animal Ecol., **31**, p. 519—524, Figs. 1—3.

= *gigas* MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 127, Pl. V, Fig. 5 A—D (*Nepheleis*).

= *trocheta* APÁTHY (1888): Mitt. Zool. Stat. Neapel, **8**, p. 154 (*Nepheleis*).

= *trochetia* MOQUIN-TANDON (1826): Monographie de la famille des Hirudinées, Montpellier, p. 129 (*Nepheleis*).

= *trochetii* DE BLAINVILLE (1827): Dict. Sci. nat., **47**, p. 246 (*Geobdella*).

Distribution: West, South and Southeast Europe, North Africa, Turkey, Sachalin.

#### GENERA INQUIRENDAE

1. **Hylacobdella** SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26**, p. 458. — SCIACCHITANO (1952): Ann. Mus. Congo Belge, Sci. Zool., **16**, p. 73.  
 Type-species: *Hylacobdella gerardi* SCIACCHITANO, 1935.

- bequaerti* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26**, p. 459.  
Distribution: Belgian Congo.
- gerardi* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26**, p. 458, Fig. 1.  
Distribution: Belgian Congo.
- gigas* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26**, p. 459.  
Distribution: Belgian Congo.
- grisea* SCIACCHITANO (1936): Rev. Zool. Bot. Afr., **28**, p. 163.  
Distribution: Belgian Congo.
- sulcata* SCIACCHITANO (1935): Rev. Zool. Bot. Afr., **26**, p. 458—459.  
Distribution: Belgian Congo.
2. **Pinacobdella** DIESING (1850): Systema Helminthum, Vindobonae, **1**, p. 458. — DIESING (1858): Denkschr. math.-naturw. Cl. K. Akad. Wiss. Wien, **14**, p. 76.  
Type-species: *Pinacobdella kolenati* DIESING, 1850.
- kolenati* DIESING (1850): Systema Helminthum, Vindobonae, **1**, p. 458. — DIESING (1858): Denkschr. math.-naturw. Cl. K. Akad. Wiss. Wien, **14**, p. 76, 79, Pl. III, Figs. 18—24.  
Distribution: Caucasus.

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\* Names in italics indicate synonyms, while those marked an asterik refer to genera and species inquirendae.



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Author's address: Budapest, VIII., Baross u. 13, Hungary.



NEW PHANEROPTERA SERV. AND NEPHOPTERA UV.  
SPECIES (ORTHOPTERA: TETTIGONIIDAE)

By

H. STEINMANN

ZOOLOGICAL DEPARTMENT OF THE HUNGARIAN NATURAL HISTORY MUSEUM, BUDAPEST  
(DIRECTOR: DR. Z. KASZAB)

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The Orthoptera Collection of the Hungarian Natural History Museum, Budapest, had very fortunately been enriched with a number of foreign materials. Copious materials had arrived from Palaearctic Asia, but a number of exemplars had been received also from Africa and South America. The earlier, unidentified material of the collection had also been worked up, respectively is under identification, together with the newly acquired samples. In the last few years, work concentrated mainly on the identification of Acridids, and the present paper submits the description of new species found in the recently determined grasshopper material.

Family: TETTIGONIIDAE

Subfamily: **Phaneropterinae**

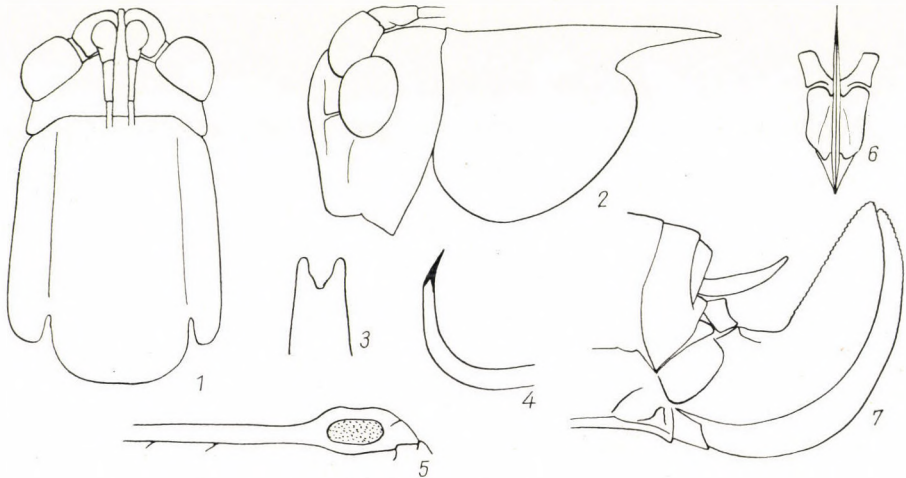
**Phaneroptera jordanica** sp. n. (Figs. 1-7)

Head, when seen from above, comparatively short and wide, discounting extremely wide and thick scapes of antennae. Posterior margin almost as wide as exterior marginal line of eyes. Vertex smooth, distance between eyes about equal with width of one eye measured from above. Eyes large, spherical, situated on antero-lateral section of head. In a lateral view, head high, visibly longer than wide. Frontal, facial portion of head widely rounded and decurrent strongly anteriorad, widest section attained before median line of eyes. Antennae articulating between eyes, along their anterior section; long. Scape large-sized, second joint moderately long.

Pronotum, when viewed from above, with almost parallel lateral edges. Anterior margin straight from line of lateral edges. Dorsal section, characteristic of Phaneropterae, expressed also in this species. Pronotum consisting of sharply delimited flat dorsal and two, almost perpendicular, lateral planes. Posterior margin of pronotum widely rounded; postero-lateral margin sharply excised at base of wings. In a lateral view, dorsal line of pronotum slightly sinuous, nearly straight. Posterior, extended section thick, dagger-shaped. Anterior margin of

segment as given on Fig. 2. Laterally deflected lobe ovate, anterior half slightly arcuate, posterior half evenly elliptical.

Tegmen long, when at repose two and a half times exceeding length of body, projecting even beyond hind femur aligned to longitudinal axis of body, and apex of tegmen extending approximately to middle of hind tibia. Tegmen about one-third shorter than hind wing. Apex of tegmen elongated but widely rounded, apex of hind wing slightly truncate.



Figs. 1—7. *Phaneroptera jordanica* sp. n. 1 = head and pronotum from above; 2 = same, laterally; 3 = apex of subgenital plate of male from below; 4 = cerci of male; 5 = genal section of fore tibia with tympanal organ; 6 = ovipositor of female posteriorly; 7 = same, laterally, with end of abdomen

Tympanal organs strongly expressed at genal apex of fore tibia, standing free on both sides of tibia (Fig. 5). Femur of middle leg extending to end of abdomen, discounting genital appendages.

Subgenital plate of male well visible, comparatively long, lateral margins almost parallel, straight. Apical incision as on Fig. 3. Cerci widely rounded in a quarter arc, apically attenuate, but exterior section of arch visibly truncate; cerci tapering evenly but almost imperceptibly apicad (Fig. 4). Ovipositor of female, when viewed posteriorly and discounting its wide, high, spatulate plate, with a relatively high basal section, upper lobe widening, its upper margin widely and arcuately excised (Fig. 6). In a lateral view, ovipositor medium-sized, inner margin slightly broken near basal section, then finely serrate to apex. Apex meeting anterior and posterior margins in an obtuse angle, tip of anterior plate slightly longer than that of posterior one (Fig. 7). Posterior margin of last abdominal segment straight, semicircular epiproctum well discernible.

## Diagnostic measurements in mm

<i>Phaneroptera jordanica</i> sp. n.		
	female	male
Length of body (without ovipositor in female)	15	12
Length of tegmen	25—26	24—25
Length of hind femur	16—17	16—17
Length of antenna	38—42	37—38

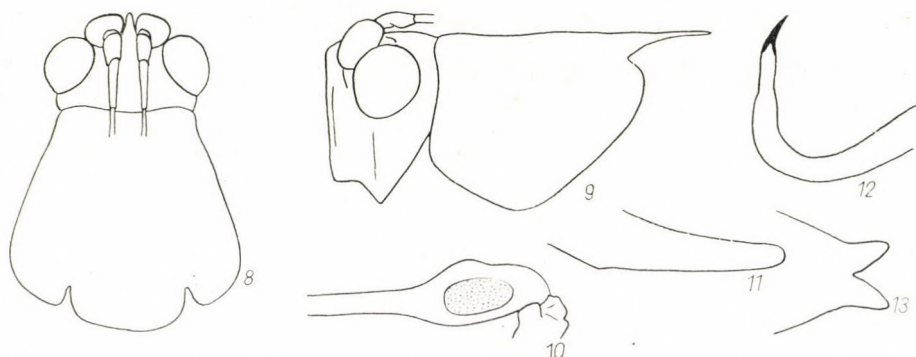
Holotype male: "O. Jordania, Amman, 800 m, 19.6.1959, leg. J. KLAPPERICH". Paratypes: "Libanon, Ainab, s. Beirut, 650 m, 23.9.1959, leg. J. KLAPPERICH", 1 male; "O. Jordania, Amman, 800 m, 9.6.1959, leg. J. KLAPPERICH", 2 males; "O. Jordania, 7.9.1957, leg. J. KLAPPERICH", 1 female; "O. Jordania, Fruhes, N. Amman, 1000 m, 17.6.1956, leg. J. KLAPPERICH", 1 male; "O. Jordania, Amman, 800 m, 21.5.1959, leg. J. KLAPPERICH", 1 female; "Jordania, Jordantal Jericho (Agricult Stat. in Citrus), 250 m, 30.12.1957, leg. J. KLAPPERICH", 1 male. Deposited in the Natural History Museum, Budapest.

The nearest ally of the species is *Phaneroptera falcata* PODA, resembling it in stature. The essential differences between the two species are as follows: the body of *Ph. jordanica* is slightly more slender; the cerci of the male essentially finer, evenly arcuate, and apically slightly truncate. The male cerci of *Ph. falcata* PODA is thicker from its base to the median section, here visibly broken, and after a widening section, considerably broader than the median section, it tapers lanceolately without a truncated portion. The subgenital plate of the male (Fig. 3) is essentially wider than in *Ph. falcata* PODA, its lateral margins strongly divergent, the apex considerably wider than the basal portion. The central incision of the apex is obtuse. The pronotum displays differences also in a lateral view: the lateral lobe of the pronotum in *Ph. falcata* PODA is more rounded, the excision at the base of the wings lying also higher. The basal section of the hind femur is essentially narrower than in *Ph. jordanica* sp. n. The ovipositor of the female shows rather finer differences: the basal fourth of the upper margin is less arched than broken (Fig. 7), and the apex of the inner plate is perceptibly longer than that of the external one.

***Phaneroptera africana* sp. n. (Figs. 8—13)**

A rather small-sized species. Head, when seen from above, slightly elongate, vertex pointed, visibly if slightly elongated between scapes of antennae. Exterior margins of eyes essentially wider than width of head. Vertex smooth, with scattered, pale reddish violet, minute dots. In a lateral view, vertex slightly arcuate, angularly broken at articulation of antennae and continuing in median facial ribs. Eyes rounded. Scapes of antennae moderately large, elliptical, long, articulating between, and frontally of anterosuperior section of, eyes.

Pronotum, when viewed from above, visibly deplanate and expanding, width measured at anterior margin considerably exceeded by width of posterior third. Border between dorsal and lateral sides of pronotum wide, arcuately rounded, without any discernible edge. Anterior margin slightly concave, posterior margin rounded, postero-lateral margin sharply excised at base of wings. In a lateral view, dorsal line of pronotum almost straight, only slightly



Figs. 8—13. *Phaneroptera africana* sp. n. 8 = head and pronotum from above; 9 = same, laterally; 10 = genal section of fore tibia with tympanal organ; 11 = subgenital plate of male laterally; 12 = cerci, and 13 = apex of subgenital plate, from below

sinuous. Posterior, elongate section thin, spiniform. Anterior margin of lateral lobe sinuous, shape of lobe as on Fig. 9. Anterior half and posterior half nearly straight, but median section rounded.

Tegmen long, at repose about twice longer than abdomen. Hind wing essentially longer, and twice longer than section of tegmen projecting beyond end of abdomen. Apex of tegmen rounded.

Tympanal organs (below genu of fore tibia) well discernible, oval, as on Fig. 10. Apex of middle femur not reaching end of abdomen, even discounting genital appendages.

Subgenital plate of male at end of abdomen long, slender, narrow. In a lateral view (Fig. 11), visibly broken at inferior margin, then straightly decurrent, slowly tapering toward apex. Apex, in an inferior view, sharply incised (Fig. 13). Lateral margins convergent immediately to preapical section, then forming a parallel section at terminal line of incision, medially displaying a nearly rectangular incision of almost straight margins. Cerci comparatively thick, strongly curving, not tapering evenly beyond median section but becoming incrassate as if slightly inflated, and terminating, after a narrower preapical section, in a strongly attenuate apex. Female unknown.

Length of body, without cerci, 10.5 mm, length of hind wing 22.8 mm, length of hind femur 15 mm, length of abdomen 37 mm.

Holotype male: Conakry, Guinea, 31 March, 1961, leg. Mrs. GYÁROS. Deposited in the Hungarian Natural History Museum, Budapest.

The nearest ally of the species is *Phaneroptera curvata* (WILLEMSE), differing from it in the following characters: the subgenital plate of *Ph. curvata* in a lateral view, has a largely similar shape, but rather bent, hence the inferior margin is slightly broken, and the superior margin is not straight but arcuate. The apex of the subgenital plate, when viewed inferiorly, is rounded, the apical incision approximately guttiform. The apex of the subgenital plate of *Ph. africana* sp. n., rather resembles that of *Ph. magna* RAGGE, or *Ph. longispina* RAGGE, displaying a similarly formed apex and apical incision. However, the subgenital plates of these latter two are extremely elongate in a lateral view, the median section extraordinarily attenuating, rather shaped like a spoon. The cerci resemble those of *Ph. brevis* SERV., inhabiting the Indonesian and Polynesian islands, inasmuch as it is visibly swollen beyond the median section, and differing from this latter species in being more strongly arcuate and the terminal spine evenly mucronate, against the strongly truncate cerci of *Ph. brevis* SERV.

***Phaneroptera guineana* sp. n. (Figs. 14—18)**

Head, when viewed from above, relatively wide and short. Lateral margins of eyes only slightly wider than lateral sections of head. Vertex smooth and strongly convex, anterior portion attenuately elongate. In a lateral view, head long, eyes comparatively small (Fig. 15). Antennae articulating at antero-superior corner of eyes, scape small. In a lateral view, vertex visibly convex behind eyes, flattening around antennae, and then bending into facial section in a very obtuse angle (with a rounded corner) in front of antennae.

Pronotum, when viewed from above, short and wide. Dorsal surface deflecting with a weak edge (mainly in posterior section) into lateral surfaces. Anterior margin of pronotum straight, posterior one arcuate. In a lateral view, dorsal line of pronotum visibly sinuous, posterior section short, slightly ascending (Fig. 15). Anterior margin of lateral lobe of segment strongly concave, its anterior section deeply descending, posterior section deeply excised at base of wing.

Wings long. Tegmen at repose extending by one-fourth of its length beyond body, respectively ovipositor in female. Hind wing projecting by one-half length over body. Apex of tegmen rounded.

Tympanal organs as on Fig. 16. Genu of middle legs falling considerably short of abdominal end. Hind femur extending beyond tegmen, but not reaching apex of hind wing, terminating about middle distance between apices of tegmen and hind wing.

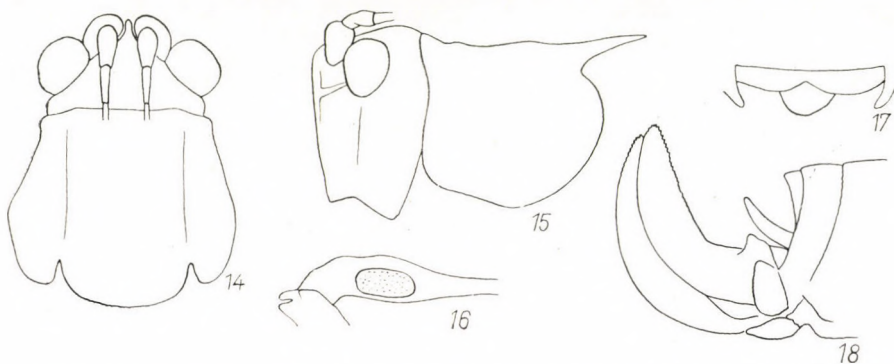
Basic section of female ovipositor (discounting wide, high, spatulate plates) wide and low in a posterior view; upper supporting lobes relatively small, plate semicircularly arcuate between two small lateral apices. In a lateral view, ovipositor rather small, inner margin slightly broken, outer margin

an almost semicircular arch (Fig. 18). End of abdomen, when viewed from above, apparently last dorsal segment (as shown on Fig. 17). Male unknown.

Length of body (with ovipositor) 16.5 mm, length of hind wing 26.2 mm, length of hind femur 17.5 mm, length of antenna 38 mm.

Holotype female: "N. Guinea, Satteberg, Huon Golf, 1898, leg. L. BIRÓ". Deposited in the Natural History Museum, Budapest.

The nearest relative of the new species is *Ph. neglecta* (KARNY), whose female differs from that of *Ph. guineana* sp. n., mainly in the shape of the pronotum (in a lateral view). The dorsal line of this segment of *Ph. neglecta*



Figs. 14—18. *Phaneroptera guineana* sp. n. 14 = head and pronotum from above; 15 = same, laterally; 16 = genal section of fore tibia with tympanal organ; 17 = last abdominal tergite of female from above, and 18 = end of abdomen, laterally

(KARNY) is straight, the posterior margin shorter, its end decumbent and slightly claw-shaped. The anterior margin is slightly arcuate, nor is any section of the inferior part of the lateral lobe straight, but evenly rounded. The end of the dorsal surface of the abdomen also displays considerable differences: the anterior margin of the last segment is not slightly but strongly convex, with also a small excision in the middle of the margin (that of *Ph. guineana* sp. n., as on Fig. 17). The posterior margin of the last segment is also slightly convex, and not with a conspicuous incision. Finally, the squamiform plate, appearing from below the last segment, is large.

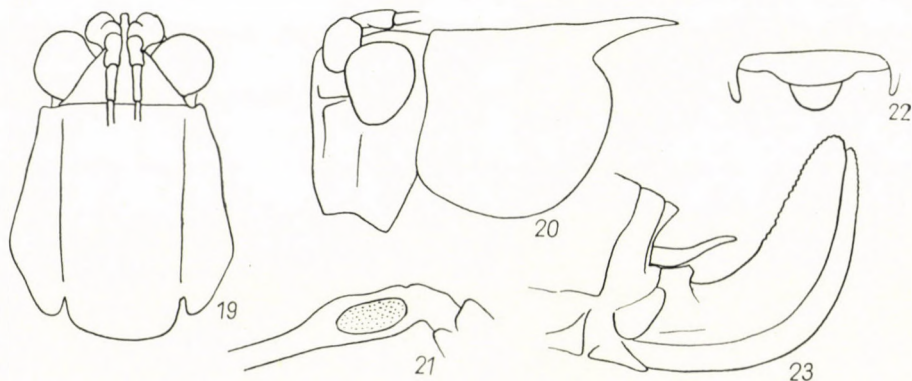
#### ***Phaneroptera phantasma* sp. n. (Figs. 19—23)**

Head, when viewed from above, small; vertex merely a small triangular area when discounting eyes. These latter large, their lateral margins considerably wider than lateral sections of head. In a lateral view, eyes enormous, extending to almost entire upper area of head. Vertex nearly straight, finely sloping toward antennae, then arcuately decumbent to facial section in front of antennae. Scape long, of moderate size.



Pronotum, when viewed from above, medium long, anterior margin straight; dorsal section delimited from lateral lobes more or less markedly, occasionally with a less distinct edge. Posterior margin short, rounded. In a lateral view, dorsal line slightly sinuous, posteriorly projecting margin long, slightly deflected. Posterior margin of pronotum sharply excised at basal section of wings. Anterior margin of lateral lobes sinuous; lateral plates rounded.

Wings long, tegmen also comparatively wide. At repose considerably extending beyond length of body, tegmen with about one-third, hind wing with more than, one-half of their lengths.



Figs. 19—23. *Phaneroptera phantasma* sp. n. 19 = head and pronotum from above; 20 = same, laterally; 21 = fore leg with tympanal organ; 22 = last abdominal tergite of female from above, and 23 = end of abdomen, laterally

Tympanal organ (below genu of fore tibia) long, as shown on Fig. 21. Genu of middle legs almost reaching end of abdomen, discounting ovipositor. Posterior femur projecting by almost half of its length beyond abdomen, its bisecting line coincident with about that of ovipositor.

Basic section of female ovipositor (discounting spatulate lamella) comparatively narrow and low in a posterior view; upper supporting lobe medium-sized, plate semicircularly arcuate between two small lateral apices. In a lateral view, ovipositor rather long, ascending section normal, but basal section elongate, its inner margin without angularly broken portion. Last abdominal tergite as on Fig. 20. Male unknown.

Length of body (with ovipositor) 16.5—17.8 mm, length of hind wing 28—30 mm, length of hind femur 19—20 mm, length of antenna 38—39 mm.

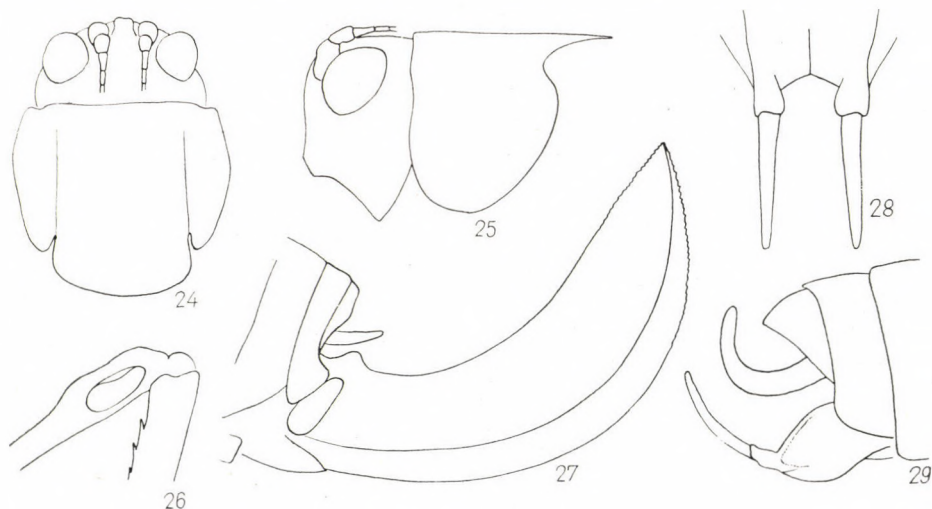
Holotype female: "N. Guinea, Simbang, Huon Golf, 1899, leg. L. BIRÓ". Paratypes: "N. Guinea, Simbang, Huon Golf, 1899, leg. L. BIRÓ", 2 female. Deposited in the Natural History Museum, Budapest.

The nearest ally of the species seems to be *Ph. guineana* sp. n., described above. Their distinguishing characters are as follows: the anterior margin of

the last abdominal tergite of the female is shaped in *Ph. guineana* as on Fig. 17, that of *Ph. phantasma* sp. n. as on Fig. 22. That of this latter rather resembles, and shows some similarity to, the respective margin of *Ph. brevis* SERV., with the difference, however, that the posterior margin of this latter species is more strongly arcuate posteriorad and thus almost covers the subsegmental squamiform structure. The shape of the ovipositor also distinguishes *Ph. phantasma* sp. n. from *Ph. guineana* sp. n. The former has a larger and less arched ovipositor (Fig. 23), without any break in the curve of the inner margin.

***Nephoptera sinica* sp. n. (Figs. 24—29)**

Medium-sized animals of a vivid green color. Head, when viewed from above, comparatively wide and short. Eyes small, interocular distance smaller than cephalic width at eyes. Vertex smooth, anterior apex obtuse, terminating



Figs. 24—29. *Nephoptera sinica* sp. n. 24 = head and pronotum from above; 25 = same, laterally; 26 = fore leg with tympanal organ; 27 = abdominal end of female; 28 = subgenital plate of male from below; 29 = end of male abdomen, laterally

in slightly elongate, flat pair of ribs. In a lateral view, head short, squat. Vertex flat. Eyes oval. Scape small, articulating between eyes and facial ribs. Antennae extremely long, considerably projecting beyond even apices of hind wings.

Pronotum, when viewed from above, comparatively wide and short; lateral and dorsal surfaces separated by rounded margins. Posterior margin slightly arcuate, anterior margin straight. In a lateral view, dorsal outline of pronotum straight. Anterior margin slightly sinuous. Lateral lobe of segment longer than wide, largely oval. Posterior margin slightly attenuate, terminating in spiniform apex. Excision at base of wings rounded, deep (Fig. 25).

Tegmen yellowish basally, but vivid green from basal third. Hind wing, except for apex, colorless, transparent, hyaline; apex green. Tegmen shorter than hind wing, relatively wide, about 4—4.5 times longer than wide; at repose about one-third longer than abdomen and ovipositor combined. Hind wing long and wide, at repose longer by one-half than abdomen and ovipositor together, its apex pointed.

Tympanal organ (below genu of fore tibia) oval, free on both sides of tibia, not covered by a lobe or any other kind of appendage. Femur of middle leg extending to middle of abdomen. Hind femur longer by almost one-half than abdomen.

Subanal plate of male extremely widening at base, pyriform, terminating in paired, narrow, long and slender, slightly curving appendages (Fig. 29). Appendages, when viewed from below, blade-shaped, apically rounded (Fig. 28). Cerci comparatively long, pale brownish, arcuate, apically slightly clavate. Ovipositor of female medium-sized, relatively narrow basally, evenly widening medially, and mucronate apically (Fig. 27).

Diagnostic measurements in mm

<i>Nephotera sinica</i> sp. n.		
	female	male
Length of body (without ovipositor in female)	19—20	17
Length of hind wing	36—37	34
Length of hind femur	21	19
Length of antenna	44—46	41

Holotype female: "China, Prov. Kiangsi, Lushan-Gebirge, 2—6. IX. 1959, leg. DR. V. SZÉKESY et YANG". Paratypes: "China, Prov. Kiangsi, Lushan-Gebirge, 2—6. IX. 1959, leg. DR. V. SZÉKESY et YANG", 1 male and 1 female. Deposited in the Natural History Museum, Budapest.

The nearest ally of the species is *N. persica* Uv. The separation of the two species is rather easy by a comparison of the pronota in a lateral view, since the anterior margin of the lateral lobe on the pronotum of *N. persica* Uv. arches in on obtusely broken angle into the inferior portion. The excision at the base of the wings is essentially shallower and less deeply cut in the pronotum than in that of *N. sinica* sp. n. The subgenital plate of the male is considerably stouter and of a slightly different construction: medially fused for a longer stretch, and with also stouter appendages. The ovipositor of the female is essentially shorter, less curved, and almost straight as compared to that of *N. sinica* sp. n.

Author's address: Budapest, VIII., Baross u. 13, Hungary.



ÖKOLOGISCHE, ETHOLOGISCHE,  
TIERGEOGRAPHISCHE UND  
SYSTEMATISCHE UNTERSUCHUNGEN  
AN PALÄARKTISCHEN GRYONINEN  
(HYMENOPTERA: PROCTOTRUPOIDEA, SCELIONIDAE)

Von

J. B. SZABÓ

STAATLICHES INSTITUT FÜR HYGIENE, PARASITOLOGISCHE ABTEILUNG, BUDAPEST  
(DIRECTOR: DR. T. BAKÁCS)

(Eingegangen am 28. September 1965)

Das hier behandelte reichhaltige Material des Ungarischen Naturwissenschaftlichen Museums wurde mir zur Bearbeitung noch im Jahre 1957 übergeben. Damals wußte ich noch nicht, wie viele Jahre die Durchsicht des Materials benötigen wird.

Meine Untersuchungen führten zu dem Ergebnis, daß die Mehrzahl der zur Unterfamilie Gryoninae gehörigen Gattungen und Arten eine sehr große Variationsbreite aufweist, die aber m. E. eine auf die natürlichen Verbindungen aufgebaute Systematisierung noch keineswegs ausschließt. Aus diesem Grunde vermag ich L. MASNER nicht beizupflichten, der nur die Gattungen *Gryon* HAL., 1836, und *Eremioscelio* PRIESN., 1951, anerkennt, dagegen eine so gute — in den Tropen und auch im Paläarktikum durch mehrere Arten repräsentierte — Gattung, wie *Hadronotus* FÖRSTER, 1856, mit *Gryon* HAL., 1836, zusammenzieht. Diese Auffassung erwies sich im Lichte meiner Untersuchungen als unhaltbar. Die *Hadronotus*-Arten können nämlich von den nahe verwandten Gattungen durch den quergestreiften Stirneindruck und durch die von den Forschern bisher ganz und gar außer acht gelassenen Flügelborstenreihen leicht und gut abge sondert werden.

Es ist eine unbestrittene Tatsache, daß sich die Gryoninen-Gattungen voneinander nur durch minuziöse Merkmale unterscheiden. Dies beweist aber nichts anderes, als daß wir es hier mit einer plastischen, sich noch heute nach mehreren Richtungen hin entwickelnden Unterfamilie zu tun haben, und zwar mit einer Unterfamilie und nicht mit einem Tribus, da sie morphologisch der Unterfamilie Telenominae nahesteht. Es war deshalb erforderlich, sie aus der Unterfamilie Scelioninae herauszuheben und als selbständige Unterfamilie zu behandeln.

In den paläarktischen Gebieten ist die Gattung *Gryon* HAL. meines Wissens durch mehrere nahe verwandten Arten vertreten. Erwähnenswert ist die

Tatsache, daß *Gryon misellus* HAL., 1833, in polymorphen Formen vorkommt. Diese Art weist eine so extreme Variationsbreite auf, daß man sie nach unseren heutigen Wissen als eine »in statu nascendi« befindliche Art betrachten muß. Ja, ich bin sogar überzeugt, daß sich Taxone, die heute nur für Formen gelten, auf Grund künftiger Zuchtangaben als selbständige Arten erweisen werden. Zur Zeit sind jedoch die einzelnen Erscheinungsformen voneinander noch nicht einwandfrei zu trennen, und man darf höchstens von einem *Gryon misellus*-Formenkreis sprechen. Dieser Sachverhalt wurde übrigens von L. MASNER erkannt.

L. MASNER hat die Gattung *Hadronotellus* KIEFF., 1917 ebenfalls der Gattung *Gryon* zugezählt. Seine Feststellungen entbehren indes der Stichhaltigkeit, da er sehr wichtige Merkmale, wie die Beschaffenheit des Scheitelrandes, die Form des Schildchens und die Höhenverhältnisse des Körpers außer acht gelassen hat, obzwar diese Unterschiede Tribuswert besitzen. Die Gattungen, bei denen das Tier einen gedrungenen, flachen Körperbau hat, oder bei denen der Petiolus durch das Scutellum bis zur Hälfte überdacht ist (*Hadronotellus*, *Eremioscelio*, *Masneria* gen. nov., *Encyrtoscelio* DODD, 1914, *Pachyscelidris* SZEL., 1941) rechne ich zu Tribus Hadronotellini, die übrigen oben nicht angeführten Gattungen hingegen zu den Gryonini.

Phylogenetisch betrachtet, halte ich die Gattung *Hadronotus* für die Urform. Die hierher gehörenden Arten (tropische und auch paläarktische) haben die größte Skulptur. Sie sind wahrscheinlich auf der Marginalis und Subcostalis mit Sinnesborsten bedeckt, weiters bei denen, wo, wie bei *Hadronotus ochraceus* sp. n., am Mesoscutum drei vertiefte, durchlaufende Furchen vorhanden sind. Die Gryoninen-Gattungen haben sich aus der Urform *Hadronotus* in drei Richtungen entwickelt. Die Formen, die sich in die Richtung von Hadronotellini entwickelten, haben einen gedrungenen, flachen Körper, ihr Schildchen überdacht, von oben betrachtet, den Petiolus bis zur Mitte. Auch die Rückbildung des Flügelgeäders hat, wie dies *Masneria* gen. nov., *Eremioscelio* und *Pachyscelidris* beweisen, bereits begonnen. Eine andere Richtung haben die Gattungen der Gryonini eingeschlagen: von dem starke Übergangsformen zeigenden *Pannongryon* gen. nov. gelangen wir über *Plesiobaesus* KIEFF., 1913, *Hungarogryon* gen. nov., *Mirotelenomus* DODD, 1913 zu *Gryon* HAL. Das Flügelgeäder der angeführten Gattungen — ausgenommen jenes von *Mirotelenomus* — ist komplett, d. h. es besteht aus Subcostalis, Marginalis und Stigmalis. Bei den *Gryon*-Arten ist sogar eine Postmarginalis vorhanden. Die dem Tribus Gryonini angehörenden Arten sind von schlanker Gestalt, die Form des Abdomens mehr oder weniger konkav, die Skulptur detailreicher als bei den Hadronotellini. *Sundholmia* gen. nov. stellt die dritte Entwicklungsrichtung dar. Hier ist der Körper glatt und glänzend.

Alle meine Daten lassen sich auch zahlenmäßig beweisen. Die *Hadronotus*-Arten zählten in meinem Material ungefähr 70 Stücke, die Arten der Hadronotellini etwa 250 Exemplare, die der Gryonini etwa 560 Exemplare. Auffallender-

weise repräsentierten in diesem reichen Material die Gattung *Sundholmia* gen. nov. insgesamt nur 6 Stücke.

L. MASNER mißt der Rückbildung des Flügelgeäders ein übermäßig großes Gewicht bei, obgleich das Verschwinden des Flügelgeäders, d. h. seine innerhalb derselben Art vorkommende Rückbildung bzw. sein völliges Verschwinden nur als die Zwischenstufe einer noch heute andauernden Spezialisierung zu betrachten ist. Eben deshalb dürften die bisweilen komplette Nervatur zeigenden Exemplare von *Eremioscelio* und *Masneria* gen. nov. als Gattungen betrachtet werden. Hier stehen wir derselben phylogenetischen Situation gegenüber wie beim Formenkreis *Gryon misellus*. Man kann übrigens in der Natur schwerlich eine solche systematische Einheit finden, die in irgendeiner tiergeographischen Gebietseinheit keine Übergangsformen aufwiese.

Leider wurde der Holotypus von *Hadronotellus pedestes* KIEFF., 1917, bisher noch nicht untersucht, trotzdem über diese Gattung schon mehrere Forscher (MASNER, MUESEBECK, NIXON etc.) ihre Meinung geäußert haben. Das liebenswürdige Entgegenkommen von Herrn DR. B. PETERSEN, hat es mir ermöglicht, den im Naturhistorischen Museum zu Kopenhagen aufbewahrten Exemplare der typische Art der erwähnten Gattung zu sehen, wofür ich ihm meinen aufrichtigsten Dank ausspreche. Das Auffinden des Holotypus war für die Systematisierung äußerst wichtig und für die Klärung der Verwandtschaftsverhältnisse der Gryoninen von größter Bedeutung.

Die Ausleihebestimmungen des »G.-Doria-Museums« in Genova haben mir — da eine Reise nach dort umständehalber leider nicht in Frage kommt —, die Untersuchung der dort aufbewahrten Holo- und Paratypen einfach unmöglich gemacht. Aus diesem Grunde mußte ich jene Arten, deren Holotypus wahrscheinlich Genova besitzt und die ich leider nur aus oberflächlichen Beschreibungen von J. J. KIEFFER kenne, aus meinem Bestimmungsschlüssel weglassen.

### Bestimmungstabelle der mir bekannten paläarktischen Gryoninen-Gattungen

- |   |   |                                      |
|---|---|--------------------------------------|
| 1 | (4) Scheitel scharf quergekielt (Abb. 5).   |                                      |
| 2 | (3) Flügel verkürzt, verschmälert beim ♀ oder völlig entwickelt, dann aber mit Subcostalis, Marginalis und Stigmalis. Thorax fein und mikroskopisch fein dicht punktiert                |                                      |
|   |   | 1. <i>Hadronotellus</i> KIEFF., 1917 |
| 3 | (2) Vorderflügel höchstens mit Spuren einer Subcostalis, seltener auch mit Marginalis und Stigmalis. Thorax wellenartig quergestreift   |                                      |
|   |   | 2. <i>Eremioscelio</i> PRIESN., 1951 |
| 4 | (1) Scheitel abgerundet oder flach, nicht quergekielt.  |                                      |
| 5 | (6) Kopf mit einer zwischen die Augen reichenden Stirnlamelle. Flügeln fehlend oder vorhanden, dann aber ohne Adern, an der Hand mit auffallend langen Wimperhaaren, am Ende abgerundet |                                      |
|   |   | 3. <i>Pachyscelidris</i> SZEL., 1941 |
| 6 | (5) Kopf ohne solche Stirnlamelle.  |                                      |
| 7 | (16) Kopf mit einem seichten oder tiefen Stirneindruck.   |                                      |
| 8 | (9) Kopf mit einem seichten, quergestreiften Stirneindruck (Abb. 3). Subcostalis und Marginalis mit starken, langen, gereihten, dicken Borstenhaaren (Abb. 1—2)                         |                                      |
|   |   | 4. <i>Hadronotus</i> FÖRSTER, 1856   |

- 9 (8) Stirneindruck nicht quergestreift. Marginalis und Subcostalis nicht mit auffallend langen, starken Borstenhaaren beborstet.
- 10 (11) Abdomen zugespitzt. Marginalis punktförmig. Scutellum, von der Seite gesehen, stark gewölbt, das Metascutum und Propodeum überdachend (Abb. 6,8)  
5. *Pannongryon* gen. nov.
- 11 (10) Abdomen hinten abgerundet.
- 12 (13) Flügeln voll entwickelt. Tergite des Abdomens immer skulptiert.
- 13 (12) Flügeln verkürzt, stummelförmig, den Hinterrand des Propodeums erreichend. Tergite des Abdomens glatt und glänzend. Zweites Tergit länger und breiter als der Thorax (Abb. 10). Scutellum die Mitte des Petiolus nicht überragend  
6. *Sundholmia* gen. nov.
- 14 (15) Vorderflügel mit einer kurzen Subcostalis. Scutellum von gewöhnlicher Gestalt. Körper schlank  
7. *Mirotelenomus* DODD, 1913
- 15 (14) Vorderflügel ohne Adern. Scutellum die Mitte des Petiolus überragend. Metascutum fehlend, Propodeum beiderseits sichtbar. Körper dick, plump  
8. *Masneria* gen. nov.
- 16 (7) Kopf ohne Stirneindruck. Petiolus mit drei parallelen, stets vorkommenden, weit voneinander stehenden Längskielen.
- 17 (18) Vorderflügel ohne Postmarginalis, am Ende zugespitzt, mit auffallend langen Wimperhaaren (Abb. 9) etwas verschmälert. Keule sechsgliedrig.  
9. *Hungarogryon* gen. nov.
- 18 (17) Vorderflügel ohne auffallend lange Wimperhaare.
- 19 (20) Keule sechsgliedrig. Flügel verkürzt, oder voll entwickelt. Marginalis lang, Postmarginalis vorhanden.  
10. *Gryon* HAL., 1833
- 20 (19) Keule fünfgliedrig (Abb. 11). Flügel stets voll entwickelt. Marginalis punktförmig, Postmarginalis fehlend.  
11. *Plesiobaeus* KIEFF., 1913

### 1. *Hadronotellus* KIEFF., 1917

Kopf quer, hinten mit einem Querkiel. Augen kahl, fast den Hinterrand erreichend. Stirneindruck nicht gerandet, flach oder tief, nie quergestreift. Antennen zwölfgliedrig, beim ♀ mit einer sechsgliedrigen Keule. Antenne beim ♂ faden- oder perlschnurförmig. Thorax etwas von oben zusammengedrückt, flach. Scutellum die Mitte des Petiolus erreichend. Metascutum fehlend. Vorderflügel verkürzt, verschmälert oder voll entwickelt, mit Subcostalis, Marginalis, Stigmatis und Postmarginalis. Abdomen dick, plump, aus sechs sichtbaren Segmenten zusammengesetzt. Körper dick, plump. Thorax immer fein und dicht punktiert. Tarsen 5, 5, 5. Sporen 1, 1, 1.

Typische Art: *Hadronotellus pedester* KIEFF., 1917 ♂♀.

### Bestimmungstabelle der mir bekannten paläarktischen Arten der Gattung *Hadronotellus* Kieff., 1917

- 1 (2) Zweites Tergit des Abdomens höchstens dreimal so breit wie lang  
1. *hungaricus* sp. nov. ♂♀
- 2 (1) Zweites Tergit des Abdomens viermal breiter als lang.
- 3 (4) Scheitel mit einem stark gebogenen Querkiel. Kopf, von oben gesehen, halbkreisförmig, zweieinhalbmal breiter als lang, mit einem tiefen Stirneindruck  
2. *howardi* MOKR. & OGL., 1931 ♂♀
- 4 (3) Querkiel des Scheitels nicht stark bogig. Kopf, von oben gesehen, nicht halbkreisförmig, mehr als viermal so breit wie lang. Stirneindruck seicht.



5 (6) Scutellum dreieckig. Flügel beim ♀ verkürzt

3. *pedester* KIEFF., 1917 ♂♀

6 (5) Scutellum halbkreisförmig. Flügel beim ♀ stets entwickelt

4. *monspeliensis* PICARD, 1924 ♂♀

1. *Hadronotellus hungaricus* sp. nov. ♂♀ (Abb. 7)

♂ — Schwarz. Beine gelb. Scapus gelb. Pedicellus dunkelbraun. Scapus etwa siebenmal länger als breit. Erstes Fadenglied zweimal so lang wie breit. Fadenglieder 4—9 so lang wie breit. Das Endglied fast zweimal so lang wie das neunte Glied.

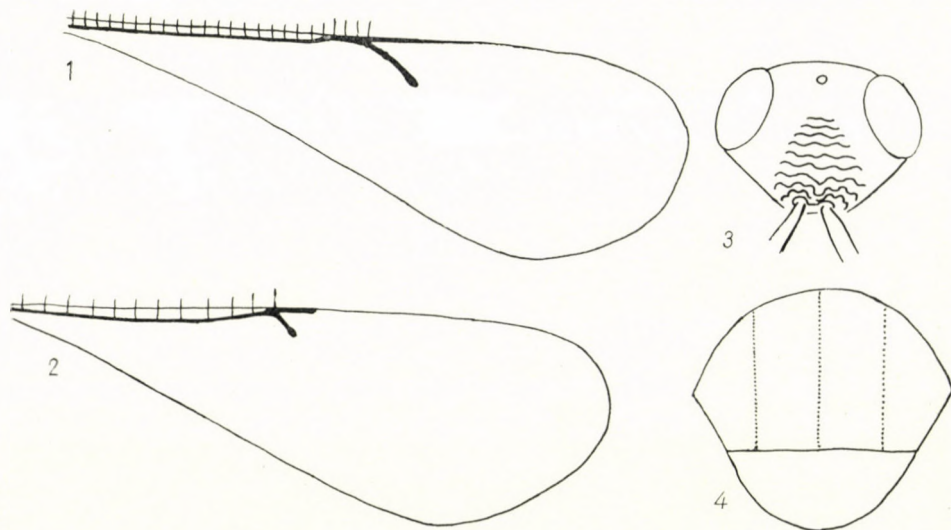


Abb. 1—4. 1 = *Hadronotus hungaricus* sp. nov. ♀. Vorderflügel; 2 = *Hadronotus muscaeformis* NEES ♀. Vorderflügel; 3 = *Hadronotus muscaeformis* NEES ♀. Stirn von vorne gesehen; 4 = *Hadronotus ochraceus* sp. nov. ♀. Mesoscutum von oben gesehen

♀ — Schwarz. Schenkel lehmig gelb. Beine sonst gelb. Coxae schwarz. Scapus rötlich gelb. Pedicellus dunkelbraun. Flügel rauchig. Kopf quer, etwa dreimal breiter als lang, überall mikroskopisch fein punktiert. Hinterrand des Kopfes scharf bogig gekielt. Stirneindruck tief, nicht gerandet, mit einem feinen Mittel-längskiel. Augen groß, kahl, durch eine tiefe Furche mit der Mandibelbasis verbunden. Ocellen im Dreieck stehend, wobei die lateralen vom Augenrand um ihren doppelten Querdurchmesser entfernt sind. Scapus fast anderthalbmal länger als der Pedicellus und Fadenglieder 1—4 zusammen etwa achtmal länger als breit. Pedicellus birnenförmig, dreimal länger als breit. Erstes Fadenglied zweimal länger als breit, um die Hälfte länger als das zweite, das dritte so lang wie breit. Viertes quer becherförmig. Pedicellus und Fadenglieder 1—4 kürzer als die Keule. Thorax sehr fein und mikroskopisch fein dicht punktiert.

Scutellum halbkreisförmig, die Mitte des Petiolus überragend. Propodeum beiderseits sichtbar. Propleuren fein punktiert. Meso-, Metapleuren quergestreift. Vorderflügel mit Subcostalis. Marginalis doppelt so lang wie breit. Stigmalis etwas kürzer als die Postmarginalis. Vorderflügel distal bewimpert. Hinterflügel heller gefärbt, mit Subcostalis und Marginalis. Abdomen so lang wie der übrige Körper, dick und plump. Petiolus etwa viermal breiter als lang, dicht längsgestreift. Zweites Tergit das längste, vorn dicht gestreift, im übrigen dicht lederartig punktiert-genetzt. Tergite 3—6 fein lederartig punktiert (Abb. 7). L.: 1,2—1,4 mm. Biologie unbekannt.

Holotypus (1 ♀) und Paratypen (4 ♀), ferner Allotypus (1 ♂) befinden sich in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Unterscheidet sich von den bisher bekannten *Hadronotellus*-Arten durch die Kopfbildung, durch die Antennenbildung und ferner durch die Skulptur des Abdomens.

Fundorte: I/1. Duka-Csöröghegy 3. XI. 1924 (inter muscos), 2 ♀; Sződ 17. III. 1920, 1 ♀ (Holotypus); Vác-Tudósdomb 20. VII. 1929, 1 ♀; Vác-Tudósdomb 21. VII. 1929, 1 ♂ (Allotypus). — II/1. Budapest, Gellért-hegy 17. III. 1920, 1 ♂; Budapest, Hűvösvölgy 19. V. 1908, 1 ♀ (Bi).

## 2. *Hadronotellus howardi* MOKR. & OGL., 1931 ♂ (nov.), ♀

♂ — Schwarz. Beine gelb. Flügel rauchig. Scapus an der Basis rötlich, sonst schwarz, etwa achtmal länger als breit, länger als die vier folgenden Antennenglieder zusammen. Pedicellus zweieinhalbmal so lang wie breit, birnenförmig. Erstes Fadenglied walzenrund, dreimal länger als breit länger als das folgende. Zweites Glied etwa zweimal länger als breit, walzenrund, das dritte so lang wie dick, im distalen  $\frac{2}{3}$  gezähnt. Viertes bis neuntes Glied walzenrund, anderthalbmal länger als breit. Das Endglied um die Hälfte länger als das neunte Glied, an der Spitze allmählich verjüngt.

♀ — Schwarz. Beine gelb. Flügel rauchig. Kopf quer, zweieinhalbmal breiter als lang, hinten bogig quergekielt gerandet, überall fein und mikroskopisch fein dicht punktiert. Stirneindruck tief, fein quengerunzelt-genetzt, scharf gerandet, in der Mitte mit einem Mittellängskiel. Augen fast den Hinterrand des Kopfes erreichend, eirund. Augen durch eine tiefe Furche mit der Mandibelsbasis verbunden. Ocellen in einem Dreieck stehend, wobei die lateralen vom Augenrand weniger weit abstehen als voneinander. Scapus achtmal länger als breit, länger als die fünf folgenden Antennenglieder zusammen. Pedicellus länglich, birnenförmig, etwa dreieinhalbmal länger als breit, länger als das erste Fadenglied. Erstes Fadenglied fast walzenrund, dreimal länger als breit, länger als das zweite. Das dritte Fadenglied so lang wie breit, das vierte quer, zweimal breiter als lang. Keule länger als die Fadenglieder 1—4 zusammen. Thorax kaum schmaler als der Kopf, überall fein und mikroskopisch fein dicht punktiert. Praescutum beiderseits sichtbar. Mesoscutum etwas breiter als lang. Scu-

tellum halbkreisförmig, die Mitte des Petiolus überragend. Propodeum beiderseits sichtbar. Pleuren quergestreift. Vorderflügel mit langer Subcostalis. Marginalis zweimal länger als breit. Stigmalis so lang wie die Postmarginalis, am Ende knotenartig verdickt. Vorderflügel distal bewimpert. Subcostalis und Marginalis ohne Borstenhaare. Hinterflügel heller gefärbt, hinten mit langen

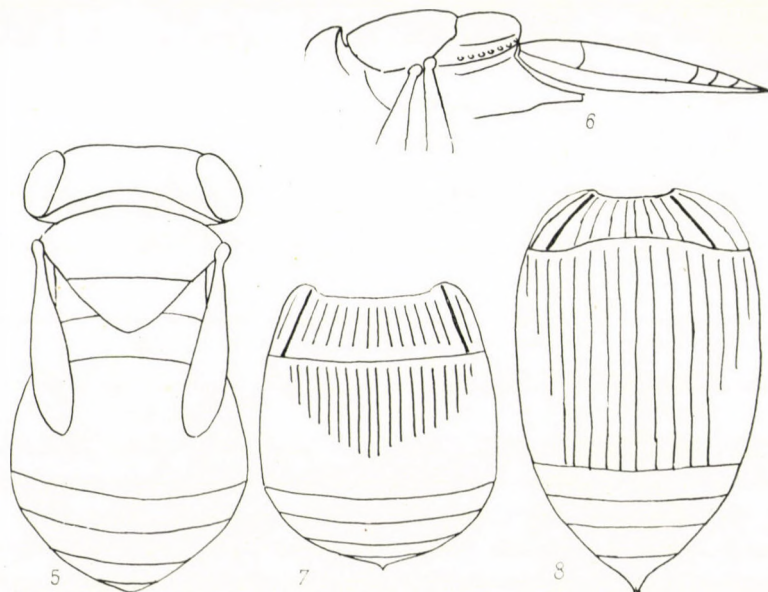


Abb. 5—8. 5 = *Hadronotellus pedester* KIEFF. ♀. Habitus; 6 = *Pannongryon szelenyii* sp. nov. ♀. Thorax von der Seite gesehen; 7 = *Hadronotellus hungaricus* sp. nov. ♂. Abdomen; 8 = *Pannongryon szelenyii* sp. nov. ♀. Abdomen

Wimperhaaren, mit Subcostalis und Marginalis. Abdomen so lang wie der übrige Körper. Petiolus längsgestreift, lateral fein punktiert, etwa viermal breiter als lang. Zweites Tergit das größte, vorn gestreift, sonst grob genetzt-punktiert, um die Hälfte länger als der Petiolus. Tergite 3—6 sehr fein punktiert, fast glatt. L.: 1,2—1,4 mm. Biologie: Die Art lebt in Eiern von *Lymantria dispar* (L.).

Allotypus (1 ♂) und weitere 4 ♂♂ befinden sich in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Fundorte: I/1. Duka-Csöröghegy 4. XI. 1923 (inter muscos), 1 ♀ (Bi); Sukoró 13—15. X. 1951, 1 ♀ (K). — II/1. Budaörs 30. VI. 1957, 5 ♂ (Csiki hg.) (JBSz); Somlóvásárhely, Lovasi völgy 29. VIII. 1954 (aus Abfallaub gesiebt und mit dem Ausleseapparat gewonnen), 1 ♀ (Bal). — Italien: Illyria, Görz, Vezice plato 24. I. 1923, 1 ♀ (Fo).

### 3. *Hadronotellus pedester* KIEFF., 1917. ♂♀ (Abb. 5)

Neubeschreibung des Holo- und Allotypus.

♂ — Schwarz. Beine rotgelb, Coxae schwarz. Scapus länger als die fünf folgenden Fadenglieder zusammen, etwas bogig. Pedicellus birnenförmig, etwas kürzer und viel schmaler als das folgende Fadenglied. Zweites Fadenglied in

der Mitte mit einem kleinen Zähnchen, aber distal abgestutzt, proximal abgerundet. Fadenglieder 4—9 in Form und Länge gleich. Das Endglied zweimal so lang wie das neunte Glied, allmählich sich verjüngend. Vorderflügel gut entwickelt, mit einer langen Subcostalis und einer punktförmigen Marginalis. Postmarginalis zweieinhalbmal so lang wie die schräge Stigmalis. Vorderflügel glashell, distal bewimpert.

♀ — Schwarz. Beine rotgelb, Coxae schwarz. Körper flach und plump. Kopf viermal so breit wie lang, zweimal höher als lang, überall fein lederartig punktiert. Hinterrand des Kopfes bogig scharf gekielt. Stirn mit einem in der Richtung des Mundes verbreiterten und vertieften Stirneindruck, mit einer gut sichtbaren, in der Richtung des Mundes sich verbreiternden Mittellängsleiste. Ocellen im Dreieck stehend, die lateralen vom Augenrande um ihren doppelten Querdurchmesser getrennt. Augen kahl, länger als die Wangen, eirund, mit der Mandibelbasis durch eine tiefe Furche verbunden, den Hinterrand des Kopfes erreichend. Scapus sechsmal so lang wie breit, bogig, so lang wie der Pedicellus und die Fadenglieder 1—4 zusammen. Pedicellus birnenförmig, zweieinhalbmal so breit wie lang, an der Spitze allmählich sich verdickend. Erstes Fadenglied zweimal so breit wie lang, walzenrund, zweites um die Hälfte kürzer als das dritte. Das dritte und vierte Fadenglied allmählich breiter werdend, fast quadratisch. Keule sechsgliedrig. Keulenglieder 1—2 quer, zusammengenommen so lang wie das dritte Keulenglied. Die folgenden Keulenglieder, mit Ausnahme des Endgliedes — gleichlang, gleichdick. Das Endglied länger als das vorletzte Glied, am Ende allmählich verjüngt. Thorax so breit wie der Kopf, überall fein lederartig punktiert. Mesoscutum zweieinhalbmal so breit wie lang, ohne Spur der Parapsidenfurchen. Scutellum rundlich dreieckig, das vordere  $\frac{2}{3}$  des Petiolus überdachend, lederartig. Mesopleuren quergestreift, Metapleuren quergestreift. Abdomen breit sitzend. Petiolus sechsmal so breit wie lang, gestreift. Zweites Tergit das längste, an der Basis gestreift, sonst in der Mitte fein fingerhutartig punktiert, beiderseits fein lederartig wie die folgende Tergite. Flügeln verkürzt, den Vorderrand des zweiten Tergits erreichend. L.: ca. 1 mm. Biologie: Die Art lebt in Eiern von *Aelia acuminata* (L.) (Hemiptera).

Holotypus (1 ♀) und Paratypus (1 ♂) befindet sich im Universitetets Zoologiska Museum in Kopenhagen.

Variiert beim ♀: Flügel gut entwickelt, dann aber mit Subcostalis, mit einer punktförmigen Marginalis. Stigmalis kurz, Postmarginalis bald vorhanden, bald fehlend.

Die von mir untersuchten Exemplare (Holotypus 1 ♀ und Paratypus 1 ♂) sind in Alkohol konserviert, ihre Daten sind die folgenden: »*Hadronotus pedestes* KLEFF., Type, Ag. *Aelia acuminata*-Og; tager Fiskebak, 27./6., 15. Klakket 20. 8. 15. J. P. KRYGER ded.«

F u n d o r t e : I/1. Ágasegyháza 23. X. 1953 (Sandhügel, aus Gräsern gesiebt und mit dem Ausleseapparat gewonnen), 1 ♀ (Bal); Duka-Csöröghegy 4. XI. 1923 (inter muscos), 1 ♀; Duka-Csöröghegy 6. X. 1924 (sub muscis), 2 ♀; Duka-Csöröghegy 3. XI. 1924 (inter muscos), 1 ♀; Sződ 24. III. 1920, 1 ♀; Sződ 26. V. 1920, 1 ♀ (Bi). — II/1. Fehérvárcsurgó 27. IX. 1923, 1 ♀ (Bi); Velencei hgs., Nadap 23. X. 1951, 8 ♀ (K.). — Bulgarien: Mts. Rila 18. IX. 1928, 1 ♀ (Bi).

Untersuchtes Material 19 ♀ (1) und 1 ♂. Eine sehr seltene Art. Die Art kommt in Ungarn auf xerothermen Sandhügeln und Bergabhängen vor.

4. *Hadronotellus monspeliensis* PICARD, 1924 ♂ (nov.), ♀ (Abb. 16)

♂ — Schwarz. Beine, Scapus und Pedicellus rotgelb. Flügeln bräunlich angelaufen. Scapus etwa achtmal so lang wie breit, etwas bogig. Pedicellus birnenförmig, zweieinhalbmal länger als breit. Erstes Fadenglied so lang wie der Pedicellus, aber viel breiter als das erwähnte Antennenglied. Zweites Fadenglied kürzer und schmaler als das erste. Das dritte im distalen  $\frac{2}{3}$  etwas zahnartig vorgezogen. Vom vierten bis neunten etwas länger als breit. Das Endglied fast dreimal so lang wie breit, allmählich sich verjüngend, zugespitzt.

♀ — Neubeschreibung des Holotypus. Schwarz. Beine rötlichgelb. Scapus und Pedicellus rot. Kopf quer, etwa fünfmal breiter als lang, überall mit feiner und mikroskopisch feiner dichter Punktierung. Stirneindruck seicht, nicht gerandet, punktiert, ohne Mittellängskiel oder Furche. Hinterkopf stark bogig gekielt. Augen kahl, den Hinterrand des Kopfes erreichend, durch eine tiefe Furche mit der Mandibelbasis verbunden. Ocellen im Dreieck stehend, die lateralen weit vom Augenrand abstehend. Scapus achtmal länger als breit, länger als die fünf folgenden Antennenglieder zusammen. Pedicellus fast viermal so lang wie breit, fast walzenrund, proximal etwas dünner als distal, so lang wie die beiden folgenden Fadenglieder zusammen. Erstes Fadenglied fast walzenrund, doppelt so lang wie breit, länger als das zweite, dieses fast so lang wie breit, das dritte dem zweiten gleich, das vierte quer, doppelt so breit wie lang. Keule etwas länger als der Pedicellus und die Fadenglieder 1—4 zusammen. Thorax schwach gewölbt, von oben zusammengedrückt, sehr fein und dicht mikroskopisch fein punktiert, fast zweimal breiter als lang. Scutellum halbkreisförmig, fein und dicht mikroskopisch fein punktiert, die Mitte des Petiolus überdachend. Propodeum nur beiderseits sichtbar. Pre- und Mesopleuren fein lederartig punktiert. Metapleuren quergestreift. Vorderflügel schwach braunlich angelaufen. Subcostalis ohne Borstenhaare. Stigmalis punktförmig. Postmarginalis fast so lang wie die kurze, schräge Stigmalis. Abdomen breit sitzend. Petiolus siebenmal so breit wie lang, gestreift, vorn in der Mitte eingedrückt, lateral beiderseits punktiert. Zweites Tergit das größte, an der Basis in der Mitte mit sehr kurzen Streifen, sonst fingerhutartig punktiert, viermal breiter als lang. Tergite 3—6 punktiert. L.: 0,9—1 mm. Biologie unbekannt.

Holotypus (1 ♀) befindet sich in der Sammlung des Französischen Naturhistorischen Museums in Paris, Allotypus (1 ♂) und weitere 70 ♂♂ in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Die Fangdaten und die Fundorte sind — nach der tiergeographischen Gebietseinheiten von L. MÓCZÁR geordnet — folgende: I/1. Budapest, Ferencváros 9. VII. 1915 (Robinienwald), 1 ♂; Budapest, Káposztásmegyer 26. VII. 1916, 3 ♂; Budapest, Rákos 20. VI. 1908, 1 ♂; Budapest, Rákoser Gemeindefriedhof 17. VIII. 1915, 2 ♂; Csepel 9. VII. 1908, 1 ♂ (Bi); Dömsöd, Apajpuszta 1. X. 1951, 2 ♀ (K); Duka-Csöröghegy 26. X. 1923, 1 ♀; Duka-Csöröghegy 30. VII. 1924, 1 ♀; Duka-Csöröghegy 6. X. 1924 (sub muscis), 2 ♀; Duka-Csöröghegy 17. IX. 1925, 1 ♀ (Bi); Kunfehértó 11. VII. 1955 (*Festucetum vaginatae*), 3 ♂; Kunfehértó 19. VII. 1955 (*Festucetum vaginatae*), 4 ♂ (JBSz); Nyírbátor 5. VI. 1928, 1 ♂ (Szil); Szigetmonostor 2. VII. 1957 (Sandhügel), 2 ♂, 1 ♀ (JBSz); Szigetszentmiklós 2. VII. 1931, 1 ♂; Sződ 25. VII.

1918, 1 ♂; Sződ, 23. VII. 1920, 1 ♂; Sződ 10. IX. 1920, 1 ♂; Sződ 20. V. 1931, 1 ♂ (Bi); Tompa 25. VIII. 1955, 1 ♂; Tompa 16. VIII. 1955, 1 ♀ (JBSz); Vác-Gajáritelep 25. VII. 1924, 3 ♂; Vác-Szokolya 2. IX. 1926, 1 ♂; Vác—Sződ 21. VIII. 1922, 2 ♂; Vác—Sződ 20. VII. 1925, 1 ♂; Vác—Sződ 31. VIII. 1925, 1 ♂; Vác—Sződ 21. VII. 1929, 2 ♂; Vác—Sződ 18. VIII. 1929, 1 ♂; Vác-Tudósdomb 14. VIII. 1927, 1 ♂; Vác-Tudósdomb 8. VII. 1929, 1 ♂; Vác-Tudósdomb 21. VII. 1929, 4 ♂; Vác-Tudósdomb 3. XI. 1929 (radix graminum in pratis, cribrifera ope), 1 ♀; Vác-Tudósdomb 25. V. 1930 (in pratis, retis ope), 1 ♀; Vác-Tudósdomb 24. VI. 1930, 2 ♂; Vác-Tudósdomb 30. VI. 1930 (xerophil in arenosis), 2 ♂ (Bi). — II/1. Budaörs 30. VI. 1957 (Csíki hg.), 3 ♂ (JBSz); Budapest, Rózsadomb 17. VIII. 1919, 1 ♂; Budapest, Sashegy 20. XI. 1905, 1 ♀; Budapest, Sashegy 10. VI. 1917, 1 ♂; Budapest, Sashegy 7. VII. 1917, 1 ♂; Budapest, Sashegy 28. VII. 1919, 1 ♂; Budapest, Sashegy 21. XI. 1926 (cribrifera ope), 1 ♂; Budapest, Sashegy 6. VIII. 1927, 1 ♂; Fehérvársurgó 25. VII. 1923, 2 ♂ (Bi); Nadap, Velencei hg. 14. X. 1951 (unter Baumrinde), 3 ♀; Nadap, Velencei hg. 23. X. 1951, 1 ♀; Pákozd 9. X. 1951, 2 ♀ (K); Tihany 20. VII. 1954 (unter Abfalllaub im *Pinus-nigra*-Wald gesiebt), 1 ♀ (Bal). — II/2. Aggtelek (Nagymező) 7. VI. 1958 (im Boden einer Doline, mit dem Ausleseapparat gewonnen), 1 ♂ (Bal). — III/4. Tasnád 7. VII. 1912, 3 ♂; Tasnád 9. VII. 1912 (*Hadronotus pubescens* det. BRÖ), 1 ♂; Tasnád 18. VII. 1912, 2 ♂, 1 ♀ (Bi). — III/5. Nagyenyed 23. VII. 1917, 1 ♂ (Bi). — VI/2. Simontornya 30. V. 1912, 1 ♀ (Pil); Simontornya 13. VII. 1931 (in quercetis), 2 ♂ (Bi). — Bulgarien: Küfetsé 24. VII. 1928, 1 ♂; Küstendil 10. VIII. 1928 (xerophil), 2 ♂; Mts. Rila 8. IX. 1928 (in aridis), 3 ♂; Mts. Rila 12. IX. 1928 (1200 m Seehöhe, in pinetis), 1 ♂ (Bi).

Das untersuchte Material umfaßt 93 Exemplare, unter diesen Weibchen 22 (17) und Männchen 71 (27). Eine eurychrone Art, die jährlich wenigstens drei Generationen entwickelt (Abb. 16, II), lebt auf xerothermen Bergabhängen in sandigen Gebieten und vom Eichenwald bis zum Fichtenwald (1200 m Seehöhe) verbreitet. Sammelbar nach verschiedenen Methoden (Siebe, Ausleseapparat, Bodenprobe, Ketscher). Die überwinternden Individuen leben im Boden, unter Moos usw. Das Männchen-Weibchen-Häufigkeitsverhältnis beträgt 3,4 : 1. Die Imagines fliegen von Mitte Mai bis Mitte Oktober. Parasitiert wahrscheinlich Lepidopteren oder Pentatomiden-Eier. Die Art lebt in Frankreich, Bulgarien, Ungarn, Rumänien. Es ist meiner Meinung nach nicht ausgeschlossen, daß die von H. PRIESNER im Jahre 1951 beschriebene neue Art, *Hadronotus fasciatus*, mit *Hadronotellus monspeliensis* PICARD identisch ist.

## 2. *Eremioscelio cydnoides* PRIESNER, 1951 ♂♀ (Abb. 16)

Die Fangdaten und Fundorte der Art *Eremioscelio cydnoides* sind — nach der tiergeographischen Gebietseinheiten von L. MÓCZÁR geordnet — die folgenden: I/1. Ágasegyháza 23. X. 1953 (auf Sandhügel, unter *Juniperus communis* gesiebt und mit dem Ausleseapparat gewonnen), 10 ♀ (Bal); Budapest, Káposztásmegyer 26. VII. 1916, 5 ♂; Budapest, Káposztásmegyer 16. V. 1917, 1 ♂; Budapest, Káposztásmegyer 22. VI. 1908, 1 ♂; Budapest, Rákos 8. VII. 1908, 1 ♂; Budapest, Rákos 1920, 1 ♂; Csepel 14. V. 1908, 2 ♂, 1 ♀; Csepel 20. V. 1908, 1 ♂, 1 ♀; Csepel 9. VII. 1908, 2 ♂; Duka-Csöröghegy 2. VIII. 1921, 1 ♂; Dunakeszi 3. VIII. 1916, 1 ♂, 1 ♀ (Bi); Kunfehértó 11. VII. 1955 (*Festucetum vaginatae*), 1 ♀; Kunfehértó 19. VII. 1955 (*Festucetum vaginatae*), 1 ♂, 1 ♀; Kunfehértó 3. VIII. 1955 (*Festucetum vaginatae*), 1 ♂; Szigetmonostor 2. VII. 1957 (*Festucetum vaginatae*, Sandhügel), 1 ♂, 1 ♀ (JBSz); Szigetszentmiklós 29. VIII. 1911, 1 ♂; Szigetszentmiklós 19. IX. 1911, 1 ♂; Szigetszentmiklós 25. VII. 1912, 1 ♂; Szigetszentmiklós 2. VIII. 1912, 1 ♂, 3 ♀; Szigetszentmiklós 25. VIII. 1912, 2 ♀; Sződ 28. V. 1918, 1 ♀; Sződ 5. VII. 1918, 1 ♂, 2 ♀; Sződ 25. VII. 1919, 1 ♂, 1 ♀; Sződ 25. VI. 1920, 1 ♂; Sződ 23. VII. 1920, 5 ♂; Sződ 9. VII. 1921, 2 ♂; Sződ 13. VII. 1928, 1 ♂; Vác-Csöröghegy 25. VIII. 1929, 1 ♂; Vác-Gajáritelep 15. V. 1924, 1 ♂; Vác-Gajáritelep V. 1924, 1 ♂; Vác-Gajáritelep 25. VII. 1924, 2 ♂; Vác—Sződ 21. VII. 1921, 1 ♂; Vác—Sződ 20. VII. 1925, 2 ♀; Vác—Sződ 1. VIII. 1927, 1 ♂, 1 ♀; Vác—Sződ 21. VII. 1929, 1 ♂; Vác-Tudósdomb 21. VII. 1929, 1 ♂, 1 ♀; Vác-Tudósdomb 20. VII. 1929, 1 ♂; Vác-Tudósdomb 30. VI. 1930 (xerophil in arenosis), 1 ♀; Vác-Tudósdomb 5. VII. 1931 (ripa Danubii, in pratis, humidis), 1 ♂

(Bi). — II/1. Budapest, Sashegy 21. VI. 1917, 1 ♂; Budapest, Sashegy 25. VIII. 1917, 1 ♂; Budapest, Sashegy 22. V. 1918, 1 ♂; Budapest, Sashegy 27. V. 1918, 1 ♂; Budapest, Sashegy 22. VIII. 1918, 1 ♀; Budapest, Sashegy 6. VIII. 1927, 4 ♂; Budapest, Sashegy 4. VII. 1930, 1 ♂ (Bi); Nadap, Velencei hg. 14. XI. 1951 (Baumrinde, gesiebt), 1 ♀ (K); Tihany 20. VII. 1954 (unter *Pinus nigra*, gesiebt und mit dem Ausleseapparat gewonnen), 1 ♂ (Bal). — II/2. Nógrádszakál 12. V. 1922, 1 ♂ (Bi). — III/5. Nagyenyed 16. VII. 1917, 1 ♂ (Bi). — Bulgarien: Küfetse 24. VII. 1928, 1 ♂; Madara 25. VII. 1928, 3 ♂, 1 ♀ (Kalpagtab); Küstendil 6. VIII. 1928 (xerophil), 2 ♂; Küstendil 6. VIII. 1928 (in vinetis), 1 ♂, 1 ♀; Küstendil 10. VIII. 1928 (xerophil), 2 ♀; Küstendil 24. VIII. 1928, 1 ♂; Mts. Osogovo 25. VIII. 1928 (1600 m Seehöhe), 1 ♂; Mts. Rila 8. IX. 1928 (in aridis), 1 ♀ (Bi). — Griechenland: Elbaron 8. X., 1 ♀ (Fo). — Jugoslawien: Lesina 1914, 3 ♂ (Horv.).

Das untersuchte Material umfaßt 113 Exemplare, unter ihnen Weibchen 38 (25) und Männchen 75 (32). Eine eurychrone Art, die jährlich drei Generationen entwickelt (Abb. 16, I), lebt in sandigen Heiden, auf xerophilen Berghängen, ferner in 1600 m Seehöhe und schmarotzt wahrscheinlich in Lepidopteren-Eiern. Die Art ist in Ägypten, Bulgarien, Rumänien, in der Sowjetunion, der Tschechoslowakei, in Ungarn und Jugoslawien verbreitet. Sie kann nach verschiedenen Methoden (Siebe, Ausleseapparat, Bodenprobe, Ketscher) gesammelt werden. Das Männchen-Weibchen-Häufigkeitsverhältnis beträgt 2 : 1. Die überwinternden Exemplare leben im Boden, unter Baumrinde. Die Männchen fliegen von Mitte Mai bis Mitte September. Eine sehr stark variierende Art. Besonders stark wechselt die Flügelnervatur.

### 3. *Pachyscelidris aptera* SZEL., 1941

F u n d o r t : Budapest, Ferencvároser Robinienwald, 4. VII. 1915, 1 ♂ (Bi).

Eine sehr seltene Art, die in xerothermen Gebieten lebt.

### 4. *Hadronotus* FÖRSTER, 1856

Kopf quer, hinten abgerundet, ohne Querkiel. Augen stark behaart. Stirneindruck seicht, immer stark quergestreift. Antennen zwölfgliedrig, beim ♀ mit einer sechsgliedrigen Keule. Antenne des Männchens fadenförmig. Thorax gewölbt. Scutellum halbkreisförmig. Vorderflügel mit einer Subcostalis, Marginalis, Postmarginalis und Stigmalis. Subcostalis und Marginalis stets mit starken, langen, aufrechten Borstenhaaren bedeckt. Abdomen breit eirund. Zweites Tergit das längste und breiteste. Tarsen: 5, 5, 5, Sporen: 1, 1, 1.

Typische Art: *Hadronotus muscaeformis* NEES, 1834 ♀.

### Bestimmungstabelle der mir bekannten paläarktischen Arten der Gattung *Hadronotus* Förster, 1856

1 (2) Körper einfarbig, schwarz. Femur des Hinterbeines schwarz. Zweites Tergit fingerhutartig punktiert

1. *muscaeformis* NEES, 1834 ♂ (nov.), ♀

2 (1) Kopf stets schwarz. Abdomen rötlich oder bräunlich gelb. Beine gelb.

3 (4) Mesonotum mit drei Furchen, nur der Kopf schwarz.

2. *ochraceus* sp. nov. ♀

- 4 (3) Mesoscutum ohne Furchen. Kopf und Thorax schwarz.  
 5 (6) Marginalis lang, um  $\frac{1}{4}$  kürzer als die Stigmatis, zweites Tergit dicht lederartig genetzt  
 3. *hungaricus* sp. nov. ♀  
 6 (5) Marginalis kurz, doppelt so lang wie breit. Zweites Tergit dicht fingerhutartig punktiert  
 4. *bolivari* GIARD, 1895 ♂ (nov.), ♀

1. *Hadronotus muscaeformis* NEES, 1834 ♂ (nov.), ♀ (Abb. 2, 3, 16)

*Teles muscaeformis* NEES 1834 (♀), Hym. Monogr., 2, p. 290.

*Hadronotus musciformis* G. MAYR.: 1879. Verh. Ges. Wien, 29, p. 698 (♀).

*Hadronotus laticeps* FÖRST. 1856. A. FÖRSTER: Hym. Stud., 2, p. 105 (descr. nulla, nomen nudum); *Hadronotus stygius* FÖRST. 1856. A. FÖRSTER: Hym. Stud., 2, p. 105 (♀), (descr. nulla, nomen nudum). Syn. nov.

*Hadronotus laticeps* KIEFF. 1908. J. J. KIEFFER: Ann. Soc. Sci. Bruxelles, 32, p. 144 (♀).

*Hadronotus laticeps* KIEFF. 1908. J. J. KIEFFER: 1926. Scelionidae. in: Das Tierreich, Lief. 48, p. 457—458.

*Hadronotus laticeps* FÖRST. 1856. L. MASNER: 1956. Acta Faun. Ent. Mus. Nat. Pragae, 1, p. 110.

*Hadronotus laticeps* FÖRST. 1856. L. MASNER: 1958. Entomophaga, 5, III, p. 42 (♀).

*Hadronotus exculptus* FÖRST. 1861. A. FÖRSTER: 1861. Progr. Realsch. Aachen, p. 41 (♀). — *Hadronotus exculptus* FÖRST. 1861. J. J. KIEFFER: 1926. Scelionidae. in: Das Tierreich, Lief. 48, p. 458. Syn. nov.

♂ — Schwarz. Hinterer Femur schwarz. Beine sonst dunkel- bis hellbraun. Scapus etwa siebenmal länger als breit. Pedicellus birnenförmig, andert-halbmal länger als breit. Erstes Fadenglied doppelt so lang wie breit, an der Spitze allmählich verdickt. Das zweite etwas länger als breit, so lang wie das dritte. Das vierte bis neunte gleichlang, gleichdick. Das Endglied zweieinhalbmal so lang wie breit, an der Spitze allmählich sich verjüngend, zugespitzt. Sonst wie das Weibchen.

Neubeschreibung des Lectotypus ♀ (*Hadronotus exculptus* FÖRST., 1861). — Schwarz. Distalende der Trochanter, die Tibien und Tarsen rötlichgelb. Flügel schwach bräunlich angelaufen. Kopf quer, etwa dreimal so breit wie lang, und zweimal höher als lang, überall fein und dicht lederartig punktiert-gerunzelt, ausgenommen den quergestreiften Stirneindruck (Abb. 3). Augen durch eine tiefe Furche mit der Mandibelbasis verbunden. Augen stark und dicht behaart. Mandibeln dreizählig. Ocellen im Dreieck stehend, wobei der Abstand der lateralen vom Augenrande ihrem doppelten Querdurchmesser entspricht. Scapus etwa achtmal so lang wie breit, länger als die fünf folgenden Fadenglieder zusammen, etwas bogig. Pedicellus birnenförmig, zweieinhalbmal so lang wie breit, distal allmählich verdickt. Erstes Fadenglied mehr als dreimal so lang wie breit, walzenrund, zweimal so lang wie das erste becherförmige Fadenglied. Das dritte und vierte Fadenglied kurz, becherförmig, etwas breiter als lang. Keule sechsgliedrig, so lang wie Pedicellus und die Fadenglieder 1—4 zusammen. Thorax so breit wie der Kopf, lederartig punktiert-gerunzelt. Mesoscutum ohne Spur von Parapsidenfurchen, hinten in der Mitte längsgestreift. Scutellum halbkreisförmig. Pleuren längsgestreift. Metascutum als Platte vorhanden. Propodeum in der Mitte tief ausgeschnitten, beiderseits



lederartig. Vorderflügel (Abb. 2) mit einer langen Subcostalis. Marginalis viermal so lang wie breit, halb so lang wie breit, halb so lang wie die schräge, am Ende knotenförmig verdickte Stigmalis. Postmarginalis anderthalbmal so lang wie die Stigmalis. Subcostalis mit langen, zerstreuten, aufrechten Borstenhaaren. Radialis in Spuren vorhanden. Hinterflügel mit Subcostalis und Marginalis, mit drei Frenalhäckchen. Abdomen breit sitzend, so lang wie der Kopf und Thorax zusammen. Erstes Tergit gestreift, fünfmal so breit wie lang. Zweites Tergit das größte, an der Basis in der Mitte gestreift, sonst in der Mitte fingerhutartig punktiert, lateral beiderseits lederartig. Das dritte Tergit fast so lang wie das erste, lederartig punktiert. Die Tergite 4—7 fein lederartig punktiert, an der Spitze allmählich sich verjüngend. Sternite punktiert. L.: 1 mm. Biologie unbekannt.

Das von mir untersuchte Lectotypus-Exemplar trägt folgende Etiketten: 1. »collect. G. MAYR.«, 2. »FÖRST.«, 3. »Hofingry ??«, 4. »*Hadronotus exculptus* FÖRSTER, Type«, 5. »*Hadronotus exculptus* M. ♀ N. 117.«, 6. »*Hadronotus*« 72. Scel. 1. — Das Lectotypus-Exemplar befindet sich in der Sammlung des Naturhistorischen Museums in Wien.

Der Allotypus (1 ♂) und weitere 19 ♂♂ befinden sich in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Die Fangdaten und die Fundorte von *Hadronotus muscaeformis* NEES, 1834, sind — nach der tiergeographischen Gebietseinheiten von L. MÓCZÁR geordnet —, die folgenden: I/1. Budapest, Káposztásmegyér 16. V. 1917 (Allotypus), 1 ♂; Budapest, Káposztásmegyér 26. VII. 1916, 1 ♂; Budapest, Káposztásmegyér 17. V. 1917, 2 ♂; Budapest, Kispest 25. V. 1927, 1 ♀; Budapest, Rákost 7. VII. 1931, 1 ♀; Csepel 14. V. 1908, 1 ♂; Csepel 6. IX. 1908, 1 ♀; Duka-Csöröghegy 14. XI. 1925, 1 ♀ (Bi); Perkáta 21. VII. 1954 (Siba tanya), 2 ♀ (JBSz); Szigetszentmiklós 17. VI. 1911, 1 ♂; Szigetszentmiklós 29. VIII. 1911, 1 ♂; Sződ 18. VI. 1918, 1 ♂; Sződ 25. VII. 1918, 1 ♂; Sződ 21. VIII. 1922, 2 ♀; Vác 24. VI. 1923, 1 ♀ (Bi). — II/1. Budaörs 30. VI. 1957 (Csiki hg.), 7 ♂ (JBSz); Budapest, Hübösvölgy ? 10. XI. 1922 (in quercetis, sub foliis), 1 ♀; Budapest, Farkasvölgy 14. XI. 1922 (sub foliis, in quercetis), 1 ♀; Fehérvársurgó 23. IX. 1923, 1 ♀; Fehérvársurgó 27. IX. 1923, 1 ♀ (Bi); Nadap, Velencei hgs. 14. XI. 1951 (unter Baumrinde), 1 ♂, 4 ♀; Nadap, Velencei hgs. 14. XI. 1951 (Antóniahegy), 2 ♀ (K). — III/3. Ósebeshely 26. VI. 1913, 1 ♀ (Bi). — III/4. Rév 5. VI. 1912, 1 ♀; Tasnád 7. VII. 1912, 1 ♂; Tasnád 18. VII. 1912, 2 ♂ (Bi). — VII. Crkvenica 25. VI., 1 ♀ (Anonymus). — Bulgarien: Küstendil 6. VIII. 1928 (in vinetis), 1 ♂ (Bi); Mts. Rila 1927 (1800 m Seehöhe), 1 ♀ (Fo).

Das untersuchte Material umfaßt 55 Exemplare, unter ihnen Weibchen 35 (17) und Männchen 20 (8). Wahrscheinlich eine eurychrone Art, mit jährlich drei Generationen (Abb. 16, IV). Fliegt von Mitte Mai bis Anfang Oktober. Biologie unbekannt. Die Art lebt in xerothermen Gebieten in Sandhügeln, auf Berghängen. Eine seltene Art, die in Bulgarien, Deutschland, Rumänien, in der Schweiz, in Ungarn, in der Tschechoslowakei lebt. Das Weibchen-Männchen-Häufigkeitsverhältnis beträgt 1,75 : 1.

## 2. *Hadronotus ochraceus* sp. nov. ♀ (Abb. 4)

Kopf schwarz. Thorax, Abdomen — die zwei letzten, schwarzbraunen Segmente ausgenommen — rötlichgelb. Beine hellgelb. Scapus und Pedicellus rötlichgelb. Die Fadenglieder 1—4 lehmgelb. Das erste Keulenglied lehmgelb, sonst die Keule schwarzbraun. Flügel schwach bräunlich angeläufen.

Kopf quer, zweieinhalbmal so breit wie lang und mehr als anderthalbmal höher als lang, behaart mit aufrechten, langen Haaren, überall fein lederartig punktiert, ausgenommen den quergestreiften, vom vorderen Ocellus bis zur Insertionstelle der Antennen reichenden Stirneindruck. Wangen nicht gestreift. Ocellen im Dreieck stehend, der Abstand der lateralen vom Augenrand dem Doppelten ihres Querdurchmesser entsprechend. Hinterrand des Kopfes nicht scharf begrenzt. Augen dicht und lang behaart, mehr als doppelt so lang wie die Wangen, eirund, durch eine tiefe Furche mit der Mandibelbasis verbunden. Mandibeln zweizählig, gelb. Scapus länger als die sechs folgenden Antennenglieder zusammen, ungefähr achtmal so lang wie breit, schwach bogig, in der Mitte am breitesten, am Ende schwach ausgebuchtet. Pedicellus birnenförmig, dreimal so lang wie breit, distal allmählich verdickt. Erstes Fadenglied walzenrund, zweimal so lang wie dick, um die Hälfte länger als das zweite, dieses etwas länger als breit, das dritte und vierte Glied kurz, becherförmig, breiter als lang, das vierte etwas breiter als das dritte. Das erste Keulenglied becherförmig, distal anderthalbmal so breit wie lang. Die Keulenglieder 2—5 in Form und Länge gleich, zweimal so dick wie lang. Das Endglied länger als das fünfte Glied, distal allmählich sich verjüngend, zugespitzt. Antennenglieder mit sehr feinen, aufrechten Härchen bedeckt. Praescutum nicht sichtbar. Mesoscutum mit drei durchlaufenden, seichten Furchen, sehr fein verschwommen punktiert, mit kurzen, feinen, anliegenden Härchen bedeckt. Scutellum halbkreisförmig, sehr fein verschwommen punktiert, vom Mesoscutum (Abb. 4) durch eine tiefe Furche getrennt. Metascutum kaum sichtbar. Propodeum in der Mitte nicht ausgeschnitten, sehr fein verschwommen punktiert, ohne Zahn oder Zähnchen. Pro-, Meso- und Metapleuren mit vereinzelt Streifen, oben fast glatt und glänzend. Metapleuren lang und dicht behaart. Prosternum mit langen vereinzelt longitudinalen Streifen. Vorderflügel etwa zweieinhalbmal so lang wie breit. Subcostalis lang, mit langen gereihten Borstenhaaren bedeckt. Marginalis kurz, kaum doppelt so lang wie breit, Postmarginalis um die Hälfte kürzer als die lange, schrägverlaufende, am Ende knotenförmig verdickte Stigmatis. Vorder- und Hinterflügel ohne Wimperhaare. Abdomen etwas länger als Kopf und Thorax zusammengenommen. Petiolus sechsmal so lang wie breit, gestreift mit sich verzweigenden Streifen. Zweites Tergit das größte, an der Basis kurz gestreift, sonst dicht fingerhutartig punktiert, fast viermal so breit wie lang. Das dritte Tergit kürzer als das zweite, fingerhutartig punktiert. Tergite 4—6 sehr schmal, fein lederartig punktiert. Männchen und Biologie unbekannt. L.: 1,5 mm.

Unterscheidet sich von den bisher bekannten Arten durch die Färbung des Körpers, durch die Skulptur des Petiolus und der Tergite 2—3.

Der Holotypus und die Paratypen (2 ♀) befinden sich in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

F u n d o r t: Bulgarien: Küstendil 6. VIII. 1928 (in herbis aridis, retis ope), leg. BIRÓ (Holo- und Paratypen).

3. *Hadronotus hungaricus* sp. nov. ♀ (Abb. 1)

Kopf und Thorax schwarz. Abdomen rötlichbraun. Beine gelb. Coxae schwarz. Scapus und Pedicellus dunkelbraun. Kopf quer, etwa zweieinhalbmal breiter als lang, überall fein und dicht mikroskopisch fein punktiert. Stirneindruck seicht, quergestreift. Augen stark behaart. Wangen nicht gestreift, mit einer von den Augenrändern bis zur Mandibelbasis reichenden, tiefen Furche. Scheitel bogig abgerundet. Ocellen im Dreieck stehend, die lateralen vom Augensrande in einem Abstand der ihrem doppelten Querdurchmesser entspricht. Scapus länger als der Pedicellus und die Fadenglieder 1—4 zusammen, etwa achtmal länger als breit, etwas bogig. Pedicellus birnenförmig, etwa zweieinhalbmal länger als breit, so lang wie das erste Fadenglied, dieses dreimal länger als breit, walzenrund. Das zweite Fadenglied um die Hälfte kürzer als das erste, etwas länger als das dritte. Das vierte becherförmig, so lang wie breit. Keule länger als der Pedicellus und die Fadenglieder 1—4 zusammen. Thorax schmaler als der Kopf, stark gewölbt. Mesoscutum und Scutellum fein und dicht mikroskopisch fein punktiert. Mesoscutum länger als breit. Scutellum halbkreisförmig. Metascutum kaum wahrnehmbar. Propodeum in der Mitte ausgeschnitten. Propleuren oben dicht und mikroskopisch fein punktiert, unten quergestreift. Meso- und Metapleuren quergestreift. Vorderflügel (Abb. 1) glashell, mit braunen Härchen bedeckt. Subcostalis lang. Marginalis um  $\frac{1}{4}$  kürzer als die Stigmalis. Subcostalis und Marginalis mit gereihten, starken Borstenhaaren. Postmarginalis kürzer als die Stigmalis. Abdomen länger als der übrige Körper. Petiolus viermal breiter als lang, gestreift. Zweites Tergit das längste und breiteste, fein und dicht lederartig genetzt. Das dritte Tergit kürzer als das zweite, fein und dicht lederartig genetzt. Das vierte Tergit fein und dicht lederartig genetzt. Die Tergite 5—6 punktiert. L.: um etwa 2,5 mm. Biologie und Männchen unbekannt.

Holotypus (1 ♀) in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Unterscheidet sich von *Hadronotus ochraceus* sp. nov. ♀ durch die Färbung des Thorax und Abdomens, durch das Fehlen der Parapsidenfurchen, von *Hadronotus bolivari* GIARD, 1895 ♂ ♀ durch die Länge der Marginalis und durch die Länge und Skulptur des Abdomens.

F u n d o r t : Fehérvárcsurgó 24. VII. 1923, leg. BIRÓ.

4. *Hodronotus bolivari* GIARD, 1895 ♂ ♀ (Abb. 15)

♂ — Kopf und Thorax schwarz. Fadenglieder 1—10 dunkelbraun. Scapus und Pedicellus braun. Abdomen rötlichgelb, ausgenommen den schwarzbraunen Hinterrand des dritten Tergites. Die Tergite 4—6 bräunlich schwarz. Beine gelb, Coxae schwarz. Scapus länger als die vier folgenden Fadenglieder zusam-

men, etwa achtmal länger als breit. Pedicellus birnenförmig, zweieinhalbmal länger als breit. Das erste Fadenglied dreimal länger als breit, walzenrund, länger als das zweite. Das zweite zweimal länger als breit, walzenrund. Die Fadenglieder 3—9 anderthalbmal länger als breit, walzenrund. Das Endglied anderthalbmal länger als das vorletzte, am Ende allmählich sich verjüngend zugespitzt.

♀ — Kopf und Thorax schwarz. Der Hinterrand des dritten Tergites, ferner die Tergite 4—6 des Abdomens bräunlichschwarz. Petiolus, das zweite Tergit und die vorderen  $\frac{2}{3}$  des dritten Tergites rötlichgelb. Beine gelb. Coxae schwarz. Scapus rötlichgelb. Pedicellus, die Fadenglieder 1—4, ferner die Keulenglieder 1—2 rötlichgelb. Keule sonst schwarz. Flügel wasserhell, mit braunen Härchen bedeckt.

Kopf quer, dreimal breiter als lang, breiter als der Thorax. Scheitel hinten abgerundet, ohne Kante oder Kiel. Kopf überall fein und dicht punktiert mit mikroskopisch feiner Punktierung. Stirneindruck seicht, nicht gerandet, querverrunzelt, ohne Mittellängskiel oder Leiste. Augen groß, stark behaart mit langen Haaren. Ocellen im Dreieck stehend, die lateralen den Augenrand fast berührend, von diesem in einem Abstand, der ihrem doppelten Querdurchmesser entspricht. Wangen nicht gestreift, mit einer von den Augenrändern bis zur Mandibelbasis reichenden tiefen Furche. Scapus länger als der Pedicellus und die Fadenglieder 1—4 zusammen, etwas bogig, etwa zehnmal länger als breit (Abb. 15). Pedicellus birnenförmig, etwa dreieinhalbmal länger als breit, fast dreimal länger als das erste Fadenglied. Dieses etwa doppelt so lang wie dick, etwas länger als das zweite. Das dritte und vierte gleichlang, gleichdick, etwas quer. Keule etwas länger als der Pedicellus und die Fadenglieder 1—4 zusammen. Das Endglied fast zweimal länger als breit. Thorax sehr fein und dicht mikroskopisch fein punktiert. Mesoscutum länger als breit. Scutellum halbkreisförmig, gewölbt. Metascutum als schmale Platte vorhanden. Propodeum in der Mitte tief ausgeschnitten. Pleuren quergestreift. Vorderflügel mit langer Subcostalis. Marginalis doppelt so lang wie breit. Stigmatis länger als die Postmarginalis. Subcostalis und Marginalis mit langen, gereihten, starken Borstenhaaren. Hinterflügel heller gefärbt, mit Subcostalis und Marginalis. Abdomen breit sitzend. Petiolus gestreift, mindestens viermal breiter als lang. Das zweite Tergit das längste und breiteste, dicht fingerhutartig punktiert. Das dritte Tergit fingerhutartig punktiert. Das vierte bis sechste Tergit schwach verschwommen punktiert. L.: 1,5 mm. Biologie: Parasitiert in Eiern des Heteropteren *Phyllomorpha laciniata* VILLERS (nach KIEFFER).

F u n d o r t e : Bulgarien: Küstendil 10. VIII. 1928 (xerophil) 1 ♀; Küstendil 6. VIII. 1928 (in herbis aridis, retis ope) 1 ♂ (Bi).

5. **Pannongryon** gen. nov.

Kopf quer. Scheitel bogig gerandet. Antenne zwölfgliedrig, beim ♀ mit einer kaum wahrnehmbaren sechsgliedrigen Keule. Antenne des Männchens mit kurzen, walzenrunden Gliedern. Augen kahl oder mit seltenen sehr kurzen, kaum wahrnehmbaren, silberweißen Härchen. Stirneindruck tief, nicht gerandet. Thorax stark gewölbt; Scutellum den Petiolus nicht überdachend. Vorderflügel mit punktartiger Marginalis, mit langen Subcostalis. Postmarginalis vorhanden. Abdomen zugespitzt, länglich, schlank. Das zweite Tergit ist das längste. Tarsen: 5, 5, 5, Sporen: 1, 1, 1.

Typische Art: *Pannongryon szelenyii* sp. nov. ♀.

Unterscheidet sich von den bisher bekannten paläarktischen Gryoninen-Gattungen durch das auffallend stark gewölbte Scutellum, durch die zugespitzte Form des Abdomens.

**Bestimmungstabelle der mir bekannten Pannongryon-Arten**

- |   |                                  |
|---|----------------------------------|
| 1 (2) Abdomen schwarz, zweites Tergit grob und durchwegs gestreift                            | 1. <i>szelenyii</i> sp. nov. ♀   |
| 2 (1) Abdomen braun oder rot, zweites Tergit größtenteils fingerhutartig punktiert-gerunzelt. |                                  |
| 3 (4) Keulenglieder der Antennen stark quer, Abdomen rot und plump                            | 3. <i>rubrigaster</i> sp. nov. ♀ |
| 4 (3) Keulenglieder der Antennen quadratisch, Abdomen braun und schlank                       | 2. <i>hungaricum</i> sp. nov. ♂♀ |

1. **Pannongryon szelenyii** sp. nov. ♀ (Abb. 6, 8, 12)

♀ — Beine lehmgelb. Mandibeln gelb. Kopf, Thorax, Abdomen dunkelbraun. Vorderflügel schwach rauchig, die Umgebung der Stigmatis und Marginalis etwas dunkler. Antennen schwarzbraun, Keule etwas dunkler. Kopf etwa zweieinhalbmal so dick wie lang, anderthalbmal höher als lang, überall dicht und fein punktiert, mit sich berührenden Pünktchen. Wangen fein, kaum sichtbar fächerartig gestreift. Stirneindruck tief, nicht gerandet, mit einer bis zu den oberen  $\frac{2}{3}$  der Stirn reichenden Mittellängsleiste. Augen kahl, durch eine tiefe Furche mit der Mandibelbasis verbunden. Ocellen im Dreieck stehend, die lateralen vom Augenrand in einem ihrem doppelten Querdurchmesser entsprechenden Abstand. Scheitel bogig gerandet. Mandibeln zweizähmig. Clypeus glatt, glänzend. Scapus länger als die fünf folgenden Antennenglieder zusammen (Abb. 12), schwach bogig, fast zehnmal so lang wie breit. Pedicellus viereinhalbmal länger als breit, länglich birnenförmig, länger als das erste Fadenglied. Dieses fast walzenrund, viermal länger als breit. Das zweite Glied halb so kurz wie das erste. Das dritte etwas länger als breit. Das vierte so lang wie breit. Keule schlank, kaum dicker als die Fadenglieder, etwas länger als die Fadenglieder 1—4 zusammen. Thorax (Abb. 6) stark

gewölbt, mikroskopisch fein und dicht punktiert. Mesoscutum fast zweieinhalbmal breiter als lang. Scutellum stark gewölbt, halbkreisförmig, den Vorderrand des Petiolus erreichend, das Propodeum und Metascutum überdachend, aber beide vorhanden, und von der Seite gesehen, sichtbar. Propodeum in der Mitte nicht ausgeschnitten. Propleuren dicht lederartig punktiert. Meso- und Metapleuren quergestreift. Vorderflügel mit langer Subcostalis. Marginalis punktförmig. Stigmalis schräg, am Ende knotenartig verdickt. Postmarginalis fehlend. Hinterflügel heller, mit Subcostalis und Marginalis. Abdomen fast um die Hälfte länger als der übrige Körper, schlank, zugespitzt, aus sieben gut sichtbaren Segmenten zusammengesetzt. Petiolus dreimal breiter als lang, dicht gestreift, beiderseits dicht behaart. Das zweite Tergit ist das längste, länger als die fünf folgenden Tergite zusammen, grob längsgestreift, beiderseits dicht behaart. Die Tergite 4—7 punktiert, seitlich behaart (Abb. 8). L.: ca. 1,8 mm. Männchen und Biologie unbekannt.

Holotypus (1 ♀) befindet sich in meiner privaten Sammlung in Budapest.

F u n d o r t: Budapest (Budaörs) 2. VI. 1957 (xerotherme Berghänge, auf Gräsern mit dem Ketscher erbeutet) Csiki hegyek, leg. DR. J. B. SZABÓ.

Die neue Art *Pannongryon szelenyii* sp. nov. unterscheidet sich von *Pannongryon hungaricum* sp. nov. ♂♀ durch die gröbere Skulptur des Abdomens, durch die Form des Abdomens, von *Pannongryon rubrigaster* sp. nov. durch die Färbung und Form des Abdomens.

Die neue Art wurde zu Ehren meines verehrten Lehrers DR. G. SZELÉNYI benannt.

## 2. *Pannongryon hungaricum* sp. nov. ♂♀ (Abb. 14)

♂ — Schwarz. Beine rötlichgelb. Scapus braun, Pedicellus rötlichbraun. Flügeln schwach bräunlich angelaufen. Scapus etwa achtmal länger als breit. Pedicellus birnenförmig, zweieinhalbmal länger als breit. Das erste Fadenglied walzenrund, mehr als dreimal länger als breit, etwas länger als das zweite. Die Fadenglieder 3—9 — einzeln genommen — um die Hälfte länger als breit, walzenrund. Das Endglied fast zweimal so lang wie das neunte Glied, am Ende zugespitzt.

♀ — Schwarz. Abdomen dunkelbraun. Beine rötlichgelb. Kopf quer, zweimal breiter als lang, überall fein und dicht punktiert. Stirneindruck tief, nicht gerandet, mit einer seichten Mittellängsleiste. Wangen nicht gestreift. Augen groß, kahl, mit der Mandibelbasis durch eine tiefe Furche verbunden. Scheitel schwach bogig gerandet. Scapus etwa neunmal länger als breit, länger als der Pedicellus und die Fadenglieder 1—4 zusammen (Abb. 14). Pedicellus birnenförmig, dreimal länger als breit, so lang wie das erste Fadenglied. Dieses viermal länger als breit, walzenrund, das zweite halb so kurz wie das erste. Das dritte etwas kürzer als das zweite. Das vierte quer, andert-halbmal breiter als lang. Keule etwas länger als der Pedicellus und die Faden-

glieder 1—4 zusammen. Thorax stark gewölbt. Mesoscutum etwas breiter als lang. Scutellum halbkreisförmig, stark gewölbt. Metascutum sichtbar. Propodeum in der Mitte tief ausgeschnitten. Propleuren oben fein punktiert, unten quergestreift. Meso- und Metapleuren quergestreift. Vorderflügel mit Subcostalis, mit punktartiger Marginalis. Postmarginalis bei dieser Art vorhanden, zweieinhalbmal länger als die kurze, schräge, am Ende knotenartig verdickte Stigmalis. Subcostalis proximal mit einigen gereihten, kaum wahrnehmbaren Borstenhaaren. Hinterflügel heller gefärbt, mit Subcostalis und Marginalis und mit drei Frenalhäckchen. Abdomen etwas länger als der übrige Körper, hinten zugespitzt, einförmig. Petiolus dreimal breiter als lang, gestreift. Das zweite Tergit das längste, länger als die Tergite 3—7 zusammen, dicht fingerhutartig punktiert-gerunzelt. Die Tergite 3—7 fein punktiert. L.: ca. 2 mm. Biologie unbekannt.

Der Holotypus (1 ♀), Allotypus (1 ♂) und die Paratypen (3 ♀, 5 ♂) befinden sich in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Unterscheidet sich von *Pannongryon szelenyii* sp. nov. ♀ durch die Form des Abdomens und die Skulptur des zweiten Tergites.

Fundorte: I/1. Holics 14. VII. 1918, 2 ♂; Sződ 10. IX. 1919 (Holotypus), 1 ♀; Vác 26. V. 1914, 1 ♂; Vác-Tudósdomb 13. VII. 1930 (Allotypus), 1 ♂; Vác—Sződ 21. VII. 1925, 1 ♂ (Bi). — II/1. Budaörs 27. IV. 1957 (Csíki hg.), 1 ♀ (JBSz); Budapest, Sashegy 8. III. 1927, 1 ♀ (Fo); Nadap, Velencei hgs. 14. XI. 1951 (unter Baumrinde), 1 ♀ (K). — II/2. Mátra hgs. 21. VII. 1953, Bagolyirtás kaszálója, 1 ♂ (Erd). — III/2. Pecsétszeg 8. VIII. 1911, 1 ♂ (Bi).

### 3. *Pannongryon rubrigaster* sp. nov. ♀ (Abb. 13)

Kopf und Thorax schwarz. Scapus hellgelb. Pedicellus an der basalen Hälfte braun, sonst hellgelb. Die Fadenglieder 1—4 schwarzbraun, die Keulenglieder 1—2 lehmgelb, die Keulenglieder 3—6 schwarzbraun. Beine hellgelb. Vordere Coxae schwarz, mittlere und hintere Coxae dunkelrot. Abdomen rot, die drei letzteren Tergite in der Mitte etwas dunkler-rot werdend. Vorderflügel in der Umgebung der Marginalis, Stigmalis und Postmarginalis mit einer braunen Querbinde, sonst sehr fein geraucht. Kopf quer, in der Mitte gesehen, mehr als dreimal so breit wie lang, mikroskopisch fein und dicht punktiert, mit sich berührenden Pünktchen. Stirneindruck des Kopfes reicht vom vorderen Ocellus bis zum Antennenhöcker, in der Mitte sehr tief und durchlaufend gekielt, sonst mit dichten, schimmernden, aber verschwommenen Pünktchen. Stirneindruck nicht scharf gerandet und, von vorne gesehen, kreisrund begrenzt. Augen groß, kurz und selten behaart, fast den Hinterrand des Kopfes erreichend, länger als die Wangen, durch eine tiefe Furche mit der Mandibelbasis verbunden. Ocellen im Dreieck stehend, die lateralen in einem ihrem doppelten Querdurchmesser entsprechenden Abstand. Scapus länger als die fünf folgenden Antennenglieder zusammen (Abb. 11), mindestens, zehnmals länger als breit. Pedicellus birnenförmig, mehr als dreimal

länger als breit, wenig kürzer als die zwei folgenden Fadenglieder zusammen. Das erste Fadenglied annähernd walzenrund, um  $\frac{1}{3}$  länger als das zweite, fast dreimal länger als breit, das zweite Glied walzenrund, doppelt so lang wie breit, um  $\frac{1}{3}$  länger als das dritte. Dieses etwas länger als breit, das vierte quer, fast anderthalbmal breiter als lang. Die Keule länger als der Pedicellus und die Fadenglieder 1—4 zusammen. Das erste und zweite Keulenglied stark quer, mehr als anderthalbmal breiter als lang, in Form und Länge gleich. Das dritte Keulenglied das breiteste und längste, etwas mehr als anderthalbmal breiter als lang. Die Keulenglieder 4—5 fast zweimal breiter als lang, in Form und Länge gleich. Das Endglied etwas länger als das fünfte Glied, an der Spitze allmählich sich verjüngend, zugespitzt. Thorax (Mesoscutum und Scutellum) stark gewölbt. Mesoscutum und Scutellum mit feinen, dicht nebeneinander stehenden Pünktchen punktiert. Hinterrand des Scutellums und Metascutum, ferner des Propodeums — von der Seite gesehen —, in gleicher Linie endigend, sonst den Vorderrand des Petiolus erreichend. Scutellum — von der Seite gesehen —, etwas höher als das Mesoscutum. Vorderflügel mit einer braunen Querbinde in der Umgebung der Marginalis und Stigmatis. Subcostalis ohne Borstenhaare. Marginalis mehr als doppelt so lang wie breit. Vorderflügel ohne Wimperhaare. Hinterflügel wasserhell, mit Subcostalis und Marginalis. Propleuren verschwommen punktiert. Meso- und Metapleuren glatt, glänzend. Abdomen so lang wie Kopf und Thorax zusammen. Petiolus fast sechsmal so breit wie lang, größtenteils dicht längsgestreift, ausgenommen lateral beiderseits, wo fein punktiert, lateral beiderseits mit je einem Längskielchen. Das zweite Tergit an der Basis gestreift, sonst fingerhutartig gestreift-gerunzelt, hintere Hälfte fingerhutartig genetzt. Die Tergite 3—6 lederartig punktiert. Das letzte Tergit zugespitzt. L.: ca. 1,5 mm. Männchen und Biologie unbekannt.

F u n d o r t : Tompa 12. VII. 1961, leg.: Dr. J. ERDŐS.

Holotypus (1 ♀) und Paratypus (1 ♀) befinden sich in der privaten Sammlung des Herrn Dr. J. ERDŐS in Tompa, Ungarn.

Unterscheidet sich von den bisher bekannten paläarktischen Gryoninen-Arten durch die Färbung des Abdomens.

## 6. *Sundholmia* gen. nov.

Kopf quer. Antenne zwölfgliedrig, beim ♀ mit einer sechsgliedrigen Keule. Stirneindruck tief, nicht gerandet. Scheitel abgerundet. Mesoscutum und Scutellum zusammen viel kürzer und schmaler als das Abdomen. Flügel verkürzt, stummelförmig. Abdomen aus sechs sichtbaren Tergiten zusammengesetzt. Alle Tergite ohne besondere Skulptur, glatt. Tarsen 5, 5, 5, Sporen 1, 1, 1.



Typische Art: *Sundholmia nitens* sp. nov. ♀.

Unterscheidet sich von den bisher bekannten paläarktischen Gryoninen-Gattungen durch die Kopfbildung, durch die Skulptur des Körpers, ferner durch die Größe und Länge des Abdomens und durch die Form des Körpers.

Die neue Gattung wurde zu Ehren des hervorragenden schwedischen Proctotrupiden Forschers ARNE SUNDHOLM benannt.

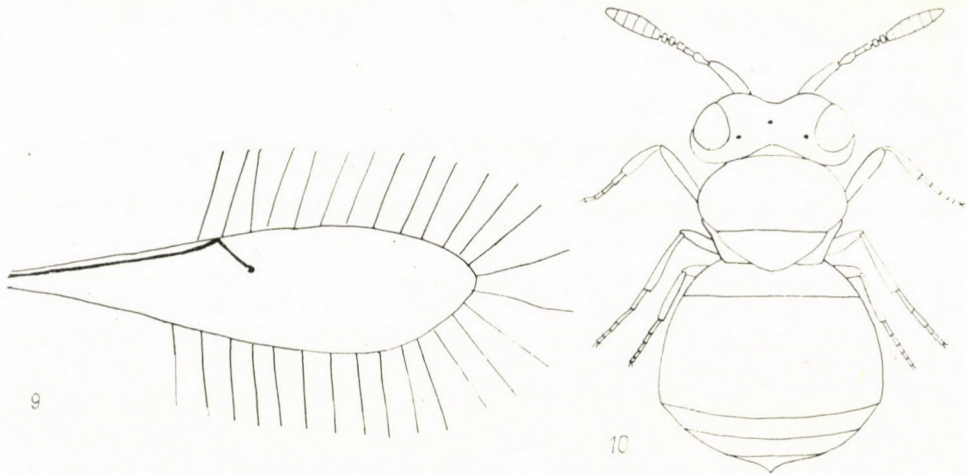


Abb. 9—10. 9 = *Hungarogryon moczari* sp. nov. ♀. Vorderflügel; 10 = *Sundholmia nitens* sp. nov. ♀. Habitus

***Sundholmia nitens* sp. n. ♀ (Abb. 10)**

Schwarz. Beine, Scapus und Pedicellus gelb bis lehmgelb. Coxae schwarz. Kopf quer, fast zweimal breiter als lang, überall fein verschwommen punktiert. Augen kahl. Ocellen im Dreieck stehend, die lateralen in einem dem doppelten ihres Querdurchmessers entsprechenden Abstand. Augen durch eine tiefe Furche mit der Mandibelbasis verbunden. Mandibeln gelb, zweizählig. Scapus so lang wie die fünf folgenden Antennenglieder zusammen, etwa siebenmal länger als breit. Pedicellus birnenförmig, breiter als lang, so lang wie die zwei folgenden Fadenglieder zusammen. Das dritte und vierte Fadenglied breiter als lang, einzeln genommen so lang wie das zweite. Keule länger als die Fadenglieder 1—4 und Pedicellus zusammen. Thorax und Kopf viel schmaler als das Abdomen, überall fast glatt, mit verschwommenen Punkten. Propleuren verschwommen punktiert. Mesopleuren verschwommen quergestreift. Metapleuren glatt, glänzend. Abdomen fast kreisrund, dick und plump. Petiolus an der Basis verschwommen gestreift, sonst glatt und glänzend, etwa sechsmal breiter als lang. Zweites Tergit das größte und längste, glatt

und glänzend. Das dritte bis sechste Tergit glatt und glänzend. L.: 0,6 mm. Biologie und Männchen unbekannt.

Die Holotypus (♀) und die Paratypen (5 ♀) befinden sich in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Unterscheidet sich von *Hadronotus micropterus* KIEFF., 1913 ♀ durch die Skulptur der Pleuren, durch die Skulptur des zweiten Tergits.

Fundorte: I/1. Dömsöd, Apajpuszta 7. VI. 1952 (Boden, Wiese, gesiebt), 2 ♀ (Holotypus); Dömsöd, Apajpuszta 1. X. 1952 (gesiebt), 1 ♀ (K); Duka-Csöröghegy 6. X. 1924 (sub muscis), 2 ♀ (Bi). — II/1. Budapest, Sashegy 12. XII. 1925 (gesiebt), 1 ♀ (Bi).

### 7. *Mirotelenomus artus* KOZLOV, 1963 ♂, ♀ (nov.)

♂ — Schwarz. Beine, Scapus und Pedicellus schwarzbraun. Scapus etwa siebenmal länger als breit. Pedicellus birnenförmig, etwas länger als das erste Fadenglied, zweimal länger als breit. Das erste Fadenglied anderthalbmal länger als breit, kürzer als das zweite, das dritte so lang wie das zweite. Das

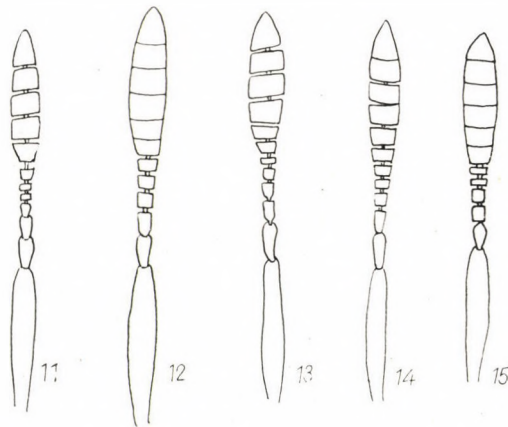


Abb. 11—15. 11 = *Plesiobaesus hospes* KIEFF. ♀. Antenne; 12 = *Pannongryon szelenyii* sp. nov. ♀. Antenne; 13 = *Pannongryon rubrigaster* sp. nov. ♀. Antenne; 14 = *Pannongryon hungaricum* sp. nov. ♀. Antenne; 15 = *Hadronotus bolivari* GIARD ♀. Antenne

vierte etwas kürzer und schmaler als das dritte. Die Fadenglieder 5—9 in Form und Länge gleich, das zehnte etwas länger als das neunte. Das Endglied anderthalbmal länger als das zehnte Glied, an der Spitze sich allmählich verjüngend, zugespitzt.

♀ — Schwarz. Tibien braunschwarz, Tarsen lehmgelb. Coxae schwarz. Antennenglieder schwarzbraun. Kopf quer, zweieinhalbmal breiter als lang, überall mikroskopisch fein punktiert. Stirneindruck tief, nicht gerandet. Augen groß, eirund, kahl. Wangen nicht gestreift. Mandibeln zweizählig. Ocellen im Dreieck stehend, die lateralen den Augenrand fast berührend.

Wangen mit der Mandibelbasis durch eine tiefe Furche verbunden. Scapus länger als die sechs folgenden Fadenglieder zusammen, etwa achtmal länger als breit. Pedicellus birnenförmig, zweieinhalbmal länger als breit, länger als das erste Fadenglied, walzenrund, zweimal länger als breit. Das zweite Fadenglied quadratisch, gleichlang, gleichdick. Das dritte und vierte quer, breiter als lang, etwas breiter als das zweite. Keule sechsgliedrig, etwa anderthalbmal länger als der Pedicellus und die Fadenglieder 1—4 zusammen. Das erste Keulenglied quer, anderthalbmal breiter als lang. Das zweite breiter als das erste, anderthalbmal breiter als lang, das dritte mehr als um die Hälfte länger als das zweite Keulenglied. Das vierte das breiteste, etwas breiter als das dritte. Das fünfte etwas schmaler als das vierte. Das Endglied fast anderthalbmal länger als das vorletzte Keulenglied, am Ende allmählich sich verjüngend, zugespitzt. Mesoscutum fast anderthalbmal breiter als lang, mit mikroskopisch feinen Pünktchen, ohne Parapsidenfurchen. Scutellum halbkreisförmig, mikroskopisch fein punktiert. Metascutum kaum sichtbar. Propodeum kurz, ohne Zahn oder Zähnen. Pleuren sehr fein mikroskopisch punktiert. Vorderflügel schwach bräunlich angelaufen, mit einer sehr kurzen, am Ende knotenartig verdickten Subcostalis. Vorderflügel hinten lang bewimpert. Hinterflügel lang bewimpert. Abdomen breit sitzend. Petiolus längsgestreift, lateral beiderseits mit je einem durchlaufenden Längskielchen, etwa siebenmal breiter als lang. Zweites Tergit das längste und breiteste, grob fingerhutartig punktiert-gerunzelt. Das dritte bis sechste Tergit punktiert. L.: 0,9 mm. Biologie bisher unbekannt.

Der Allotypus (1 ♀) und ein weitere ♀ befinden sich in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Die Fangdaten und Fundorte von *Mirotelenomus artus* KOZLOV, 1963 — geordnet nach der tiergeographischen Gebietseinheiten von L. MÓCZÁR —, sind: I/1. Budapest, Rákos 22. VI. 1908, 1 ♂; Duka-Csöröghegy 26. X. 1923, 1 ♀ (Bi); Kunfehértó 19. VII. 1955 (*Festucetum vaginatae*), 2 ♂; Kunfehértó 3. VIII. 1955 (*Festucetum vaginatae*), 2 ♂ (JBSz); Szigetszentmiklós 29. VIII. 1911, 1 ♂; Szigetszentmiklós VII. 1912, 1 ♂; Sződ 18. VI. 1918, 1 ♂; Sződ 16. VIII. 1918, 2 ♂; Sződ 25. VII. 1919, 1 ♂; Sződ 26. VIII. 1922, 1 ♂ (Bi); Tömpa 25. VIII. 1955 (Zsíroskúti erdő), 1 ♂ (JBSz); Vác-Tudósdomb 20. VIII. 1929, 1 ♂ (Bi). — II/1. Budapest, Rózsadomb 7. VIII. 1919, 1 ♂; Budapest, Sashegy 30. VI. 1917, 1 ♂; Budapest, Sashegy 10. VIII. 1927, 1 ♂; Visegrád 12. VI. 1926 (Holotypus), 1 ♀ (Bi). — Bulgarien: Küstendil 3. VIII. 1928 (in *vinetis aridis*), 1 ♂; Küstendil 24. VIII. 1928, 1 ♂ (Bi).

Das untersuchte Material umfaßt 21 Exemplare, unter ihnen Weibchen 2 und Männchen 19 (2). Wahrscheinlich eine eurychrone Art, mit jährlich zwei-drei Generationen. Kommt in Ungarn auf xerothermen Gebieten (Sandhügeln, Berghängen) vor. Die Männchen sind viel häufiger. Die Art lebt in Bulgarien, in der Sowjetunion, der Tschechoslowakei und in Ungarn. M. E. wurde diese Art von M. A. KOZLOV unter verschiedenen Namen mehrmals beschrieben. In unserem Material liegen nämlich die Übergangsformen der von KOZLOV beschriebenen Arten in mehreren Exemplare vor.

8. *Masneria* gen. nov.

Kopf quer, hinten bogig abgerundet. Augen kahl. Stirneindruck seicht, mit kaum wahrnehmbarem Mittellängskielchen. Antenne zwölfgliedrig, beim ♀ mit einer sechsgliedrigen Keule, beim ♂ mit walzenrunden Gliedern. Thorax von oben etwas zusammengedrückt. Scutellum halbkreisförmig, Petiolus bis zur Mitte überdachend. Vorderflügel ohne Adern, oder manchmal mit Spuren einer verkürzten Subcostalis. Abdomen breit sitzend. Petiolus etwa siebenmal breiter als lang. Das zweite Tergit ist das längste. Tarsen: 5, 5, 5. Sporen: 1, 1, 1.

Typische Art: *Masneria (Hadronotus) lymantriae* (Ms., 1958) ♀.

Die neue Gattung benenne ich zu Ehren meines Freundes DR. L. MASNER.

*Masneria lymantriae* (MASNER, 1958) ♂ (nov.), ♀

♂ — Schwarz. Beine gelb bis lehmgelb. Scapus fast so lang wie die fünf folgenden Antennenglieder zusammen, rötlichbraun, achtmal länger als breit. Pedicellus birnenförmig, doppelt so lang wie breit. Das erste und zweite Fadenglied gleichlang, gleichdick, zweieinhalbmal länger als breit. Die Fadenglieder 4—9 gleichlang, gleichdick, doppelt so lang wie breit, walzenrund. Das Endglied länger als das neunte Glied, am Ende allmählich verjüngend, zugespitzt.

♀ — Schwarz. Beine, Scapus ockergelb. Coxae schwarz. Kopf quer, mehr als dreieinhalbmal breiter als lang, überall mikroskopisch fein und dicht punktiert. Wangen fein vermischt gestreift. Augen groß, kahl, den Hinterrand des Kopfes nicht erreichend. Ocellen im Dreieck stehend, die lateralen vom Augenrand im Abstand ihres doppelten Querdurchmessers. Augen mit der Mandibelbasis durch eine tiefe Furche verbunden. Stirneindruck seicht, mit stumpfem Mittellängskielchen. Scapus länger als die fünf folgenden Fadenglieder zusammen, etwa siebenmal so lang wie breit, etwas bogig, an der Spitze schwach ausgebuchtet. Pedicellus birnenförmig, zweieinhalbmal länger als breit. Das erste Fadenglied etwa zweimal länger als breit, walzenrund, das zweite Glied kaum länger als breit, so lang wie das dritte. Das vierte fast anderthalbmal breiter als lang. Keule so lang wie der Pedicellus und die Fadenglieder 1—4 zusammen. Thorax mikroskopisch fein und dicht punktiert. Scutellum fast halbkreisförmig den Petiolus bis zur Mitte überdachend. Propodeum nur beiderseits sichtbar. Propleuren mikroskopisch fein und dicht punktiert. Meso- und Metapleuren gestreift. Vorderflügel schwach bräunlich angelaufen, fast wasserhell, die distalen Wimperhaare sind braun ohne Adern, nur mit Spuren einer kaum wahrnehmbaren Subcostalis. Abdomen plump. Das erste Tergit lateral beiderseits mit je einem durchlaufenden Längskiel, zwischen diesen Kielen dicht gestreift, an der Basis, in der Mitte eingedrückt. Das zweite Tergit an der Basis schwach gestreift, sonst fingerhutartig punk-

tiert. Das dritte Tergit fein lederartig punktiert wie die folgenden. L.: 1—1,5 mm. Nach MASNER parasitiert diese Art in Eiern von *Lymantria dispar* (L.).

Der Allotypus (1 ♂) und weitere 4 ♂♂ befinden sich in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Die Funddaten und Fundorte der Art *Masneria lymantriae* (MASNER, 1958) — nach der tiergeographischen Gebietseinheiten von L. MÓCZÁR geordnet —, sind: I/1. Budapest, Káposztásmegyer 26. VII. 1916, 1 ♀; Duka-Csöröghegy 3. XI. 1924 (sub muscis), 2 ♂ (Bi); Kiskunhalas 17. VII. 1955 (Alsószállás), 1 ♀ (JBSz); Szöd 10. IX. 1920, 1 ♀; Szöd 23. VII. 1920, 1 ♀; Vác—Szöd 6. VI. 1926, 1 ♀; Vác—Szöd 1. VIII. 1927, 1 ♀ (Bi). — II/1. Budapest, Hármashatárhegy 16. X. 1919, 1 ♂; Budapest, Hűvösvölgy 19. V. 1908, 1 ♂ (Bi); Nadap, Antóniahegy 14. X. 1951 (unter Baumrinde), 2 ♀; Pákozd, Bella völgy 9. X. 1951 (durch Ausleseapparat erhalten), 2 ♀; Pákozd, Velencei tó 9. X. 1951, 2 ♀ (K). — II/2. Rimaszombat VIII. 1907 (Allotypus), 1 ♂ (Sz—P); Vác—Szokolya 2. IX. 1926, 1 ♀ (Bi). — VI/2. Simon-tornya 26. VI. 1917, 1 ♀ (Pill).

Das untersuchte Material umfaßt 20 Exemplare, von diesen Weibchen 15 (4) und Männchen 5 (1). Wahrscheinlich eine eurychrone Art, mit jährlich zwei-drei Generationen. Das Weibchen-Männchen-Häufigkeitsverhältnis beträgt: 3 : 1. Lebt in unseren xerothermen Gebieten (Sandhügeln, Berghängen). Eine seltene Art in Ungarn, wurde bisher nur im Karpatenbecken (Tschechoslowakei, Ungarn) aufgefunden.

### 9. *Hungarogryon* gen. nov.

Kopf quer. Augen kahl. Stirneindruck fehlt. Antennen zwölfgliedrig, mit einer sechsgliedrigen Keule. Thorax so breit wie der Kopf. Mesoscutum mit zwei durchlaufenden Parapsidenfurchen. Scutellum halbkreisförmig. Metascutum vorhanden. Vorderflügel mit einer Subcostalis, mit punktförmiger Marginalis, mit Stigmatis. Postmarginalis fehlend. Vorderflügel schmal, mit auffallend langen Wimperhaaren an allen Seiten, am Ende rundlich-zugespitzt. Abdomen aus sechs sichtbaren Segmenten zusammengesetzt. Petiolus mit drei durchlaufenden voneinander gleich weit verlaufenden Längskielchen. Das zweite Tergit ist das längste. Tarsenglieder: 5, 5, 5. Sporen: 1, 1, 1.

Typische Art: *Hungarogryon moczari* sp. nov. ♀.

Unterscheidet sich von den bisher bekannten Gryoninen-Gattungen durch die auffallend langen Wimperhaare des Vorderflügels.

### *Hungarogryon moczari* sp. n. ♀ (Abb. 9)

Kopf und Thorax schwarz. Antennen braun. Abdomen größtenteils gelb. Die Tergite 1—3 des Abdomens dunkelbraun. Beine gelb. Scapus gelb. Kopf quer, zweimal breiter als lang, überall fein schimmernd, lederartig punktiert. Augen länger als die Wangen. Ocellen im Dreieck stehend, die lateralen vom Augenrand im Abstand ihres doppelten Querdurchmesser. Scheitel bogig abgerundet. Scapus viel länger als der Pedicellus und die Fadenglieder 1—4 zusammen, mindestens zehnmal länger als breit. Pedicellus birnenförmig,

dreimal breiter als lang, länger als die zwei folgenden Fadenglieder zusammen. Die Fadenglieder 1—2 in Form und Länge gleich. Das dritte und vierte Fadenglied so lang wie breit, quer. Die Keule länger als der Pedicellus und die Fadenglieder 1—4 zusammen. Die Keulenglieder 3—5 schräg abgestutzt, stark quer, wenigstens zweieinhalbmal breiter als lang. Thorax fein und dicht lederartig punktiert, schimmernd. Mesoscutum vorn mit drei Furchen, die Parapsidenfurchen durchlaufend, aber schwach ausgebildet. Scutellum halbkreisförmig, lederartig, schimmernd. Metascutum als schwache Platte vorhanden. Propodeum in der Mitte tief ausgeschnitten. Pleuren schwach lederartig punktiert. Vorderflügel (Abb. 9) verschmälert, zugespitzt, mit auffallend langen Wimperhaaren, die länger sind als die Breite des Vorderflügels. Hinterflügel heller gefärbt, mit langen Wimperhaaren. Flügel schwach bräunlich angelaufen. Abdomen so lang wie der übrige Körper. Petiolus stark quer, etwa fünfmal breiter als lang, dicht und fein gestreift. Das zweite Tergit das größte, fein und dicht lederartig punktiert. Die Tergite 3—6 fein punktiert. L.: ca. 0,6 mm. Männchen und Biologie unbekannt.

Der Holotypus (1 ♀) und die Paratypen (2 ♀) befinden sich in der Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

F u n d o r t e : Duka-Csöröghegy 5. X. 1925, leg. BIRÓ (Holotypus); Duka-Csöröghegy 1. X. 1925, leg. BIRÓ; Duka-Csöröghegy 27. V. 1926, leg. BIRÓ (Paratypen).

Die neue Art wurde zu Ehren des ungarischen Hymenopterologen DR. L. MÓCZÁR benannt.

#### 10. *Gryon misellus* HAL., 1833, ♂♀ (Abb. 16)

Die Fangdaten und Fundorte — nach den tiergeographischen Gebietseinheiten von L. MÓCZÁR geordnet — sind: I/1. Ágasegyháza 4. VI. 1954 (ex radix graminum, Moos, *Festucetum vaginatae*, mit dem Ausleseapparat erbeutet), 1 ♂, 1 ♀ (Bal); Bátorliget, Nyírség 28. IX. — 1. X. 1949 (im Wald), 2 ♀ (K); Budafok 30. VIII. 1923, 1 ♂, 2 ♀; Budapest-Csepel 26. V. 1927 (im Wald), 1 ♂; Budapest, Kerepeser Gemeindefriedhof 13. VII. 1916, 1 ♀; Budapest-Múzeumkert 12. XI. 1917, 2 ♀; Budapest, Népliget 17. XI. 1912, 1 ♀; Budapest, Népliget 17. XI. 1919, 20 ♀; Budapest, Népliget 24. X. 1922, 1 ♀; Budapest, Rákos 31. V. 1908, 1 ♂; Budapest, Rákos 30. VI. 1908, 1 ♀; Csepel 7. VII. 1908, 1 ♀ (Bi); Csepel 1. II. 1931, 1 ♀ (Szel); Duka-Csöröghegy 26. X. 1923, 8 ♀; Duka-Csöröghegy 4. XI. 1923 (inter muscos), 8 ♀; Duka-Csöröghegy 10. XI. 1923, 1 ♀; Duka-Csöröghegy 6. X. 1924 (cribri ope, sub muscis), 3 ♀; Duka-Csöröghegy 12. X. 1924 (sub muscis), 3 ♀; Duka-Csöröghegy 3. XI. 1924 (inter muscos), 3 ♀; Duka-Csöröghegy 10. XI. 1924, 2 ♀; Duka-Csöröghegy 1. X. 1926, 7 ♀; Duka-Csöröghegy 5. X. 1925, 3 ♀; Duka-Csöröghegy 6. X. 1925 (sub muscis), 3 ♀; Duka-Csöröghegy 27. V. 1926 (cribri ope, sub muscis), 2 ♀; Duka-Csöröghegy 25. IX. 1926 (cribri ope, sub foliis), 2 ♀; Duka-Csöröghegy 2. XI. 1927 (cribri ope in muscis), 1 ♀; Holics 14. VII. 1918, 1 ♀ (Bi); Kecskemét 2. VIII. 1921 (Szikra), 1 ♂ (Bi); Kiskunhalas 14. VII. 1955 (Alsószállás), 1 ♀; Kiskunhalas 12. VII. 1955 (Alsószállás), 1 ♂ (JBSz); Ócsa, Nagyerdő 24. IV. 1952 (unter Erlenbaum, gesiebt und mit dem Ausleseapparat erbeutet), 1 ♀; Ócsa, Nagyerdő 16. IX. 1952 (unter Bäumen gesiebt und mit dem Ausleseapparat erbeutet), 9 ♀ (K—Szé); Ócsa, Nagyerdő 10. X. 1952 (gesiebt), 2 ♀ (Kovné—Hám-né); Ócsa, Nagyerdő 28. X. 1952 (unter Erlenbaum gesiebt und mit dem Ausleseapparat erbeutet), 27 ♀; Ócsa, Turjáni erdő 29. IV. 1952 (unter Erlenbaum gesiebt und mit dem Ausleseapparat erbeutet), 1 ♀ (K); Ócsa 26. VI. 1953 (Luzernenfeld), 1 ♀ (L. Mocz); Perkáta 21. VIII. 1954 (Zugó), 1 ♀ (JBSz); Pótharasz 17. VII. 1936 (unter *Juniperus communis* gesiebt und mit dem Ausleseapparat erbeutet), 6 ♀; Soltvadkert 15. III. 1944 (gesiebt), 4 ♀ (Bal); Szigetszentmiklós 14. IX. 1911, 1 ♀; Szigetszentmiklós 21. IX. 1911, 3 ♀; Szigetszentmiklós 29. IX. 1911, 2 ♀; Szigetszentmiklós 7. X. 1911, 3 ♀; Szigetszentmiklós 13. X. 1911, 1 ♀; Sződ 18. VI. 1916, 1 ♀; Sződ 5. VII. 1916, 1 ♀; Sződ 18. VI. 1918, 2 ♀; Sződ 16. VIII. 1918, 1 ♀; Sződ 14. IX. 1918 (cribri ope), 1 ♀; Sződ 10. XI. 1919 (hibernans), 3 ♀; Sződ 26. II. 1920, 1 ♀; Sződ 10. III. 1920 (cribri ope in salicetis), 1 ♀; Sződ 17. III. 1920, 1 ♂, 17 ♀; Sződ 19. III.

1920, 4 ♀; Sződ 24. III. 1920, 3 ♀ (Bi); Tabdi 31. VI. 1951 (Sumpfwald), 1 ♀ (Bal); Tabdi 22. V. 1959, 1 ♀; Tarján 27. V. 1959 (im Wald), 1 ♀ (JBSz); Vác 24. VI. 1912, 1 ♀; Vác-Csörög 14. XI. 1929 (cribri ope), 1 ♀; Vác-Gajáritelep 17. V. 1924, 1 ♀; Vác-Gajáritelep 1. XII. 1924 (in robinetis, sub foliis, cribri ope), 1 ♀; Vác-Naszályhegy 17. VIII. 1924 (südliche Berg-hänge), 1 ♀; Vác-Naszályhegy 10. XI. 1924, 1 ♂; Vác-Szokolya 2. IX. 1926, 1 ♂, 1 ♀; Vác—Sződ 23. IV. 1923, 1 ♀; Vác—Sződ 21. VII. 1925, 1 ♀; Vác—Sződ 9. VIII. 1927, 1 ♀; Vác—Sződ 30. X. 1927 (cribri ope, sub foliis), 2 ♀; Vác-Tudósdomb 3. VII. 1926 (in robinetis), 1 ♂; Vác-Tudósdomb 3. XI. 1929 (radix graminum, in pratis, cribri ope), 3 ♀; Vác-Tudósdomb 13. VII. 1930, 1 ♀ (Bi). — II/1. Balatonederics III. 1904, 1 ♀ (Gyár); Budaörs 4. IV. 1957 (Csíki hg.), 1 ♀; Budaörs 30. VI. 1957 (Csíki hg.), 1 ♂; Budaörs 15. VIII. 1957 (Csíki hg., aus Bodenprobe, mit dem Ausleseapparat erbeutet), 1 ♀; Budaörs 11. V. 1958 (Csíki hg.) 1 ♀ (JBSz); Budapest-Budafok 11. X. 1958 (im Garten, gesiebt und mit dem Ausleseapparat erbeutet), 1 ♀ (Mah); Budapest, Farkasrét 10. IX. 1950 (gesiebt und mit dem Ausleseapparat erbeutet), 1 ♀; Budapest, Farkasrét 14. III. 1954 (gesiebt und mit dem Ausleseapparat erbeutet), 2 ♀ (Bal); Budapest, Farkasrét 23. XI. 1958 (im Eichenwald, aus Abfallaub gesiebt und mit dem Ausleseapparat erbeutet), 4 ♀ (Mah); Budapest, Farkasvölgy 14. XI. 1922 (cribri ope lecta, sub foliis, in quercetis), 1 ♂, 3 ♀; Budapest, Gellérthegy 4. IV. 1914, 1 ♀; Budapest, Gellérthegy 12. II. 1916, 1 ♀; Budapest, Gellérthegy 26. IV. 1916, 1 ♀; Budapest, Gellérthegy 28. IV. 1919, 1 ♀; Budapest, Gellérthegy 17. II. 1920, 6 ♀; Budapest, Gellérthegy 17. VI. 1920, 1 ♀; Budapest, Gellérthegy 6. I. 1921, 2 ♀; Budapest, Gellérthegy 10. XII. 1924, 1 ♀; Budapest, Gellérthegy 5. IV. 1927 (cribri ope), 9 ♀; Budapest, Hárshegy 27. VII. 1927, 1 ♀; Budapest, Hűvösvölgy 1. V. 1907, 1 ♀; Budapest, Hűvösvölgy 20. II. 1917 (cribri ope, sub muscis), 3 ♀; Budapest, Hűvösvölgy 20. VI. 1917 (sub muscis, hibernans), 1 ♀; Budapest, Hűvösvölgy 22. III. 1918, 1 ♀; Budapest, Hűvösvölgy 4. I. 1920 (sub muscis), 1 ♀; Budapest, Hűvösvölgy 10. XI. 1922 (in quercetis), 1 ♀; Budapest, Hűvösvölgy 9. VI. 1926, 1 ♀; Budapest, Hűvösvölgy 21. IX. 1927 (retis ope), 4 ♀; Budapest, Hűvösvölgy 10. X. 1927 (cribri ope), 1 ♀; Budapest, Hűvösvölgy 25. VIII. 1931 (cribri ope), 1 ♀; Budapest, Kelenföld 14. IV. 1927 (cribri ope), 1 ♀; Budapest, Remetehgy 30. XI. 1958 (aus Abfallaub gesiebt und mit dem Ausleseapparat erbeutet), 1 ♀ (Mah); Budapest, Sashegy 11. VII. 1918, 1 ♂; Budapest, Sashegy 21. I. 1920 (in trunco fagi, hibernans), 4 ♀; Budapest, Sashegy 10. IX. 1927 (retis ope), 1 ♀; Budapest, Zugliget 22. V. 1919, 1 ♀ (Bi); Esztergom 1913, 1 ♀ (Bok); Fehérvárcsurgó, Várhegy 24. VII. 1923, 1 ♂; Fehérvárcsurgó 23. IX. 1923, 1 ♀; Fehérvárcsurgó 27. IX. 1923, 2 ♀ (Bi); Káptalanfüred, Káptalanhegy 25. VIII. 1955 (Moos, mit dem Ausleseapparat erbeutet), 1 ♀ (Bal); Nadap 1951, 1 ♀; Nadap 22. X. 1951, 1 ♀; Nadap 24. X. 1951 (aus Abfallaub gesiebt und mit dem Ausleseapparat erbeutet), 1 ♀; Pákozd, Velencei tó 5. X. 1950, 1 ♀; Pákozd, Velencei tó 9. X. 1951 (aus dem Ausleseapparat) 8 ♀; Sukoró, Meleghegy 14. X. 1951, 1 ♀; Sukoró, Velencei tó 12. IX. 1951, 16 ♀; Sukoró, Velencei tó 15. IX. 1951, 1 ♀; Sukoró, Velencei tó 12. XI. 1951, 68 ♀; Sukoró, Velencei tó 13.—15. X. 1951, 4 ♀ (K); Tarján 11. V. 1959 (im Wald), 1 ♀; Tarján 27. V. 1959 (im Wald), 1 ♀ (JBSz); Tátika 12. IX. 1953 (plato, *Fagus*), 1 ♀ (K); Tihany 20. VII. 1953 (Felsenmoos, aus dem Ausleseapparat), 2 ♀; Tihany 13. VII. 1954 (getrocknete Gräser gesiebt, aus dem Ausleseapparat), 1 ♀; Tihany 13. VII. 1954 (Felsenmoos gesiebt, aus dem Ausleseapparat), 1 ♂; Tihany 20. VII. 1954 (aus dem Ausleseapparat), 1 ♀; Tihany, Óvár 13. VII. 1954 (Moos unter Bäumen, aus dem Ausleseapparat), 1 ♀; Uzsa 1. IX. 1955 (unter *Juniperus communis*, aus Abfallaub gesiebt, *Callinetum* aus dem Ausleseapparat), 7 ♀; Uzsa, 1. IX. 1955 [*Rhaconitrium canescens* (Moos) aus dem Ausleseapparat], 2 ♀; Velence 18. V. 1951 (Bodenprobe im Park, aus dem Ausleseapparat), 1 ♀ (Bal); Vértes hgs., 1 ♀ (Mah). — II/2. Aggtelek 22. IX. 1953 (Doline »Bibice«), 1 ♀ (Vágvölgyi); Börzsöny hgs., Királyháza 26. III. 1920, 3 ♀; Börzsöny hgs., Mt. Magasfa 27. III. 1920, 1 ♀; Börzsöny hgs., Mt. Magasfa 28. III. 1920 (906 m Seehöhe), 1 ♀ (Dud); Börzsöny hgs., 1954 (aus dem Ausleseapparat), 1 ♀ (Endr); Bükk hgs., Békő 13. VII. 1955, 1 ♀ (Mih); Letkés 15. VII. 1920 (sub foliis, in quercetis), 1 ♂, 2 ♀; Letkés 17. VII. 1920 (cribri ope, in pomariis), 1 ♂, 1 ♀; Máriabesnyő 28. IX. 1916, 1 ♀; Máriabesnyő 4. X. 1916, 2 ♀ (Bi); Máriabesnyő 3. X. 1926, 1 ♀; Máriabesnyő 10. XI. (Iharotető, cribri ope), 1 ♀; Mts. Mátra, Nagyalyatető 30. VII. 1923 (963 m Seehöhe), 1 ♀ (Fo); Nógrádszakál 18. V. 1921, 1 ♂; Nógrádszakál 12. V. 1922, 2 ♀ (Bi); Rimaszombat IX. 1918, 4 ♀ (Bok); Zempléni hgs., Istvánkút 29. IX. — 4. X. 1955, 2 ♀; Zempléni hgs., Nagypéterménkö 28. IX. — 4. X. 1955, 5 ♀; Zempléni hgs., Rostalló 28. IX. — 4. X. 1955, 1 ♂, 35 ♀ (K); Rakottásbarlang 22. VI. 1952, 1 ♂ (Endr). — III/1. Malacka 16. VII. 1918, 1 ♂ (Bi); Tátraháza 16. VIII. 1934, 1 ♂, 1 ♀; Tátraháza 22. VIII. 1934, 1 ♂; Tátraháza 23. VIII. 1934, 1 ♂, 2 ♀; Tátraháza 28. VIII. 1934, 1 ♀ (Szel). — III/2. Csíkszentmihály 15. III. 1917, 1 ♀; Csíkszépvíz 27. III. 1917 (Pogányhavas, 786 m Seehöhe), 1 ♀; Csíkszépvíz 27. III. 1917 (Pogányhavas), 1 ♀; Csíkszépvíz 5. V. 1917 (Kishavas, 1085 m Seehöhe), 1 ♀; Csíkszépvíz 6. V. 1917 (Pogányhavas, 950 m Seehöhe), 1 ♀; Csíkszépvíz 6. VII. 1917, 1 ♂, 16 ♀ (Fo); Kolibica, Bisztrica völgy IX. 1941 (1200 m Seehöhe, gesiebt, aus dem Auslese

apparat), 2 ♀ (Dud). — III/3. Alp. Kudsir VIII. 1913 (Mt. Surián, 1900 m Seehöhe, criбри ope), 1 ♀; Ósebeshely 30. VIII. 1913, 1 ♀; Ósebeshely 7. VII. 1914, 1 ♂ (Bi); Petrozsény 4. VII. 1925 (Zsiec völgy), 1 ♀; Puj, Hunyad m. VII. 1925, 1 ♂ (Fo); Retyezát 6. IX., 1 ♀ (Anonymus); Urik, Hunyad m. 18. VII. 1926 (Rau Barbat Vallis), 1 ♂ (Fo). — III/4. Tasnád VII. 1912, 1 ♂; Tasnád 9. VII. 1912, 1 ♀; Tasnád 31. VIII. 1914, 1 ♀ (Bi). — III/5. Magyarbág 27. VII. 1917, 1 ♀; Nagyenyed 19. VII. 1917 (im Wald), 1 ♀; Nagyenyed 29. VII. 1917 (unter *Juglans* sp., gesiebt), 2 ♀; Nagyenyed 30. VII. 1917 (Órhegy), 1 ♀; Nagyenyed 3. VIII. 1917, 1 ♂, 4 ♀; Nagyenyed 6. VIII. 1917 (Órhegy, in *prunetis*, criбри ope), 1 ♂, 1 ♀; Nagyenyed 11. VIII. 1917, 1 ♀ (Bi); Nagyenyed 14. VII. 1918, 1 ♂ (Szil). — V/2. Sopron 3. XI. 1944 (gesiebt, aus dem Ausleseapparat), 1 ♀ (Dud); Sopron 22. VII. 1944 (Tomajmilérc, köfejtő, gesiebt, aus dem Ausleseapparat), 2 ♀ (Dud). — VI/1. Magyaregregy 16. IX. 1920, 1 ♀ (Bi); Pécs, Jakabhegy 6. VI. 1955, 1 ♀ (JBSz); Pécs, Dömörkapu 25. X. 1958 (aus Abfallaub gesiebt, aus dem Ausleseapparat), (südliche Berghänge), 2 ♀ (Mah); Simontornya 16. I. 1919, 3 ♀ (Ujh); Simontornya 13. VII. 1931 (in *queretis*), 1 ♀ (Bi). — VI/2. Balatonszentgyörgy 2. III. 1950 (im Wald, aus dem Ausleseapparat), 1 ♀ (K—Szé); Kisbalaton, Diás 20. III. 1950, 2 ♀ (K—Szé); Kisbalaton, Diás 15.—18. IV. 1950 (gesiebt), 1 ♀ (k); Kisbalaton, Vörs 20. IX. 1950, 1 ♀; Kisbalaton, Zalavár 19. IV. 1950, 1 ♀; Kisbalaton, Vágóórs 20. III. 1950 (aus dem Ausleseapparat), 1 ♀ (K—Szé). — VI/3. Krapina, 1 ♀ (Hensch). — Albanien: Ipek 20. VI. 1917 (Akad. Balk. Exp.), 4 ♀ (Csi). — Bulgarien: Küstendil 3. VIII. 1928 (in *pratis*, *retis* ope), 2 ♀; Küstendil 10. VIII. 1928 (xerophil), 1 ♀; Küstendil 25. VIII. 1928 (*retis* ope in *prunetis*), 1 ♀; Mts. Osogovo 16. VIII. 1928 (criбри ope, 1800 m Seehöhe), 2 ♂, 2 ♀; Mts. Rila 6. IX. 1928, 1 ♀; Mts. Rila, Karabunas 14. IX. 1928 (2200 m Seehöhe), 2 ♂, 3 ♀; Mts. Rila 17. IX. 1928, 1 ♂; Mts. Rila 18. IX. 1928 (*retis* ope in *pratis*), 1 ♀ (Bi). — England: coll. MARSHALL »*misellus*«, »161«, »cotype«; coll. MARSHALL, leg.: A. MATHEWS 1 ♀; coll. MARSHALL, »*niger*«, 1 ♂, 1 ♀; — Griechenland: Korfu, 1 ♀ (REITTER). — Sowjetunion: Kaukasus, Suanethien, LEDER, REITTER, »216«, »*Plastogryon sagax* var. *brevipennis* KIEFF.« det. L. BIRÓ, 1 ♂; Kaukasus, Suanethien, LEDER, REITTER, »171«, »*Gryon misellus*«, 1 ♂, det. L. BIRÓ. — Tschechoslowakei: Sl. Skrzeczon 23. IX. 1918, 1 ♀ (Dud). — Jugoslawien: Bosnien, Trebovic 11. V. 1929 (criбри ope in *fagetis*), 1 ♀; Hercegowina, Kobila Glava III. 1917 (Eichen, APFELB.), 1 ♀ (Fo).

Das untersuchte Material umfaßt 560 Exemplare, von diesen Weibchen 518 (361) und Männchen 42 (9). Eine wirklich eurychrone Art, die von Mitte Mai bis Mitte Oktober fliegt. Kann nach verschiedenen Methoden (Siebe, Ketscher, Ausleseapparat, Bodenprobe etc.) erbeutet werden. Besonders in Bodenproben häufig. Wirt und Biologie unbekannt. Die Art entwickelt jährlich mindestens drei Generationen (Abb. 16, III). Eine sehr stark variierende Art, weswegen sie so oft unter verschiedenen Namen von mehreren Autoren beschrieben wurde. Die Männchen werden von Mitte März bis Mitte November, gleichfalls aus Bodenproben gesammelt. Die Art lebt noch in 2200 m Seehöhe. Von England bis in die Sowjetunion (Kaukasus) verbreitet. Das Weibchen-Männchen-Häufigkeitsverhältnis beträgt 12,33 : 1.

### 11. *Plesiobaeus hospes* KIEFF., 1913 ♂♀

Die Fangdaten und Fundorte von *Plesiobaeus hospes* KIEFFER — geordnet nach der tiergeographischen Gebietseinheiten von L. MÓCZÁR —, sind: I/1. Budapest, Népliget 12. III. 1918, 1 ♀; Budapest, Népliget 17. XI. 1919, 13 ♀; Budapest, Rákosszentimre 1907, 1 ♀ (Bi); Csévharaszt 17. VII. 1956 (mit dem Ausleseapparat erbeutet), 1 ♀ (Bal); Duka-Csöröghegy 4. XI. 1923 (inter *muscos*), 1 ♀; Duka-Csöröghegy 6. X. 1924 (sub *muscis*), 2 ♀ (Bi); Polgárdi, Kicsésirpuszta 23. VI. 1937, 1 ♀ (Szel); Soltvadkert 15. III. 1944 (aus dem Ausleseapparat), 1 ♀ (Bal); Sződ 7. III. 1920, 1 ♀; Sződ 17. III. 1920, 9 ♀; Sződ 19. III. 1920, 2 ♀; Vác-Csörög 14. XI. 1929 (criбри ope), 5 ♀; Vác-Gajáritelep 1. XII. 1924 (in *Robinetis*, sub *foliis*, criбри ope), 1 ♀; Vác-Szokolya 2. IX. 1926, 1 ♀; Vác—Sződ 6. VI. 1926 (in *Robinetis*, *retis* ope), 1 ♀; Vác-Tudósdomb 3. VII. 1926 (in *Robinetis*), 2 ♀; Vác-Tudósdomb 1. VIII. 1926, 1 ♂; Vác-Tudósdomb 2. V. 1927 (*retis* ope), 1 ♀ (Bi). — II/1. Budaörs 12. V. 1957 (Csíki hg.), 1 ♀; Budaörs 11. V. 1958 (Csíki hg., im Robinienwald), 1 ♀ (JBSz); Budapest, Csúcshegy 9. V. 1937, 1 ♀ (Szel);



Budapest, Gellérthegy 10. IV. 1920 (cribri ope), 1 ♀; Budapest, Gellérthegy 6. I. 1921, 1 ♀; Budapest, Hűvösvölgy 4. XII. 1905 (sub muscis), 1 ♀; Budapest, Hűvösvölgy 22. III. 1918 (sub muscis), 2 ♀; Budapest, Hűvösvölgy 11. XII. 1919, 2 ♀; Budapest, Hűvösvölgy 21. I. 1921 (in trunco fagi), 1 ♀; Budapest, Jánoshegy 3. XI. 1917, 1 ♀; Nadap, Velencei hg. 15. X. 1951, 1 ♀; Nadap, Velencei hgs. 22. X. 1951, 1 ♀; Nadap, Velencei hgs. 23. X. 1951, 13 ♀; Pákozd, Bella-völgy 9. X. 1951 (aus dem Ausleseapparat), 2 ♀; Sukoró, Velencei tó 12. IX. 1951, 1 ♀; Sukoró, Velencei hgs. 13.—15. X. 1951, 2 ♀; Tátika 12. IX. 1953 (Plato, *Fagus*), 1 ♀ (K). — II/2. Aggtelek 22. IX. 1953 (Doline »Bibic«), 1 ♀ (K); Máriabesnyő 4. X. 1926, 1 ♀; Máriabesnyő 23. XI. 1930 (hibernans, sub muscis), 1 ♀ (Fo); Mts. Börzsöny 26. III. 1920 (Királyháza), 2 ♀; Mts. Börzsöny 25.—28. III. 1920 (Királyháza), 1 ♀; Mts. Börzsöny 27. III. 1920 (Magasfa, 900 m Seehöhe), 5 ♀; Mts. Börzsöny 27. III. 1920 (Nagymanna), 9 ♀ (Dud). — III/2. Mts. Hargita (Udvarhely m.) 24. V. 1917 (950 m Seehöhe), 1 ♀; Pecsétszeg 8. VIII. 1911, 1 ♀ (Bi). — III/5. Nagyenyed 29. VII. 1917 (unter *Junglans* sp., gesiebt), 2 ♀ (Bi). — V/1. Kőszeg VI. 1937, 1 ♀ (Bal). — V/2. Endréd 21. VII. 1955 (Moos im Eichenwalde, aus dem Ausleseapparat), 1 ♀ (Bal). — VI/1. Magyaregregy 15. X. 1958 (aus Abfalllaub am Ufer eines Baches, gesiebt, aus dem Ausleseapparat), 1 ♀ (Mah). — VI/2. Balatonszentgyörgy 2. III. 1956 (im Eichenwald gesiebt), 1 ♀ (K—Szé); Simontornya 16. I. 1919, 4 ♀ (Ujh).

Das untersuchte Material besteht aus 110 Exemplaren, von diesen Weibchen 108 (42) und Männchen 2. Wahrscheinlich eine eurychrone Art mit jährlich zwei-drei Generationen. Sie kann nach verschiedenen Methoden (Siebe, Ketscher, Ausleseapparat, Bodenproben, Moos etc.) gesammelt wer-

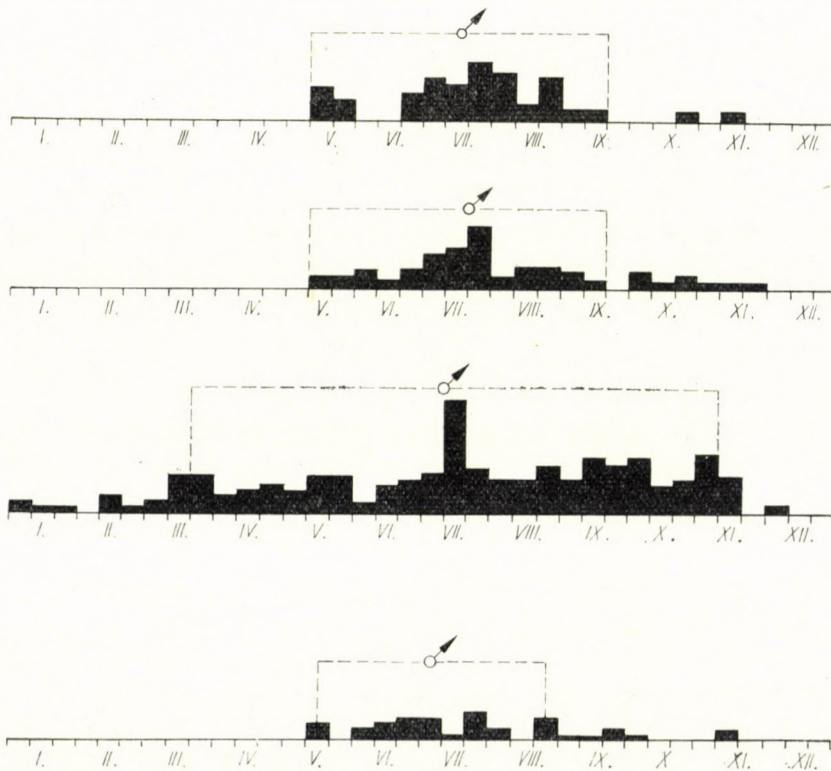


Abb. 16. Flugdiagramme von *Eremioscelio cydnoides* PRIESN. ♂♀ (I), von *Hadronotellus monspeliensis* PIC. ♂♀ (II), von *Gryon misellus* HAL. ♂♀ (III), von *Hadronotus muscaeformis* NEES ♂♀ (IV)

den. Die überwinternden Individuen leben im Moos, im Boden. Fliegt von Mitte März bis Mitte Oktober. Häufig in unseren xerothermen Gebieten (Berghängen, Hügeln), kommt jedoch auch in Wäldern vor. Die Art lebt in England, Rumänien, in der Tschechoslowakei, in Ungarn. Biologie und Wirt unbekannt.

In der vorliegenden Arbeit versuche ich, die Generationszahl und die Flugperioden der angeführten Gattungen, mit annähernder Genauigkeit festzustellen (Abb. 16). Es wurden 921 Exemplare untersucht, die 11 Gattungen und 18 Arten angehören.

Die theoretischen Grundlagen und die Durchführung beruhen auf den Arbeiten von Á. Soós. In der Abbildung 16. findet sich die Diagramme der Flugperioden, die auf Grund der Fangdaten (Ort und Zeit, geordnet nach Dekaden und Tagen der Einsammlung) zusammengestellt wurden. Bei mehreren gleichen Zeitpunkten und Fundorten wurde nur eine Angabe berücksichtigt.

Jene Tiere, deren Fund- und Zeitangaben ungenügend sind, ferner die Duplumexemplare sind in Klammern angeführt. Es wurde weiterhin das Männchen-Weibchen-Häufigkeitsverhältnis in Betracht gezogen.

Die Sammler des Materials sind der hier folgenden Liste zu entnehmen (die Namensabkürzungen stehen in Klammern):

J. BALOGH (Bal), L. BIRÓ (Bi), E. CSIKI (Csi), E. DUDICH (Dud), J. FODOR (Fo), J. GYÖRFFY (Győr), HÁMORINÉ (Hám-né), E. HORVÁTH (Horv), Z. KASZAB (K), KOVÁCS I-NÉ (Kovné), S. MAHUNKA (Mah), F. MIHÁLYI (Mi), F. PILLICH (Pi), J. B. SZABÓ (JBSz), J. SZABÓ—PATAY (Sz—P), G. SZELÉNYI (Szel), V. SZÉKESSY (Szé), Z. SZILÁDY (Szil), ÚJHELYI (Ujh).

Schließlich gebe ich eine Liste der Fundorte mit ihren tiergeographischen Koordinaten nach L. MÓCZÁR:

Ágasegyháza: I/1, L-15; — Aggtelek: II/2, K-14; — Alp. Kudsir (Mt. Surián): III/3, P/R-25/26; — Apajpuszta: I/1, F-14; — Balatonederics: II/1, L-10; — Balatonszentgyörgy: VI/2, L-9; — Bátorliget: I/1, H-12; — Börzsöny hgs. (Mts. Börzsöny, Királyháza, Magasfa, Nagymanna): II/2, H-13/14; — Budafok: II/1, I/J-14; — Budaörs: II/1, J-14; — Budapest (Ferencváros, Gemeindefriedhof, Káposztásmezyer, Kispest, Múzeumkert, Népliget, Rákoser Gemeindefriedhof, Rákos): I/1, I/J-14; — Budapest (Csúcshegy, Farkasrét, Farkasvölgy, Gellérthegey, Hárshegy, Hüvösvölgy, Jánoshegy, Kelenföld, Remetehegy, Rózsadomb, Sashegy, Zugliget): II/1, I/J-14; — Bükk hgs. (Békkő): II/2, H-17; — Csepel: I/1, K-14; — Csík-szépvíz: III/2, M-31; — Crkvenica: VII, S-4; — Dömsöd (Apajpuszta): I/1, F-14; — Duka-Csöröghegy: I/1, H-14; — Esztergom: II/1, H-13; — Fehérvársurgó: II/1, J-29; — Holics: I/1, N-16; — Káptalanfüred: II/1, K-11; — Kecskemét: I/1, L-16; — Kisbalaton (Diás, Vágóörs): VI/2, M-9; — Kiskunhalas: I/1, N-15; — Kőszeg: V/1, J-7; — Krapina: VI/3, N-16; — Kunfehértó: I/1, N-15; — Letkés: II/2, H-13; — Magyaregregy: VI/1, F-9; — Máriabesnyő: II/2, J-14; — Mts. Hargita: III/2, L/M/N-29-30; — Mts. Mátra (Nagyalyatető, Bagolyirtás): II/2, H-16; — Nadap: II/1 7-13. — Nagyenyed: III/5, N-26; — Nógrádszakál: II/2, G-15; — Nyírbátor: I/1, H-22; — Ócsa, Nagyerdő: I/1, J-14; — Ósebeshely: III/3, P-25; — Pákozd: II/1, J-13; — Pecsétszeg: III/2, I-26; — Pécs (Dömörkapu, Jakabhegy): VI/1, O-12; — Perkáta: I/1, K-13; — Petrosény: III/3, R-25; — Polgárdi: I/1, K-12; — Pótharasz: I/1, I-14; — Púj: III/3, R-24; — Rakottásbarlang: II/2, H-13/14; — Retyezát: III/3, R-24; — Rév: III/4, K-23; — Rimaszombat: II/2, F-16; — Simontornya: VI/2, L-13; — Soltvadkert: I/1, M-15; — Somlővásárhely: II/1, K-10; — Sopron: V/2, J-8; — Sukoró: II/1, J-13; — Szigetmonostor: I/1, I-14; — Szigetszentmiklós: I/1, J-14; — Sződ: I/1, J-14; — Tabdi: I/1, M-15; — Tarján: II/1, J-12; — Tasnád: III/4, J-13; — Tátika: II/1, L-10; — Tompa: I/1, N-15; — Urik: III/3,

R-24; — Vác (Csörög, Gajáritelep, Naszályhegy, Tudósdomb): I/1, H-14; — Vác—Szöd: I/1, J/H-14; — Velence I/1, J-13; — Vértés hgs: II/1, J-12; — Zalavár (Kisbalaton, Diás): VI/2, M-9; — Zempléni hgs. (Istvánkút, Nagypéterméknő, Rostalló): II/2, F-20.

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ZWEI NEUE ASTEROBIUM-ARTEN  
 (HOMOPTERA: APHIDIDAE) AUS UNGARN

Von

H. SZELEGIEWICZ

ZOOLOGISCHES INSTITUT DER POLNISCHEN AKADEMIE DER WISSENSCHAFTEN, WARSZAWA  
 (DIRECTOR: PROF. DR. J. NAST)

(Eingegangen am 16. Dezember 1965)

**Macrosiphoniella (Asterobium) soosi** sp. n. (Abb. 1—5)

Ungeflügeltes vivipares Weibchen

**Morphologische Kennzeichen:** Körper breit oval, etwa 1,90—2,99 mm lang. Kopf und Pronotum sklerotisiert, dunkelbraun. Abdomen weichhäutig, mit großen dunkelbraunen Antesiphonalplatten und recht großen, bräunlichen Haarplättchen sowie einem bräunlichem Querband am VIII. Tergit. Dorsale Haare nicht zahlreich, etwa 8—11 je Tergit, recht lang, am Ende zugespitzt oder stumpf, niemals erweitert; die spinalen am III. Abdominaltergit 1,60—1,87mal so lang wie der basale Durchmesser des 3. Fühlergliedes; ventrale Haare sehr zahlreich, ungeordnet und verschieden lang. Das VIII. Tergit mit 4—7, gewöhnlich 5 oder 6 Haaren, die ganz wenig länger sind als jene am Tergit III. Frontaltuberkel nicht allzu gut entwickelt, divergierend; Sinus frontalis konkav. Scheitelhaare etwas länger als jene auf Tergit VIII. Fühler länger als der Körper, dunkelbraun, nur das 3. Glied basal bisweilen hell geringelt. Flagellum fein geschuppt, Hauptrhinarien gewimpert. Das 3. Glied in basaler Hälfte mit 4—11, meistens 6—8 sekundären Rhinarien, diese verschieden groß und meistens nicht in einer Reihe angeordnet. Processus terminalis etwa so lang wie Glied 3 und 3,6—4,1mal so lang wie die Basis des 6. Gliedes. Das 4. Glied deutlich länger als Glied 5. Die längsten Haare am Glied 3 ein wenig länger als der basale Durchmesser des Gliedes. Rüssel kurz, kaum bis zu den mittleren Coxen reichend; das Endglied von typischer *Asterobium*-Gestalt, so lang oder etwas kürzer als das 2. Glied der Hintertarsen, mit 4—7, meistens jedoch 6 sekundären Haaren. Siphonen dunkelbraun, fast schwarz, etwa 0,15—0,16 der Körperlänge, zylindrisch, gegen die Basis zu deutlich erweitert, mit undeutlicher Flansche; distales 0,50—0,65 mit Netzskulptur, außerhalb der Netzskulptur mit basalwärts schwacher werdender, feiner Schuppung. Cauda dunkelbraun, etwa 0,72—0,80 der Siphollänge, schwach eingeschnürt mit 10—18 Haaren. Subgenitalplatte rundlich-oval, bräunlich, mit 2 langen Haaren am Vorderrande und 2 Gruppen von etwa 2—5 kürzeren Haaren seitlich am Hinterrande. Beine

recht lang, die Hintertibien etwa 0,55—0,65 der Körperlänge, dunkelbraun, fast schwarz, nur die Femora in den distalen zwei Fünfteln hell. Erste Tarsenglieder mit 3 Haaren; das mittlere ein wenig kürzer als die lateralen Haare.



Abb. 1—5. *Macrosiphoniella (Asteroobium) soosi* sp. n., ungeflügeltes vivipares Weibchen: 1 = Habitus (links dorsale, rechts ventrale Seite), 2 = Hintertarsus, 3 = Rüsselendglied, 4 = Cauda, 5 = Siphunculus

Farbe der lebenden Tiere: Körper hellgrün; Kopf, Fühler, Beine, Siphonen und Cauda schwarz; Augen rot.

Maße einiger Tiere in mm:

Nr.	Körper	Flagellum	Flagellarglieder:				Rhin. am 3. Glied	Siphon	Cauda	Rüsselendgl.	2. Glied der Hintertars.
			3	4	5	6					
1	2,99	3,16	0,75	0,68	0,56	0,20+0,75	5 ; 6	0,48	0,38	0,13	0,15
2	2,34	3,07	0,72	0,67	0,49	0,20+0,72	7 ; 6	0,37	0,29	0,14	0,15
3	2,65	2,62	0,63	0,57	0,50	0,19+0,73	5 ; 4	0,42	0,33	0,12	0,14
4	2,53	3,19	0,72	0,69	0,51	0,20+0,74	11 ; 7	0,45	0,33	0,12	0,14
5	1,90	2,42	0,52	0,48	0,39	0,16+0,66	7 ; 6	0,30	0,23	0,11	0,12
6	2,54	2,95	0,68	0,63	0,51	0,18+0,72	8 ; 5	0,43	0,31	0,14	0,14
7	2,61	2,60	0,67	0,59	0,48	0,18+0,68	5 ; ?	0,44	0,33	0,12	0,12
8	2,38	2,69	0,63	0,62	0,50	0,20+0,74	? ; ?	0,41	0,30	0,12	0,13
9	2,50	2,81	0,68	0,61	0,48	0,19+0,66	5 ; 4	0,38	0,28	0,14	0,13
10	2,50	?	0,68	?	?	?	6 ; 5	0,41	0,34	0,12	0,13

Wirtspflanze: *Aster punctatus*

Holotypus: ein ungeflügeltes vivipares Weibchen (Präp. Nr. 2964a) Ungarn, Pusztakócs: Ohat, 10. IX. 1965, auctor leg. Paratypen: 9 ungeflügelte vivipare Weibchen, Daten wie beim Holotypus. Holotypus und ein Teil der Paratypen befinden sich in der Sammlung des Zoologischen Instituts der Polnischen Akademie der Wissenschaften in Warszawa, die übrigen Paratypen in der Sammlung der Zoologischen Abteilung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

Biologie: Wenig bekannt. Die Tiere leben einzeln an der Unterseite der schmalen Blätter und werden nicht von Ameisen besucht. Die Art scheint sehr selten zu sein. Lebenszyklus unbekannt, aber wahrscheinlich monözisch und holozyklisch.

Systematische Stellung: Die neue Art unterscheidet sich von allen bekannten europäischen Arten des Subgenus *Asterobium* H. R. L. sofort durch die schöne hellgrüne Körperfärbung und die roten Augen. Sie scheint mit *M. (A.) asteris* (WALK.) am nächsten verwandt zu sein, unterscheidet sich aber von dieser Art außer durch die genannten Farbunterschiede auch durch die dunkle Cauda und die Beine. Bei *M. (A.) asteris* (WALK.) ist überdies die ganze distale Hälfte des 3. Gliedes und das 2. Glied hell, während bei der neuen Art höchstens das 3. Glied basal hell geringelt ist.

Die neue Art ist meinem Freund, Herrn DR. ÁRPÁD Soós zu Ehren benannt, dessen Hilfe mir das Studium der ungarischen Aphiden erleichtert hat.

**Macrosiphoniella (Asterobium) ohatensis** sp. n. (Abb. 6—10).

## Ungeflügeltes vivipares Weibchen

**Morphologische Kennzeichen:** Körper breit spindelförmig, etwa 2,28—2,69 mm lang. Kopf, Pro- und Mesonotum sklerotisiert, dunkelbraun. Abdomen weichhäutig, mit sehr großen dunkelbraunen Anteriorplatten, recht großen, dunkelbraunen Haarplättchen sowie mit einem unregelmäßigen dunkelbraunen Querband am VIII. Tergit. Marginale Haarplättchen bisweilen zusammenfließend und größere, 2—3 Haare tragende Platten bildend. Auf den Segmenten III—V treten unregelmäßig kleine Marginaltuberkeln auf, die meisten so groß, bisweilen aber kleiner oder etwas größer sind als die Haarsockeln. Dorsale Haare recht zahlreich, bis zu 15 je Tergit, recht lang, am Ende stumpf oder ein wenig erweitert; die spinalen am III. Abdominaltergit bis 2mal so lang wie der basale Durchmesser des 3. Fühlergliedes; ventrale Haare sehr zahlreich, verschieden lang und zugespitzt. Das VIII. Tergit mit 4—6, meistens jedoch mit 4 Haaren, die etwa 1,9—2,2mal so lang sind wie der basale Durchmesser des 3. Fühlergliedes. Frontaltuberkel nicht allzu gut entwickelt, stark divergierend; Sinus frontalis schwach konkav. Die Scheitelhaare etwa so lang wie jene auf Tergit VIII. Fühler deutlich länger als der Körper, dunkelbraun, nur die Basis des 3. Gliedes bisweilen ein wenig heller. Flagellum fein geschuppt, Hauptrhinarien deutlich gewimpert. Das 3. Glied in basaler Hälfte (bei den Herbsttieren aber bisweilen in  $3/4$ ) mit 12—20, ausnahmsweise mit weniger sekundären Rhinarien. Processus terminalis etwa so lang wie Glied 3 und 3,1—3,7mal so lang wie die Basis des 6. Gliedes. Glied 4 deutlich länger als das 5. Glied. Die längsten Haare am Glied 3 etwa so lang wie der basale Durchmesser des Gliedes. Rüssel bis zu den hinteren Coxen reichend; das Endglied von typischer *Asterobium*-Gestalt, stets etwas kürzer als das 2. Glied der Hintertarsen, mit 4—7, meistens 5 oder 6 sekundären Haaren. Siphonen dunkelbraun, fast schwärzlich, etwa 0,14—0,19 der Körperlänge, zylindrisch, gegen die Basis zu sichtlich erweitert, ohne deutliche Flansche; in der proximalen Hälfte stark geschuppt, die Schuppung ohne deutliche Grenze in die distale Netzskulptur übergehend. Cauda dunkelbraun, etwas kürzer bis so lang wie die Siphonen, deutlich eingeschnürt, mit 13—24 Haaren. Subgenitalplatte rundlich-oval, braun, mit 2 langen Haaren am Vorderrande und 2 Gruppen von etwa 3—8 kürzeren seitlich am Hinterrande. Beine recht lang, die Hintertibien etwa 0,61—0,70 der Körperlänge, durchaus dunkelbraun, nur die Femora basal hell geringelt. Erste Tarsenglieder mit 3 Haaren, das mittlere nur ein wenig kürzer als die lateralen Haare.

Farbe der lebenden Tiere: Glänzend braun bis bräunlichschwarz, mit schwarzen Augen. Fühler, Beine, Siphonen und Cauda schwärzlich.



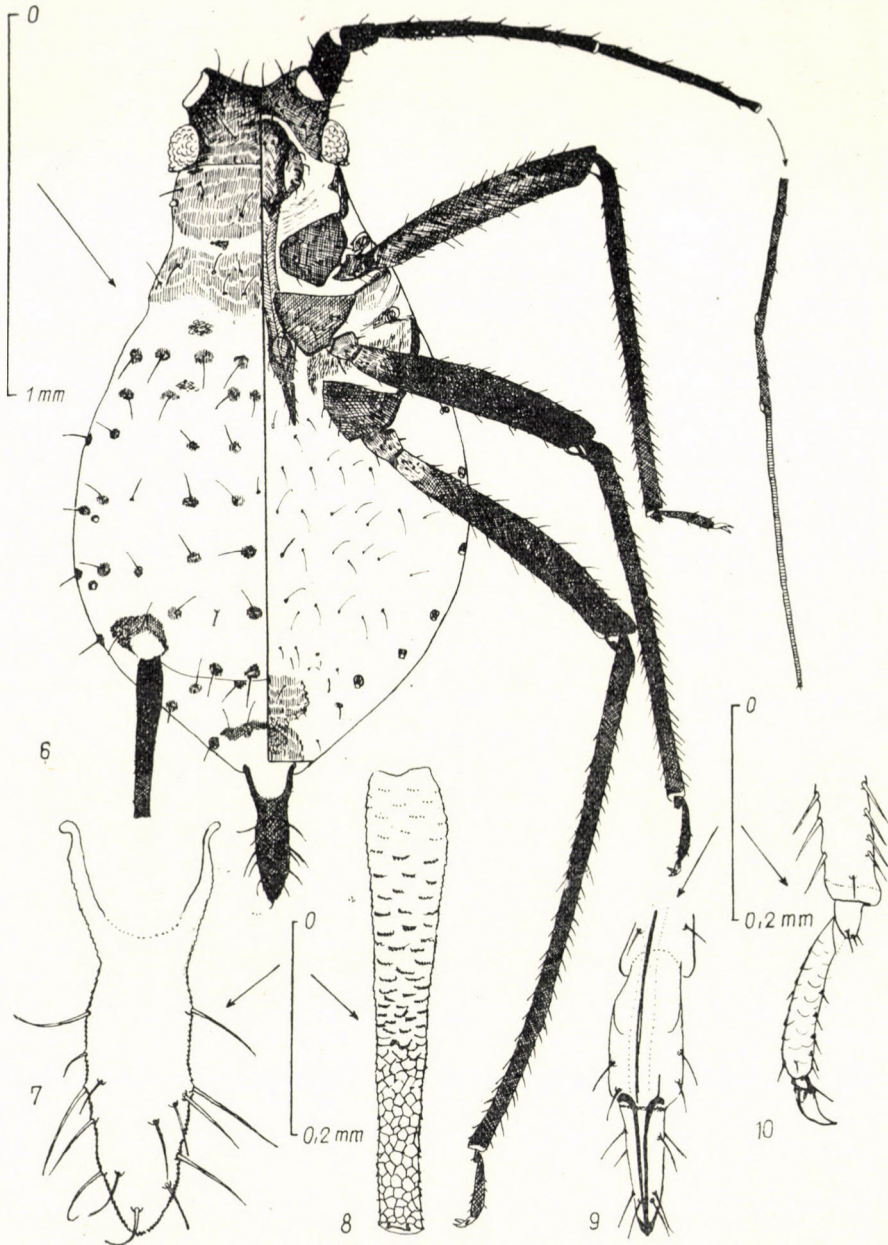


Abb. 6—10. *Macrosiphoniella (Asterobium) ohatensis* sp. n., ungeflügeltes vivipares Weibchen: 6 = Habitus (links dorsale, rechts ventrale Seite), 7 = Cauda, 8 = Siphunculus, 9 = Rüsselendglied, 10 = Hintertarsus

## Maße einiger Tiere in mm:

Nr.	Körper	Flagellum	Flagellarglieder:				Rhin. am 3. Glied	Siphon	Cauda	Rüsselendgl.	2. Glied der Hintertars.
			3	4	5	6					
1	2,30	2,36	0,57	0,53	0,41	0,19+0,66	12 ; 13	0,41	0,37	0,14	0,15
2	2,35	2,55	0,67	0,56	0,48	0,20+0,64	16 ; 13	0,45	0,41	0,13	0,14
3	2,48	2,62	0,69	0,58	0,50	0,20+0,65	15 ; 17	0,45	0,41	0,14	0,15
4	2,39	2,59	0,65	0,57	0,46	0,21+0,70	14 ; 12	0,43	0,38	0,13	0,15
5	2,45	2,64	0,68	0,60	0,50	0,20+0,66	13 ; 17	0,44	0,40	0,14	0,15
6	2,55	2,44	0,65	0,50	0,44	0,20+0,65	18 ; 19	0,43	0,38	0,13	0,15
7	2,50	2,47	0,64	0,54	0,44	0,20+0,65	13 ; 16	0,42	0,38	0,13	0,14
8	2,28	2,70	0,79	0,60	0,47	0,19+0,68	15 ; 13	0,43	0,43	0,14	0,15
9	2,50	2,61	0,68	0,57	0,48	0,20+0,68	12 ; 11	0,43	0,40	0,14	0,15
10	2,60	2,62	0,67	0,57	0,47	0,22+0,69	13 ; 14	0,50	0,43	0,14	0,16
11	2,40	2,70	0,71	0,60	0,48	0,19+0,72	20 ; 20	0,40	0,42	0,14	0,15
12	2,41	2,90	0,75	0,69	0,50	0,21+0,75	9 ; 10	0,46	0,42	0,14	0,16
13	2,46	2,64	0,69	0,59	0,46	0,20+0,70	17 ; 16	0,40	0,43	0,14	0,16
14	2,69	3,05	0,68	0,61	0,49	0,20+0,67	15 ; 13	0,37	0,36	0,14	0,15
15	2,53	2,90	0,78	0,68	0,50	0,21+0,73	13 ; 14	0,47	0,41	0,15	0,16

1—10: Ohat, 25. VI. 1964; 11—15: Ohat, 10. IX. 1965.

## Geflügeltes vivipares Weibchen (nach 1 Exemplar)

**Morphologische Kennzeichen:** Kopf und Thorax sklerotisiert, bräunlichschwarz. Abdomen mit braunen Antesiphonalplatten, recht großen, 3—5 Haare tragenden Marginalplatten und ziemlich großen Haarplättchen, von denen die spinalen am Tergit I—III zusammenfließen. Marginaltuberkeln etwas größer als die Haarsöckeln, deutlicher als beim ungeflügelten Weibchen ausgebildet. Fühler deutlich länger als der Körper, dunkelbraun, das 3. Glied basal hell geringelt und mit 33—35 auf seiner ganzen Länge verteilten sekundären Rhinarien. Flügel normal. Übrige Merkmale wie bei der vorigen Form.

Maße des untersuchten Tieres: Körper 2,29 mm, Fühlerflagellum 2,73 mm, Siphonen 0,42 mm, Cauda 0,36 mm, Rüsselendglied 0,15 mm, das 2. Glied der Hintertarsen 0,16 mm, Flagellarglieder 3—6: 0,73 : 0,60 : 0,48 : 0,19 + 0,73 mm. Glied 3 mit 35 und 33 sekundären Rhinarien.

Wirtspflanze: *Aster punctatus*

Holotypus: ein ungeflügeltes vivipares Weibchen (Präp. Nr. 2326a): Ungarn, Pusztakócs: Ohat, 25. VI. 1964, auctor leg. Paratypen: ein geflügeltes und 45 ungeflügelte vivipare Weibchen, Daten wie beim Holotypus,

sowie 15 ungeflügelte vivipare Weibchen, Ohat, 10. IX. 1965, auctor leg. Holotypus und ein Teil der Paratypen befinden sich in der Sammlung des Zoologischen Instituts der Polnischen Akademie der Wissenschaften in Warszawa, ein Teil der Paratypen in der Zoologischen Abteilung des Ungarischen Naturwissenschaftlichen Museums in Budapest und die übrigen Paratypen in der Sammlung von D. HILLE RIS LAMBERS, Bladluisonderzoek T. N. O., Bennekom, Niederlande, sowie im British Museum (Natural History), London.

**Biologie:** Wenig bekannt. Die Tiere bilden kleine Kolonien an den Stengelspitzen und sind sehr beweglich; beunruhigt, lassen sie sich sofort zu Boden fallen. Die Art ist an der Fundstelle sehr gemein, und man konnte ihr fast an jeder *Aster*-Pflanze begegnen. Ge Flügelte scheinen sehr selten zu sein. Im Juni konnte ich trotz Suchens nur ein einziges geflügeltes Tier finden. Wahrscheinlich monözisch und holozyklisch.

**Systematische Stellung:** Die neue Art ist mit *M. (A.) linariae* (KOCH) sehr nahe verwandt und von dieser sehr schwer zu trennen. Außer durch die Wirtspflanze unterscheiden sich beide Arten durch die Zahl und Anordnung der sekundären Rhinarien bei ungeflügelten Tieren, die Zahl der dorsalen Haare sowie durch die Marginaltuberkeln, die bei *M. (A.) linariae* (KOCH) höchstens auf dem Pronotum vorkommen, sowie durch andere, graduelle Unterschiede.

### Schlüssel zur Bestimmung der europäischen Arten des Subgenus *Asterobium* H. R. L. nach den ungeflügelten viviparen Weibchen

- 1 Cauda viel heller als die Siphonen. Tibien hell, mit dunklen Enden. Distales  $\frac{1}{3}$ — $\frac{1}{2}$  des 3. Fühlergliedes hell. An *Aster tripolium* ..... **M. (A.) asteris** (WALK.)
- Cauda schwarz, nicht heller als die Siphonen. Tibien durchwegs schwarz. Das 3. Fühlerglied gänzlich dunkel, höchstens mit heller Basis. Nicht an *Aster tripolium* ..... 2
- 2 Körper glänzend dunkelbraun bis schwarz. Augen schwarz ..... 3
- Körper hellgrün, Augen rot. An *Aster punctatus* blattunterseits, keine Kolonien bildend **M. (A.) soosi** sp. n.
- 3 Abdominaltergite II—V mit Marginaltuberkeln. Spinalhaare meistens verdoppelt. Das 3. Fühlerglied mit 12—20 sekundären, gewöhnlich über die basale Hälfte des Gliedes verteilten Rhinarien. An *Aster punctatus* ..... **M. (A.) ohatensis** sp. n.
- Marginaltuberkeln höchstens am Pronotum, niemals an Abdominaltergiten vorhanden. Spinalhaare nur ausnahmsweise verdoppelt. Das 3. Fühlerglied gewöhnlich mit mehr sekundären Rhinarien, die auch meistens über  $\frac{2}{3}$  der Gliedlänge verteilt sind. An *Aster linosyris* ..... **M. (A.) linariae** (KOCH)

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2. HILLE RIS LAMBERS, D. (1938): Contributions to a Monograph of the Aphidiae of Europe I. — Temminckia, Leiden, **3**, pp. 44.

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# ZOOLOGISCHE JAHRBÜCHER

Begründet von J. W. Spengel. Herausgegeben von Prof. Dr. phil. Alfred Kaestner, München, Prof. Dr. phil. Erwin Stresemann, Berlin, Prof. Dr. phil. Manfred Gersch, Jena, und Prof. Dr. Bernhard Hassenstein, Freiburg/Br.

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Seit 1886 sind die »Zoologischen Jahrbücher« ein wichtiger Bestandteil der zoologischen Zeitschriften-Literatur Deutschlands. Durch ihre umfassende Vielseitigkeit und durch den strengen wissenschaftlichen Maßstab, den die Herausgeber an jedes eingehende Manuskript legen, haben sich Wert und Geltung der »Zoologischen Jahrbücher« stets erhalten und gefestigt. Die hervorragende technische Ausgestaltung der Zeitschrift ist ihrem Inhalt angemessen.

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**VEB GUSTAV FISCHER VERLAG JENA**

I. LOKSA

# Die bodenzöologischen Verhältnisse der Flaumeichen-Buschwälder Südost-Mitteleuropas

**(Monographie der Flaumeichen-Buschwälder 2.)**

*In deutscher Sprache • Etwa 510 Seiten • 105 Abbildungen • 21 Original-  
photos • 63 Tabellen im Text • 76 Tabellen als Beilage*

**An Hand von Untersuchungen, die sich vom nördlich der Dobrudscha gelegenen Gebiet bis zum ungarischen Karst erstrecken, bespricht der Verfasser die in der Streuschicht der Buschwälder Südostmitteleuropas lebenden Arthropoden-Assoziationen und gibt eine ausführliche Bearbeitung sämtlicher Arthropoden-Gruppen, mit Ausnahme der Acariden. Einen wichtigen Teil des Buches bildet auch die Beschreibung der qualitativen und quantitativen zoozöologischen Aufnahmemethoden.**

AKADÉMIAI KIADÓ

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# ACTA ZOOLOGICA

ТОМ XII ВЫП. 3—4

РЕЗЮМЕ

## О ДИНАМИЗМЕ ПОПУЛЯЦИИ ЗООБЕНТОСА ОДНОГО МЕЛКОГО ОЗЕРА

А. БЕРЦИК (Будапешт)

На основании очередных исследований, проводившихся в течение двух лет, сообщаются изменения массовых соотношений макрозообентоса озера в 19 га, со средней глубиной 130 см. Озеро с полуискусственными условиями в периоде исследования было использовано в качестве рыбного пруда для карпов.

На видовой состав донной фауны и на изменения массовых соотношений решающим образом повлияли отсутствие глубинного расчленения и недостаток кислорода в воде дна озера. Фауна отличается крайней однородностью: почти единственными ее представителями являются личинки *Chironomus plumosus* L. (табл. 7). Господство этого одного вида позволяет хорошо регистрировать изменения массовых условий зообентоса. Личинки *Chironomus plumosus* с весны до осени непрерывно вылупливаются из яиц, причем, в зависимости от погоды наблюдаются три хорошо распознаваемых роения этого вида в май-июне, июль-августе и сентябре. Сопоставление пропорции молодых и более старших личинок, встречающихся в материале отдельных сборов, в значительной мере способствует определению сроков роения (рис. 5.).

Результаты исследований предоставляют данные о своеобразных лимнологических и гидробиологических условиях мелких прудов.

## TINEIDAE (LEPIDOPTERA) ИЗ БАНГИ (СРЕДНЕАФРИКАНСКАЯ РЕСПУБЛИКА)

Л. А. ГОЗМАНЬ (Будапешт)

В настоящей статье автор сообщает результат обработки коллекции молей из Банги, столицы Среднеафриканской Республики, храняемой в Парижском Музее Естественной истории. В сравнительно немногочисленном материале содержится ряд своеобразных видов: *Miramonopis* gen. n. *viettei* sp. n., *Monopis ubangi* sp. n., *M. stenorrhoea* sp. n., *Pachypsaltis morosa* sp. n., *Nannotinea* gen. n. *simplex* sp. n., *Perissomastix onyx* sp. n., *Ectabola* gen. n. *protracta* sp. n., *Hyperbola primoti* sp. n., *Episcardia truncata* sp. n. В коллекции было определено также несколько экземпляров, собранных на других местах Африки.

## ТАКСОНОМИЧЕСКИЕ ИССЛЕДОВАНИЯ НА ВЕНГЕРСКИХ РЫБАХ ПРИ ПОМОЩИ БУМАЖНОЙ ХРОМАТОГРАФИИ

Л. ХАЛМАДЬИ и Й. ТОТ (Гёдёллэ)

Авторы исследовали 32 вида венгерских рыб, относящихся к 9 семействам (Salmonidae 2, Esocidae 1, Cyprinidae 18, Cobitidae 2, Siluridae 1, Amiuridae 1, Anguillidae 1, Gadidae 1, Percidae 5). Полосу кожи головы нанесли прямо на бумагу для хроматографирования и проводили трехкратное фильтрование при помощи смеси бутанола — уксусной кислоты — воды в соотношении 4 : 1 : 5. Хроматограммы изучались в ультрафиолетовом свете аналитической кварцевой лампы.

Хроматограммы семейств *Salmonidae*, *Esocidae*, *Cyprinidae* и *Cobitidae* оказались хорошо оцененными и специфическими для данных семейств и их видов. Хроматограммы остальных исследованных семейств для оценки не пригодились. На основании полученных результатов вышеописанный метод бумажной хроматографии оказался пригодным для таксономического исследования значительной части видов, живущих в пресноводных прудах Венгрии.

## РЕВИЗИЯ РОДА MICRODERA ESCHSCHOLTZ (COLEOPTERA: TENEBRIONIDAE)

З. КАСАБ (Будапешт)

Автор проводил ревизию рода *Tenebrionidae*, распространенного в Средней Азии, и подытоживает в настоящей статье результаты таксономического исследования отдельных видов этого рода. Последнюю подытоживающую работу по этому вопросу опубликовал Э. Рейттер в 1900 году, в которой дается ключ для определения 26 видов. С тех пор число известных видов возросло более чем два раза и, поэтому, идентификация видов, общераспространенных в аридной зоне Средней Азии, наталкивалась на большие трудности. Несколько видов на основании исследованных типов оказались синонимами. Помимо ключа для определения видов дается описание двух новых подродов и 9 новых видов и подвигов. Сообщается также каталог всех описанных до сих пор видов, в котором содержатся, однако, лишь данные оригинального описания.

## ОБЗОР ВИДОВ РОДА MELANESTHES LACORDAIRE (COLEOPTERA: TENEBRIONIDAE)

З. КАСАБ (Будапешт)

В статье дается обзорный ключ для определения всех видов рода *Melanesthes* и выясняется система этого рода, широко распространенного в Средней Азии. Последняя подытоживающая работа по этому вопросу появилась в 1936 году. С тех пор было описано много новых видов, прежде всего в работах Скопина и автора настоящей статьи. Следовательно, прежний ключ для определения ныне уже непригоден. В новом ключе для определения содержатся все описанные до сих пор виды этого рода.

## COLLEMBOLAE ИЗ ЧИЛИ

### NORTE GRANDE I.

И. ЛОКША (Будапешт) и И. РУБИО (Сантьяго)

Авторы обработали коллекцию Collembolae из северной части Чили. В настоящей статье исследование семейства *Poduridae*, *Onychuridae* и *Isotomidae*. Три из идентифицированных 11 видов оказались новыми для науки, а именно: *Onychiurus (O.) bunsteri*, *Varisotoma alticola*, *Proisotoma pajonalica*. Помимо этого дается и описание нового подвида: *Onychiurus (Protaphorura) fimatus chilensis*.

## ИССЛЕДОВАНИЕ МУХ НА БУДАПЕШТСКОМ РЫНКЕ ДЛЯ ПИЩЕВЫХ ПРОДУКТОВ

Ф. МИХАЙИ (Будапешт)

На рынке Уйпештского района города Будапешт под руководством автора с 1 по 3 сентября 1965 года собрали мух. На пищевых продуктах насекомых собрали при помощи сетки. 595 экземпляров мух, относящихся к 36 видам, дают хорошее представление о составе мух на данном рынке.

Больше всего мух (239 экземпляров) было собрано на дынях. Из них 28,9% относились к виду *Muscina stabulans*, 16,7% к виду *Lucilia sericata*, 13% к виду *Muscina assimilis*, 7,1% к виду *Paregle radicum*, 6,3% к виду *Bellieria melanura*, 6,3% к виду *Bercaea haemorrhoidalis*. На груше было собрано 67 экземпляров, большинство из них (32,8%) относилось к виду *Lucilia sericata* и *Bellieria melanura* (23,4%). На сливе также господствовали эти два вида (по 34,7% каждый). На винограде был собран 31 экземпляр мух, среди них 16,1% относились к виду *Bercaea haemorrhoidalis*, 12,9% к виду *Lucilia sericata*, 12,9% к виду *Parasarcophaga aegyptica* (= *parkeri*), 9,7% к виду *Calliphora uralensis*, и 9,7% к виду *Bellieria melanura*.

На мясе было уловлено 209 экземпляров, относящихся к 16 видам. Среди них три вида были представлены многочисленными особями: именно *Lucilia sericata* (79,4%), *Bercaea haemorrhoidalis* (6,7) и *Calliphora erythrocephala* (5,7%).

Из вида *Musca domestica* было найдено лишь два экземпляра (0,3%). Следовательно, роль этого вида в распространении болезней незначительна. Виды, собравшиеся на рынке массовыми экземплярами, почти без исключения относятся к видам, систематически посещающим человеческие испражнения, или развивающимся в последних.

В целях преодоления опасности мух автор предлагает устранение мест их разведения, строение уборных, недоступных для мух и предохранение пищевых продуктов от мух.

## О РАЗЛИЧНЫХ ТИПАХ BETHYLIDAE (HYMENOPTERA) KIEFFERA И MARSHALLA, ХРАНЯЕМЫХ В ВЕНГЕРСКОМ МУЗЕЕ ЕСТЕСТВОЗНАНИЯ

Л. МОЦАР (Будапешт)

Автор определил лекто-, паралекто- и голотипы 14 видов, относящихся к семейству Bethylidae и принадлежащих к типам KIEFFERA и MARSHALLA, храняемых в Венгерском Музее Естествознания. Сообщаются подробные данные отдельных типов, затем приводятся отклонения их от оригинального описания и необходимые дальнейшие данные отдельных видов. Обсуждаемые виды в большинстве случаев отдаленные друг от друга, и, поэтому, вместо ключа для определения приводятся лишь важнейшие признаки отдельных видов. Типы видов Dryinidae KIEFFER и MARSHALL были обработаны уже раньше (Мוצар 1965), а типы видов Mesitius и Epyris обсуждаются в другом сообщении.

## ПРАВИЛЬНЫЕ ГРАНИЦЫ ПАЛЕАРКТИЧЕСКОЙ ОБЛАСТИ В ГИМАЛАЕ НА ОСНОВАНИИ ИНДИЙСКИХ ВИДОВ LIMNOPHILINAE (TRICHOPTERA)

Ф. ШМИД (Оттава)

Дается описание двух новых видов Limnophilinae, собранных на больших высотах Гималая: *Limnophilus tibeticus* sp. n. и *Asynarchus tibetanus* sp. n., а также нескольких видоизменений вида *Limnophilus fuscovittatus* Mats. Это первые сообщения о встречаемости палеарктических элементов в индийской части Гималая. Автор предлагает провести южную границу палеарктической области, с точки зрения трихoptерологии, через севернотибетскую горную цепь, а не через Гималай, как это было общепринято до сих пор.

## КЛЮЧ ДЛЯ ОПРЕДЕЛЕНИЯ РОДОВ ПИАВОК (HIRUDINOIDEA) ВСЕГО МИРА И КАТАЛОГ ВИДОВ III. СЕМЕЙСТВО: ERPOBDELLIDAE

А. ШООШ (Будапешт)

В настоящей части серии статей, начатой в предыдущих двух номерах журнала Acta Zoologica (11, стр. 417—463 и 12, стр. 145—160) автор дает описание семейства Erpobdellidae. В введении статьи сообщаются важнейшие примечания автора к 17 родам этого семейства. Во второй части статьи приводится ключ для определения родов. Третья часть представляет собой каталог, содержащий 60 видов, 4 подвиды, и 5 видоизменений 17 родов. Работа дополняется списком литературы и указателем.

НОВЫЕ ВИДЫ PHANEROPTERA SERV. И NERHOPTERA UV.  
(ORTH., TETTIGONIIDAE)

Х. ШТЕЙНМАНН (Будапешт)

В последние годы коллекция прямокрылых (Orthoptera) Будапештского Музея Естественной истории обогатилась отрядно, главным образом экзотическим материалом. Значительное количество прямокрылых было и прислано из палеарктической области Азии, но больше или меньше экземпляров было получено также из Африки и Южной Америки. В настоящей статье автор сообщает описание 5 новых видов из двух родов подсемейства Phaneropteriinae, собранных в Иордании, Гвинее, Новой Гвинее и Китае.

ЭКОЛОГИЧЕСКИЕ, ЭТОЛОГИЧЕСКИЕ, ЗООГЕОГРАФИЧЕСКИЕ  
И СИСТЕМАТИЧЕСКИЕ ИССЛЕДОВАНИЯ GRYONINAE ПАЛЕАРКТИКИ  
(HYM. PROCTOTRUPOIDEA, SCELIONIDAE)

Й. Б. САБО (Будапешт)

На основании исследования почти 1000 экземпляров Gryoninae автор устанавливает, что судя по их биологическим и морфологическим признакам они представляют новое подсемейство в пределах Scelionidae. Для нового подсемейства характерен общий мельчайший признак, находящийся на petiolus и состоящий из двух или трех продольных ребришек. При внимательном осмотре этот признак всегда обнаруживается, за исключением рода Encyrtoscelio.

Много авторов поставили под сомнение правильность обособления рода *Hadronotellus* KIEFF. но автор настоящей статьи на основании голотипа и аллотипа восстанавливает, этот род. Род *Eremioscelio* PRIESN. также нельзя прекратить, так как скульптура груди в пределах семейства Scelionidae не имеет себе подобную. Род *Hadronotus* FÖRST., который в последние годы считался необоснованно ликвидированным, автор снова восстанавливает. Помимо этого на основе богатого материала (с учетом также материала Gryoninae всего мира), автор сделает филогенетические заключения. В статье содержится описание 4 новых родов и 8 новых видов, а также 6 неизвестных полов.

Согласно результатам исследований автора необоснованные соединения систематических категорий этого подсемейства, не способствуют точному выяснению системы этих насекомых. Автор указывает на то, что у Proctotrupoidea мельчайшие признаки имеют очень большое значение. Относительно чаще встречаемых видов сообщаются также этологические, зоогеографические и т. д. данные.

ДВА НОВЫХ ВИДА ASTEROBIUM ИЗ ВЕНГРИИ (HOMEOPTERA: ARNIDIDAE)

Х. СЕЛЕГИЕВЫЦ (Варшава)

Дается описание двух новых видов, обнаруженных автором в Венгрии, именно: *Macrosiphoniella (Asterobium) soosi* sp. n., *M. (A.) ohatensis* sp. n. Оба вида были найдены на *Aster punctatus*, собранном в Охатском лесу, простирающемся в пустыне Хортобадь. В конце статьи составлен ключ для определения бескрылых живородящих самок европейских видов подрода *Asterobium*.

The *Acta Zoologica* publish papers on zoological subjects in English, German, French and Russian.

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