594.584

Acta Zoologica Hungarica

VOLUME 35, NUMBERS 1–2, 1989

EDITOR-IN-CHIEF
J. BALOGH

ASSISTANT EDITOR
J. PAPP

EDITORIAL BOARD
I. ANDRÁSSY, L. GALLÉ, T. JERMY, I. LOKSA, S. MAHUNKA,
I. MATSKÁSI, Á. SOÓS, H. STEINMANN, A. ZICSI

Akadémiai Kiadó, Budapest
ACTA ZOOL. HUNG. 35 (1–2) 1–190 (1989) HU ISSN 0236–7130

ACTA ZOOLOGICA HUNGARICA

A QUARTERLY OF THE HUNGARIAN ACADEMY OF SCIENCES

Acta Zoologica is published in yearly volumes of four issues by

AKADÉMIAI KIADÓ
Publishing House of the Hungarian Academy of Sciences
H-1054 Budapest, Alkotmány u. 21

Subscription information

Orders should be addressed to

KULTURA Foreign Trading Company
H-1389 Budapest, P.O. Box 149

or to its representatives abroad

Acta Zoologica Hungarica is abstracted/indexed in Biological Abstracts, Chemical Abstracts, Current Contents–Agriculture, Biology and Environmental Sciences, Helminthological Abstracts, International Abstracts of Biological Sciences, Keyword in Context

---

© *Akadémiai Kiadó, Budapest*

304.587

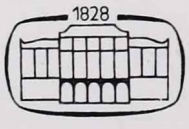
Acta Zoologica Hungarica

Editor-in-chief
J. Balogh

Assistant editor
J. Papp

Editorial board
I. Andrássy, L. Gallé, T. Jermy, I. Loksa, S. Mahunka,
I. Matskási, Á. Soós, H. Steinmann, A. Zicsi

Volume 35



Akadémiai Kiadó, Budapest
1989

INDEX

Six new nematode species from South America, I. Andrássy 1
Oribatid mites from Ecuador (Acari), II. P. Balogh 17
Fridericia Arten aus Marokko (Oligochaeta: Enchytraeidae), K. Dózsa-Farkas 29
Neue Enchytraeiden-Arten (Oligochaeta) aus Ekuador, K. Dózsa-Farkas 191
Data to the Thysanoptera fauna of Ethiopia, G. Jenser 205
Addenda to the millipede fauna of Vietnam (Diplopoda), Z. Korsós and S. I. Golovatch 211
Oribatids from the Southern Hemisphere (Acari: Oribatida), S. Mahunka 41
Some Steganacarus Ewing, 1917 species (Acari: Oribatida) from Turkey, S. Mahunka and L. Miko 221
Melanesian representatives of Toxicum and Cryphaeus (Coleoptera, Tenebrionidae: Toxicini), O. Merkl 235
Thirty-five new hydroptilid species from Vietnam (Trichoptera, Hydroptilidae), J. Oláh 255
Braconidae (Hymenoptera) from Korea, X., J. Papp 81
Braconidae (Hymenoptera) from Korea, XI., J. Papp 295
A new apterous sphaerocerid fly from Thailand (Diptera: Sphaeroceridae), L. Papp ... 105
Revision of the species of Pterogrammoides L. Papp (Diptera, Sphaeroceridae), L. Papp 327
Taxonomic studies on the genus Autophila Hübner, 1823 (Lepidoptera: Noctuidae), II., L. Ronkay 111
Studies on the Palaearctic Noctuidae. Sect. Amphipyrinae, I. The genus Pseudohadena Alpheraky, 1889. The laciniosa group, L. Ronkay and Z. Varga 339
A revision of the genus Cosmiella Verhoeff, 1902 (Dermaptera: Forficulidae), H. Steinmann 143
Identification keys to the genera of Oppiidae Grandjean, 1951 (Acari: Oribatei), L. S. Subias and P. Balogh 355
Weitere neue Glossodrilus-Arten aus Ekuador (Oligochaeta: Glossoscolecidae), Regenwürmer aus Südamerika 9., A. Zicsi 165
Revision der Gattung Yagansia Michaelsen, 1889 (Oligochaeta, Acanthodrilidae), Regenwürmer aus Süd-Amerika, 11., A. Zicsi 413

Acta Zoologica Hungarica 35 (1—2), pp. 1—16 (1989)

SIX NEW NEMATODE SPECIES FROM SOUTH AMERICA

I. ANDRÁSSY

Zoosystematical and Ecological Institute, Eötvös Loránd University, H-1088 Budapest, Puskin utca 3, Hungary

(Received 28 March, 1988)

Six new species and a new genus of free-living nematodes are described from three South American countries: *Aphanolaimus furcifer*, *Ceratoplectus amoenus*, *Prodesmodora loksai*, *Paraphelenchus zicsii*, *Kallidorylaimus singularis* and *Monotrichodorus muliebris* spp. n. *Kallidorylaimus* gen. n. belongs to the family Qudsianematidae and is closely related to the genera *Eudorylaimus* ANDRÁSSY, 1959, *Epidorylaimus* ANDRÁSSY, 1986 and *Microdorylaimus* ANDRÁSSY, 1986 but differs from them especially in the presence of a single preanal supplement of the male. With 8 (32) original figures.

In my nematode collection originating from South America several species can be found which represent new forms for science. Hereunder six species are described. They had been collected in Ecuador, Peru and Bolivia. Three of them belong to the subclass Torquentia *(Aphanolaimus furcifer, Ceratoplectus amoenus* and *Prodesmodora loksai)*, one to Secernentia *(Paraphelenchus zicsii)* and two to Penetrantia *(Kallidorylaimus singularis* and *Monotrichodorus muliebris)*.

Aphanolaimus furcifer sp. n.
(Fig. 1)

♀: $L = 0.74$ mm; $a = 22$; $b = 4.1$; $c = 6.4$; $V = 49\%$; $c' = 6$.
♂: $L = 0.62—0.64$ mm; $a = 27—28$; $b = 4.2—4.4$; $c = 6.6—6.7$; $c' = 4.7—4.9$.

Body of middle length, comparatively plump, 33 μm (♀) or 23—25 μm (♂) wide. Cuticle thick, 3.3—3.7 μm, heavily annulated; annules 2.5—3 μm wide. Body consisting of 267—278 annules (from head to posterior end of oesophagus 53—55 annules, from head to vulva 132 annules, from head to anus or cloaca 227 [♀] or 217 [♂] annules, tail with 50—51 annules). Lateral field marked by two crenate lines, originating at the 3rd somatic annule and extending over the body to the 7th to 11th annule from tail tip. 25—29 large (12—17 μm) subcuticular glands are present on each side of body which open by the same number of circular pores on the surface. These pores are arranged in a more or less alternating row on both sides of the lateral fields. On one side there are 6—7 pores in the oesophageal region and 1—3 pores on the tail, respectively. The first pore occurs at the 8th to 9th annule.

Head distinctly separated by its smooth contour, about as wide (8—9

Acta Zool. Hung. 35, 1989
Akadémiai Kiadó, Budapest

MAGYAR TUDOMÁNYOS AKADÉMIA

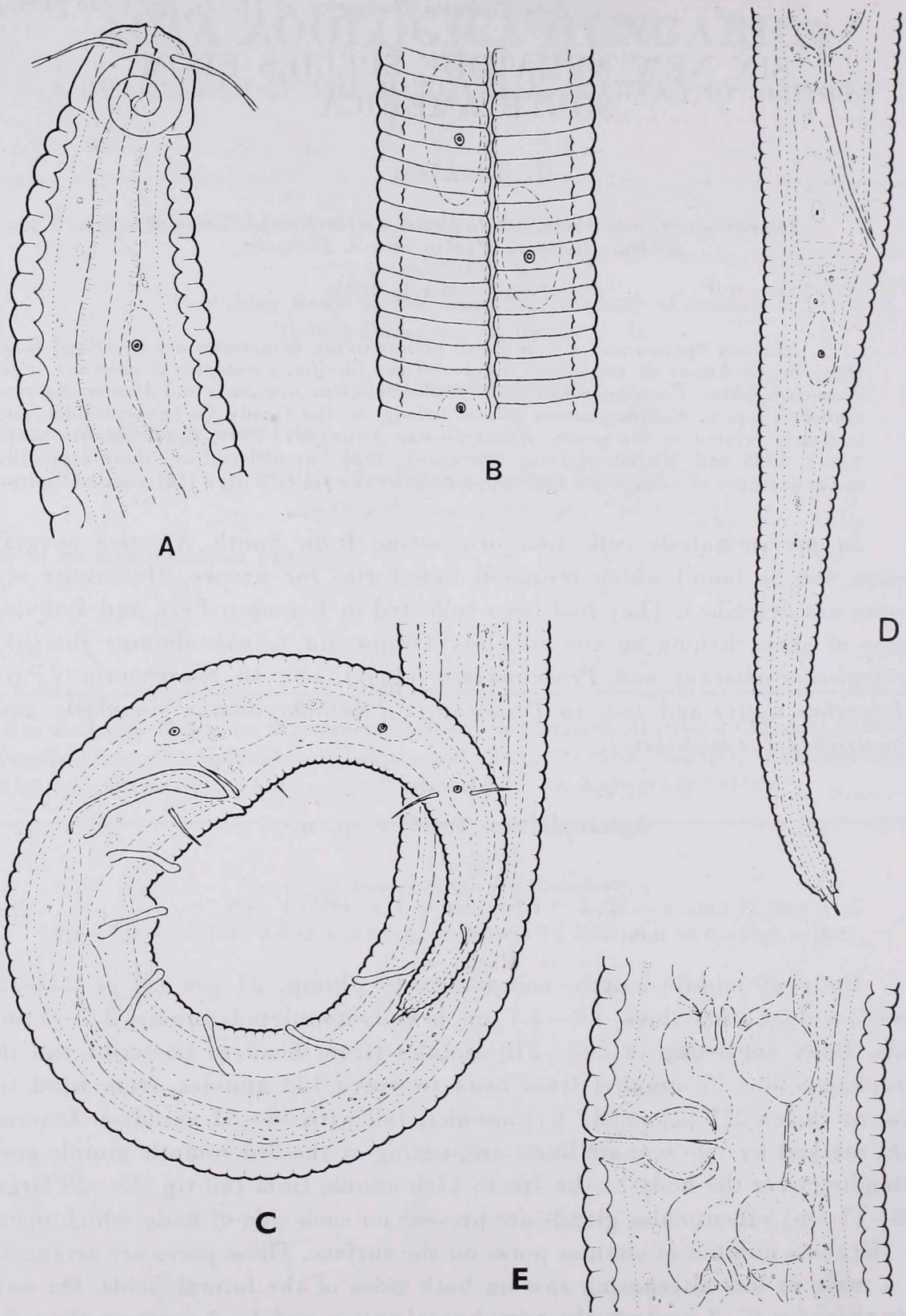


Fig. 1. *Aphanolaimus furcifer* sp. n.: A = anterior end (×1100); B = structure of cuticle (×1100); C = posterior end of male (×760); D = female tail (×760); E = vulval region (×1100)

μm) as high, provided with four setae, 6—7 μm long, i.e. somewhat shorter than head diameter. Tip of setae very finely forked. Body at posterior end of oesophagus 2.5—3.2 times as wide as head. Amphids large, 6—7 μm, about 3/4 as wide as head, with two turns.

Oral opening with small projected liplets. Mouth cavity a short tube, nearly half as long as head height. Oesophagus simple and fairly slender, 142—152 μm long. In the region of the oesophago-intestinal junction there is a large ventral gland. Rectum 1.5 times as long as anal body diameter.

Female reproductive system amphidelphic, each arm 3.4—3.7 times as long as body diameter. Ovaries reflexed. Between each oviduct and the uterus there is a well developed sphincter. Uterus connected with two pairs of large spherical glands.

Distance vulva-anus 2.2 times as long as tail. The latter 117 μm long, 6 times anal body diameter or 26% of the total length of body, respectively. It consists of 51 annules. Caudal glands well developed, anteriormost of them extending dorsally from rectum. Tail spinneret comparatively long.

Male tail 94—96 μm long, 4.7—4.9 times anal body diameter, with 50 annules. Four pairs of caudal setae present: one pair adanal, one subventral, one subdorsal and the posteriormost one lateral. Spicula 28 μm long, rather plump; gubernaculum thin, weakly cuticularized. Six preanal tuboid supplements present, 12—13 μm long. The second supplement (counted from the cloaca) is surrounded by a cuticular hump.

Brief characteristics: A less slender species with bifurcate cephalic setae, large amphids, long spicula, six preanal tubuli and long terminal spinneret.

Holotype: male on slide SA-9552 in the collection of the author.

Type-locality: Peru, Tingo Maria, from humus and fallen leaves from a valley, November 1971, leg. J. Balogh.

So far ten species of *Aphanolaimus* de Man, 1880 have been recorded. The new species belongs to the group of smaller forms and is related to *A. attentus* de Man, 1880, *A. solitudinis* Andrássy, 1968 and *A. pseudoattentus* Coomans et De Waele, 1983. It may be distinguished from all the three having bifurcate cephalic setae, longer spicula (*attentus:* 17—24 μm; *solitudinis:* 17—19 μm; *pseudoattentus:* 20—25 μm) and six preanal supplements (*attentus:* 3—4; *solitudinis:* 5; *pseudoattentus:* 4). But further differences may be found, too, viz. in the length of cephalic setae, shape of spicula and spinneret, width of body.

Up to the present a single species, *A. louisae* Coomans et De Waele, 1979, has been described which shows an extremely finely bifurcate tip of cephalic setae. Our new species is however smaller, having longer furcae on the setae, not striated annules and spicula of an other shape.

Ceratoplectus amoenus sp. n.
(Fig. 2)

♀: $L = 0.43-0.45$ mm; $a = 21-22$; $b = 3.6-3.8$; $c = 8.2-8.6$; $V = 47-49\%$; $c' = 5.5$.

Body small and rather plump. Cuticle very thin, 0.8—1 μm, annulation also very fine. Hypodermal glands not present. Lateral field simple, only 1/8 as wide as body. Scattered somatic setae, about as long as width of lateral field; oesophageal region with five or six pairs of setae.

Head 9—9.5 μm wide, not set off, lips low. Body at posterior end of oesophagus twice as wide as head. Cephalic setae well developed, 3.5—4 μm long, typical for the genus, originating on the posterior margin of head and reaching far over the lips. Amphids large, 3 μm wide, oval, about 30% of corresponding body width, located at 4.5—5.5 μm from anterior end of body, i.e. anterior to mid-stoma.

Stoma 17 μm long (measured from head margin), 1.9—2.1 times as long as labial diameter, somewhat widened in its anterior half (5 μm). Protostom not separate. Oesophagus 115—118 μm long, 26—28% of body length, bulbus strong, cardial process long. Excretory pore at 70% of oesophageal length. Rectum as long as anal body diameter.

Vulval lips not protruding, vagina thin. Each gonad 2—2.5 times as long as body width, about 10% of body length. Distance vulva-anus 3.4—3.5 times as long as tail.

Tail 50—53 μm long, 5.5 times anal body diameter or 11—12% of body length, almost cylindrical in its posterior third. Spur 2—3 tail diameters from the extremity; further caudal setae three pairs in number. Spinneret small.

Male unknown.

Brief characteristics: A small *Ceratoplectus* species with broad head, long cephalic setae, large amphids, anteriorly widened stoma, long cardia and tail of medium length.

Holotype: Female on slide SA-11318 in the collection of the author.

Type-locality: Bolivia, Alcoche (La Paz), 800 m, mosses from rock, December 1966, leg. J. BALOGH.

At the present time seven species of *Ceratoplectus* ANDRÁSSY, 1984 are recorded. The new species resembles *C. armatus* (BÜTSCHLI, 1873) ANDRÁSSY, 1984 and *C. assimilis* (BÜTSCHLI, 1873) ANDRÁSSY, 1984, and seems to have an intermediate position between them. Nevertheless, it differs from both of those as follows; from *armatus:* cephalic setae thinner, amphids larger, mouth cavity widened anteriorly, not regularly tuboid, cardia longer, and tail longer and slenderer; from *assimilis:* body smaller, labial region flat, cephalic setae longer, amphids much larger, lateral field with two lines, stoma longer, and tail longer and slenderer.

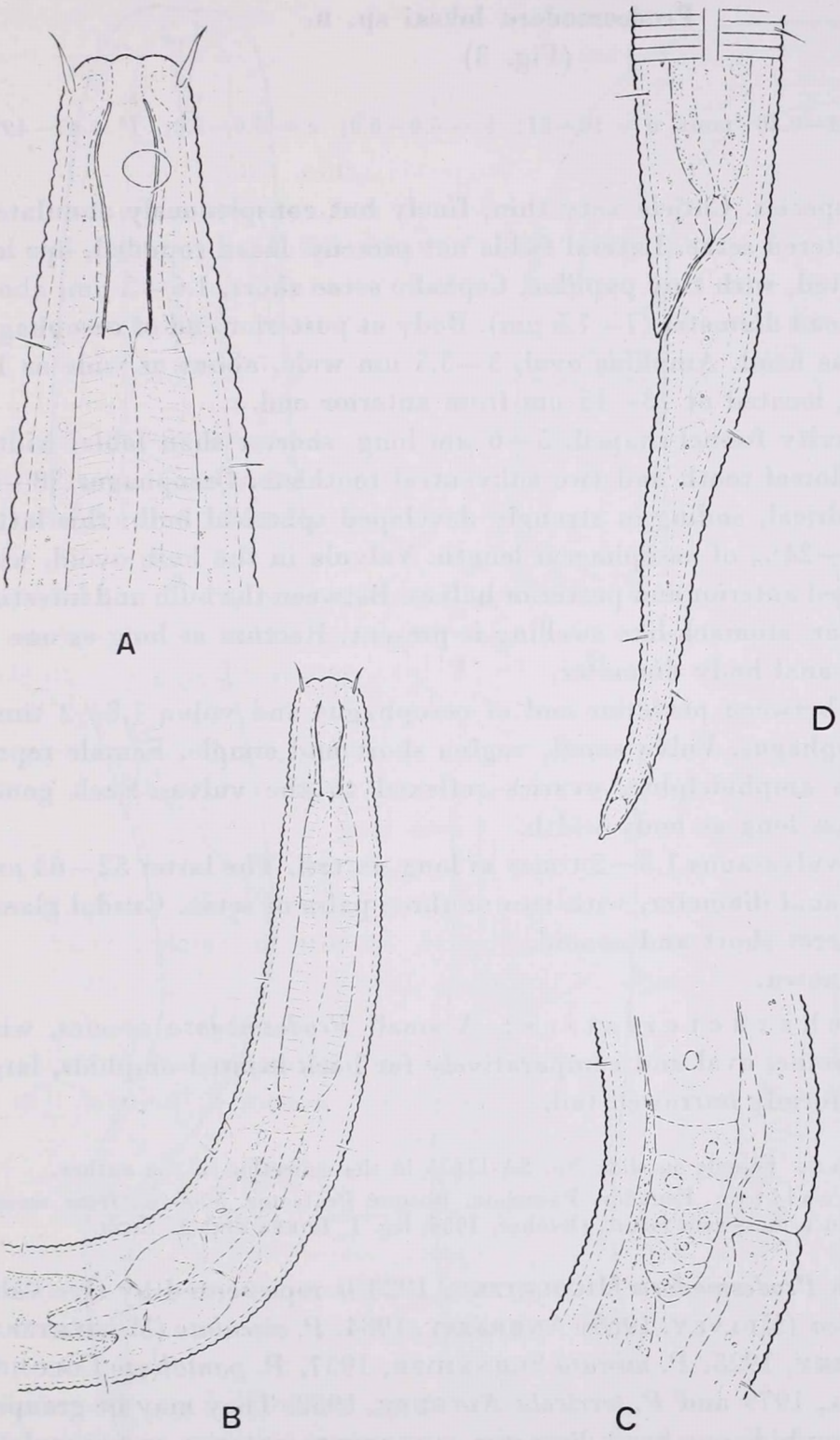


Fig. 2. *Ceratoplectus amoenus* sp. n.: A = anterior end (×1800); B = oesophageal region (×760); C = vulval region (×1100); D = female tail (×1100)

Prodesmodora loksai sp. n.
(Fig. 3)

♀: $L = 0.33-0.36$ mm; $a = 18-21$; $b = 5.8-6.0$; $c = 5.6-5.8$; $V = 47-49\%$; $c' = 4.6-6.5$.

A small species. Cuticle very thin, finely but conspicuously annulated, with small scattered setae. Lateral fields not present. Head rounded, lips low and not separated, with tiny papillae. Cephalic setae short, 1.5—2 μm, about 1/5 as long as head diameter (7—7.5 μm). Body at posterior end of oesophagus twice as wide as head. Amphids oval, 3—3.5 μm wide, about as wide as 1/3 body diameter, located at 13—15 μm from anterior end.

Mouth cavity funnel-shaped, 5—6 μm long, shorter than labial width, armed with a dorsal tooth and two subventral toothlets. Oesophagus 58—60 μm long, cylindrical, ending in strongly developed spherical bulb; this latter 12—14 μm, 20—24% of oesophageal length. Valvula in the bulb ovoid, with slightly separated anterior and posterior halves. Between the bulb and intestine a large glandular, stomach-like swelling is present. Rectum as long as one to one and a half anal body diameter.

Distance between posterior end of oesophagus and vulva 1.8—2 times as long as oesophagus. Vulva small, vagina short and simple. Female reproductive system amphidelphic, ovaries reflexed to the vulva. Each gonad 2.3—2.5 times as long as body width.

Distance vulva-anus 1.8—2 times as long as tail. The latter 52—63 μm, 4.5—6.5 times anal diameter, with two or three pairs of setae. Caudal glands elongate, spinneret short and conoid.

Male unknown.

Brief characteristics: A small *Prodesmodora* species, with short cephalic setae, oval and comparatively far back located amphids, large bulbus and uniformly narrowed tail.

Holotype: Female on slide No. SA-11835 in the collection of the author.

Type-locality: Ecuador, Pasochoa, Bosque Protector, 3000 m, from mosses and fallen leaves in a moss-rain forest, October, 1985, leg. I. Loksa and A. Zicsi.

The genus *Prodesmodora* Micoletzky, 1923 is represented by five valid species: *P. arctica* (Mulvey, 1969) Andrássy, 1984, *P. circulata* (Micoletzky, 1913) Micoletzky, 1925, *P. minuta* Schneider, 1937, *P. pantalicae* Colomba et Vinciguerra, 1979 and *P. terricola* Altherr, 1952. They may be grouped as follows: 1) amphids one head diameter or nearer to anterior end (*circulata*, *pantalicae*); 2) amphids two head diameters or farther from anterior end (*arctica*, *minuta*, *terricola*). *Prodesmodora loksai* sp. n. belongs to the second group. It may be distinguished a) from *arctica:* cephalic setae short (1/5 vs. 1/2), amphids transversely oval; b) from *minuta:* amphids oval, rectum shorter;

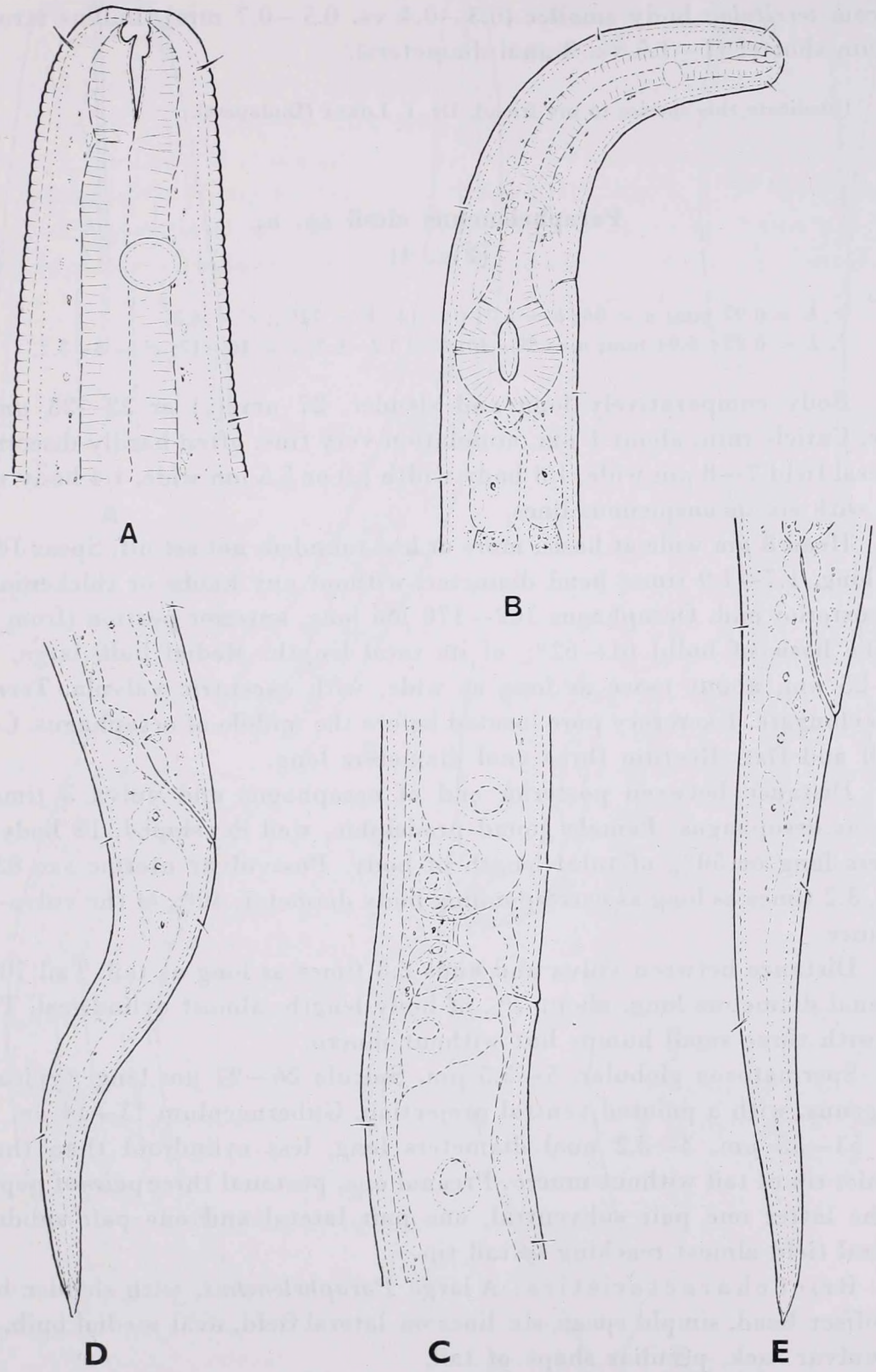


Fig. 3. *Prodesmodora loksai* sp. n.: A = anterior end (×2200); B = oesophageal region (×1100); C = mid-body region (×1100); D–E = tails of females (×1100)

c) from *terricola:* body smaller (0.3—0.4 vs. 0.5—0.7 mm), bulbus stronger, rectum shorter (1—1.5 vs. 3 anal diameters).

I dedicate this species to my friend, Dr. I. LOKSA (Budapest).

Paraphelenchus zicsii sp. n.
(Fig. 4)

♀: $L = 0.97$ mm; $a = 36$; $b = 5.7$; $c = 14$; $V = 72\%$; $c' = 4.3$.
♂: $L = 0.85—0.94$ mm; $a = 38—40$; $b = 5.2—5.7$; $c = 16—17$; $c' = 3—3.2$.

Body comparatively long and slender, 27 μm (♀) or 22—23 μm (♂) wide. Cuticle thin, about 1 μm, annulation very fine, often hardly discernible. Lateral field 7—8 μm wide, 1/3 body width (♀) or 5.5 μm wide, 1/4 body width (♂), with six inconspicuous lines.

Head 8 μm wide at basis, more or less rounded, not set off. Spear 14—15 μm long, 1.7—1.9 times head diameter, without any knobs or thickenings at its posterior end. Oesophagus 162—170 μm long, anterior portion (from head to the basis of bulb) 61—62% of its total length. Medial bulb large, oval, 23—25 μm, about twice as long as wide, with excentric valvula. Terminal bulb elongate. Excretory pore located before the middle of oesophagus. Cardia small and flat. Rectum three anal diameters long.

Distance between posterior end of oesophagus and vulva 3 times as long as oesophagus. Female gonad prodelphic, well developed, 18 body diameters long or 50% of total length of body. Postvulvar uterine sac 82 μm long, 3.2 times as long as corresponding body diameter, 40% of the vulva-anus distance.

Distance between vulva and anus 2.8 times as long as tail. Tail 70 μm, 4.3 anal diameters long, about 7% of body length, almost cylindrical. Tip of tail with three small humps but without mucro.

Spermatozoa globular, 5—5.5 μm. Spicula 26—27 μm long, typical for the genus, with a pointed ventral projection. Gubernaculum 13—14 μm long. Tail 53—55 μm, 3—3.2 anal diameters long, less cylindroid than that of female; tip of tail without mucro. Preanal one, postanal three pairs of papillae; of the latter one pair subventral, one pair lateral and one pair subdorsal. Lateral field almost reaching to tail tip.

Brief characteristics: A large *Paraphelenchus*, with slender body, not offset head, simple spear, six lines on lateral field, oval medial bulb, long postvulvar sack, peculiar shape of tail.

Holotype: Female on slide SA-11286 in the collection of the author.

Type-locality: Ecuador, Volcan Cotopaxi, 3300 m, humus around the roots of *Berberis*, October 1985, leg. I. LOKSA and A. ZICSI.

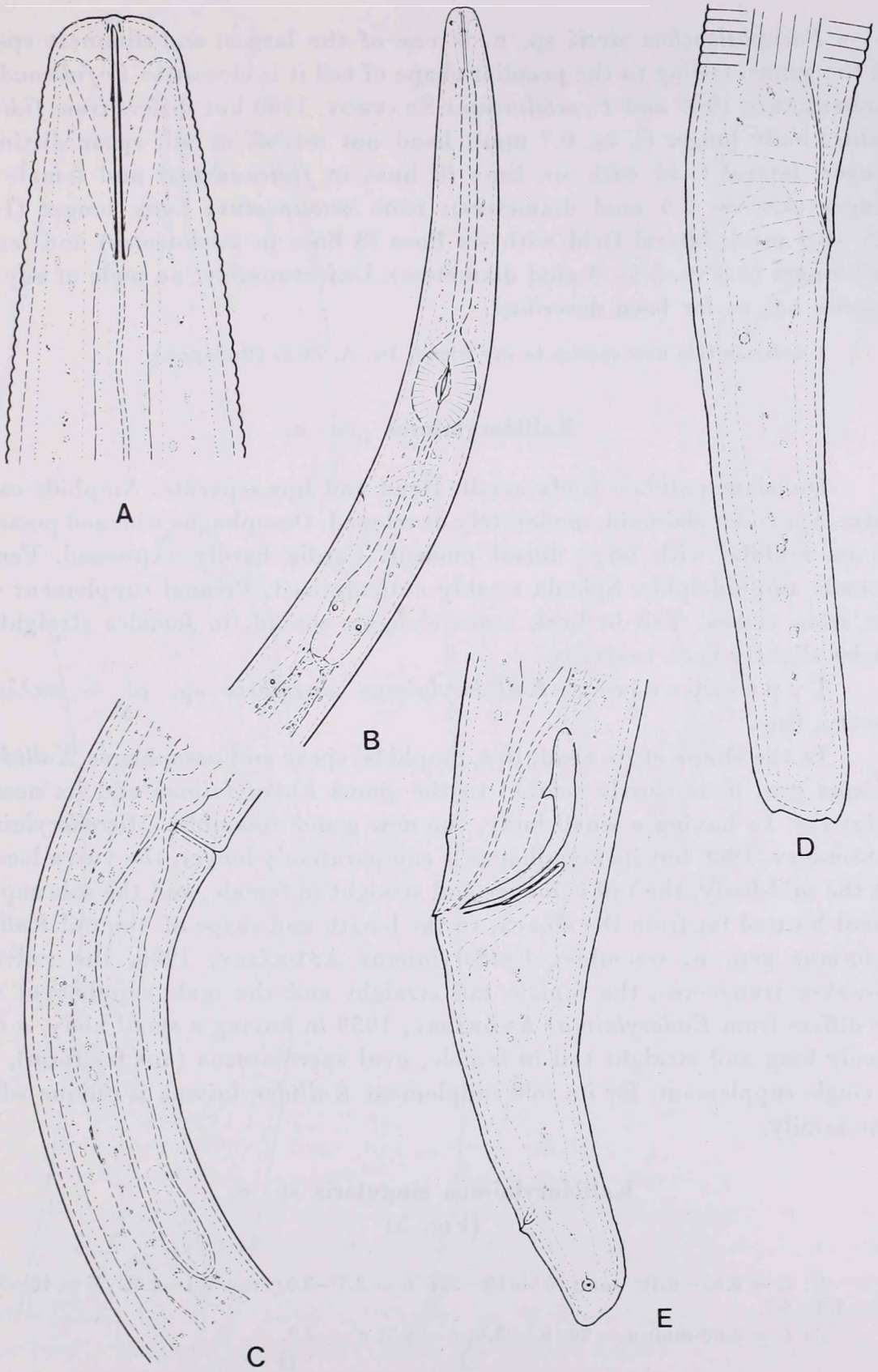


Fig. 4. *Paraphelenchus zicsii* sp. n.: A = anterior end (×2200); B = oesophagus (×560); C = vulval region (×760); D = female tail (×1100); E = male tail (×1100)

Paraphelenchus zicsii sp. n. is one of the largest and slimmest species of the genus. Owing to the peculiar shape of tail it is closest to *P. fidicaudatus* EROSHENKO, 1966 and *P. octolineatus* SHAVROV, 1968 but differs from *fidicaudatus:* body longer (1 vs. 0.7 mm), head not set off at all, spear distinctly longer, lateral field with six lines (8 lines in *fidicaudatus*) and female tail longer (4.3 vs. 2.5 anal diameters); from *octolineatus:* body longer (1 vs. 0.5—0.6 mm), lateral field with six lines (8 lines in *octolineatus*) and female tail longer (4.3 vs. 2.5—3 anal diameters). Unfortunately, no male of any one species has so far been described.

I dedicate this new species to my friend, Dr. A. ZICSI (Budapest).

Kallidorylaimus gen. n.

Qudsianematidae. Body small. Head and lips separate. Amphids caliciform. Spear dorylaimoid, moderately developed. Oesophagus widened posterior to its middle, with large dorsal nucleus. Cardia hardly expressed. Female gonads amphidelphic. Spicula weakly cuticularized. Preanal supplement one, far from cloaca. Tail in both sexes elongate-conoid, in females straight, in males slightly bent ventrally.

Type-species: *Kallidorylaimus singularis* sp. n. — καλλι- = pretty, fine.

In the shape of its head, lips, amphids, spear and oesophagus *Kallidorylaimus* gen. n. is closely related to the genus *Eudorylaimus* and its nearest relatives. In having a small body, the new genus resembles *Microdorylaimus* ANDRÁSSY, 1986 but its oesophagus is comparatively longer, the vulva located at the mid-body, the tail is longer and straight in female, and the sole supplement located far from the cloaca. In the length and shape of the tail *Kallidorylaimus* gen. n. resembles *Epidorylaimus* ANDRÁSSY, 1986, the vulva is however transverse, the female tail straight and the male supplement one. It differs from *Eudorylaimus* ANDRÁSSY, 1959 in having a small body, a relatively long and straight tail in female, oval spermatozoa (not fusiform), and a single supplement. By its sole supplement *Kallidorylaimus* is unique within the family.

Kallidorylaimus singularis sp. n.
(Fig. 5)

♀: $L = 0.65—0.70$ mm; $a = 19—22$; $b = 3.7—3.9$; $c = 8.1—8.6$; $V = 48—52\%$; $c' = 4.0—4.7$.

♂: $L = 0.60$ mm; $a = 20$; $b = 3.6$; $c = 8.5$; $c' = 3.2$.

Body small and rather plump, 31—37 (♀) or 29 (♂) μm wide, in male more strongly bent ventrally than in female. Cuticle smooth and thin, about

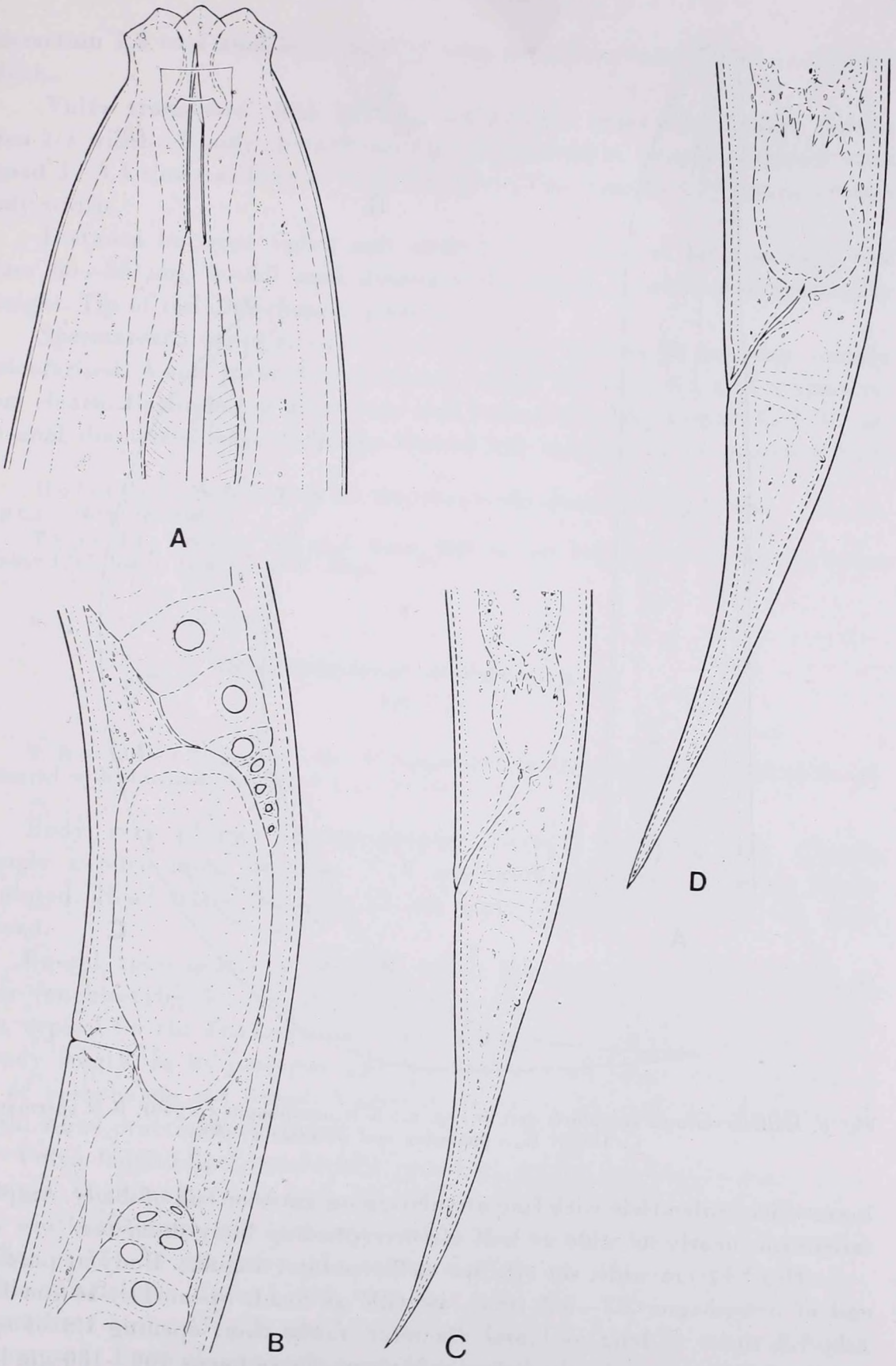


Fig. 5. *Kallidorylaimus singularis* gen. n., sp. n.: A = anterior end (×1800); B = mid-body region (×760); C—D = tails of two females (×760)

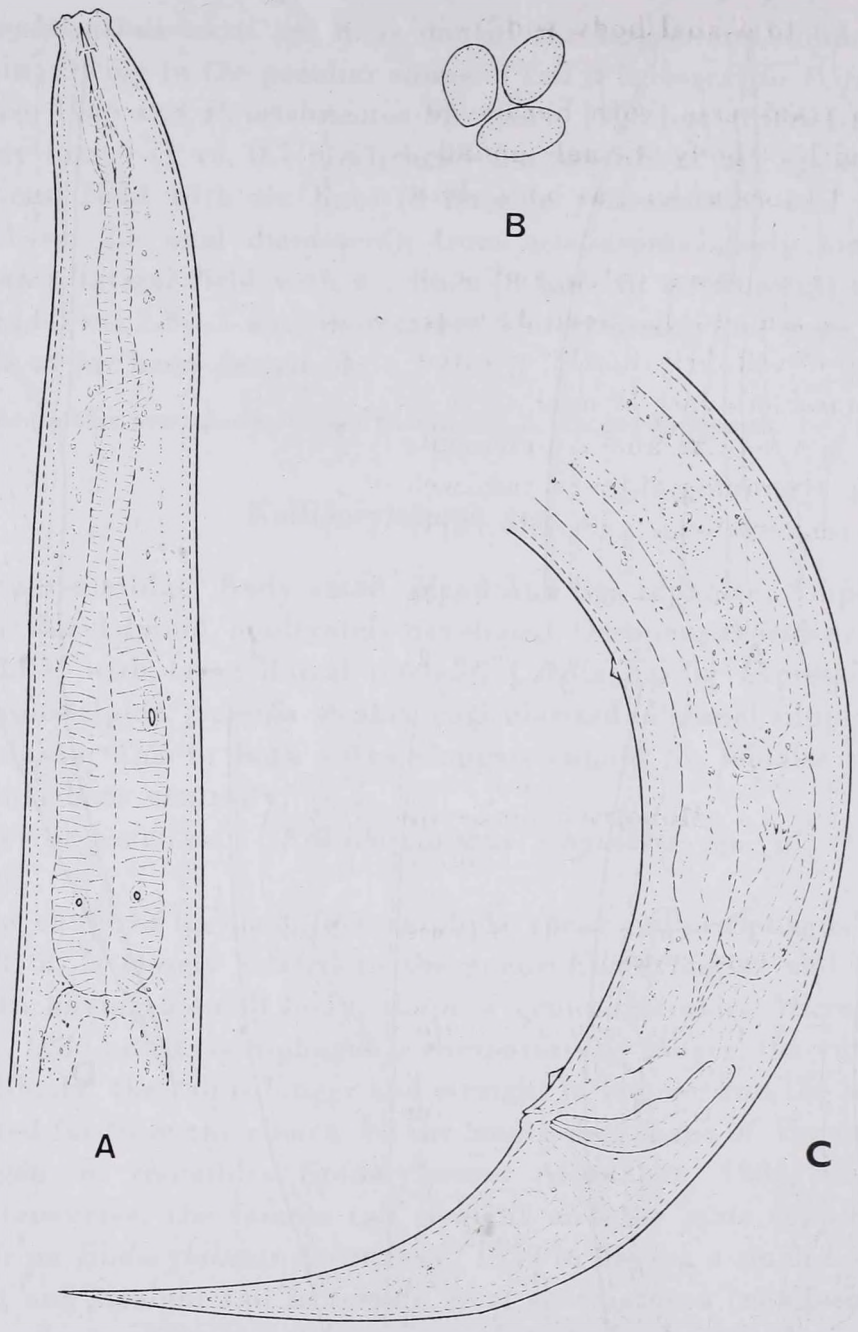


Fig. 6. *Kallidorylaimus singularis* gen. n., sp. n.: A = oesophagus (×560); B = spermatozoa (×1800); C = posterior end of male (×760)

1 μm thick, subcuticle with fine annulation on anterior end of body. Amphids caliciform, nearly as wide as half of corresponding body diameter.

Head 11 μm wide, set off, lips well separate, angular. Body at posterior end of oesophagus 2.2—3.2 times as wide as head. Spear 13—14 μm long, 1.2—1.3 times as long as labial diameter, fairly thin; opening 1/3 of spear length. Guiding ring simple, before mid-spear. Oesophagus 160—180 μm long, in 60—63% expanded, with a large dorsal nucleus. Cardia insignificant.

Prerectum 1.5 to 4 anal body widths long, rectum as long as the mentioned width.

Vulva transverse, with hardly cuticularized inner lips, vagina shorter than 1/3 width of body. Female gonads amphidelphic, ovaries reflexed; each gonad 3—3.4 times as long as body diameter. One egg: 63×29 μm, 1.7 times body width.

Distance between vulva and anus 3—3.2 times as long as tail. The latter 80—86 μm, 4—4.7 anal diameters in length, conoid and practically straight. Tip of tail dirk-shaped, pointed.

Spermatozoa ovoid or oval, 5—6 μm large. Spicula 30 μm long, weakly cuticularized. A sole preanal supplement, far (at 70 μm or 3.2 anal diameters) from cloaca. Beginning of prerectum well behind the supplement. Tail 70 μm, 3.2 anal diameters long, ventrally curved but straight in its posterior half.

Holotype: Male on slide No. SA-11744 in the collection of the author. — Paratypes: three females.

Type-locality: Ecuador, Nono, 2400 m, wet humus from a moss-rain forest, October 1985, leg. I. Loksa and A. Zicsi.

Monotrichodorus muliebris sp. n.

(Fig. 7)

♀: L = 1.04—1.18 mm; a = 20—21 (measured with the outer thick cuticle) or 26—27 (measured with the inner cuticle); b = 4.7—4.5; c = 0; V = 76—77%.

Body very plump, sausage-shaped, rounded on both ends. Cuticle strongly swollen upon fixation, 7—8 μm thick, smooth, subcuticle finely annulated. Head fairly flat, 10—12 μm wide. Amphids about 1/2 as wide as head.

Buccal tube nearly a long as labial diameter, proximally widened. Spear (onchiostyle) 55—59 μm long, 5—6 times head diameter, ventrally bent, typical for the Trichodoridae. Oesophagus 222—228 μm long, 38—43% of body length, in its posterior part guttiform, with large nuclei. Posterior end of oesophagus not lobed. Excretory pore in 40—42% of oesophageal length. Anus practically terminal.

Vulva longitudinal, sclerotized pieces at vagina separate, weakly cuticularized. Vagina extremely long, 32—36 μm, almost as long as corresponding body width, anteriorly directed, with strong musculature. One pair of advulval papillae at 12—23 μm before the vulva. Female reproductive system monodelphic, prodelphic. Gonad 438—446 μm long, 38—43% of body length. Spermatheca large, 47—52 μm, oval, filled with 5.5—6.5 μm large globular spermatozoa. Postvulvar uterine sac about as long as corresponding width of body.

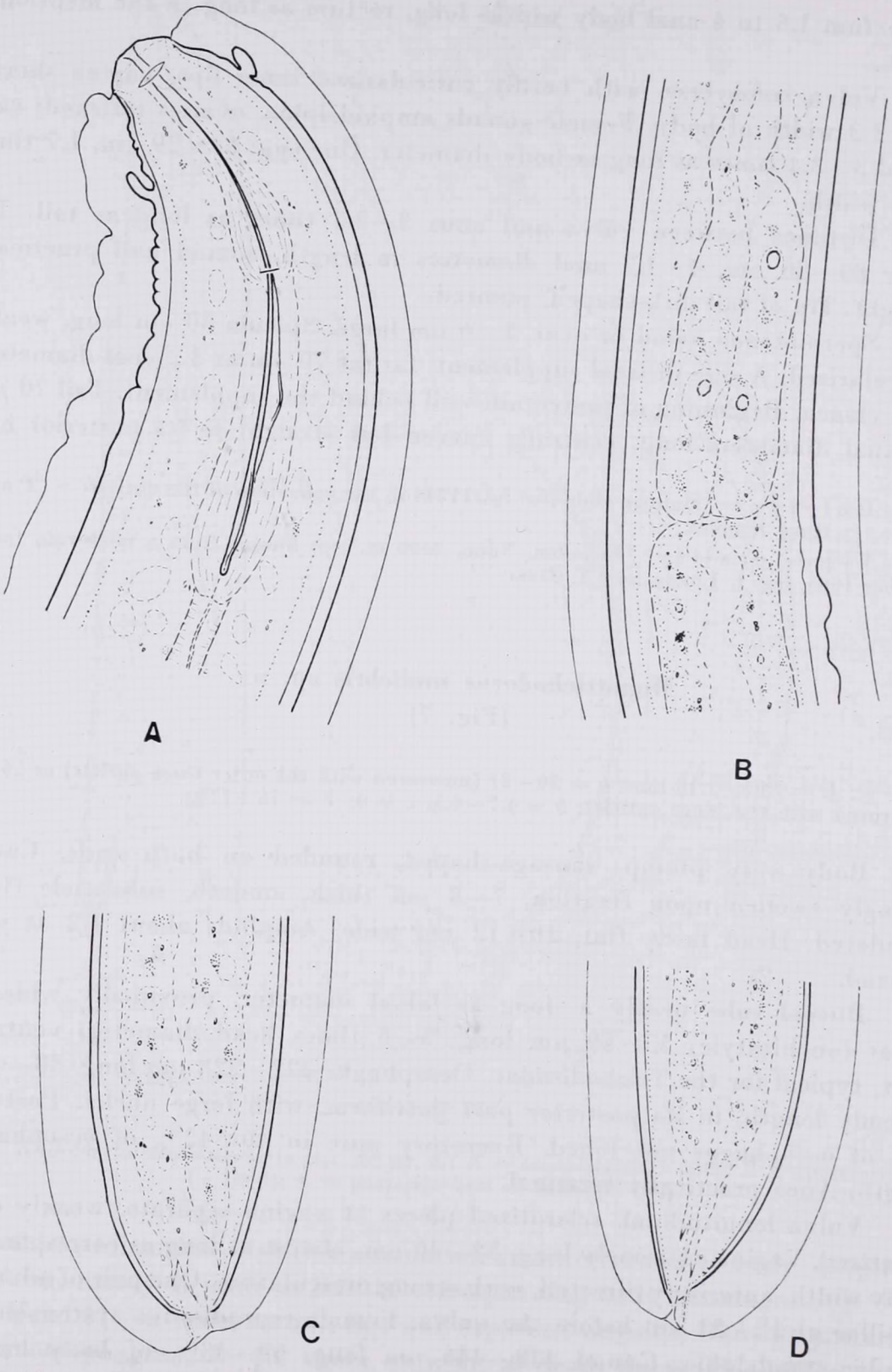


Fig. 7. *Monotrichodorus muliebris* sp. n.: A = anterior end (×1100); B = posterior end of oesophagus (×760); C—D = posterior ends of two females (×760)

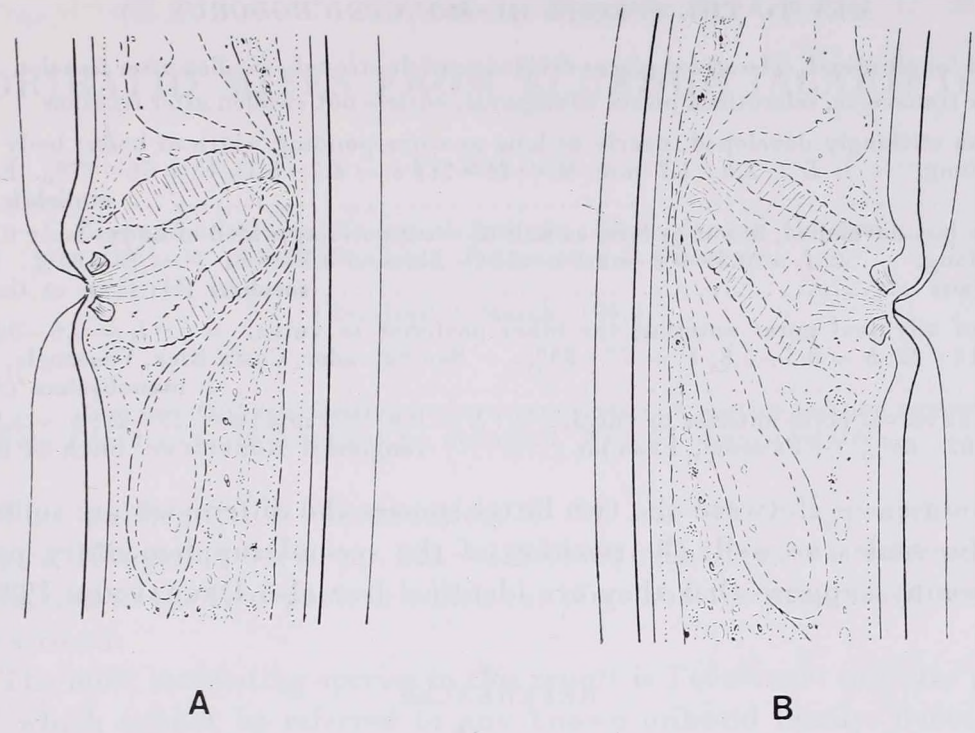


Fig. 8. *Monotrichodorus muliebris* sp. n.: A—B = vulval regions of two females (×760)

Since the anal opening is terminal or subterminal, the tail is practically absent.

Male unknown.

Brief characteristics: A large *Monotrichodorus*, with flat head, long spear, not lobed oesophagus, longitudinal vulva, uncommonly large vagina, lateral advulval pores and terminal anus.

Holotype: Female on slide No. SA-11493 in the collection of the author.

Type-locality: Ecuador, Volcan Cotopaxi, roots of "parámo"-grass, November 1984, leg. J. Balogh.

The following three species of *Monotrichodorus* have been described hitherto: *M. monohystera* (Allen, 1957) Andrássy, 1976, *M. vangundyi* Rodriguez, Sher et Siddiqi, 1978 and *M. sacchari* Baujard et Germani, 1985. The vulva in *monohystera* and *vangundyi* is transverse, in *sacchari* longitudinal. In having a longitudinal vulva, *M. muliebris* sp. n. is related to *M. sacchari*, its body is however much longer (1.0—1.2 vs. 0.5—0.8 mm), the vulva located further ahead (76—77 vs. 79—84%), the vagina of an other shape and much bigger, the posterior uterine sac longer. In addition to its longitudinal vulva, the new species differs from *M. monohystera* and *M. vangundyi* in its greater length and much larger vagina.

KEY TO THE SPECIES OF *MONOTRICHODORUS* (♀)

1 Vulva longitudinal, sclerotized pieces divided; cuticle strongly swollen after fixation ... 2
—Vulva transverse, sclerotized pieces contiguous; cuticle not swollen after fixation 3

2 Vagina strikingly developed, nearly as long as corresponding width of body; body 1—1.2 mm long. — ♀: $L = 1.0-1.2$ mm; $a = 20-21$; $b = 4.7-5.1$; $V = 76-77\%$. Ecuador ..... **muliebris** sp. n.
—Vulva less developed, about as long as half of corresponding width of body; body 0.5—0.8 mm long. — ♀: $L = 0.5-0.8$ mm; $a = 14-21$; $b = 3.5-6.8$; $V = 79-84\%$. French Guayana ..... **sacchari** BAUJARD et GERMANI

3 One of advulval pores anterior, the other posterior to vulva. — ♀: $L = 0.6-0.8$ mm; $a = 15-22$; $b = 3.5-5.8$; $V = 77-83\%$. — San Salvador, Costa Rica, Venezuela, Brazil, Peru ..... **monohystera** (ALLEN)
—Both advulval pores anterior to vulva. — ♀: $L = 0.6-0.8$ mm; $a = 15-22$; $b = 3.5-5.8$; $V = 82-86\%$. — Panama, Ecuador ..... **vangundyi** RODRIGUEZ, SHER et SIDDIQI

N o t e. — Between the two latter species the differences are so insignificant (in males as well: the position of the second supplementary papilla) that we may suppose that they are identical (see also DECRAEMER 1980 and 1987).

REFERENCES

ANDRÁSSY, I. (1984): Klasse Nematoda. (Ordnungen Monhysterida, Desmoscolecida, Araeolaimida, Chromadorida, Rhabditida). — In: Bestimmungsb. Bodenfauna Europas, pp. 509.
ANDRÁSSY, I. (1985): The genus Plectus Bastian, 1865 and its nearest relatives (Nematoda: Plectidae). — Acta Zool. Hung., **31:** 1—52.
ANDRÁSSY, I. (1986): The genus Eudorylaimus Andrássy, 1959 and the present status of its species (Nematoda: Qudsianematidae). — Opusc. Zool. Budapest, **22:** 3—42.
COOMANS, A. & DE WAELE, D. (1979): Species of Aphanolaimus (Nematoda: Araeolaimida) from Africa. — Zool. Scripta, **8:** 171—180.
DECRAEMER, W. (1980): Systematics of the Trichodoridae (Nematoda) with keys to their species. — Revue Nématol., **3:** 81—99.
DECRAEMER, W. (1987): Morphological comparison between the monodelphic genera Monotrichodorus and Allotrichodorus with some remarks on their relation to both didelphic genera of the Trichodoridae (Nematoda). — Nematologica, **32:** 256—264.
EROSHENKO, A. S. (1966): Three new nematode species of the genus Paraphelenchus (Micoletzky, 1922) Micoletzky, 1925 (Nematoda, Aphelenchidae). — Zool. Zhurn., **45:** 1873—1876 (in Russian).
SHAVROV, G. N. (1968): A new species of the genus Paraphelenchus (Micoletzky, 1922) Micoletzky, 1925 (Nematoda, Aphelenchinae). — Soobshch. Dalnevost. Fil. Akad. Nauk SSSR, **26:** 135—136 (in Russian).

Acta Zoologica Hungarica 35 (1–2), pp. 17–28 (1989)

ORIBATID MITES FROM ECUADOR (ACARI) II.*

P. Balogh

Zoosystematical and Ecological Institute, Eötvös Loránd University, H-1088 Budapest, Puskin utca 3, Hungary

(Received 1 March, 1988)

One new Oribatid family, one new genus, six new species and one new subspecies from Ecuador (South America) are described. With 27 original figures.

This publication is continuation of the one which appeared in Acta Zoologica Hungarica 34(4), pp. 321–338 (1988). The reader is referred to the introduction in the first part, in which the aims and the progress of the study are described.

The most interesting species in this report is *Tubulozetes rostratus* gen. n., sp. n. which cannot be referred to any known oribatid family, hence it has become necessary to describe a new family.

OTOCEPHEIDAE

Cavernocepheus monticola sp. n. (Figs 1–5)

L: 1017 μm; W: 426 μm. Sensillus setiform, directed laterad, smooth. Interlamellar setae unperceivable. Lamellar setae flagellate, originating on the lamellar cuspis near to rostrum. Rostral setae fine, setiform. Lamellae long, almost parallel, twisted, apical half foveolate. Prodorsum medially excavate, laterally with two large tubercles, opposite to lateral notogastral condyle.

N o t o g a s t e r : Dorsosejugal suture absent. Anterior part of notogaster with deep hollow. The anterior part of hollow connected with the excavated medial part of prodorsum; the posterior part continuing in a narrow channels, disappearing about the middle of the notogaster. 12 (or 13?) pairs of fine, flagellate notogastral setae (partly broken). Notogaster with faint longitudinal lines.

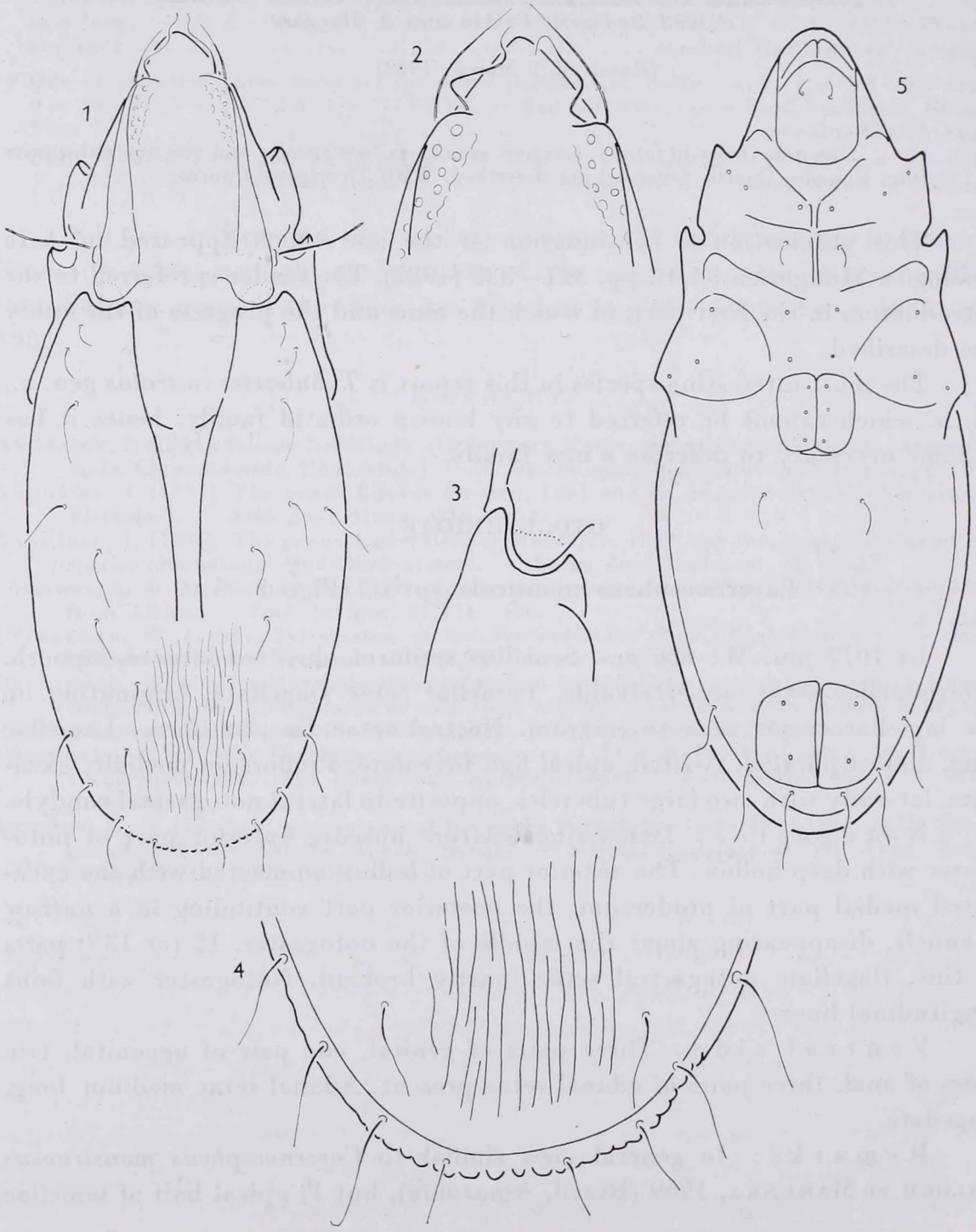
V e n t r a l s i d e : Three pairs of genital, one pair of aggenital, two pairs of anal, three pairs of adanal setae present. Adanal setae medium long, flagellate.

R e m a r k s : In general view similar to *Cavernocepheus monstruosus* Balogh et Mahunka, 1969 (Brazil, Amazonia), but 1) apical half of lamellae

* Results of soil-zoological collectings of Drs Imre Loksa and András Zicsi in South America.

foveolate, 2) lamellae twisted, 3) anterior hollow of notogaster longer and continuing in a narrow channel, 4) notogastral setae shorter.

Material examined: Ecuador, Provincia Cotopaxi, San Francisco de las Pampas, 2300 m; fragment of montane forest; litter and soil; one holotype.



Figs 1—5. *Cavernocepheus monticola* sp. n.: 1 = dorsal side, 2 = rostral region, 3 = prodorsal and notogastral condyles, 4 = posterior part of notogaster

MICROZETIDAE

Gymnozetes longisetus sp. n. (Figs 6—8)

L: 300—303 μm; W: 197 μm. Sensillus directed forward, almost as long as prodorsum, bacilliform, straight, smooth; with small, spiniform, thick appendage on the tip. Interlamellar setae originating on the lamellae, setiform, long, tip almost reaching the basal part of cuspis. Lamellar setae thick, elongately phylliform with small teeth. Rostral setae long with flagellate end, originating near each other. Lamellae broad, converging, covering the lateral part of prodorsum. Lateral tip of cuspides very short, medial one much longer. Medial margin of lamellae connecting. Interlamellar area transversally bipartite; apical part small, transverse ovate, Basal part very large, triangular with rounded medial margin.

Notogaster broader than long, dorsosejugal suture straight, pteromorphae short. Notogastral setae very short or absent.

Ventral side: Apodemata IV broad, of the Microzetidae type. Six pairs of genital, one pair of aggenital, two pairs of anal, three pairs of adanal alveoli; only the first pair of genital setae well developed, directed anteriad. Genital and anal plates remote from each other: distance between them about twice as long as lenght of genital plates.

Remarks: This is the second species of the genus. The type species *Gymnozetes marginatus* P. BALOGH, 1984 (from Colombia) has very short interlamellar setae, the apical part of bipartite interlamellar area small, circular; their basal part much smaller and the notogastral setae marginal, short but well observable.

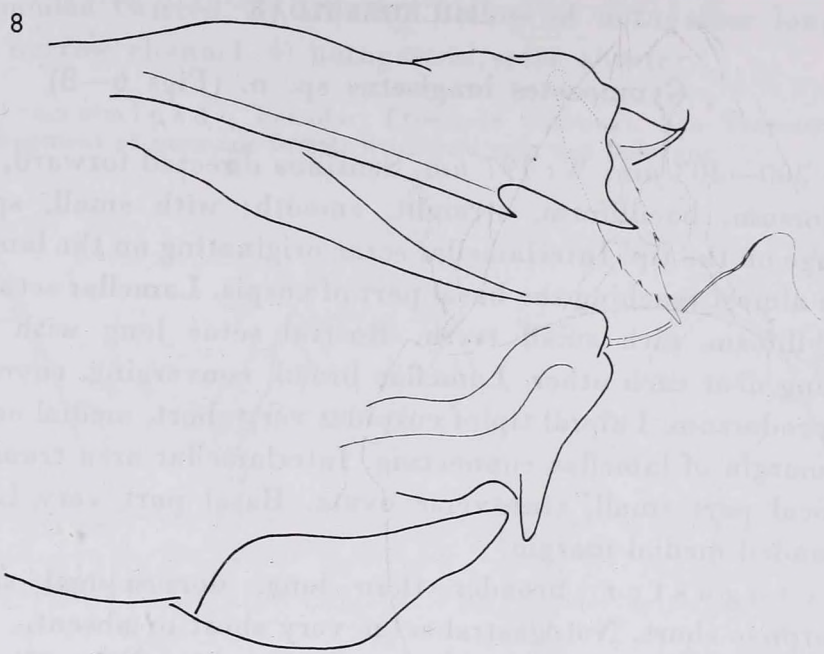
Material examined: Ecuador, Provincia Cotopaxi, San Francisco de las Pampas, 2300 m; fragment of montane forest, litter and soil, holotype and one paratype.

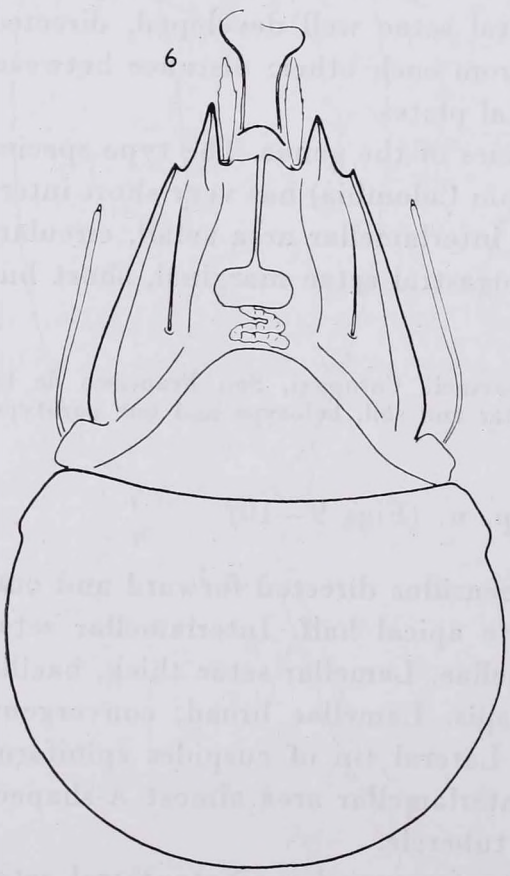
Cosmozetes ecuadoriensis sp. n. (Figs 9—10)

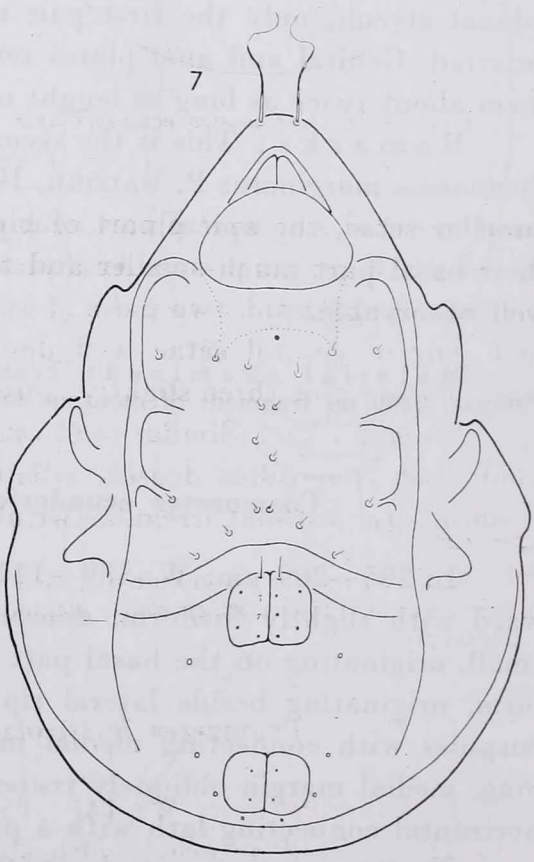
L: 205—209 μm; W: 139—144 μm. Sensillus directed forward and outward with slightly fusiform, densely ciliate apical half. Interlamellar setae small, originating on the basal part of lamellae. Lamellar setae thick, bacilliform, originating beside lateral tip of cuspis. Lamellae broad, convergent, cuspides with connecting medial margin. Lateral tip of cuspides spiniform, long, medial margin obliquely truncate. Interlamellar area almost A-shaped; horizontal connecting lath with a median tubercle.

Notogaster circular with short pteromorphae. Notogastral setae absent.

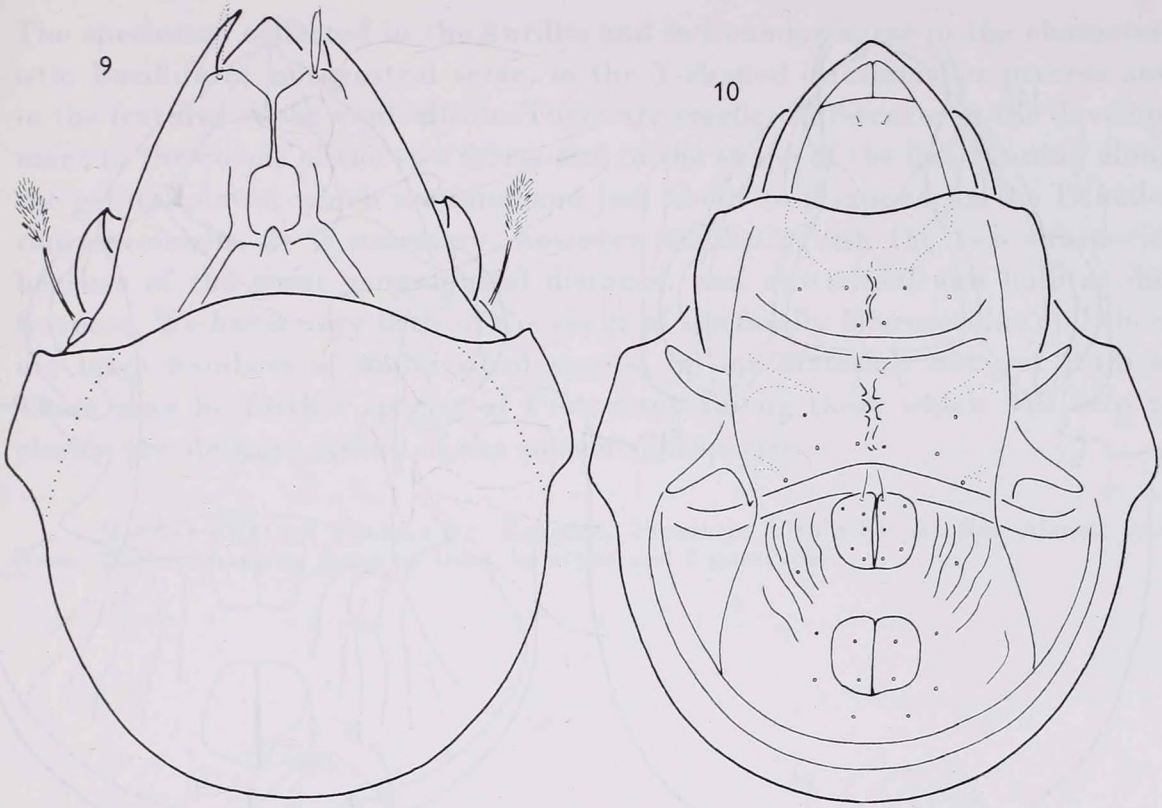
Ventral side: Epimeral region with irregularly undulating medial line. Apodemata IV broad, of the Microzetidae type; apodemata II medially







Figs 6—8. *Gymnozetes longisetus* sp. n.: 6 = dorsal side, 7 = ventral side, 8 = rostral region, lateral view



Figs 9—10. *Cosmozetes ecuadoriensis* sp. n.: 9 = dorsal side, 10 = ventral side

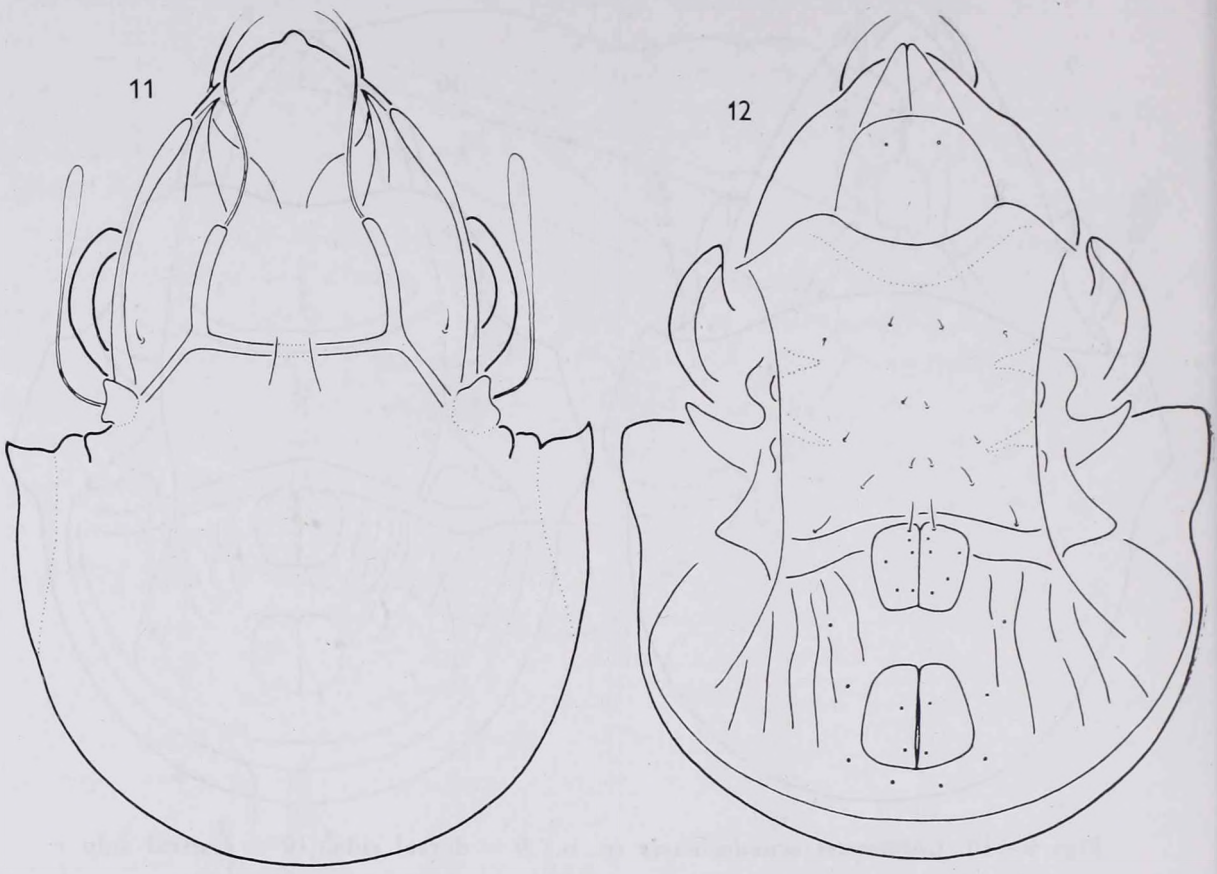
fused. Genital and anal plates near each other; distance a little shorter than the length of genital plates. Anal plates sparsely punctate. Six pairs of genital, one pair of aggenital, two pairs of anal, three pairs of adanal alveoli; only the first pair of genital setae well developed, long, directed anteriad. Ventral plate with two or three slightly converging longitudinal lines.

R e m a r k s : Similar to *Cosmozetes vermiculatus* (BALOGH et MAHUNKA, 1980), but 1) sensillus densely ciliate, 2) lamellae without longitudinal lines, 3) notogaster without irregular wrinkles.

M a t e r i a l e x a m i n e d : Ecuador, Provincia Tungurahua, between Rio Negro and Rio Verde, 1270 m, steep slope, fragment of montane forest; litter and soil; holotype and 2 paratypes.

Protozetes longicornis sp. n. (Figs 11—12)

L: 201—206 μm; W: 147—152 μm. Sensillus long, longer than pedotecta II, directed anteriad, with slightly dilated, smooth apical half. Interlamellar setae small, originating on the basal part of lamellae. Lamellar setae originating on the medial margin of lamellae, setiform, thin, slightly S-shaped, reaching beyond rostrum. Lateral tip of cuspides bicuspidate; median cuspis sharp and longer, median one blunt and shorter.



Figs 11—12. *Protozetes longicornis* sp. n.: 11 = dorsal, 12 = ventral

Notogaster broad; as long as wide; dorsosejugal suture straigth or slightly excavate, bearing median interlamellar apophysis.

Ventral side: Apodemata IV broad, of the Microzetidae type; apodemata II and dorsosejugal medially not fused, well separated. Six pairs of genital, one pair of aggenital, two pairs of anal, three pairs of aggenital alveoli. Only the first pair of genital setae well developed, long, directed anteriad, parallel. Anal plates densely punctate. Genital and anal plates near each other; distance shorter than the length of genital plates. Ventral plate much broader than long, with five or six pairs of longitudinal lines.

Remarks: The species of the genus *Protozetes* have short and fusiform sensillus: this is the first species with long, slightly dilated apical part.

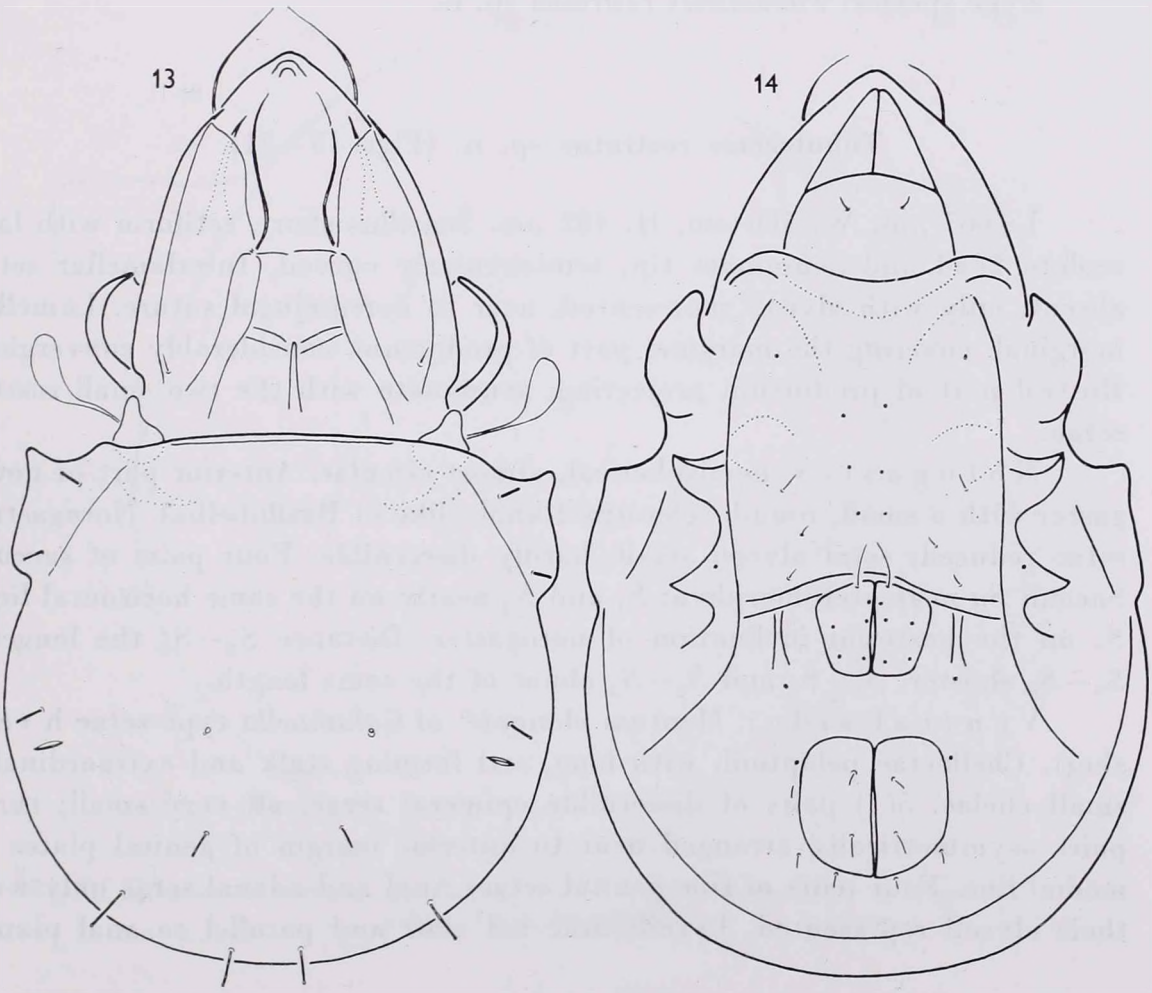
Material examined: Ecuador, Provincia Cotopaxi, Naranhito (near San Francisco de las Pampas), 2200 m; decaying stump with moss; holotype and two paratypes.

Protozetes digitifer alticola ssp. n. (Figs 2, 13—14)

L: 254—258 μm; W: 152 μm. The three specimens found in Ecuador closely resemble those described by MAHUNKA from St. Lucia (Antilles).

The specimens collected in the Antilles and in Ecuador agree in the characteristic bacilliform notogastral setae, in the Y-shaped interlamellar process and in the features of the ventral side. There are smaller differences in the development of the cuspis of the two forms and in the shape of the line running along the genital plates, which are faint and just about to disappear in the Ecuadorian specimens. It is necessary, however, to distinguish the two subspecies because of the great geographical distance, and altitudinal and habitat differences. We know very little of the range of the family Microzetidae and there are large numbers of undescribed species in our materials not yet studied. There may be further species of Protozetes among these which will help to clarify the definite status of the present subspecies.

Material examined: Ecuador, Provincia Pichincha, at Rio Alamo, near Nono, 2250 m; hanging moos on trees, holotype and 2 paratypes.



Figs 13—14. *Protozetes digitifer alticola* ssp. n.: 13 = dorsal side, 14 = ventral side

Tubulozetidae fam. n.

Poronota with four pairs of sacculi. Movable pteromorphae present. Infracapitulum suctorial. Chelicerae extraordinally small, of Uropodina type. Discidium, pedotecta disappearing. Apodemes II, sejugal and III well developed. Four pairs of genital setae.

Only one genus.

Tubulozetes gen. n.

Rostrum acuminate, type of *Galumnopsis*. Prodorsum almost vertical. Dorsosoejugal suture present. Lamellae marginal. Cuspides rounded, bearing lamellar setae. Dorsosejugal suture present. Notogaster hemispheric, smooth, notogastral setae absent. Pteromorphae of *Peloribates* type, long. Four pairs of genital, one pair of aggenital, two pairs of anal, three pairs of adanal setae. Legs heterotridactyle.

Type species: *Tubulozetes rostratus* sp. n.

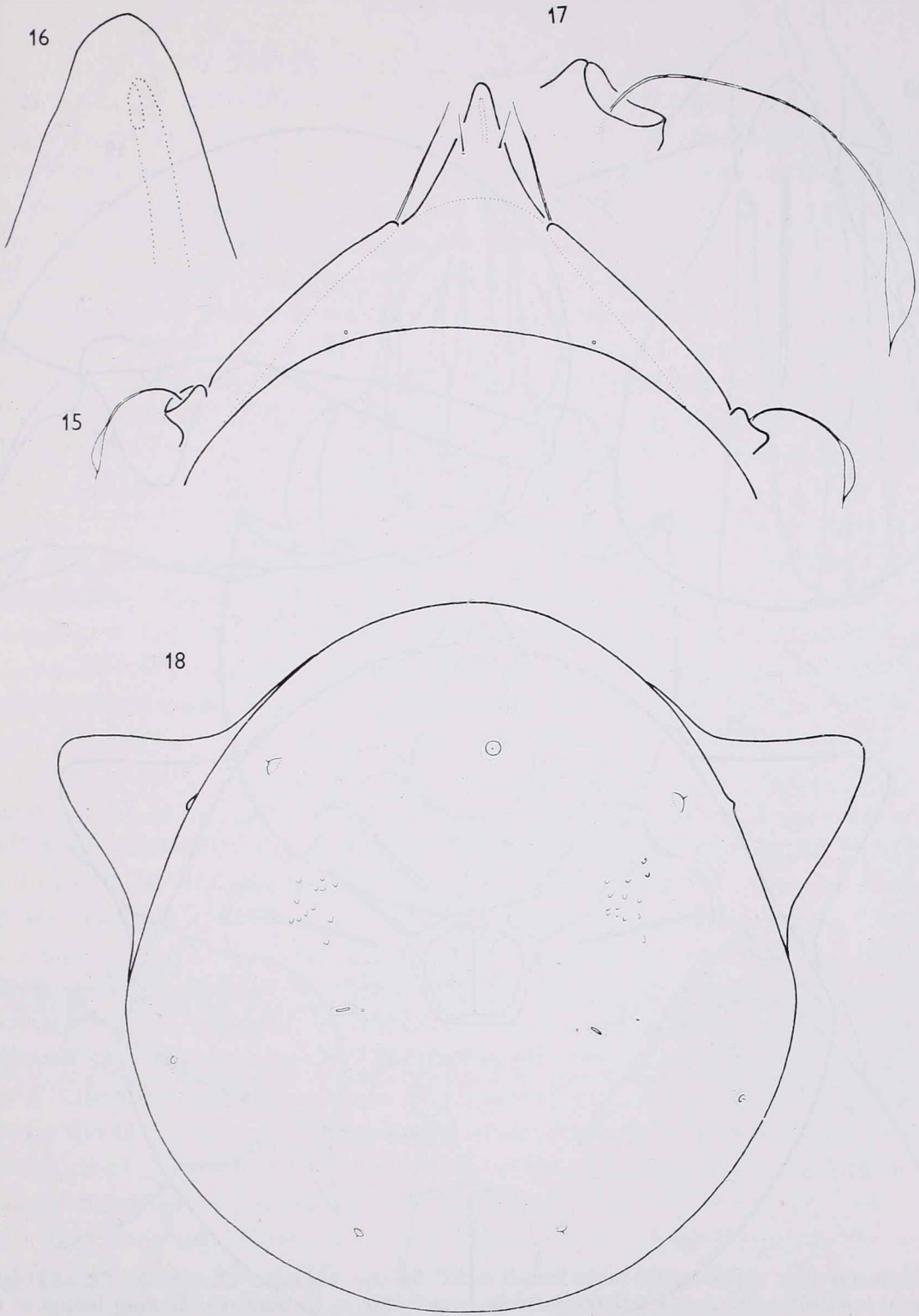
Tubulozetes rostratus sp. n. (Figs 15–21)

L: 667 μm; W: 566 μm, H: 492 μm. Sensillus short, setiform with lanceolate head and acuminate tip; semicircularly curved. Interlamellar setae absent, only with alveoli represented, near to dorsosejugal suture. Lamellae marginal, covering the marginal part of prodorsum, considerably converging. Rostral part of prodorsum projecting, acuminate with the two small rostral setae.

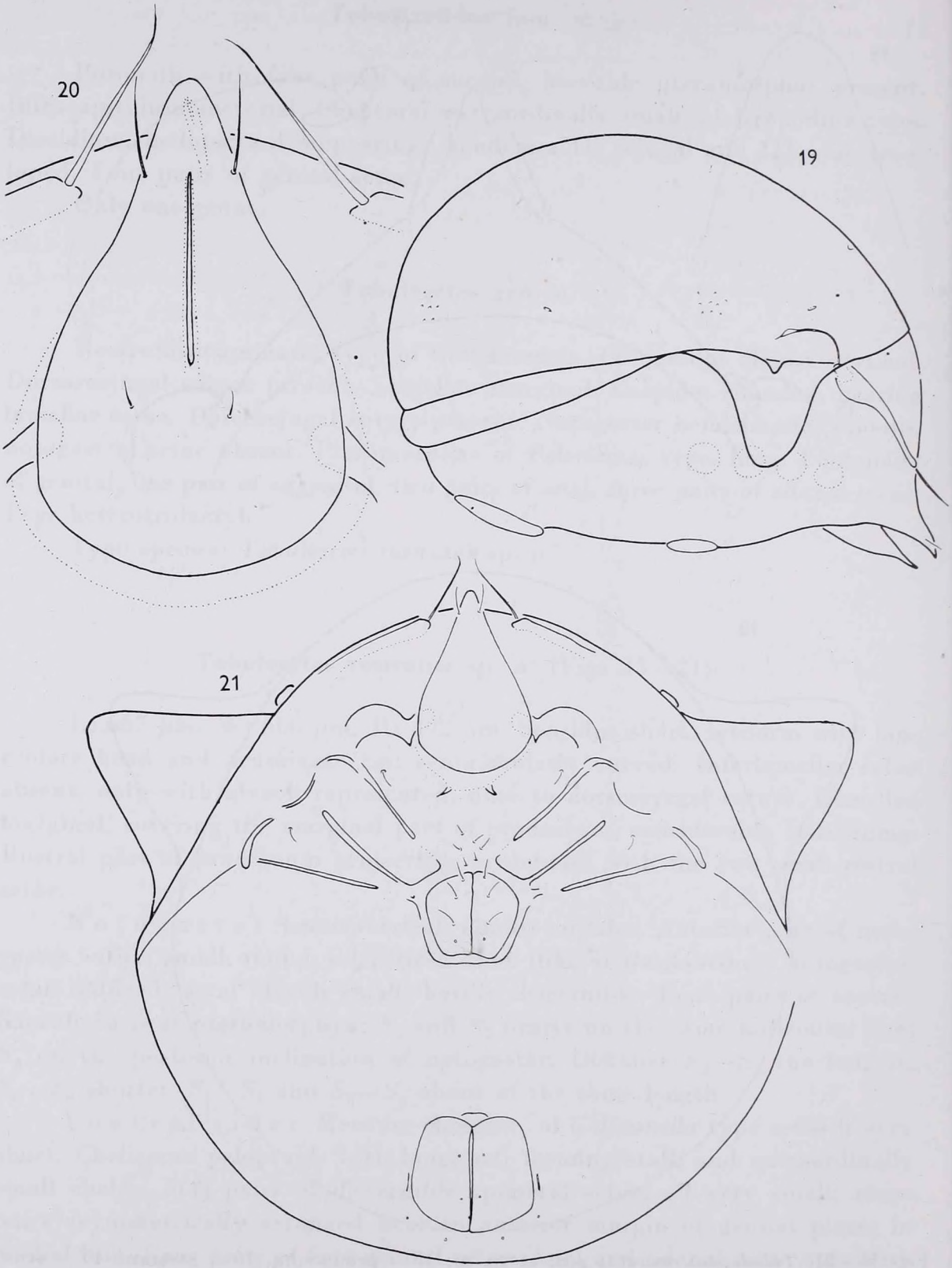
N o t o g a s t e r hemispherical, almost circular. Anterior part of notogaster with a small, round, sclerotized knob (like of Basilobelba). Notogastral setae reduced; setal alveoli small, hardly discernible. Four pairs of sacculi. Sacculi *Sa* near pteromorphya; S_1 and S_2 nearly on the same horizontal line; S_3 on the posterior inclination of notogaster. Distance S_2—S_2 the longest, S_a—S_a shorter, S_1—S_1 and S_3—S_3 about of the some length.

V e n t r a l s i d e : Mentum elongate, of *Galumnella* type setae h very short. Chelicerae peloptoid, with long, seti forming stalk and extraordinally small chelae. 5(?) pairs of discernible epimeral setae, all very small; three pairs asymmetrically arranged near to anterior margin of genital plates in medial line. Four pairs of fine genital setae. Anal and adanal setae only with their alveoli represented. Lyrifossurae iad near and parallel to anal plates.

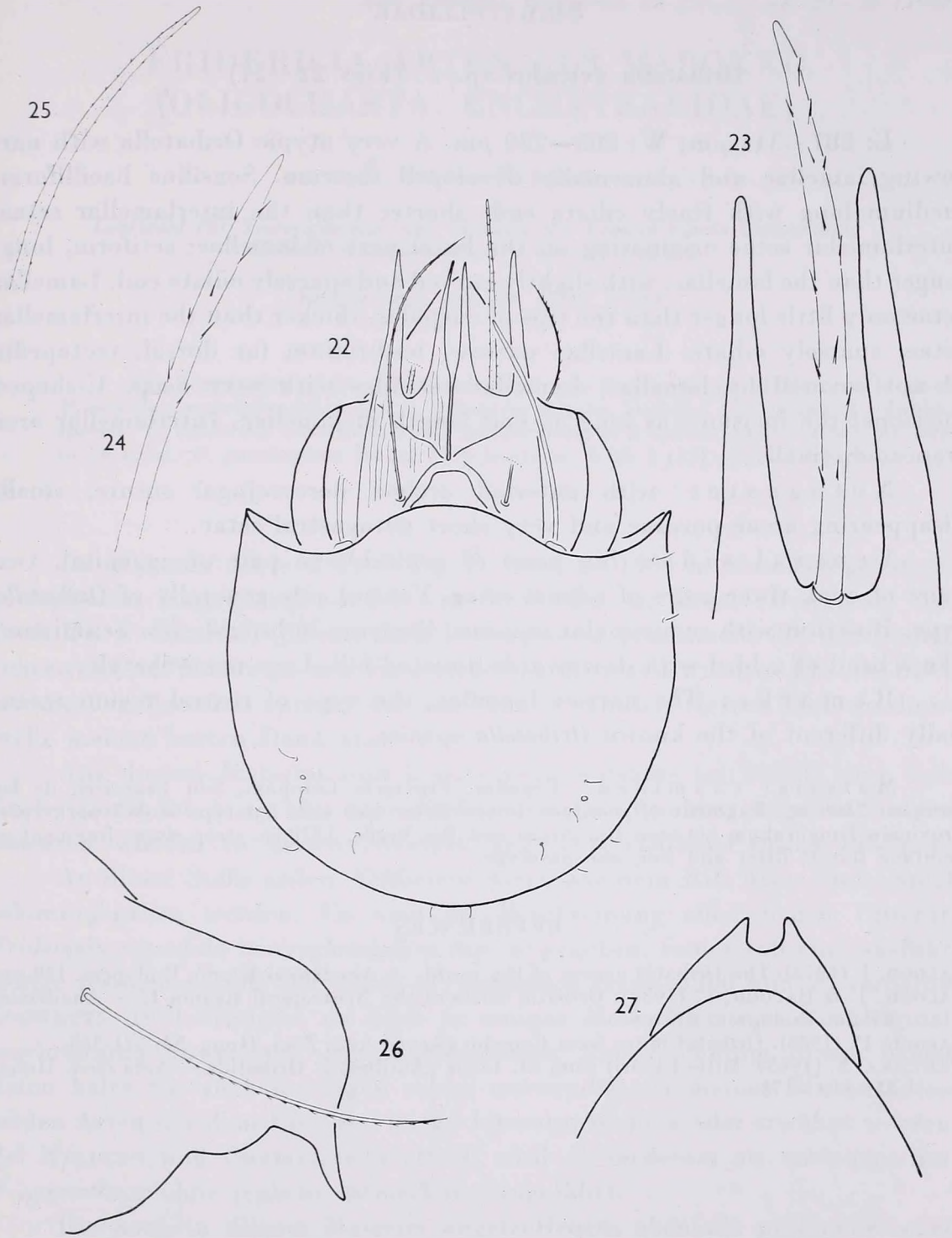
M a t e r i a l e x a m i n e d : Ecuador, Provincia Cotopaxi, San Francisco de las Pampas, 2200 m; fragment of montane forest; litter and soil; holotype and four paratypes.



Figs 15—21. *Tubulozetes rostratus* gen. et sp. n.: 15 = prodorsum, 16 = rostrum, 17 = sensillus, 18 = dorsal side



Figs 19—21. *Tubulozetes rostratus* gen. et sp. n.: 19 = lateral view, 20 = mentum, 21 = ventral side



Figs 22—27. *Oribatella aviculus* sp. n.: 22 = dorsal side, 23 = cuspis and lamellar seta, 24 = apical part of sensillus, 25 = apical part of interlamellar setae, 26 = rostrum in lateral view, 27 = apical part of rostrum

ORIBATELLIDAE

Oribatella aviculus sp. n. (Figs 22—27)

L: 287—344 μm; W: 205—230 μm. A very atypic Oribatella with narrowing lamellae and abnormally developed rostrum. Sensillus bacilliform, medium long with finely ciliate end; shorter than the interlamellar setae. Interlamellar setae originating on the basal part of lamellae; setiform, long: longer than the lamellae, with slightly curved and sparsely ciliate end. Lamellar setae only little longer than the tips of cuspides, thicker than the interlamellar setae, sparsely ciliate. Lamellae narrow, bothridium far dorsal, tectopedia II not covered by lamellae. Lamellar cuspides with very deep, U-shaped incisions: the incisions as long as half length of lamellae. Interlamellar area trapezoid, small.

Notogaster with anteriad arched dorsosejugal suture, small, disappearing areae porosae and very short notogastral setae.

Ventral side: Six pairs of genital, one pair of aggenital, two pairs of anal, three pairs of adanal setae. Ventral side generally of *Oribatella* type. Rostrum with semicircular incision. Rostrum in lateral view acuminate, like a head of a bird with downwards directed bill. Legs monodactyle.

Remarks: The narrow lamellae, the type of rostral region essentially different of the known *Oribatella* species.

Material examined: Ecuador, Provincia Cotopaxi, San Francisco de las Pampas, 2300 m; fragment of montane forest, litter and soil, holotype and 2 paratypes; Provincia Tungurahua, between Rio Negro and Rio Verde, 1270 m, steep slope, fragment of montane forest; litter and soil, one paratype.

REFERENCES

BALOGH, J. (1972): The Oribatid genera of the world. — Akadémiai Kiadó, Budapest, 188 pp.
BALOGH, J. & BALOGH, P. (1988): Oribatid mites of the Neotropical Region I. — Akadémiai Kiadó, Budapest, 335 pp.
BALOGH, P. (1988): Oribatid mites from Ecuador (Acari) Acta Zool. Hung. **34:** 321-338.
MAHUNKA, S. (1985): Mites (Acari) from St. Lucia (Antilles) 2. Oribatida — Acta Zool. Hung. **31:** 119—178.

Acta Zoologica Hungarica 35 (1—2), pp. 29—39 (1989)

FRIDERICIA ARTEN AUS MAROKKO (OLIGOCHAETA: ENCHYTRAEIDAE)

K. Dózsa-Farkas

Lehrstuhl für Tiersystematik und Ökologie der Loránd-Eötvös-Universität, H-1088 Budapest, Puskin utca 3, Ungarn

(Eingegangen am: 29. März, 1988)

The description of five *Fridericia* taxa new for the fauna of Morocco is given. *F. maculata macroglandulosa* ssp. n. is new for science. Detailed description of a dubious species, *F. sardorum* Cognetti, 1901, furthermore, of a species equivocally considered to be valid, *F. gammotheca* Issel, 1906 is given. With 5 (22) original figures.

Im Rahmen der von Prof. Dr. P. Omodeo 1986 in Marokko geleiteten zoologischen Expedition wurden von Prof. Dr. A. Zicsi (Budapest) und Prof. Dr. F. Bernini (Siena) auch Bodenproben gesammelt, die mir freundlicherweise auf Nachweis von Enchytraeiden übersand wurden. Für die Überlassung des Materials spreche ich den oben erwähnten Herren auch an dieser Stelle meinen besten Dank aus.

Aus diesem Material sind bereits zwei Aufsätze im Druck, eine neue Enchytronia Art, sowie eine neue *Fridericia* Art und weitere Angaben von den Balearen wurden in diesen Arbeiten angeführt (Dózsa-Farkas 1988a, b).

An dieser Stelle sollen *Fridericia* Arten aus dem Rif, Atlas und Larach bekanntgegeben werden. Es wird die Beschreibung einer neuen Unterart *Fridericia maculata macroglandulosa* ssp. n. gegeben, ferner soll eine ausführlichere Kennzeichnung der Arten *F. gamotheca* Issel, 1906 und *F. sardorum* Cognetti, 1901 erfolgen, da diese in einigen Merkmalen von der Originalbeschreibung abweichen. Die ausführlichere Kennzeichnung dieser beiden Arten halte ich auch deswegen schon notwendig, da meines Wissens diese beiden Arten seit dem Erstfund in der Literatur nicht wieder erwähnt werden. Bei Nielsen und Christensen (1959) wird *F. sardorum* als unsichere Art, *F. gamotheca* ohne jegliche Bemerkung angeführt.

Die noch in diesem Material angetroffenen, ebenfalls problematischen Arten (*F. bulbosa* Rosa, 1887 und *F. paroniana* Issel, 1904) ermöglichen es die taxonomischen Kriterien berührenden Merkmale durch eingehende Untersuchungen näher beurteilen zu können. Deswegen befasse ich mich auch mit diesen Arten etwas ausführlicher.

Sämtliche in dieser Arbeit angeführten Arten sind neu für die Fauna Marokkos.

Wegen der geringen Menge der zugesandten Bodenproben (cca 50 cm^3) wurde der Boden in kleinen Mengen auf einem Planktonnetz ausgewaschen. Mit Hilfe eines Mikroskopes wurden die Enchytraeiden ausgelesen und in vivo bestimmt. Nach einer Fixation in 70% Alkohol bzw. Bouen-Lösung wurden die Tiere in 70% Alkohol aufbewahrt. Einige Tiere sind während der Bearbeitung zugrunde gegangen.

Fridericia maculata macroglandulosa ssp. n.
(Abb. 1.)

Kleine Art. Holotypus Länge lebend 7,6 mm, Breite 0,25 mm, Segmentzahl 38. Bei den Paratypen Länge lebend 7—8 mm, Breite 0,23—0,25 mm, am Gürtel 0,26—0,30 mm, Segmentzahl 35—39. Bei zwei Exemplaren, die während der Untersuchungen zugrunde gingen, konnte eine Segmentzahl von 42—43 festgestellt werden. Kopfporus O/I. Dorsalporen im VII. Segment beginnend. Farbe weisslich. Borsten gerade mit einem kleinen entalen Haken: 2—2 : 2, (3)—2. Länge der Borsten 33 μm. Die hyalinen Hautdrüsen in 1—3 Querreihen auf den Segmenten. Von diesen eine immer aus grösseren Drüsen bestehend. Clitellum XII—1/2 XIII. Segment, Drüsen in Querreihen geordnet, in anderen Fällen kann auch eine unregelmässige Anordnung vorkommen.

Gehirn 2-mal grösser als breit, beim Holotypus 139,5 μm lang und 70 μm breit (Abb. 1a). Peptonephridien (Abb. 1b) kurz unverzweigt *a*-Typ nach Nielsen & Christensen (1959). Lymphozyten entsprechend der Gattung zweiartig: grosse, über Kerne verfügende, *a*-Typ von Möller (1971), Länge 25—36 μm, und viele kleine, hyaline, kernlose Lymphozytenkörperchen, Länge 8—12 μm. Die Coelomflüssigkeit enthält am meisten im VI.—VII. Segment abgestossene Borsten, 4—6 in einem Bündel. Die Septaldrüsen (3 primäre und 3 sekundäre) sowie die Nephridien sind für die Gattung *Fridericia* kennzeichnend. Rückengefäss entspring im XVI.—XVII. (XIX). Segment. Blut farblos. Chloragogenzellen sind vom V. Segment beginnend vorhanden, und bedecken nur in einer dünnen Schicht den Darm.

Vesicula seminalis im X. oder XI. Segment vorhanden, im Durchlicht hellbraun. Samentrichter (Abb. 1c) 2—2 1/2-mal länger als breit, beträgt die Hälfte des Körperdurchmessers. Kragen gut zu erkennen, so breit wie der Körper des Trichters. Samenleiter mittelmässig lang, etwas gewunden. Penialbulbus mittelgross und kompakt (Abb. 1d).

Spermatheken (Abb. 1e—f) bestehen, wie bei *F. maculata*, aus einer zylindrischen Ampulle und zwei unregelmässigen, manchmal schwer zu erkennenden Divertikeln. Der kurze entale Ductus mündet separiert voneinander in den Oesophagus. Ektaler Ausführungsgang mittelmässig lang (ungefähr 140—210 μm) und ziemlich dick (15—18 μm). Bei einem Exemplar (P. 13.2)

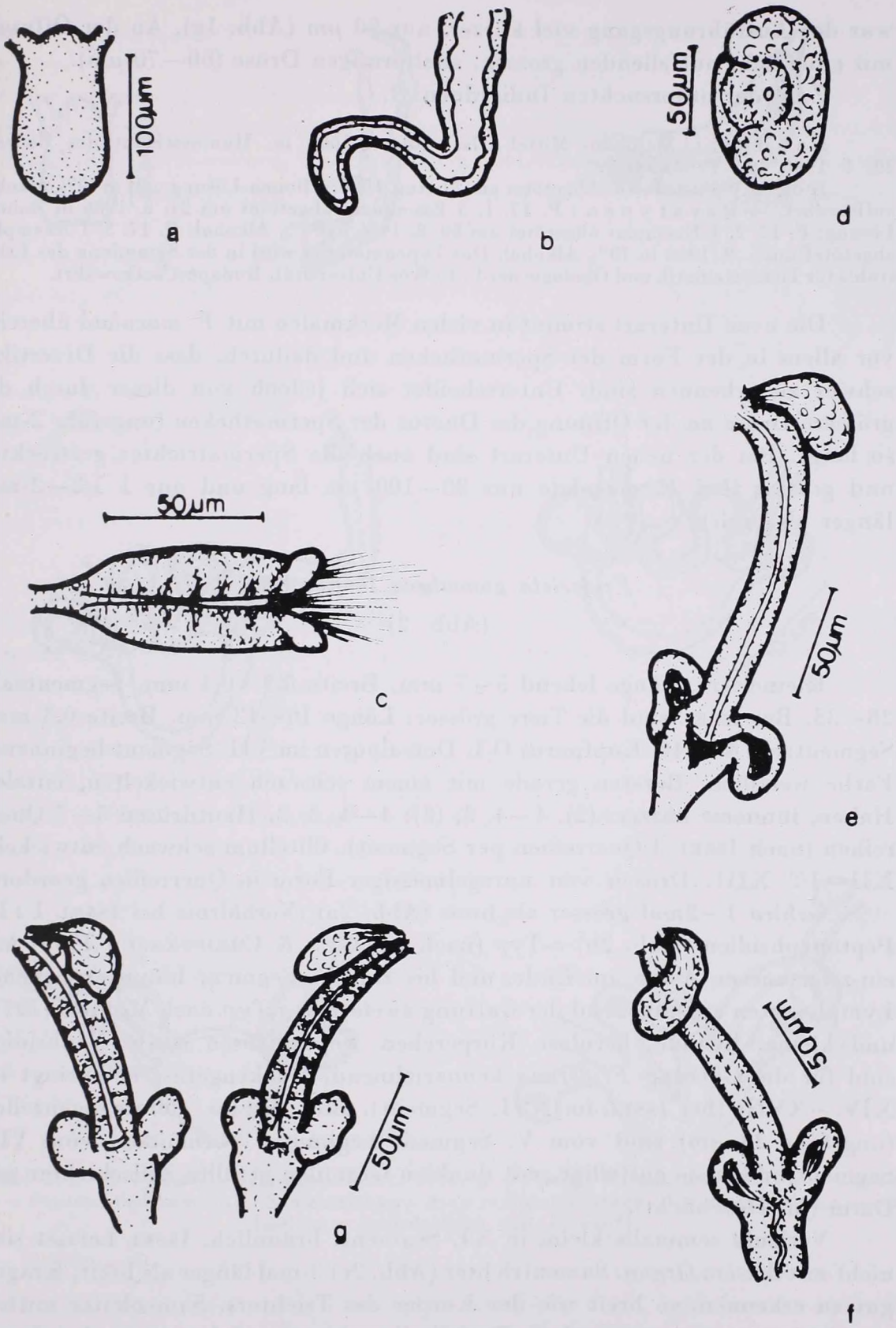


Abb. 1. a—d. *Fridericia maculata macroglandulosa* ssp. n.: a = Gehirn, b = Peptonephridium, c = Samentrichter, d = Penialbulbus, e—f = Spermatheken, g = Spermatheken mit kürzerem Ausführungsgang

war der Ausführungsgang viel kürzer, nur 90 μm (Abb. 1g). An der Öffnung mit einer sehr auffallenden grossen, stielförmigen Drüse (60—70 μm).

Zahl der untersuchten Individuen: 9.

Fundort: Marokko, Mittel-Atlas, Ifrane, 1600 m, Humusschicht des Bodens, 30. 4. 1986, leg. F. BERNINI.

Holotypus F. 10. Abgetötet am 27. Aug. 1986 in Bouen-Lösung und in 70% Alkohol aufbewahrt. — Paratypen: P. 17. 1. 3 Exemplare abgetötet am 27. 8. 1986 in Bouen-Lösung; P. 17. 2. 1 Exemplar abgetötet am 30. 8. 1986 in 70% Alkohol; P. 17. 3. 1 Exemplar abgetötet am 5. 9. 1986 in 70% Alkohol. Das Typenmaterial wird in der Sammlung des Lehrstuhls für Tiersystematik und Ökologie der L. Eötvös Universität, Budapest aufbewahrt.

Die neue Unterart stimmt in vielen Merkmalen mit *F. maculata* überein, vor allem in der Form der Spermatheken und dadurch, dass die Divertikel schwer zu erkennen sind. Unterscheidet sich jedoch von dieser durch die grössere Drüse an der Öffnung des Ductus der Spermatheken (ungefähr 2-mal so lang). Bei der neuen Unterart sind auch die Spermatrichter gestreckter und grösser (bei *F. maculata* nur 80—100 μm lang und nur 1 1/2—2-mal länger als breit).

Fridericia gamotheca ISSEL, 1906

(Abb. 2)

Kleine Art, Länge lebend 5—7 mm, Breite 0,3—0,4 mm, Segmentzahl 28—33. Bei ISSEL sind die Tiere grösser: Länge 10—12 mm, Breite 0,3 mm, Segmentzahl 40—44. Kopfporus O/I, Dorsalporen im VII. Segment beginnend. Farbe weisslich. Borsten gerade mit einem schwach entwickelten, entalen Haken, innnerer kürzer: (2), 4—4, 3, (2): 4—4, 3, 2. Hautdrüsen 5—7 Querreihen (nach ISSEL 3 Querreihen per Segment). Clitellum schwach entwickelt, XII—1/2 XIII. Drüsen von unregelmässiger Form in Querreihen geordnet.

Gehirn 1—2mal grösser als breit (Abb. 2a) (Verhältnis bei ISSEL 1 : 1). Peptonephridien (Abb. 2b) *a*-Typ (nach NIELSEN & CHRISTENSEN 1959) mit ein-zwei kurzen Ästen am Ende, und bis zum V. Segment hinunterreichend. Lymphozyten entsprechend der Gattung zweiartig: *a*-Typ nach MÖLLER (1971) und kleine, hyaline, kernlose Körperchen. Septaldrüsen sowie Nephridien sind für die Gattung *Fridericia* kennzeichnend. Rückengefäss entspringt im XIV.—XVII. (bei ISSEL im XVI. Segment). Blut farblos. Chloragogenzellen (ungefähr 28 μm) sind vom V. Segment beginnend vorhanden, vom VII. Segment bilden sie auffällige, mit dunklen Granulen gefüllte Zellschichten am Darm (im Durchlicht).

Vesicula seminalis klein, in XI. Segment, bräunlich. ISSEL befasst sich nicht mit diesem Organ. Samentrichter (Abb. 2c) 3-mal länger als breit, Kragen gut zu erkennen, so breit wie der Körper des Trichters. Samenleiter mittelmässig lang, etwas gewunden. Penialbulbus klein und kompakt (bei ISSEL fehlt die Prostata).

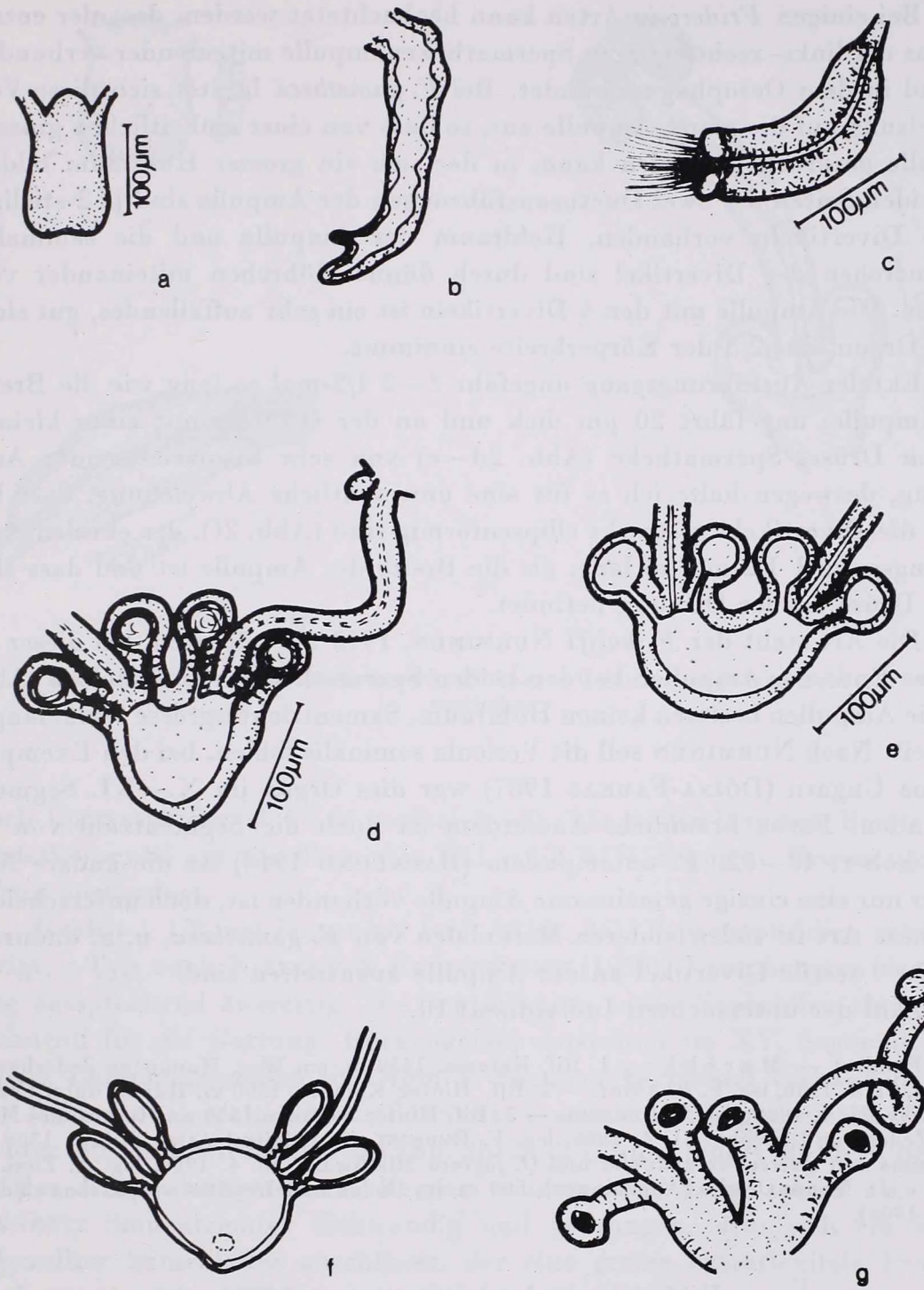


Abb. 2. a—f. *Fridericia gamotheca* Issel, 1906, g: *F. kalffi* Nurminen, 1973: a = Gehirn b = Peptonephridium, c = Samentrichter, d—e = Spermatheken, f = Spermatheka nach Issel, g = Spermatheka von *F. kalffi*

Bei einigen *Fridericia* Arten kann beobachtetet werden, dass der entale Ductus der links- rechtsseitigen Spermathekenampulle miteinender verbunden ist und in dem Oesophagus mündet. Bei *F. gamotheca* breitet sich diese Verschmelzung auf die ganze Ampulle aus, so dass von einer einheitlichen grossen Ampulle gesprochen werden kann, in der sich ein grosser Hohlraum bildet. An beiden Seiten der zwei Ductusausführungen der Ampulle sind je 2 stielige, runde Divertikeln vorhanden. Hohlraum der Ampulle und die seminalen Kämmerchen der Divertikel sind durch dünne Röhrchen miteinander verbunden. Die Ampulle mit den 4 Divertikeln ist ein sehr auffallendes, gut sichbares Organ, das 2/3 der Körperbreite einnimmt.

Ektaler Ausführungsgang ungefähr 2—2 1/2-mal so lang wie die Breite der Ampulle, ungefährt 20 μm dick und an der Öffnung mit einer kleinen sessilen Drüse. Spermatheke (Abb. 2d—e) von sehr kennzeichnender Ausbildung, deswegen halte ich es für eine unwesentliche Abweichung, dass bei ISSEL die Divertikeln gestreckt ellipsenförmig sind (Abb. 2f), der ektalen Ausführungsgang 1 1/2-mal so lang, als die Breite der Ampulle ist und dass sich keine Drüse an der Öffnung befindet.

Die Art steht der *F. kalffi* NURMINEN, 1973 am nächsten, bei dieser ist nur das Ende der Ampullen bei den beiden Spermatheken verschmolzen (Abb. 2g), die Ampullen besitzen keinen Hohlraum, Samentrichtergrösse 5-mal länger als breit. Nach NURMINEN soll die Vesicula seminalis fehlen, bei den Exemplaren aus Ungarn (DÓZSA-FARKAS 1987) war dies Organ im X.—XI. Segment vorhanden, Farbe bräunlich. Ausserdem ist auch die Segmentzahl von *F. kalffi* höher: 48—52. *F. uniampullata* (BACKLUND 1946) ist die andere Art, bei der nur eine einzige gemeinsame Ampulle vorhanden ist, doch unterscheidet sich diese Art in vielen anderen Merkmalen von *F. gamotheca*, u. a. dadurch, dass 7—9 sessile Divertikel an der Ampulle anzutreffen sind.

Zahl der untersuchten Individuen: 10.

Fundort — Marokko: 1. Rif. Ketama, 1450 m, am Weg, Humus an Zederbaumwurzeln, 21. 4. 1986, leg. F. BERNINI. — 2. Rif. Hinter Ketama, 1500 m, Humus unter *Cedrus laurifolius*, 21. 4. 1986, leg. F. BERNINI. — 3. Rif. Hinter Ketama, 1550 m, Humus und Moos unter Zedern und Eichen, 21. 4. 1986, leg. F. BERNINI. — 4. Mittel Atlas, Ifrane, 1500 m, im Humus von *Quercus rotundifolia* und *Q. faginea* Mischwald, 30. 4. 1986, leg. A. Zicsi. — Italien: Monte Orsello (Appeninnen), 500 m, im Boden und Detritus von Eichenwäldern (ISSEL 1906).

Fridericia sardorum COGNETTI, 1901
(Abb. 3)

Grosse Art. Länge lebend 15 mm, Breite 0,7 mm, Segmentzahl 49, 55 (bei COGNETTI Länge 15,2 mm, Breite 1 mm, Segmentzahl 50—55). Kopfporus O/I. Dorsalporen im VII. Segment beginnend. Borsten gerade, mit einem schwach entwickelten entalen Haken, innere kürzer: 4,5—4,5 : 4, 5, 6—6

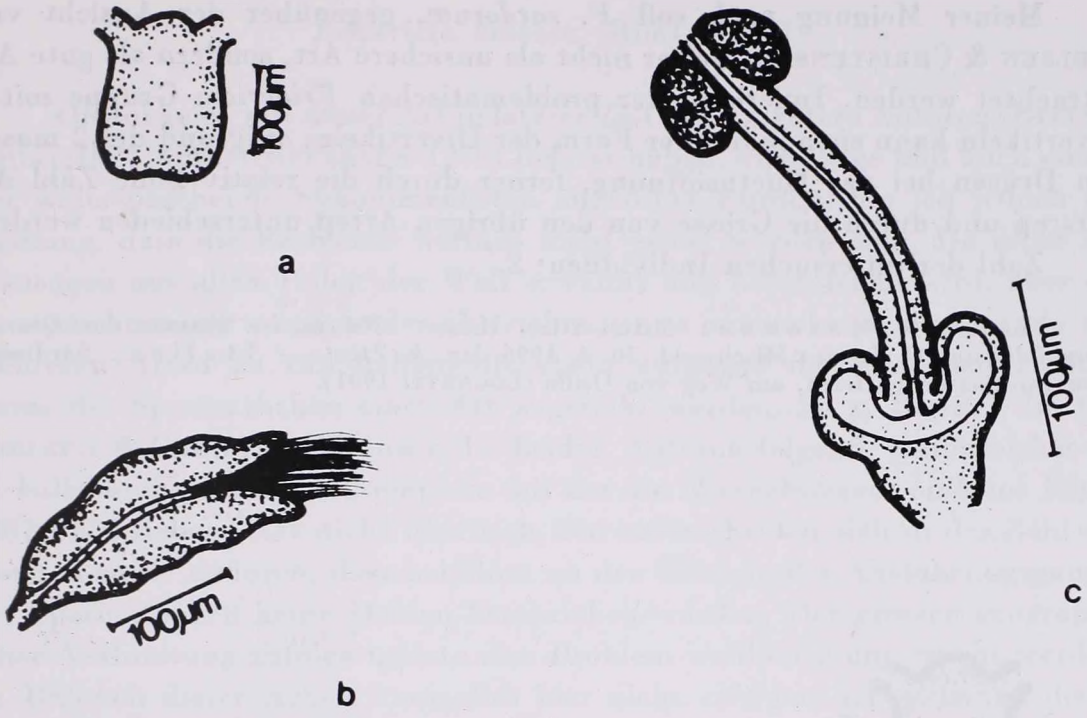


Abb. 3. a—c. *Fridericia sardorum* COGNETTI, 1901: a = Gehirn, b = Samentrichter, c = Spermatheka

(nach COGNETTI dorsal 4—6, ventral 6—8). Länge der längsten Borsten am Vorderkörper 84 µm. Clitellum vom XII.—1/2 XIII. Segment, Drüsen unregelmässig angeordnet.

Gehirn 1 1/2-mal länger als breit (Abb. 3a). Peptonephridien sehr verzweigt, *c*-Typ nach NIELSEN & CHRISTENSEN (1959). Lymphozyten der Gattung entsprechend zweiartig. Die Septaldrüsen sowie Nephridien sind kennzeichnend für die Gattung. Rückengefäss entspringt im XV. Segment. Blut farblos. Chloragogenzellen sind vom V. Segment beginnend vorhanden.

Vesicula seminalis fehlen (COGNETTI erwähnt dies Organ nicht). Samentrichter mit unklaren Konturen (Abb. 3b) 2—2 1/2-mal länger als breit, beträgt 1/3 des Körperdurchmessers. Kragen sondert sich nicht scharf ab. Nach COGNETTI Samentrichter dickwandig und gedrungen, dem sich ein locker aufgerollter Samenleiter anschliesst, der eine grosse extraflexibile Prostata durchquert und im VII. Segment austritt.

Spermatheken (Abb. 3c) bestehen aus einer kleinen konusförmigen Ampulle und zwei sessilen Divertikeln. Von COGNETTI werden diese zusammen als herzförmig betrachtet. Der kurze entale Ductus mündet in den Oesophagus separiert voneinander. Ektaler Ausführungsgang kurz und dick (ungefähr 280—310 µm lang und 28—32 µm breit), an der Öffnung mit 2 grossen massiven, eiförmigen, im Durchlicht bräunlichen Drüsen (74 µm lang).

Meiner Meinung nach soll *F. sardorum*, gegenüber der Ansicht von NIELSEN & CHRISTENSEN, weiter nicht als unsichere Art, sondern als gute Art betrachtet werden. Innerhalb der problematischen *Fridericia* Gruppe mit 2 Divertikeln kann sie anhand der Form der Divertikeln, aufgrund der 2 massiven Drüsen bei der Ductusöffnung, ferner durch die relativ hohe Zahl der Borsten und durch die Grösse von den übrigen Arten unterschieden werden.

Zahl der untersuchen Individuen: 2.

Fundort — Marokko: Mittel-Atlas, Ifrane, 1500 m, im Humus von *Quercus rotundifolia* und *Q. faginea* Mischwald, 30. 4. 1986, leg. A. ZICSI. — Italien: Sardinien, 7 km von Sassari entfernt, am Weg von Osillo (COGNETTI 1901).

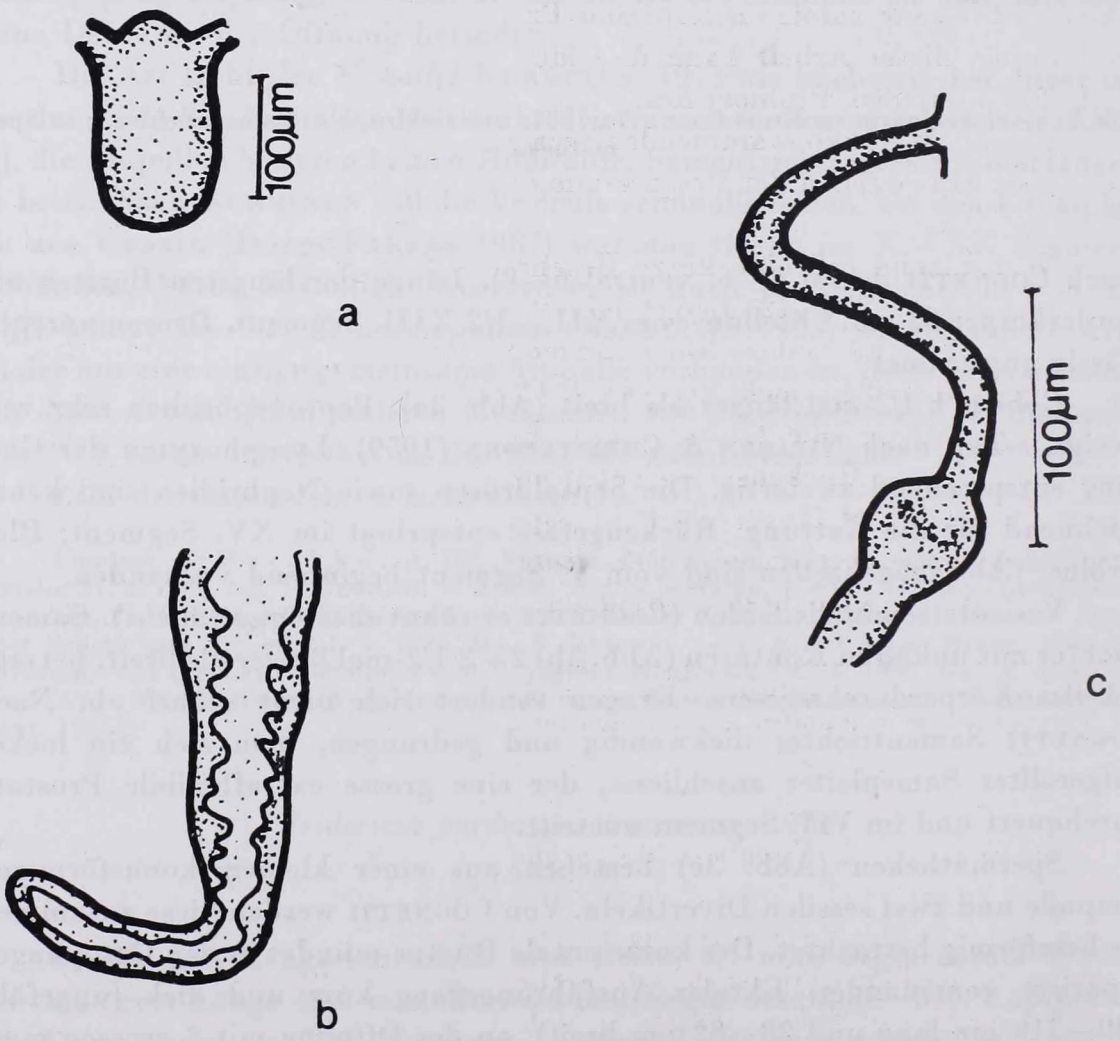


Abb. 4. a—c. *Fridericia bulbosa* (ROSA, 1887): a = Gehirn, b = Peptonephridium, c = Spermatheka

Fridericia bulbosa (Rosa, 1887)

Obwohl sich mit dieser Art in letzter Zeit auch mehrere Autoren (Bittencourt 1974, Christoffersen 1976) befasst haben, vielfältige und auch einander widersprechende Synonimenlisten angeführt wurden, bin ich jedoch der Meinung, dass die Probleme weitaus nicht gelöst worden sind. Da diese Art sozusagen aus allen Teilen der Welt erwähnt und beschrieben wird, aber die Kennzeichnungen voneinander abweichen, ist es anzunehmen, dass wir es mit mehreren Arten zu tun haben, die allein aufgrund der einfachen Bulbus-Form der Spermatheken einer Art zugereiht werden. So z. B. sind die von Nielsen & Christensen sowie die beiden Autoren folgend, meine bisher als *F. bulbosa* angesehenen Exemplare mit der als *Neoenchytraeus bulbosus* Rosa, 1887 beschriebene Art nicht identisch. Sie unterscheiden sich in der Zahl der Borsten sowie dadurch, dass bei Rosa an der Öffnung des Ausführungsganges der Spermatheken keine Drüsen beschrieben wurden. Der grossen geographischen Verbreitung zufolge müsste dies Problem weitläufig untersucht werden, im Rahmen dieser Arbeit kann dies hier nicht erfolgen, ich weise an dieser Stelle bloss auf dies Problem hin.

Die aus Marokko stammenden, von mir jetzt als *F. bulbosa* bestimmten Exemplare entsprechen der Beschreibung von Rosa (1887) bzw. Bittencourt (1974).

Nachstehend soll eine kurze Beschreibung meiner Exemplare erfolgen.

Segmentzahl 34—42. Länge 7,7—9,0 mm, Breite 0,28—0,32 mm. Borsten: 4—4,2 : 4—4,2. Gehirn 2-mal länger als breit (Abb. 4a). Peptonephridien kurz und breit, *a*-Typ nach Nielsen & Christensen (1959) (Abb. 4b). Lymphozyten zweiartig, die Grossen, mit Kernen, sind granuliert, deshalb im Durchlicht braun. Rückengefäss entspringt in XV.—XVI. Segment. Samentrichter klein, 2-mal länger als breit. Spermatheken (Abb. 4c) mit zwiebelförmiger Ampulle, mit langem Ausführungsgang. Keine Drüse an der Öffnung.

Zahl der untersuchten Individuen: 5.

Fundort — Marokko: Mittel-Atlas, Ifrane, im Humus von *Quercus rotundifolia* und *Q. faginea* Wald, 30. 4. 1986, leg. A. Zicsi. Sämtliche Tiere wurden eingerollt innerhalb der Bodenaggregate angetroffen, es ist anzunehmen, dass die Tiere in Diapause waren.

Fridericia paroniana Issel, 1904

Da die in der Literatur angeführten Merkmale dieser Art nicht vollkommen einheitlich sind, ist es erforderlich eine kurze Beschreibung der aus Marokko stammenden Tiere zu geben, wobei ein Vergleich mit den aus Ungarn bzw. aus der Tschechoslowakei stammenden Tiere vollzogen werden kann.

Länge 5,7 mm, Breite 0,19 mm, am Gürtel 0,26 mm. Segmentzahl 33.

Borsten gerade mit einem entalen Haken, innerer kürzer: 3, 4—4, 3 : 4—4, 3. Länge der längsten Borsten am Vorderkörper 33 μm, am Ende des Körpers 58 μm. Borstenzahl anscheinend variierend, bei Nielsen und Christensen sind meistens 2 Borsten angegeben, im Material aus der Tschechoslowakei sind ebenfalls 2 Borsten bei den Tieren vorhanden. In Ungarn sind beide Variationen vorhanden, doch sind die Populationen mit 4 Borsten häufiger.

Clitellum von XII.—1/2 XIII. Segment, die Drüsen unregelmässig angeordnet. Peptonephridien kurz, unverzweigt *a*-Typ nach NIELSEN & CHRISTENSEN 1959. Chloragogenzellen vom VII. Segment gut entwickelt, und im Durchlicht dunkel. Lymphozyten (Abb. 5a) zweiartig: discoid, grob granuliert *b*-Typ nach MÖLLER (1971), ganz dunkel im Durchlicht, 33—41 μm lang und kleinen hyalinen Körperchen. Vesicula seminalis fehlen. Spermatrichter klein 1 1/2—2-mal so lang wie breit, beträgt 1/3 des Körperdurchmessers. Penialbulbus klein. Spermatheken (Abb. 5b) bestehen aus einer konischen Ampulle und 2 sessilen runden Divertikeln. In den Divertikeln gut erkennbare runde Saminalkammer in der auch Spermen vorkommen. Ausführungsductus mittelgross (420 μm lang und 13 μm dick), bei der Öffnung mit einer Drüse.

Aufgrund meiner bisherigen Kenntnisse halte ich bei der Identifizierung dieser Art die Form der Spermatheken und den Typ der Lymphozyten am ausschlaggebensten. Letzterer war bei allen, von verschiedenen Fundorten stammenden Tieren immer gleich, und erwies sich als gut erkennbares Merkmal. Deswegen muss die Stichhaltigkeit der von MÖLLER 1971 beschriebenen *F. paroniana* in Frage gestellt werden.

Zahl der untersuchten Individuen: 1.

Fundort — Marokko, Larache, 200 m, im Humus von mediterranen Macchia und Farn, 2. 5. 1986, leg. F. BERNINI.

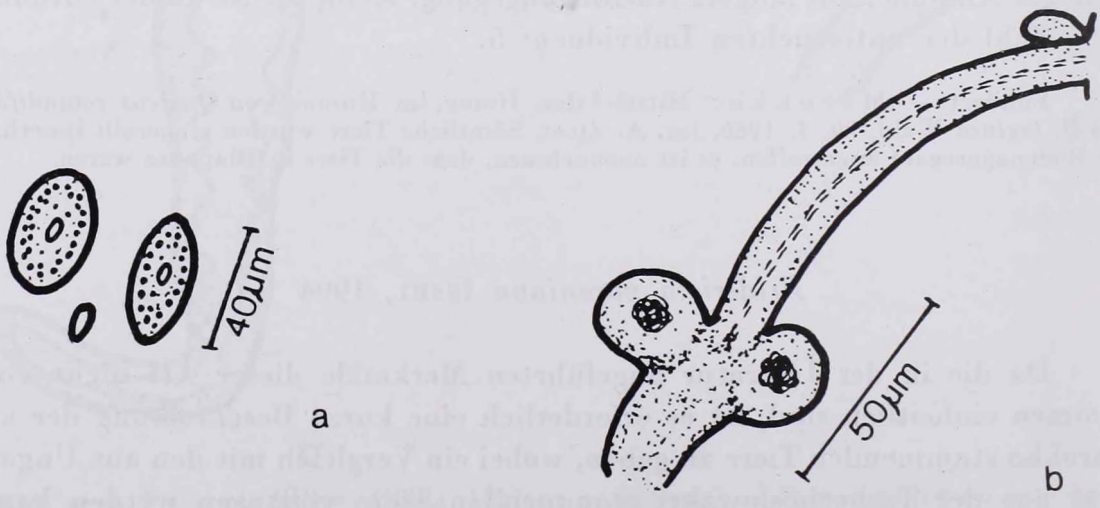


Abb. 5. a—b. *Fridericia paroniana* ISSEL, 1904: a = Lymphozyten, b = Spermatheka

SCHRIFTUM

BACKLUND, H. O. (1946): Swedish Enchytraeida I. — Kungl. Fysiogr. Sällsk. Handl. N. F., **57** (13): 1—23.

BITTENCOURT, E. C. R. (1974): Algumas Enchytraeidae (Oligochaeta) de Sao Paulo. — Rev. Brasil. Biol., **34** (3): 369—378.

CHRISTOFFERSEN, M. L. (1976): Two species of Fridericia Mich. 1889 (Oligochaeta, Enchytraeidae) from Brasil. — Bolm. Zool. Univ. S. Paulo **1**: 239—256.

COGNETTI, L. (1901): Gli Oligocheti della Sardegna. — Boll. Mus. Zool. Anat., **16** (404): 1—26.

DÓZSA-FARKAS, K. (1987): Über den Enchytraeidenbesatz in Nadelholzwäldern Ungarns. — Soil Fauna and Soil Fertility. Proc. of the 9th International Colloquium on Soil Zoology Moscow 1985: 312—316.

DÓZSA-FARKAS, K. (1988a): Eine neue Enchytronia Art aus Marokko. — Opusc. Zool., 23: 149—151.

DÓZSA-FARKAS, K. (1988b): Fridericia berninii sp. n. und weitere Angaben über die Enchytraeiden-Fauna (Oligochaeta) der Balearen. — Acta zool. hung., **34** (4): 339—344.

ISSEL, R. (1904): Due nouve Fridericia. — Atti. Soc. Ligust. Sc. nat. Geogr. Genova, **15**: 31—39.

ISSEL, R. (1906): Un Enchitreide ad Ampolla spermatecale unica. — Atti. Soc. Nat. Mat. Modena, **4** (7): 77—79.

MÖLLER, F. (1971): Systematische Untersuchungen an Terricolen Enchytraeiden einiger Grünlandstandorte im Bezirk Potsdam. — Mitt. Zool. Mus. Berlin, **47** (1): 131—167.

NIELSEN, C O. & CHRISTENSEN, B. (1959): The Enchytraeidae critical revision and taxonomy of European species. — Nat. Jutl., 8—9: 1—160.

NURMINEN, M. (1973): Enchytraeidae (Oligochaeta) from the vicinity of Montreal, Canada. — *Ann. zool. fennici*, **10**: 399—402.

ROSA, D. (1887): Il Neoenchytraeus bulbosus n. sp. — Boll. Mus. Zool. Anat. Comp. Univ. Torino, **2** (no. 29): 1—3.

Acta Zoologica Hungarica 35 (1—2), pp. 41—79 (1989)

ORIBATIDS FROM THE SOUTHERN HEMISPHERE (ACARI: ORIBATIDA)

S. MAHUNKA

Zoological Department, Hungarian Natural History Museum
H-1088 Budapest, Baross utca 13, Hungary

(Received March 17, 1988)

Oribatid species from Africa, mostly from Kenya, Nigeria and from the Republic of South Africa and Tasmania are discussed. Seventeen species are described as new to science. One of them also necessiates the establishment of a new genus: *Safrobates* gen. n. (Oribatellidae), and at the same time a new subfamily: Safrobatinae subfam. n. With 109 original figures.

In this paper I discuss Oribatid species deriving from different parts of the Ethiopian and Australian Regions. In this contribution I present species collected in Angola, Kenya, Nigeria, in the Republic of South Africa and Tasmania.

This article comprises the description of seventeen new species, the extablishment of a new genus representing also a new subfamily in the family of Oribatellidae JACOT, 1925, a complementary description of a *Suctobelbella* species heretofore known only from New Zealand some notes on the relation of different taxa and keys for some species group (e.g. *Stomacarus*).

The examined material was collected by Dr. A. DEMETER (Nigeria), Dr. S. ENDRŐDY-YOUNGA (Republic of South Africa and Tasmania), Dr. Z. SZABÓ (Angola), by L. MAHUNKA-PAPP and myself (Kenya). The types are deposited in the Hungarian Natural Museum, Budapest (HNHM), in the Transvaal Museum, Pretoria (MTP), in the Museum d'Histoire Naturelle, Genève (MHNG) and in the Natural History Museum, Nairobi (NHMN).

List of localities

Afr. 213. Nigeria, Bauchi State, Yankaari game reserve, Wikki, gallery forest, soil + humus, 22. VII. 1978. leg. A. DEMETER.

Afr. 216. Nigeria, Bauchi State, Yankari game reserve, Gaji river, decaying log from swamp forest, 3. VIII. 1978. leg. A. DEMETER.

Angola 1. Angola, Environ Malange, forest litter and moss. 12. V. 1980. leg. Z. SZABÓ.

Kenya 2. Kenya, Ukunda, sea shore, 16. IX. 1985. Berlese-, Nematoda- and Tardigrada-samples from litter and debris of evergreen and succulent vegetation on sandy shore. leg. S. MAHUNKA and L. MAHUNKA—PAPP.

Kenya 3. Kenya, Ukunda, sea shore. 16. IX. 1985. Berlese-, Nematoda- and Tardigrada-samples from digging out roots of grassy vegetation, near the sea shore. leg. S. MAHUNKA and L. MAHUNKA-PAPP.

Kenya 46. Kenya, Mwachema, Ras Mwachema, 23. IX. 1985. Five soil traps with ethylene glycol placed at the base of large baobab trees, baited with meat. leg. S. MAHUNKA and L. MAHUNKA-PAPP.
E. Y. No. 200. Rep. South Africa, W. Cape, Hawguas, 33—34 S. —19.08 E, 12. XI. 1973. sifted humus. leg. S. ENDRŐDY-YOUNGA.
Kz. 175. Tasmania, Wateralt Bay. 21. XII. 1982. leg. S. ENDRŐDY-YOUNGA.
Kz. 178. Tasmania, Collinsvale. 5. XII. 1982. leg. S. ENDRŐDY-YOUNGA.
Kz. 179. Tasmania, Hartz Mtn. 31. XI. 1982. leg. S. ENDRŐDY-YOUNGA.

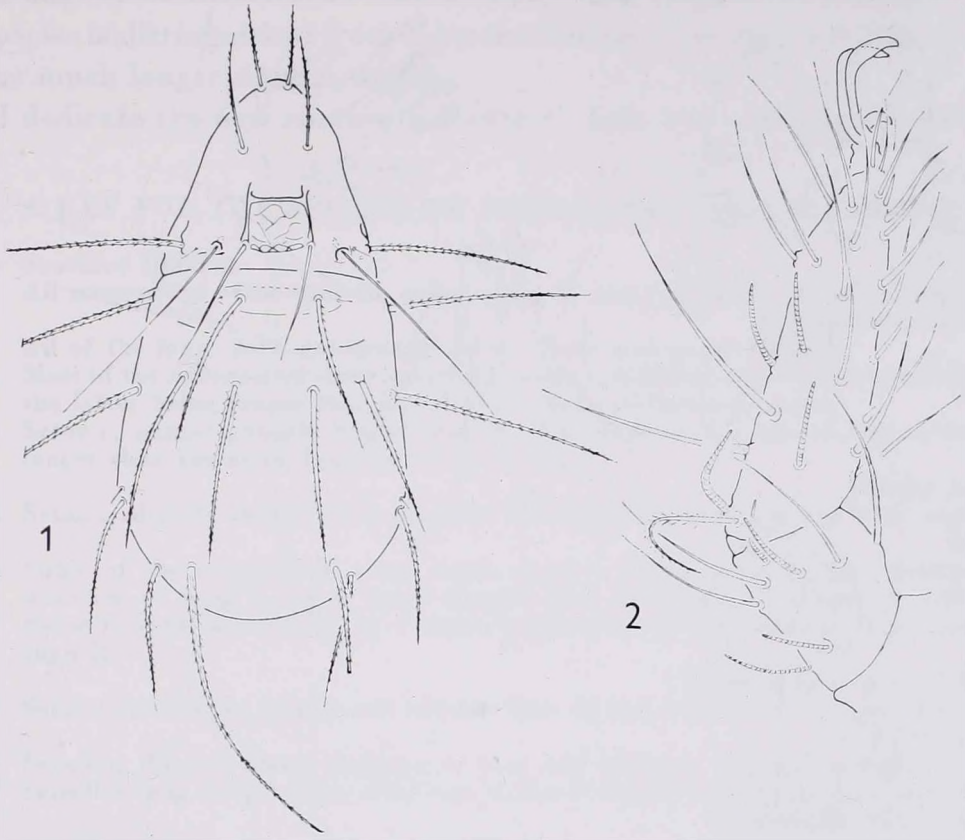
List of species

Archeonothridae GRANDJEAN, 1954
Stomacarus leei sp. n.
Phthiracaridae PERTY, 1841
Archipthiracarus imbecillis sp. n.
Eremaeozetidae BALOGH, 1972
Eremaeozetes machadoi sp. n.
Carabodidae C. L. KOCH, 1837
Diplobodes aokii sp. n.
Oppiidae GRANDJEAN, 1954
Lanceoppia adjuncta sp. n.
Lanceoppia tasmanica sp. n.
Lanceoppia consimilis sp. n.
Lanceoppia pertineata sp. n.
Lanceoppia tortile sp. n.
Membranoppia globifera sp. n.
Stachyoppia monstruosa sp. n.
Suctobelbidae GRANDJEAN, 1954
Suctobelbella nondivisa (HAMMER, 1966)
Locality: Kz. 178: South Africa: 4 specimens.
Suctobelbella penicillata (BALOGH et MAHUNKA, 1966)
Locality: Afr. 213: Nigeria: 3 specimens.
Suctrobelbella tricornuta sp. n.
Scutoverticidae GRANDJEAN, 1954
Scutovertex bidactylus sp. n.
Oribatulidae THOR, 1929
Phauloppia sculpturata sp. n.
Maculobates endroedyyoungai sp. n.
Oribatellidae JACOT, 1925
Lamellobates engelbrechti sp. n.
Safrobates miniporus gen. et sp. n.

Stomacarus leei sp. n.
(Figs 1—7)

Measurements — Length: 331—364 μm, width: 181—204 μm.

Prodorsum: Rostrum elongated, nasiform, basal part of prodorsum well convex medially, both characters also well observable in lateral view (Fig. 7). Median convex part well framed by costuliform lines (Fig. 1), an anterior transverse lath also visible, its surface ornamented by polygonate sculpture. All prodorsal setae — excepting *exa* — dark, long and ciliate. Their ratio: *exp* > *in* > *le* > *ro* > *exa*. Sensillus very long (140 μm), thin, filiform, longer than setae *exp* (105 μm).



Figs 1—2. *Stomacarus leei* sp. n.: 1 = dorsal view, 2 = leg 1

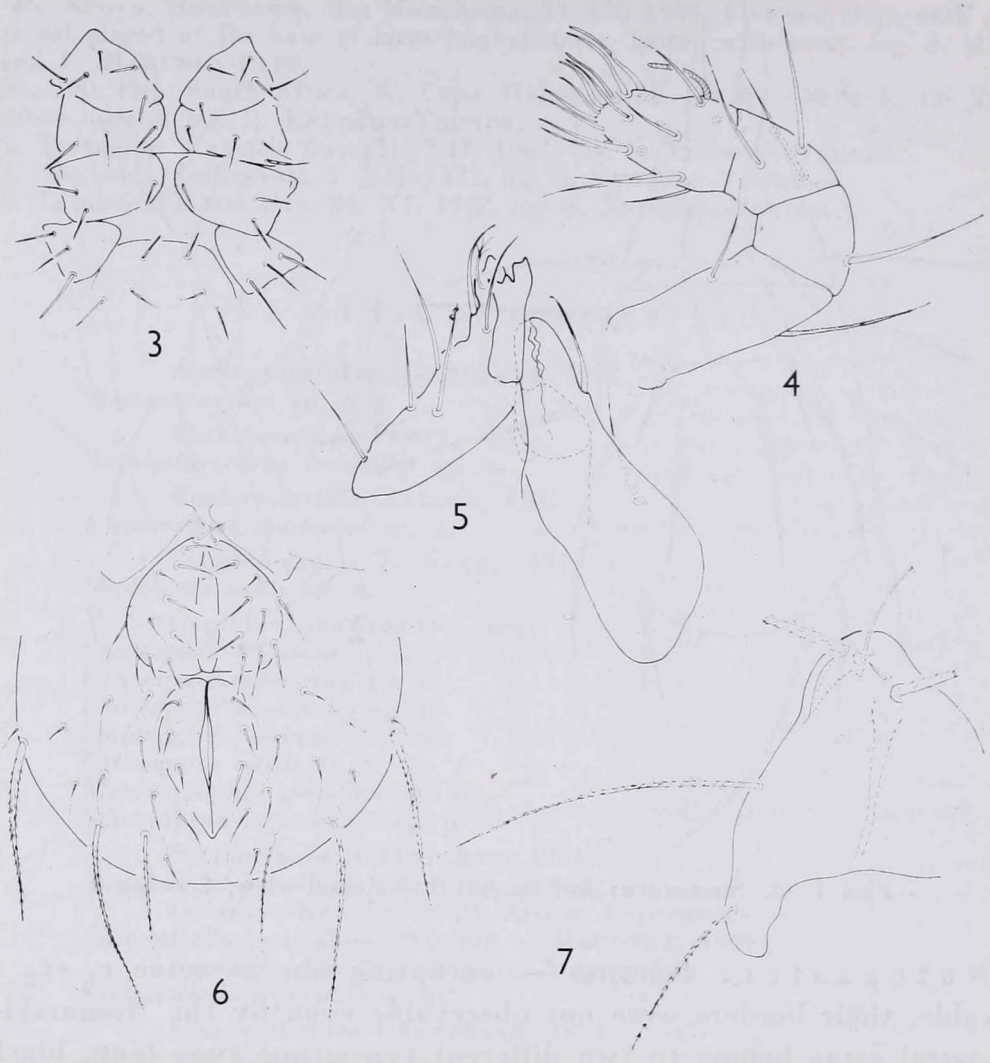
N o t o g a s t e r : Sclerites — excepting one at setae c_1—c_2 — not observable, their borders were not observable even by the Nomarski-effect. Notogastral setae belong to two different types; one type long, black, well ciliate and sometimes with a divided velum; the other type, e.g. c_2, cp, f_1, very short and simple. Setae $c_1 = d_1 = d_2$, setae$_1$ reaching to the insertion point of d_1. Setae f_1 the longest of all, but to measure their exact length is, impossible (all setae were partly destroyed). Setae h_1 nearly as long as setae f_2 setae ps_2 much shorter than the preceding ones.

G n a t h o s o m a : Rutellum divided into two parts with 4 teeth. Setae or_1 braching anteriorly (Fig. 5). Chelicera with well-developed teeth on both parts. Setal formula of the palpus: 2—1—3—18 + 1 (Fig. 4).

C o x i s t e r n a l r e g i o n (Fig. 3): Epimeres 1 much smaller than the others and located very far from each other. All the others touching medially. Epimeral setal formula: 4—3—3—5. Median setae (*1c*, *2a* and *3a*) much shorter than the lateral ones.

A n o g e n i t a l r e g i o n (Fig. 6): Quite similar to the other species of this genus. Ovipositor* with the characteristic two pairs of very strong, dark and curved spines.

* I have found only female specimens.



Figs 3—7. *Stomacarus leei* sp. n.: 3 = coxisternal region, 4 = palp, 5 = mentum and chelicera, 6 = anogenital region, 7 = prodorsum in lateral view

L e g s : Claws hardly dilated anteriorly, empodium small. Solenidium ω_p of leg I strongly bent outwards, ε long, curved and well ciliate (Fig. 2). Solenidium ω_2 of tarsus II minute.

Type material — H o l o t y p e : Kz. 178. Tasmania. 4 p a r a t y p e s : from the sample. — Holotype and 1 paratype deposited in the TMP,** 2 paratypes (1314-PO-88) in the HNHM*** and 1 paratype in the MHNG.****

R e m a r k s : The new species may be included in the genus *Stomacarus* GRANDJEAN, 1952. It belongs to the species group characterized by the filiform sensillus. On the basis of the ratio of the notogastral setae ($d_1 \simeq d_2$) it

** Transversal Museum, Pretoria.
*** Hungarian Natural History Museum, Budapest.
**** Museum d'Histoire Naturelle, Genève.

stands nearest to *Stomacarus ciliosus* LEE, 1982 from New Zealand, but the new species is distinguished from it by the shorter setae c_1(c_1 not longer than d_1) and the much longer setae f_2 and h_2.

I dedicate the new species to DAVID C. LEE, the renown oribatidologist.

A KEY FOR THE SPECIES OF *STOMACARUS* GRANDJEAN, 1952

1 (10) Sensillus filiform.
2 (3) All notogastral setae smooth, setae c_1, d_1, h_1 and f_2 filiform, slightly flagellate
tristani GRANDJEAN, 1952
3 (2) All of the long, dark notogastral setae ciliate and never filiform.
4 (7) Most of the notogastral setae very long, setae c_1 reaching over the insertion of setae d_1, the latter being longer than the distance between setae d_1 and e_1.
5 (6) Setae c_1 unambiguously longer than d_1. The distance between d_2 and e_2 three times longer than the same between setae d_2 and d_1
ciliosus LEE, 1982
6 (5) Setae c_1 slightly shorter than d_1; setae d_2 originating nearly as far from setae e_2 as d_1
leei sp. n.
7 (4) Some of the notogastral setae much shorter; either setae c_1 not reaching to the insertion of setae d_1, or d_1 much shorter than the distance between d_1 and e_1.
8 (9) Setae f_2 very short, only 2—3 times longer than f_1 and setae d_1 four times longer than it
macfarlani (GRANDJEAN, 1957)
9 (8) Setae f_2 normal in length, not shorter than d_1 and 8—10 times longer than f_1
abresi LEE, 1981
10 (1) Sensillus dilated, short, capitate or long and strongly thinned medially.
11 (12) Sensillus long, longer than setae *exp*, thinned medially, its distal part spindle-shaped
ligamentifer (HAMMER, 1967)
12 (11) Sensillus shorter than setae exp, capitate.
13 (14) Setae d_1 and d_2 equal in length; setae c_1 very strong and long, reaching over the insertion of setae d_1
campbellensis WALLWORK, 1966)
14 (13) Setae d_1 much longer than d_2, setae c_1 shorter than d_1 and ending far from the insertion of setae d_1
watsoni (TRAVÉ, 1964)

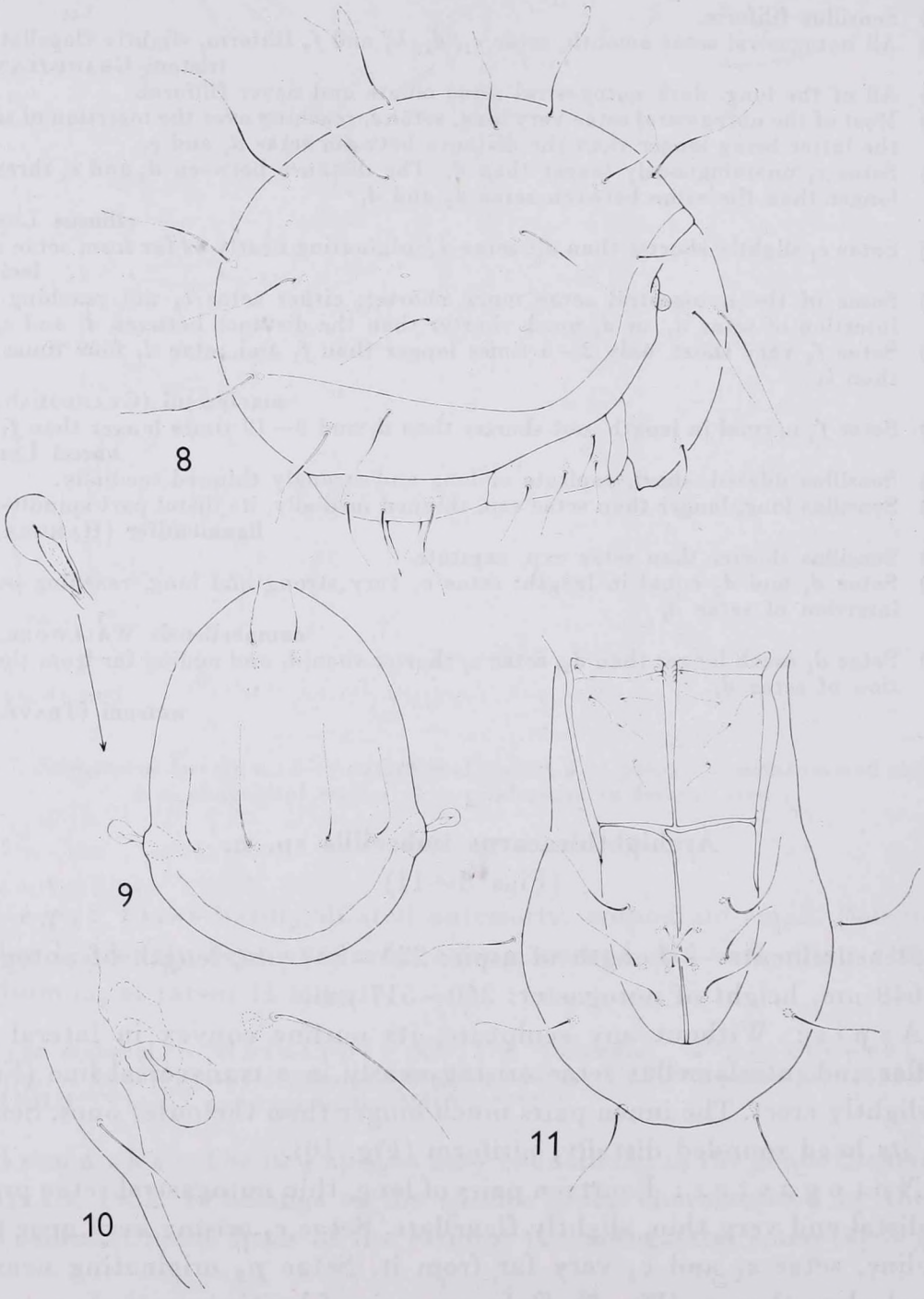
Archiphthiracarus imbecillis sp. n.
(Figs 8—11)

Measurements — Length of aspis: 254—337 μm, length of notogaster; 451—648 μm, height of notogaster: 360—517 μm.

A s p i s : Without any sculpture, its outline convex in lateral view. Lamellar and interlamellar setae arising nearly in a transversal line (Fig. 9), both slightly erect. The innen pairs much longer than the outer ones. Sensillus short, its head rounded distally, piriform (Fig. 10).

N o t o g a s t e r : Fourteen pairs of long, thin notogastral setae present, their distal end very thin, slightly flagellate. Setae c_3 arising very near to the collar-line, setae c_1 and c_2 very far from it. Setae p_2 originating nearer to the anal plate than p_3 (Fig. 8). Only one pair of lyrifissures (*im*) present, all the others absent!

Anogenital region: Anal setae equal in length, all adanal ones longer than the preceding ones. Setae ad_3 the longest of all, $ad_2 > ad_1$. Nine pairs of genital setae present, four of them long, one pair arising laterally, far from the others (Fig. 11), five very short setae originating on the anterior narrow part of the genital plate, very near to each other.



Figs 8—11. *Archiphthiracarus imbecillis* sp. n.: 8 = body in lateral view, 9 = aspis, 10 = lateral part of aspis, 11 = anogenital region

Legs: Setal formula of leg I: 1—4—4—6—20—1.

Type material — Holotype: E. Y. No. 200. South Africa. 27 paratypes: from the same sample. — Holotype and 15 paratypes deposited in the TMP, 10 paratypes (1315-PI-88) in the HNHM and 2 paratypes in the MHNG.

Remarks: The new species is well characterized by the position of the genital setae: one pairs originating far from all other setae. This feature was not known among the known *Phthiracarus* of *Archiphthiracarus* species.

Eremaeozetes machadoi sp. n.
(Figs 12—16)

Measurements — Length: 360—392 μm, width: 208—232 μm.

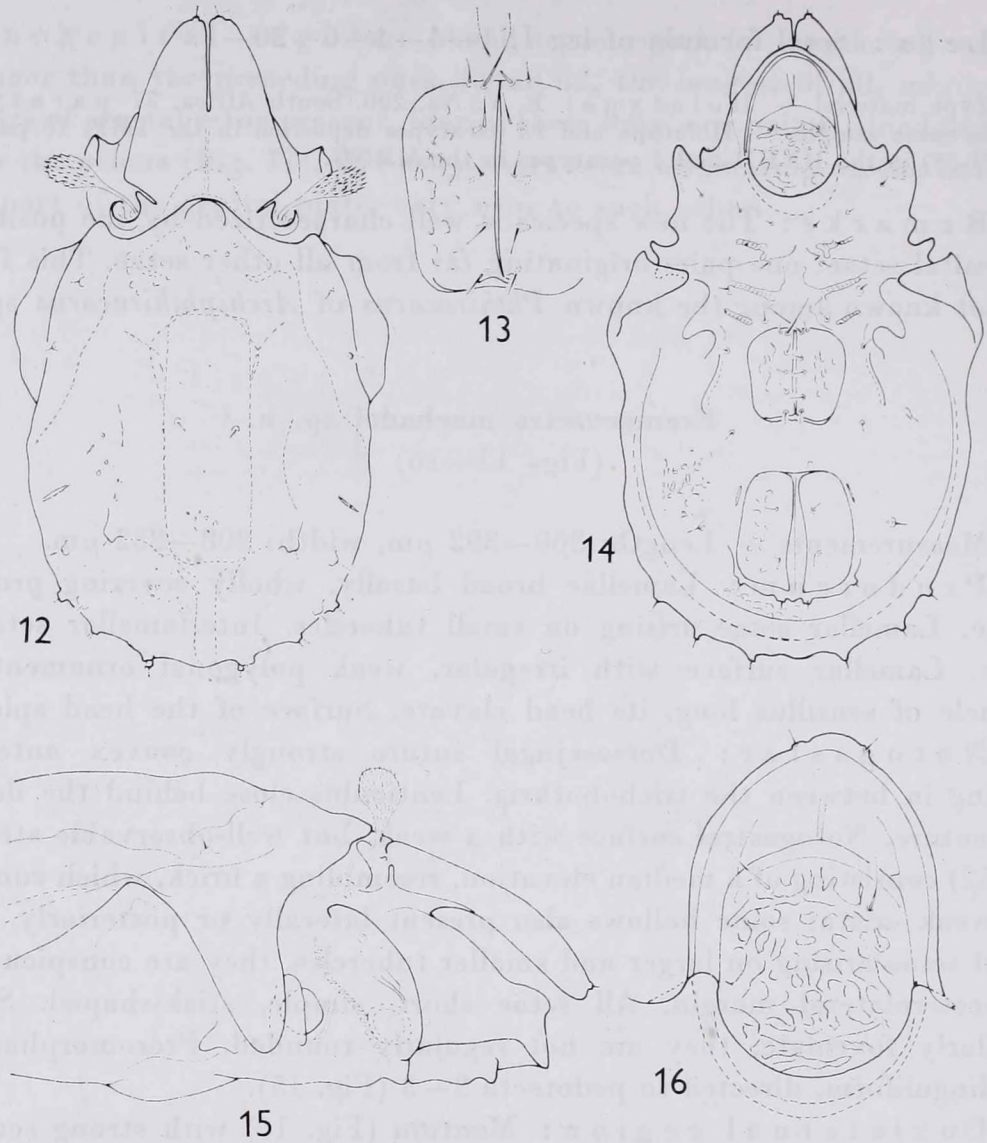
Prodorsum: Lamellae broad basally, wholly covering prodorsal surface. Lamellar setae arising on small tubercles. Interlamellar setae not visible. Lamellar surface with irregular, weak polygonal ornamentation. Peduncle of sensillus long, its head clavate. Surface of the head spiculate.

Notogaster: Dorsosejugal suture strongly convex anteriorly, reaching in between the trichobothria. Lenticulus close behind the dorsosejugal suture. Notogastral surface with a weak, but well-observable structure (Fig. 12) consisting of a median elevation, resembling a brick, which continues in a weak crista; some hollows also present laterally or posteriorly. Notogastral setae arising on larger and smaller tubercles, they are conspicuous on the posterolateral margin. All setae short, simple, stick-shaped. Surface irregularly foveolate, they are not regularly rounded. Pteromorphae very long, linguliform, directed to pedotecta 2—3 (Fig. 15).

Coxisternal region: Mentum (Fig. 16) with strong sculpture consisting of alveoli and irregular rugae. Surface of epimeres also similar, but sculpture weaker, a stronger transversal and a pair of oblique laths present before genital aperture. Epimeral borders hardly observable, apodemes short, only ap. sej. longer. Epimeral setal formula: 3—1—1—2. All setae arising on small tubercles. Pedotecta 1 large, pedotecta 2—3 strongly asymmetrical. Discidium also large, resembling a hooked beak.

Anogenital region; Whole surface — including the genital (Fig. 13) and anal plates — irregularly foveolate or rugose, the sculpture is stronger laterally and posteriorly than medially. Behind the anal aperture a strong chitinous frame (Fig. 14) present, setae ad_1 and ad_2 arising on it. Anogenital setal formula: 6—1—2—3. Setae g_6 very long, three times longer than g_5. Lyrifissure *iad* in adanal position.

Type material — Holotype (1316-HO-88): Angola. 1. 8 paratypes from the same sample. Holotype and 6 paratypes (1316-PO-88) deposited in the HNHM, 2 paratypes in the MHNG.



Figs 12—16. *Eremaeozetes machadoi* sp. n.: 12 = dorsal view, 13 = genital plate, 14 = ventral view, 15 = body in lateral view, 16 = mentum

R e m a r k s : This species is well characterized by the broad lamellae, the position of the lenticulus and the structure and sculpture of the notogaster. It stands nearest to *Eremaeozetes lineatus* MAHUNKA, 1985 (St. Lucia), however, the median field of the latter larger and its margin is not straight.

I dedicate the new species to Dr. A. DE BARROS-MACHADO in recognizing his activing in a better understanding of the West-African soil-fauna.

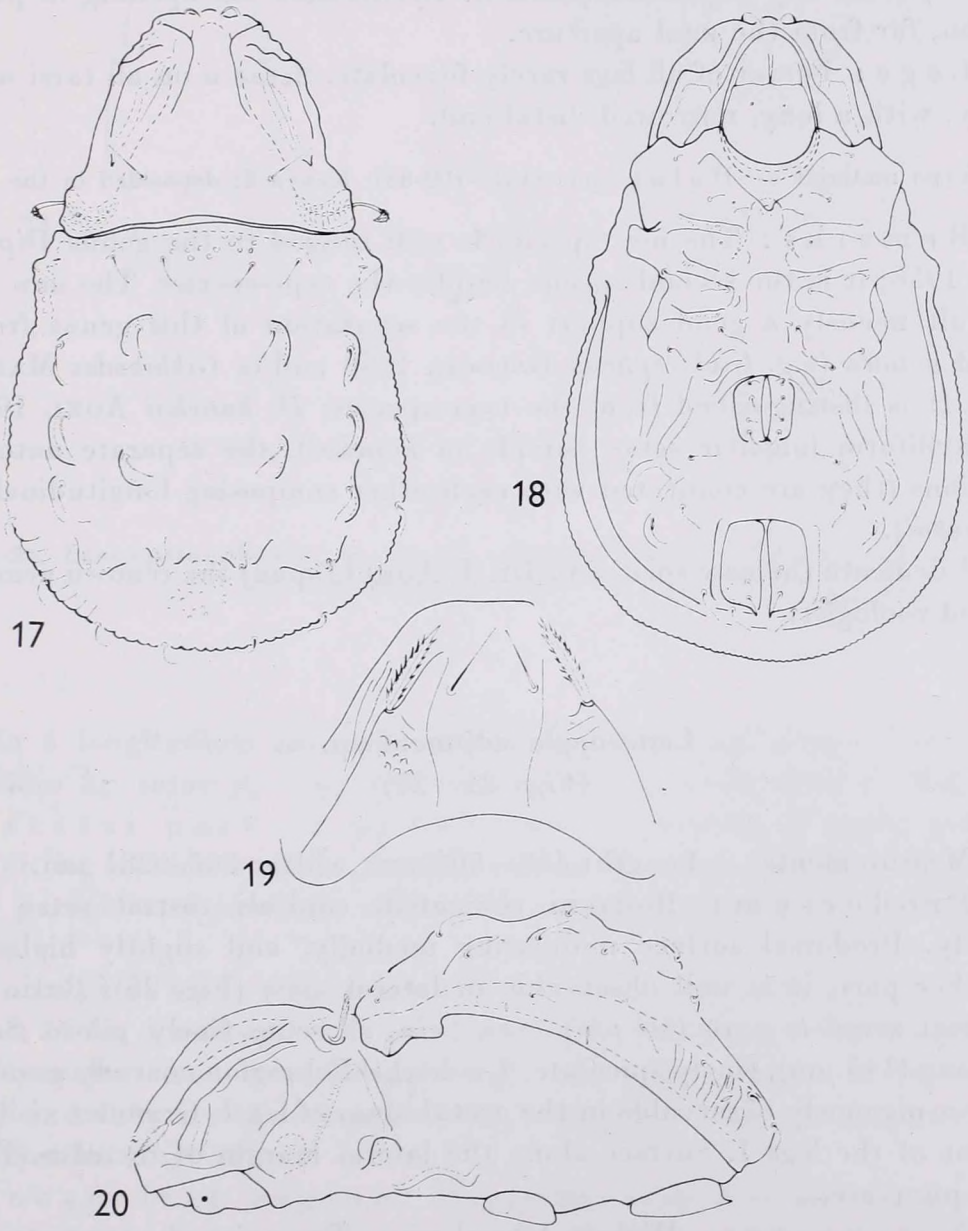
Diplobodes aokii sp. n.
(Figs 17—20)

Measurements — Length: 762 μm, width: 468 μm.

P r o d o r s u m : Rostrum well separate, rostral setae short, slightly dilate, spiniform. Lamellae wide, with a double structure (Fig. 17), slightly

convex, and with a well-observable lateral keel. Lamellar setae phylliform, arising on their apex. Interlamellar setae fine, filiform. Sensillus bent backwards, with fusiform head. Prodorsal surface — with the exception of the weakly foveolate lamellar surface — smooth. Basally a narrow "split" observable.

N o t o g a s t e r : Shoulder large, angular. Dorsosejugal suture convex. The surface ornamented by alveoli, but marginally parallel rugae visible. Three pairs of median and four pairs of lateral elevations visible (Fig. 20),



Figs 17—20. *Diplobodes aokii* sp. n.: 17 = dorsal view, 18 = ventral view, 19 = rostrum in anterior view, 20 = body in lateral view

bearing notogastral setae. Fourteen pairs of fine, filiform notogastral setae present, five pairs of them originating in posteromarginal position (Fig. 17).

Coxisternal region: Apodemes well chitinized, but epimeral borders only partly observable. A wide, median hollow present narrowing posteriorly (Fig. 18). Epimeral setal formula: 3—1—2—4, because setae *3a* arising very near to setae *4a*, all setae fine, mostly short.

Anogenital region: Surface divided by laths and elevations (Fig. 18). Genital aperture originating near to the anal one. The surface of the preceding one is smooth, but latter well foveolate. Anal plate with a long spine posteriorly. Anogenital setal formula: 4—1—2—3. Setae ad_1 and ad_2 in postanal, setae ad_3 in preanal position. Lyrifissures *iad* opening in paraanal position, far from the anal aperture.

Legs: Femur of all legs rarely foveolate. Setae *u* on all tarsi widened basally, with a long, narrowed distal end.

Type material — Holotype (1317-HO-88): Kenya 2; deposided in the HNHM.

Remarks: The new species is well ranged to the genus *Diplobodes* Aoki, 1958; it is the second species besides the type-species. The new species is simultaneously a good support in the separation of this genus from the related genera (e.g. *Gibbicepheus* Balogh, 1958 and/or *Gibbibodes* Mahunka, 1986). It is distinguished from the type-species: *D. kanekoi* Aoki, 1958, by the phylliform lamellar setae (simple in *kanekoi*), the separate notogastral elevations (they are connected with each other composing longitudinal crests in *kanekoi*).

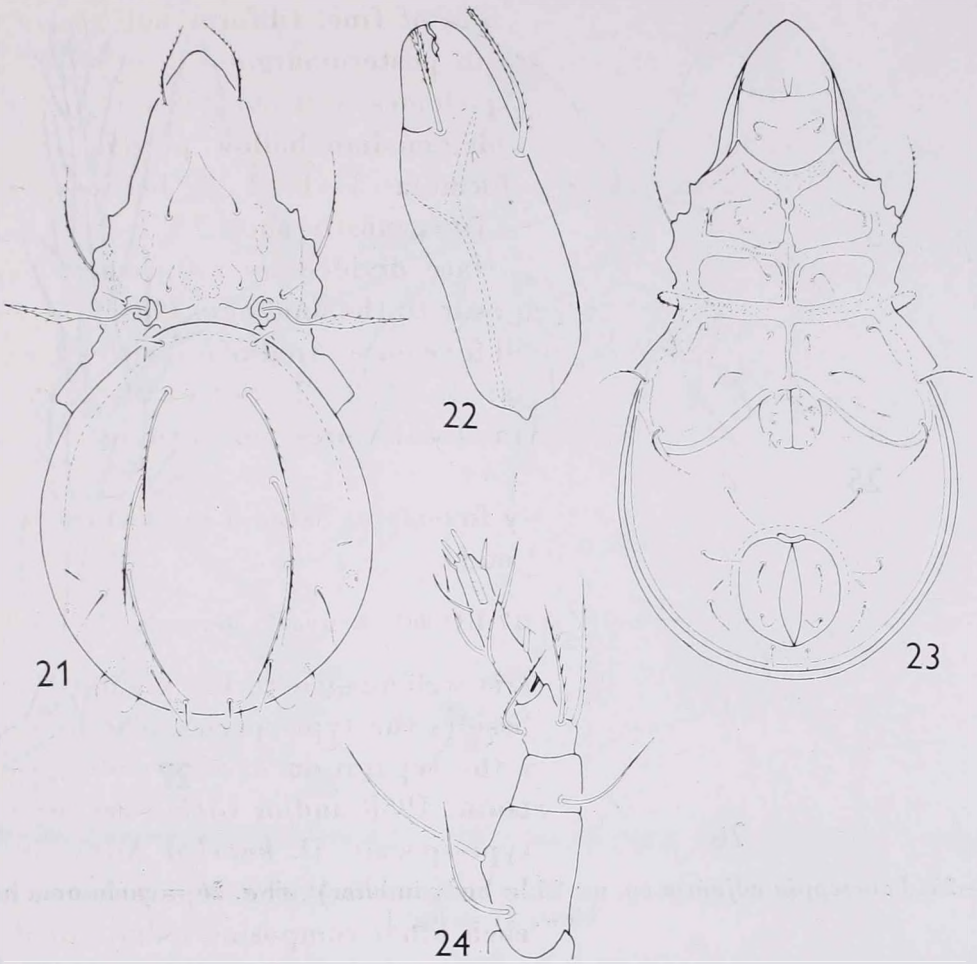
I dedicate the new species to Dr. J. Aoki (Japan) the renown acarologist and soil zoologist.

Lanceoppia adjuncta sp. n.
(Figs 21—27)

Measurements — Length: 469—500 μm, width: 240—281 μm.

Prodorsum: Rostrum elongated, conical; rostral setae arising laterally. Prodorsal surface undulating medially, and slightly higher than the other part, it is well observable in lateral view (Fig. 26). Ratio of the prodorsal setae *le* ≅ *ro* (46 μm) > *ex* > *in*, all setae finely pilose. Sensillus very long (145 μm), finely spiculate. Exobothridial region coarsely granulated, it is conspicuously observable in the acetabulum of leg I. Granules visible also in front of the legs I. Surface along the lateral margin of rostrum (Fig. 25) finely punctate.

Notogaster: High in lateral view. Ten pairs of notogastral setae of various length present, setae c_2 the shortest, setae *1a*, *1m* and *1p* arranged



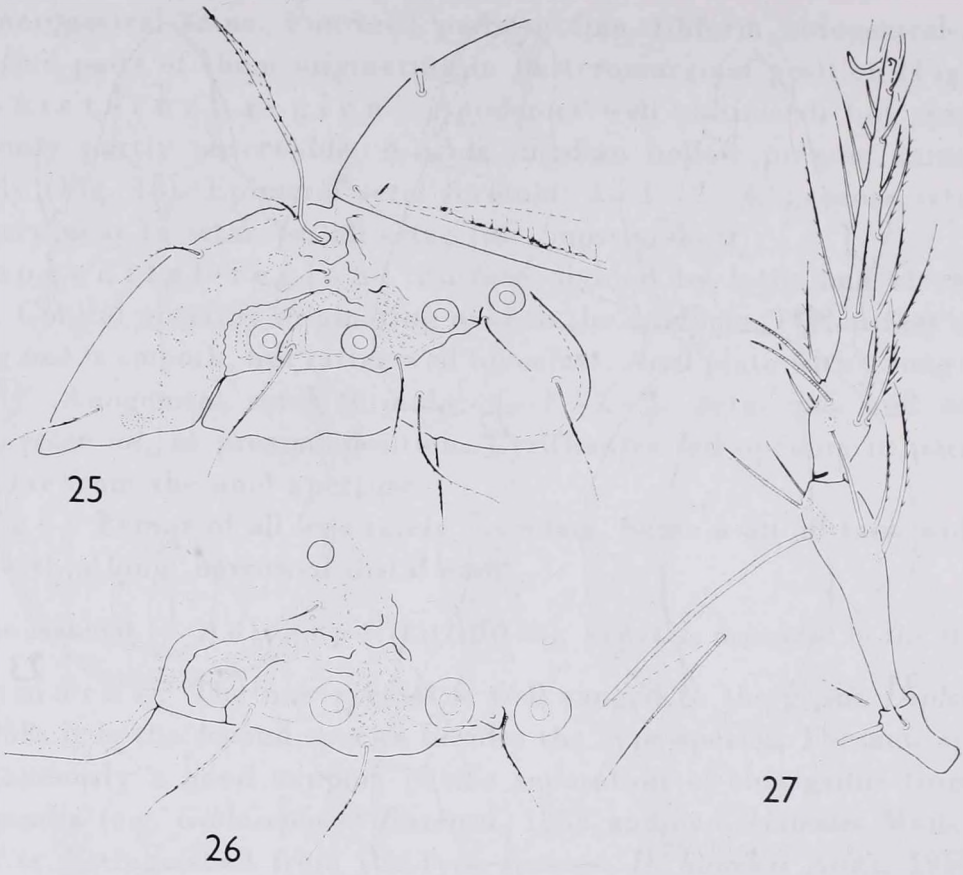
Figs 21—24. *Lanceoppia adjuncta* sp. n.: 21 = dorsal view, 22 = chelicera, 23 = ventra view, 24 = palp

nearly in a longitudinal row, all three pairs very long, almost four times longer than h_3; setae $p_1 - p_3$ very short, much shorter than h_3 (Fig. 21).

Lateral part of podosoma: Pedotecta 1 small, setae *1c* arising on its median surface. Sejugal surface between legs II—III conspicuously granulate. Discidium well developed, its posterior and triangulate (Fig. 26).

Coxisternal region: All apodemes and borders — with the exception of *bo. 3* and *ap. 3* — well developed composing a continuous network. Epimeral setae conspicuously long and ciliate, setae *1c* arising far laterally and they are the longest of all. Setae *2a*, *3a* and *4a* originating on small tubercles (Fig. 23).

Anogenital region: Anogenital setal formula: 6—1—2—3. Ratio some of these setae: $ad_1 < ad_2 < ad_3 < ag$; $an_1 < an_2$. Lyrifissures *iad* in apoanal position.



Figs 25—27. *Lanceoppia adjuncta* sp. n.: 25 = body in lateral view, 26 = podosoma in lateral view, 27 = leg 1

G n a t h o s o m a : Tarsus of palp very long. ω solenidium shorter than half the length of tarsus (Fig. 24). Setal formula: 2—1—3—10 (?). Both setae on chelicera (Fig. 22) dilated distally, well ciliate.

L e g s : All joints of legs very long and thin. Solenidia on tarsus I (Fig. 27) nearly equal in length, ω_1 only hardly thicker than ω_2.

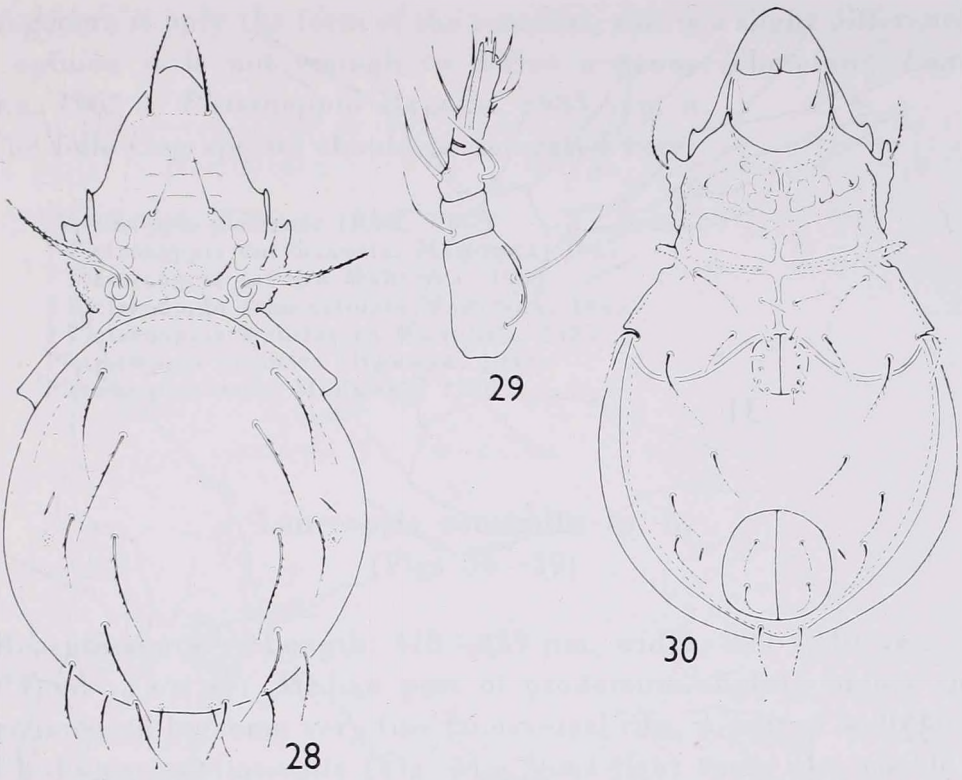
Type material — H o l o t y p e : Kz. 178. Tasmania. 11 p a r a t y p e s from the same sample. — Holotype and 5 paratypes deposited in the TMP, 5 paratypes (1318-PO-88) in the HNHM and 1 paratypes in the MHNG.

R e m a r k s : The new species is well characterized by the three pairs of very long notogastral seta. On this basis, it stands nearest to *Lanceoppia hexapili* HAMMER, 1962, however, it is distinguished from the new species by the form of the sensillus and the ratio of the other setae of notogaster.

Lanceoppia tasmanica sp. n.
(Figs 28—33)

Measurements — Length: 324—367 μm, width: 172—206 μm.

P r o d o r s u m : Rostrum simply rounded, rostral setae arising laterally, far from each other. Prodorsal surface irregular, sculptured by trans-



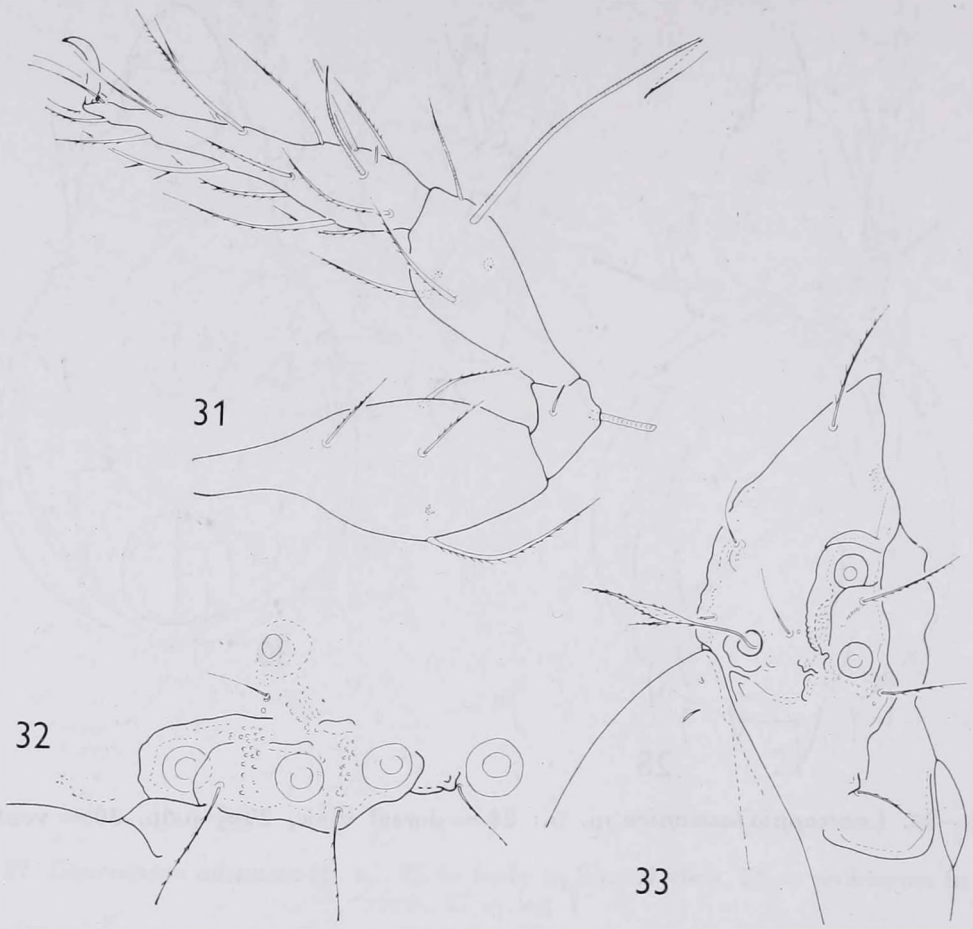
Figs 28—30. *Lanceoppia tasmanica* sp. n.: 28 = dorsal view, 29 = palp, 30 = ventral view

versal rugae or fossae, which are well observable in lateral view (Fig. 33). A weak and short costula sometimes also visible. Bothridia large, each has a large posterior lobe, which are opposed with other tubercles in the dorsosejugal region (Fig. 28). Two pairs of weak interbothridial spots present. Prodorsal setae belong to different types, setae *le* thin, fine, filiform, setae *in* much stronger than these, erect and well ciliate. Ratio among them: *ro* > *in* > *le* > > *ex*. Sensillus large, basally lanceolate, rarely spiculate, with a long, gradually narrowed distal part. Exobothridial region granulate, some larger tubercles also present.

Notogaster: Notogaster circular. The pairs of notogastral setae present c_2 minute. Setae *1a*, *1m*, h_2 and h_3 longer than the others, setae *1p* nearly as long as p_1. All setae ciliate.

Coxisternal region: Epimeres well framed, sejugal border wide, *bo. 4* strongly arched posteriorly. Discidium long, its posterior end forming a triangular apex. At the insertion of setae *3c* the lateral border strongly dilated (Fig. 30). Epimeral setae mostly long and ciliate, ratio among some setae: *1c* > *4b* > *3c* > *4c* > *3b*. The longest cilia visible on setae *4b*.

Anogenital region: Genital plates narrow, genital setae arising nearly along a bent longitudinal line (Fig. 30). Anogenital setal formula: 6—1—2—3. Adanal setae nearly equal in length, setae ad_2 arising



Figs 31—33. *Lanceoppia africana* sp. n.: 31 = leg 1, 32 = podosoma in lateral view, 33 = body in lateral view

conspicuously anteriorly, very far from ad_1, and near to the apoanal lyrifissures *iad*. All setae in this region ciliate.

Gnathosoma: Setal formula palp (Fig. 29): 2—1—3—10 (?). ω very long, nearly as long as tarsus.

Legs: All legs long, their joints also elongated (e.g. Fig. 31 of leg I). Solenidium ω_2 of tarsus I not shorter than the thicker ω_1.

Type material — Holotype: Kz. 178. Tasmania. 8 paratypes: from the same sample. — Holotype and 3 paratypes deposited in the TMP, 4 paratypes (1319-PO-88) in the HNHM and 1 paratype in the MHNG.

Remarks: The new species belongs to the genus *Lanceoppia* HAMMER, 1962. The species of this genus known only in the south areas of the world: New Zealand, South Australia, Chile and now South Africa, however, the species, which were described earlier as *Pletzenoppia* BALOGH, 1983 also belong in this genus. The genus *Pletzenoppia* was based as the type of *Oppia pletzenae* KOK, 1967. But BALOGH erroneously wrote in the original description of the genus that pori *iad* in adanal position. The other difference between

the two genera is only the form of the sensillus, this is a slight difference, thus, in my opinion it is not enough to define a genus. Therefore, *Lanceoppia* HAMMER, 1962 = *Pletzenoppia* BALOGH, 1983 syn. n.

The following species should be relegated here:

Pletzenoppia pletzenae (KOK, 1967)
? Pletzenoppia curviclavata, MAHUNKA, 1985
? Pletzenoppia rattura MAHUNKA, 1985
? Pletzenoppia semicostulata MAHUNKA, 1985
? Pletzenoppia translucens MAHUNKA, 1985
Pletzenoppia inclinata (HAMMER, 1962)
Pletzenoppia aseta MAHUNKA, 1986

Lanceoppia consimilis sp. n.
(Figs 34—39)

Measurements — Length: 418—439 μm, width: 229—240 μm.

P r o d o r s u m : Median part of prodorsum slightly higher than the rest, ornamented by some very fine transversal ribs. A pair of well-developed, arched laths present laterally (Fig. 34). Some light spots also visible on the lateral region. Ratio of prodorsal setae: $ro > le > in \cong ex$ (Fig. 39). Sensillus very long, its distal end lanceolate. Its surface finely spiculate. Exobothridial region granulate.

N o t o g a s t e r : Ten pairs of notogastral setae present, setae c_2 short and fine, setae *1a*, *1m*, *1p* and r_2 longer than the others.

L a t e r a l p a r t o f p o d o s o m a : A strong lateral lath runs from the acetabulum of leg III to bothridium (Fig. 37). The whole surface between legs I—III granulated.

G n a t h o s o m a : Solenidium ω of palp short, shorter than half the length of tarsus (Fig. 35).

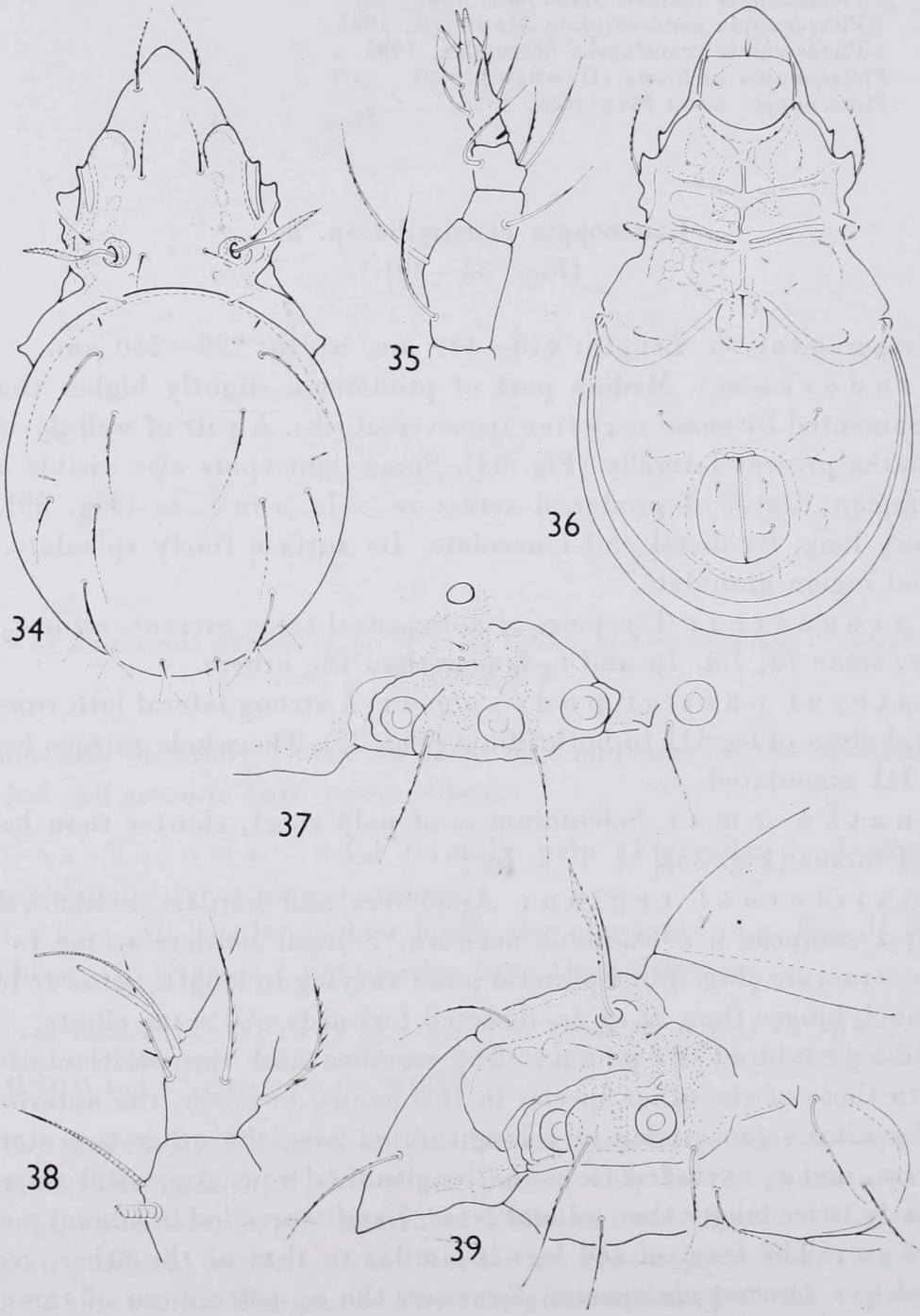
C o x i s t e r n a l r e g i o n : Apodemes and borders well developed, the latters compose a continuous network. Sejugal borders seems to be of a double structure (Fig. 36). Epimeral setae varying in length, setae *1c* longest of all, much longer than *3c* or *4c*, directed forwards. All setae ciliate.

A n o g e n i t a l r e g i o n : The number and the position of setae similar to those of the other species in this genus, however, the anterior four pairs of genital setae arising in a longitudinal row, the other two stand far from these, and g_5 excluded from the longitudinal row. Aggenital setae very long, nearly twice longer than adanal setae. Lyrifissures *iad* in adanal position.

L e g s : The form of the legs is similar to that of the other, recently described two *Lanceoppia* species, however, the ω_2 solenidium of tarsus 1 is much longer than ω_1, ε arising behind them (Fig. 38). Two ventral setae on tarsus IV dilated and penicillate.

Type material — Holotype: Kz. 178. Tasmania. 3 paratypes: from the same sample. — Holotype and 1 paratype deposited in the TMP, 1 paratype (1320-PO-88) in the HNHM and 1 paratype in the MHNG.

Remarks: The recently described five new *Lanceoppia* species are well distinguished from one another. *Lanceoppia tasmanica* is much smaller than the other two. Sensilli also rather different. *Lanceoppia adjuncta* sp. n.



Figs 34—39. *Lanceoppia consimilis* sp. n.: 34 = dorsal view, 35 = palp, 36 = ventral view, 37 = podosoma in lateral view, 38 = basal part of tarsus 1, 39 = body in lateral view

differs from both other by the smooth, non-granulated area between legs I and II. They are clearly distinguished also from one another by the ratio of the dorsal and ventral setae.

All three species resemble one another by some very characteristic features, which probably will be important for the diagnosis of the genus: e.g. sculpture of the prodorsum: foveolate lateromarginally but granulate basally; position of setae *1c*, form of the epimeral borders, first of all *bo. 4;* position of the adanal setae and the lyrifissures.

Lanceoppia pertineata sp. n.
(Figs 40—45)

Measurements — Length: 632—715 μm, width: 357—400 μm.

P r o d o r s u m : Rostral apex elongated, beak-shaped in lateral view (Fig. 44), nasiform in dorsal view. Lateral margin of rostrum foveolate or punctulate at the basis of rostral setae. Median part of prodorsum scarcely higher than the other part, some light spots present medially and laterally. Ratio of prodorsal setae: *ro* > *le* > *in* > *ex* (Fig. 44). Rostral and lamellar setae distinctly barbed. Bothridium without a posterior lobus. Exobothridial region distinctly and coarsely granulated.

N o t o g a s t e r : Anterior part very broad. Setae *ta* and lyrifissures *ia* originating far from each other. Ten pairs of notogastral setae present, setae *ta* fine and short, but all setae thin, filiform. Setae h_1 shorter than p_1 (Fig. 40).

Podosoma in lateral view: Setae *1c* longer than *3c* and *4c*, arising on pedotecta 1. Pedotecta 1 narrow. Anterior border of acetabulum line waved. A strong lath runs from the acetabulum of leg III to bothridium. This whole anterior surface — with the exception of a small field between the first and second legs — well granulate.

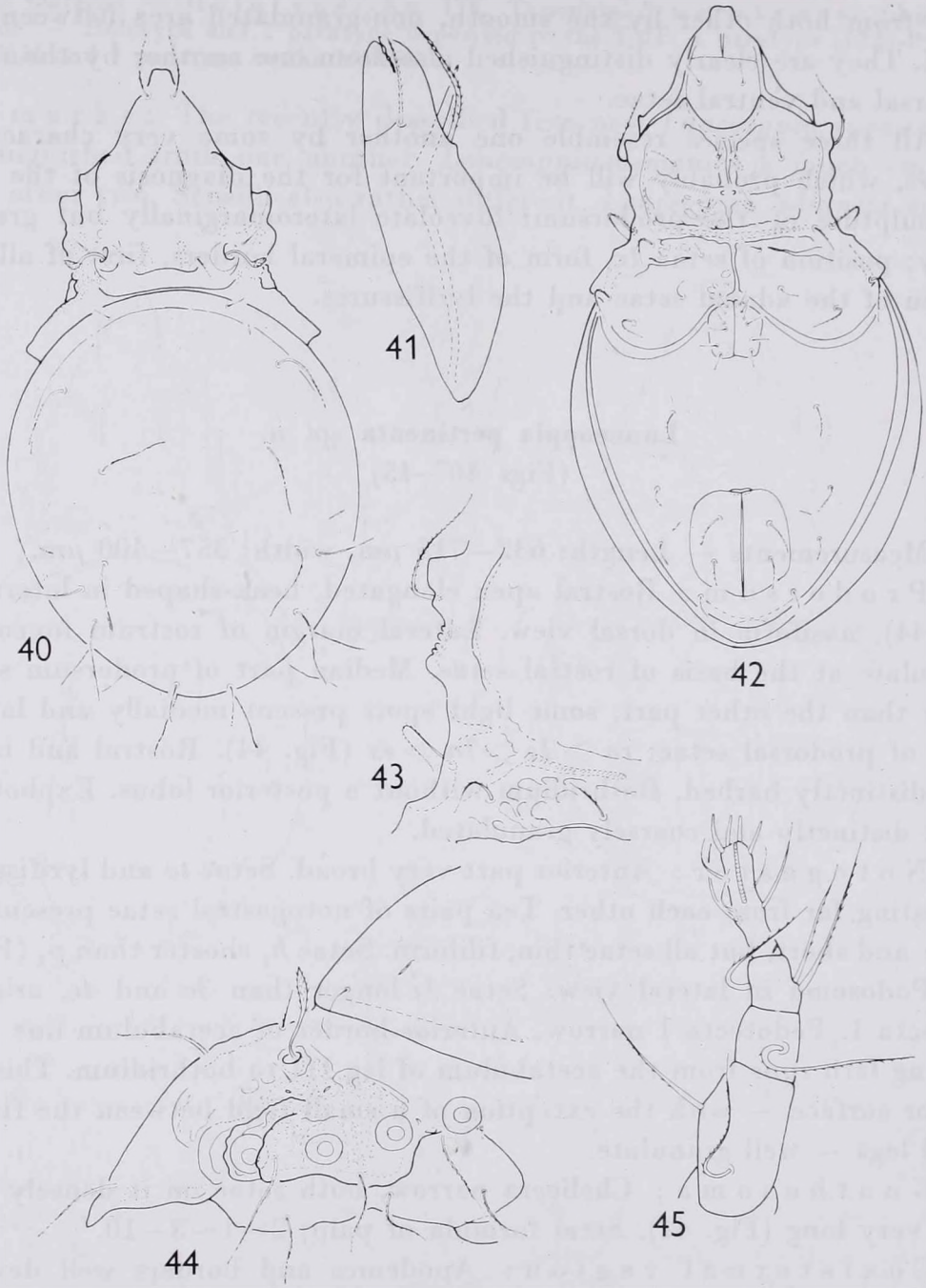
G n a t h o s o m a : Chelicera narrow, both setae on it densely ciliate. Spine very long (Fig. 41). Setal formula of palp: 2—1—3—10.

C o x i s t e r n a l r e g i o n : Apodemes and borders well developed (Fig. 42) a short *bo.* 3 also observable (Fig. 43), sternal ones wide. Epimeral surface partly ornamented by irregular spots. Epimeral setae comparatively short, but all well visibly ciliate.

A n o g e n i t a l r e g i o n : Both pairs of anal setae longer and thicker than the aggenital or adanal ones. Setae ad_1 stand comparatively far from each other.

L e g s : Solenidium ω_2 longer than ω_1. ε originating behind them.

Type material — H o l o t y p e : Kz.! 178. Tasmania. 13 p a r a t y p e s from the same sample. — Holotype and 6 paratypes deposited in the TMP, 6 paratypes (1321-PO-88) in the HNHM and 1 paratype in the MHNG.



Figs 40—45. *Lanceoppia pertineata* sp. n.: 40 = dorsal view, 41 = chelicera, 42 = ventral view, 43 = sejugal region, 44 = podosoma in lateral view, 45 = palp

Remarks: The new species belongs to a species-group characterizable by a comparatively short sensillus and short notogastral setae. It stands nearest to *L. aseta* (MAHUNKA, 1986) and *L. curviclavata* (MAHUNKA, 1985). The latter is distinguished from both by the position of setae *1a* and *1m*, *aseta* is distinguished from the other two by the lack of the interlamellar setae, while the new species from the two earlier species by the form of its rostral apex.

Lanceoppia tortile sp. n.
(Figs 46—51)

Measurements — Length: 742—825 μm, width: 433—472 μm.

P r o d o r s u m : Rostrum wide, conical. On the median part of prodorsum some weak rugae or furrows observable. An arched lath on each side visible laterally. Ratio of prodorsal setae: *le* > *ro* > *in* > *ex*. Rostral and lamellar setae well ciliate. Sensillus very short, lanceolate distally, its surface covered by small spicules. Exobothridial region densely granulate, granules missing in front of the anterior margin of acetatebulum 1. A longitudinal field punctulate along the insertion of rostral setae. Some light spots laterally and one pair of spots in the interbothridial region present.

N o t o g a s t e r : Very wide (Fig. 46). Setae c_2 absent, represented only by their alveoli. Notogastral setae varying in length (a moderate individual difference also observable), setae *la*, *lm* and *lp* longer than r_2 and r_3. Setae r_1 and p_{1-3} much shorter than the preceding ones. All setae sparsely ciliate.

Lateral part of podosoma: Pedotecta 1 small, setae *lc* arising on their basis. Discidium large, its posterior outer corner triangulate. Surface between legs I and II, or II and III granulate. An arched lath running from leg III in the direction of the bothridium (Fig. 50).

G n a t h o s o m a : Both setae of chelicera densely barbed, setae *chb* dilated distally (Fig. 47). Palp (Fig. 49) with conspicuously ciliate, strong, setae; the setal formula: 2—1—3—10.

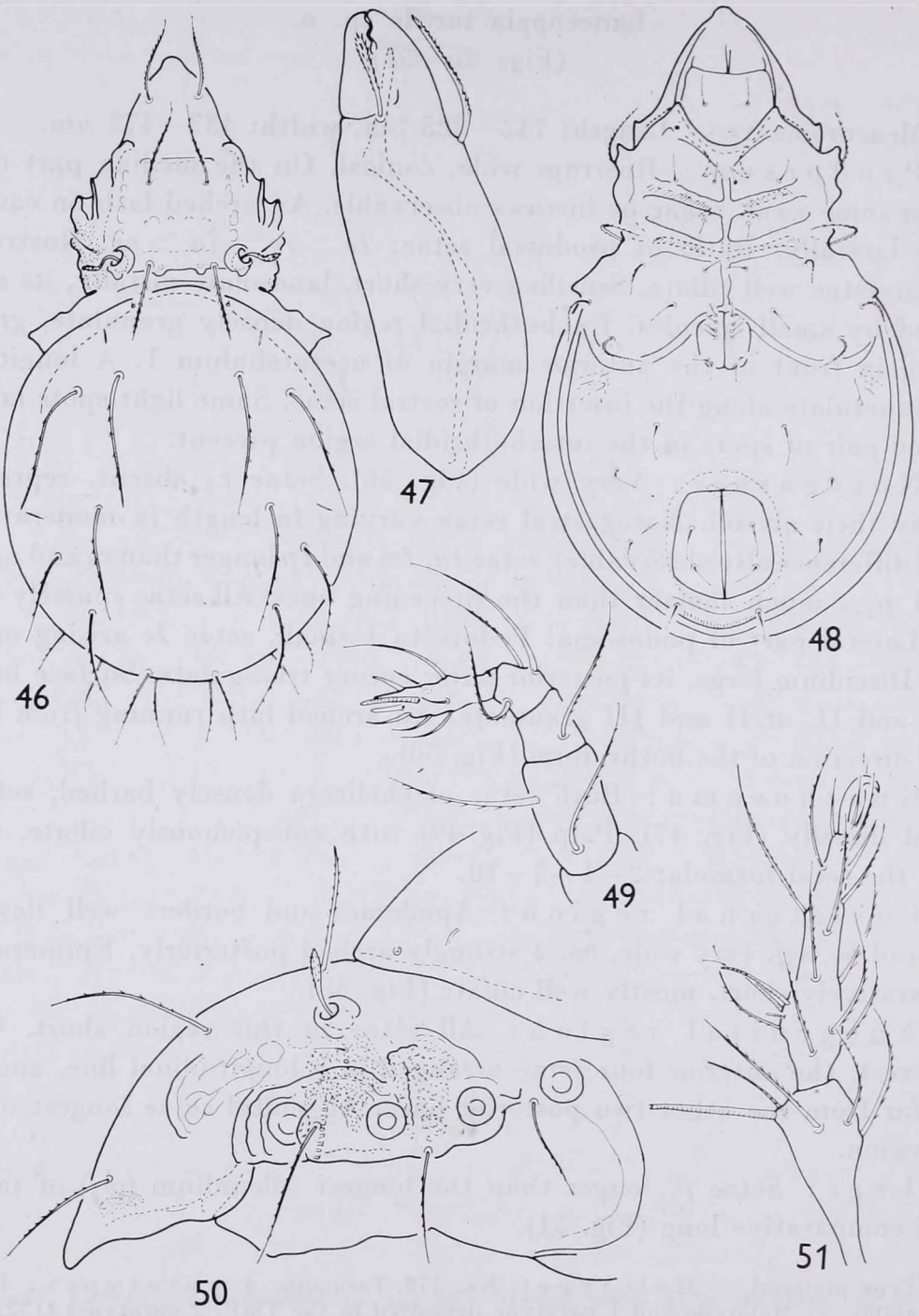
C o x i s t e r n a l r e g i o n : Apodemes and borders well developed *bo. 2* and *bo. sej.* very wide, *bo. 4* strongly arched posteriorly. Epimeral setae comparatively short, mostly well ciliate (Fig. 48).

A n o g e n i t a l r e g i o n : All setae in this region short. Genital ones erect, the anterior four setae arranged in a longitudinal line, and stand very far from the other two posterior ones. Aggenital setae longest of all in this region.

L e g s : Setae *ft'* longer than the longest solenidium (ω_2) of tarsus I, ε also comparative long (Fig. 51).

Type material — H o l o t y p e : Kz. 178. Tasmania. 4 p a r a t y p e s : from the same sample. — Holotype and 1 paratype deposited in the TMP, 2 paratypes (1322-PO-88) in the HNHM and 1 paratype in the MHNG.

R e m a r k s : The new species belongs to the same species-group as the preceding species. It is well characterized by the very small and finely spiculate sensillus, the measurements of the body and the ratio of the prodorsal and notogastral setae. It stands nearest to *L. pletzenae* (Kok, 1967), however, the sensillus of the latter has longer cilia, one pair of tubercles is visible in the interlamellar region and the notogastral setae are much longer than in the new species.

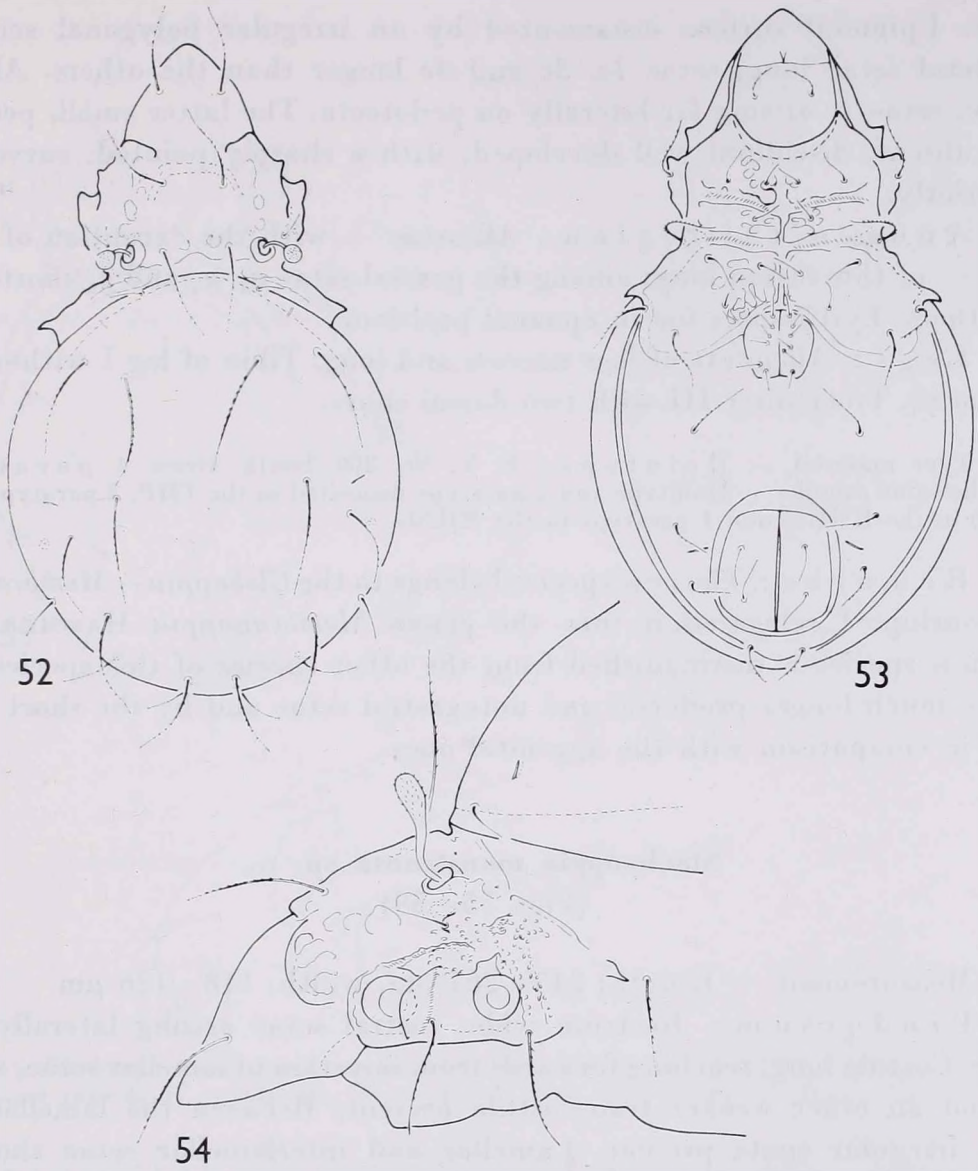


Figs 46—51. *Lanceoppia tortile* sp. n.: 46 = dorsal view, 47 = chelicera, 48 = ventral view, 49 = palp, 50 = body in lateral view, 51 = leg 1

Membranoppia globifera sp. n.
(Figs 52—54)

Measurements — Length: 393—435 μm,-width: 236—260 μm.

P r o d o r s u m : Rostrum rounded, rostral setae arising laterally. All prodorsal setae thin, long, their ratio: *in* > *le* ≅ *ro* > *ex*. All finely ciliate.



Figs 52—54. *Membranoppia globifera* sp. n.: 52 = dorsal view, 53 = ventral view, 54 = body in lateral view

Prodorsal surface with costulae, laterally arched laths also present. Transcostula sometimes weaker than the latter (Fig. 52). Some irregular alveoli or spots also present in the interbothridial and lamellar region. Sensillus short, clavate (Fig. 53), its head with short spines. Exobothridial region pustulate, well chitinized.

N o t o g a s t e r : Ten pairs, comparatively long notogastral setae present, anterior setae much longer (Fig. 52) than posterior ones. Setae c_2 and $p_1 - p_3$ the shortest of all. Setae *1a* and *1m* originating nearly in a transversal line. All setae finely ciliate.

C o x i s t e r n a l r e g i o n : All epimeral borders well developed composing an unbrokened framework (Fig. 54), border 5 well arched poste-

riorly. Epimeral surface ornamented by an irregular polygonal sculpture. Epimeral setae long, setae *1c*, *3c* and *4c* longer than the others. All setae ciliate, setae *1c* arising far laterally on pedotecta. The latter small, pedotecta 2—3 absent, discidium well developed, with a sharply pointed, curved spur posteriorly.

Anogenital region: All setae — with the exception of adanal setae — of this region long; among the genital setae g_3, g_4 and g_5 shorter than the others. Lyrifissures *iad* in apoanal position.

Legs: All joints of legs narrow and long. Tibia of leg I without solenidium φ_1. Trochanter III with two dorsal spurs.

Type material — Holotype: E. Y. No. 200. South Africa. 4 paratypes: from the same sample. — Holotype and 1 paratype deposited in the TMP, 2 paratypes (1323-PO-88) in the HNHM and 1 paratype in the MHNG.

Remarks: The new species belongs to the *Globoppia—Membranoppia* relationship. I relegated it into the genus *Membranoppia* HAMMER, 1966. The new species is distinguished from the other species of this species-group by the much longer prodorsal and notogastral setae and by the short adanal setae in comparison with the aggenital ones.

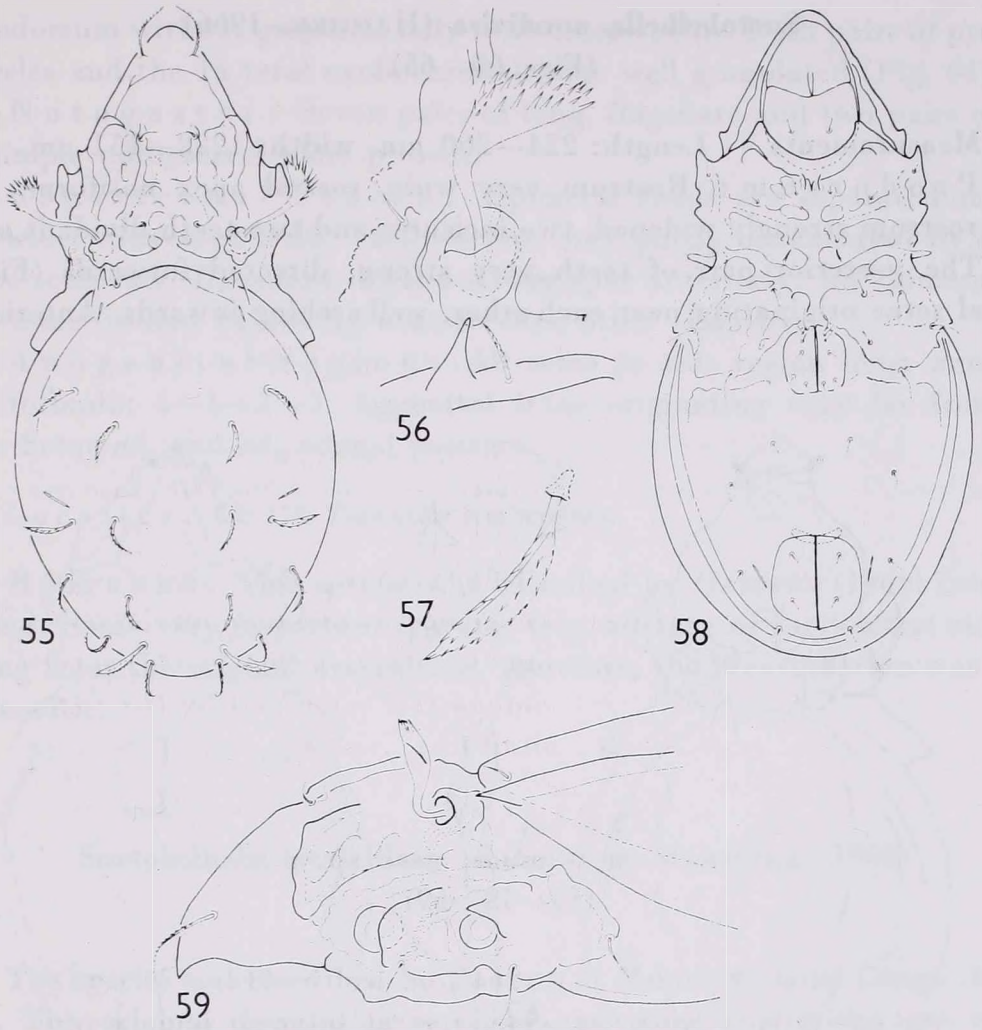
Stachyoppia monstruosa sp. n.
(Figs 55—59)

Measurement — Length: 245—264 μm, width: 118—126 μm.

Prodorsum: Rostrum wide, rostral setae arising laterally, long, ciliate. Costula long, reaching forwards from insertion of lamellar setae, a stronger and an other weaker transcostula present. Between the lamellae some large, irregular spots present. Lamellar and interlamellar setae short but thick, blunt at tip. A lateral strong chitinous lath also present on both sides, each bending inwards (Fig. 56). Sensillus long, its head clavate with long spines, arranged in three longitudinal rows (Fig. 55). Exobothridial setae minute, setiform. Lateral part of prodorsum pustulate, with some strong laths or tubercles. Bothridium with a strong, posterior tubercle.

Notogaster: Lateral teeth of dorsosejugal region sharply pointed, setae c_2 nearly as long as this one. Ten pairs of notogastral setae present, six pairs of them phylliform (Fig. 57), four pairs (c_2, $p_1 - p_3$) bacilliform; all well ciliate.

Coxisternal region: Apodemes thin, but the epimeral borders well developed. This region strongly chitinized. Sejugal borders broadening laterally and framing an elliptical field (Fig. 58). Epimeral surface ornamented also by a polygonal reticulation. Epimeral setae short, simple, setae *3c* longer than the margin of pedotecta 1. Discidium large, without sharp posterolateral spur.



Figs 55—59. *Stachyoppia monstruosa* sp. n.: 55 = dorsal view, 56 = lateral part of the dorsosejugal region, 57 = seta lm, 58 = ventral view, 59 = body in lateral view

A n o g e n i t a l r e g i o n : Six pairs of genital setae, the anterior first pair much longer and stronger than the others. Aggenital setae also short and simple, ad_3 in preanal position. They stand farther from each other than the aggenital ones. Lyrifissures *iad* in apoanal position.

L e g s : Solenidium φ_1 and φ_2 on leg I, and φ_1 on leg II arising on strong tubercles.

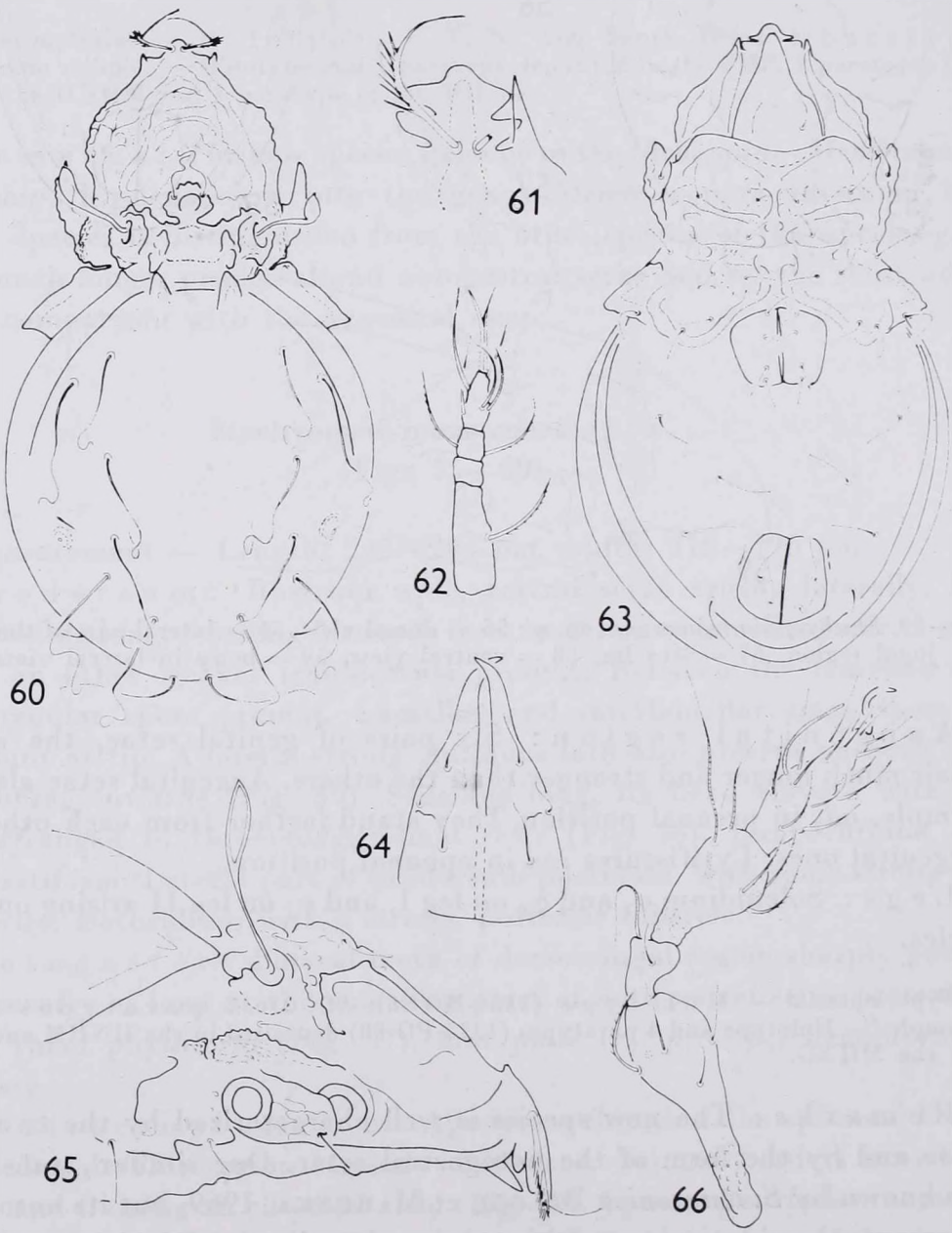
Type material — H o l o t y p e (1324-HO-88): Afr. 216. 5 p a r a t y p e s from the same sample. — Holotype and 4 paratypes (1324-PO-88) deposited in the HNHM and 1 paratype in the MHNG.

R e m a r k s : The new species is well characterized by the two translamellae and by the form of the notogastral setae. One similar translamella type is known by *S. amazonica* Balogh et Mahunka, 1969, but its notogastral setae are much wider an unambiguous prelamellae visible in front of the lamellae.

Suctobelbella nondivisa (HAMMER, 1966)
(Figs 60—65)

Measurements — Length: 224—260 μm, width: 1222—151 μm.

P r o d o r s u m : Rostrum very wide, rostral apex nasiform, behind them rostrum strongly widened, two incisures and two teeth divide it on each side. The posterior pair of teeth very strong, directed forwards (Fig. 61). Rostral setae originating near each other, well arching inwards. Anterior part



Figs 60—66. *Suctobelbella nondivisa* (HAMMER, 1966): 60 = dorsal view, 61 = rostrum, 62 = palp, 63 = ventral view, 64 = body in lateral view, 65 = mentum, 66 = leg 1

of prodorsum without granules, only some lines visible. Both pairs of prodorsal tubercles and the 1a teral exobothridial ridge well granulated (Fig. 64).

N o t o g a s t e r : Seven pairs of long, flagellate and two pairs of shorter, simple notogastral hairs present.

C o x i s t e r n a l r e g i o n : Epimeral fields are separated medially by a wide, excavated field. Their surface only partly ornamented by a polygonate sculpture. Discidium with a strong spur anteriorly. All epimeral setae long, setae *3a* and *3b* arising near to each other (Fig. 63).

A n o g e n i t a l r e g i o n : All setae in this region long, anogenital setal formula: 4—1—2—3. Aggenital setae originating very far from each other. Setae ad_1 and ad_2 adanal position.

L o c a l i t y : Kz. 178: Tasmania: 4 specimens.

R e m a r k s : This species was described by HAMMER (1966) from New Zealand. Some very important features (e.g. all rata of the ventral side) are missing from the original description, therefore, the identification was rather problematic.

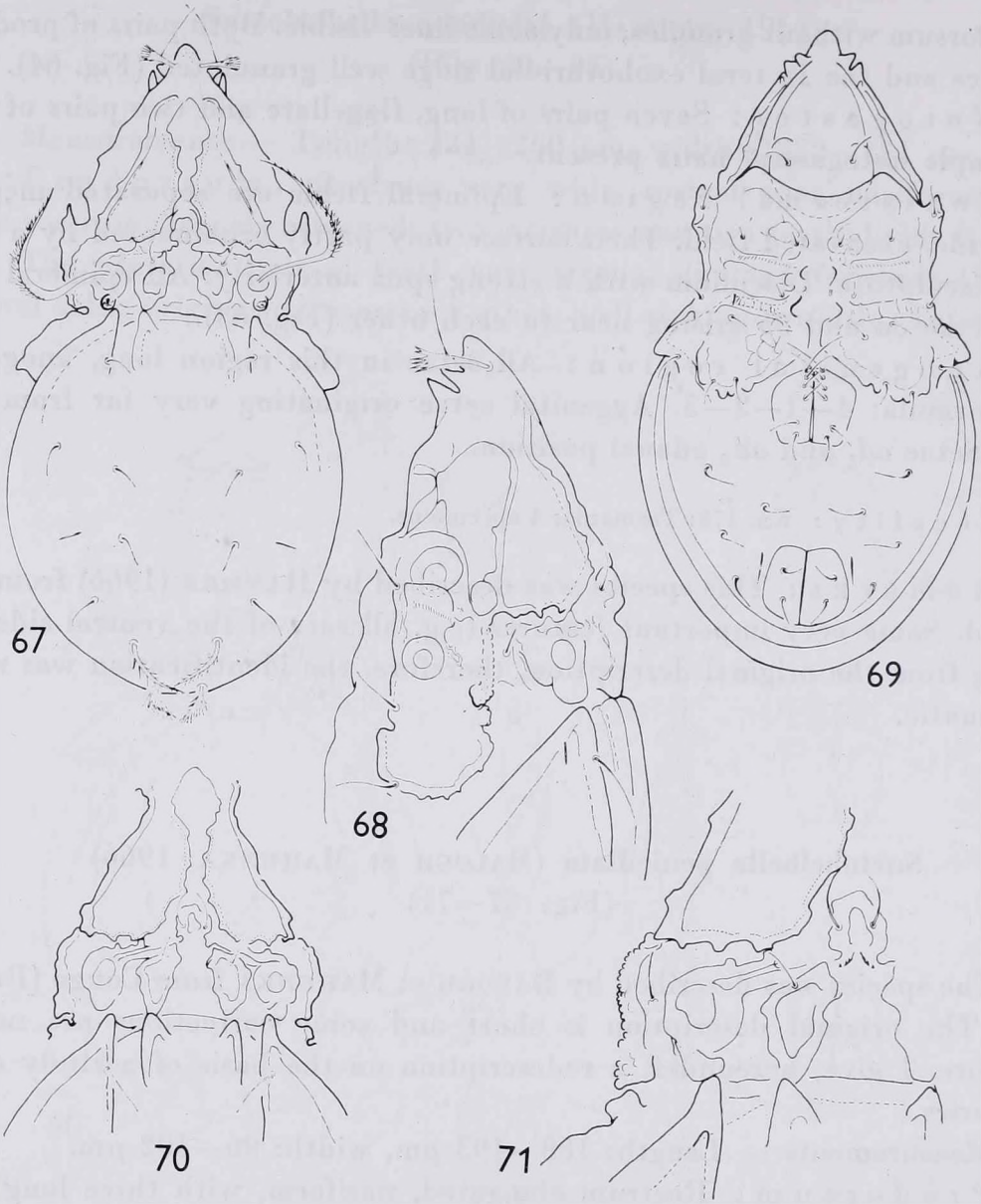
Suctobelbella penicillata (BALOGH et MAHUNKA, 1966)
(Figs 67—71)

The species was described by BALOGH et MAHUNKA from Congo (Brazzaville). The original description is short and some corrections are needed. Therefore, I give, hereunder, a redescription on the basis of a study of the type-series.

Measurements — Length: 188—193 μm, width: 96—102 μm.

P r o d o r s u m : Rostrum elongated, nasiform, with three long teeth on each side, among them the 1st tooth much smaller than the posterior two pairs (Fig. 68). Rostral apex finely granulate. Rostral setae geniculate, their basal part well dilated. Fenestrate spots large, well framed (Fig. 71), opened anteriorly (Fig. 70). Lamellar knob large, without an sharp anterior apex, it is connected with the interbothridial crests by a thin ridge. They are very wide and well framed. Bothridium with a well-developed hind lobe. Lamellar and interlamellar setae fine, short. Sensillus large, its head curved inwards, basally dilated, and strongly narrowed anteriorly. Outer surface covered with spines. Exobothridial region granulate (Fig. 67).

N o t o g a s t e r : Two pairs of large notogastral condyli present, they are not very sharp anteriorly and reaching posteriorly the level of insertion of setae dm. Nine pairs of notogastral setae present, two of them plumose, all the others conspicuously short, simple.



Figs 7—71. *Suctobelbella penicillata* (BALOGH et MAHUNKA, 1966): 67 = dorsal view, 68 = body in lateral view, 69 = ventral view, 70 = prodorsum, 71 = lateral part of prodorsum

G n a t h o s o m a : Chelicera very long, narrow. Setal formula of palpus: 2—0—2—7.

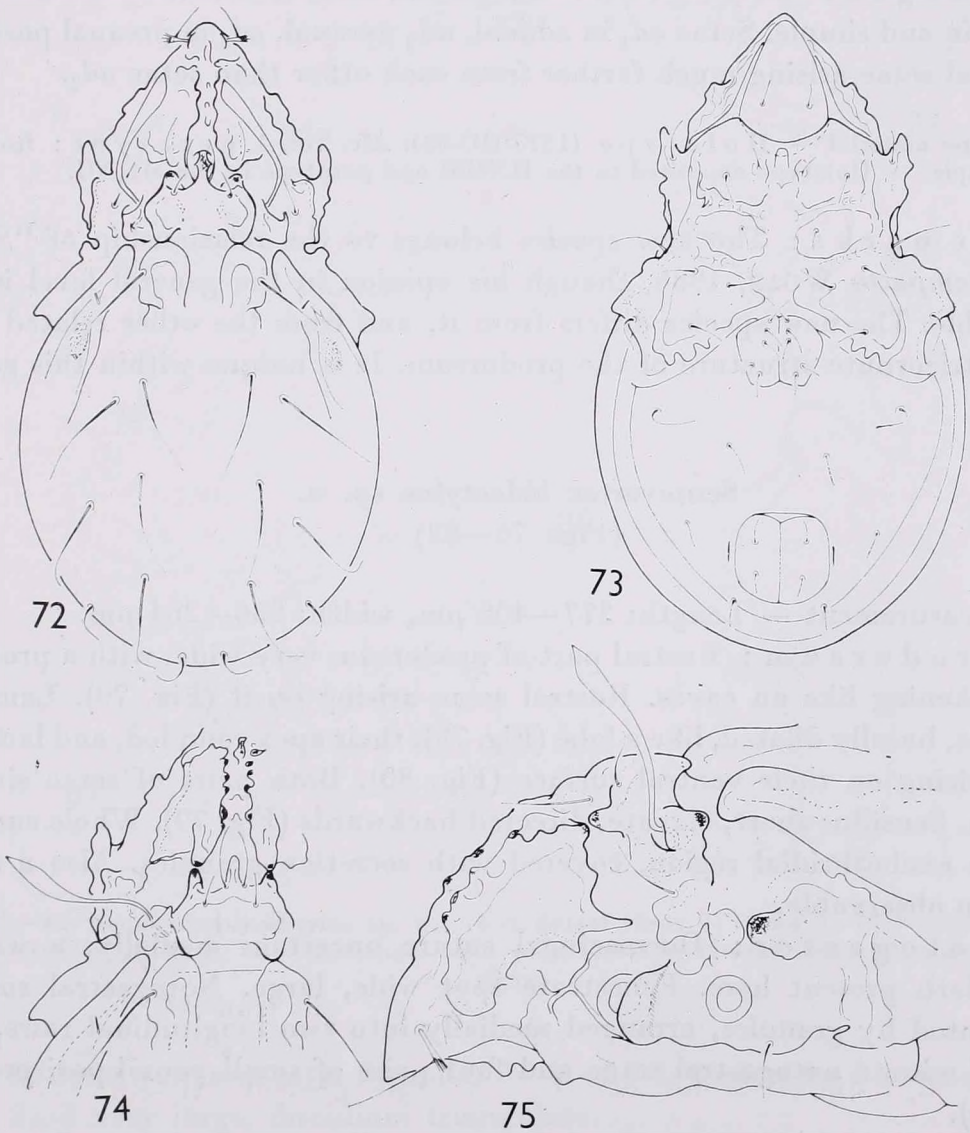
C o x i s t e r n a l r e g i o n : Epimeres well framed, not touching medially. Posterior borders of epimeres 3—4 with some tubercles posteriorly. On the sejugal border some longitudinal ridges present. All epimeral setae short and fine (Fig. 69).

E x a m i n e d m a t e r i a l : Afr. 213: Nigeria: 3. specimens.

Suctobelbella tricornuta sp. n.
(Figs 72—75)

Measurements — Length: 164—188 μm, width: 104—108 μm.

P r o d o r s u m : Rostrum conical, without lateral incisures and teeth. Rostral setae arising laterally, geniculate. Fenestrate spots large, well framed, with large tubercles on their inner margin. Between them also some tubercles present (Fig. 72). Their basal part divided by a strong longitudinal lath, their basal end knob-shaped, which are opposed to the strong tubercles on either side of the lamellar knob. Lamellar knob elongate, this knob as the two tubercles give a threecornute configuration. Interbothridial ridge auricular. Bothridium with a well-developed posterior tubercle. Lamellar setae



Figs 72—75. *Suctobelbella tricornuta* sp. n.: 72 = dorsal view, 73 = ventral view, 74 = lateral part of prodorsum, 75 = body in lateral view

long, interlamellar setae much shorter. Sensillus asymmetrically clavate, its head gradually dilate distally with a short apex. Its surface smooth. Lateral part of prodorsum with some rugae, exobothridial region weakly pustulate (Fig. 75).

Notogaster: Notogastral teeth very large (Fig. 74), connected with each other, median pair more or less blunt anteriorly. Strong borders run backwards from the outer pair. Ten pairs of very long, but simple, thin notogastral setae present, seven anterior pairs much longer than the others.

Coxisternal region: Apodemes and epimeral borders well observable. Posterior border of the region with 3—4 very large tubercles or teeth on each side. On 2nd and sejugal borders some short, longitudinal ridges also present. Epimeral setae long, thin, simple (Fig. 69).

Anogenital region: Anogenital setal formula: 5—1—2—3, all setae thin and simple. Setae ad_1 in adanal, ad_2 paranal, ad_3 in preanal position. Aggenital setae arising much farther from each other than setae ad_3.

Type material — Holotype (1325-HO-88): Afr. 216. 1 paratype: from the same sample. — Holotype deposited in the HNHM and paratype in the MHNG.

Remarks: The new species belongs to the relationship of "*Suctobelba*" *compacta* Woas, 1986, though his opinion in the general level is not acceptable. The new species differs from it, and from the other related taxa by the tricornute structure of the prodorsum. It is unique within this genus.

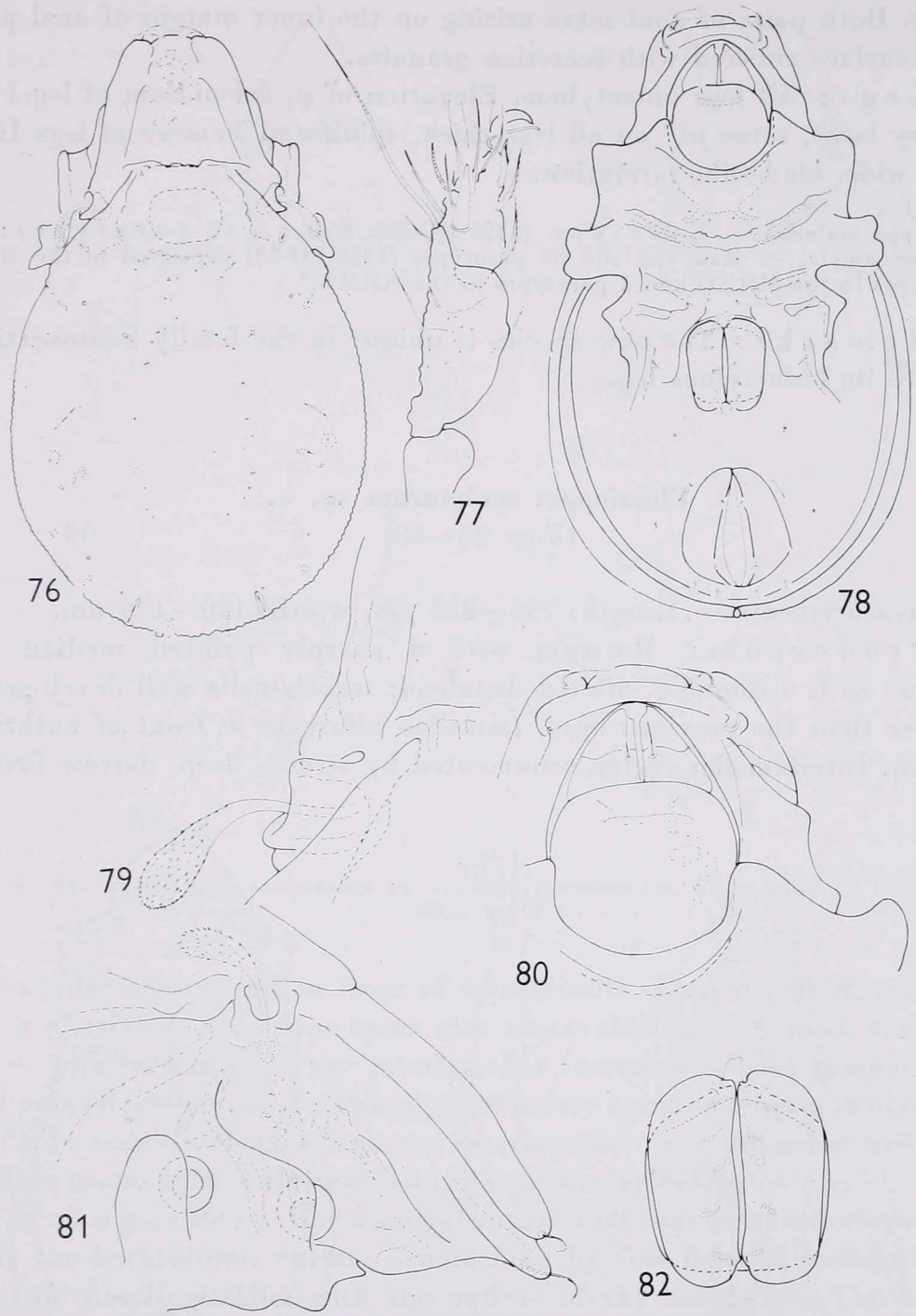
Scutovertex bidactylus sp. n.
(Figs 76—82)

Measurement — Length: 377—405 μm, width: 236—264 μm.

Prodorsum: Rostral part of prodorsum very wide, with a protruding thickening like an eaves. Rostral setae arising on it (Fig. 70). Lamellae also wide, basally dilated, like a lobe (Fig. 79), their apex rounded, and lamellar setae arising on their ventral surface (Fig. 80). Both pairs of setae simple, setiform. Sensillus short, clavate, directed backwards (Fig. 79). Whole surface, also the exobothridial region, covered with secretion granules. Also a short tutorium observable.

Notogaster: Dorsosejugal suture uncertain medially, a waved, strong lath present here. Fenestrate spot wide, large. Notogastral surface ornamented by granules, arranged medially into two longitudinal rows. Ten pairs of minute notogastral setae and four pairs of small, round pori present (Fig. 76).

Coxisternal region: Epimeral borders and apodemes well observable, *ap.* and *bo.* 2 and *sej.* compose two transversal bands. All epimeral



Figs 76—82. *Scutovertex bidactylus* sp. n.: 76 = dorsal view, 77 = leg 1, 78 = ventral view, 79 = trichobothrium, 80 = mentum, 81 = prodorsum in lateral view, 82 = genital plates

setae minute; epimeral setal formula: 3—1—2—2. Pedotecta 1 normal, pedotecta 2—3 very large, discidium triangulate.

Anogenital region: Genital plates (Fig. 82) larger than the genital aperture (Fig. 78). Anogenital setal formula: 6—1—2—3. All setae

minute. Both pairs of anal setae arising on the inner margin of anal plates. Whole surface covered with secretion granules.

L e g s : All legs bidactylous. Elevation of φ_1 solenidium of leg I (Fig. 77) very large, setae *pl*" on all legs thick, spiniform. Femora of legs II—IV with a wide, blade-like formation.

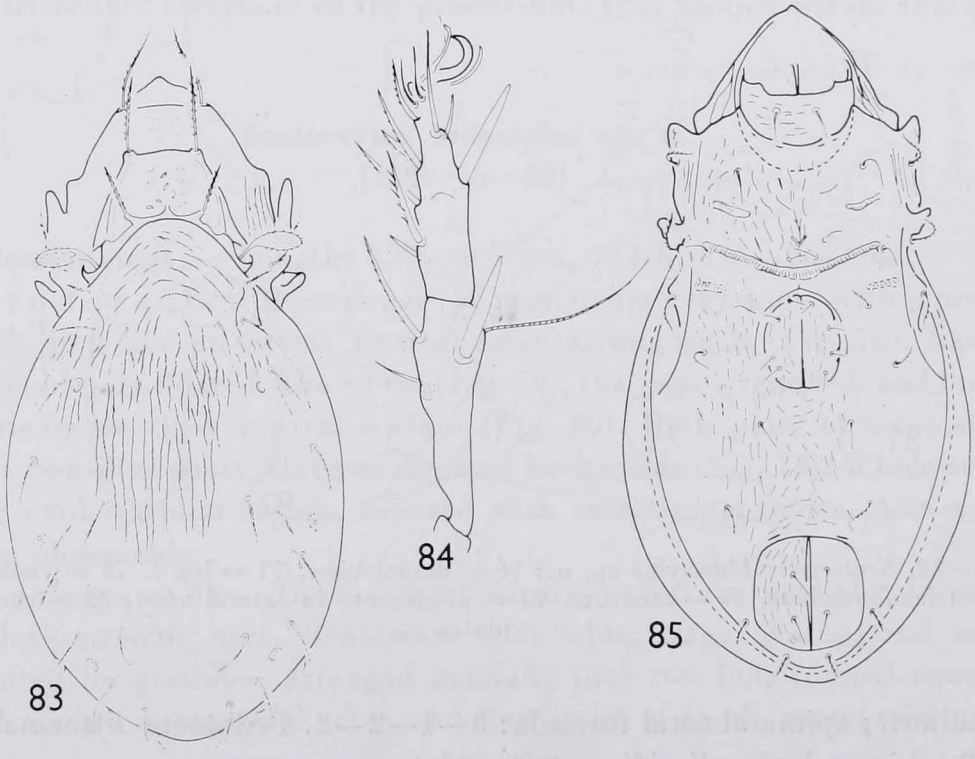
Type material — H o l o t y p e (1326-HO-88): Kenya 3. 60 p a r a t y p e s : from the same sample. — Holotype and 50 paratypes (1326-PO-88) deposited in the HNHM, 5 paratypes in the MHNG and 5 paratypes in the NHMN.*

R e m a r k s : The new species is unique in the family Scutoverticidae owing to its bidactylous legs.

Phauloppia sculpturata sp. n.
(Figs 83—88)

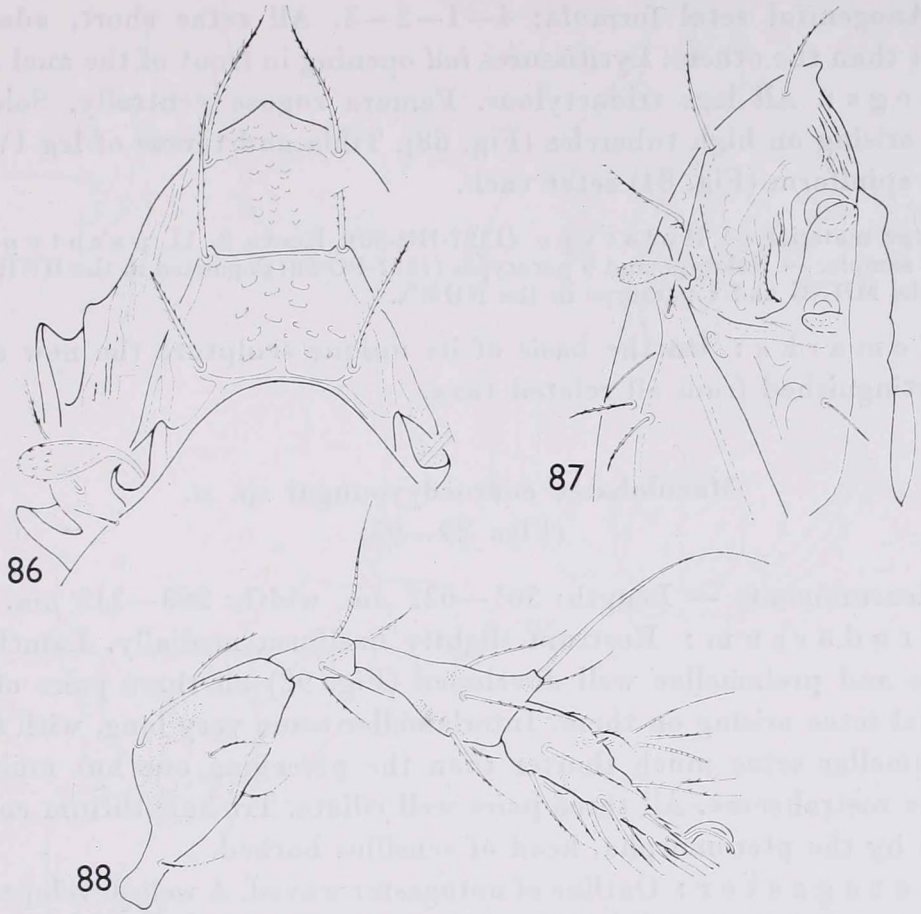
Measurements — Length: 296—332 μm, width: 140—176 μm.

P r o d o r s u m : Rostrum with a sharply pointed median apex. Lamellae with a rounded, dilated distalend; translamella well developed but narrower than the previous ones. Lamellae bifurcate in front of bothridium (Fig. 86). Interlamellar region ornamented by strong, deep, narrow foveolae,



Figs 83—85. *Phauloppia sculpturata* sp. n.: 83 = dorsal view, 84 = leg 1, 85 = ventral view

* Natural History Museum, Nairobi.



Figs 86—88. *Phauloppia sculpturata* sp. n.: 86 = prodorsum, 87 = body in lateral view, 88 = leg 1

some similar ones visible in front of translamella. Lateral part of prodorsum (Fig. 87) striated, some fine spots also observable here. A weak transversal lath — bifurcate near to the interlamellar insertion — also present on the basal part of prodorsum. Prodorsal setae nearly equal in length, exobothridial setae only scarcely shorter than the interlamellar ones. All setae well ciliate. Sensillus short, with a clavate head, its surface spiculate.

N o t o g a s t e r : Dorsosejugal suture well convex anteriorly, reaching before the bothridium. Surface ornamented by fine lines of various lengths, they run mostly parallel with the outline of the notogaster. The lines are shortest near the dorsosejugal region, longest in the median part of notogaster (Fig. 83). Three pairs of areae porosae and fourteen pairs of strong, well-ciliate notogastral setae present.

V e n t r a l s i d e : Whole surface ornamented. Mentum with transversal, other parts of this region with longitudinal, strong, deep scratches (Fig. 85). Surface of the genital and anal plates similar to the other parts. Epimeral setal formula: 3—1—3—3, all setae ciliate. Setae *1c*, *3c* and *4c* longer than the others, setae *3c* arising on tubercles. Discidium comparatively

wide. Anogenital setal formula: 4—1—2—3. All setae short, adanal ones stronger than the others. Lyrifissures *iad* opening in front of the anal aperture.

L e g s : All legs tridactylous. Femora rugose ventrally. Solenidia φ_1 and φ_2 arising on high tubercles (Fig. 88). Tibia and tarsus of leg IV bearing a thick spiniform (Fig. 84) setae each.

Type material — H o l o t y p e (1327-HO-88): Kenya 3. 11 p a r a t y p e s : from the same sample. — Holotype and 9 paratypes (1327-PO-88) deposited in the HNHM, 1 paratype in the MHNG and 1 paratype in the NHMN.

R e m a r k s : On the basis of its unique sculpture the new species is well distinguished from all related taxa.

Maculobates endroedyyoungai sp. n.
(Figs 89—95)

Measurements — Length: 561—622 μm, width: 263—312 μm.

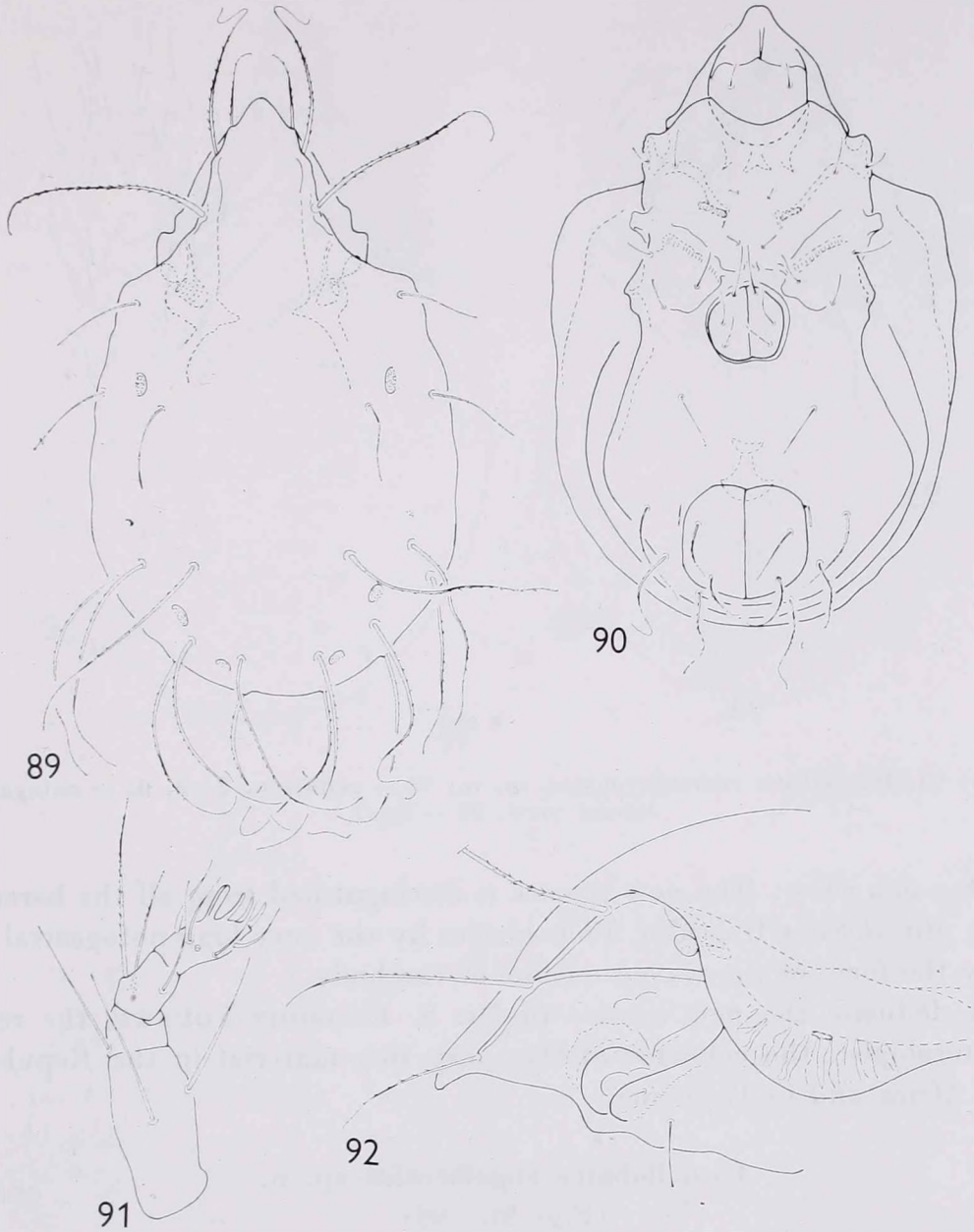
P r o d o r s u m : Rostrum slightly nasiform medially. Lamellae, sublamellae and prelamellae well developed (Fig. 92) all three pairs of median prodorsal setae arising on them. Interlamellar setae very long, with flagellate end. Lamellar setae much shorter than the preceding one but much longer than the rostral setae. All three pairs well ciliate. Trichobothrium completely covered by the pteromorpha, head of sensillus barbed.

N o t o g a s t e r : Outline of notogaster waved. A well-developed, lateral rim present, it is well observable on the posterior end of body in lateral view (Fig. 89). Dorsosejugal suture absent medially. Pteromorphae well arched laterally, their lateral margin with fine lines. Three pairs of well-developed areae porosae, A_1 absent. Ten pairs of long, but various notogastral setae observable, three short (c_1, *da*, *la*) arising on the anterior half of notogaster, the other 7 pairs originating on the posterior half, all of them very long, mostly flagellate at tip. Surface of notogastral setae very finely roughened.

L a t e r a l p a r t o f p o d o s o m a : Exobothridial setae minute. Area porosae "lamellares" not observable, areae porosae adalares small. Pedotecta 1 narrow, setae *la* arising near to its margin, pedotecta 2—3 large consisting of two parts (Fig. 92).

C o x i s t e r n a l r e g i o n : Apodemes and epimeral borders weakly developed, but *ap. sej.* are approaching the genital aperture. Epimeral borders composing a characteristic sculpture in front of the genital aperture. Epimeral setal formula: 3—1—2—2 (?). Setae *3c* and *4c* was not observable. Setae *1b* much longer than *1c*.

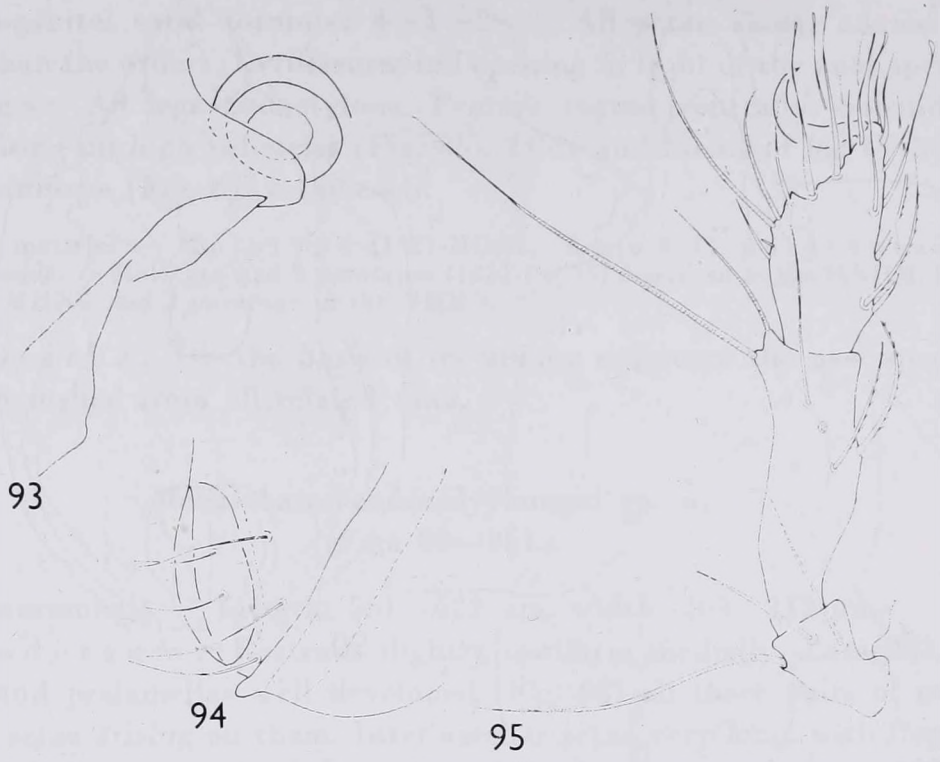
A n o g e n i t a l r e g i o n : A strong longitudinal rib observable. Anogenital setal formula: 3—1—2—3. Genital and aggenital setae long but very fine, setae in the ano-adanal position robuster than the others and well ciliate (Fig. 90).



Figs 89—92. *Maculobates endroedyyoungai* sp. n.: 89 = dorsal view, 90 = ventral view, 91 = palp, 92 = prodorsum in lateral view

L i m b s : Palp as shown in Fig. 91. Setal formula: 2—1—3—9. All legs robust, femora II—IV with a wide blade-like formation. All tibiae conspicuously long, leg I bearing a long process, solenidia φ_1 and φ_2 arising on the latter (Fig. 95). Setal formula of leg I: 1—5—2 + 1—4 + 2—17 + 3.

Type material — H o l o t y p e : Kz. 179. Tasmania. 3 p a r a t y p e s from the same sample; 2 paratypes: Kz. 178. Tasmania. — Holotype and 2 paratypes deposited in the TMP, 2 paratypes (1328-PO-88) in the HNHM and 1 paratype in the MHNG.



Figs 93—95. *Maculobates endroedyyoungai* sp. n.: 93 = pedotecta 2—3, 94 = notogaster in lateral view, 95 = leg 1

R e m a r k s : The new species is distinguished from all the heretofore known *Maculobates* HAMMER, 1966 species by the very long notogastral setae and by the form of the waved outline of the body.

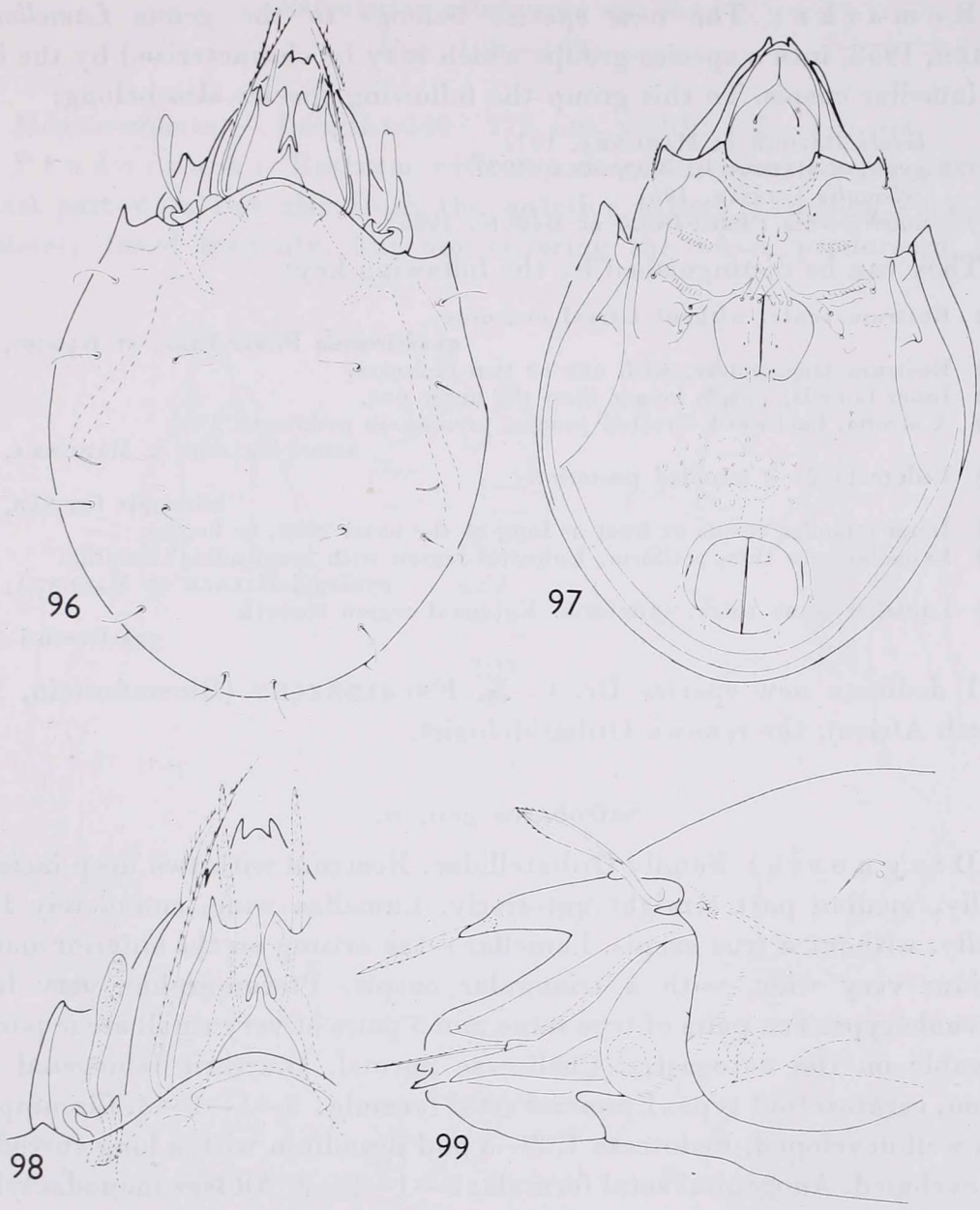
I dedicate the new species to Dr. S. ENDRÖDY-YOUNGA, the renown coleopterologist, the collector of this very rich material in the Republic of South Africa and in Tasmania.

Lamellobates engelbrechti sp. n.
(Figs 96—99)

Measurements — Length: 264—284 μm, width: 88—96 μm.

P r o d o r s u m : Rostrum with two long lateral teeth, tricuspidate. Rostral setae arising laterally on small tubercles, under the tutorium (Fig. 99). Lamellae well developed, with a widened basal part (Fig. 98). Both apex as well developed, outer and inner ones nearly equal in length. Lamellar setae thick and robust, well roughened. Interlamellar setae characteristically curved basally, setiform, finely ciliate (Fig. 96). Sensillus fusiform, but its distal end sometimes blunt, its margin and surface finely roughened or ciliate. Inner margin of bothridium sharply pointed, outer ones rounded.

N o t o g a s t e r : Surface smooth. Nine (?) pairs of notogastral setal present, setae p_3 not observable.



Figs 96—99. *Lamellobates engelbrechti* sp. n.: 96; dorsal view, 97 = ventral view, 98 = lateral part of prodorsum, 99 = prodorsum in lateral view

Coxisternal region: Epimeral surface smooth. All epimeral setae thin and simple (Fig. 97).

Anogenital region: Ventral plate ornamented by foveolae. Genital setae different in lengths, anterior inner setae shorter than the two lateral ones. Aggenital setae minute, two pairs of anal and two pairs of adanal setae present, all short and thin.

Type material — Holotype (1329-HO-88): Afr. 216, Nigeria. 5 paratypes: from the same sample. — Holotype and 4 paratypes (1329-PO-88) deposited in the HNHM, and 1 paratype in the MHNG.

Remarks: The new species belongs to the genus *Lamellobates* HAMMER, 1958, into a species-groups which may be characterized by the long, inner lamellar cuspis. To this group the following species also belong:

botari BALOGH et MAHUNKA, 1977
gyoergyi BALOGH et MAHUNKA, 1977
orientalis CSISZÁR, 1961
quadricornis PÈREZ-IÑIGO et BAGGIO, 1985

They can be distinguished by the following key:

1 (2) Rostrum acute, without lateral incisures
quadricornis PÈREZ-IÑIGO et BAGGIO, 1985
2 (1) Rostrum tricuspidate, with one or two incisures.
3 (6) Inner lamellar cuspis longer than the outer one.
4 (5) A strong, backward directed process present on pedotecta 2—3
botari BALOGH et MAHUNKA, 1977
5 (4) Pedotecta 2—3 rounded posteriorly
orientalis CSISZÁR, 1961
6 (3) Inner lamellar cuspis at least as long as the outer ones, or longer.
7 (8) Lamellar seta thin, setiform. Epimeral region with longitudinal striation
gyoergyi BALOGH et MAHUNKA, 1977
8 (7) Lamellar setae thick, spiniform. Epimeral region smooth
engelbrechti sp. n.

I dedicate new species Dr. C. N. ENGELBRECHT (Bloemfontein, Rep. of South Africa), the renown Oribatidologist.

Safrobates gen. n.

Diagnosis: Family Oribatellidae. Rostrum with two deep incisures laterally, median part straight anteriorly. Lamellae wide, completely fused medially, without a true cuspis. Lamellar setae arising on the anterior margin. Tutorium very wide, with a triangular cuspis. Pteromorphae very large, immovable type. Ten pairs of true setae and 3 pairs of very small areae porosae observable on the notogaster. Chelicerae normal. Diarthric labiogenal articulation, ceratozetoid type. Epimeral setal formula: 3—1—2—3. Circumpedal carina well developed. Pedotecta 1, 2—3 and discidium with a long custodium well developed. Anogenital setal formula: 5—1—2—3. All legs monodactylous. Femora of legs II—IV with a blade-like formation. No spur on genu or tarsus of legs I—II. Solenidium φ_2 arising on a long tubercle, in front of φ_1. Lateral seta (l'') of genua I and II thick, spiniform. Pedipalpus ceratozetoid type.

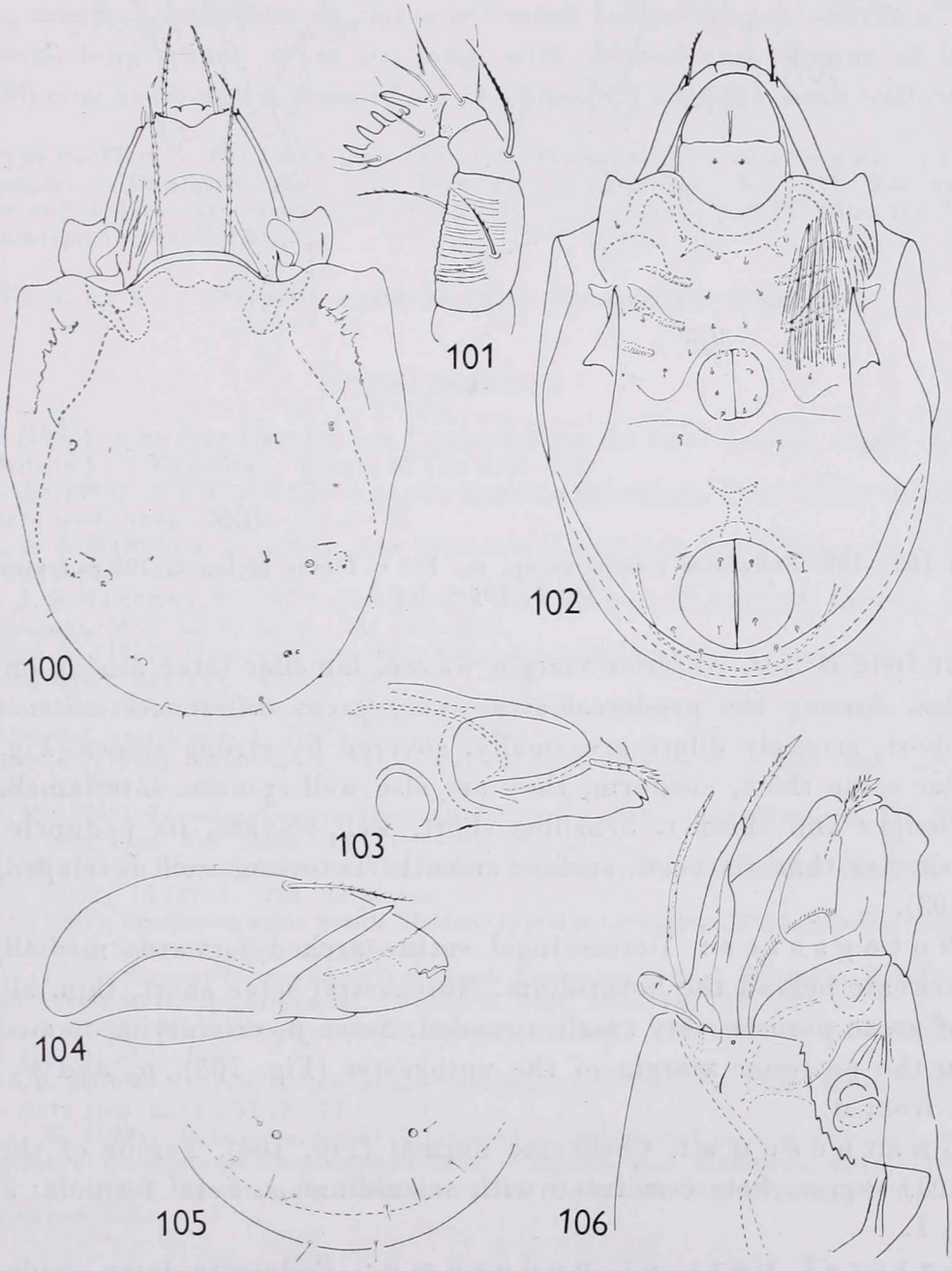
Type species: *Safrobates miniporus* sp. n.

Remarks: The relegation of the new taxon was rather problematic. It unites some features of Ceratozetidae, Oribatellidae and Tegoribatidae, but these latter families are also heterogeneous. Apparently, it stands, on the basis of the large tutorium, the shape of the pedipalpus and the legs, the absence of the genal teeth, etc., closest to the taxa of the family Oribatellidae. But it is distinguished from all Oribatellidae taxa by the fused and very wide lamellae, by the three pairs of very small areae poroseae and the shape of the rostrum. For this features a new subfamily is established: Safrobatinae subfam. n.

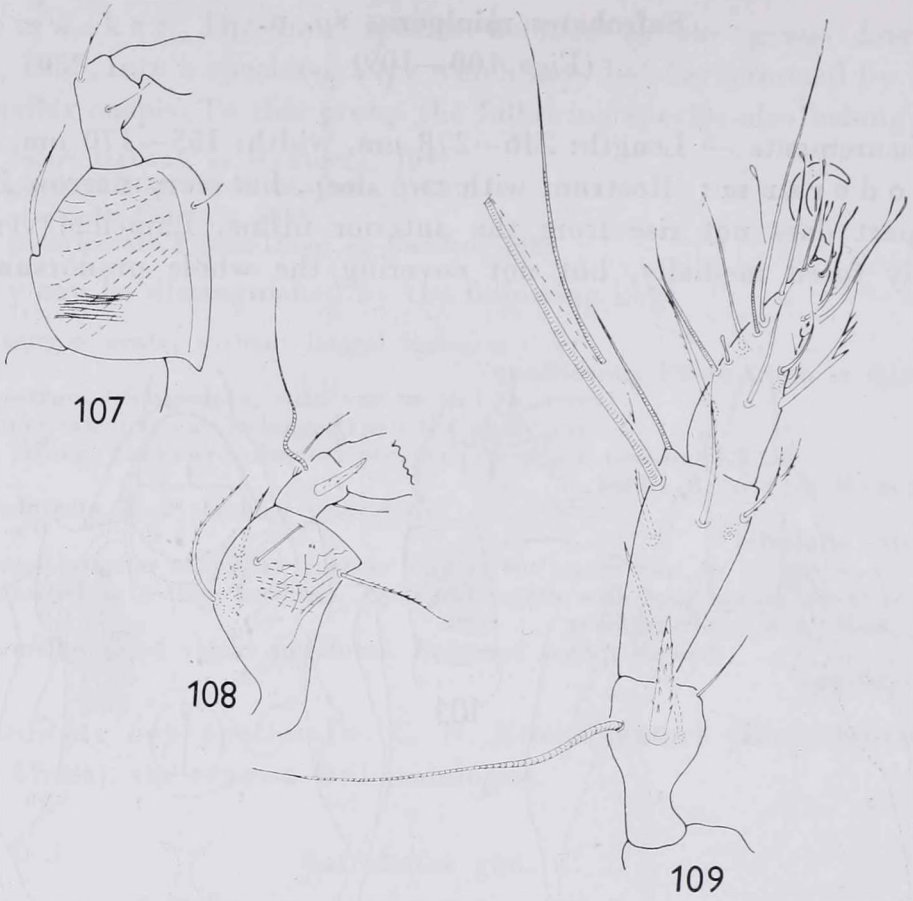
Safrobates miniporus sp. n.
(Figs 100—109)

Measurements — Length: 246—278 μm, width: 155—170 μm.

P r o d o r s u m : Rostrum with two deep, but very narrow incisions. Median part does not rise from the anterior utline. Lamellae very wide, completely fused medially, but not covering the whole prodorsum, inter-



Figs 100—106. *Safrobates miniporus* sp. n.: 100 = dorsal view, 101 = palp, 102 = ventral view, 103 = genal tooth, 104 = chelicera, 105 = end of notogaster, 106 = prodorsum lateral view



Figs 107—109. *Safrobates miniporus* sp. n.: 107 = femur of leg 4, 108 = femur of leg 2, 109 = leg 1

lamellar field is free. Anterior margin waved, lamellar setae arising on small tubercles. Among the prodorsal setae very great differences exist: rostral setae short, strongly dilate proximally, covered by strong spines (Fig. 106). Lamellar setae thick, ensiform, they are also well spinose, interlamellar one much longer and thinner. Sensillus short, well clavate, its peduncle being much shorter than its head, surface smooth. Tutorium well developed, wide (Fig. 103).

N o t o g a s t e r : Dorsosejugal suture arched forwards medially and well excavate behind the bothridium. Notogastral setae short, thin, all three pairs of areae porosae very small, rounded. Setae p_1 originating immediately near to the posterior margin of the notogaster (Fig. 105), p_2 and p_3 much farther from it.

G n a t h o s o m a : Chelicerae normal (Fig. 104). Femur of the palp (Fig. 101) rugose. Seta *ecm* fused with solenidium ω. Setal formula: 2—1—3—9 + 1.

L a t e r a l p a r t o f p o d o s o m a : Pedotecta large, wide (Fig. 106). Discidium normally developed, custodium very long, narrow, slightly arched outwards, circumpedal carina well developed.

Epimeral region: Whole surface striated longitudinally, more strongly laterally, finely medially. Apodemes short, thin; *ap. sej.* scarcely longer than *ap. 2*. Epimeral borders not observable. Epimeral setal formula: 3—1—2—2, all setae fine and short.

Anogenital region: Genital and anal apertures framed (Fig. 102). All setae in this region also fine and short. Lyrifissures *iad* in adanal position.

Legs: All legs monodactylous. Tarsus of leg I (Fig. 109) with solenidium ω_2 much shorter than ω_1, setae *tc*'' much longer than *tc*'. Setae *v*'' very thick, with long spines, setae (*a*) long, with dilated end. Femur of leg II (Fig. 108) concave basally, same of leg IV (Fig. 107) straight, both well rugose.

Type material — Holotype: Kz. 178. Tasmania. 2 paratypes: from the same sample; 3 paratypes: Kz. 175. Tasmania; 4 paratypes: Kz. 179. Tasmania. — Holotype and 4 paratypes deposited in the TMP, 4 paratypes (1330-PO-88)in the HNHM and 1 paratype in the MHNG.

Remarks: See the remarks after the generic diagnosis.

REFERENCES

Aoki, J. (1958): Eine neue Gattung von Carabodiae aus der Insel Hachijo, Japan. (Acarina: Oribatei). — Zool. Mag., Tokyo, **67** (2): 390—392

Balogh, J. (1983): A partial revision of the Oppiidae Grandjean, 1954 (Acari: Oribatei). — Acta zool. hung., **29** (1—3): 1—79.

Balogh, J. & Mahunka, S. (1966): New Oribatids (Acari) from South Africa. — Acta zool. hung., 12/1—2/: 1—23.

Balogh, J. & Mahunka, S. (1979): New taxa in the system of the Oribatida (Acari). — Annls hist.-nat. Mus. natn. hung., **71:** 279—290.

Grandjean, F. (1952): Observations sur les Palaeacaroides (Acariens) (1re série). — Bull. Mus. natn. Hist. nat. (2), **24:** 360—367.

Grandjean, F. (1954): Étude sur les Palaeacaroides (Acariens, Oribates). — Mém. Mus. natn. Hist. nat. (n.s.), sér. A. Zool., **7:** 179—274.

Grandjean, F. (1958): Observations sur les Palaeacaroides (5e série). — Bull. Mus. natn. Hist. nat., (2) **30:** 76—83.

Hammer, M. (1962): Investigations on the Oribatid Fauna of the Andes Montains. III. Chile. — Biol. Skr. Dan. Vid. Selsk., **13** (2): 1—92, 30 plates.

Hammer, M. (1966): Investigations on the Oribatid fauna of New-Zealand. — Biol. Skr. Dan. Vid. Selsk., **15** (2): 1—108, 45 plates.

Kok, D. J. (1967): Studies on some South African Oppiidae Grandjean, 1953 (Acarina: Oribatei). — J. ent. Soc. sth. Afr., **30:** 40—74.

Lee, D. C. (1981): Sarcoptiformes (Acari) of South Australian soils. 1. Notation. 2. Bifemorata and Ptyctima (Cryptostigmata). — Rec. S. Aust. Mus., **18:** 199—222.

Mahunka, S. (1985): Mites (Acari) from St. Lucia (Antilles) 2. Oribatida. — Acta zool. hung., **31** (1—3): 119—178.

Mahunka, S. (1986): A survey of the family Carabodidae C. L. Koch, 1836 (Acari: Oribatida). — Acta zool. hung., **32** (1—2): 73—135.

Niedbala, W. (1985): Catalogue des Phthiracaroidea (Acari), clef pour la détermination des espèces et descriptions d'espèces nouvelles. — Annals. zool. Warszawa, **40** (4): 309—370.

Niedbala, W. (1986): Systéme des Phthiracaroidea (Oribatida, Euptyctima). — Acarologia, **27** (1): 61—84.

Acta Zoologica Hungarica 35 (1—2), pp. 81—103 (1989)

BRACONIDAE (HYMENOPTERA) FROM KOREA, X.*

J. PAPP

Zoological Department, Hungarian Natural History Museum, H-1088 Budapest, Baross utca 13, Hungary

(Received 17 October 1987)

Fifty-eight Braconid species are reported from Korea representing eight subfamilies. Six species are described as new to science: *Macrocentrus* (*Macrocentrus*) *cordanus* sp. n., *Schizoprymnus cavernus* sp. n., *S. commotus* sp. n., *S. querculus* sp. n., *Opius* (*Merotrachys*) *derus* sp. n. and *Aleiodes* (*Neorhogas*) *territatus* sp. n. Twenty-nine species are new to the fauna of Korea. The Braconid material serving for the present elaboration is deposited in the Hungarian Natural History Museum, Budapest. With 69 original figures.

1. List of the species

Fifty-eight Braconid species are listed from Korea (i.e. the Democratic People's Republic of Korea) belonging to eight subfamilies as Helconinae (1 species), Macrocentrinae (4 species of which 1 is new to science), Homolobinae (2 species), Blacinae (2 species), Calyptinae (12 species of which 3 is new to science), Orgilinae (2 species), Opiinae (19 species of which 1 is new to science) and Rogadinae (16 species of which 1 is new to science). Detailed collecting data are given for every species and, where necessary, completed with taxonomical as well as zoogeographical notes. The Braconid material was collected by the staff-members of the Hungarian Natural History Museum (Budapest) during collecting trips to North Korea in the years of 1970—1985 (Dr. O. Gy. DELY, Dr. Á. DRASKOVITS, Dr. L. FORRÓ, Dr. S. HORVATOVICH, Dr. S. MAHUNKA, Dr. J. PAPP, Dr. L. RONKAY, Dr. H. STEINMANN, Dr. Gy. TOPÁL, Dr. T. VÁSÁRHELYI, Dr. A. VOJNITS and Dr. L. ZOMBORI).

HELCONIAE

Diospilus fusciventris HELLÉN, 1958 — Reported from Finland and Hungary. New to the fauna of Korea.

Locality — 1 ♂: Pyongyang City, Daesong-san, 31 June 1985, No. 970.

MACROCENTRINAE

Macrocentrus (Amicroplus) blandus EADY et CLARK, 1964 — Localites: 1 ♂: Pyongyang City, Ryongak-san 30 May 1985, at light, No. 962. — 1 ♀: Pyongyang City, Daesong-san, 31 May 1985, at light, No. 969.

* Zoological Collectings by the Hungarian Natural History Museum in Korea, No. 85.

Macrocentrus (Amicroplus) collaris (SPINOLA, 1808) — Localities: 1 ♀: Pyongan Prov., Lokam Reserve, about 40 km N of Pyongyang, 25 May 1985, No. 944. — 3 ♀ + 2 ♂: Pyongyang City, Daesong-san, 1 June 1985, No. 970.

Macrocentrus (Macrocentrus) cordanus sp. n.: see p. 86.

Macrocentrus (Macrocentrus) thoracicus (NEES, 1812) — Localities: 1 ♀ + 4 ♂: Pyongyang City, Ryongak-san, 30 May 1985. No. 962. — 1 ♀ + 3 ♂: Pyongyang City, Daesong-san, at light, 31 May 1985, No. 969.

HOMOLOBINAE

Homolobus annulicornis (NEES, 1834) — A Palaearctic and rather frequent species. New to the fauna of Korea.

Locality — 1 ♂: Pyongyang City, Daesong-san, at light, 31 May 1985, No. 969.

Homolobus infumator (LYLE, 1914) — Locality: 1 ♂: Pyongyang City, Ryongak-san, 30 May 1985, at light, No. 962.

BLACINAE

Blacus (Ganychorus) capeki HAESELBARTH, 1973 — Locality: 1 ♀: North Pyongan Prov., Myohyang-san, about 1000 m, 22 May 1985, No. 934.

Blacus (Ganychorus) nixoni HAESELBARTH, 1973 — Described from Cyprus, reported from Bulgaria and the Netherlands. New to the fauna of Korea.

Locality — 1 ♀: North Pyongan Prov., Myohyang-san, 23 May 1985, No. 940.

CALYPTINAE

Eubazus (Eubazus) flavipes (HALIDAY, 1835) — Frequent in the western Palaearctic Region as far eastwards as the Caucasus Mts in the USSR. New to the fauna of Korea.

Locality — 1 ♀: Prov. Ryang-gang, Chann-pay plateau, Sam-zi-yan, 1600 m, 28 Aug. 1971, No. 218.

Eubazus (Brachistes) subvagus TOBIAS, 1986 — Antenna with 23 joints, antennal joints 15—22 cubic. Ovipositor sheath as long as metasoma. Otherwise the single Korean specimen matches with the original description. — Described from the USSR (Sotchi). New to the fauna of Korea (this is its second distributional datum).

Locality — 1 ♀: Pyongan Prov., Myohyang-san by the Hyangsanchon, 21 May 1985, No. 930.

Schizoprymus acataphractus (ŠNOFLÁK, 1953) — Antenna with 26 joints. Head in dorsal view 1.7 times as broad as long. — Up to now known from Czechoslovakia and Hungary. New to the fauna of Korea.

Locality — 1 ♀: De Sang-san, 10 km NE from Pyongyan, 1 July 1977, No. 332.

Schizoprymnus azerbaidzhanicus ABDINBEKOVA, 1967 — My Korean male specimen is quite identical (disregarding sexual features) with the two females from Armenia (USSR) compared with authenticated specimens by Tobias. Since its description from Azerbaidzhan this is its second distributional datum. New to the fauna of Korea.

Locality — 1 ♂: Kangwon Prov., Kumgang-san, 28 May 1985, No. 956.

Schizoprymus cavernus sp. n.: see p. 89.

Schizoprymnus commotus sp. n.: see p. 92.

Schizoprymnus nigripes (THOMSON, 1892) — Antenna with 24 joints. Temple in dorsal view rounded. Carapace apically incurved, i.e. its ventral cavity about two-thirds as long as carapace itself. Body 3.8 mm. — Known in Europe and in the western half of the USSR as far eastwards as Kazakhstan (TOBIAS 1986). New to the fauna of Korea.

Locality — 1 ♀: Pektusan, wooded environs of the Sam-zi-yan hotel, 18 July 1977, No. 372.

Schizoprymnus opacus (THOMSON, 1892) — Antenna with 26 joints. Lateral lobes of mesonotum almost smooth and shiny. Otherwise similar to the European (Hungarian) forms. A Palaearctic species. New to the fauna of Korea.

Locality — 1 ♂: Pektusan: Mupo, brook Dehongdan, 20 July 1977, No. 380.

Schizoprymnus querculus sp. n.: see p. 95.

Schizoprymnus temporalis TOBIAS, 1966 — Head in dorsal view somewhat less transverse, 1.8 times as broad as long (and not twice broader). Antenna with 20 joints (and not 21). Head above and mesonotum shiny and with very fine and rather disperse punctation, face also

shiny and subpunctate. Otherwise agreeing with the description (Tobias 1966). — Known from Turkmenia (USSR). New to the fauna of Korea.

Locality — 1 ♂: Prov. South Phenan: Pyongyang, Nung-ra do (island in the river Te-dong), 27 May 1970, No. 36.

Triaspis flavipes IVANOV, 1899 — Antenna with 22 joints. Tergites 1—3 evenly and distinctly (i.e. relatively strongly) rugose. 2.3—2.4 mm long. — Known from Czechoslovakia and the USSR (Kharkhov region). New of the fauna of Korea.

Locality — 2 ♂: Prov. Kengi: Bagyon san, San-chon tong, about 20 km SE from Kaesong, 8 June 1970, No. 112.

Triaspis lugubris ŠNOFLÁK, 1952 — Antenna with 19 (2 ♀ + 1 ♂) and 20 joints (3 ♀). Middle polished field of third tergite either present or absent, i.e. in the latter case striated as elsewhere. Ovipositor sheath in lateral view as long as metasoma. Ground colour of legs reddish yellow with variable fumous to blackish tint. — Described from Czechoslovakia, reported from the USSR as far eastward as eastern Siberia (TOBIAS 1986). New to the fauna of Korea.

Localities — 1 ♀: Prov. Ryang-gang: Chann-pay plateau, Sam-zi-yan, 1700 m, 24 July 1975, No. 282. — 2 ♀: Prov. Ryang-gang: Hyesan, Mt. Ze-dong, 1150 m, 26 July 1975, No. 293. — 1 ♀ + ♂: Pektusan, wooded environs of the Sam-zi-yan hotel, 1 ♀: 18 July 1977, No. 372. 1 ♂: 19 July 1977, No. 376. — 1 ♀: Pektusan, Mupo, brook Dehongdan, 20 July 1977, No. 380.

ORGILINAE

Charmon cruentatus HALIDAY, 1833 — Localities: 1 ♂: Pyongyang City, Daesong-san, at light, 17 May 1985, No. 923. — 1 ♂: Ryanggang Prov., Samjiyon, park, at light, 5 June 1985, No. 1005.

Charmon paloratus PAPP, 1983 — Reported from Korea by me (PAPP 1985).

Locality — 1 ♀: Ryanggang Prov., Samjiyon, park, at light, 5 June 1985, No. 1005.

OPIINAE

Biosteres (Chilotrichia) punctiscuta (THOMSON, 1895) — A rare species in Europe, reported from the countries of Denmark, France, Hungary with a single locality each. New to the fauna of Korea.

Locality — 2 ♀: Kangwon Prov., Kumgang-san, 28 May 1985, No. 956.

Bitomus hemicoriaceus (FISCHER, 1966) ♀ new — The female is identical with the male. Antenna with 25 (right antenna) and 24 joints (left antenna). Ovipositor sheath in lateral view almost as long as hind tarsal joints 1—2.

Locality — 1 ♀: Pyongyang City, Daesong-san, 1 June 1985, No. 970.

Opius (Nosopoea) ambiguus WESMAEL, 1835 — Distributed in the Palaearctic Region, its easternmost record is from Mongolia. New to the fauna of Korea.

Locality — 1 ♂: Ryang-gang Prov., Chann-pay plateau, Pektusan, Mu-do-bong, 2100—2200 m, 25 July 1975, No. 288.

Opius (Cryptonastes) blantoni FISCHER, 1964 — Reported from Korea by me (PAPP 1978, 1980).

Locality — 1 ♀: Pyongyang City, Ryongak-san, 17 May 1985, No. 920.

Opius (Opius) circinus PAPP, 1979 — Described from Hungary, up to now no further distributional datum was listed. New to the fauna of Korea. — This species is very similar to *O.* (*O.*) *meracus* FISCHER, 1960 (Europe), too, unmentioned in my original description (PAPP 1979):

O. circinus PAPP	*O. meracus* FISCHER
1. In dorsal view head between temples as between eyes.	1. In dorsal view head between temples somewhat broader than between eyes, i.e. head broadening behind.
2. Antenna with 24—27 joints.	2. Antenna with 20 joints.
3. First tergite as long as wide at hind.	3. First tergite one-fourth longer than wide at hind.
4. Ovipositor sheath about as long as half metasoma or hind tarsal joints 1—3 (—4).	4. Ovipositor sheath at least as long as two-thirds of metasoma or entire hind tarsus.

Locality — 1 ♀: Pyongyang City, Botongyang Park, 30 May 1985, No. 961.

Opius (Opiostomus) clausus FISCHER, 1958 — Reported from Austria, Hungary and Japan. New to the fauna of Korea.

Locality — 1 ♂: Kangwon Prov., Kumgang-san, near rest house Oe-Kumgang, 26 May 1985, No. 946.

Opius (Psyttalia) cyclogaster THOMSON, 1895 — Described from France, recently reported from the USSR (Ural Mts, western Kazakhstan) (TOBIAS 1986). New to the fauna of Korea.

Locality — 1 ♀ + 1 ♂: Prov. North Pyongan, Myohyang-san, 1 ♂: 14 August 1982 and 1 ♀: 18 August 1982, leg. Beron et Popov.

Opius (Merotrachys) derus sp. n.: see p. 98.

Opius (Gastrosema) distortus PAPP, 1980 — Antenna with 27 (1 ♀) and 32 joints (1♂) (according to the original description holotype ♀ with 31 joints). Light colour of female reddish yellow to testaceous; male more black (head above and mesosoma entirely black), face blackish brown, vertex laterally and mesosternum with faint rusty suffusion, second tergite yellow, further tergites black. — Described and up to now known only from Korea.

Localities — 1 ♀: North Pyongan Prov., Myohyang-san, 23 May 1985, No. 940. — 1 ♂: Pyongyang City, Botogyang Park, 30 May 1985, No. 961.

Opius (Phaedrotoma) diversiformis FISCHER, 1960 — Body relatively large, 2 mm long. Antenna with 28 joints. First tergite rugose. — Sporadic in the western Palaearctic Region, reported from a few localities in Europe (Austria, Hungary) and in the USSR (Armenia, Georgia). New to the fauna of Korea.

Locality — 1 ♂: Kangwon Prov., Kumgang-san, near rest house Oe-Kumgang, 26 May 1985, No. 946.

Opius (Phaedrotoma) exiguus WESMAEL, 1835 — Locality: 1 ♀ + ♂: Pyongyang City, Daesong-san, 15 May 1985, No. 911.

Opius (Cryptonates) gracilis var. **vividus** PAPP, 1979 — Face brownish, ventral and lateral side of mesosoma reddish yellow. Reported from Korea by me (PAPP 1978, 1980, 1985)

Locality — 1 ♂: Pyongyang City, Daesong-san, 1 June 1985, No. 970

Opius (Xynobius) japanus FISCHER, 1963 — Described and up to now known only from Japan. New to the fauna of Korea. — The Korean single female agrees with the original description as well as with a female paratype from Japan (Sapporo) (purchased by an exchange from the Townes Collection, Gainesville, USA), excepting the proportional length of radial vein (*r*1—3):

Korean female	Japanese female
1. *r3* only 1.5 times as long as *r2*.	1. *r3* twice (original description) and 1.6 times (paratype) as long as *r2*.
2. *Cu2* relatively long, *r2* twice as long as *cuqu1*.	2. *Cu2* relatively less long, *r2* 1.6—1.7 times as long as *cuqu1*.

Locality — 1 ♀: Pyongyang City, Ryongak-san, 17 May 1985, No. 920.

Opius (Nosopoea) nobilis PAPP, 1981 — Antenna with 32 joints. Third femur 3.75 times as long as broad. Tergites brownish yellow, first tergite black; otherwise matching with the original description. — Described from Hungary, up to now no further distributional datum was listed. New to the fauna of Korea.

Locality — 1 ♀: Pyongyang City, Botongyang Park, 30 May 1985, No. 961.

Opius (Lissosema) parvungula THOMSON, 1895 — Localities: 2 ♂: Pyongyang City, Botongyang Park, 30 May 1985, No. 961. — 1 ♂: Pyongyang City, Daesong-san, 1 June 1985 No. 970.

Opius (Opiothorax) phytobiae FISCHER, 1959 — Locality: 1 ♀: Pyongyang City, Ryongak-san, 31 May 1985, No. 963.

Opius (Opiothorax) propodealis FISCHER, 1958 — Face blackish. Antenna with 23 joints. Reported from Korea by me (PAPP 1980), and recently from the USSR in several localities (TOBIAS 1986).

Locality — 1 ♂: North Pyongyan Prov., Myohyang-san, 23 May 1985, No. 940.

Opius (Utetes) rotundiventris THOMSON, 1895 — A Palaearctic and rather frequent species. New to the fauna of Korea.

Locality — 1 ♂: Pyongyang City, Daesong-san, 15 May 1985, No. 911.

Opius (Allophlebus) singularis WESMAEL, 1835 — A Palaearctic and frequent species. New to the fauna of Korea.

Locality — 1 ♀: Pyongyang City, Daesong-san, 16 May 1985, No. 917.

ROGADINAE

Aleiodes (Aleiodes) bicolor var. **assimilis** (NEES, 1812) — Locality: 1 ♂: Pektusan, wooded environs of the Sam-zi-yan hotel, 18 July 1977, No. 372.

Aleiodes (Aleiodes) circumscriptus (NEES, 1834) — Localities: 1 ♀ + 5 ♂: Pyongyang City, Daesong-san, 7 August 1971 (3 ♂) Nos 145—146, 8 July 1977 (2 ♂) No. 349, at light 17 May 1985 (1 ♀) No. 923. — 3 ♀ + 3 ♂: Prov. South Pyongan, Nam-po, 19 July 1975, No. 273. — 2 ♀ + 4 ♂: Ryanggang Prov., Hyesan, 22 July 1975 (1 ♀) No. 276, 2 Oct. 1978 (4 ♂) No. 445, 9 Oct. 1978 (1 ♀) No. 476. — 3 ♂: Ryanggang Prov., Chann-pay plateau, Sam-zi-yan, 1700 m, 24 July 1975 (1 ♂) No. 282, 19 July 1977 (2 ♂) No. 379. — 3 ♀ + 6 ♂: Kangwon Prov. (= Prov. Gang-von), On-dzong, Kumgang-san, near hotel, 5 August 1975 (2 ♀ + 3 ♂) No. 319, 9 July 1977 (1 ♀) No. 351, 12 Oct. 1978 (2 ♂) No. 488, 14 Oct. 1978 (1 ♀) No. 508, 19 Sept. 1980 (1 ♂) No. 720. — 1 ♂: South Pyongan Prov., Taesong-ho, 26 Sept. 1978 No. 406. — 7 ♂: Pyongyang City, Lyong-ak-san, 15 km W of Pyongyang, 270 m, 11 August 1971 (2 ♂) No. 160, 20 Sept. 1979 (5 ♂) No. 557. — 2 ♂: North Pyongan Prov., Myohyang-san, Hotel Myohyang-san, 13 July 1982, No. 783. — 1 ♂: Pyohyang-san, Hotel Myohyang-san, 13 July 1982, No. 783. — 1 ♂: Pyongyang City, 6 August 1982, leg. BERON et POPOV. — 6 ♀ + 3 ♂: Prov. North Pyongan, Myohyang-san, 14—18 August 1982, leg. BERON et POPOV. — 3 ♀ + 2 ♂: Prov. Kangwon, Kumgang-san, environs of hotel, 20 August 1982, leg. BERON et POPOV.

Aleiodes (Neorhogas) dendrolimi (MATSUMURA, 1926) — Localities: 1 ♀: Prov. South Pyongan, Pyongyan, Pyongyan Hotel garden, 5 August 1971, No. 141. — 5 ♀: "Korea, leg. Takagi".

Aleiodes (Neorhogas) dimidiatus (SPINOLA, 1808) — Locality: 1 ♂: North Pyongyan Prov., Myohyang-san, 15 Sept. 1980. No. 680.

Aleiodes (Aleiodes) gastritor (THUNBERG, 1822) — Supposedly a Palaearctic species, in Europe frequent. Very easy to misidentify as *A. circumscriptus* (NEES). New to the fauna of Korea.

Localities. — 1 ♀ + 1 ♂: Prov. South Pyongan, Pyongyan Hotel garden, 5—6 August 1971, Nos 143—144. — 4 ♀: Pyongang City, Daesong-san, 8 August 1971 (1 ♀) No. 153, 11 Sept. 1979 (1 ♀) No. 522, 17 May 985 (2 ♀) No. 923. — 2 ♀: Pyongyang City, garden of Hotel Pyongyang, 9—10 August 1971 (1 ♀) No. 156, 25 Sept. 1978 (1 ♀) No. 403. — 2 ♂: Prov. South Pyongan, Lyong-ak-san, 14—15 km W from Pyongyang, 11 August 1971, No. 160. — 1 ♂: Prov. South Pyongan, Nam-po, 19 July 1975, No. 273. — 12 ♀ + 4 ♂: Ryanggyng Prov., Chann-pay plateau, Samjiyon, park, 24 July 1975 (1 ♀ + 1 ♂) Nos 282 and 285, 18—19 July 1977 (3 ♂) Nos 373 and 379, 5 June 1985 (11 ♀) No. 1005. — 5 ♀ + 2 ♂: Kangwon Prov. (= Prov. Gang-von), Kumgang-san, environments of hotel, 4—6 August 1975 (4 ♀ + 2 ♂) Nos 315 and 318, 26 May 1985 (1 ♀) No. 948. — 1 ♂: Ryanggang Prov., Hyesan, 2 Oct. 1978, No. 445. — 2 ♀ + 5 ♂: North Pyongan Prov., Myohyang-san, hotel, 13 Sept. 1980 (4 ♂) No. 663, 18 July 1982 (2 ♀) No. 829, 21 May 1985 (1 ♂) No. 933. — 1 ♂: Kangwon Prov., Wonsan, park, Songdown, 20 Sept. 1980, No. 729. — 1 ♀ + 2 ♂: South Hwanghae Prov., Haeju, Suyong-san, 31 July 1982, No. 894. — 3 ♀ + 2 ♂: North Pyongan Prov., Myohyang-san, hotel, 14—18 August 1982, leg. BERON et POPOV. — 20 ♀: Kanwon Prov., Kumgang-san, environs of hotel, 20 August 1982, leg. BERON et POPOV. — 1 ♀: Kaesong, 28 August 1982, leg. BERON et POPOV. — 1 ♂ (in Zool. Inst. Warszawa): Onpho, ad. Chongjin, 20 August 1959, leg. PISARSKI et PRÓSZYNSKI.

Aleiodes (Aleiodes) gracilipes (TELENGA, 1941) ♂ new — Deviation from the female: 1. body entirely brownish black (♀: black, tergites 1—2 reddish yellow), 2. head in dorsal view 1.6 times as broad as long (♀: 1.7 times), 3. antenna with 49 joints (♀: 60). — Up to now known only from the type locality Ussuri region, Yakovlevka (USSR). New to the fauna of Korea.

Locality — 1 ♂: Ryanggang Prov., Chann-pay plateau, Samzi-yan, 1700 m, 24 July 1975, No. 282.

Aleiodes (Aleiodes) nigricornis WESMAEL, 1838 — A Palaearctic species. New to the fauna of Korea.

Localities — 2 ♀ + 2 ♂: Kangwon Prov., Kumgang-san, near Kuryong Falls and hotel 28 Sept. 1979 (1 ♀) No. 593, 26 May 1985 (1 ♀ + 2 ♂) No. 948. — 2 ♀ + 12 ♂: Pyongyang City, Daesong-san, 10 km NE of Pyongyang, 10 Sept. 1980 (1 ♀), 15, 17 and 31 May 1985 (1 ♀ + 12 ♂) Nos 911, 923 and 969. — 1 ♀: North Pyongan Prov., Myohyang-san, Hotel Myohyang, 14 Sept. 1980, No. 673. — 1 ♀ + 8 ♂: Pyongyang City, Ryongak-san, at light, May 1985, No. 962.

Aleiodes (Aleiodes) pallidator (THUNBERG, 1822) — Frequent to common in the Palaearctic Region. New to the fauna of Korea.

Localities — 1 ♂: South Pyongan Prov., Bongwa-ri, 16—17 August 1971, No. 181. — 1 ♂: North Pyongan Prov., Myohyang-san, hotel, 14 Sept. 1980, No. 673.

Aleiodes (Neorhogas) pallidicornis (HERRICH-SCHÄFFER, 1838) — Reported from Korea by me (PAPP 1985).

Locality — 1 ♀: Pyongyang City, Botongyang Park, 30 May 1985, No. 961.

Aleiodes (Neorhogas) praetor (REINHARD, 1863) — 1 ♂: Kangwon Prov., Kumgang-san, near rest house Oe-Kumgang, 26 May 1985, No. 948.

Aleiodes (Aleiodes) sudatorius (PAPP, 1986 ♂ new — The Korean specimens (1 ♀ + 1 ♂) agree well with the holotype from Hungary. First tergite as long as wide at hind and its lateral side straight (and not somewhat concave, see Fig. 5 in PAPP 1986: 139). Reddish yellow colour of body less vivid, black pattern less extended (2nd tergite and mesopleuron entirely reddish yellow, hind third of 1st tergite pale). Male similar to female. Fifth and sixth joints of maxillary palp equal in length. — Described recently from Hungary. New to the fauna of Korea.

Locality — 1 ♂: Tesson, water basin, about 35 km SW from Pyongyan, 4 July 1977, No. 343. — 1 ♀: Kaesong, 28 August 1982, leg. BERON et POPOV.

Aleiodes (Neorhogas) territatus sp. n.: see p. 100.

Aleiodes (Aleiodes) tristis WESMAEL, 1838 — A Palaearctic and less frequent species. New to the fauna of Korea.

Locality — 1 ♂: Pyongyang City, Daesong-san, at light, 17 May 1985, No. 923.

Aleiodes (Aleiodes) vittiger WESMAEL, 1838 — In Europe sporadic to frequent. Supposedly a Palaearctic species (from Mongolia reported by me, PAPP 1977). New to the fauna of Korea.

Localities — 4 ♀ + 16♂: Kangwon Prov. (= Prov. Gang-von), district On-dzong, Kumgang-san, near Hotel Go-song, 4—7 August 1975, Nos 315, 317, 319, 322, 325. — 1 ♂: Kangwon Prov., Kumgang-san, Hotel Kumgang-san, 22 July 1982, No. 850. — 1 ♀ + 1 ♂: Pyongyang City, Daesong-san, 10 km NE from Pyongyan, 1 July 1977 (1 ♀) No. 332, 15 May 1985 (1 ♂) No. 911. — 1 ♀: North Hwanghae Prov., Sariwon, 20 km SSE from town by Lake Sohung, 29 Sept. 1978, No. 425. — 1 ♂: Ryanggang Prov., Hyesan, 2 Oct. 1978, No. 445. — 7♀ + 2 ♂: North Pyongan Prov., Myohyang-san, near to hotel, 13—14 Sept. 1980 (1 ♀ + 2 ♂) Nos 663 and 673, 21 May 1985 (6 ♀) No. 933. — 1 ♂: Ryangak-san, Pyongyang City, 24 May 1985, No. 942. — 7 ♂: Prov. North Pyongan, Myohyang-san, near to hotel, 14 August 1982, leg. BERON et POPOV. — 2 ♂: Prov. Kangwon, Kumgang-san, environs of hotel, 20 August 1982, leg. BERON et POPOV.

Petalodes unicolor WESMAEL, 1838 — Frequent in Europe and in the USSR. Supposedly a Palaearctic species. New to the fauna of Korea.

Locality — 3 ♀: Pyongyang City, Daesong-san, at light, 17 May (2 ♀) and 31 May 1985 (1 ♀), Nos 923, 969.

Rogas tricolor (WESMAEL, 1838) — Distributed sporadically in Europe, in the USSR (Armenia, Moldavia) and Japan. New to the fauna of Korea.

Localities — 1 ♀: South Pyongan Prov., Lyongak-san, 25 km W from Pyongyan, 10 August 1971, No. 158. — 1 ♀: Kangwon Prov. (= Prov. Gang-von), On-dzong, Kumgang-san, along Ok-rudong, 7 August 1975, No. 324. — 1 ♂: Kangwon Prov., Kumgang-san, environs of hotel, 20 August 1982, leg. BERON et POPOV.

2. Description of the new species

Six new species are described from North Korea (i.e. from the Democratic People's Republic of Korea) representing the genera *Aleiodes* WESMAEL, 1838 (1 species), *Macrocentrus* CURTIS (1 species), *Opius* WESMAEL, 1835 (1 species) and *Schizoprymnus* FOERSTER, 1862 (3 species). Detailed descriptions as well as related allies are given for every new species. The types are deposited in the Hungarian Natural History Museum, Budapest.

Macrocentrus (Macrocentrus) cordanus sp. n.
(Figs 1—6 and 16)

♀. Body 10 mm long. — Head in dorsal view (Fig. 1) transverse, 2.2—2.3 times broader than long, eye large and protruding, temple very short, i.e. strongly receded, occiput excavated. Ocelli large, elliptic in form, hind

pair of ocelli greater than fore ocellus, distance between fore and a hind ocelli about half as long as greatest diameter of fore ocellus; greatest diameter of hind ocellus twice as long as POL, OOL about one-third longer than POL (Fig. 1). Eye in lateral view distinctly 1.4 times as high as wide; temple very narrow. Malar space slightly shorter than basal width of mandible. Face 1.6 times wider than high. Clypeus somewhat wider below than high medially. Head polished; face and clypeus with fine punctation, interspaces about equal with diameter of punctures. — Antenna filiform, about twice as long as body, with 60 joints (1♀ paratype). First flagellar joint eight times as long as broad, further joints gradually shortening and attenuating so that penultimate joint four times as long as broad.

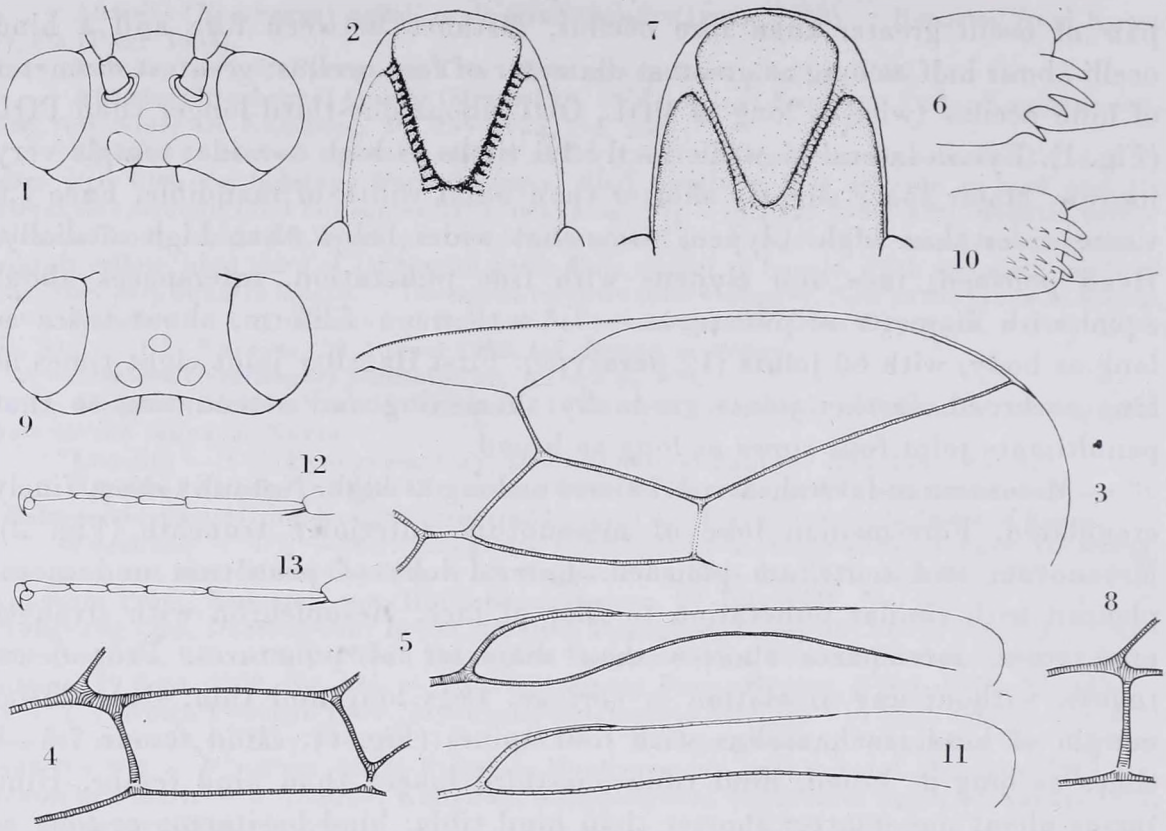
Mesosoma in lateral view 1.7 times as long as high. Notaulix deep, finely crenulated. Fore-median lobe of mesonotum anteriorly truncate (Fig. 2). Mesonotum and scutellum polished. Lateral lobe of pronotum and mesopleuron with similar punctation to that of face. Mesopleuron with stronger punctation, interspaces shorter than diameter of punctures. Propodeum rugose, without any areolation or carinae. Legs long and thin. Outer-lower margin of hind trochantellus with four spines (Fig. 6). Hind femur 7.5—8 times as long as broad, hind tibia one-third longer than hind femur. Hind tarsus about one-quarter shorter than hind tibia; hind basitarsus as long as further four joints of hind tarsus. Hind coxa finely punctate, interspaces polished and much longer than diameter of punctures.

Fore wing about as long as body. Pterostigma (Fig. 3) clearly four times as long as wide, issuing radial vein distally from its middle. *r1* as long as width of pterostigma, *r2* 2.5—3 times as long as *r1* and one-third longer than *cuqu1*, *r3* somewhat more than twice as long as *r2* and reaching tip of wing. *N. rec.* antefurcal. Nervulus postfurcal, *d1* somewhat less than half as long as nervulus (Fig. 4). Radial vein of hind wing strongly curved and at its middle section approaching fore margin of wing (Fig. 5).

Metasoma somewhat longer than head and mesosoma together. First tergite (Fig. 16) 2.5—2.7 times as long as broad behind, posteriorly from spiracles parallel- or almost parallel-sided. Second tergite twice as long as broad, parallel-sided. Third tergite somewhat longer than broad at hind, further tergites distinctly transverse. First three tergites longitudinally and rather finely striate, further tergites smooth and shiny. Ovipositor sheath long, one-and-one-half times as long as body.

Body ochre yellow, prosternum and legs (except hind femur) rather yellow. Face medially, ocellar field and spot of median lobe of mesonotum black. Mandible yellow, apically brownish to black, palps yellow. Antenna ochre yellow. Wings hyaline, pterostigma yellow, veins brownish.

Male and host unknown.



Figs 1—6. *Macrocentrus cordanus* sp. n : 1 = head from above, 2 = mesonotum, 3 = distal part of right fore wing, 4 = brachial cell with nervulus, 5 = distal part of right hind wing, 6 = hind trochantellus with spines. — Figs 7—8. *M. cerasivoranae* VIERECK: 7 = mesonotum, 8 = nervulus of right fore wing. — Figs 9—11. *M. thoracicus* (NEES): 9 = head in dorsal view, 10 = hind trochantellus with spinules, 11 = distal part of right hind wing. — Figs 12—13. Hind tarsus of 12 = *Schizoprymnus cavernus* sp. n. and 13 = *S. cylindricus* (ŠNOFLÁK)

Locality — Holotype ♀ and 1 ♀ paratype: Korea, Prov. North Pyongan, Myohyang-san, hotel, 14 August 1982 (holotype) and 18 August (paratype), leg. Beron et Popov.

Holotype and 1 paratype are deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7098 (holotype) and 7099 (paratype).

The new species, *Macrocentrus* (*Macrocentrus*) *cordanus* sp. n., belongs to the *thoracicus* species-group within the genus *Macrocentrus* CURTIS (*M. bicolor* CURTIS, 1833 and *M. thoracicus* NEES, 1812); and closely related to *M.* (*M.*) *thoracicus* (NEES, 1812) (Palaearctic Region), the distinctive features between the two species are very subtile and requires some practice in recognizing them, however, of specific value:

M. cordanus sp. n.	*M. thoracicus* (NEES)
1. Body relatively strong, 10 mm long.	1. Body relatively less strong, 5.5—8 mm long.
2. Ocelli large, greatest diameter of a hind ocellus twice as long as POL, latter about one-third shorter than OOL (Fig. 1).	2. Ocelli less large but not small, greatest diameter of a hind ocellus as long as POL, latter equal with OOL (Fig. 9).

3. Outer-lower margin of trochantellus with four spines (Fig. 6).
4. *Cu2* relatively long, *r2* about 2.5—3 times as long as *r1*, pterostigma about four times as long as wide (Fig. 3); nervulus issuing more proximal from *d*, i.e. *d1* somewhat less than half as long as nervulus (Fig. 4). Radial vein of hind wing more curved towards fore margin of wing (Fig. 5).
5. First tergite behind spiracles parallel- or almost parallel-sided (Fig. 16).
6. Body ochre yellow, prosternum and legs rather yellow.

3. Outer side of trochantellus with spinules (Fig. 10).
4. *Cu2* relatively less long, *r2* 2—2.2 times as long as *r1*, pterostigma about thrice as long as wide (Fig. 14); nervulus issuing less proximal from *d*, i.e. *d1* about one-third to one-fourth shorter than nervulus. Radial vein of hind wing less curved towards fore margin of wing (Fig. 11).
5. First tergite behind spiracles somewhat though distinctly broadening posteriorly (Fig. 15).
6. Body black, mesosoma laterally and ventrally brownish to reddish yellow, legs pale yellow.

The new species is also related to *M.* (*M.*) *cerasivoranae* VIERECK, 1912 (Nearctic Region) owing to its corporal colour, strongly receded temple and its prepectal carina on mesopleuron; the specific distinctions are tabulated below:

M. cordanus sp. n.

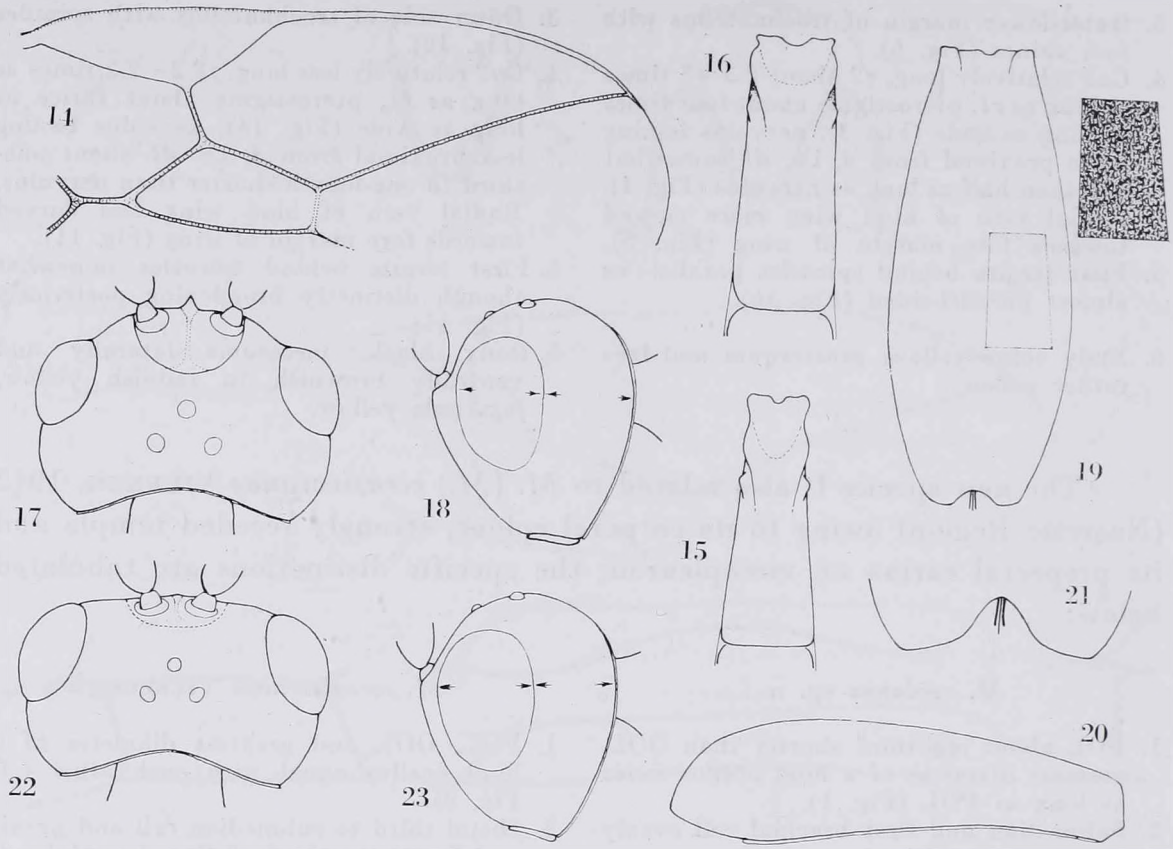
1. POL about one-third shorter than OOL, greatest diameter of a hind ocellus twice as long as POL (Fig. 1).
2. Submedian and first brachial cell evenly to almost evenly setose.
3. Fore-median lobe of mesonotum anteriorly truncate (Fig. 2).
4. Hind coxa finely and rather dispersely punctate, interspaces smooth and shiny.
5. Nervulus distinctly postfurcal (Fig. 4); *r3* somewhat more than twice as long as *r2* (Fig. 3).
6. Colour of body ochre yellow with black markings on face, ocellar field and median lobe of mesonotum.

M. cerasivoranae VIERECK

1. POL, OOL and greatest diameter of a hind ocellus equal with each other (cf. Fig. 9).
2. Distal third to submedian cell and proximal fourth to third of first brachial cell glabrous.
3. Fore-median lobe of mesonotum anteriorly round (Fig. 7).
4. Hind coxa rather transversely striocoriaceous.
5. Nervulus just postfurcal (Fig. 8); *r3* thrice as long as *r2*.
6. Colour of body ferrugineous to reddish yellow without black(ish) markings.

Schizoprymnus cavernus sp. n. ♀♂
(Figs 12, 17—21, 24—25)

♀. Body elongated, 4 mm long. — H e a d in dorsal view (Fig. 17) less transverse, 1.75 times as broad as long, eye slightly protruding and as long as temple, latter rounded, occiput rather moderately excavate, occiput and temple carinated. Ocelli round, distance between fore and a hind ocelli 1.5 times as long as diameter of an ocellus; OOL clearly twice as long as POL (Fig. 17). Frontal cavity conspicuously deep, frontal crest in the middle of cavity high (Fig. 17). Eye in lateral view as wide as temple (Fig. 18, see arrows). Malar space 1.5 times as long as basal width of mandible. Clypeus 1.6—1.7 times as wide below as high medially, its lower margin arched.



Figs 14—15. *Macrocentrus thracicus* (NEES): 14 = distal part of right fore wing, 15 = first tergite. — Fig. 16. *M. cordanus* sp. n.: first tergite. — Figs 17—21. *Schizoprymnus cavernus* sp. n.: 17 = head in dorsal view, 18 = head in lateral view, 19 = carapace from above with indication of its sculpture, 20 = carapace in lateral view, 21 = apical incision of carapace in frontal view. — Figs 22—23. *S. elongatus* SZÉPLIGETI: 22 = head in dorsal view, 23 = head in lateral view

Distance between tentorial pits equal with distance between a tentorial pit and lowest margin of eye. Face twice as wide as high, inner margin of eyes parallel. Head rugose-subrugose, temple weakly punctate, interspaces polished. — Antenna somewhat shorter than body, with 27 joints. First flagellar joint 3.6 times, second flagellar joint 4 times as long as broad, further joints gradually shortening and slightly attenuating so that penultimate joint cubic.

Mesosoma in lateral view 1.66 times as long as high. In dorsal view 1.4 times broader than mesonotum between tegulae. Notaulix evenly deep, crenulated. Pronotum anteriorly rugose, its posterior third almost smooth and shiny. Mesonotum punctate, scutellum somewhat less punctate, interspaces shiny. Propodeum rugose, laterally with a pair of low tubercles. Sternaulix rugo-crenulated, otherwise mesopleuron with rather disperse punctation, interspaces shiny. Propodeum rugose, laterally with a pair of very low tubercles. Hind femur 3.75 times as long as broad. Hind tibia as long as hind tarsus. Hind basitarsus relatively long, i.e. as long as tarsal joints 2—4 (Fig. 12).

For wing about one-fifth shorter than body. Pterostigma 3.5—3.6 times as long as wide, issuing radial vein clearly distally from its middle; *r1* half as long as width of pterostigma, *r2* arched and ending far before tip of wing. Length of radial cell along metacarpal vein distinctly one-fifth shorter than that of pterostigma, *cuqu1* four times as long as *r1; d1* extremely short, i.e. nervulus just postfurcal. — First section of mediella only somewhat shorter than its second section (Fig. 25, see arrows).

Carapace in dorsal view long, 2.3 times as long as broad at its hind third (Fig. 19), in lateral view 3.7 times as long as high (Fig. 20). Pair of converging basal keels short, restricted to declivous base of carapace. Carapace apically bifid (Fig. 21) and moderately incurved, i.e. its ventral cavity one-sixth shorter than carapace itself (Fig. 24). First and second sutures indistinct. Carapace somewhat longitudinally rugulose. Ovipositor sheath short, in lateral view as long as hind tarsal joints 1—2.

Body black. Scape, pedicel and first two flagellar joints yellow, further two joints darkening to black, rest of flagellum black. Mandible yellow, apically blackish; palps yellowish. Tegulae brownish yellow. Wings hyaline; pterostigma brownish, veins yellowish-brownish. Legs yellow, coxae basally darkening.

♂. Similar to female. Carapace in dorsal view twice as long as broad, in lateral view 3.4—3.5 times as long as high, apically somewhat impressed (i. e. not bifid) and ventrally not incurved. Antenna with 23-24 joints. Ground colour of body brownish black, legs somewhat vivid yellow.

Host unknown.

Localities — Holotype ♀: "Korea, De Sang-san, 10 km NE Pyongyan, 1 VII 1977" (first label); "No. 332, netting in grasses, DELY et DRASKOVITS" (second label). — 2 ♂ paratypes: "Korea: Prov. Kengi: Bagyon san, Bagyon popo, about 27 km SW from Kaesong; 7 June 1970" (first label); "Hung. Zool. Exp. I. in Korea, No. 99, leg. Dr. S. MAHUNKA et Dr. H. STEINMANN" (second label).

Holotype (♀) and 2 ♂ paratypes are deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. Nos 7111 (holotype) and 7112—7113 (paratypes).

The new species, *Schizoprymnus cavernus* sp. n., runs to *S. elongatus* (SZÉPLIGETI, 1898) (Hungary, USSR) and to *S. cylindricus* ŠNOFLÁK, 1953 (Czechoslovakia) in the key of TOBIAS (1985). All three species are characterized by their elongated or cylindrical corporal form, their specific distinction is given in a tabular form:

S. cavernus sp. n.	*S. elongatus* (SZÉPL.)
1. Eye in dorsal view as long as temple. Frontal cavity unusually deep, frontal crest in the middle of cavity high (Fig. 17). Antenna with 27 joints.	1. Eye in dorsal view somewhat though distinctly longer than temple. Frontal cavity of normal depth, frontal crest in the middle of cavity low (Fig. 22). Antenna with 20 joints.

2. Carapace apico-ventrally curved, i.e. its ventral cavity one-sixth shorter than carapace itself (Fig. 24).
3. Carapace apically bifid (Fig. 21).
4. In lateral view eye about as wide as temple (Fig. 18, see arrows).

S. cavernus sp. n.

1. Frontal cavity unusually deep, frontal crest in the middle of cavity high (Fig. 17).
2. Antenna with 27 (♀) and 23—24 (♂) joints.
3. Hind basitarsus relatively long, i.e. as long as tarsal joints 2—4 (Fig. 12).
4. First section of mediella (or *M* + *Cu*) only somewhat longer than its second section (or *1-M*) (Fig. 25, see arrows); that of ♂ one-third longer.
5. Ventral cavity of ♀ long, one-sixth shorter than carapace itself; i.e. carapace apico-ventrally less incurved (Fig. 24).

2. Carapace apico-ventrally not incurved, i.e. its ventral cavity as long as carapace itself (Fig. 26).
3. Carapace apically circularly excised (Fig. 27).
4. In lateral view eye minutely wider than temple (Fig. 23, see arrows).

S. cylindricus (Šnofläk)

1. Frontal cavity of normal depth, frontal crest in middle of cavity low (cf. Fig. 22).
2. Antenna with 24 (♀) and 21—22 (♂) joints.
3. Hind basitarsus relatively short, i.e. shorter than tarsal joints 2—3 (Fig. 13).
4. First section of mediella (or *M* + *Cu*) nearly twice as long as its second section (or *1-M*) (Fig. 29, see arrows); that of ♂ distinctly twice longer.
5. Ventral cavity of ♀ less long, one-fifth shorter than carapace itself; i.e. carapace apico-ventrally more incurved (Fig. 28).

Schizoprymnus cavernus sp. n. is related also to *S. rufipes* (Herrich-Schäffer, 1838) (Palaearctic Region) by its cylindrical body, however, the two species may be distinguished by the following features:

S. cavernus sp. n.

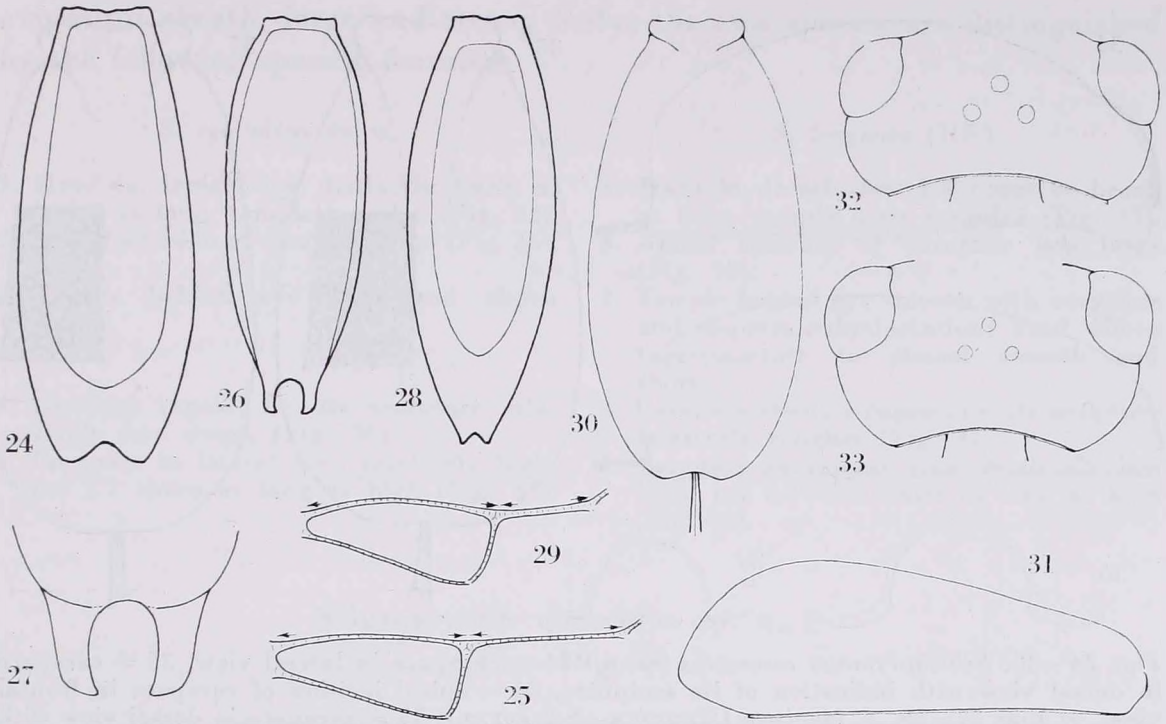
1. Carapace (♀) in dorsal view more elongated, 2.3 times as long as broad (Fig. 19); in lateral view relatively less high, 3.7 times as long as high (Fig. 20).
2. Frontal cavity deep, frontal crest in the middle of cavity high (Fig. 17).
3. Tarsi relatively long; hind basitarsus as long as tarsal joints 2—4 (Fig. 12).

S. rufipes (HS.)

1. Carapace (♀) in dorsal view less elongated, twice as long as broad (Fig. 30); in lateral view relatively high, 2.7—2.9 times as long as high (Fig. 31).
2. Frontal cavity of normal depth frontal crest in the middle of cavity low.
3. Tarsi relatively less long; hind basitarsus shorter than tarsal joints 2—4.

Schizoprymnus commotus sp. n. ♀
(Figs 32, 34—36)

♀. Body 5.1 mm long. — H e a d in dorsal view transverse (Fig. 32), twice broader than long, eye slightly protruding and somewhat longer than temple, latter rounded, occiput and temple carinated. Ocelli round, distance between fore and a hind ocelli as long as diameter of an ocellus; OOL twice as long as POL (Fig. 32). Eye in lateral view nearly as high as wide and as wide as temple. Malar space as long as basal width of mandible. Clypeus nearly as wide as face, 2.4 times wider than high, its lower margin weakly arched. Distance between tentorial pits almost twice as long as distance between a tentorial pit and lowest margin of eye. Face twice wider than high, inner

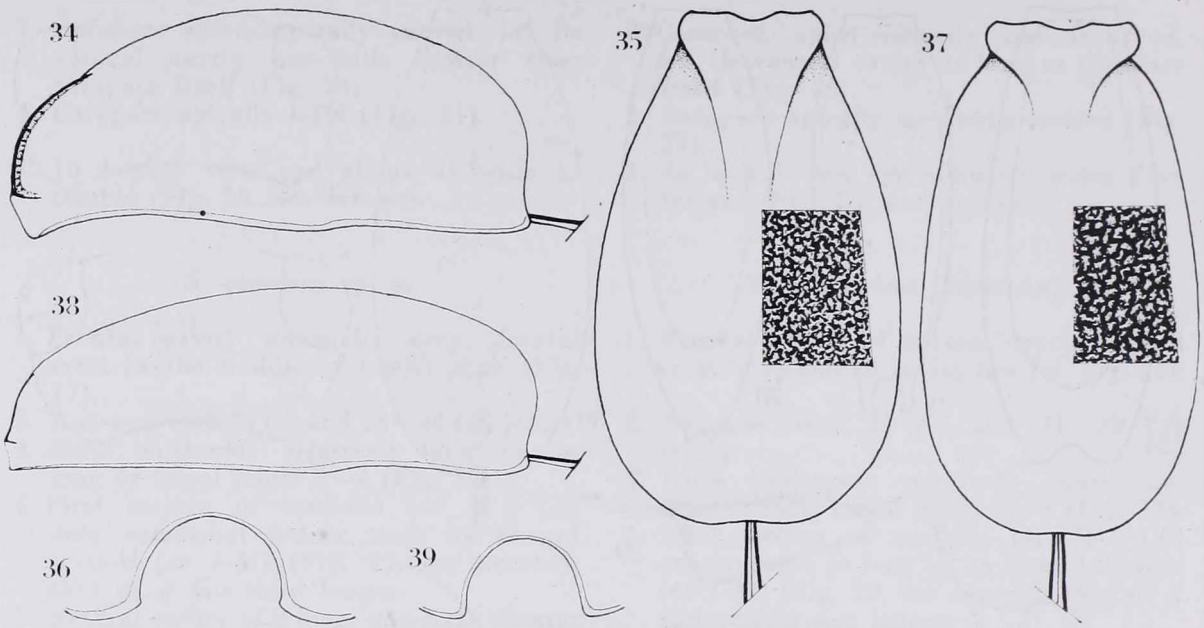


Figs 24—25. *Schizoprymnus cavernus* sp. n.: 24 = carapace from below, 25 = n. mediella and submediellan cell. — Figs 26—27. *S. elongatus* (Szépligeti): 26 = carapace from below, 27 = apical incision of carapace in frontal view. — Figs 28—29. *S. cylindricus* (Šnoflák): 28 = carapace from below, 29 = n. mediella and submediallan cell. — Figs 30—31. *S. rufipes* (Herrich—Schäffer): 30 = carapace in dorsal view, 31 = carapace in lateral view. — Figs 32—33. Head in dorsal view: 32 = *S. commotus* sp. n. and 33 = *S. longiseta* (Herrich—Schäffer)

margin of eyes ventrally somewhat diverging. Face densely punctate-rugose, otherwise head rugose to strongly rugose, occiput above carina and temple behind almost smooth, shiny. — Antenna as long as body, with 36 joints. Frontal cavity not deep, usual in size, frontal crest in the middle of cavity low. First two flagellar joints four times as long as broad, further joints gradually shortening and attenuating so that penultimate joint 1.5 times as long as broad.

Mesosoma in lateral view 1.5 times as long as high. Mesonotum between tegulae only somewhat less broad than head. Notaulix evenly deep, crenulated. Pronotum anteriorly scrobiculate, postero-laterally punctate and shiny. Mesonotum punctate, scutellum smooth with a few small punctures, interspaces shiny. Propodeum rugose-scabrose, laterally with a pair of low tubercles. Sternaulix wide and scrobiculate, otherwise mesopleuron punctate, interspaces shiny. Hind femur 3.2 times as long as broad. Hind tibia about one-sixth longer than hind tarsus. Hind basitarsus as long as tarsal joints 2—3.

Fore wing as long as body, pterostigma 3.3 times as long as wide and issuing radial vein from its middle; *r1* two-thirds as long as width of pterostigma, *r2* arched and ending far before tip of wing. Length of radial cell



Figs 34—36. *Schizoprymnus commotus* sp. n.: 34 = carapace in lateral view, 35 = carapace in dorsal view with indication of its sculpture, 36 = apical incision of carapace in frontal view. — Figs 37—39. *S. longiseta* (HERRICH—SCHÄFFER): 37 = carapace in dorsal view with indication of its sculpture, 38 = carapace in lateral view, 39 = apical incision of carapace in frontal view

along metacarpal vein slightly longer than that of pterostigma, *cuqu1* twice as long as *r1; d2* five times as long as *d1*. — First section of mediella almost twice as long as second section.

Carapace in dorsal view 1.66 times as long as broad (Fig. 35); in lateral view relatively high, 2.2 times as long as high (Fig. 34). Pair of basal keels strong, converging posteriorly and merging into sculpture before middle of carapace. Carapace apically with a large semicircular excision (Fig. 36), its rim not incurved. First and second sutures hardly distinct. Carapace evenly rugose (Fig. 35). Ovipositor sheath very long, about one-third longer than body.

Body and antenna black. Mandible brownish yellow, apically darkening, palpi yellowish. Scape below with a rusty streak. Tegulae yellow. Legs testaceous. Hind tibia black, basally whitish; last joint of fore and middle tarsi dark, entire hind tarsus black, basitarsus basally whitish. Wings hyaline. Pterostigma, parastigma and carpal vein black, further veins yellowish.

♂ and host unknown.

Locality — Holotype ♀: "Korea: Prov. Kanwon: Kum-gang san, environs of Hotel" (first label); "20. VIII. 1982, leg. BERON et POPOV, No. 12" (second label).

Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7100.

The new species, *Schizoprymnus commotus* sp. n., stands nearest to *S. longiseta* (HERRICH-SCHÄFFER, 1838) (Austria, Germany) with its long

ovipositor sheath, large and strong body; the two species are distinguished by the following specific features:

S. commotus sp. n.	*S. longiseta* (HS.)
1. Head in dorsal view distinctly twice as broad as long, temple rounded (Fig. 32).	1. Head in dorsal view 1.8 times as broad as long, temple more rounded (Fig. 33).
2. Apical excision of carapace large (Fig. 36).	2. Apical excision of carapace less large (Fig. 39).
3. Temple behind eye and head above rugose.	3. Temple behind eye smooth with very fine and disperse subpunctation; head above rugo-punctate to almost smooth and shiny.
4. Carapace rugose, i.e. its sculpture relatively less rough (Fig. 35).	4. Carapace areolate-rugose, i.e. its sculpture relatively rougher (Fig. 37).
5. Carapace in lateral view relatively high, i.e. 2.2 times as long as high (Fig. 34).	5. Carapace in lateral view relatively less high, i.e. 2.4—2.5 times as long as high (Fig. 38).

Schizoprymus querculus sp. n. ♀
(Figs 40—45)

♀. Body rather stout, 2.2—2.3 mm long. — Head in dorsal view transverse (Fig. 40), twice as broad as long, eye somewhat longer than temple, latter contracted, occiput weakly excavated, temple and occiput with weak carina. Ocelli small and round, distance between fore and a hind ocelli almost twice as long as diameter of an ocellus; OOL somewhat longer than POL (Fig. 40). Eye in lateral view minutely wider than temple. Malar space somewhat longer than base of mandible. Clypeus twice wider below than high medially, its lower margin bisinuate. Distance between tentorial pits almost twice greater than distance between a tentorial pit and lowest margin of eye. Face twice wider than high, inner margin of eyes parallel. Head polished, face and clypeus punctate, punctation around base of antenna somewhat denser, interspaces shiny. — Antenna about one-fourth shorter than body, with 20 joints. First two flagellar joints thrice as long as broad, further joints gradually shortening so that flagellar joints 11—16 subcubic (i.e. 1.2—1.1 times as long as broad), penultimate three joints somewhat attenuating so that 1.3—1.2 times as long as broad (Fig. 41).

Mesosoma in lateral view stout, slightly longer than high. In dorsal view head 1.2 times broader than mesonotum between tegulae. Notaulix evenly deep and finely crenulated. Pronotum anteriorly striated, posterior third smooth and shiny. Mesonotum finely and dispersely punctate, interspaces shiny. Propodeum rugose, laterally with a pair of low tubercles. Hind femur (Fig. 42) thickened, 2.6—2.7 times as long as broad. Hind tibia somewhat longer than hind tarsus. Hind tarsus short, basitarsus just shorter than tarsal joints 2—3 together (Fig. 42).

Fore wing somewhat shorter than body. Pterostigma 2.6—3 times as

long as wide, issuing radial vein more or less distally from its middle; *r1* shorter than half width of pterostigma, *r2* arched and ending far before tip of wing. Length of radial cell along metacarpal vein one-third shorter than that of pterostigma, section of metacarp beyond radial cell about one-third shorter than within radial cell; *cuqu1* distinctly thrice as long as *r1*; *d2* five times as long as *d1*. — First section of mediella one-fifth longer than second section.

Carapace globoid, as long as to slightly shorter than mesosoma; in dorsal view 1.7—1.8 times as long as broad; in lateral view (Fig. 43) convex, twice as long as high about its middle. Pair of keels short and restricted to basal declivous part of carapace. First suture distinct, second suture less distinct. Carapace apically weakly excised, without lateral dentation (Fig. 44), not incurved ventrally (i. e. ventral cavity as long as carapace itself). Carapace rather longitudinally strio-rugose, third tergite medially with a narrow and longitudinal, almost smooth to polished field. Ovipositor sheath in lateral view somewhat though distinctly longer than carapace.

Ground colour of body black. Scape, pedicel and flagellar joints 1—2 yellow, flagellar joints 3—4(—5) darkening, further joints black (holotype ♀), or flagellum proximo-distally darkening to black (2 ♀ paratypes). Mandible yellow, apically blackish; palpi yellowish. Tegulae brown. Legs yellow to vivid yellow, coxae basally brownish fumous, hind tibia apically and entire hind tarsus more or less dark fumous. Wings hyaline; pterostigma brownish, veins yellowish brownish.

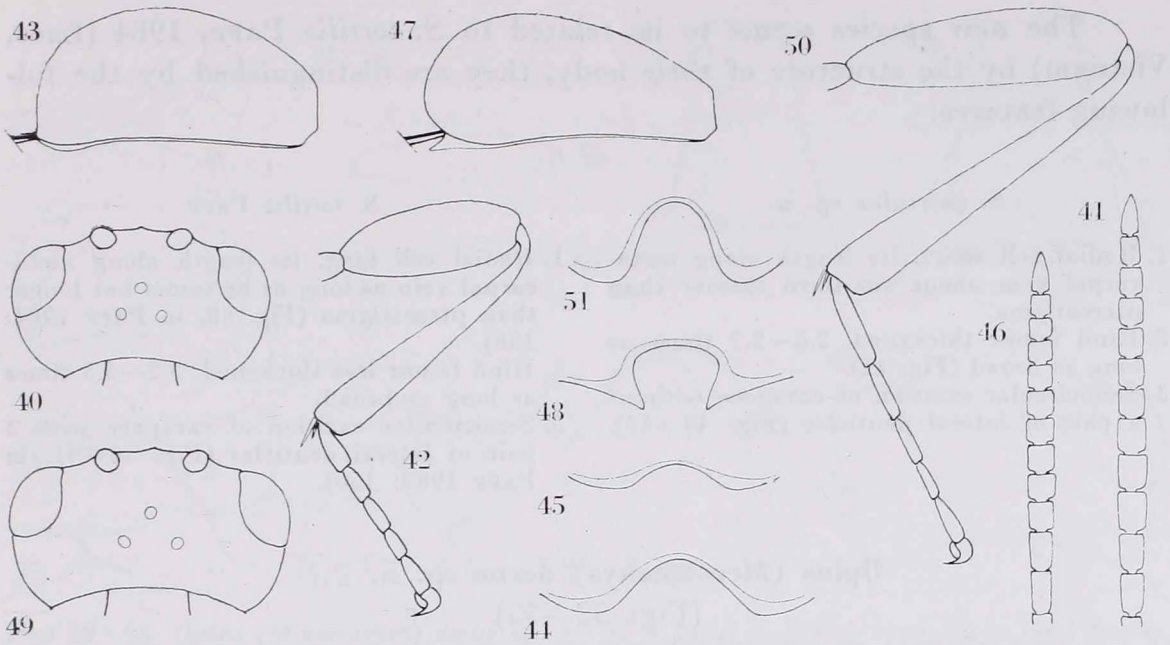
♂. Similar to female. Body 2.1 mm long. Antenna with 19 joints. Every flagellar joint distinctly longer than broad, first flagellar joint 3.6—3.7 times, second flagellar joint four times, further joints gradually shortening so that penultimate joint 1.6—1.7 times as long as broad. Carapace in dorsal view 1.5 times as long as broad, in lateral view less convex than that of female, 2.8—2.9 times as long as high. Apical rim of carapace faintly excised (Fig. 45). Ground colour of body brownish black. Legs rather vivid yellow.

Host unknown.

Localities — 1. Holotype ♀: "Korea, Prov. South Pyongan, Pyongyan, Hotel garden, 31 Aug. 1971" (first label); "No. 225, leg. S. HORVATOVICH et J. PAPP" (second label). — 2. 1 ♂ paratype: "Korea, Prov. South Pyongan, Mang-yong-dae, 5 Aug. 1971" (first label); "No. 139, leg. S. HORVATOVICH et J. PAPP" (second label). — 3. 1 ♀ paratype: "Korea, Prov. South Pyongyang, Lake Taesong-ho" (first label); "11 IX 1979, leg. Dr. H. STEINMANN et Dr. T. VÁSÁRHELYI, No. 528" (second label). — 4. 1 ♀ paratype: "Korea, Prov. Kangwon, near Lake Samilpo" (first label); "29 IX 1979, leg. Dr. H. STEINMANN et Dr. T. VÁSÁRHELYI, No. 603" (second label).

Holotype (♀) and 3 paratypes (2 ♀ + 1 ♂) are deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ No. 7114 (holotype) and 7115—7117 (paratypes).

The new species, *Schizoprymnus querculus* sp. n., is readily allied to *S. tantalus* PAPP, 1981 (Hungary, Greece, Turkey) and to *S. arcuatus* TOBIAS, 1976 (European part of the USSR), the three species are distinguished by the features expounded in a tabular form:



Figs 40—45. *Schizoprymnus querculus* sp. n.: 40 = head in dorsal view, 41 = antennal joints 9—20, 42 = hind leg, 43 = carapace in lateral view, 44—45 = apical incision of carapace of ♀ (44) and ♂ (45) in frontal view. — Figs 46—47. *S. tantalus* PAPP: 46 = antennal joints 7—18, 47 = carapace in lateral view, 48 = apical incision of carapace in frontal view. — Figs 49—51. *S. arcuatus* TOBIAS: 49 = head in dorsal view, 50 = hind leg, 51 = apical incision of carapace in frontal view

S. querculus sp. n.

1. Carapace in lateral view more convex, twice as long as high about its middle (Fig. 43).
2. Apical margin of carapace weakly excised, laterally without dentation (Figs 44—45).
3. Flagellar joints 11—16 subcubic, 1.2—1.1 times, and penultimate three joints of antenna 1.3—1.2 times as long as broad (Fig. 41).
4. Ovipositor sheath somewhat though distinctly longer than carapace.
5. Legs yellow, coxae basally faintly brownish fumous.

S. tantalus PAPP

1. Carapace in lateral view less convex, 2.1—2.3 times as long as at its hind third (Fig. 47).
2. Apical margin of carapace semicircularly excised and laterally dentated (Fig. 48).
3. Penultimate 9—10 joints of antenna cubic (Fig. 46).
4. Ovipositor sheath in lateral view shorter than carapace, i.e. as long as three-fourths to five-sixths of carapace.
5. Legs dark brown with yellow(ish) pattern on fore femur and all tibiae.

S. querculus sp. n.

1. Apical margin of carapace weakly excised (Figs 44—45).
2. Hind tarsus short, basitarsus shorter than tarsal joints 2—3 together (Fig. 42).
3. Temple in dorsal view contracted (Fig. 40).
4. Femora thickened, hind femur 2.6—2.7 times as long as broad (Fig. 42).
5. Legs vivid yellow, coxae basally brownish fumous.

S. arcuatus TOBIAS

1. Apical margin of carapace strongly excised (Fig. 51).
2. Hind tarsus not short, i.e. usual in size, basitarsus as long as tarsal joints 2—3 together (Fig. 50).
3. Temple in dorsal view rounded (Fig. 49).
4. Femora not thickened, hind femur 3.9 times as long as broad (Fig. 50).
5. Legs reddish yellow, coxae blackish to brown, femora and tibiae with more or less dark pattern.

The new species seems to be related to *S. tortilis* PAPP, 1984 (Laos, Vietnam) by the structure of their body, they are distinguished by the following features:

S. querculus sp. n.

1. Radial cell short, its length along metacarpal vein about one-third shorter than pterostigma.
2. Hind femur thickened, 2.6—2.7 times as long as broad (Fig. 42).
3. Semicircular excision of carapace without a pair of lateral denticles (Figs 44—45).

S. tortilis PAPP

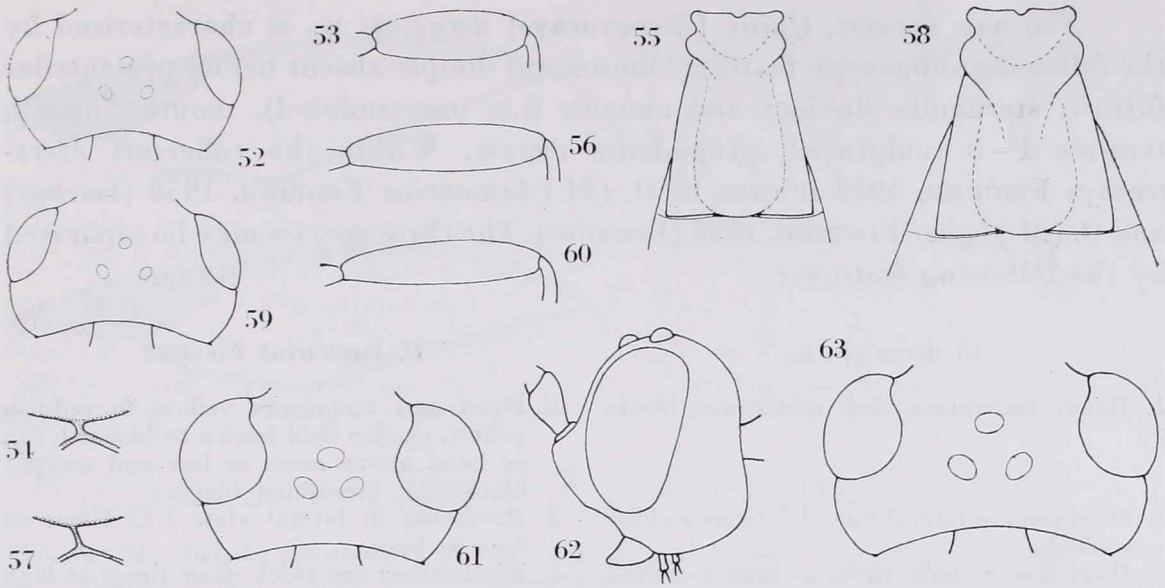
1. Radial cell long, its length along metacarpal vein as long as or somewhat longer than pterostigma (Fig. 68, in PAPP 1984: 156).
2. Hind femur less thickened, 3.2—3.5 times as long as broad.
3. Semicircular excision of carapace with a pair of lateral denticles (Figs 70—71, in PAPP 1984: 156).

Opius (Merotrachys) derus sp. n. ♀♂
(Figs 52—55)

♀. Body elongated, 2.2 mm long. — H e a d in dorsal view transverse (Fig. 52), 1.8 times as broad as long, eye twice as long as temple, latter constricted, occiput moderately excavated, temple carinated, occiput not carinated. Ocelli small, distance between fore and a hind ocelli 1.6—1.7 times as long as diameter of fore ocellus; OOL distinctly twice greater than POL. In lateral view eye 1.7 times higher than wide, and 1.3 times wider than temple, latter widest somewhat ventrally from its middle. Malar space as long as basal width of mandible. Toruli as far to each other as to eye. Face 1.55 times wider than high, inner margin of eye parallel. Clypeus almost four times wider below than high medially, its lower margin truncate. Distance between tentorial pits clearly twice greater than distance between tentorial pit and lowest margin of eye. Mandible gradually broadening basally. Mouth open. In lateral view maxillary palp about as long as height of head. Head polished, clypeus uneven. — A n t e n n a somewhat longer than body, with 26 joints. First flagellar joint four times as long as broad, further joints gradually shortening so that penultimate joint twice as long as broad.

Mesosoma elongated, in lateral view 1.5 times as long as high. Mesonotum minutely longer than wide between tegulae, mesonotal dimple absent, notaulix less deep and restricted to declivous part of mesonotum. Prescutellar furrow finely crenulated. Sternaulix linearly impressed. Mesosoma polished, propodeum rugose, metapleuron uneven to subrugulose. Hind femur thick, thrice as long as broad (Fig. 53). Hind tarsus somewhat longer than hind tibia; hind basitarsus as long as hind tarsal joints 2—3.

Fore wing somehat longer than body. Pterostigma six times as long as wide, issuing radial vein from its proximal third; *r1* very short (Fig. 54), *r2* twice as long as *cuqu1*, *r3* reaching tip of wing and distinctly twice as long



Figs 52—55. *Opius* (*Merotrachys*) *derus* sp. n.: 52 = head in dorsal view, 53 = hind femur, 54 = *r1*, 55 = first tergite. — Figs 56—58. *O.* (*M.*) *laetatorius* FISCHER: 56 = hind femur, 57 = *r1*, 58 = first tergite. — Figs 59—60. *O.* (*M.*) *beieri* FISCHER: 59 = head in dorsal view, 60 = hind femur. — Figs 61—62. *Aleiodes territatus* sp. n.: 61 = head in dorsal view, 62 = head in lateral view. — Fig. 63. *A. schewyrewi* (KOKUJEV): head in dorsal view

as *r2*, *Cu2* narrowing distally. *N. rec.* postfurcal, somewhat shorter than *d*, *d1* very short, *B* closed.

Metasoma nearly as long as head and mesosoma together. First tergite (Fig. 55) 1.3 times longer than broad at hind, moderately broadening posteriorly, i.e. 1.5 times wider behind than basally. Basal pair of keels short and merging into rugosity. First tergite evenly rugose, second and third tergites subrugulose-coriaceous, further tergites polished. Second tergite almost quadrate, somewhat wider behind than long medially, further tergites transverse. In lateral view hypopygium large, ovipositor sheath as long as first tergite.

Ground colour of body black. Clypeus, cheek and mandible yellow, latter apically brown. Palps pale. Scape yellowish, apically brownish black, pedicel and flagellum blackish. Tegula yellow. Second tergite with brownish tint. Legs yellow, fifth joint of tarsi 1—2 and entire tarsus 3 dark fumous. Wings, hyaline, pterostigma greyish-brownish, veins light brownish.

♂. Similar to female. Body 2 mm long. Antenna distinctly longer than body, with 25 joints, penultimate joint somewhat more than twice as long as broad.

Host unknown.

Locality — Holotype ♀ and 1 ♂ paratype: "Korea, Pyongyang City, Mt. Daesong-san" (first label); "1. VI. 1985, leg. VOJNITS et ZOMBORI, No. 970" (second label).

Holotype and 1 paratype are deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. Nos 7118 (holotype) and 7119 (paratype).

The new species, *Opius* (*Merotrachys*) *derus* sp. n., is characterized by the following subgeneric features: mesonotal dimple absent before prescutellar furrow, sternaulix distinct and smooth (i.e. uncrenulated), mouth "open", tergites 1—3 sculptured, propodeum rugose. Within the subgenus *Merotrachys* FISCHER, 1973 it runs to *O.* (*M.*) *laetatorius* FISCHER, 1958 (Europe) and *O.* (*M.*) *beieri* FISCHER, 1968 (Ecuador). The three species may be separated by the following features:

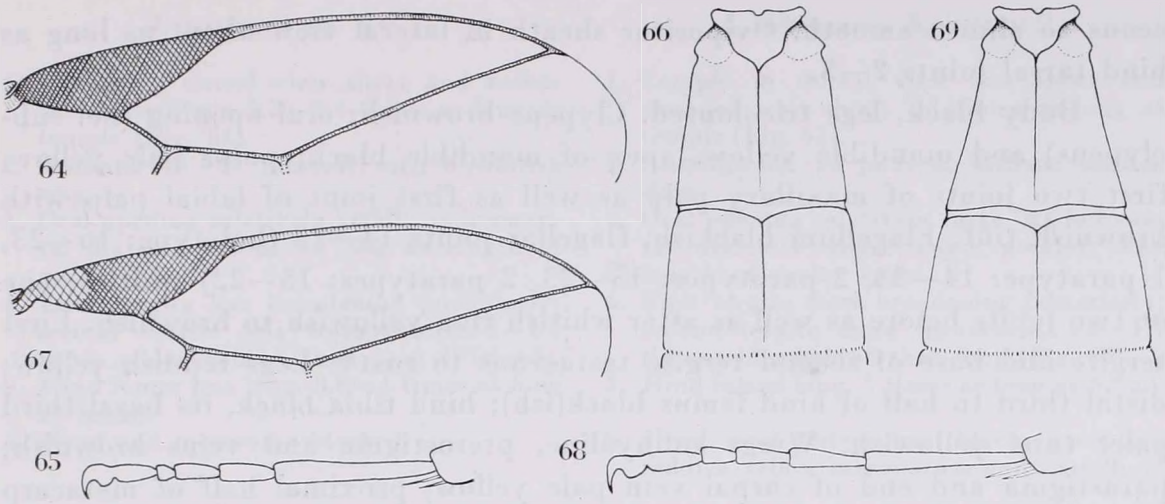
O. derus sp. n.	*O. laetatorius* FISCHER
1. Head, mesosoma and metasoma black.	1. Head and metasoma yellow to reddish yellow, ocellar field brown to blackish (♀), or head above more or less and occiput black(ish); mesosoma black.
2. Mesosoma in lateral view 1.5 times as long as high.	2. Mesosoma in lateral view 1.25 times as long as high.
3. Hind femur thick, thrice as long as broad (Fig. 53).	3. Hind femur not thick, four times as long as broad (Fig. 56).
4. Antenna with 26 (♀) and 25 (♂) joints.	4. Antenna with 28—32 joints.
5. First tergite relatively small, 1.3 times as long as broad at hind; broadening posteriorly, i.e. 1.5 times wider behind than at base; pair of basal keels short, merging into rugosity clearly before middle of tergite (Fig. 55).	5. First tergite relatively large, 1.2 times as long as broad at hind; more broadening posteriorly i.e. 1.6 times wider behind than at base; pair of basal keels long, merging into rugosity at about middle of tergite (Fig. 58).

O. derus sp. n.	*O. beieri* FISCHER
1. In dorsal view eye twice as long as temple, latter constricted (Fig. 52).	1. In dorsal view eye distinctly 1.3 times as long as temple, latter rounded (Fig. 59).
2. Hind femur thick, thrice as long as broad (Fig. 53); hind tarsus somewhat though clearly longer than hind tibia.	2. Hind femur not thick, five times as long as broad (Fig. 60); hind tarsus as long as hind tibia.
3. Antenna with 25—26 joints (♀♂); first flagellar joint four times as long as broad.	3. Antenna with 26—29 joints (♀♂); first flagellar joint 3.5 times as long as broad.
4. First tergite 1.3 times longer than broad at hind (Fig. 55).	4. First tergite as long as broad at hind.

Aleiodes (Neorhogas) territatus sp. n. ♀
(Figs 61—62, 64—66)

♀. Body 6—7 mm long. — H e a d in dorsal view (Fig. 61) transverse, 2.3—2.4 times broader than long, eye 1.8—2 times as long as temple, latter rather constricted. Ocelli elliptic and of medium size, distance between fore and a hind ocelli shorter than greatest diameter of hind ocellus; OOL about one-third longer than POL (Fig. 61). Eye in lateral view 1.8—1.9 times as high as wide; temple widening ventrally and behind mandible its margin convex (Fig. 62). Face 1.6—1.7(—1.8) times wider than high, inner margin of eyes slightly diverging ventrally. Oral opening of medium size, its horizontal (or greatest) diameter about as long as length of malar space. Maxillar palp about one-quarter longer than height of head. Head nearly evenly rugose

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA



Figs 64—66. *Aleiodes territatus* sp. n.: 64 = distal part of right fore wing, 65 = hind tarsus, 66 = tergites 1—2. — Figs 67—68. (after KUSIGEMATI 1983) *A. tashimai* (KUSIGEMATI): 67 = distal part of right fore wing, 68 = hind tarsus. — Fig. 69. *A. schewyrewi* (KOKUJEV): tergites 1—2

with striate element. — Antenna about as long as body, with 44 (holotype) or 44—43 joints (paratypes, 44: 4 ♀, 43: 1 ♀). First flagellar joint 1.5—1.6 times as long as broad, further 11—14 joints gradually shortening so that rest of joints subcubic, i.e. indistinctly longer than broad.

Mesosoma in lateral view 1.7 times as long as high. Mesonotum between tegulae as broad as width of head. Pronotum anteriorly rugose, posterolaterally crenulo-rugose. Mesonotum and scutellum dull, coriaceous with fine and disperse punctation. Propodeum strongly rugose. Mesopleuron shiny with fine punctation, epipleuron and sternaulix rugose. Hind femur 3.8—4 times as long as broad at about middle; hind tibia one-fifth longer than hind tarsus. Fourth joint of hind tarsus unusually short, i.e. cubic, in lateral view as long as high; third joint twice longer than fourth joint (Fig. 65).

Fore wing somewhat shorter than body. Pterostigma (Fig. 64) 3.3—3.4 times as long as wide, issuing radial vein somewhat proximally from its middle; *r1* slightly shorter than width of pterostigma, *r2* clearly 1.5 times as long as *cuqu1*, *r3* 2.4—2.5 times as long as *r2* and approaching tip of wing. *N. rec.* antefurcal. Nervellus issuing from about first quarter of discoidal vein. Radial cell of hind wing widening distally.

Metasoma somewhat longer than head and mesosoma together. First tergite (Fig. 66) as long as wide at hind, its sides less broadening posteriorly, i.e. its hind breadth about one-third greater than basal breadth; second tergite less transverse, 1.4—1.5 times wider behind than long; third tergite twice wider basally than long, its hind margin convex. Further tergites smaller and clearly transverse. Tergites 1—2 longitudinally rugose, tergite 3 with similar sculpture but posteriorly somewhat weakening, further tergites faintly coria-

ceous to almost smooth. Ovipositor sheath in lateral view about as long as hind tarsal joints 2—3.

Body black, legs tricoloured. Clypeus brownish; oral opening (i.e. subclypeus) and mandible yellow, apex of mandible black; palps pale yellow, first two joints of maxillary palp as well as first joint of labial palp with brownish tint. Flagellum blackish, flagellar joints 14—23 (holotype: 16—23, 1 paratype: 14—23, 2 paratypes: 15—23, 2 paratypes: 15—22) whitish, one or two joints before as well as after whitish ring yellowish to brownish. First tergite and base of second tergite testaceous to rusty. Legs reddish yellow; distal third to half of hind femur black(ish); hind tibia black, its basal third pale; tarsi yellowish. Wings subhyaline, pterostigma and veins brownish; parastigma and end of carpal vein pale yellow, proximal half of metacarp yellowish.

♂ and host unknown.

Localities — Holotype ♀: "Korea, Prov. Gang-von, district On-dzong, Kum-gang san, near Hotel Go-song, 250 m" (first label); "No. 319, 5 August 1975, leg. J. PAPP et A. VOJNITS" (second label). — 3 ♀ paratypes: locality data the same as for the holotype, No. 315, 4 August 1975, collectors the same persons. — 1 ♀ paratype: locality data the same as for the holotype, No. 322, 6 August 1975, collectors the same persons. — 1 ♀ paratype: "Korea, Prov. North Pyongan, Mt. Myohyang-san" (first label), "18 VIII 1982, leg. BERON et POPOV, No. 3." (second label).

Holotype (♀) and 5 ♀ paratypes are deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. Nos 7120 (holotype) and 7121—7125 (paratypes).

The new species, *Aleiodes* (*Neorhogas*) *territatus* sp. n., seems to be related to *A. tashimai* KUSIGEMATI, 1983 (Japan), the distinctive features of the two species are tabulated below:

A. territatus sp. n. ♀	*A. tashimai* KUSIGEMATI ♀♂
1. Antenna with 43—44 joints, first flagellar joint 1.5—1.6 times longer than broad, further flagellar joints up to 12—15 shortening so that rest of joints subcubic, i.e. hardly longer than broad; flagellar joints 14—23 witish, one or two joints before and after whitish ring yellowish to brownish.	1. Antenna with 51—54 (♀) and 49—53 (♂) joints flagellar joint 2—2.3 times (♀) and 2.1—2.3 times (♂) longer than broad, further flagellar joints shortening so that penultimate joint 1.6 times longer than broad; flagellar joints 18–20—29–37 whitish.
2. OOL as long as greatest diameter of hind ocellus (Fig. 61).	2. OOL distinctly shorter than greatest diameter of a hind ocellus.
3. Radial vein approaching tip of wing (Fig. 64).	3. Radial vein reaching tip of wing (Fig. 67).
4. Fourth joint of hind tarsus cubic, i.e. in lateral view as long as high, third joint twice longer than fourth joint (Fig. 65).	4. Fourth joint of hind tarsus long, in lateral view twice longer than high, third joint 1.5—1.6 times longer than fourth joint (Fig. 68).

In Telenga's key for the species of the genus *Aleiodes* (= *Rogas* auct.) of the USSR (TELENGA 1941) it runs to *A. schewyrewi* (KOKUJEV, 1898) (West China, Mongolia), the two species may be distinguished by the following features:

A. territatus sp. n. ♀

1. Temple in dorsal view short and rather constricted, eye 2.3—2.4 times as long as temple (Fig. 61).
2. Antenna 43—45 jointed, with a whitish ring.
3. Oral opening relatively small, its horizontal diameter about as long as length of malar space.
4. First tergite less broadening posteriorly; second tergite less transverse, 1.4—1.5 times wider behind than long (Fig. 66).
5. Hind femur less long, 3.8—4 times as long as broad.
6. Head and mesosoma black.

A. schewyrewi KOKUJEV ♀

1. Temple in dorsal view less short and rounded, eye about 1.3 times as long as temple (Fig. 63).
2. Antenna 50—54 jointed, without whitish ring.
3. Oral opening relatively large, its horizontal diameter about twice greater than length of malar space.
4. First tergite more broadening posteriorly; second tergite more transverse, 1.6—1.7 times wider behind than long (Fig. 69).
5. Hind femur long, 5 times as long as broad.
6. Head and mesosoma black excepting reddish yellow mesonotum and scutellum.

REFERENCES

KUSIGEMATI, K. (1983): A new braconid-parasite of Scopula epirrhoë Prout (Hymenoptera). — Mem. Fac. Agr. Kagoshima Univ. **19:** 115—117.

PAPP, J. (1977): Braconidae (Hymenoptera) from Mongolia. VI. — Folia ent. hung. **30** (1) (ser. n.): 109—118.

PAPP, J. (1978): Braconidae (Hymneoptera) from Korea. III. — Acta zool. hung. **14** (1—2): 133—148.

PAPP, J. (1979): New Opius Wesm. species from Hungary and Czechoslovakia (Hymenoptera, Braconidae, Opiinae). II. — Acta zool. hung. **25:** 347—356.

PAPP, J. (1980): Braconidae (Hymenoptera) from Korea, IV. — Acta zool. hung. **26** (1—3): 197—210.

PAPP, J. (1981): New species of Braconidae from the Hortobágy National Park, Hungary (Hymenoptera). — Acta zool. hung. **27** (3—4): 369—379.

PAPP, J. (1985): Braconidae (Hymenoptera) from Korea, VII. — Acta zool. hung. **31** (4): 341—365.

PAPP, J. (1986): Aleiodes (Aleiodes) sudatorius sp. n. from the Hortobágy National Park, Hungary (Hymenoptera, Braconidae: Rogadinae). — Acta zool. hung. **32** (1—2): 137—140.

ŠNOFLÁK, J. (1953): La monographie de Triaspis Hal. (Hym. Bracon.) de la Tchécoslovaquie. — Acta ent. Mus. natn. Pragae **28** (417) (1952): 285—395.

(TELENGA, N. A.) Теленга Н. А. 1941: Насекомые перепончатокрылые, Braconidae. — Фауна СССР, **5** (3): I—XVII + 1—466.

(TOBIAS, V. I.) Тобиас. В. И. (1966): Новые виды браконид (Hymenoptera, Braconidae). — Труды Зоол. Инст. **37:** 111—131.

(TOBIAS, V. I.) Тобиас, В. И. (1986): Перепончатокрылые. Четвертая часть. — Определитель Насекомцх Европейской Части СССР **3:** 1—501.

(Further references see in Papp 1985)

Acta Zoologica Hungarica 35 (1—2), pp. 105—109 (1989)

A NEW APTEROUS SPHAEROCERID FLY FROM THAILAND (DIPTERA: SPHAEROCERIDAE)

L. PAPP

Zoological Department, Hungarian Natural History Museum, H-1088 Budapest, Baross utca 13, Hungary

(Received March 17, 1988)

Minocellina thaii sp. n. is described from sifted materials collected in Thailand with remarks on its possible relegation to the genus *Aptilotus* Mik. With 6 original figures.

The sphaerocerid fauna of the Oriental Region has been the least known one among the big zoogeographical regions. The most remarkable feature of the data published in HACKMAN's catalog (1977) for the earlier literature is a lack of knowledge on apterous or brachypterous forms. However, in the last decade several species of the reduced-winged sphaerocerids were also described (e.g. PAPP 1981). For apterous forms, collectings by sifting and funnelling deserve special attention, so collecting activities of A. SMETANA (BRI, Ottawa, see e.g. MARSHALL 1987) and those of the research workers of the Muséum d'Histoire naturelle Genève resulted in the discovery of numerous interesting species: one of them is described below.

This new species belongs to the genus *Minocellina* L. PAPP, 1981, which was described as a monotypical genus to include an apterous species. If this new species is compared to the type-species, *Minocellina besucheti* L. PAPP, 1981, it is seen, that the reduction in bristles is probably a comparatively quick process in this group in an evolutionary scale of time (Fig. 1, vs. Fig. 1 of PAPP 1981). In the course of recent taxonomical studies in several genera of the subfamily Limosininae, an increasing number of data has been revealed to verify a foreknowledge that the true relationships among reduced-winged forms are to be effectively analyzed by studies on genital features only. Dr. S. A. MARSHALL (pers. comm.) has found that several reduced-winged forms would belong to the genus *Aptilotus* MIK, 1898 (described as monotypic, type-species *A. paradoxus* MIK, 1898, a European species), though a formal synonymization has not been made.

A c k n o w l e d g e m e n t s — I sincerely thank Drs I. LÖBL and D. H. BURCKHARDT of the Département d'Entomologie, Muséum d'Histoire naturelle Genève, providing me with materials from their collectings, including

this type-series. I am indebted to Dr. STEVEN A. MARSHALL, Dept of Environmental Biology, University of Guelph, Canada, for his comments on the taxonomical position of this new species.

Minocellina thaii sp. n.
(Figs 1—6)

Body length: holotype male 1.15 mm, paratypes 1.15 to 1.40 mm.

Body and legs dark brown, only tarsomeres 1—4 yellow or reddish yellow.

Head comparatively large but much less wide than abdomen, somewhat higher than long. Eyes rather large, longitudinal axis 3.6 times as long as smallest genal width but gena much widening posteriorad (cf. Fig. 1 of PAPP 1981). Ocelli minute or not visible. Frons with a pair of silvery bands connecting bases of *vti* and antennae, frontal (ocellar) triangle enlarged, with silvery pollen at least on a sagittal stripe. Lunule continued anteriorly into a sharp pointed, triangular tubercle between and below antennae, facial plate deeply concave below this tubercle (as a cavity). Mouth edge much protruding in profile. Facial cavity, peristomalia and anterior part of genae shining. Antennae normal, 0.125 mm long, arista 0.40 mm, with moderately long cilia. First antennal segment with a strong anteriorly projecting bristle, 2nd segment with a subapical row of long (ca. 0.10—0.11 mm) bristles. No orbital bristles, ocellars long (0.14—0.16 mm!) and upright, *vti* even longer, *vte* very short. Vibrissae long and thick (ca. 0.16 mm).

Thorax less wide than abdomen, with a big emargination (a deep long cavity) through posterior parts of pleura (Fig. 1) to receive mid and hind femora when at rest. Scutellum 0.115×0.33 mm, i.e. only half as long as wide. Thoracic chaetotaxy: no humeral (i.e. not longer than *acmi*); 2 *np*, 1 *prst* and 1 *sa* not longer than mesonotal microchaetae; 1 very strong *pa;* 1 prescutellar *dc;* 1 *st*. Acrostichals in ca. 4 unarranged rows. Apical scutellar bristle long (almost 0.2 mm), perpendicular to the plane of scutellum, and widely separated from each other (distance 0.20—0.24 mm), lateral scutellars much shorter (0.09—0.10 mm) and thinner. Legs short (Fig. 1), all tarsomeres comparatively very short (e.g. fore tarsi shorter than tibia). Fore tibia with a distinct dorsal preapical seta. Mid femur with a ventrally directed spine-like anterior bristle preapically (like in *M. besucheti*). Mid tibia with a moderately long ventroapical, no medial ventral bristle. One anterodorsal each at distal 6/7 and proximally at 2/7 of tibial length, a short anteroventral to pair distal anterodorsal. Hind tibia with a short (ca. 0.05 mm) ventral spur. No wings or halteres.

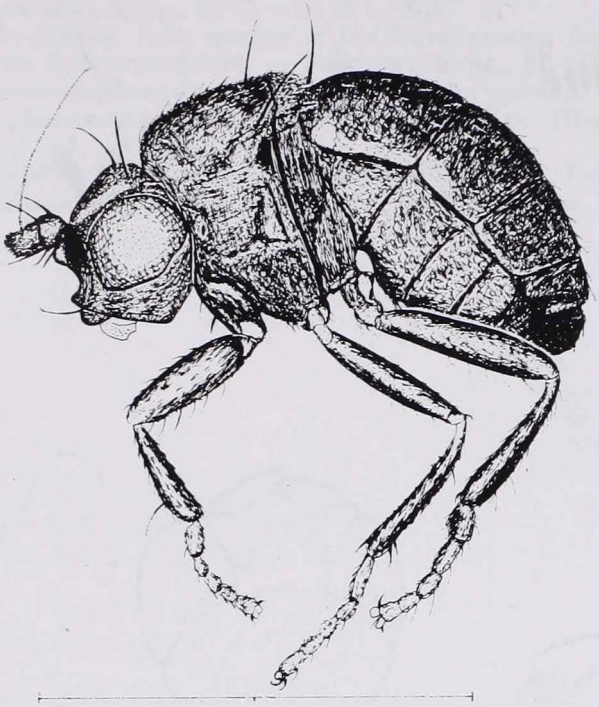


Fig. 1. *Minocellina thaii* sp. n., paratype male (scale: 1.0 mm)

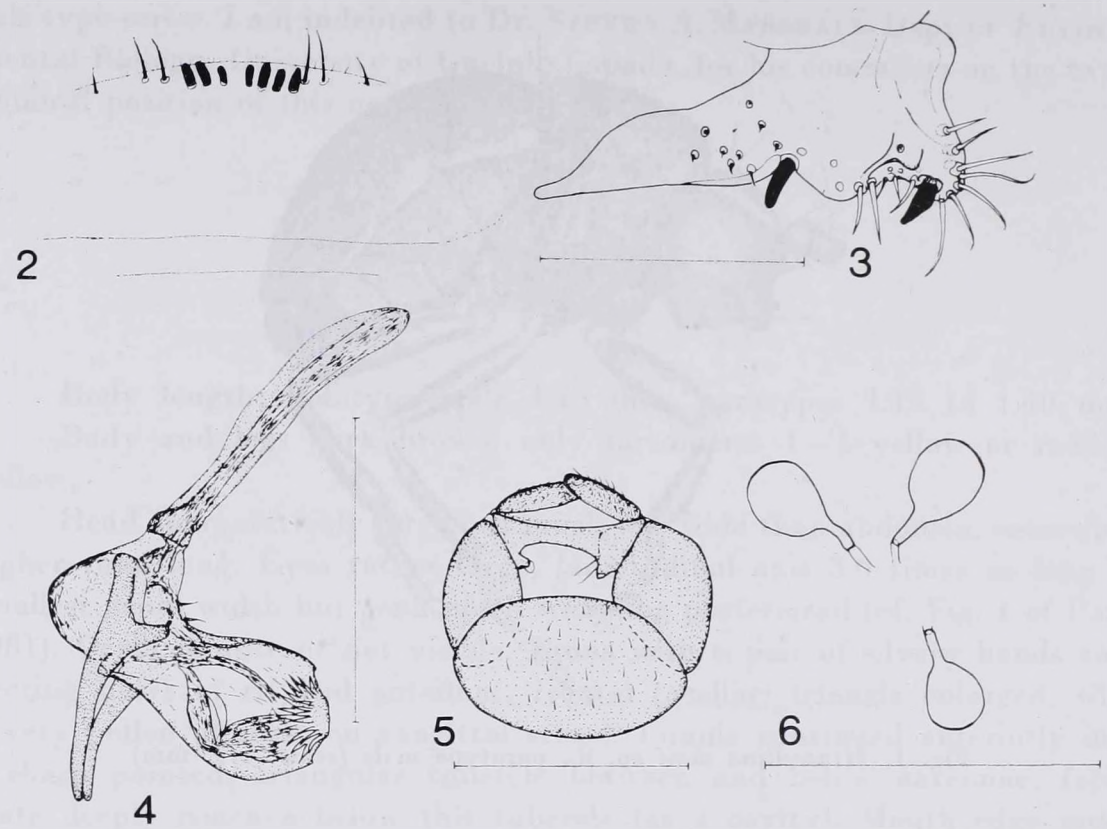
Abdominal terga heavily chitinized with evenly distributed, moderately long (ca. 0.04 mm) but not thin bristles, sterna almost as wide as terga in both sexes. Abdomen strongly convex (Fig. 1).

Male sternite 5 without long marginal bristles but with 7(8) posteromedial denticles (Fig. 2), which are blunt contrarily to those of *M. besucheti*. Surstyli (Fig. 3) with a large anterior lobe each, which is narrowed but not pointed cranially; surstyli without long bristles, ventral blunt thorns of surstylus very short compared to those of *M. besucheti* (Fig. 3 vs. Fig. 3 of PAPP 1981). Aedeagal complex (Fig. 4) with normal aedeagal apodeme but with a big phallophore; postgonites long thin and only slightly curved (nearly straight apically). Distiphallus apically with a radial structure of numerous rays in two concentric rows.

Female postabdominal segments very short and hidden in preabdomen. Sternite 8 rather large, widely rounded apically (Fig. 5) without any bristles (with small hairs only), cerci short. Spermathecae globular, ball-shaped, and very small without any pecularities (Fig. 6).

H o l o t y p e male: Thailand, Doi Inthanon, 2500 m, 9. XI. 1985, leg. I. LÖBL et D. H. BURCKHARDT (No. 18: "ravin en forêt très humide; tamisage de feuilles mortes, branches pourries et mousses"). — P a r a t y p e s: 11 ♂, 6 ♀: data same as for the holotype.

The holotype and a majority of the paratypes are deposited in the collection of the Département d'Entomologie, Muséum d'Histoire naturelle Genève, 4 male and 2 female paratypes in the Hungarian Natural History Museum. — The type series had been preserved in alcohol after its collecting and they were mounted on minutia pins in the course of description.



Figs 2—6. *Minocellina thaii* sp. n.: 2 = caudal part of male S_5, 3 = surstylus, lateral view, 4 = aedeagal complex, 5 = female terminalia, caudal view, 6 = spermathecae. — Scales: 0.1 mm for Figs 2—3, 0.2 mm for Figs 3—5

R e m a r k — *Minocellina thaii* sp. n. is a highly characteristic minute species. Although it is undoubtedly congeneric with *Minocellina besucheti* L. PAPP, 1981, they are not closely related. *M. thaii* sp. n. is even smaller and its setae are even more reduced (e.g. it has no upper orbitals). Its male surstylus (Fig. 3) is much shorter with shorter bristles, more resembling to some *Aptilotus* species, described as *Paralimosina* by PAPP & ROHÁCEK (1981); postgonites are less curved (almost straight apically). Female terminalia are much different again: though sternite 8 is rather large but comparatively smaller than that of *M. besucheti* and there are very short setulae only on sternite 8. Female cerci are short without long hairs. Spermathecae (Fig. 6) are resembling to those of *Aptilotus beckeri* (Duda) (cf. ROHÁČEK 1983).

REFERENCES

HACKMAN, W. (1977): Family Sphaeroceridae (Borboridae). — In: M. D. DELFINADO & D. E. HARDY (eds): A Catalog of the Diptera of the Oriental Region, **3:** 388—405.

MARSHALL, S. A. (1987): A review of the Holarctic genus Terrilimosina (Diptera: Sphaeroceridae), with descriptions of new species from Nepal and Japan. — Proc. ent. Soc. Wash., **89** (3): 502—511.

PAPP, L. (1981): Two new genera of the apterous and subapterous Sphaeroceridae (Diptera) from India. — Acta zool. hung., **27** (3—4): 381—388.

PAPP, L. & ROHÁČEK, J. (1981): New species of the Paralimosina beckeri-group from the Canary Is. (Diptera: Sphaeroceridae). — Folia ent. hung., **42** (34) (2): 143—154.

ROHÁČEK, J. (1983): A monograph and re-classification of the previous genus Limosina Macquart (Diptera, Sphaeroceridae) of Europe. — Beitr. Ent. (Berlin), **33** (1): 3—195, **33** (2): 203—255.

ROHÁČEK, J. & PAPP, L. (1988): A review of the genus Paralimosina L. Papp (Diptera, Sphaeroceridae), with descriptions of ten new species. — *Annls hist.—nat. Mus. natn. hung.*, **80:** 105—143.

Acta Zoologica Hungarica 35 (1—2), pp. 111—141 (1989)

TAXONOMIC STUDIES ON THE GENUS AUTOPHILA HÜBNER, 1823 (LEPIDOPTERA, NOCTUIDAE), II.*

L. RONKAY

Zoological Department, Hungarian Natural History Museum
H-1088 Budapest, Baross utca 13, Hungary

(Received 30 September, 1987)

The description of three new species (*Autophila cinnamonea*, *A. iranica*, *A. xenomima* spp. n.), seven new subspecies (*A. depressa pakistana*, *A. banghaasi geghardica*, *A. subfusca latistria*, *A. subfusca brandti*, *A. asiatica mienshana*, *A. inconspicua altaica* and *A. maculifera calligrapha* sspp. n.); the survey of the *limbata-subfusca* group and the redescription of *Autophila tancrei* BOURSIN, 1940. With 74 original figures and 3 photoplates.

In the first part of this series the taxonomic position of the genus and its closest relatives was discussed. It was stated by the arguments based on morphological, zoogeographical and ethological studies that the genus *Autophila* belongs to the subfamily Othreinae. Besides the higher taxonomy of the genus the descriptions of new taxa and the results of the studies on the *libanotica-depressa* pair of species were also published.

The second part contains the results of the further investigations on extensive Asian material originating from Turkey, Iran, Afghanistan, Pakistan, China and Mongolia.

The main part of this paper is the detailed survey of the *limbata-subfusca* group with the characterization of the whole group, the identification keys based on the genitalia of both sexes and the descriptions of the new taxa belonging to this group.

The second chapter consists of the descriptions of further new species and subspecies while the third chapter is the redescription of *Autophila tancrei* BOURSIN, 1940, with the diagnosis of the previously unknown male and the illustrations of the unpublished genitalia of both sexes of *tancrei*.

In addition, the genitalia of several species are illustrated here for the first time and the photos of the species described in the first part of the series are published also in this paper. The references connected with this topic have been listed in the first part of the series.

I would like to express my thanks to Mrs. E. VARTIAN (Vienna), Dr. M. HONEY and E. P. WILTSHIRE (London), Dr. B. GUSTAFSSON and A. MOBERG

* Part I.: Acta zool. hung. 32 (1—2): 141—159 (1986).

(Stockholm), M. FIBIGER (Sorø), G. EBERT (Karlsruhe), Dr. W. DIERL (Munich); Dr. D. STÜNING (Bonn), H. HACKER (Staffelstein), G. BEHOUNEK (Deisenhofen), Prof. Dr. C. NAUMANN (Bielefeld), Prof. Dr. H.-J. HANNEMANN (Berlin), Dr. F. KASY (Vienna), P. SAMMUT (Rabat, Malta), Dr. Z. VARGA and Dr. A. VOJNITS (Budapest) for their kind help.

I. THE LIMBATA-SUBFUSCA GROUP

This group consists of twelve known species and their races which belong to two main evolutionary lines. The first line (the *limbata* subgroup) is represented by the species as follows: *limbata*, *sinesafida*, *iranica* sp. n., *banghaasi*, *luxuriosa* and *eurytaenia*, having well developed peniculi and a strong, beak-shaped distal processus on the ventral side of aedeagus. The second line (the *subfusca* subgroup) can be characterized by the reduction of peniculi and the less sclerotized, rounded distal end of aedeagus. This subgroup contains the following species: *subfusca*, *laetifica*, *cryptica*, *xenomima* sp. n. and *eremochroa*. One of the species belonging to the discussed group, *xena*, shows an intermediate stage between the two subgroups since the peniculi are reduced — the feature of the *subfusca* group — but the configuration of the aedeagus is the same in type as that of the *limbata* subgroup and the external appearance of it resembles *luxuriosa* or *eurytaenia* much more than any of the members of the *subfusca* subgroup. And, as the successive abbreviation of peniculi can be observed in different races of *luxuriosa* and in case of the undescribed subspecies of *eurytaenia* — according to the conclusion of the previous article — this disputed species should be considered as a modified member of the *limbata* subgroup, representing the result of a partly parallel development.

The group can be characterized with the medium or a little bit smaller size, an ochreous-brownish ground colour of the fore wing with strong shine, the conspicuous pattern and the usually intensive darker suffusion of the fore wing, a bright ochreous underside with wide darker marginal area and sometimes with cellular lunules or obsolescent transversal lines. In the configuration of the male genitalia — besides the features mentioned in the separation of the two subgroups — the well developed editum and the usually large saccular extension are typical for this group. The saccular extension can be either flattened or bilobate; an interesting asymmetry may appear in some species in the configuration of both the editum and the saccular extension. The characteristic features of the female genitalia are the sclerotized lamina or the pocket-like appendage of the ostium bursae and the conspicuous, ribbon-like or wide, moon- or U-shaped signum.

The species group has a widespread distribution from W Europe to Central Asia but the majority of the *limbata* subgroup has an Anatolian-Iranian range and the species *limbata* has the westernmost and *xena* the

easternmost area. The taxa of the *subfusca* subgroup are distributed in Iran, Soviet Turkestan, Afghanistan. The species belonging to this group inhabit semi-desert (or desert) and xeromontane steppe habitats.

SYNOPSIS

limbata STAUDINGER, 1871 (= limbata parnassicola DRAUDT, 1934, **syn. n.:** = dilucida praeclara SCHAWERDA, 1917, **syn. n.**)
ssp. from Sicily (under description)
sinesafida WILTSHIRE, 1952
iranica sp. n.
banghaasi BOURSIN, 1940
ssp. *geghardica* ssp. n.
luxuriosa ZERNY, 1933
ssp. *cyprogena* BOURSIN, 1940
ssp. *taurica* BOURSIN, 1940
ssp. *elbursica* BOURSIN, 1940
ssp. *clara* WILTSHIRE, 1952
ssp. *hormuza* WILTSHIRE, 1977
eurytaenia BOURSIN, 1963
ssp. from SW Iran (undescribed)
xena RONKAY, 1986
subfusca (CHRISTOPH, 1893)
ssp. *latistria* ssp. n.
ssp. *brandti* ssp. n.
laetifica (STAUDINGER, 1888)
cryptica RONKAY, 1986
xenomima sp. n.
eremochroa BOURSIN, 1940

Key for species based on the characteristics of the male genitalia (the male of *xenomima* sp. n. is unknown)

1 (12) Peniculi present
2 (3) Peniculi straight (Figs 9—14) **banghaasi** BOURSIN, 1940
3 (2) Peniculi curved
4 (9) Distal processus of aedeagus without small teeth
5 (6) Saccular extensions symmetric, large and rounded (Figs 1—2) **limbata** STAUDINGER, 1871
6 (5) Saccular extensions more or less asymmetric, smaller with more pointed lobes
7 (8) Valvae shorter and wider, saccular extensions strongly asymmetric, partly furcate **eurytaenia** BOURSIN, 1963
8 (7) Valvae longer and narrower, saccular extensions less asymmetric, bilobate with longer inner lobe (Figs 15—19) **luxuriosa** ZERNY, 1933
9 (4) Distal processus of aedeagus with small teeth
10 (11) Peniculi short, saccular extensions laminate, editum with recurved and more pointed apex, distal processus of aedeagus shorter (Figs 3—4) **sinesafida** WILTSHIRE, 1952
11 (10) Peniculi long and strong, saccular extensions finely bilobate with essentially larger inner lobe, editum without recurved apical part, distal processus of aedeagus longer (Figs 5—8) **iranica** sp. n.
12 (1) Peniculi absent
13 (14) Aedeagus with beak-shaped distal processus (Figs 36—37) **xena** RONKAY, 1986
14 (13) Aedeagus without beak-shaped distal processus (at most a less sclerotized, rounded plate)
15 (16) Saccular extensions strongly asymmetric (Figs 41—42) **laetifica** (STAUDINGER, 1888)
16 (15) Saccular extensions not or only slightly asymmetric
17 (18) Saccular extensions narrow and bar-shaped, originated very near to ventral margin, aedeagus more robust and less arcuate (Figs 44—51) **subfusca** (CHRISTOPH, 1893)
18 (17) Saccular extensions wider and flattened, originated far from ventral margin, aedeagus more gracile and arcuate
19 (20) Saccular extensions large with strongly acute outer part (Figs 38—39) **cryptica** RONKAY, 1986
20 (19) Saccular extensions much shorter with more or less rounded apices (Figs 34—35) **eremochroa** BOURSIN, 1940

Key for species based on the characteristics of the female genitalia (the female genitalia of *eremochroa* BOURSIN is still unknown)

1 (4) Ostium bursae with only a sclerotized lamina
2 (3) Signum short and narrow, ductus bursae with two disjunct, sclerotized rings (Figs 20—21) **iranica** sp. n.
3 (2) Signum large, wide and arcuate, proximal part of ductus bursae less sclerotized, nearly homogenous (Fig. 24) **limbata** STAUDINGER, 1871
4 (1) Ostium bursae with a pocket or sac-like, sclerotized appendage
5 (10) Signum large and wide, more or less curved
6 (7) Ostial appendage narrow and elongate, signum relatively short and slightly curved (Figs 32—33) **subfusca** (CHRISTOPH, 1893)
7 (6) Ostial appendage large and round(ed), signum longer and strongly curved
8 (9) Ostial appendage semiglobular, apex bursae finely granulose, signum nearly symmetric, C- or U-shaped (Figs 29—30) **luxuriosa** ZERNY, 1933
9 (8) Ostial appendage rounded but flattened, apex bursae membranous and slightly rugulose, signum strongly asymmetric, "boomerang-shaped" (Fig. 28) **eurytaenia** BOURSIN, 1963
10 (5) Signum ribbon-like, narrow, of variable shape
11 (14) Ostial appendage large and entirely sclerotized
12 (13) Caudal part of ductus bursae and apex bursae strongly sclerotized, ductus bursae with only a narrow membranous ring at middle (Fig. 22) **sinesafida** WILTSHIRE, 1952
13 (12) Caudal part of ductus bursae with only a weakly sclerotized medial stripe, apex bursae folded or rugulose but without strongly sclerotized part (Figs 25—27) **banghaasi** BOURSIN, 1940
14 (11) Ostial appendage smaller, elongate with a strongly sclerotized part only
15 (16) Ductus bursae entirely membranous, short (Fig. 23) **xena** RONKAY, 1986
16 (15) Ductus bursae significantly longer with more or less strongly sclerotized parts
17 (20) Ostial appendage sac-like with stronger, triangular apex, ductus bursae with a sclerotized lateral lamina
18 (19) Apex bursae sclerotized, less rugulose, signum very long and wider (Fig. 31) **xenomima** sp. n.
19 (18) Apex bursae membranous and strongly rugulose, signum shorter and narrower (Fig. 40) **cryptica** RONKAY, 1986
20 (17) Ostial appendage with rounded and less sclerotized apex, ductus bursae with sclerotized maculae but without sclerotized lateral plate (Fig. 43) **laetifica** (STAUDINGER, 1888)

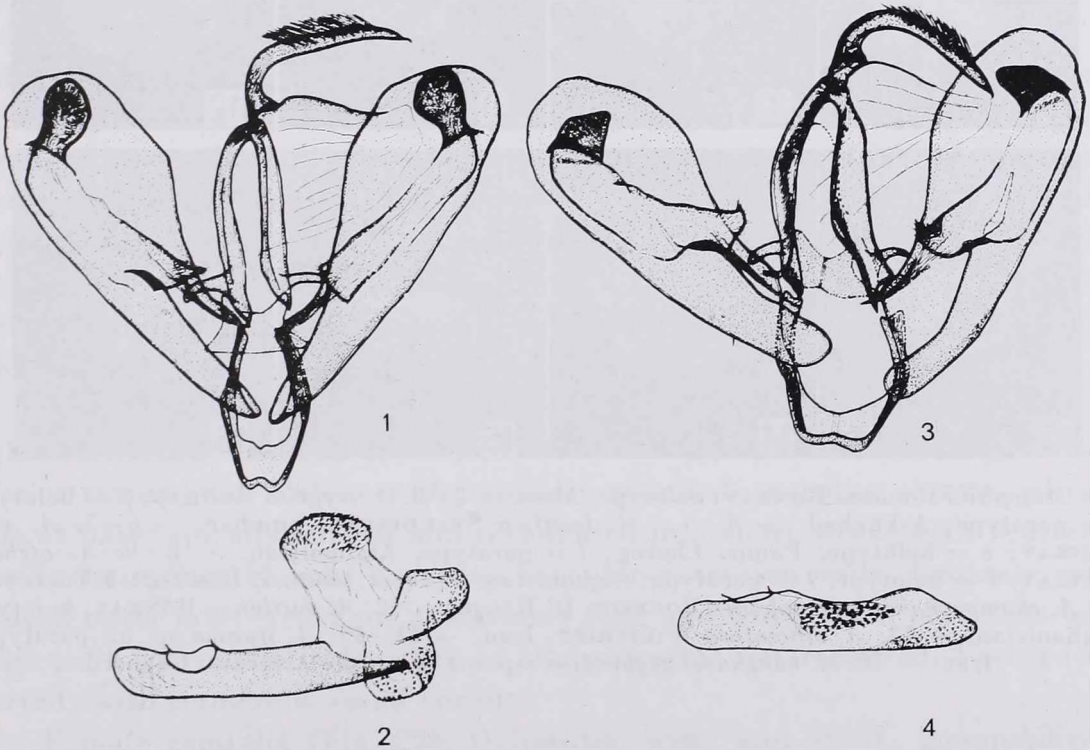
Redescription of *Autophila sinesafida* Wiltshire, 1952

This very interesting and rare species was described by a single — and unfortunately worn — male specimen, based on the male genitalia which were different from those of the related *A. banghaasi*. Further data of this species has not been published. In the material of the Brandt collection (Zoological Museum, Stockholm) a fresh female specimen was found which has the external features agreeing with the — recognizable — characters of the holotype of *sinesafida* and the genitalia are different from those of all the known *Autophila* species. Its collecting locality is near to the type locality of the discussed species. These facts suggest that the female specimen is conspecific with the holotype of *sinesafida*. The redescription of this species, beside the characterization of the newly discovered female, is important for the satisfactory comparison of this species and the new species, *A. iranica*.

Autophila sinesafida WILTSHIRE, 1952
(Plate I: 13)

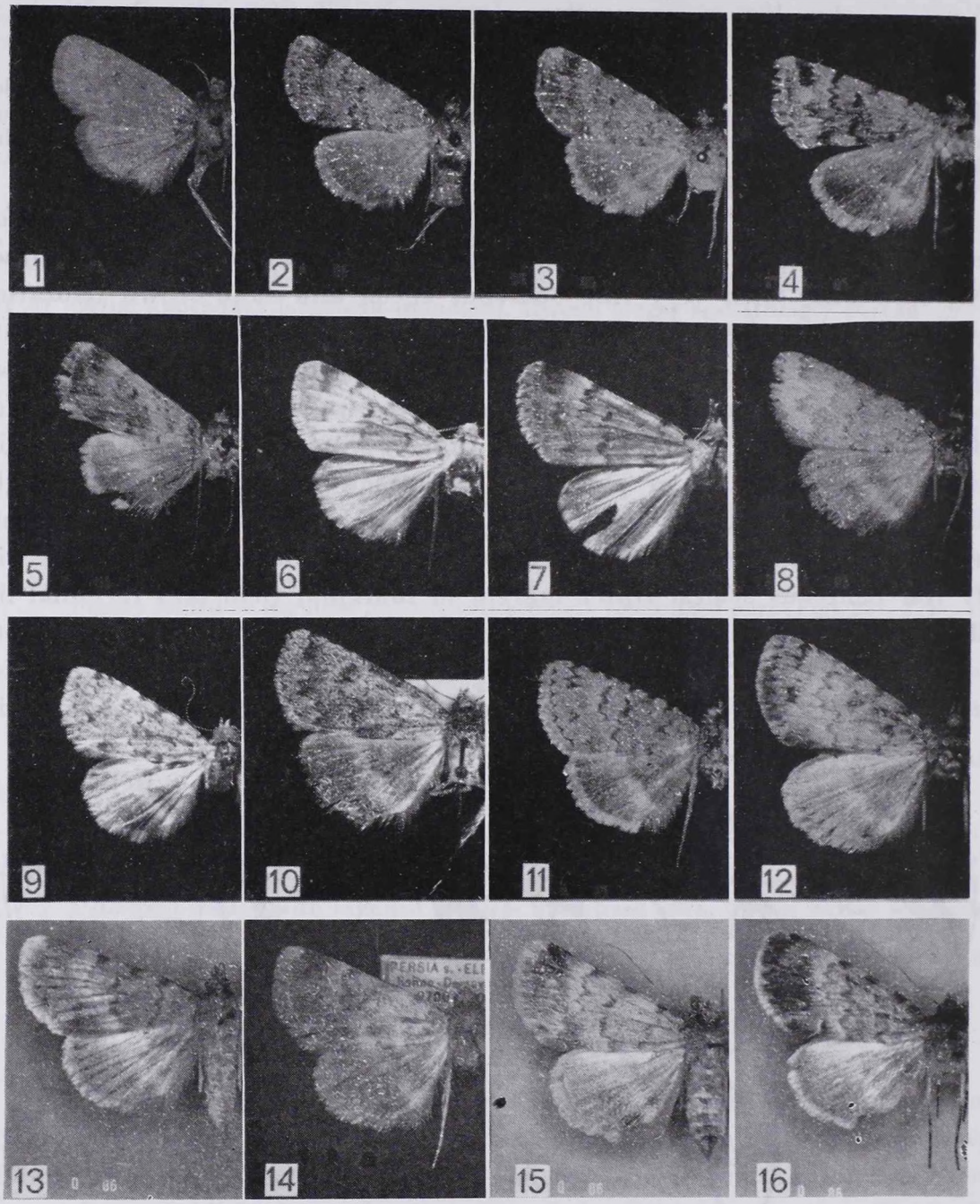
Examined material: holotype male, by the photos of the specimen (colour slides of both the upper and underside) and the genitalia; 1 female, Iran, Fars, Str. Ardekan-Talochosroe, Comée (Barm-i-Firus), 3750 m, 4—5 July 1937, coll. BRANDT (ZM Stockholm), slide No. 1967 RONKAY.

Alar expanse 42 mm, length of fore wing 20 mm. Head, thorax and fore wing light ochreous grey with darker hairs on vertex, collar and thoracic crest, fore wing with very fine ochreous sheen and sand-brown irroration. Dark pattern of wing relatively pale, brownish, subbasal line absent, antemedial line oblique, dentate, with a large spot at costa, basal area with brownish shadow at middle. Medial line obsolescent but with strong costal patch, orbicular spot absent, reniform a fine, slightly arcuate spot, postmedial line sinuous or serrated, upper part of it arcuate, lower part nearly straight, oblique, costal spot large. Subterminal line pale, ochreous, strongly serrate, partly covered by brown, marginal area wide and dark brown mixed with only few ochreous scales. Outer margin of marginal field and terminal line yellowish, inner side of cilia light orange-brown, spotted with brown, outer side lighter, ochreous. Hind wing pale ochreous-white with some light greyish, inner area finely covered with brown mostly on veins, transversal line wide

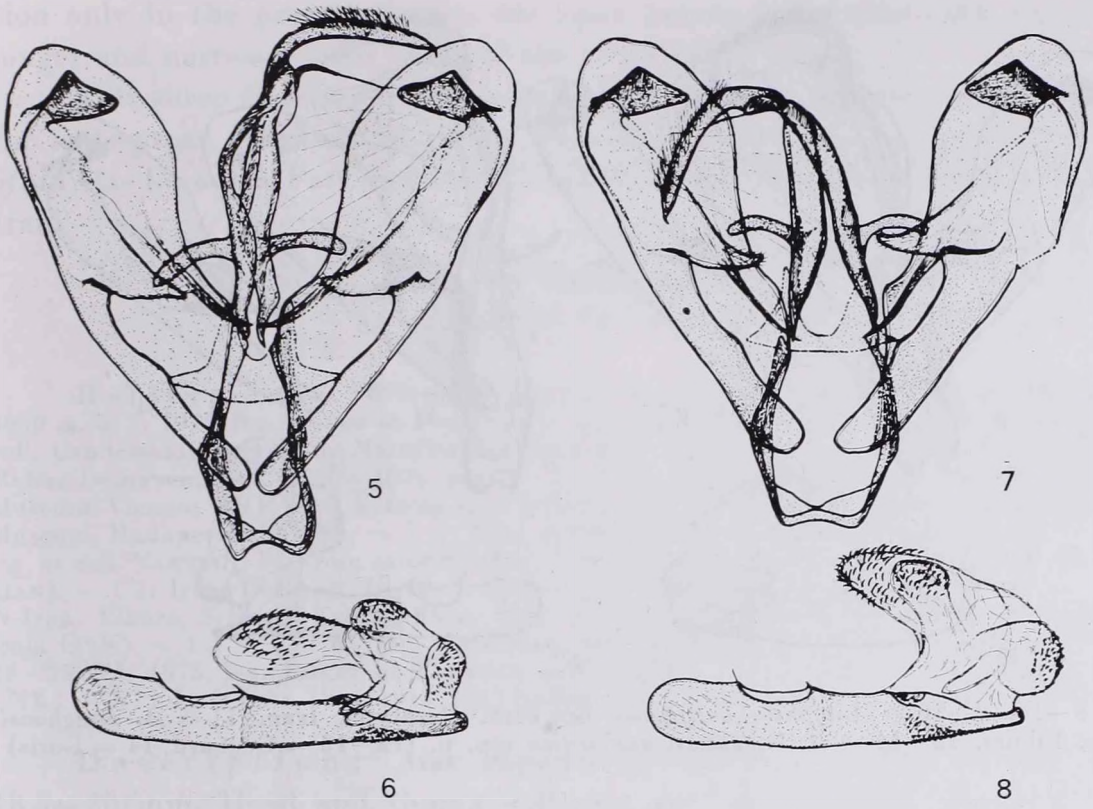


Figs 1—4. 1—2 = *Autophila limbata* STAUDINGER, Mostar (Holotype of *dilucida praeclara* SCHAWERDA). 3—4 = *A. sinesafida* WILTSHIRE, Holotype, Iran, Fars

Plate I.



1 = *Autophila simulata* RONKAY: holotype, Aksu. — 2—3. *A. cryptica* RONKAY: 2 = holotype, 3 = paratype; Askhabad. — 4—5 = *A. laetifica* STAUDINGER, Sumbar. — 6—7. *A. xena* RONKAY: 6 = holotype, Pamir, Chorog, 7 = paratype, Afghanistan. — 8—9. *A. afghana* RONKAY: 8 = holotype, 9 = paratype; Afghanistan. — 10. *A. plattneri* BOURSIN, E Turkey. — 11. *A. chamaephanes macrophanes* BOURSIN, Ili Range. — 12. *A. vartianae* RONKAY: holotype, Afghanistan. — 13. *A. sinesafida* WILTSHIRE, Iran. — 14—15. *A. iranica* sp. n.: paratypes, Iran. — 16. *A. banghaasi geghardica* ssp. n.: holotype, Armenia: Geghard.

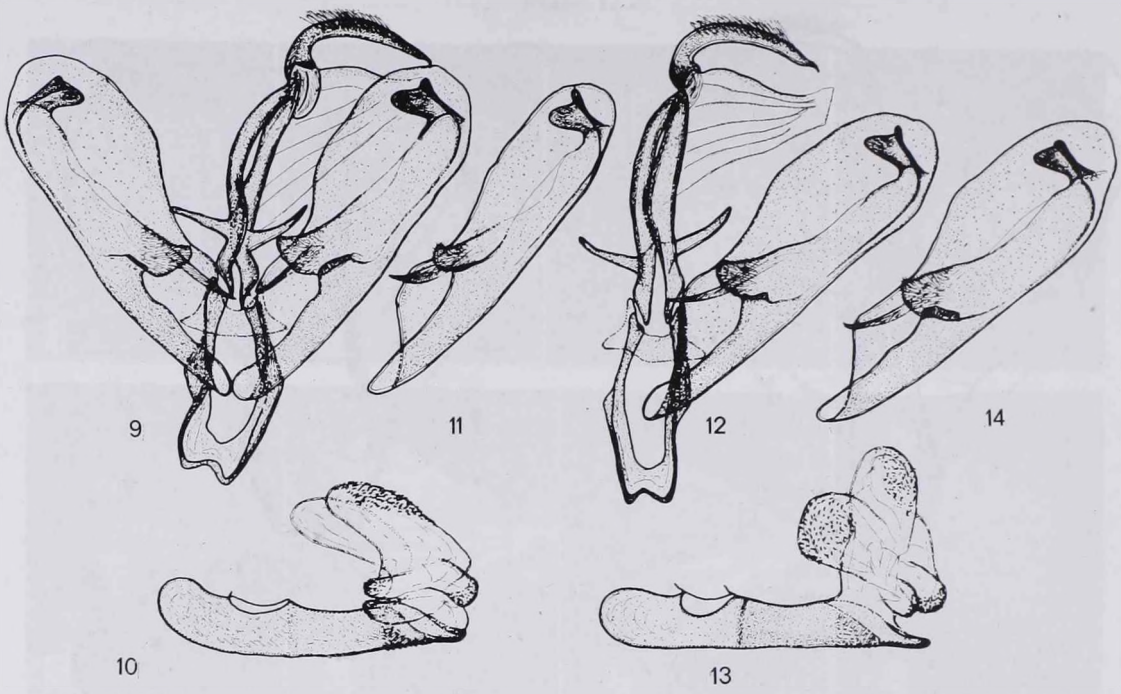


Figs 5—8. 5—6 = *Autophila iranica* sp. n., Holotype, W-Iran, 7—8 = ditto, paratype, Iran, Elburs

and diffuse, cellular lunule only very slightly visible, marginal field very wide, outer part darker, inner part with some lighter irroration, veins darker. Terminal line yellowish, cilia whitish with ochreous inner side and some pale brownish spots. Underside of both wings pale whitish-ochreous, cellular lunules and transversal lines absent, only costal spot of postmedial line can be seen. Marginal field wide, dark brown with serrated inner margin; veins partly covered with ochreous scales. Terminal line orange, cilia whitish ochreous.

Male genitalia (Figs 3—4): Uncus long and curved, slender, tegumen high and narrow, peniculi short and arcuate. Vinculum wide, strong, fultura inferior trapezoidal. Valvae wide, apically rounded, sacculus narrow, editum wide at base, apically curved and terminated in a short peak, with scattered sensory hairs mostly near to apex. Saccular extension wide, laminate with reduced outer lobe. Aedeagus moderately long and wide, distal processus with small teeth on ventral side, apex of the processus not recurved. Vesica (not everted) with numerous small cornuti.

Female genitalia (Fig. 22): Ovipositor wide and short, gonapophyses slender, relatively long. Ostium bursae membranous, with a large, strongly sclerotized and granulose, pocket-like appendage. Caudal part of ductus



Figs 9—14. 9—10 = *Autophila banghaasi* BOURSIN, Paratype, Iran. 11 = *A. banghaasi*, Iran, Elburs. 12—14 = *A. banghaasi geghardica* ssp. n. (12—13 = Geghard, 14 = Goris)

bursae sclerotized, with much stronger margins, proximal part with stronger laminae, these two parts connected with a narrow, membranous ring. Apex bursae nearly smooth, sclerotized, corpus bursae membranous, elliptical, signum short, ribbon-like.

This species is similar in its appearance to *iranica* and *banghaasi*, but differs from the former with its much paler ground colour and pattern of upper side of wings, from the latter with dark, wide marginal field on underside. *Sinesafida* can be easily separated from the related two species by its very characteristic genitalia of both sexes, the distinctive features are as follows: the peniculi are short and curved (in *banghaasi* they are straight and long, in *iranica* arcuate but strong and long), the saccular appendage is a large lamina with reduced outer lobe (both of *banghaasi* and *iranica* have more or less bilobate saccular appendages), the configuration of editum is different in shape and the dispersion of sensory hairs (see Figs 5—8, 9—14), the distal part of aedeagus is shorter and wider than those of *banghaasi* and *iranica*. In case of the female genitalia *sinesafida* has an ostial appendage, the caudal and proximal parts of ductus bursae are heavily sclerotized, similarly to the apex bursae, the signum is short and narrow. *Iranica* has no ostial appendage but a sclerotized plate, ductus bursae with two strongly sclerotized rings, apex bursae rugulose but not sclerotized, signum broader. In *banghaasi* the ostium has a large appendage, the ductus bursae with stronger sclerotiza-

tion only in the proximal part, the apex bursae is rugulose, the signum is longer and narrower than those of the two related taxa.

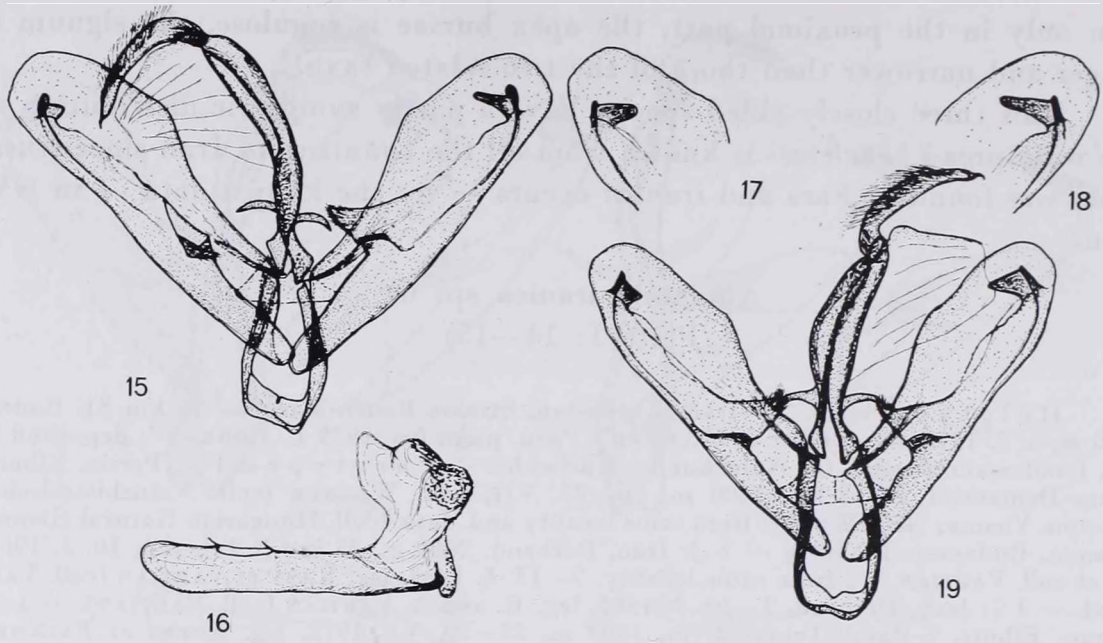
This three closely allied species have a partly sympatric distribution as the widespread *banghaasi* is known from all the countries of Iran since *sinesafida* was found in Fars and *iranica* occurs — by the known data — in NW Iran.

Autophila iranica sp. n.
(Plate I: 14—15)

Holotype: male, "W-Iran, Kardestan, Strasse Baneh-Marivan, 85 km SE Baneh, 1950 m, 5. 7. 1975, leg. EBERT et FALKNER", "gen. prep. No. 1929 L. RONKAY"; deposited in coll. Landessammlungen für Naturkunde, Karlsruhe. — Paratypes: 1 ♂: Persia, Elburs, Rehne-Demavend, ca. 2700—3600 m, 20—27. VII, coll. WAGNER (coll. Naturhistorisches Museum, Vienna; NHMW). 1 ♀: from same locality and data (coll. Hungarian Natural History Museum, Budapest; HNHM). — 1 ♂: Iran, Derbend, 2000 m, 25 km N Teheran, 10. 5. 1969, leg. et coll. VARTIAN, 1 ♀ from same locality, 7—15. 6. 1963, leg. KASY et VARTIAN (coll. VARTIAN). — 1 ♀: Iran, Derbend, 1—10. 7. 1962, leg. E. and A. VARTIAN (coll. VARTIAN). — 1 ♂: N-Iran, Elburs, S-Rand, Tehran-Evin, 1800 m, 25—28. VI. 1972, leg. EBERT et FALKNER (coll. LNK). — 1 ♂ + 1 ♀: W-Iran, Kardestan, Str. Zandjan-Bijar, 53 km S. Zandjan, 1700 m, 28—29. VI. 1975, leg. EBERT et FALKNER (coll. LNK). — 1 ♀: data as the holotype (coll. LNK). — Slides 1685, 1914, 1915, 1942 (males), 1702, 1741, 1925, 1930 (females) L. RONKAY.

Description: Alar expanse 37—41 mm, length of fore wing 18,5—20 mm. Head and thorax ochreous grey or brownish, irrorated with darker hairs. Fore wing more or less elongate, ground colour ochreous grey (Elburs, Derbend) or yellowish-grey with fine reddish shade (W-Iran, Kardestan), with more or less intensive brownish suffusion. Subbasal line a dark spot, antemedial line oblique, waved, more or less diffuse (Elburs) or sharper (W-Iran), medial area with stronger dark irroration. Orbicular spot a small dark spot or obsolete, reniform arcuate, darker brown, medial line a diffuse, pale stripe with large dark patch at costa. Postmedial line strongly sinuous, brown with ochreous outer line. Marginal field strongly suffused with dark grey-brown, subterminal line serrated, sometimes obsolescent, yellowish or ochreous with dark, wide inner shadow. Terminal line yellowish, cilia whitish-ochreous, inner part strongly spotted. Hind wing whitish with more or less extensive greyish shade, transversal line wide, diffuse, marginal field strong, wide, dark greyish-brown. Terminal line ochreous, cilia whitish-ochreous with dark spots in inner side. Underside of wings light ochreous yellowish, very shiny, sometimes with fine reddish sheen. Elements of dark pattern pale or obsolescent, cellular lunule(s) and upper part of transversal line often can be seen, sometimes only as a pale shadow of upper side-pattern. Marginal area dark and wide, greyish-brown, without light ochreous scales or with only at veins, terminal line orange-yellow, cilia ochreous, not or only slightly spotted.

Male genitalia (Figs 5—8): Uncus long and slender, tegumen high and narrow, peniculi strong and arcuate, fultura inferior trapezoidal, vinculum

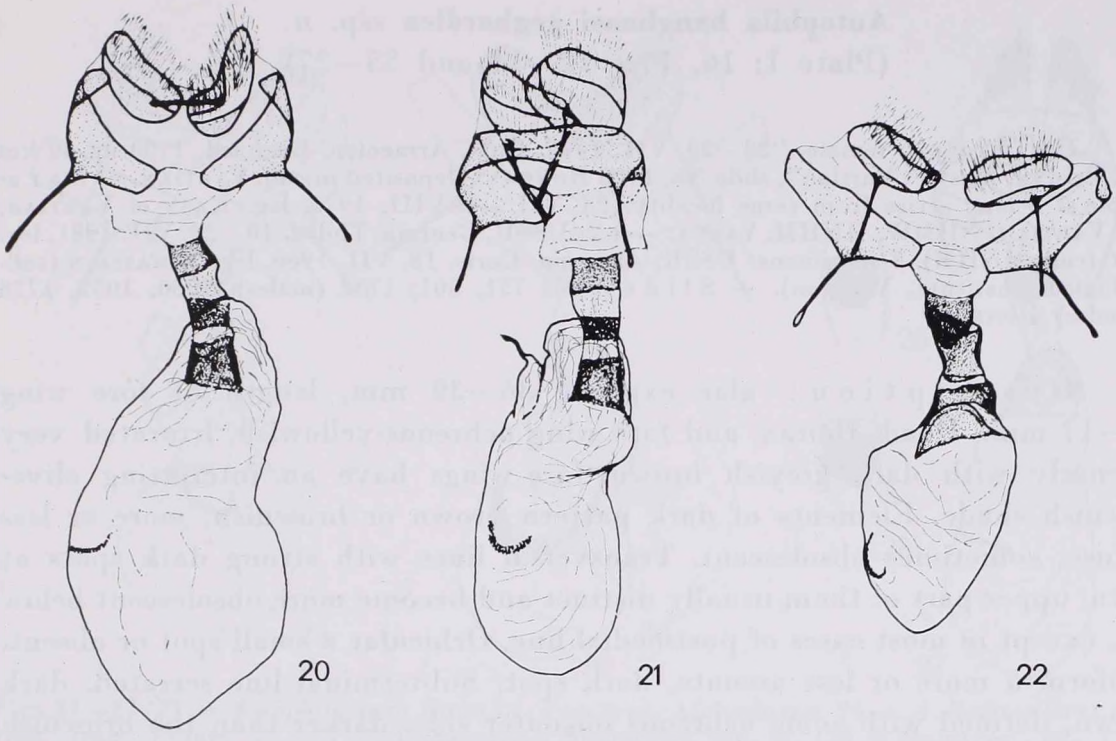


Figs 15—19. 15—16 = *Autophila luxuriosa* ZERNY, Palestina. 17—18 = *A. luxuriosa clara* WILTSHIRE, SW Iran. 19 = *A. luxuriosa elbursica* BOURSIN, Iran, Derbend

strong, quadrangular. Valvae broad and elongate, sacculus narrow, editum elongate, narrow, not or only slightly arcuate. Saccular extension large, outer lobe small, inner lobe wide, with elongate apical part. Aedoeagus moderately long, slightly curved, distally with a beak-shaped processus on ventral side wearing fine teeth. Vesica everted dorsally, consists of numerous diverticles, some of them with spiculiform, fine cornuti; largest diverticulum broad and strongly reclinate, reaching ostium ductus ejaculatorii.

Female genitalia (Figs 20—21): Ovipositor short and wide, gonapophyses slender, moderately long. Ostium bursae with a sclerotized lamina, without pocket-like appendage, ductus bursae membranous with strong medial and proximal rings. Apex bursae rugulose, corpus bursae large, elongate-elliptical, signum short, narrow.

Specific differences and taxonomic position — The new species is closely related to *banghaasi* and *sinesafida* but differs from them by several characteristic features, which were partly mentioned in the redescription of *sinesafida*. The more detailed discussion is given below. The new species has wider and more rounded fore wings with finer pattern than in case of *banghaasi* and the underside of the former has stronger and wider dark marginal field since *banghaasi* has much diffuse marginal suffusion. The species *sinesafida* has more obsolete and pale wing pattern on upper side than that of *iranica*, the underside of wings is similar in both species. In the configuration of the male genitalia the differences are also spectacular: *iranica* has strong, arcuate peniculi, large and wide valvae with characteristically shaped saccular extensions, narrow and elongate editum with fine and scarce



Figs 20—22. 20—21 = *Autophila iranica* sp. n., Paratypes (20 = Iran, Derbend; 21 = Iran, Elburs). 22 = *A sinesafida* WILTSHIRE, Iran, Fars

sensory hairs, the aedeagus has strong and long distal processus wearing small teeth, the largest diverticulum of vesica is broad and long, reclinate, reaching ostium ductus ejaculatorii. *Banghaasi* has long, straight peniculi and more elongate valvae with the bilobate saccular extensions of different shape (see the Figs 9—14), wider and shorter editum, often with curved apical end densely covered with sensory hairs; the aedeagus is shorter, the distal processus is shorter and less robust, the largest diverticulum of vesica is less broad and reclinate, shorter, does not reach the ostium ductus ejaculatorii. *Sinesafida* has fine, arcuate peniculi, wide, laminar saccular extensions of valvae, wide and finely curved editum with scarce sensory hairs and more slender proximal part of aedeagus with short and wide distal processus wearing small teeth. In case of the female genitalia the new species has no ostial appendage but only a sclerotized plate (since both *banghaasi* and *sinesafida* have such appendages), ductus bursae is with two sclerotized rings (while *banghaasi* has only a proximal granulation), apex bursae is rugulose (in case of *sinesafida* the apex is sclerotized) and the signum is shorter than that of *banghaasi* but stronger than in *sinesafida*. The other member of this group, *limbata*, which also has no ostial appendage, displays very different configuration of ductus bursae with only a weak proximal sclerotization and a quite different, large and wide, moon-shaped signum.

D i s t r i b u t i o n : NE Iran (the Elburs range, the vicinity of Teheran and Kurdistan).

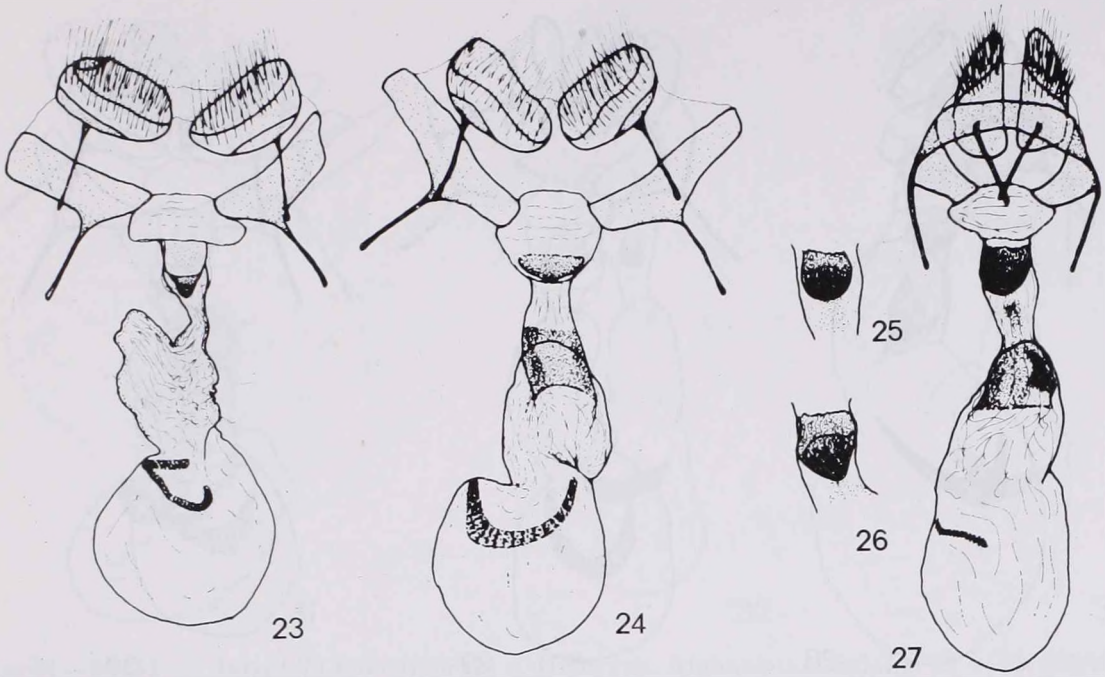
Autophila banghaasi geghardica ssp. n.
(Plate I: 16, Figs 12—14 and 25—27)

Holotype: female, "28—29. VII. 1976, Russ. Armenien, Geghard, 1700 m, 40 km östl. Eriwan, Kasy et Vartian", slide No. 1728 RONKAY. Deposited in coll. VARTIAN. — Paratypes: a long series from same locality, 28. VII.—4. VIII. 1976, leg. KASY et VARTIAN, coll. VARTIAN, NHMW, HNHM, VARGA. — 1 ♀: USSR, Georgia, Tbilisi, 10—20. VII. 1981, leg. SZÉL (coll. HNHM). 5 specimens: USSR, Armenia, Goris, 18. VII. 1966, leg. MINASSIAN (coll. Zoological Institute, Yerevan). — Slides Nos 751, 801, 1732 (males), 1050, 1052, 1728 (females) RONKAY.

Description: alar expanse 36—39 mm, length of fore wing 16—17 mm. Head, thorax and fore wing ochreous-yellowish, irrorated very intensely with dark greyish brown; fore wings have an interesting olive-greenish shade. Elements of dark pattern brown or brownish, more or less diffuse, sometimes obsolescent. Transversal lines with strong dark spots at costa, upper part of them usually distinct and become more obsolescent below cell, except in most cases of postmedial line. Orbicular a small spot or absent, reniform a more or less arcuate, dark spot. Subterminal line serrated, dark brown, defined with some ochreous on outer side, darker than the brownish marginal field; postmedial line sometimes with an ochreous stripe on outer side. Terminal line and apical spot ochreous, cilia yellowish with large brown spots on inner side. Hind wing pale ochreous with strong brownish covering in marginal field and at base of wing except costal area, transversal line a more or less visible, wide stripe, rarely a very pale cellular lunule also can be seen. Terminal line yellowish, cilia ochreous, spotted with brown. Underside of wings light ochreous yellowish, with some darker brown scales in cell of fore wing, cellular lunules present only on fore wings, transversal line very pale or absent. Dark marginal suffusion relatively wide but strongly irrorated with yellowish scales, in some parts entirely covering the dark colour.

The new subspecies can be very easily separated from the other populations of *banghaasi* by its characteristic, dense brownish irroration, the olive-greenish shade and the much lighter marginal area of fore wing with more conspicuous pattern; the underside of wings more bright yellowish. The male genitalia (Figs 12—14) are more or less identical with those of the Turkish and Iranian specimens, only the inner lobe of the saccular appendage is somewhat more elogate and pointed. The configuration of the female genitalia is identical with that of the nominate race (Figs 25—27).

Distribution: The new subspecies represents the northernmost race of this species widespread and frequent in Asia Minor and Iran, it was found in Armenia and Georgia. The specimens of *banghaasi* collected in different localities may be conspicuously different from one another. But, since this species has a very large individual variability, so larger and more regular material is needed for the detailed studies on the Turkish and Iranian popula-



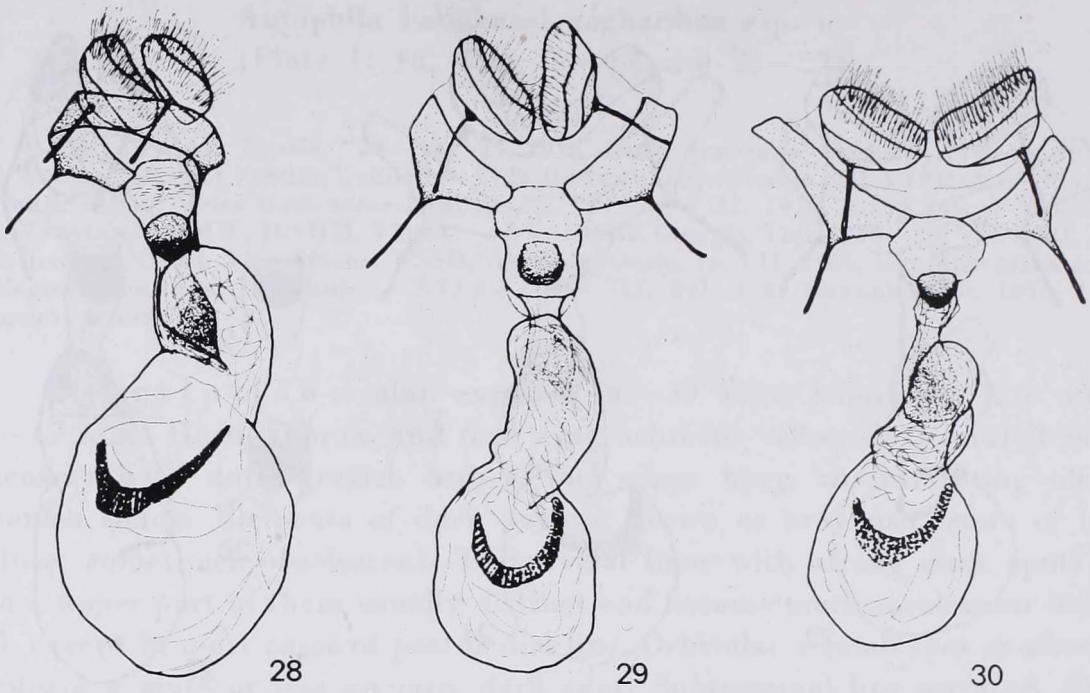
Figs 23—27. 23 = *Autophila xena* RONKAY, Paratype, Afghanistan. 24 = *A. limbata* STAUDINGER, Iran, Elburs. 25—27 = *A. banghaasi geghardica* ssp. n. (25 = Holotype, 26—27 = Paratypes, USSR, Armenia, Geghard)

tions of banghaasi. This was the main reason why I did not describe, for example, the probably distinct, reddish-brown coloured Farsistan subspecies as new. On the other hand, the large and homogeneous series from Armenia (and Georgia) and its peripherial range in the distribution of *banghaasi* give the basis of the subspecific separation of *geghardica*.

Autophila subfusca latistria ssp. n.

H o l o t y p e: female "N-Iran, Elburs-Geb., Sheshmak, 1700 m, 20. VI. 1969, leg. H. G. AMSEL", slide No. 1938 RONKAY, deposited in coll. LN Karlsruhe. — P a r a t y p e s: 4 ♂♂: from same locality and data, coll. LNK and HNHM. — 1 ♂: Iran, Derbend, 25 km N Teheran, 2000 m, 7—15. VI. 1963, KASY et VARTIAN, coll. LNK. — 10 specimens: from the Elburs range and the vicinity of Teheran, leg. et coll. VARTIAN. — 1 ♂: Iran, Quom, 700 m, 13.5 1977, leg. DITTRICH, coll. BEHOUNEK. — S l i d e s Nos 926 BEHOUNEK, 65 EBERT, 1913, 1917 L. RONKAY (males).

D e s c r i p t i o n : alar expanse 32—37 mm, length of fore wing 15—17 mm. Fore wing narrow and elongate, ground colour of it light, very shiny ochreous brown, strongly irrorated with darker brown. Basal field with some reddish shade, antemedial line wide, oblique, sinuous, sometimes diffuse, orbicular absent or a small spot, reniform short, diffuse. Medial line a dark, diffuse stripe, postmedial line sinuous, strongly angled inwards below cell, with wide yellowish stripe at outer side. Marginal field very wide, dark brown, subterminal line absent or very pale, cilia whitish, inner part strongly spotted.



Figs 28—30. 28 = *Autophila eurytaenia* BOURSIN, Iran, Derbend. 29 = *A. luxuriosa taurica* BOURSIN, Taurus. 30 = *A. luxuriosa elbursica* BOURSIN, Paratype, Iran, Elburs

Hind wing whitish grey with strong silky shine, inner area slightly, marginal area strongly suffused with dark brown, sometimes a pale and diffuse cellular lunule also visible. Cilia whitish with strongly spotted inner part. Underside of wings light ochreous, very shiny, inner area slightly darker. Pattern absent with the exception of a pale shadow of upper part of postmedial line. Marginal field relatively narrow with more or less strong, lighter irroration. Cilia as on upper side.

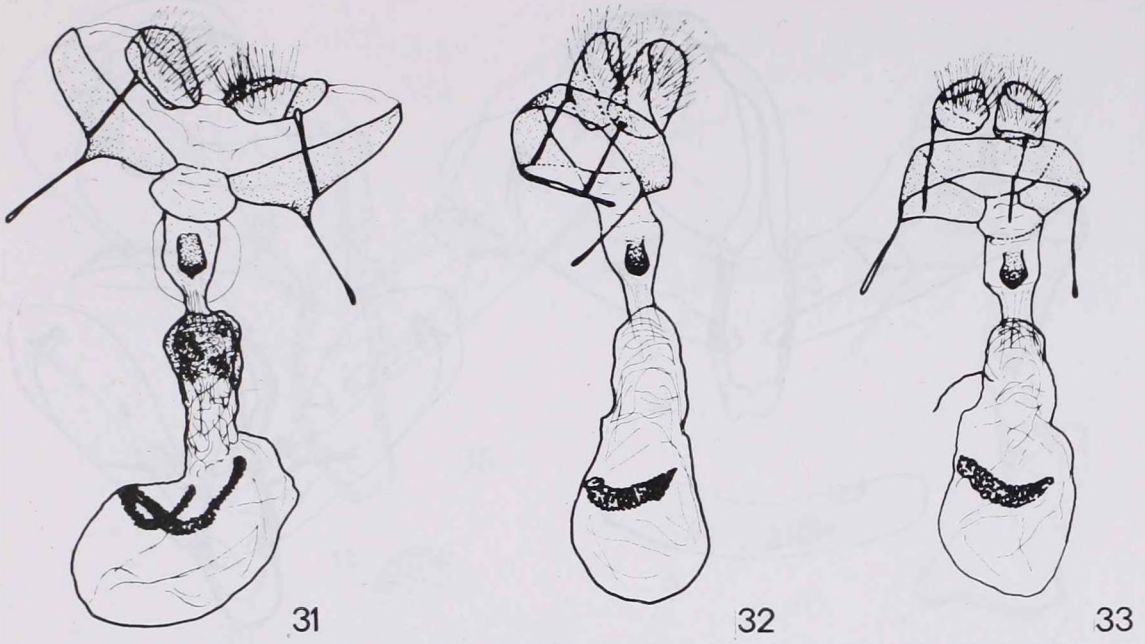
The configuration of the genitalia of both sexes is more ore less identical with that of the nominate *subfusca*.

This subspecies differs from the nominate *subfusca* with its narrower fore wing, the more intensive dark pattern of upper side, the more contrasty ocheous-yellowish stripe at the outer side of postmedial line and the narrower dark marginal field on underside.

D i s t r i b u t i o n : NW Iran (Elburs, the vicinity of Teheran, Qum).

Autophila subfusca brandti ssp. n.
(Plate II: 27—28, Figs 33, 48—51)

H o l o t y p e: male, "Iran, Balouchistan, Kouh-i-Taftan (Khach), 2500 m, 30. Apr. 1938, coll. BRANDT", slide No. 1916 RONKAY. The holotype specimen can be recently found in LN Karlsruhe but it was probably a part of the material borrowed by CH. BOURSIN from the BRANDT collection (ZM Stockholm). — P a r a t y p e s: 1 ♂: 5 ♀♀ from same locality and data (LNK and ZM Stockholm). — 1 ♂: Iran, Baloutchistan, Strasse Khach-Zahedar, Fort Sengan, 1800 m, 1938, coll. BRANDT. — 1 ♀: "Sgn" (with the handwriting of BRANDT, probably from

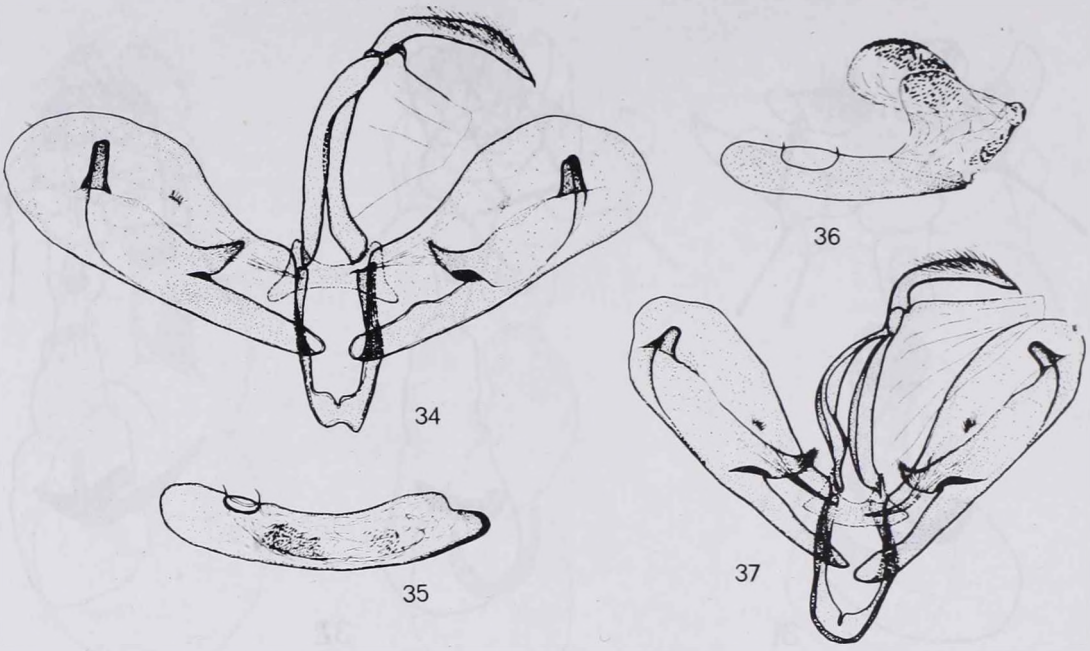


Figs 31—33. 31 = *Autophila xenomima* sp. n. Holotype, Afghanistan, Salang. 32 = *A. subfusca* CHRISTOPH, USSR, Turkmenia. 33 = *A. subfusca brandti* ssp. n. Paratype, Iran, Baloutchistan

the previous locality), coll. ZM Stockholm. — 1 ♂, 1 ♀: Iran, Baloutchistan, Iranshar, 800 m' 1—10. III. and 1—10. IV. 1954, leg. RICHTER et SCHÄUFFELE (coll. Zoologische Staatssammlung, Munich, ZSM). — Slides Nos 1760 BOURSIN, 2703 HACKER (males), 1953 RONKAY (female).

Description: Alar expanse 33—40 mm, length of fore wing 16—18 mm. Shape of fore wing relatively short and broad, ground colour of it light ochreous grey with a fine rosy reddish shade, less shiny. Basal field unicolorous, beige-coloured, antemedial line less wide, more or less sharp, sinuous and oblique. Orbicular a small spot, reniform short, spot-like. Median area less dark than in other races, medial line wide and diffuse, with strong spot at costa. Postmedial line waved, strongly angled inwards below cell, with ochreous-grey outer line. Marginal area wide, brown, subterminal line only slightly darker or absent. Terminal line ochreous, cilia whitish with strongly spotted inner half. Hind wing whitish grey, inner area slightly, marginal area strongly suffused with brown. Underside of wings light whitish ochreous with greasy shine, pattern reduced to a short line or costal spot of postmedial line (sometimes elements of upper side pattern can be slightly seen as diffuse shadow). Marginal field relatively narrow, dark brown with more or less strong, lighter irroration. Cilia as on upper side.

The Baluchistan race of this species has very characteristic colouration being much lighter and less shiny than in the other two subspecies, the shape of the fore wing is broader and shorter. By its appearance — with the exception of the width of dark marginal field — *subfusca brandti* resembles *eremochroa*



Figs 34—37. 34—35 = *Autophila eremochroa* BOURSIN. Holotype, Central Asia. 36—37 = *A. xena* RONKAY. Holotype, USSR, Pamir, Chorog. (The drawing of the genitalia of *eremochroa* is two times more enlarged than that of *xena*!).

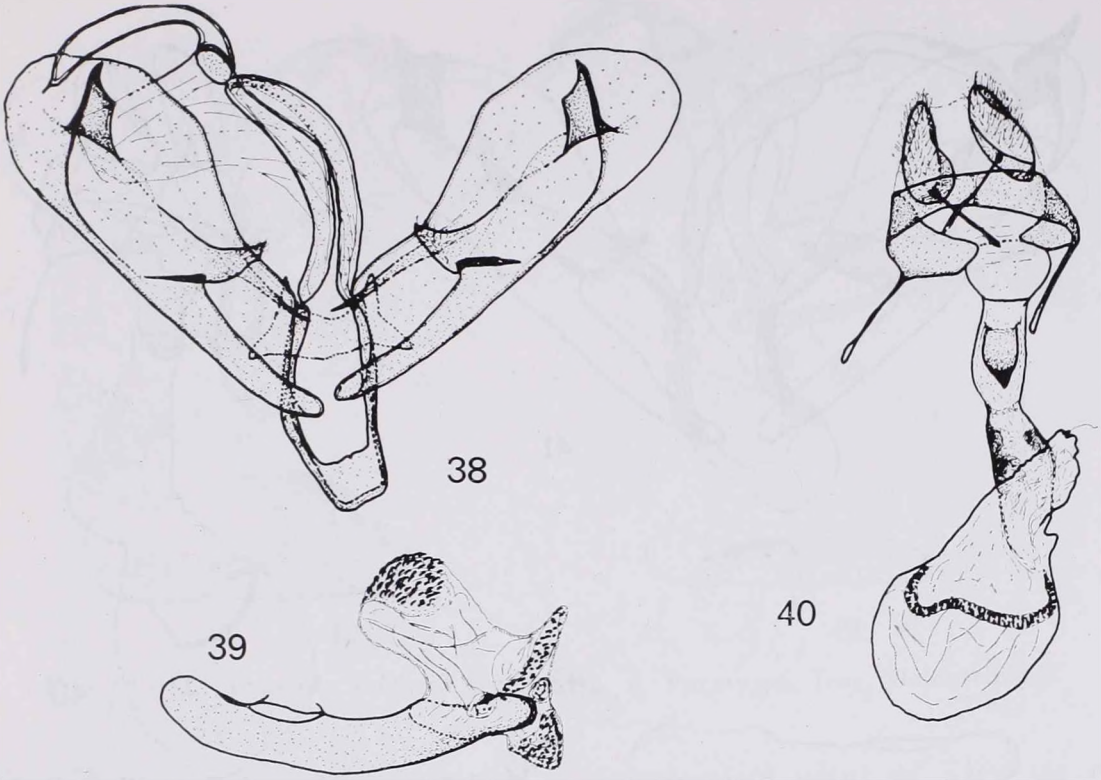
Boursin, 1940, but the genitalia of both sexes (Figs 33, 48—51) evidently show that this race belongs to *subfusca*. The configuration of the male genitalia of *subfusca brandti* differs from *subfusca* only in some fine details since the female genitalia are identical with those of the nominate subspecies.

The distribution of this eremial species is very interesting as it has three strongly disjunct subspecies with ranges of Soviet Turkestan and Transcaspia (*subfusca subfusca*), NW Iran (*subfusca latistria*) and Baluchistan (*subfusca brandti*); this special type of distribution is unique in the genus, but the species *A. gracilis* STAUDINGER, 1874, living also in desert and semi-desert habitats, displays a similar but bicentric disjunction having a Transcaspian-Turkmenian-Central-Asian and a Baluchistan range with a large gap between them.

Autophila xenomima sp. n.
(Fig. 31

H o l o t y p e: female, "O-Afghanistan, Salang-Pass, N-Seite (Khinjan), 2100 m, 5—11. 7. 1966, leg. Ebert", slide No. 1912 RONKAY, deposited in coll. LN Karlsruhe.

D e s c r i p t i o n : Alar expanse 40 mm, length of fore wing 19 mm. Head, thorax and fore wing light ochreous grey with very fine brownish irroration, elements of dark pattern strong. Basal field ochreous grey, subbasal line consists of some dark spots at costa, antemedial line strongly waved, dark brown, oblique. Median area ochreous grey with stronger brownish covering,

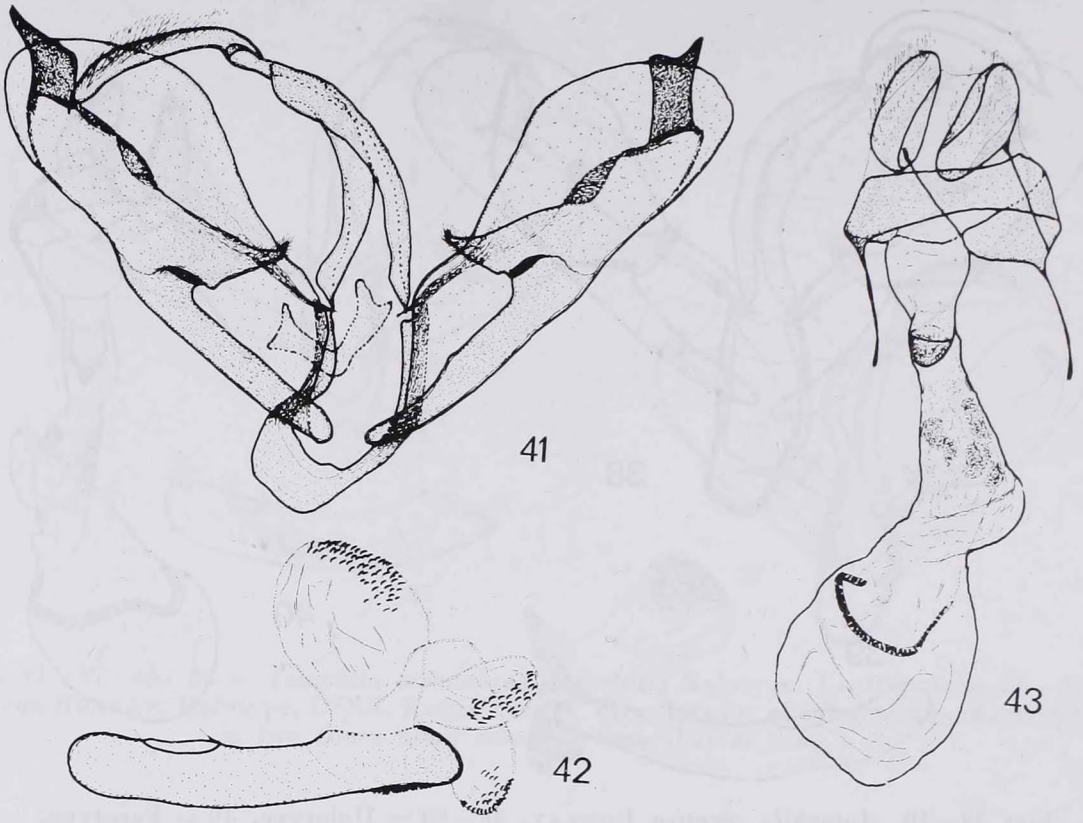


Figs 38—40. *Autophila cryptica* RONKAY. 38—39 = Holotype, 40 = Paratype; Askhabad

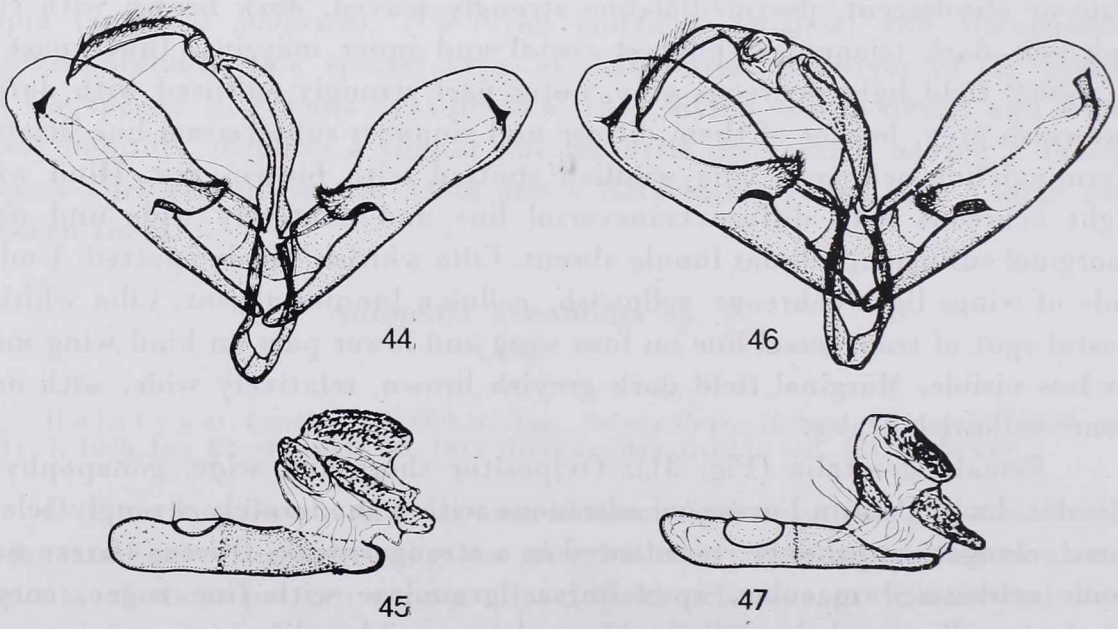
orbicular spot only a minute brown spot, reniform strong, arcuate, moon-shaped. Medial line with a wide and dark spot at costa, its lower part very pale or obsolescent, postmedial line strongly waved, dark brown with conspicuous dark triangular spots at costal and inner margins. Inner part of marginal field light ochreous grey, outer part strongly suffused with darker brownish grey, border of them diffuse and sinuous; subterminal line deleted. Terminal line ochreous, cilia wihitish spotted with brown-grey. Hind wing light ochreous with diffuse transversal line and relatively wide and dark marginal suffusion, cellular lunule absent. Cilia whitish, finely spotted. Underside of wings light ochreous yellowish, cellular lunules absent. Cilia whitish, costal spot of transversal line on fore wing and lower part on hind wing more or less visible. Marginal field dark greyish brown, relatively wide, with only some yellowish scales.

Female genitalia (Fig. 31): Ovipositor short and wide, gonapophyses slender, long. Ostium bursae membranous with a moderately strongly sclerotized, elongate appendage, terminated in a stronger peak. Ductus bursae with some sclerotized maculae, apex bursae granulose with fine rugae, corpus bursae small, rounded, with a wide and long, ribbon-like signum.

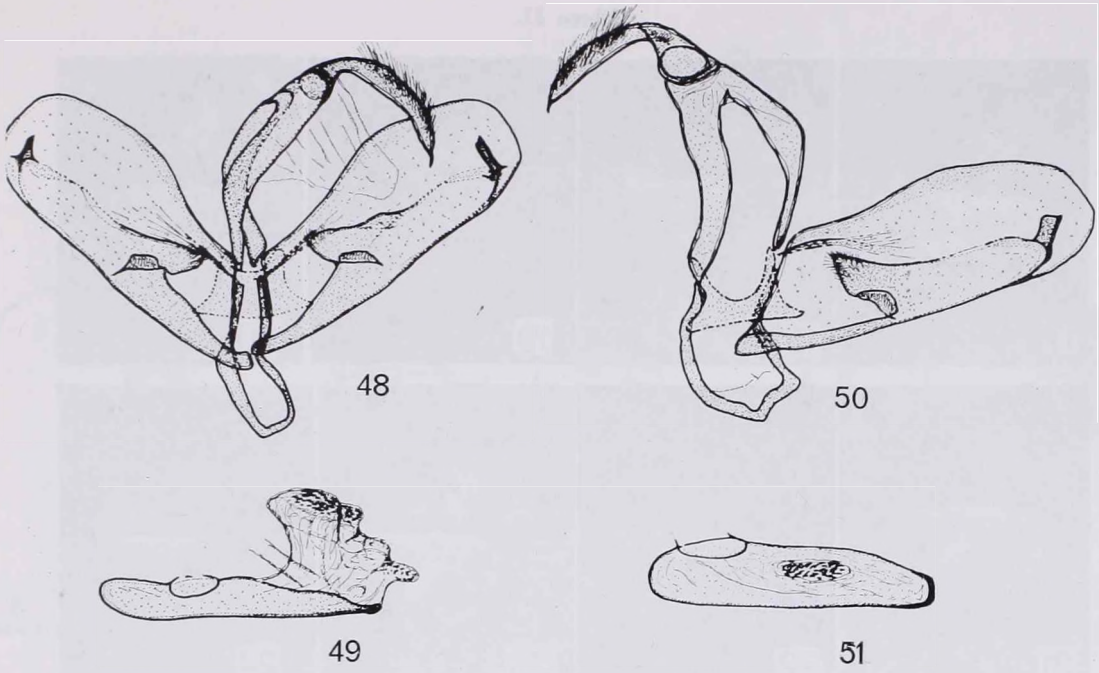
Specific differences and taxonomic position —



Figs 41—43. *Autophila laetifica* STAUDINGER, USSR, Turkmenia, Kara-Kala



Figs 44—47. 44—45 = *Autophila subfusca* CHRISTOPH, USSR, Turkmenia. 46—47 = *A. subfusca latistria* ssp. n. Paratype, Iran, Elburs



Figs 48—51. *Autophila subfusca brandti* ssp. n. Paratypes, Iran, Baloutchistan

The new species is very interesting in taxonomical point of view as externally resembles *xena*, but this similarity is only a virtual phenomenon. In point of fact this species is the closest relative of *cryptica*, consequently, it belongs to the *subfusca* subgroup. It can be easily separated by its quite different colouration and larger size from *cryptica*, the specific differences in the female genitalia are as follows: the apex bursae of *xenomima* is granulosely sclerotized and the signum is longer and broader than that of *cryptica*. (On the other hand, *xenomima* differs from *xena* by the following genital features: the ostial appendage of *xenomima* is smaller and more elongate, less sclerotized and the signum is significantly longer than in *xena*.)

Distribution: It is known only from the type locality (NE Afghanistan).

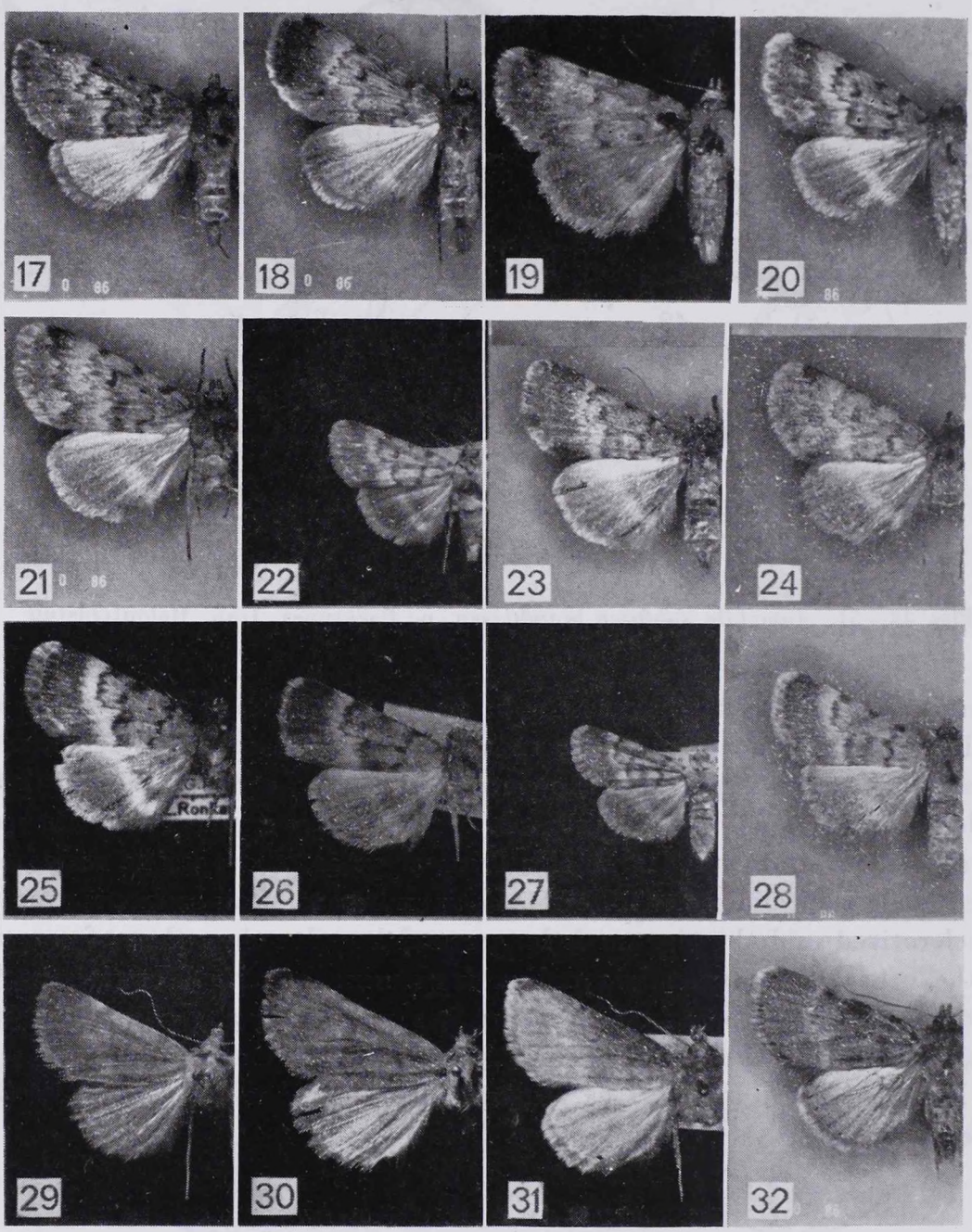
II. DESCRIPTION OF FURTHER NEW TAXA

Autophila cinnamonea sp. n.
(Plate II: 29, Figs 52—56)

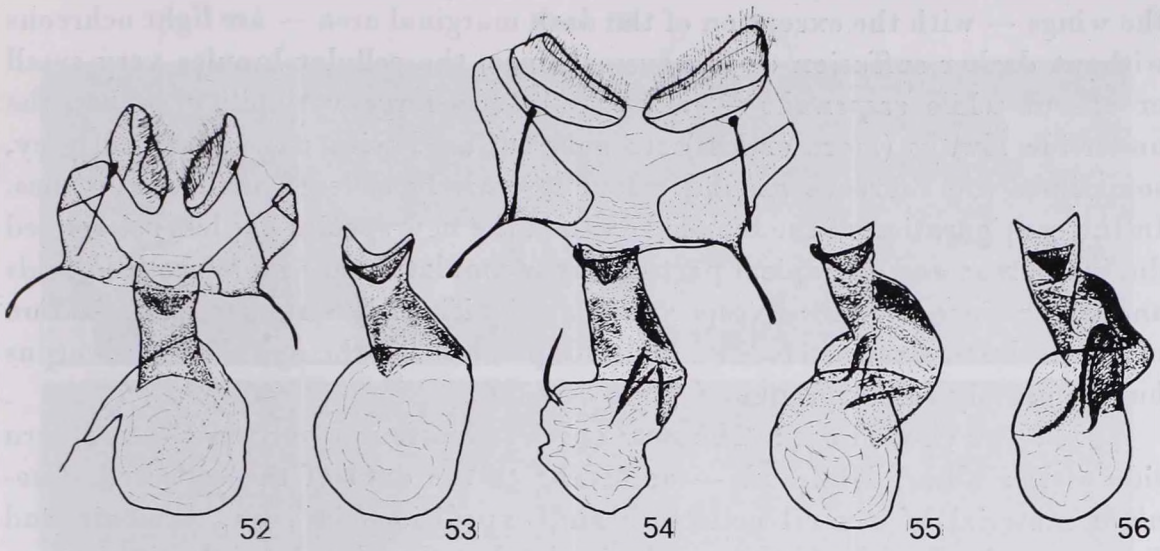
Holotype: female, "Iran, Elburs Geb., Südseite, Shimshak, 2300 m, 50 km N Teheran, 1—22. VII. 1970, leg. VARTIAN", slide No. 1692 RONKAY, deposited in coll. VARTIAN. — Paratype: 1 ♀: Iran, Elburs Mts. Prov. Tehran, 15 km E Gatschar, 2800 m, 17. VIII. 1972, leg. EBERT, coll. LN Karlsruhe. — Slide No. 1910 RONKAY.

Description: Alar expanse 34 mm, length of fore wing 16—16,5 mm. Fore wing more or less dark fuscous brown with cinnamon shade. Elements

Plate II.



17—18. *Autophila banghaasi* BOURSIN: 17 = Iran, Fars, 18 = Iran, Elburs. — 19. *A. luxuriosa* ZERNY, Palestina. — 20—21. *A. luxuriosa elbursica* BOURSIN: Iran, Elburs. — 22. *A. luxuriosa clara* WILTSHIRE, SW Iran. — 23—24. *A. eurytaenia* BOURSIN: 23 = paratype, Iran, 24 = Iran, Derbend. — 25. *A. eurytaenia* ssp., SW Iran. — 26. *A. subfusca* CHRISTOPH, USSR: Turkmenia. — 27—28. *A. subfusca brandti* ssp. n.: paratypes, Iran Baloutchistan. — 29. *A. cinnamonea* sp. n.: holotype, Iran, Elburs. — 30—32. *A. vespertalis* STAUDINGER: 30 = paralectotype, Uliassutai, 31—32 = Afghanistan.



Figs 52—56. 52—53 = *Autophila cinnamonea* sp. n. 52 = Paratype, 53 = Holotype; Iran, Elburs. 54—56 = *A. vespertalis* STAUDINGER, 54 = Afghanistan, 55 = Ili, 56 = Mongolia

of pattern diffuse, obsolescent, in case of paratype nearly entirely covered by darker greyish scales. Subbasal line only a small spot, antemedial line oblique, diffuse, only slightly darker than ground colour. Orbicular spot absent, reniform spot a pale and diffuse, arcuate line, medial line absent or an inconspicuous shadow, postmedial line a sinuous, more or less dark, diffuse stripe. Marginal field darker than inner parts of wing, wide, subterminal line absent or represented by only some very fine spots. Terminal line ochreous, inner part of cilia brown, outer part light ochreous whitish. Hind wing light brownish grey with very pale transversal line and cellular lunule, marginal field wide dark brown, cilia whitish with brown inner line. Underside of wings light ochreous with fine rosy shade and strong shine, inner parts of both wings without any darker pattern, only cellular lunule(s) might be visible. Marginal field wide and dark, brown grey, terminal line ochreous, cilia as on upper side.

Female genitalia (Figs 52—53): Ovipositor short, wide, gonapophyses fine, slender, relatively long. Ostium bursae membranous with finely sclerotized, more or less moon-shaped laminae on both surfaces. Ductus bursae membranous apically, becoming wider and strongly sclerotized proximally with heavily sclerotized margins, connected with bursa copulatrix by wide basis. Bursa copulatrix small, more or less rounded, apical part not folded or rugulose.

Specific differences and taxonomic position — The new species is closely related to *vespertalis* (STAUDINGER, 1896) but differs from it by some characteristic features. *Cinnamonea* has smaller size, shorter but broader fore wing with simplified and more obsolete pattern. The colouration of the underside is very typical and distinctive as in case of *cinnamonea*

the wings — with the exception of the dark marginal area — are light ochreous without darker suffusion or transversal lines, the cellular lunules very small or absent while *vespertalis* — although it has large variability — has the underside always (more or less) strongly suffused with dark brownish grey, sometimes the ochreous ground colour is entirely covered with dark scales. In the configuration of the female genitalia the new species has less sclerotized ductus bursae and the apical part of bursa copulatrix has no sclerotized folds and rugae since the allied vespertalis has significantly stronger sclerotization of ductus bursae and sclerotized folds of apex bursae, the apical part of corpus bursae usually finely granulose (Figs 54—56).

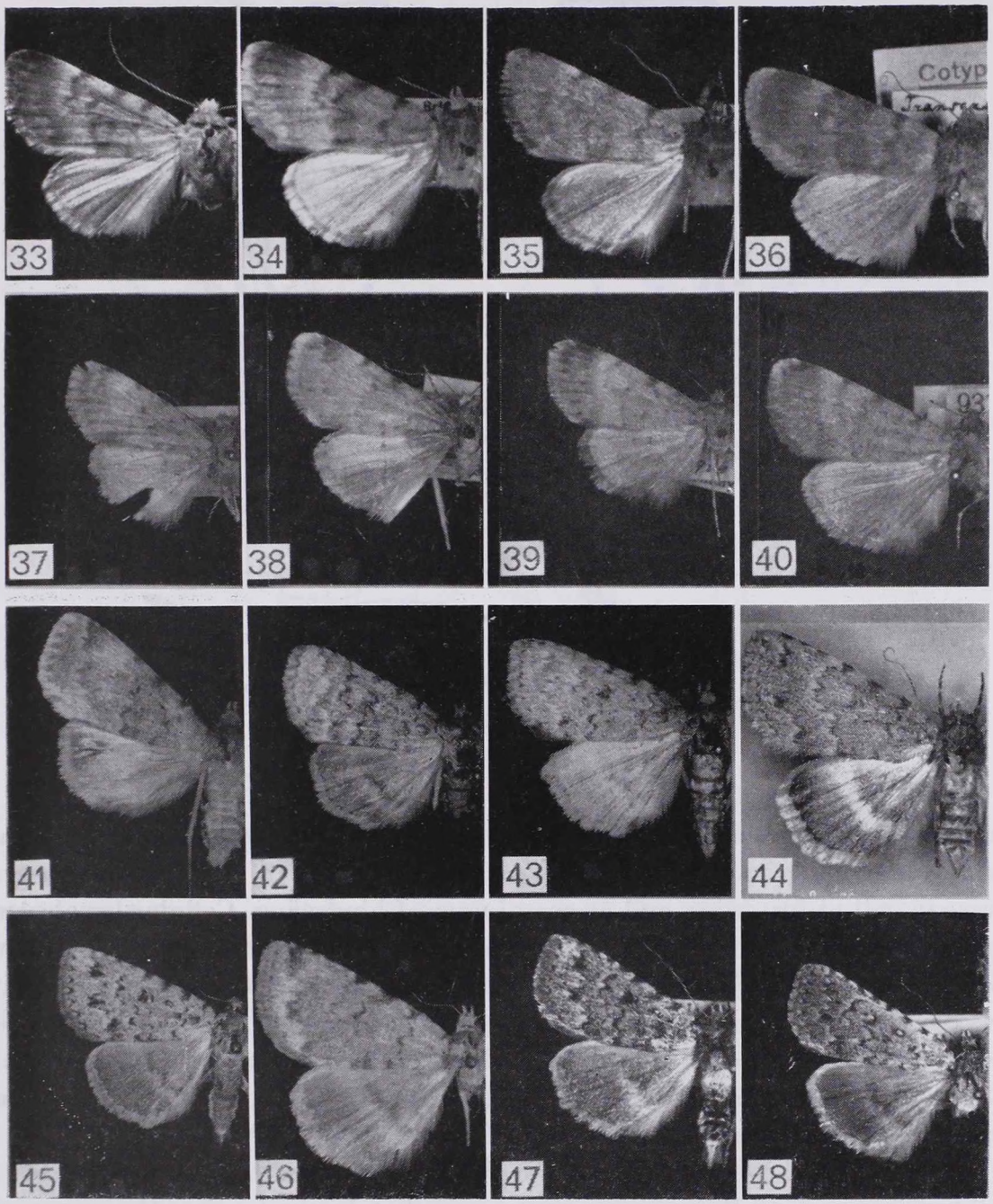
Distribution: The new species was found only in the southern side of the Elburs Mts. and — according to the data of the collected *Autophila* material of several collectors and expeditions in Iran, Armenia and Turkey — it must be very rare. This closely related pair of species has an allopatric distribution as the more widespread — but everywhere rare — *vespertalis* occurs in Central and Inner Asia, the westernmost part of its area is C Afghanistan; the geographical gap between them is large. (It is an interesting fact that the species *A. simplex* STAUDINGER, 1888 which was previously known from Central and Inner Asia was also found in the Elburs Mts., leg. et coll. Vartian, but the specimen from Iran is identical with the nominate *simplex*.)

Autophila depressa pakistana ssp. n.
(Plate III: 33, Figs 57—58)

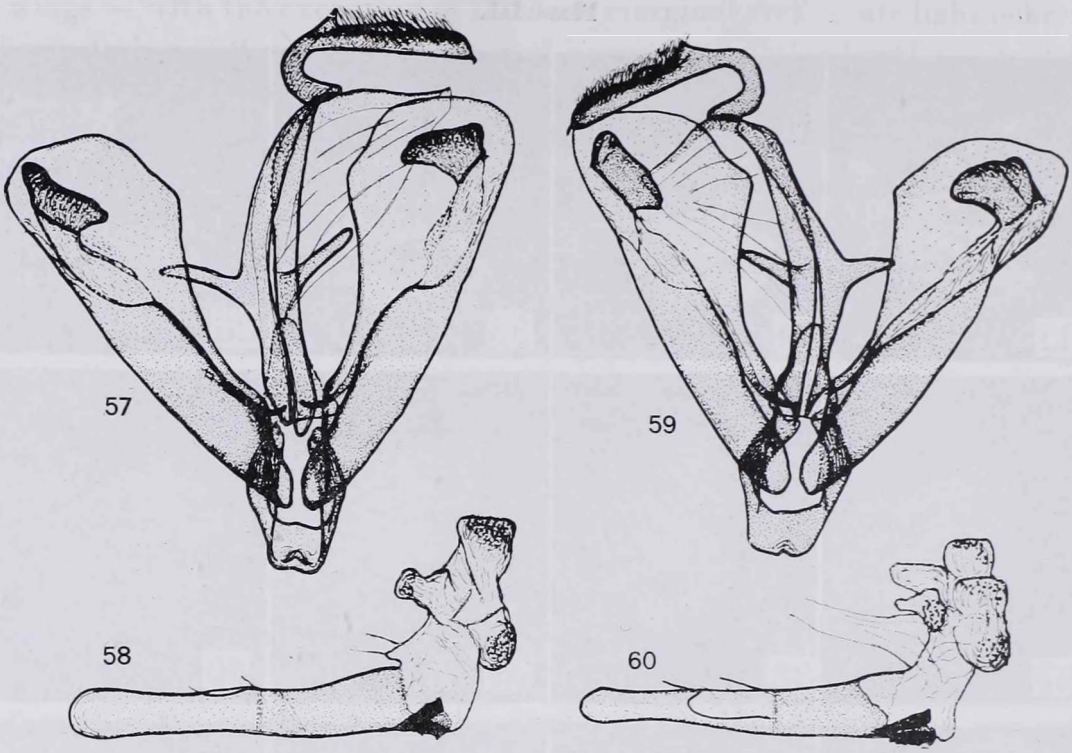
Holotype: male, "Pakistan, 80 km NW von Quetta, 2100 m, 15. V. 1965, leg. KASY et VARTIAN", slide No. 1683 RONKAY, deposited in coll. VARTIAN. — Paratypes: 4 ♀♀ from same locality and data, in coll. VARTIAN.

Description: Alar expanse 45—48 mm, length of fore wing 20—22 mm. — Male: head and thorax light ochreous grey with some brownish-grey hairs, fore wing light ochreous grey with darker greyish scales and fine ochreous shine. Shape of fore wing elongate and narrow, elements of dark pattern well discernible but more or less diffuse. Subbasal line a darker shadow. antemedial line oblique, strongly waved, medial line a wide, diffuse stripe with stronger dark spot at costa. Orbicular absent or a very pale spot, reniform arcuate, its lower part much wider, postmedial line strongly sinuous, angled inwards below cell, lower part conjoined with medial line at inner margin. Subterminal line ochreous, serrate, with wide and diffuse dark shadow at inner side and some ochreous spots at outer side; terminal area covered with brownish-grey scales. Terminal line ochreous, cilia brownish-grey with whitish outer edge. Hind wing pale ochreous grey with brownish irroration and ochreous-pinkish shine. Cellular lunule absent, marginal field somewhat

Plate III.



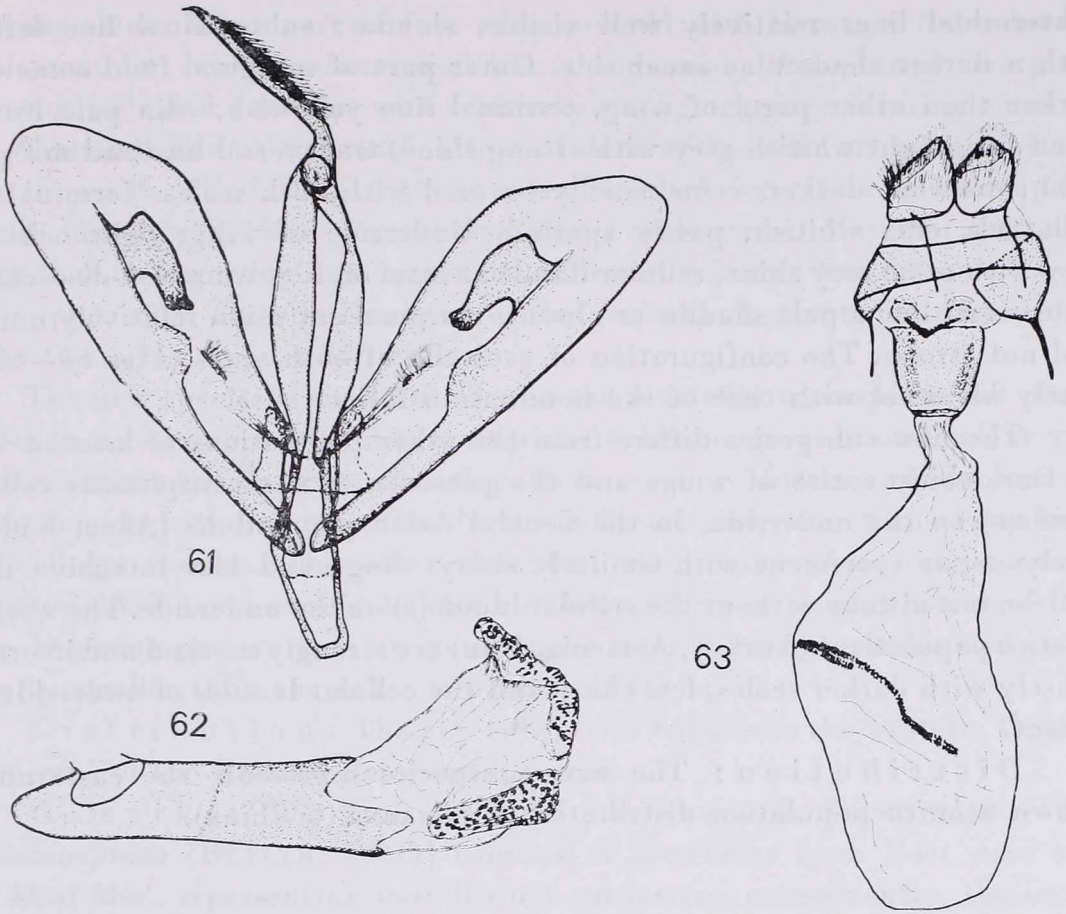
33. *Autophila depressa pakistana* ssp. n.: holotype, Pakistan, Quetta. — 34. *A. depressa perornata* BOURSIN, Iran, Baloutchistan. — 35. *A. depressa draudti* OSTHELDER, Iran, Derbend. — 36. *A. depressa* PÜNGELER: paralectotype, Askhabad. — 37—38. *A. asiatica mienshana* ssp. n.: paratypes, China, Mien-Shan. — 39—40. *A. asiatica* STAUDINGER: 39 = Altai Mts., 40 = Aksu. — 41. *A. limbata* STAUDINGER (Type of *A. dilucida praeclara* Schawerda, Istria). — 42—43. *A. inconspicua altaica* ssp. n.: paratypes, Altai. — 44. *A. magnifica* BOURSIN: holotype, Afghanistan. — 45. *A. maculifera* STAUDINGER, USSR, Kara-Kum desert. — 46. *A. eremocharis* BOURSIN: paratype, Aksu. — 47. *A. maculifera calligrapha* ssp. n.: holotype, Mongolia. — 48. *A. tancrei* BOURSIN, Mongolia



Figs 57—60. 57—58 = *Autophila depressa pakistana* ssp. n. Holotype, Pakistan, Quetta. 59—60 = *A. depressa perornata* BOURSIN, Iran, Baloutchistan

darker. Terminal line ochreous, cilia whitish with fine brownish line at inner side. Underside of wings light ochreous yellowish with some brownish-grey scales in cell of fore wing and at costal part of hind wing. Cellular lunule only a pale shadow on fore wing, transversal line very pale. Marginal suffusion reduced, paler than in case of any other races, brownish, veins covered with few dark scales. Terminal line orange-yellow, cilia light, whitish-greyish. — Female: somewhat larger and darker, dark pattern of both sides more intensive. — Configuration of male genitalia (Figs 57—58) does not differ significantly from the other *depressa* races.

The new subspecies is similar to *perornata* BOURSIN, 1947, distributed in the Iranian part of Baluchistan, but somewhat larger in size, the wings are more elongate, the dark pattern of wings is more distinct and the underside is lighter. As it was mentioned in the previous article of the series, the populations of *depressa* display more or less visible differences and they can be separated from each other relatively easily. But the western and southwestern populations (*depressa draudti* OSTHELDER, 1933) show a wide range of variation and the changes between the different populations proved to be more or less continuous. The distance between the two races of Baluchistan — by the studies on further, large material of the Iranian subspecies, including the



Figs 61—63. *Autophila asiatica mienshana* ssp. n. Paratypes, China, Mien-Shan

whole type-series — is larger than in case of the populations of *depressa draudti*, consequently, *pakistana* can be considered as a distinct taxonomic unit.

Distribution: the vicinity of Quetta (Pakistan part of Baluchistan).

Autophila asiatica mienshana ssp. n.
(Plate III: 37—38, Figs 61—63)

Holotype: female, "Mien-Shan, (Prov. Shansi), Obere Höhe ca. 1500 m, 12. 6. 1937, H. Höne", deposited in coll. Alexander Koenig Museum, Bonn. — Paratypes: 2 ♂♂, 1 ♀: from same locality but from 2000 m altitude, 24. 6., 27. 6., 28. 6. 1937, H. Höne, in coll. Alexander Koenig Museum, Bonn. — Slides Nos 1715 (male), 1714 (female) Ronkay.

Description: Alar expanse 26—33 mm, length of fore wing 12—16 mm. Head, thorax and fore wing pale ochreous brown or ochreous grey with strong greasy shine, scales very fine. Elements of dark pattern strongly reduced, pale or obsolescent except reniform and costal spots of transversal lines. Orbicular a minute spot, reniform arcuate, postmedial and

subterminal lines relatively well visible, sinuous; subterminal line defined with a darker shadow on inner side. Outer part of marginal field somewhat darker than other parts of wing, terminal line yellowish, cilia pale brown. Hind wing light whitish grey with strong shine, transversal line and marginal field somewhat darker, veins usually covered with dark scales. Terminal line yellowish, cilia whitish, partly spotted. Underside of wings light ochreous grey with some rosy shine, cellular lunule at least on fore wing well discernible, transversal line a pale shadow or absent, marginal suffusion relatively narrow and not strong. The configuration of genitalia of both sexes (Figs 61—63) is nearly identical with that of the nominate *asiatica*.

The new subspecies differs from the other populations of *asiatica* with its fine, shiny scales of wings and the presence of the conspicuous cellular lunule(s) on the underside. In the Central Asian populations (Aksu, Kuldja) rarely occur specimens with similarly shiny wings and less intensive dark pattern but always without the cellular lunule(s) on the underside. The western *asiatica* populations (Turkey, Armenia, Iran) are strongly marked and irrorated densely with darker scales, less shiny and the cellular lunules of underside are absent.

Distribution: The new subspecies represents the easternmost known *asiatica* population distributed in Shaanxi (C China).

Autophila inconspicua altaica ssp. n.
(Plate III: 42—43)

Holotype: male, "Altai, Kinderm. (ann)", "Origin.", paralectotype of *praeligaminosa* STAUDINGER, 1892, deposited in coll. Zoological Museum, Humboldt University, Berlin (ZMHU). — Paratypes: 1 ♂, 1 ♀: from same locality and data (ZMHU). — 1 ♀: Saratov, (Zoological Institute, Leningrad, ZIN). — 1 ♂: Altai, coll. EVERSMANN (ZIN). — 1 ♂, 1 ♀: Sib.(eria), Altai, coll. ERSHOV (ZIN). — 1 ♀: Altai, coll. the Regent Prince NIKOLAY MIKHAILOVITS (ZIN). — Slides Nos 5321 RJABOV (male and female), 1639 RONKAY (female).

Description: Alar expanse 39—43 mm, length of fore wing 18—19.5 mm. Head, thorax and fore wing pale grey-brown with strong ochreous shade and sheen, shape of fore wing broad and elongate. Elements of dark pattern relatively pale, diffuse or obsolescent, brown or grey-brown. Transversal lines strongly sinuous, brown(ish) with lighter outer shadows, subterminal line pale ochreous with darker inner stripe. Orbicular a very small spot, usually with lighter centre, reniform darker, diffuse, moon-shaped or quadrangular. Terminal line a row of dark spots, cilia ochreous brown, spotted with brown. Hind wing very shiny, light ochreous grey with variable strong brownish suffusion. Cellular lunule absent, transversal line a diffuse, wide stripe. Marginal suffusion wide but not strong, terminal line brown, cilia light ochreous brown. Underside of wings ochreous brown, with

ochreous shine. Inner part of fore wing covered with brown, cellular lunule obsolescent but visible, transversal line a wide and diffuse stripe, marginal suffusion wide and dark but with relatively strong ochreous covering on outer side. Terminal line orange with a row of dark spots, cilia ochreous, spotted with brownish. Hind wing without intensive dark irroration in inner part, cellular lunule well visible, transversal line a wide stripe. Marginal area narrower than on fore wing but darker, its ochreous covering less intensive. Cilia as on upper side. The configuration of the genitalia does not differ from that of the two other *inconspicua* races.

The new species is similar in size to the nominate *inconspicua* but much lighter in colouration, with a characteristic ochreous grey ground colour and ochreous shine, the elements of dark pattern are more diffuse and obsolescent, the underside with less intensive darker suffusion and paler transversal lines and cellular lunules. The other described race, *inconspicua cataphanoides* BOURSIN, 1955 has a similar lighter but more ochreous ground colour of fore wing, the wing pattern is more conspicuous than in case of *altaica* and significantly smaller than the other two races of the species.

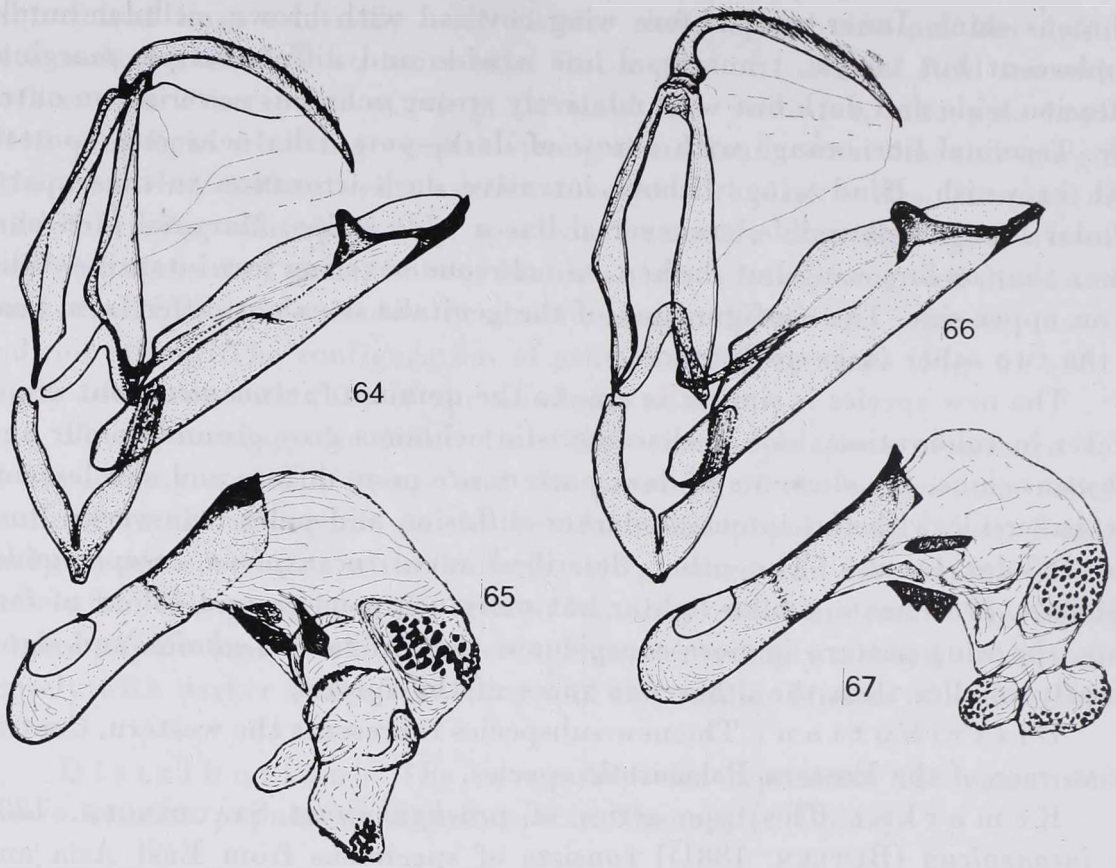
D i s t r i b u t i o n : The new subspecies represents the western, Central Asian race of the Eastern Palaearctic species.

R e m a r k s : The type series of *praeligaminosa* STAUDINGER, 1888 [= *inconspicua* (BUTLER, 1881)] consists of specimens from East Asia and the Altai Mts., representing two distinct subspecies, consequently, the lectotype of *praeligaminosa* must be designated. One of the specimens from Suifun was identified and labelled by BOURSIN as "*praeligaminosa* STGR. Holotype, MB 123 ", "*inconspicua* BTL.". This specimen is designated here as lectotype.

Autophila maculifera calligrapha ssp. n.
(Plate III: 47, Figs 64—67)

H o l o t y p e: male, "Mongolia, Chovd aimak, Dzsungar Gobi, Bulgan sum (in the village), 31—07. — 01. 08. 1986, leg. P. GYULAI; deposited in coll. P. GYULAI — P a r a t y p e s : 2♂♂, 1♀: from same locality and data leg. P. GYULAI et Z. VARGA, coll. P. GYULAI, Z. VARGA and HNHM. — S l i d e No. 2151 (male) RONKAY.

D e s c r i p t i o n : Alar expanse 32—33 mm, length of fore wing 16—18 mm. Head and thorax light ochreous grey, with stronger dark irroration of blackish grey hairs and scales. Fore wing light mouse grey with fine rosy pinkish sheen, very shiny; strongly suffused with dark grey and grey brown scales. Elements of wing pattern well discernible, transversal lines strongly sinuous, blackish grey with lighter outlines, medial line a wide, diffuse stripe. Orbicular spot small and round, blackish with conspicuous whitish centre, reniform moon-shaped, dark grey with some whitish spots and a short line at middle. Subterminal line serrated, arrowhead-spots more or less strong, defined with lighter, ochreous rosy grey on outer side. Terminal



Figs 64—67. 64—65 = *Autophila maculifera calligrapha* ssp. n. Holotype, Mongolia. 66—67 = *A. maculifera* STAUDINGER, Tura

line a row of whitish and blackish spots, inner side of cilia dark grey, outer part light ochreous grey, finely spotted. Hind wing pale grey, strongly shiny, with ochreous shade and brownish grey suffusion. Transversal line wide and diffuse, marginal area very wide, dark brown. Terminal line ochreous, inner side of cilia whitish with wide brownish suffusion. Underside of wings light and very shiny ochreous grey, dark pattern diffuse, darker suffusion moderately strong. Transversal line well visible, more obsolete on hind wing, cellular lunule strong on fore wing, pale or absent on hind wing. Marginal area wide but pale, partly covered with light ochreous scales, cilia light grey with whitish outer margin.

The new subspecies differs from the nominate race by its more greyish and shiny wings, the much lighter colouration of underside and the more sharp and conspicuous pattern of fore wing. The configuration of the male genitalia of the two races is nearly identical (Figs 64—67).

Distribution: The new subspecies represents the south-eastern marginal race of the species widely distributed in Soviet Turkestan, inhabiting semi-desert and xerophilous steppe habitats in the lowlands and xeromontane slopes in the high mountains.

Autophila maculifera (STAUDINGER, 1888)

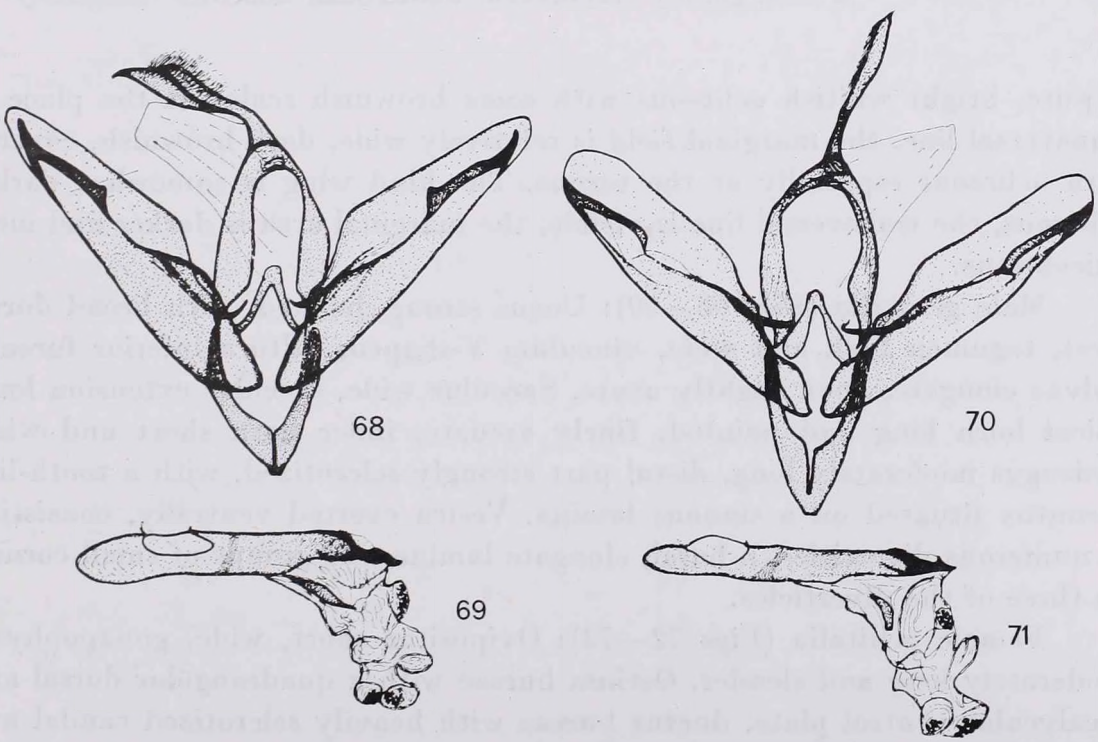
Designation of the lectotype: The type series of *maculifera* preserved in the STAUDINGER collection (ZMHU Berlin) consists of seven males and four females. From the series a male specimen was selected as lectotype with the labels "v. maculifera Stgr." (with the handwriting of STAUDINGER), "Margelan, Hbh.", "Origin.", "Lectotypus, Autophila maculifera Staudinger, des. Ronkay, 1984".

III. REDESCRIPTION OF AUTOPHILA TANCREI BOURSIN, 1940

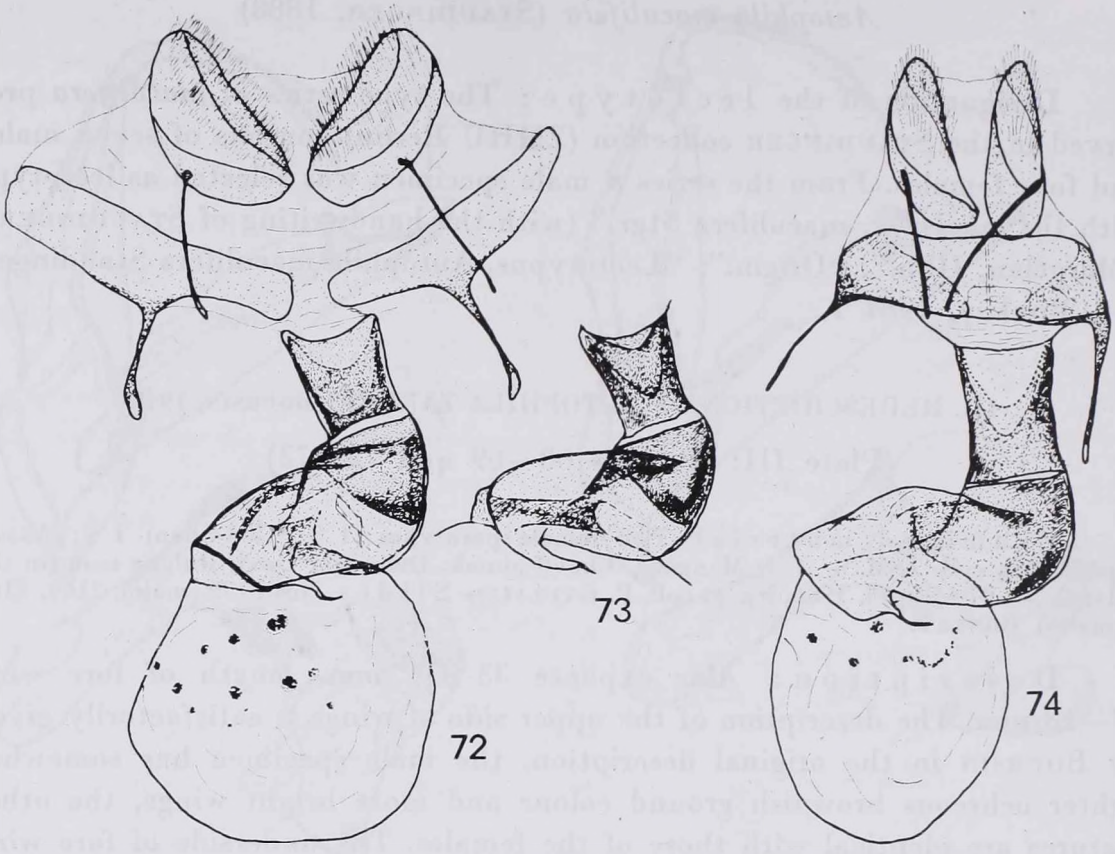
(Plate III: 48, Figs 68—69 and 72—73)

Examined material: Two female paratypes (1 ♀: Tien-Shan; 1 ♀: Aksu), deposited in coll. ZSM. — 1 ♂: Mongolia, Chovd aimak, Dzhungar Govi, Bulgan sum (in the village), 31. 07—01. 08. 1986, leg. et coll. P. GYULAI. — Slides Nos 2152 (male), 2164, 2164 (females) RONKAY.

Description: Alar expanse 33—34 mm, length of fore wing 17—18 mm. The description of the upper side of wings is satisfactorily given by BOURSIN in the original description, the male specimen has somewhat lighter ochreous brownish ground colour and more bright wings, the other features are identical with those of the females. The underside of fore wing



Figs 68—71. 68—69 = *Autophila tancrei* BOURSIN, Mongolia. 70—71 = *A. gracilis* STAUDINGER, Iran, Baloutchistan



Figs 72—74. 72—73 = *Autophila tancrei* BOURSIN. Paratypes, 72 = Aksu, 73 = Tien-Shan
74 = *A. gracilis* STAUDINGER, USSR, Kizil-Kum

is pure, bright whitish ochreous with some brownish scales at the place of transversal line, the marginal field is relatively wide, dark brownish, covered with ochreous especially at the tornus. The hind wing is somewhat darker ochreous, the transversal line is visible, the marginal area is darker and more unicolorous.

Male genitalia (Figs 68—69): Uncus strong, hooked, with broad dorsal crest, tegumen high and wide, vinculum V-shaped, fultura inferior furcate. Valvae elongate, apex slightly acute. Sacculus wide, saccular extension long, apical horn long and pointed, finely arcuate, inner horn short and wide. Aedeagus moderately long, distal part strongly sclerotized, with a tooth-like cornutus situated on a sinuous lamina. Vesica everted ventrally, consisting of numerous diverticles, a basal, elongate lamina and groups of small cornuti on three of the diverticles.

Female genitalia (Figs 72—73): Ovipositor short, wide, gonapophyses moderately long and slender. Ostium bursae with a quadrangular dorsal and a calycular ventral plate, ductus bursae with heavily sclerotized caudal and less sclerotized proximal parts; strong caudal sclerotization wide but short, nearly triangular. Bursa copulatrix globular with two rows of spot-like signa.

Specific differences and taxonomic position — This interesting and rare species is closely related to *gracilis* STAUDINGER, 1874, but differs from it by a series of distinctive characters both in external and genital morphology. These differences are as follows: *tancrei* has more elongate wings with slightly acute apex, the wing pattern is more conspicuous, the filling of reniform spot is whitish ochreous, the underside is lighter but with well discernible transversal line, especially on the hind wing. The wings of *gracilis* are less elongate, the wing pattern is diffuse or obsolescent, the filling of the reniform spot is brownish and the underside is without transversal line. In the configuration of the male genitalia *tancrei* has much larger dorsal crest on the uncus, the saccular extension is stronger with larger apical horn and a well-developed inner horn (the latter is absent in case of *gracilis*, see the Figs 70—71). The aedeagus of *tancrei* has larger cornutus on a sinuous lamina at the distal end while *gracilis* has a straight lamina and a smaller cornutus on it; the whole aedeagus of *tancrei* is somewhat larger and more robust. The vesica has the configuration similar to that of *gracilis* but the basal lamina is larger. In case of the female genitalia *tancrei* has a heavily sclerotized, triangular part of ductus bursae which does not reaching the large curve of ductus bursae since in the *gracilis* the strong sclerotization is not triangular but extending proximally to the large curve of ductus bursae (Fig. 74).

Distribution: NW China, the vicinity of the lake Kuku-Noor (= Quinghai) and SW Mongolia.

Acta Zoologica Hungarica 35 (1—2), pp. 143—164 (1989)

A REVISION OF THE GENUS COSMIELLA VERHOEFF, 1902 (DERMAPTERA: FORFICULIDAE)

H. STEINMANN

1193 Budapest, Áram u. 25, Hungary

(Received 31 March, 1988)

The description of the known species on the basis of external morphology, their systematic revision and the description of the male genital apparatus are given along with four new species: *Cosmiella hydra* sp. n. (New Guinea), *C. exornata* sp. n. (New Guinea), *C. eridana* sp. n. (Nyasaland), and *C. artificiosa* sp. n. (Tanzania). With 47 original figures.

Cosmiella VERHOEFF

1902 *Cosmiella* VERHOEFF, Zool. Anz. Leipzig, **25** (665): 195. — Species typica: *Opisthocosmia rebus* BURR, 1900.
1907 *Emboros* BURR, Trans. r. ent. Soc. London, **1907:** 103. — Species typica: *Opisthocosmia dubia* BURR, 1904 (nec BORMANS, 1894) — **syn. n.**
1907 *Skendyle* BURR, Trans. r. ent. Soc. London, **1907:** 118. Species typica: *Cosmiella aptera* VERHOEFF, 1902 — **syn. n.**
1907 *Skendylinae* BURR, Trans. r. ent. Soc. London, **1907:** 117. — Genus typicum: *Skendyle* BURR, 1907.
1909 *Archidux* BURR, Ann. Mag. nat. Hist., (8) **4:** 123. — Species typica: *Archidux adolfi* BURR, 1909 — **syn. n.**
1947 *Cosmicula* HINCKS, Ark. Zool. Uppsala, **39A** (1): 39. — Species typica: *Cosmicula flavicornis* HINCKS, 1947 — **syn. n.**

Head rounded, tumid, posterior margin more or less convex, antennae with joints elongate, and slender. Pronotum various, longer than wide, quadrate or transverse. Tegmina short, generally obliquely truncate posteriorly, lateral margins with shorter or longer, generally sharp, well-marked longitudinal keels. Wings entirely absent, or sometimes present, but concealed. Legs long and slender. Abdomen a little depressed, fusiform. Branches of male forceps simple, unarmed or with dorsal, basal, medial, and apical tooth or teeth. Female forceps generally very simple, straight, contiguous.

Distribution: all faunal regions.

IDENTIFICATION KEY TO THE SPECIES

1 (4) New World species.
2 (3) Male forceps with dorsal tooth basally (Fig. 1); branches of *Kleter*-type; tegmina comparatively long, wings absent, or sometimes present, but concealed; pronotum longer than broad **brasiliensis** MOREIRA, 1930
3 (2) Male forceps without dorsal tooth basally (Fig. 2); branches of *Cosmiella*-type, curved horizontally at apical portion; tegmina short, wings entirely absent; pronotum transverse **decui** (STEINMANN, 1897)

4 (1) Old World species.
5 (24) Oriental or Indo-Australian species.
6 (15) Tegmina keeled through not more than half the length of the plate.
7 (8) Male forceps with dorsal tooth basally (Fig. 4); branches a little depressed basally, and strongly curved medially and apically; male genitalia (Fig. 5) with well-developed external parameters; virga within genital lobe more or less straight; female forceps, as in Fig. 6 **rebus** (BURR, 1900)
8 (7) Male forceps without dorsal tooth basally.
9 (10) Branches of male forceps strongly curved medially, the curvature conspicuous (Fig. 7), the branches with a well-marked, prominent apical tooth at inner margins **javana** (BORMANS, 1903)
10 (9) Branches of male forceps less curved medially, and without apical tooth at inner margins.
11 (12) Branches of male forceps straight, inner margins with a small, but conspicuous tooth medially (Fig. 8); male genitalia characteristic, virga straight (Fig. 9); female forceps, as in Fig. 10 **aptera** VERHOEFF, 1902
12 (11) Branches of male forceps simple, without inner tooth medially. Male abdominal tergites 4—7 with smaller lateral tubercles.
13 (14) Sides of male abdominal tergites 4—7 with faintly marked lateral tubercles; branches of male forceps straight horizontally, and more or less cylindrical in cross-section at basal half (Fig. 11) **tuberculata** (BORELLI, 1924)
14 (13) Sides of male abdominal tergites 4—7 with well-marked tubercles; branches of male forceps (Fig. 13) curved horizontally, and strongly flattened, elliptical in cross-section at basal half **nitens** (GÜNTHER, 1934)
15 (6) Tegmina keeled throughout entire length.
16 (17) Pronotum quadrate, more or less as long as wide; male forceps very simple, narrowed elongate, nearly straight **dubia** (BORMANS, 1894)
17 (16) Pronotum transverse; male forceps armed with dorsal or an other inner tooth basally or apically.
18 (19) Branches of male forceps with a strongly expanded and depressed portion basally (Fig. 14), conspicuous, characteristic **cornuta** (BEY-BIENKO, 1959)
19 (18) Branches of male forceps with dorsal tooth or edge, but without a strongly depressed portion basally.
20 (21) Branches of male forceps with sharp dorsal edge basally (Fig. 15); sclerotized basal section of virga of the male genital lobe very narrow (Fig. 16); female forceps, as in Fig. 17 **hydra** sp. n.
21 (20) Branches of male forceps without dorsal edge basally, but with a conspicuous, obtuse, blunt, lobe-like dorsal tooth near at base (Fig. 18), or with sharp, trigonal dorsal tooth near at base (Fig. 21).
22 (23) Femora yellow or light brown, with three transversal dark brown bands; branches of male forceps with conspicuous lobe-like dorsal tooth near the base (Fig. 18); male genitalia characteristic, with very short external parameters; sclerotized plate of virga specific (Fig. 19); female forceps, as in Fig. 20 **exornata** sp. n.
23 (22) Femora black; branches of male forceps with a triangular dorsal tooth near at base (Fig. 21); male genitalia normally developed, virga very long, as in Fig. 22 **flavicornis** (HINCKS, 1947)
24 (5) Malagasy or African species.
25 (30) Malagasy species.
26 (27) Tegmina entirely dull; male forceps extremely long (Fig. 23), and very narrow, slender, evenly curved; male genitalia characteristic, virga strongly sclerotized with specific plate basally (Fig. 24); female forceps, as in Fig. 25 **longiforceps** (BRINDLE, 1966)
27 (26) Tegmina rather shining, but not so shining as pronotum; male and female forceps shorter.
28 (29) Branches of male forceps with specific curvature basally (Fig. 26), branches depressed near pygidium, and with a characteristic crenulated section near the depression **madagascariensis** (BRINDLE, 1978)
29 (28) Branches of male forceps without specific curvature basally, branches cylindrical near pygidium, and without crenulated section at basal half (Fig. 27); male genitalia short, sclerotized plate of virga specific, as in Fig. 28; female forceps, as in Fig. **unicolor** (BRINDLE, 1966)

30 (25) African species.
31 (32) Pronotum longer than broad; left branch of male (holotype) forceps undeveloped (Fig. 30), the right branch cylindrical, with well-marked apical tooth near apex; male genitalia with virga very long, sclerotized virgal plate, as in Fig. 31
eridana sp. n.
32 (31) Pronotum as broad as wide, or transverse (originally *Archidux* species).
33 (34) Pronotum as broad as long; larger species, body length 12 mm or more; abdomen parallel-sided, scarcely wider medially; branches of male forceps very long and slender, as long as rest of insect; pygidium small, posterior margin excised (Fig. 32); male genitalia short and wide, virga within genital lobe with a specific, strongly sclerotized curvature basally (Fig. 33); female forceps, as in Fig. 34
adolfi (BURR, 1909)
34 (33) Pronotum transverse; smaller species, body length 10—11 mm or less; abdomen fusiform, widened medially, and comparatively broader; branches of male forceps less elongated.
35 (40) Male pygidium with posterior margin deeply excised (Figs 35, 37, and 39).
36 (37) Pronotum more strongly transverse, strongly widened posteriorly; smaller species, body length 7—9 mm; dark reddish brown; head concolorous with pronotum; male pygidium large, less deeply excised posteriorly (Fig. 35); female forceps, as in Fig. 36
pygidiata (BRINDLE, 1973)
37 (36) Pronotum transverse, widened posteriorly, or sometimes parallel-sided; larger species, body length 8—10 mm.
38 (39) Blackish species with head yellow; male pygidium (Fig. 37) deeply excised on posterior margin, forming two triangular lobes; reclinate section of virga of the male genital lobe comparatively long, as in Fig. 38
bilobata (BRINDLE, 1973)
39 (38) Dark uniformly reddish brown with head dark orange; male pygidium (Fig. 39) deeply excised on posterior margin, forming two smaller, finger-like lobes; reclinate section of virga of the male genital lobes; reclinate section of virga of the male genital lobe comparatively short, as in Fig. 40
artificiosa sp. n.
40 (35) Male pygidium with posterior margin not or only faintly excised.
41 (46) Head reddish, rest of body yellowish brown to black; legs yellowish brown to brown, or with distal half of femora darkened; male forceps with each branch sharply curved dorso-posteriorly towards apex.
42 (43) Smaller species, body length 7 mm or less; femora yellow, distal half blackish; branches of male forceps straight, with larger apical tooth near apex (Fig. 41)
bicolor (BRINDLE, 1973)
43 (42) Larger species, body length 8 mm or more.
44 (45) Posterior margin of male pygidium without smaller tubercules laterally (Fig. 42); general colour deep reddish black, legs brown, femora yellow at base
neavei (BURR, 1914)
45 (44) Posterior margin of male pygidium armed with smaller tubercles laterally (Fig. 43); general colour dark yellowish brown, legs yellowish with a darker band on distal half of femora, apices of femora yellow
leavis (BRINDLE, 1975)
46 (41) Head and rest of body blackish; legs mainly blackish or with tibiae and tarsi paler in colour; male forceps with each branch strongly sinuate, or almost straight, sometimes with apical part curved dorsally.
47 (48) Inner margins of male forceps without smaller or larger ventro-median tooth (Fig. 44); smaller species, body length 7—8 mm; male genitalia short, and simple, as in Fig. 45 **minima** (BRINDLE, 1966)
48 (47) Inner margins of male forceps with smaller or larger ventro-median tooth; larger species, body length 9—12 mm.
49 (50) Legs black; lateral margin of pronotum curving dorsally, and ending in an anterior tooth which is not sharp as in *rugosa* BRINDLE; ventro-median tooth of male forceps large (Fig. 46); male genitalia, as in Fig. 47
intermedia (BRINDLE, 1966)
50 (49) Legs yellowish brown; lateral margin of pronotum slightly convex, and ending in an anterior tooth which is sharper than in *intermedia* BRINDLE; ventro-median tooth of male forceps small **rugosa** (BRIDLE, 1975)

Cosmiella brasiliensis MOREIRA

1930 *Cosmiella brasiliensis* MOREIRA, Bol. Inst. biol. Def. agr., Rio de Janeiro, **7:** 30; fig. 7 (male in dorsal view). — Terra typica: Brazil (Type male: Inst. Biol. Def. agr., Rio de Janeiro).

Male abdominal tergites punctured and pubescent; lateral glandular folds on tergites 3—4 present. Ultimate tergite transverse, smooth, simple. Each branch of forceps (Fig. 1) well developed, a little depressed basally, cylindrical medially and apically; branches with trigonal basal tooth near pygidium, the tooth directed inwards. — Female unknown.

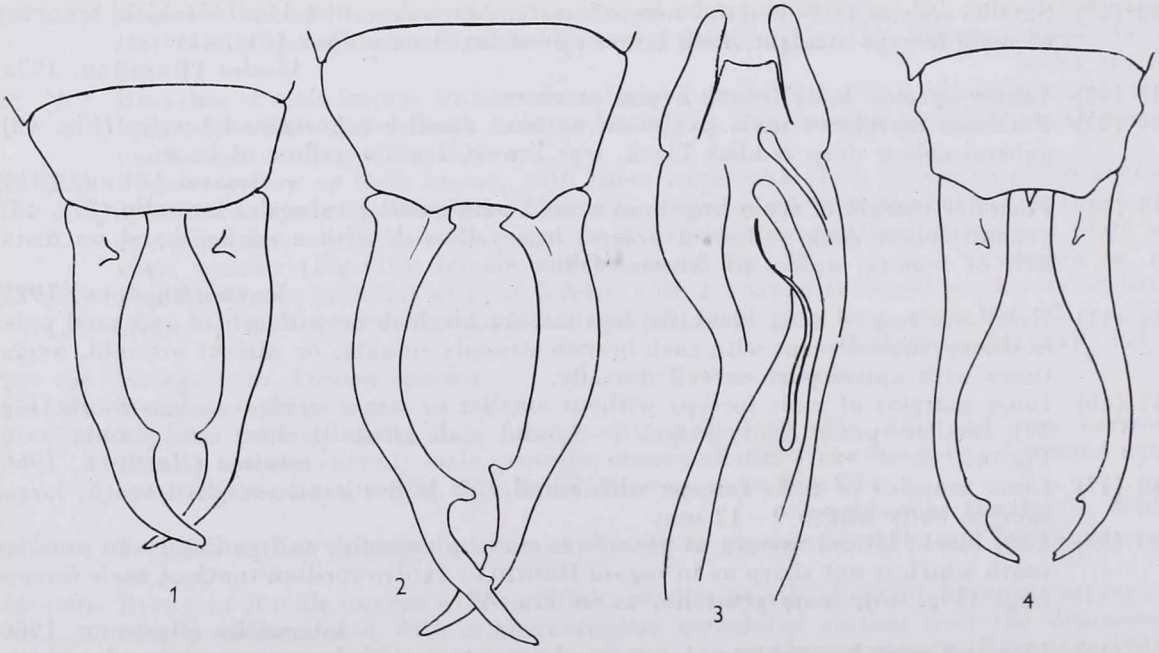
Length of body with forceps: 15—16 mm.

Distribution: Brazil.

Cosmiella decui (STEINMANN) comb. n.

1987 *Kleter decui* STEINMANN, Faune de subterranea de Venezuela, Bucuresti, **9:** 171; fig. 7 (male ultimate tergite with forceps), 8 (holotype genital armature). — Terra typica: Venezuela (Type male, gen. prep. No. 832, det. Dr. H. STEINMANN, Inst. Spéol., Bucuresti).

Male abdomen cylindrical, narrowed basally, and widened to tergites 5—6; lateral glandular folds on tergites 3—4 distinct. Ultimate tergite strongly narrowed apically, simple. Pygidium hidden. Penultimate sternite with lateral carinae, posterior margin rounded. Each branch of forceps (Fig. 2) elongate,



Figs 1—4. 1 = Male ultimate tergite with forceps of *Cosmiella brasiliensis* MOREIRA, 1930. — 2 = Male ultimate tergite with forceps of *C. decui* (STEINMANN, 1987), and 3 = ditto, male genitalia. — 4 = Male ultimate tergite with forceps of *C. rebus* (BURR, 1900) (Original)

more or less cylindrical in cross-section; branches with sharp and elongated dorsal tooth at apical portion; apical part of forceps curved horizontally. Genitalia (Fig. 3) with broad and large central parameral plate; virga within genital lobe moderate short, and simple; external paramere comparatively small, broadly rounded apically.

Female very similar to male, but forceps simple, straight, and slender, branches with very faint tubercles at inner margin.

Length of body with forceps, in both sexes: 16—18 mm.

Distribution: Venezuela.

Cosmiella rebus (BURR)

1900 *Opisthocosmia rebus* BURR, Ann. Soc. ent. Belg., **44:** 53; pl. 9, fig. 17 (female in dorsal view). — Terra typica: Java (Type female: Brit. Mus. nat. Hist., London).
1902 *Cosmiella rebus* — VERHOEFF, Zool. Anz. Leipzig, **25** (665): 196.

Male abdomen subcylindrical, strongly narrowed basally and apically, enlarged medially; lateral glandular folds on tergites 3—4 distinct, and prominent. Ultimate tergite strongly narrowed apically, smooth, simple. Pygidium hidden or very small. Penultimate sternite broadly rounded posteriorly. Each branch of forceps (Fig. 4) a little depressed basally, and strongly curved medially and apically; branches undulate (in lateral view), basal portion of forceps with sharp and prominent dorsal tooth. Genitalia (Fig. 5, gen. prep. No. 947, det. Dr. H. STEINMANN) well developed; central parameral plate elongate, virga within genital lobe very long; external paramere broad, and obtuse apically.

Female similar to male, but forceps (Fig. 6) very slender, elongate, and cylindrical.

Length of body with forceps, in both sexes: 16—19 mm.

Distribution: Java, Sumatra.

Cosmiella javana (BORMANS) comb. n.

1903 *Ancistrogaster javanus* BORMANS, in BURR, Ann. Mag. nat. Hist., (7) **11:** 266. — Terra typica: Java (Type male, type No. 19. 991: BRUNNER's Coll. Wien).
1911 *Skendyle javana* — BURR, Genera Insectorum, Bruxelles, **1922:** 91, pl. 9, fig. 16 (male abdominal end with forceps), 16a (tegmina).

Male abdomen fusiform, narrowed basally and apically, expanded medially; lateral glandular folds on tergites 3—4 prominent, sides of abdominal tergites 5—8 carinate. Ultimate tergite simple, narrowed apically. Penultimate sternite broadly rounded posteriorly. Each branch of forceps

(Fig. 7) characteristic, strongly curved medially, and with a well-marked, prominent apical tooth at inner margin. — Female unknown to me.

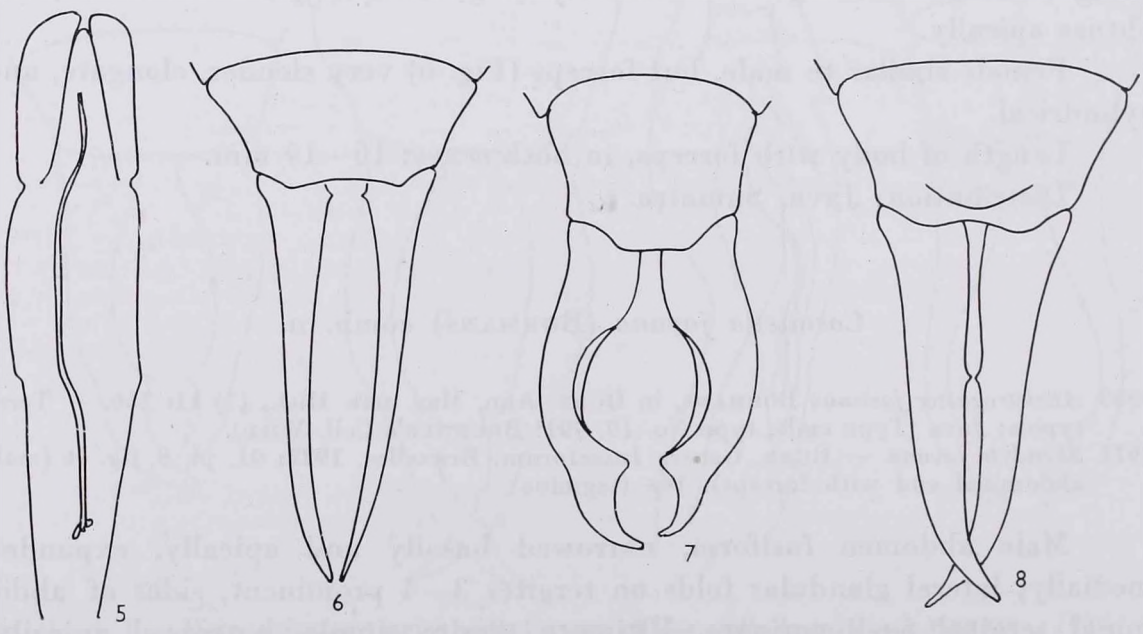
Length of body with forceps, in both sexes: 12—13 mm.

Distribution: Java.

Cosmiella aptera VERHOEFF

1902 *Cosmiella aptera* VERHOEFF, Zool. Anz. Leipzig, **25** (665): 195. — Terra typica: Java (Type unknown).
1904 *Opisthocosmia aptera* — BURR, Trans, r. ent. Soc. London, **1904:** 303.
1907 *Skendyle aptera* — BURR, Trans. r. ent. Soc. London, **1907:** 105.
1911 *Skendyle aptera* — BURR, Genera Insectorum, Bruxelles, **122:** 91, pl. 9, fig. 12 (male abdominal end with forceps), 12a (tegmina).
1976 *Skendyle aptera* — SRIVASTAVA, Misc. Pub. Occ., Calcutta, **2:** 68 (Java, and Philippines).

Male abdomen strongly enlarged medially; lateral glandular folds on tergites 3—4 prominent; sides of abdominal tergites 4—7 faintly carinate. Ultimate tergite strongly narrowed posteriorly; depressed medially near posterior margin. Pygidium hidden. Penultimate sternite simple, broadly rounded posteriorly. Each branch of forceps (Fig. 8) straight, specific, branches subcylindrical basally, and cylindrical medially and apically; inner margin with a smaller, but prominent tooth at median section. Genitalia (Fig. 9, gen. prep. No. 948, det. Dr. H. STEINMANN) well developed; central parameral plate broad, virga within genital lobe staight, with shorter sclerotized curvature basally; external paramere simple.



Figs 5—8. 5 = Male genital armature of *Cosmiella rebus* (BURR, 1900), and 6 = ditto, female ultimate tergite with forceps. — 7 = Male ultimate tergite with forceps of *C. javana* (BORMANS, 1903). — 8 = Male ultimate tergite with forceps of *C. aptera* VERHOEFF, 1902 (Original)

Female very similar to male, but forceps (Fig. 10) contiguous, tapering, straight.

Lenght of body with forceps, in both sexes: 15—17.5 mm.

Distribution: Philippine Islands, Indonesia: Java, Bali.

Cosmiella tuberculata (BORELLI) comb. n.

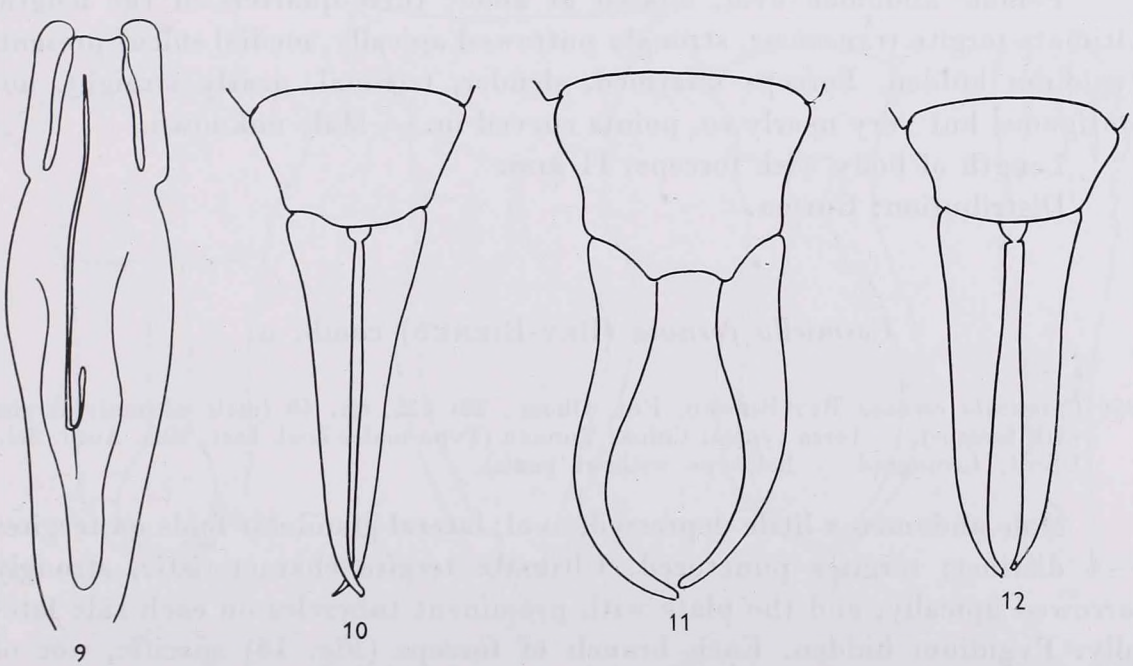
1924 *Skendyle tuberculata* BORELLI, Treubia, Buitenzorg, **5** (4): 337. — Terra typica: Buru (Type male: Zool. Mus., Buitenzorg).

Male fusiform, lateral glandular folds on tergites 3—4 distinct; sides of abdominal tergites 4—7 with lateral, characteristic protuberances. Ultimate tergite simple, narrowed posteriorly; posterior margin strongly trisinuate. Pygidium hidden. Penultimate sternite simple, broadly rounded posteriorly. Each branch of forceps (Fig. 11) strongly curved; branches straight in horizontal view, and cylindrical in cross-section. Holotype without penis.

Female similar to male, sides of abdominal tergites 4—7 without faintly marked lateral tubercles; forceps (Fig. 12) straight, simple, tapering.

Length of body with forceps, in both sexes: 15.5—17.5 mm.

Distribution: Buru.



Figs 9—12. 9 = Male genital armature of *Cosmiella aptera* VERHOEFF, 1902, and 10 = ditto, female ultimate tergite with forceps. — 11 = Male ultimate tergite with forceps of *C. tuberculata* (BORELLI, 1924), and 12 = ditto, female ultimate tergite with forceps (Original)

Cosmiella nitens (GÜNTHER) comb. n.

1934 *Skendyle nitens* GÜNTHER, Revue suisse Zool., **41** (34): 542, fig. 3A (male in dorsal view) 3B (male forceps in lateral view). — Terra typica: Java (Type male: Naturhist. Mus., Basel)

Male abdomen a little depressed, and widened medially, lateral glandular folds on tergites 3—4 very small, indistinct; sides of tergites 2—7 carinate. Ultimate tergite strongly narrowed apically, and depressed medially near posterior margin. Pygidium hidden. Each branch of forceps (Fig. 13) specific, a little depressed and elliptical in cross-section basally and medially, branches straight but apical portion strongly curved, apices directed inwards. Genitalia unknown to me. Female unknown.

Length of body with forceps: 12 mm.

Distribution: Java.

Cosmiella dubia (BORMANS)

1894 *Opisthocosmia dubia* BORMANS (nec BURR, 1904), Annali Mus. civ. Stor. nat., Genova, **34:** 399. — Terra typica: Burma (Type female: Mus. civ. Stor. nat., Genova).
1902 *Cosmiella dubia* — VERHOEFF, Zool. Anz. Leipzig, **25** (665): 195.
1907 *Emboros dubia* — BURR, Trans. r. ent. Soc. London, **1907:** 104.
1978 *Obelura dubia* — BRINDLE, Ent. Rec., **90:** 315.

Female abdomen oval, dilated at about three-quarters of the length. Ultimate tergite transverse, strongly narrowed apically, medial sulcus present. Pygidium hidden. Forceps unarmed, slender, trigonal, nearly straight, not contiguous but very nearly so, points curved in. — Male unknown.

Length of body with forceps: 11 mm.

Distribution: Burma.

Cosmiella cornuta (BEY-BIENKO) comb. n.

1959 *Cosmicula cornuta* BEY-BIENKO, Ent. Obozr., **38:** 625, fig. 40 (male ultimate tergite with forceps). — Terra typica: China: Yunnan (Type male: Zool. Inst. Mus. Acad. Sci., USSR, Leningrad — holotype without penis).

Male abdomen a little depressed, oval; lateral glandular folds on tergites 3—4 distinct; tergites punctured. Ultimate tergite characteristic, strongly narrowed apically, and the plate with prominent tubercles on each side laterally. Pygidium hidden. Each branch of forceps (Fig. 14) specific, not of *Cosmiella*-type; branches strongly depressed basally, and very slender, cylindrical apically; apical portion of forceps with small inner tooth. Genitalia unknown.

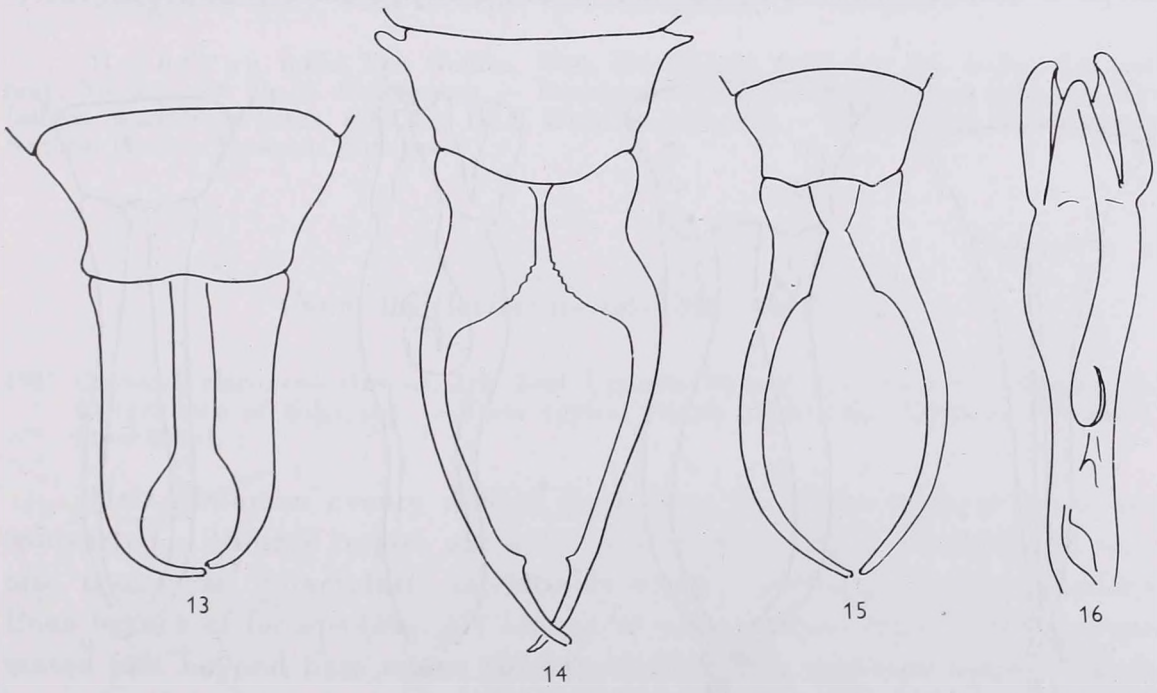
Female very similar to male, but ultimate tergite without lateral spines, and forceps slender, simple, tapering, straight.

Length of body with forceps, in both sexes: 15—18 mm.

Distribution: China: Yunnan.

Cosmiella hydra sp. n.

Male head reddish orange; antennae with joints 1—6 bicolourous, yellowish basally, and light brown apically; median portion of pronotum, tegmina, and abdominal tergites, light brown, lateral margins of pronotum, and forceps yellow; legs yellowish, femora and tibiae with darker bands transversally, abdominal tergites ornamented with two smaller blackish series of spots near lateral margins. Head normally developed, frons tumid; postfrontal and coronal sutures faintly visible; posterior margin of head more or less straight. Eyes prominent, but shorter than the length of head behind eyes. Antennae 13-jointed; first long, about as long as distance between antennal bases; second quadrate, third about as long as fourth, rest elongate, cylindrical. Pronotum transverse; lateral margins straight, widened posteriorly, posterior angles rounded, last margin convex. Tegmina short, unicolourous, simple, lateral longitudinal keels sharp, prominent; posterior margin



Figs 13—16. 13 = Male ultimate tergite with forceps of *Cosmiella nitens* (GÜNTHER, 1934). — 14 = Male ultimate tergite with forceps of *C. cornuta* (BEY-BIENKO, 1959). — 15 = Holotype ultimate tergite with forceps of *C. hydra* sp. n., and 16 = ditto holotype genital armature, (Original)

obliquely truncate. Wings entirely absent. Legs very long and slender, typical of the genus. Abdomen oval, subcylindrical; lateral glandular folds on tergites 3 very small, on tergite 4 large; sides of abdominal tergites without lateral ridges or tubercles. Ultimate tergite strongly narrowed posteriorly, simple. Pygidium hidden. Penultimate sternite broadly rounded posteriorly. Each branch of forceps (Fig. 15) characteristic; branches with sharp dorsal edge basally; margin of dorsal edge directed dorso-medially, apical part of forceps very slender, cylindrical in cross-section and curved. Genitalia (Fig. 16) typical of the genus; central parameral plate very narrow and slender, virga within genital lobe long with less sclerotized section basally; external paramere comparatively large, obtuse.

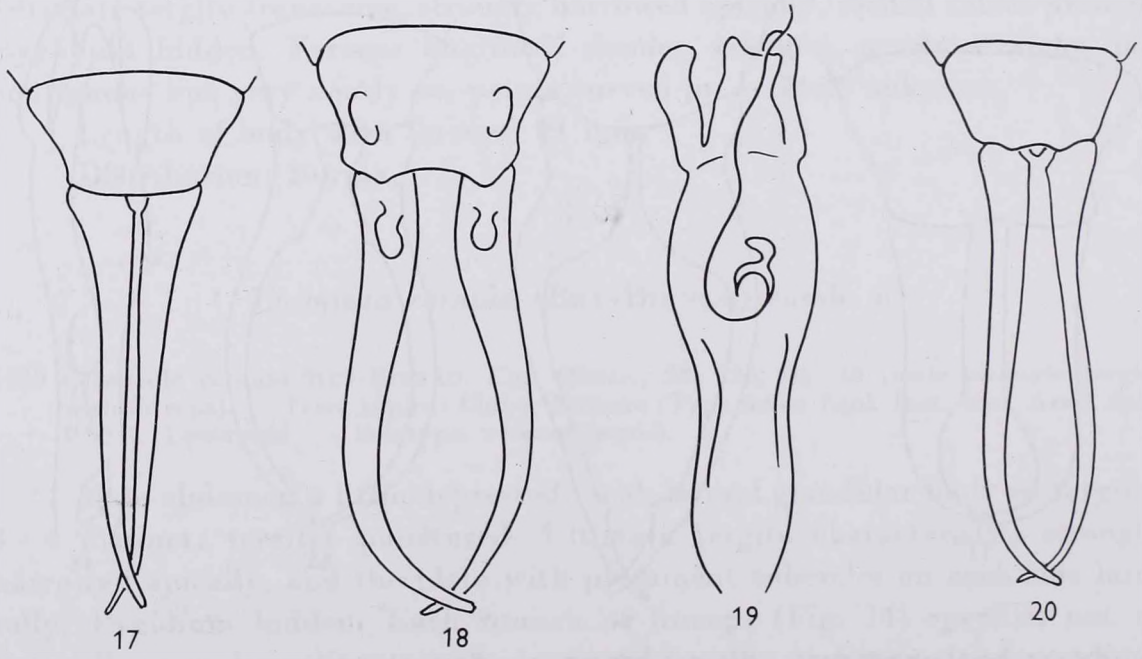
Female very similar to male, but lateral glandular folds on tergites 3—4 uniformly large, and forceps (Fig. 17) very slender, straight.

Length of body with forceps, in both sexes: 12—15 mm.

Holotype male, New Guinea, Mt. Wilhelm, near Kambugomambuno, 3200 m, forest, 14. 9. 1968, leg. Dr. J. BALOGH, gen. prep. No. 242, det. Dr. H. STEINMANN. — Paratypes: 2 males, and 4 females. — Deposited in the Hungarian Natural History Museum, Budapest.

Cosmiella exornata sp. n.

Male general colour dark reddish brown; all antennal joints light brown except a narrow yellow ring on each joint basally; femora yellow with three



Figs 17—20. 17 = Female ultimate tergite with forceps of *Cosmiella hydra* sp. n. — 18 = Holotype ultimate tergite with forceps of *C. exornata* sp. n., 19 = ditto, holotype genital armature, and 20 = ditto, female ultimate tergite with forceps (Original)

transversal brown stripes; head and ultimate tergite very dark brown. Head large, tumid, smooth, postfrontal and coronal sutures faintly marked; posterior margin convex in the middle. Eyes prominent, but shorter than the length of head behind eyes. Antennae 13-jointed; first joint long, but shorter than the distance between antennal bases; second quadrate, rest of joints elongate, slender, cylindrical. Pronotum transverse, lateral margins straight and a little widened posteriorly; posterior angles rounded, last margin faintly convex; prozona tumid, well separated from the flat metazona. Tagmina short, lateral longitudinal keels sharp, prominent; posterior margins obliquely truncate. Wings absent. Abdomen fusiform, lateral glandular folds on tergites 3—4 indistinct, small; sides of abdominal tergites simple, carinate. Ultimate tergite strongly narrowed posteriorly, with two blunt protuberances laterally; posterior margin trisinuate. Pygidium hidden. Penultimate sternite simple, broadly rounded posteriorly. Each branch of forceps (Fig. 18) characteristic; a little of *Eparchus*-type; branches with large, and obtuse, blunt dorsal tooth basally, the tooth directed upwards; branches a little depressed laterally at basal section, and cylindrical medially and apically. Genitalia (Fig. 19) typical of the genus; central parameral plate a little expanded apically, virga within genital lobe comparatively long with specific sclerotized curvature and plate basally; external paramere moderately large, obtuse.

Female similar to male, but each branch of forceps (Fig. 20) very slender and long, cylindrical, simple.

Length of body with forceps, in both sexes: 11—14 mm.

Holotype male, New Guinea, Wau, Mt. Kaindi, 1968, leg. Dr. J. BALOGH, gen. prep. No. 218, det. Dr. H. STEINMANN. — Paratypes: 3 males, and 9 females, ditto, and New Guinea, Wau, Nami Creak, 1968, leg. Dr. J. BALOGH, 3 females. — Deposited in the Hungarian Natural History Museum, Budapest.

Cosmiella flavicornis (HINCKS) comb. n.

1947 *Cosmicula flavicornis* HINCKS, Ark. Zool. Uppsala, **39A:** 40, fig. 22 (male in dorsal view., 23 (genitalia of holotype). — Terra typica: Burma (Type male: Riksmus. Naturhist., Stockholm).

Male abdomen evenly dilated from base to about segment 6, thence contracted. Ultimate tergite narrowed posteriorly, simple. Penultimate sternite transverse, punctulate, moderately hairly, posterior margin rounded. Each branch of forceps (Fig. 21) remote at base, cylindrical, slightly approximated just beyond base where there is a triangular tooth on upper surface, beyond which they are gently and regularly curved to the considerably overlapping apices; just before the middle point of forceps there is a small tooth directed inwards; in lateral view the portion beyond the basal tooth is slightly

concave. Genitalia (Fig. 22) specific; central parameral plate elongate, strongly narrowed basally, and expanded apically; virga within genital lobe very long with smaller but conspicuously sclerotized sac basally; external paramere well developed, outer margins rounded. — Female unknown.

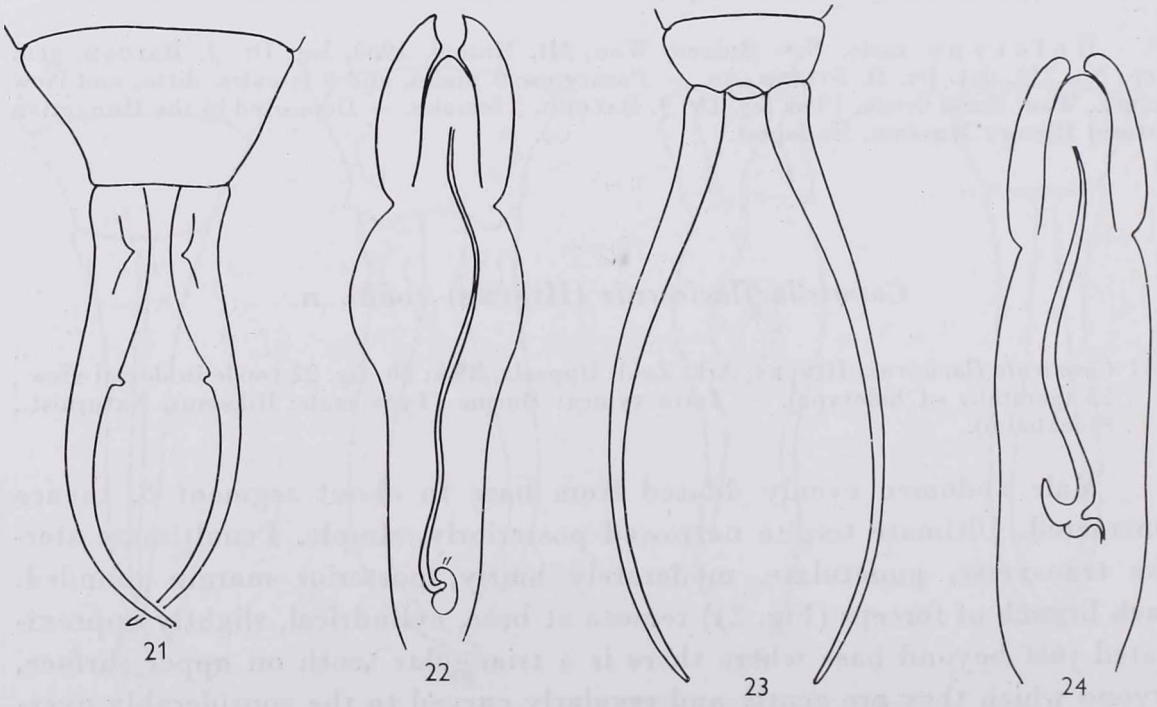
Length of body with forceps: 16—17 mm.

Distribution: Burma.

Cosmiella longiforceps (BRINDLE) comb. n.

1966 *Emboros longiforceps* BRINDLE, Trans. R. ent. Soc. London, **118:** 252, fig. 61 (genitalia of holotype), 66 (male in dorsal view), 68 (female forceps). — Terra typica: Madagascar (Type male: Mus. nation. Hist. nat., Paris).

Male abdomen transversely striate, lateral glandular folds on tergites 3—4 well developed. Ultimate tergite long, narrowed posteriorly, caudal margin trisinuate. Penultimate sternite simple, broadly rounded posteriorly. Each branch of forceps (Fig. 23) very long, remote at base, slender, cylindrical, curved evenly throughout its length. Genitalia (Fig. 24) comparatively long, central parameral plate strongly depressed, virga within genital lobe long, basal sclerite well developed; external paramere obtuse.



Figs 21—24. 21 = Male ultimate tergite with forceps of *Cosmiella flavicornis* (HINCKS, 1947), and 22 = ditto, male genital armature. — 23 = Male ultimate tergite with forceps of *C. longiforceps* (BRINDLE, 1966), and 24 = ditto, male genital armature (Original)

Female very similar to male, but antennae mainly reddish, black only at tip of first joint; ultimate tergite more narrow, forceps (Fig. 25) slender, slightly curved.

Length of body with forceps: male: 16 mm, female: 13—14 mm.

Distribution: Madagascar.

Cosmiella madagascariensis (BRINDLE) comb. n.

1904 *Opisthocosmia dubia* BURR (nec BORMANS, 1894), Trans. ent. Soc. London, **1904:** 303. — Terra typica: Madagascar (Type male: Brit. Mus. nat. Hist., London).

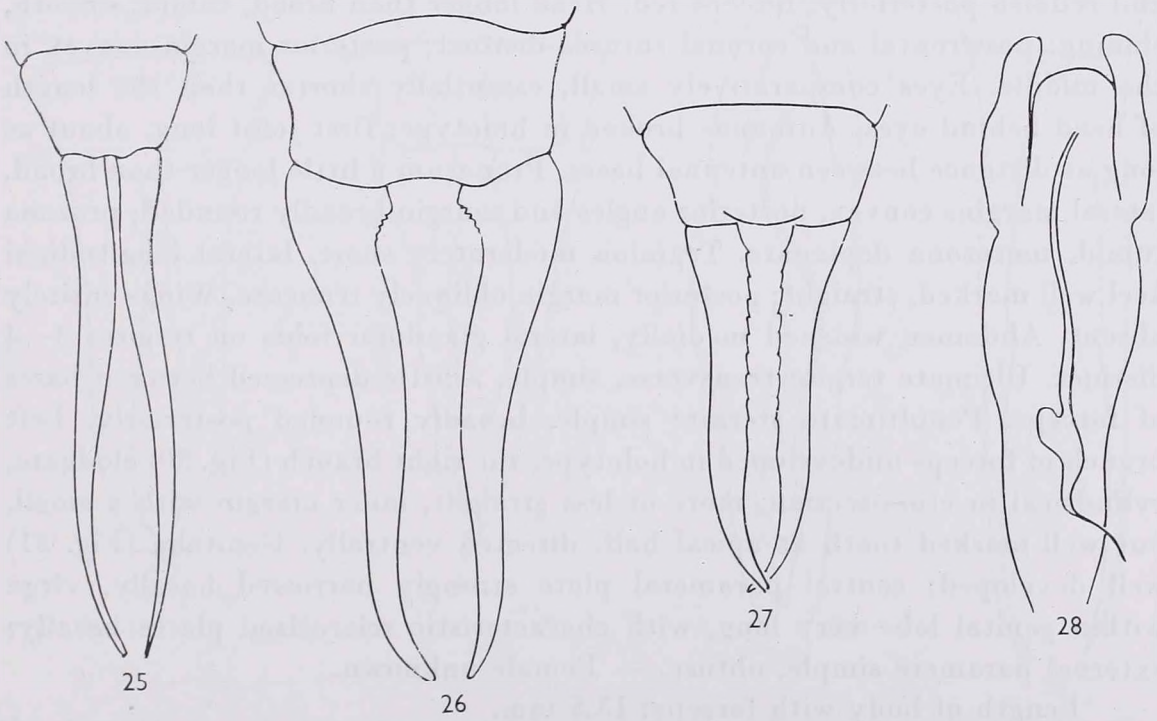
1978 *Emboros madagascariensis* BRINDLE (new name for *Opisthocosmia dubia* BURR, 1904), Entomologist's Rec., **90:** 61, fig. 1 (male in dorsal view), 2 (tegmina), 3 and 5 (cross-sections of left tegmen, diagrammatic), 4 (tegmina).

Male abdomen widened medially, smooth, shining. Ultimate tergite large, slightly depressed between bases of forceps. Penultimate sternite broad, rounded posteriorly. Each branch of forceps (Fig. 26) swollen at base, parallel-sided for most part, apex narrowed and incurved, inner margins with small denticles basally.

Female as male, but forceps contiguous, elongate, cylindrical.

Length of body with forceps, in both sexes: 8—10 mm.

Distribution: Madagascar.



Figs 25—28. 25 = Female ultimate tergite with forceps of *Cosmiella longiforceps* (BRINDLE, 1966). — 26 = Male ultimate tergite with forceps of *C. madagascariensis* (BRINDLE, 1978). — 27 = Male ultimate tergite with forceps of *C. unicolor* (BRINDLE, 1966), and 28 = ditto, male genital armature (Original)

Cosmiella unicolor (BRINDLE) comb. n.

1966 *Emboros unicolor* BRINDLE, Trans. R. ent. Soc. London, **118**: 255, fig. 62 (genitalia of holotype), 65 (male in dorsal view). — Terra typica: Madagascar (Type male: Mus. nation. Hist. nat., Paris).

Male abdomen shining, coriaceous, hardly dilated posteriorly; basal half of segments 3—4 punctate. Ultimate tergite transverse, as in Fig. 27. Penultimate sternite simple, posterior margin breadly rounded. Each branch of forceps (Fig. 27) long and slender, simple, denticulate on inner margin at basal half. Genitalia (Fig. 28) comparatively short and broad; central parameral plate expanded medially or apically, virga comparatively short, and basal sac large; external paramere normally developed, obtuse.

Female similar to male, but forceps (Fig. 29) almost contiguous, wider basally, tapering distally, straight except at tips, which curve mesad.

Length of body with forceps, in both sexes: 8—9.5 mm.

Distribution: Madagascar.

Cosmiella eridana sp. n.

Male general colour very dark reddish brown, head brownish anteriorly and reddish posteriorly; forceps red. Head longer than broad, tumid, smooth, shining; postfrontal and coronal sutures distinct; posterior margin convex in the middle. Eyes comparatively small, essentially shorter than the length of head behind eyes. Antennae broken in holotype; first joint long, about as long as distance between antennal bases. Pronotum a little longer than broad, lateral margins convex, posterior angles and margin broadly rounded; prozona tumid, metazona deplanate. Tegmina moderately short, lateral longitudinal keel well marked, straight; posterior margin obliquely truncate. Wings entirely absent. Abdomen widened medially, lateral glandular folds on tergites 3—4 distinct. Ultimate tergite transverse, simple, a little depressed between bases of forceps. Penultimate sternite simple, broadly rounded posteriorly. Left branch of forceps undeveloped in holotype, the right branch (Fig. 30) elongate, cylindrical in cross-section, more or less straight, inner margin with a small, but well-marked tooth at apical half, directed ventrally. Genitalia (Fig. 31) well developed; central parameral plate strongly narrowed basally, virga within genital lobe very long, with characteristic sclerotized plates basally; external paramere simple, obtuse. — Female unknown.

Length of body with forceps: 13.5 mm.

H o l o t y p e male: Nyasaland, btw. Liwonde, Ferry and Lilongwe, IX. 1948, A. LOVERRIDGE, gen. prep. No. 911, det. Dr. H. STEINMANN. — Deposited in the Mus. comp. Zool., Cambridge, Mass.

Cosmiella adolfi (BURR) comb. n.

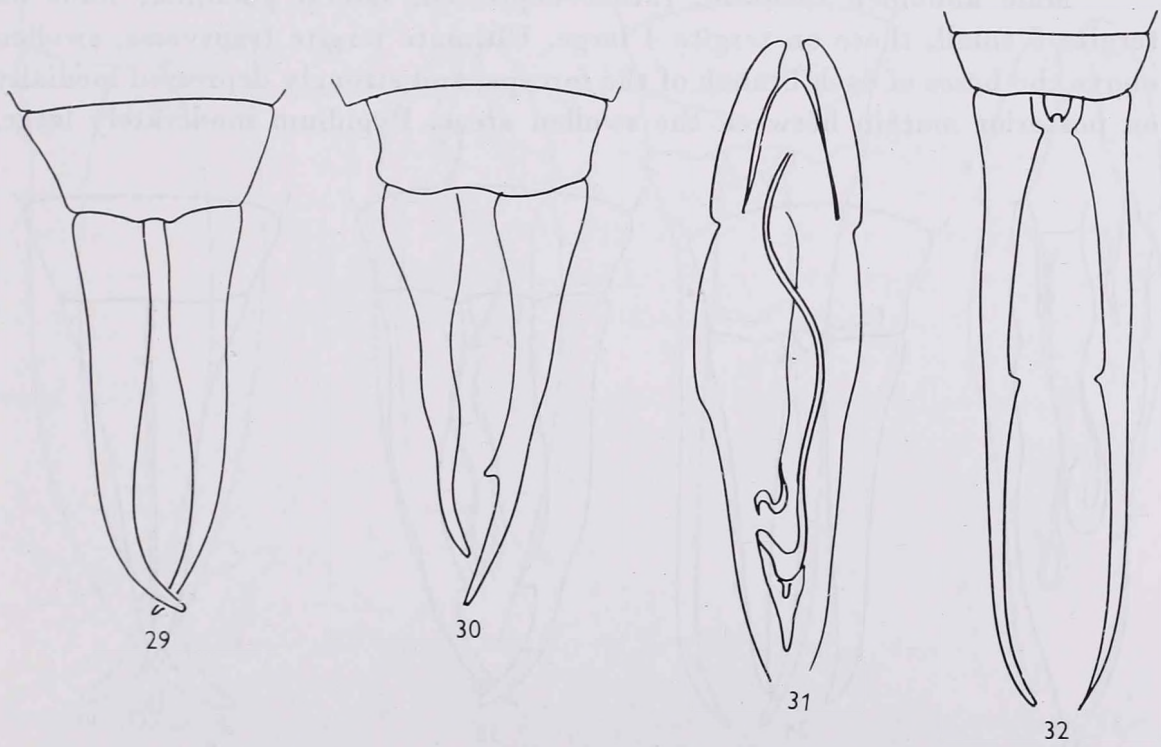
1909 *Archidux adolfi* BURR, Ann. Mag. nat. Hist., (8) **4:** 124. — Terra typica: Uganda (Type male: Brit. Mus. nat. Hist., London).
1973 *Archidux adolfi* — BRINDLE, The Dermaptera of Africa, **1:** 292, fig. 395 (male forceps), 396 (female forceps), 405 (male genitalia) (Rwanda, Tanzania).

Male abdomen long, almost parallel-sided, tergites 1—5 duller, rest shining, all segments strigose on posterior half, lateral tubercles small on third, large on fourth tergite. Ultimate tergite transverse, swollen above the base of each branch of the forceps. Pygidium small, posterior margin excised. Penultimate sternite simple, rounded posteriorly. Forceps (Fig. 32) very long, cylindrical, rather flattened medially, especially near base, inner margin finely denticulated for about basal half, and with a small ventro-median tooth near midpoint. Genitalia (Fig. 33) comparatively short and broad; central parameral plate broad, flattened, virga within genital lobe normally developed, and reclinate basally.

Female similar to male, but ultimate tergite narrowed posteriorly; each branch of forceps (Fig. 34) slender, almost straight, except at apex.

Length of body with forceps; male: 22—30 mm, female: 18—23 mm.

Distribution: Uganda, Tanzania, Rwanda.



Figs 29 — 32. 29 = Female ultimate tergite with forceps of *Cosmiella unicolor* (BRINDLE, 1966). — 30 = Holotype ultimate tergite with forceps of *C. eridana* sp. n., and 31 = ditto, genital armature. — 32 = Male ultimate tergite with forceps of *C. adolfi* (BURR, 1909) (Original)

Cosmiella pygidiata (BRINDLE) comb. n.

1973 *Archidux pygidiatus* BRINDLE, The Dermaptera of Africa, **1**: 298, fig. 403 (male forceps), 404 (female forceps). — Terra typica: Kenya (Type male: Nat. Mus., Nairobi).

Male abdomen broadened to tergites 5—7 thence narrowed; lateral glandular folds on third tergite small, those on fourth large. Ultimate tergite transverse, sides almost parallel, tergite depressed medially near posterior margin and swollen above the base of each branch of the forceps. Pygidium comparatively large, apex deeply excised. Each branch of forceps (Fig. 35) cylindrical, widely separated at base from the other branch, rather broad, with one ventro-median tooth towards apex.

Female similar to male, ultimate tergite narrower, and each branch of forceps (Fig. 36) slender, straight except at apex, branches contiguous.

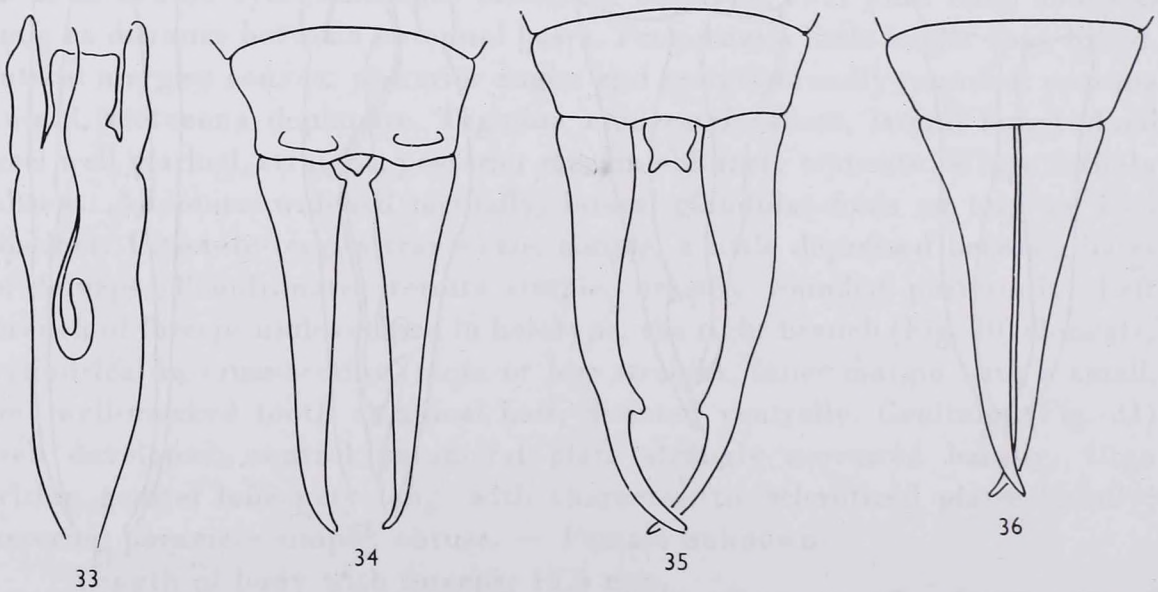
Length of body with forceps in both sexes: 10—12.5 mm.

Distribution: Kenya.

Cosmiella bilobata (BRINDLE) comb. n.

1973 *Archidux bilobatus* BRINDLE, The Dermaptera of Africa, **1**: 299, fig. 408 (female forceps), 409 (male forceps in lateral view). 407 (male forceps in dorsal view). — Terra typica: Kenya (Type male: Brit. Mus. nat. Hist., London).

Male abdomen fusiform, rather depressed; lateral glandular folds on tergite 3 small, those on tergite 4 large. Ultimate tergite transverse, swollen above the bases of each branch of the forceps, and strongly depressed medially on posterior margin between the swollen areas. Pygidium moderately large,



Figs 33—36. 33 = Male genital armature of *Cosmiella adolfi* (BURR, 1909), and 34 = ditto, female ultimate tergite with forceps. — 35 = Male ultimate tergite with forceps of *C. pygidiata* (BRINDLE, 1973), and 36 = ditto, female forceps (Original)

widened posteriorly, deeply excised on posterior margin, and forming two triangular lobes. Each branch of forceps (Fig. 37) elliptical in cross-section basally, cylindrical distally, inner margin with small isolated rounded teeth arranged longitudinally, the branch slightly arcuate; towards the apex is a ventro-median tooth, and from this tooth the branch curves sharply dorso-posteriorly. Genitalia (Fig. 38) specific; central parameral plate oval, virga within genital lobe characteristic, very long and reclinate basally; not of *Cosmiella*-type; external paramere comparatively small, obtuse apically.

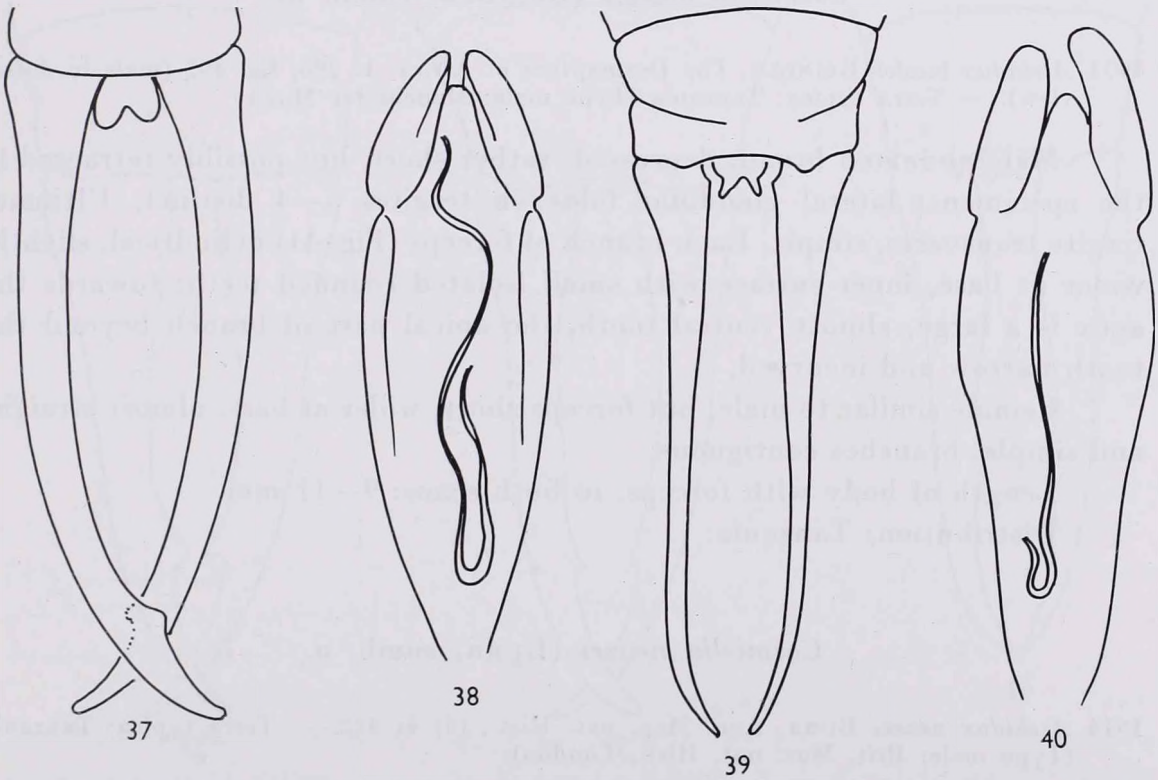
Female similar to male, each branch of forceps very slender, almost straight, tapering distally, inner margin slightly crenulated; branches contiguous.

Length of body with forceps, in both sexes: 12—14.5 mm.

Distribution: Kenya.

Cosmiella artificiosa sp. n.

Male general colour dark red; head orange, legs light brown. Head large, tumid; postfrontal and coronal sutures very deep; posterior margin strongly convex in the middle. Eyes normally developed, shorter than the length of head behind eyes. Antennae 12-jointed; first joint long, about as long as



Figs 37—40. 37 = Male ultimate tergite with forceps of *Cosmiella bilobata* (BRINDLE, 1973), and 38 = ditto, male genital armature. — 39 = Holotype ultimate tergite with forceps of *C. artificiosa* sp. n., and 40 = ditto, genital armature (Original)

distance between antennal bases; second quadrate, third a little shorter than fourth; rest elongate, cylindrical. Pronotum transverse, lateral margins deplanate and finely convex, posterior margin convex; median longitudinal furrow indistinct. Tegmina short, lateral longitudinal keel well marked, posterior margin obliquely truncate; surface conspicuous, granulate. Wings absent. Abdomen elongate, all tergites punctulate, lateral glandular folds on tergites 3—4 large. Ultimate tergite transverse, tumid anteriorly, and depressed posteriorly. Pygidium specific, posterior margin deeply excised, with two narrow finger-like protuberances laterally. Each branch of forceps (Fig. 39) very long and slender, cylindrical in cross-section; inner margins finely crenulate on the basal half. Genitalia (Fig. 40) comparatively simple; central parameral plate broad and short, virga within genital lobe normally developed, sclerotized and turned basally; external paramere oval, obtuse apically. — Female unknown.

Length of body with forceps: 21 mm.

H o l o t y p e male: Tanzania, Uzungwe Mts., Mwanihana Forest above Sanje, 600 m, Ol. viii. 1981, M. STOLZE et N. SCHARFF leg., gen. prep. No. 994, det. Dr. H. STEINMANN. — Deposited in the Zool. Mus., København.

Cosmiella bicolor (BRINDLE) comb. n.

1973 *Archidux bicolor* BRINDLE, The Dermaptera of Africa, **1:** 296, fig. 492 (male in dorsal view). — Terra typica: Tanzania (Type male: Manchester Mus.)

Male abdomen broad, depressed, rather short, but possibly retracted in the specimens; lateral glandular folds on tergites 3—4 distinct. Ultimate tergite transverse, simple. Each branch of forceps (Fig. 41) cylindrical, slightly wider at base, inner surface with small isolated rounded teeth; towards the apex is a large, almost ventral tooth, the apical part of branch beyond the tooth narrow and incurved.

Female similar to male, but forceps short, wider at base, almost straight and simple, branches contiguous.

Length of body with forceps, in both sexes: 9—11 mm.

Distribution: Tanzania.

Cosmiella neavei (BURR) comb. n.

1914 *Archidux neavei* BURR, Ann. Mag. nat. Hist., (8) **4:** 422. — Terra typica: Tanzania (Type male: Brit. Mus. nat. Hist., London).

Male abdomen short, a little depressed, lateral glandular folds on tergites 3—4 large. Ultimate tergite simple, transverse, a little depressed medially

near posterior margin. Each branch of forceps (Fig. 42) widely separated from the other at base, elongated, parallel, straight; just before apex, on upper margin, is an erect slender acute spine. — Female unknown.

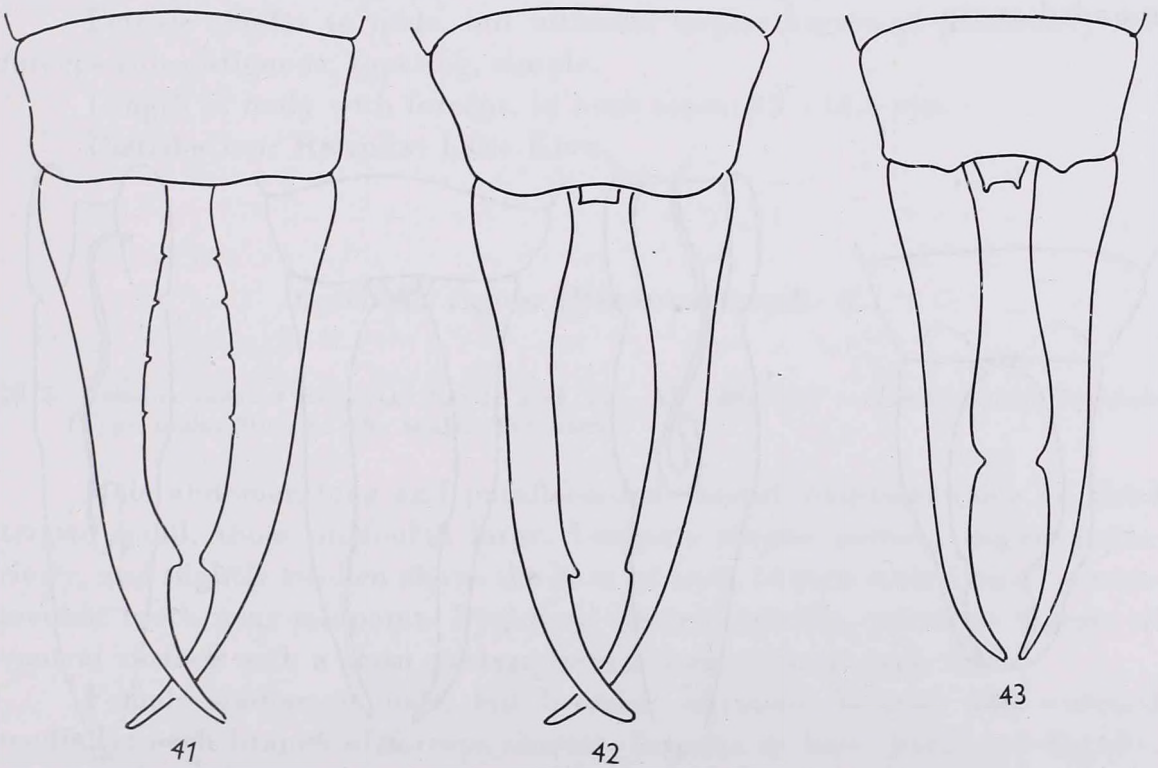
Length of body with forceps: 15—15.5 mm.

Distribution: Tanzania.

Cosmiella laevis (BRINDLE) comb. n.

1975 *Archidux laevis* BRINDLE, Revue zool. bot. Afr., **89:** 694, fig. 4 (male in dorsal view). — Terra typica: Tanzania (Type male: Mus. r. Afr. centr., Tervuren).

Male abdomen slightly widened to tergites 7—8, and only slightly depressed; glandular folds on tergites 3, small, those on 4 large and prominent. Ultimate tergite transverse, lateral margins sinuate, posterior margin thickened and darkened, median surface near posterior margin striated and raised above the base of each branch of the forceps, but depressed medially by margin. Pygidium comparatively smal , ventral surface ending bluntly in a small postero-lateral projection on each side. Forceps (Fig. 43) cylindrical, slightly widened at base, and slightly sinuate, inner margins with small denticulations basally, and with a small median tooth beyond midpoint.



Figs 41—43. 41 = Male ultimate tergite with forceps of *Cosmiella bicolor* (BRINDLE, 1973). — 42 = Male ultimate tergite with forceps of *C. neavei* (BURR, 1914). — 43 = Male ultimale tergite with forceps of *C. laevis* (BRINDLE, 1975) (Original)

Female similar to male, branches of forceps simple, typical, shorter and slender.

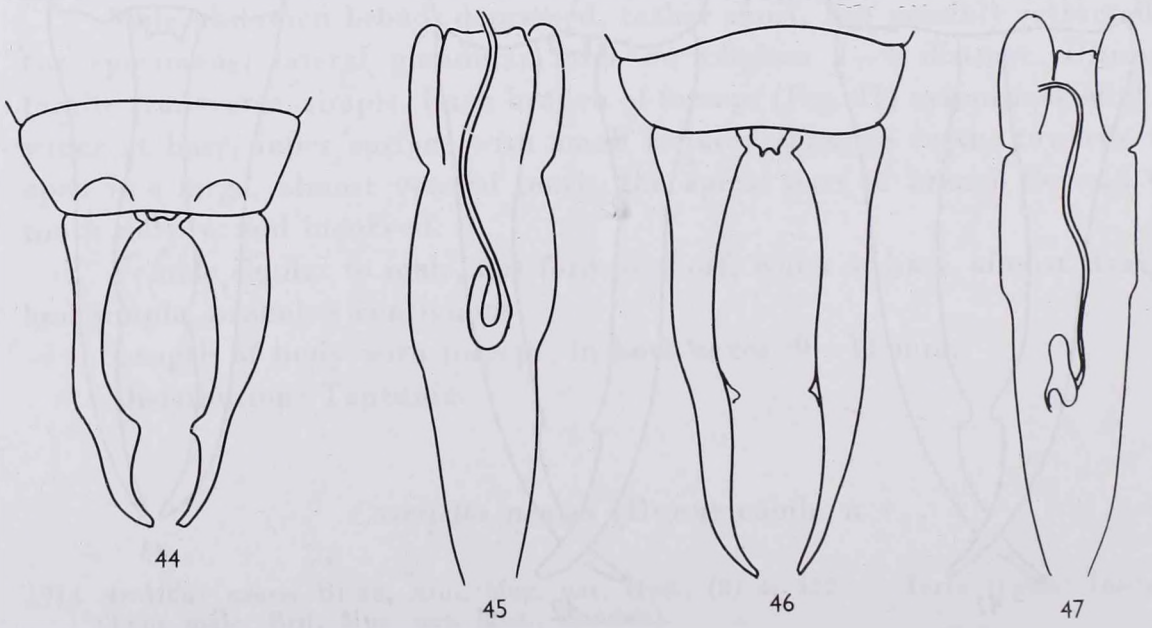
Length of body with forceps, in both sexes: 14—15 mm.

Distribution: Tanzania.

Cosmiella minima (BRINDLE) comb. n.

1966 *Archidux minimus* BRINDLE, Revue zool. bot. Afr., **73:** 56, fig. 14 (male abdominal end with forceps), 15—16 (ditto, laterally), 20 (genitalia of holotype), 23 (pronotum). — Terra typica: Kivu (Type male: Mus. r. Afr. centr., Tervuren).

Male abdomen short and dilated posteriorly, tergites punctate on basal half, lateral glandular folds on tergites 3—4 large; abdominal segments 7—8 (sometimes 9) each with raised rugose areas on each side, placed dorso-laterally. Ultimate tergite transverse, with a circular depression raised over the base of each branch of the forceps. Pygidium transverse, slightly emarginate apically. Each branch of forceps (Fig. 44) cylindrical on basal third, then flattened on inner surfaces, both dorsal edges and ventral edges of this flattened surface end in large dorso-median and ventro-median tooth. Genitalia (Fig. 45) simple; central parameral plate short, virga within genital lobe of medium size with of *Cosmiella*-type curvature basally; external paramere club-shaped, smoothly rounded at tip.



Figs 44—47. 44 = Male ultimate tergite with forceps of *Cosmiella minima* (BRINDLE, 1966), and 45 = ditto, male genital armature. — 46 = Male ultimate tergite with forceps of *C. intermedia* (BRINDLE, 1966), and 47 = ditto, male genital armature (Original)

Female as male, but ultimate tergite narrowed posteriorly, and swollen over the forceps bases; forceps slender and subcontiguous, tapered distally, straight proximally and curved gently at apices. Pygidium hidden.

Length of body with forceps, in both sexes: 10—13 mm.

Distribution: Rwanda: Lake Kivu.

Cosmiella intermedia (BRINDLE) comb. n.

1966 *Archidux intermedius* BRINDLE, Revue zool. bot. Afr., **73:** 54, fig. 21 (genitalia of holotype), 24 (pronotum), 13 (male forceps), 17 (ditto, laterally). — Terra typica: Kivu (Type male: Mus. r. Afr. ventr., Tervuren)

Male abdomen rather dilated posteriorly; lateral glandular folds on tergites 3—4 prominent. Ultimate tergite transverse, simple, median longitudinal sulcus distinct. Pygidium rounded dorsally, and excised ventrally. Each branch of forceps (Fig. 46) slender and elongate, dilated or flattened basally, cylindrical in cross-section medially and apically; inner margins with a central tooth medially. Genitalia (Fig. 47) of *Cosmiella*-type; central parameral plate comparatively narrow, virga within genital lobe long with a smaller or larger sclerotized plate basally.

Female similar to male, but ultimate tergite narrowed posterioly, and forceps subcontiguous, tapering, simple.

Length of body with forceps, in both sexes: 13—14.5 mm.

Distribution: Rwanda: Lake Kivu.

Cosmiella rugosa (BRINDLE) comb. n.

1975 *Archidux rugosus* BRINDLE, Revue zool. bot. Afr., **89:** 693. — Terra typica: Tanzania (Type male: Mus. r. Afr. centr., Tervuren).

Male abdomen long and parallel-sided, lateral glandular folds on third tergite small, those on fourth large. Ultimate tergite narrow, rugose posteriorly, and slightly swollen above the base of each branch with a small ventromedian tooth near midpoint. Pygidium convex dorsally, posterior margin of ventral surface with a short postero-lateral projection at each side.

Female similar to male, but broader, abdomen broader and widened medially; each branch of forceps shorter, broader at base, narrowed distally, excavated at extreme base near pygidium; inner margin with small denticles.

Length of body with forceps, in both sexes: 17—19 mm.

Distribution: Tanzania.

REFERENCES

Borelli, A. (1924): Dermapteres de l'Ile Buru. — Treubia, Buitenzorg, **5:** 331—339.
Brindle, A. (1966): The Dermaptera of Madagascar. — Trans. R. ent. Soc. London, **118:** 221—259.
Brindle, A. (1973): The Dermaptera of Africa, Tervuren, **1:** 1—335.
Burr, M. (1907): A preliminary revision of the Forficulidae and of the Chelisochidae, families of the Dermatoptera. — Trans. r. ent. Soc. London, **1907:** 91—134.
Burr, M. (1909): Notes on the Forficularia. XVII. — Ann. Mag. nat. Hist., (8) **4:** 113—129.
Hincks, W. D. (1947): Entomological results from the Swedish expedition 1934 to Burma and British India, Dermaptera. — Ark. Zool. Uppsala, **39**A (1): 1—43.
Steinmann, H. (1987): Dermaptera of Venezuela. — Faune de subterranea de Venezuela, Bucuresti, **1:** 165—172.
Verhoeff, K. W. (1902): Über Dermapteren. Versuch eines neuen, natürlicheren Systems auf vergleichend-morphologischer Grundlage und über den Mikrothorax der Insekten. — Zool. Anz., Leipzig, **25** (665): 181—208.

Acta Zoologica Hungarica 35 (1—2), pp. 165—190 (1989)

WEITERE NEUE GLOSSODRILUS-ARTEN AUS EKUADOR (OLIGOCHAETA: GLOSSOSCOLECIDAE), REGENWÜRMER AUS SÜDAMERIKA 9

A. Zicsi

Bodenzoologische Forschungsgruppe der Ungarischen Akademie der Wissenschaften, am Lehrstuhl für Tiersystematik und Ökologie der Eötvös-Loránd Universität, H-1088 Budapest, Puskin utca 3, Ungarn

(Eingegangen am: 29. März 1988)

Nine species and one subspecies are new for science belonging to the genus *Glossodrilus* Cognetti, 1905 and described from Ecuador. They are the following: *G. benavidesi* sp. n., *G. papillatus* sp. n., *G. loksai* sp. n., *G. seidlae* sp. n., *G. mahnerti* sp. n., *G. antisanae* sp. n., *G. tuberculatus* sp. n., *G. teranae* sp. n., *G. chimborazoi* sp. n. and *G. crucifer fragilis* ssp. n. Complementary data to the descriptions of *G. perrieri perrieri* (Cognetti, 1904) and *G. nemoralis* (Cognetti, 1905) are given. With 12 (44) original figures.

In einer vorausgehenden Arbeit wurden von mir unlängst 3 neue *Glossodrilus*-Arten aus Ekuador beschrieben (Zicsi 1988). Seither sind aus verschiedenen Teilen Südamerikas ebenfalls weitere neue Arten aus dieser Gattung bekanntgeworden (Righi 1984a—c, 1988; Righi & Merino 1987; Righi & Römbke 1987) die, die der *Glossodrilus*-Gattung angehörenden Arten, auf 43 erhöhte. Meine neueren Aufsammlungen in Ekuador (1987), die den Nachweis weiterer für die Wissenschaft neuer und bereits bekannter Arten erbrachte, veranlassen es mich mit dieser Gattung näher zu befassen. Obwohl mehr als 50% der Taxa (22 Arten bzw. Unterarten) aus Brasilien beschrieben wurden, ist nahezu die andere Hälfte der Arten in Peru (1), Ekuador (6), Kolumbien (3), Venezuella (3), Panama, Darien (4), Costa Rica (3) und Antillen (1) erbeutet worden und so in gewissen Beziehungen den Formen in Ekuador näherstehend.

Die Arten aus dem Andengebiet, wie dies bereits in der vorausgehenden Arbeit (Zicsi 1988) erwähnt wurde, sind zum grössten Teil anhand eines Exemplares, oder sehr schlecht erhaltenem Material beschrieben worden. Von den weiter oben angeführten 21 Arten bzw. Unterarten sind 11 Arten, leider insgesamt über 57%, ebenfalls aufgrund eines Exemplares bekanntgeworden. Ich glaube nicht besonders betonen zu müssen, wie sehr dieser Umstand das Identifizieren der aus diesem Gebiet stammenden Arten erschwert, in einigen Fällen unmöglich macht.

Wie dies aus den Sammelerfahrungen meiner beiden letzten Jahre hervorgeht, handelt es sich bei diesen Arten zum grössten Teil um solche Tiere,

deren Epidermis besonders zart ist, die lebend sehr zerbrechlich sind, abgetötet leicht erweichen, so dass für ihre Konservierung ein besonderes Verfahren ausgearbeitet werden musste. Aus diesem Grunde kann nach einem Sezieren dieser Individuen kaum eine Nachbestimmung durchgeführt werden. Deswegen habe ich auch verzichtet das Typenmaterial der aufgrund eines Tieres beschriebenen Arten zu erlangen, da ich mir von einer Nachbestimmung in meisten Fällen sowieso nicht viel versprechen darf.

Righi (1975, 1982a—b), der den grössten Teil der aus Brasilien bekanntgewordenen Arten beschrieben hat, befasste sich vorausgehend mit der Revision dieser Gattung und gibt auch einen Bestimmungsschlüssel der bis dahin bekannten Arten an (Righi 1970). Bei der Einziehung seiner Untergattung *Tonperoge* (Righi 1982), die aufgrund des Fehlens von Samentaschen aufgestellt wurde, wird darauf hingewiesen, dass der Reduktion dieser Organe, auch bis auf ein vollständiges Verschwinden, keine supraspezifische Bedeutung zugemessen werden kann. Die intraspezifische Bedeutung soll in Kombination mit anderen Merkmalen, insbesondere mit der der Chylustaschen verbundenen Membran, die bei einigen Arten aus Brasilien erkannt wurde, in Verbindung gebracht werden.

Obwohl die Bestimmungsmerkmale dieser Gattung, insbesondere bei Arten aus dem Andengebiet und nördlich davon, auf eine verhältnismässig enge Variation eingeschränkt ist (Lage des Gürtels vom 14., 15.—21., 22., 23. Segment, der Pubertätsstreifen oder des Pubertätsfeldes vom 16. Segment beginnend bis zum 21. Segment, Lage der männlichen Poren zwischen den Segmenten, bzw. Intersegmentalfurchen 16. bis 19. Segment, ein oder ein Paar weibliche Poren u. s.w.), sind die kleinsten Unterschiede eines dieser Merkmale in Kombination mit den anderen, in den meisten Fällen ausreichend, eine neue Art mit Sicherheit festlegen zu können. Eben deswegen ist es insbesondere bei den Beschreibungen von Arten die aufgrund eines Exemplares erfolgten besonders schwer zu entscheiden, ob Abweichungen die bei neuerem Material erkannt wurden ausreichen, sie als gesonderte, gute Art zu betrachten.

Im nachstehenden gebe ich einen Teil der in den Jahren 1986 und 1987 in verschiedenen Teilen Ekuadors gesammelten Arten bekannt. Wo ich mir beim Einreihen der Arten unsicher bin, verzichte ich auf eine Anführung des Materiales und verschiebe die Bekanntmachung auf einen späteren Zeitpunkt, wo mir eventuell ein reicheres Vergleichsmaterial zur Verfügung stehen wird oder auch das Typenmaterial nach einer Einsicht, Aufschluss geben kann.

Glossodrilus Cognetti, 1905 emend. Righi, 1975, 1982

Glossodrilus Cognetti, 1905: 5, 1906: 237; *Glossoscolex* part in Michaelsen 1918: 256; *Andioscolex* Michaelsen 1927: 372; *Glossodrilus* (*Tonperoge*) Righi & Ayres 1975: 313; *Glossodrilus* Righi, 1985: 86, 1982: 63.

Gattungsdiagnose: Borsten in 8 Längslinien. Männliche Poren intraclitellar. Ein Paar Chylustaschen, Kompositenschlauchtaschen, im 11. Segment. Geschlechtsapparat metandrisch, metagyn. Samentaschen im allgemeinen vorhanden, selten, vollkommen reduziert. Samensäcke im allgemeinen durch Durchbrechung der Dissepimnete weit nach hinten reichend. Kopulationstaschen fehlen.

Typus: *Glossodrilus parvus* Cognetti, 1905.

Beschreibung der Arten

Glossodrilus perrieri perrieri (Cognetti, 1904)

Ich glaube mit Sicherheit annehmen zu können, dass ich der *G. perrieri perrieri* gegenüberstehe, die leider ebenfalls anhand eines einzigen, vielleicht auch nicht ganz geschlechtsreifen Exemplares beschrieben wurde. Der erste von Zicsi & Csuzdi, 1987 aus Paraguay gemeldete Wiederfund, wo nur ein einziges zerschnittenes Exemplar vorlag und auch dies stark mazieriert ist, muss mit Vorbehalten als stichhaltige Bestimmung betrachtet werden.

Das vorliegende, von verschiedenen Fundorten stammende Material stimmt mit der Beschreibung von Cognetti im wesentlichen überein. Nachstehend sollen nur einige Ergänzungen der Originalbeschreibung zugefügt werden.

An Grösse ist dies die grösste in Ekuador gesammelte Art dieser Gattung. Es konnten Tiere auch von 140 mm Länge und 4,5 mm Breite und einer Segmentzahl von 193 erbeutet werden. Der Gürtel ist bei adulten Tieren eindeutig ringförmig, die Pubertätsstreifen, bzw. das Pubertätsfeld geht auch auf 1/n 16.—1/2 20. Segment über. Die Chylustaschen im 11. Segment sind mit dem Dorsalgefäss und den Lateralherzen im 11. Segment durch ein Seitengefäss verbunden, welches sich in den Chylustaschen auflösst und am Ende in das Dorsalgefäss durch zwei Querverbindungen sich anschliesst. Die Samentaschen sind mehr bohnenförmig mit langem Stiel, die Samensäcke gehen weit nach hinten und sind am Ende stark verdünnt. Der Schwanz ist vierkantig angeschwollen (Abb. 1 A—D).

Fundorte: AF/363.1 Ex. Prov. Cotopaxi. Cotopaxi 3700 m. Nadelwald. 26. II. 1986. leg. Benavides, Loksa et Zicsi. — AF/373. 2 + 1 juv. Prov. Ex. Pichincha. Pasochoa National Park 2800—2880 mm. 6. II. 1986. leg. Benavides, Loksa et Zicsi. AF/374—375. 3 + 5 juv. Ex. Fundort wie zuvor. AF/580—582. 27 + 10 juv. Ex. Fundort wie zuvor. 15. 4. 1987, leg.

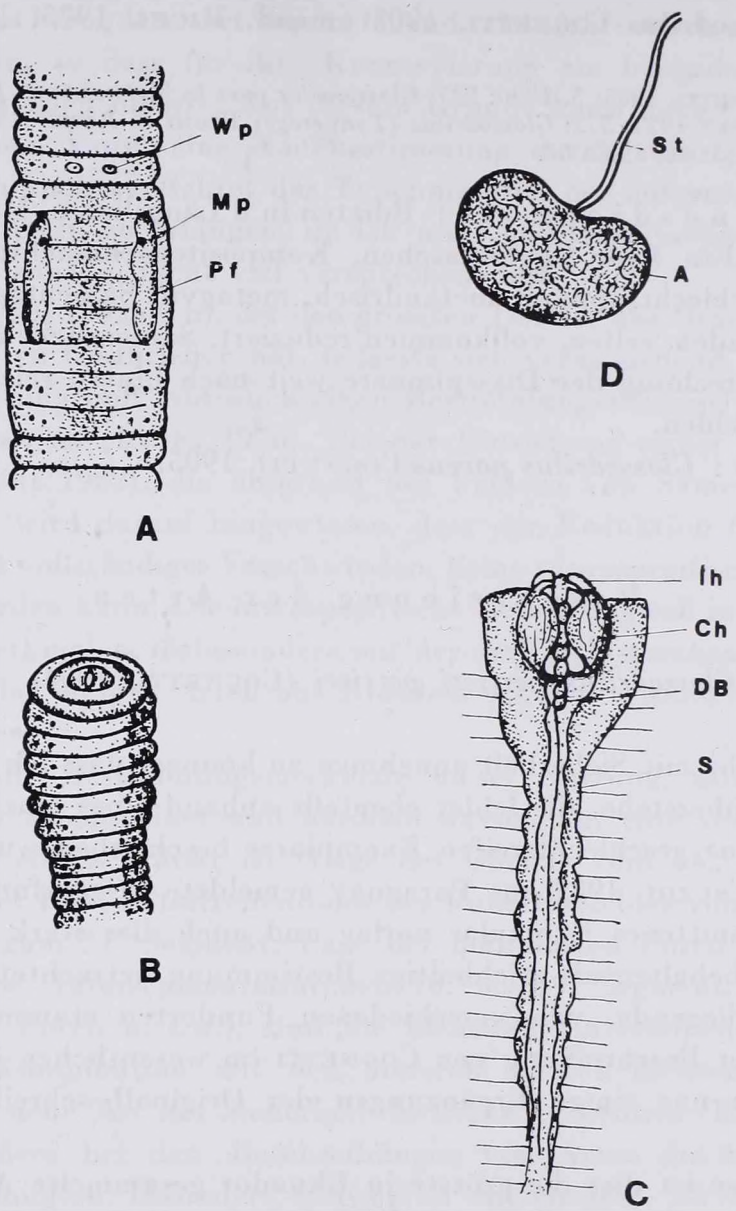


Abb. 1. *Glossodrilus perrieri perrieri* (COGNETTI, 1904): A = Ventralansicht des Gürtels: Wp = Weibliche Poren, Mp = Märnliche Poren, Pf = Pubertätsfeld; B = Ende des Körpers; C = Männliche Geschlechtsorgane: Ih = Intestinalherzen des 11. Segments, S = Samensäcke, Ch = Chylustaschen, DB = Dorsales Blutgefäss; D = Samentasche: St = Stiel, A = Ampulle

BENAVIDES, LOKSA et ZICSI. — AF/583—585. 25 + 4 juv. Ex. Prov. Pichincha., Antisana 3200—3600 m Grasland, am Ufer von Bächen. Paramo-Vegetation. 17. 4. 1987. leg. LOKSA et ZICSI. — AF/588. 2 Ex. Prov. Pichincha. Pichincha geb. 3100. m. Grasland. 19. 4. 1987. leg. LOKSA et ZICSI.

Glossodrilus benavidesi sp. n. (Abb. 2)

Länge des Holotypus 125 mm, Breite 3,4 mm, Segmentzahl 185. Bei den übrigen Tieren Länge 85—100 mm, Breite 2,8—3,6 mm, Segmentzahl 179—196.

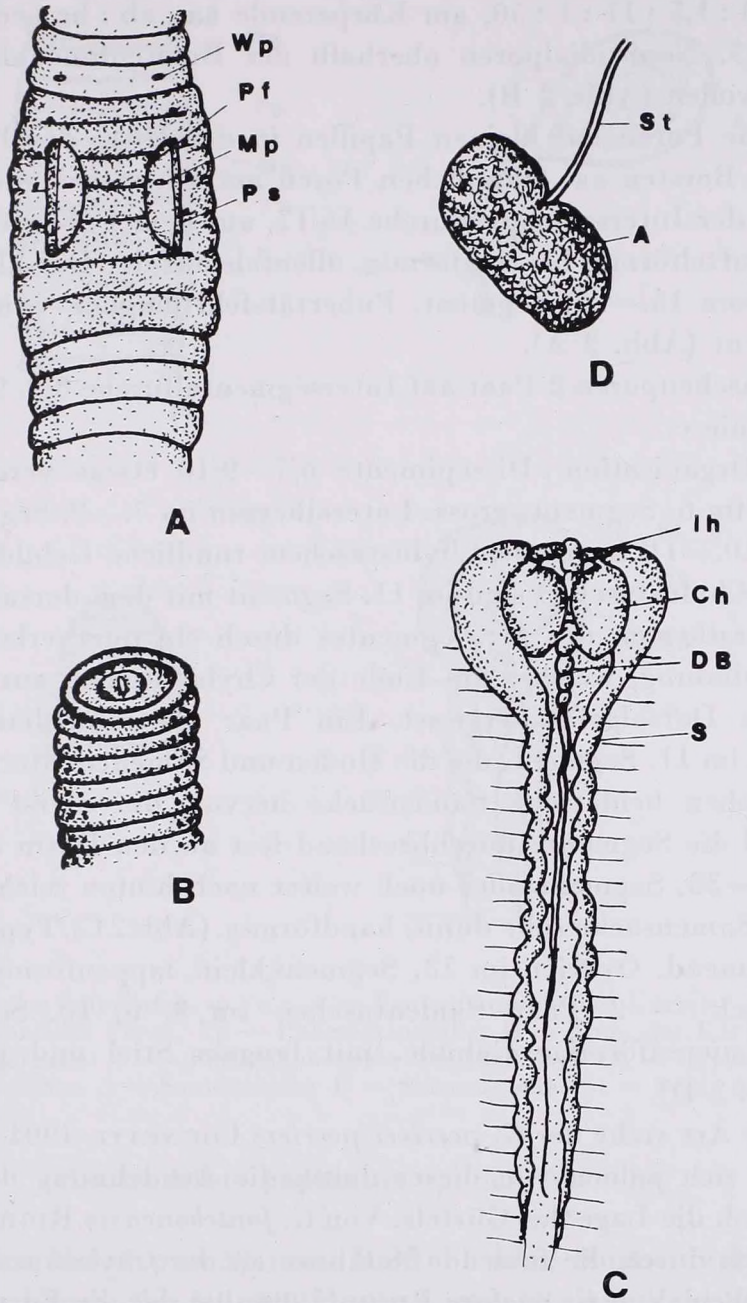


Abb. 2. *Glossodrilus benavidesi* sp. n.: A = Ventralansicht des Gürtels: Wp = Weibliche Poren, Mp = Männliche Poren, Pf = Pubertätsfeld; Ps = Pubertätsstreifen; B = Ende des Körpers; C = Männliche Geschlechtsorgane: Ih = Intestinalherzen des 11. Segmentes, S = Samensäcke, Ch = Chylustaschen, DB = Dorsales Blutgefäss; D = Samentasche: St = Stiel, A = Ampulle

Farbe weiss, Darm dunkel durchschimmernd.

Kopf proepilobisch, eingezogen. Segmente vor dem Gürtel ungeringelt, hinter dem Gürtel mehrfach geringelt. Borsten entlang des ganzen Körpers eng gepaart. Borsten cd viel enger als ab. Borstendistanz vor dem Gürtel aa : ab : bc : cd : dd = 20,7 : 2 : 7,3 : 1 : 40; hinter dem Gürtel aa : ab : bc :

: cd : dd = 40 : 1,5 : 11 : 1 : 50, am Körperende aa : ab : bc : cd : dd = 27,5 : : 1 : 11 : 1 : 3,5. Nephridialporen oberhalb der Borstenlinie ab. Körperende dick angeschwollen (Abb. 2 B).

Weibliche Poren auf kleinen Papillen in der Mitte des 14. Segmentes, innerhalb der Borsten aa. Männlichen Poren am hinteren Rand des 16. Segmentes, nahe der Intersegmentalfurche 16/17, auf dem Pubertätsfeld.

Gürtel sattelförmig bis ringförmig, allenfals auf der Dorsalseite kräftiger ausgebildet, vom 15.—22. Segment. Pubertätsfeld länglich vom 16.—1/n 20, 1/2 20. Segment (Abb. 2 A).

Samentaschenporen 2 Paar auf Intersegmentalfurche 8/9, 9/10 unterhalb der Borsteinlinie c.

Innere Organisation : Dissepimente 6/7—9/10 etwas verdickt. Runder Muskelmagen im 6. Segment, gross. Lateralherzen im 7.—9. Segment, Intestinalherzen im 10.—11. Segment. Chylustaschen, rundliche Gebilde im 11.—12. Segment. Die Chylustaschen sind im 11. Segment mit dem dorsalen Blutgefäss und den Lateralherzen des 11. Segmentes durch ein querverlaufendes Blutgefäss in Verbindung, welches am Ende der Chylustaschen austritt und sich wieder in das Dorsalgefäss ergiesst. Ein Paar ventralmedian verbundene Testikelblasen im 11. Segment, die die Hoden und Samentrichter einschliessen. Aus diesen gehen beiderseits Samensäcke hervor, die zuerst gross, später verschmälernd die Segmente durchbrechend fest an den Darm angeschmiegt, bis in das 32.—33. Segment oder noch weiter nach hinten reichen. Am Ende verlaufen die Samensäcke sehr dünn, bandförmig. (Abb.2 C). Typhlosolis im 14. Segment beginnend. Ovarien im 13. Segment klein, lappenförmig. Nephridien meganephridisch — 2 Paar Samentaschen im 9. u. 10. Segment, mehr oder weniger nierenförmige Gebilde, mit langem Stiel und prall gefüllter Ampulle (Abb. 2 D).

Die neue Art steht der *G. perrieri perrieri* Cognetti, 1904 am nächsten. Unterscheidet sich jedoch von dieser durch die Ausdehnung des Pubertätsfeldes und durch die Lage des Gürtels. Von *G. fontebonensis* Righi, 1988 unterscheidet sie sich durch die fehlende Membran an der Chylustasche und Form der Samentaschen. Von *G. paoletti* Righi, 1984, bei der die Form der Samentaschen ähneln, unterscheidet sie sich durch die Lage des Gürtels, der Pubertätsfeldes und der männlichen Poren. Von *G. p. perrieri* unterscheidet sie sich auch in der Lage der männlichen Poren.

Die neue Art wird zu Ehren nach Herrn V. Benavides, Quito benannt, der uns auf beiden Samelreisen begleitete und uns beim Sammeln weitgehend behilflich war.

Fundorte: H o l o t y p u s AF/636. Prov. Imbabura, 32 km von Otavalo entferent in Richtung Selva Alegre, 3700 m Paramo Vegetation. 22. IV. 1987. leg. Benavides, Loksa et Zicsi. — P a r a t y p e n: Fundort wie zuvor. AF/586—587. 9 + 22 juv. Ex. — AF/359. 1 Ex. Prov. Cotopaxi, Zwischen Pujili und Zumbaqua 4000 m. Paramo Vegetation. 16. II. 1986. leg. Loksa et Zicsi.

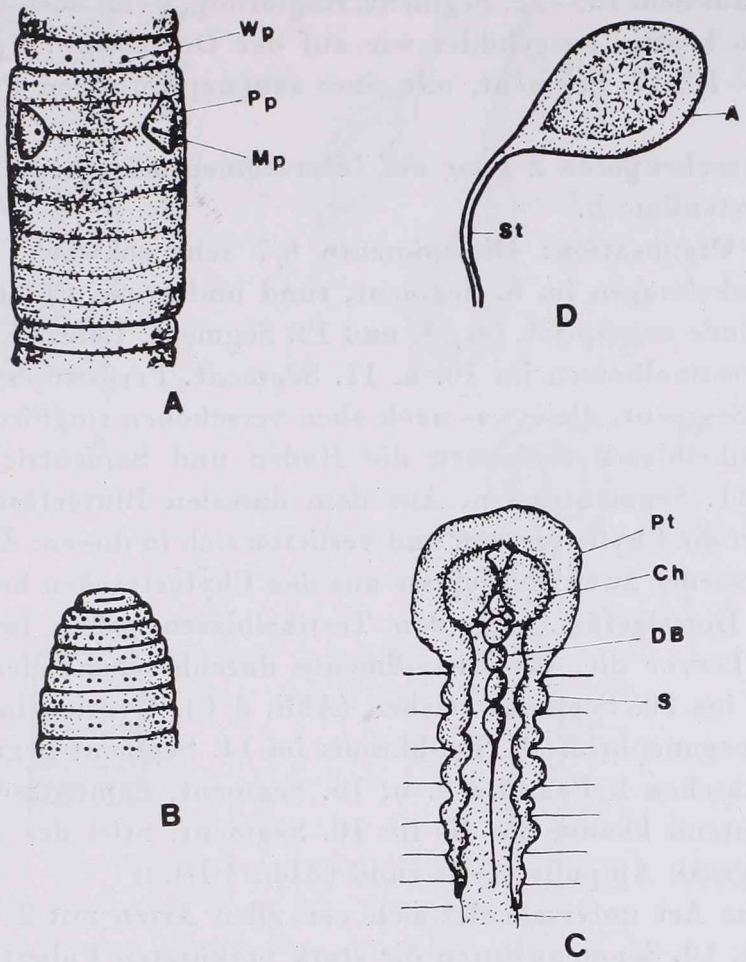


Abb. 3. *Glossodrilus papillatus* sp. n.: A = Ventralansicht des Gürtels: Wp = Weibliche Poren, Mp = Männliche Poren, Pp = Pubertätspapille; B = Ende des Körpers; C = Männliche Geschlechtsorgane: Pt = Perioesophageale Testikelblase, Ch = Chylustaschen, DB = Dorsales Blutgefäss, S = Samensäcke; D = Samentasche: St = Stiel, A = Ampulle

Glossodrilus papillatus sp. n. (Abb. 3)

Länge des Holotypus 30 mm, Breite 1 mm, Segmentzahl 89. Bei den übrigen Tieren Länge 35—40 mm, Breite 1 mm. Segmentzahl 93—101.

Farbe weiss, unpigmentiert, Darm dunkel durchschimmernd. Kopflappen eingezogen, proepilobisch. Segmente vor dem Gürtel ungeringelt, hinter dem Gürtel mehrfach geringelt. Borsten entlang des Körpers eng gepaart. Borstendistanz vor dem Gürtel aa : ab : bc : cd : dd = 20 : 1 : 7 : : 1 : 30, hinter dem Gürtel 16,7 : 1 : 4 : 1 : 13,3. — Nephridialporen oberhalb der Borstenlinie ab in Höhe der Pubertätsstreifen. Körperende nicht angeschwollen, eingezogen (Abb. 3 B).

Weibliche Poren auf dem 14. Segment, in der Mitte des Segmentes, innerhalb der Borsten aa. Männliche Poren auf Intersegmentalfurche 16/17, in der Mitte der saugnapfförmigen Papille.

Gürtel auf dem 15.—22. Segment, ringförmig, wenn auch auf der Ventralseite nicht so kräftig ausgebildet wie auf der Dorsalseite. Pubertätsstreifen auf dem 16.—1/2 17. Segment, mit einer saugnapfförmigen Papille umgeben (Abb. 3 A).

Samentaschenporen 2 Paar auf Intersegmentalfurche 8/9 u. 9/10, oberhalb der Borstenlinie b.

Innere Organsation: Dissepimente 6/7 sehr schwach, 7/8—9/10 zart verdickt. Muskelmagen im 6. Segment, rund und gross. Chylustaschen herzförmig, am Ende zugespitzt, im 11. und 12. Segment. Lateralherzen im 7.—9. Segment, Intestinalherzen im 10. u. 11. Segment. Perioesophageale Testikelblase im 11. Segment, die etwas nach oben verschoben ringförmig ausgebildet ist. Die Testikelblasen schliessen die Hoden und Samentrichter sowie die Herzen des 11. Segmentes ein. Aus dem dorsalen Blutgefäss münden zwei Blutgefässe in die Chylustaschen und verlieren sich in diesen. Am zugespitzten Ende treten wieder zwei Blutgefässe aus den Chylustaschen hervor und münden in das Dorsslgefäss. Aus den Testikelblasen gehen beiderseits dicke Samensäcke hervor die, die Dissepimente durchbrechend dem Darm angeschmiegt bis ins 20. Segment reichen (Abb. 3 C). Ovarien im 13. Segment. Nephridien meganephridisch. Typhlosolis im 14. Segment beginnend.

Samentaschen 2 Paar im 9. u. 10. Segment, Samentasche des 9. Segmentes bedeutend kleiner als die im 10. Segment. Stiel der Ampulle länger als Ampulle gross, Ampulle etwas rund (Abb. 3 D).

Die neue Art unterscheidet sich von allen Arten mit 2 Paar Samentaschen im 9. u. 10. Segment durch die stark verkürzten Pubertätsstreifen und saugnapfförmige Papille. Von *G. antisanae* sp. unterscheidet sie sich auch durch die Zahl der Samentaschen.

Fundorte: Holotypus. AF/633. Prov. Pichincha, Pichincha Gebirge 3900 m, vor Nono Grasland. 8. IV. 1987. leg. Loksa et Zicsi. — Paratypen AF/634. 2 Ex. Prov. Pichincha Antisana Geb. 3500 m Grasland. 17. 4. 1987. leg. Loksa et Zicsi.

Glossodrilus loksai sp. n. (Abb. 4)

Länge des Holotypus 25 mm, Breite 1 mm, Segmentzahl 112. Bei den übrigen Tieren Länge: 18—27 mm, Breite 0,9—1,1 mm Segmentzahl 98—120.

Farbe weiss, unpigmentiert.

Kopflappen eingezogen, prolobisch. Borsten entlang des Körpers eng gepaart, Borstendistanz vor dem Gürtel aa : ab : bc : cd : dd = 14 : 1 : 4,4 : : 1 : 19,5. Hinter dem Gürtel aa : ab : bc : cd : dd = 12,5 - 1 : 3 : 1 : 12,5. In der Ventralmedianlinie am 13., 14., 15. und 19.—26. Segment weisse Querflecken vorhanden (Abb. 4 A) Borsten ab des 9., 10. u. 11. Segmentes von Drüsenpapillen umgeben. Weisse Querflecken und Papillen sind nicht bei

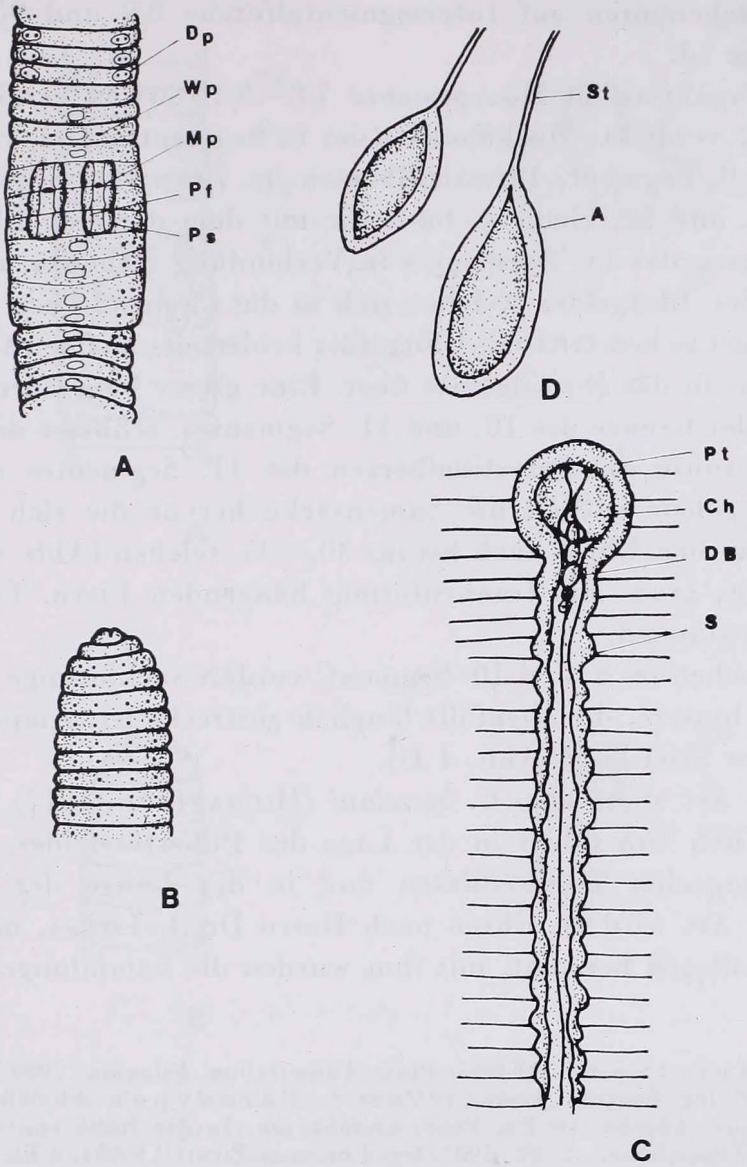


Abb. 4. *Glossodrilus loksai* sp. n.: A = Ventralansicht des Gürtels: Dp = Drüsenpapillen, Wp = Weibliche Poren, Mp = Männliche Poren, Pf = Pubertätsfeld, Ps = Pubertätsstreifen; B = Ende des Körpers; C = Männliche Geschlechtsorgane: Pt = Perioesophageale Testikelblase, DB = Dorsales Blutgefäss, S = Samensäcke; D = Samentaschen: St = Stiel, A = Ampulle

allen Tieren vorhanden. Segmente vor dem Gürtel ungeringelt, hinter dem Gürtel doppelt geringelt. Körperende ausgestülpt (Abb. 4 B).

Weibliche Poren auf dem 14. Segment, in der Mitte des Segmentes, innerhalb der Borsten aa. Männliche Poren auf Intersegmentalfurche 16/17, am inneren Rand des grossen Pubertätsfeldes.

Gürtel vom 15.—22. Segment, sattelförmig, in Höhe der Pubertätsstreifen vom 16.—18. Segment auch auf der Ventralseite etwas kräftiger ausgebildet. Pubertätsfeld und Pubertätsstreifen vom 16.—18. Segment, selten auch etwas auf die banchbarten Segmente übergehend.

Samentaschenporen auf Intersegmentalfurche 8/9 und 9/10 unterhalb der Borstenlinie cd.

Innere Organisation. Dissepimente 7/8—9/10 etwas verdickt, 6/7 und 10/11 sehr zart verdickt. Muskelmagen im 6. Segment, gross, rund. Lateralherzen im 7.—9. Segment, Intestinalherzen im 10. u. 11. Segment. Chylustaschen im 11. und 12. kleine Gebilde die mit dem dorsalen Blutgefäss und den Lateralherzen des 11. Segmentes in Verbindung stehen u. zw. durch ein querverlaufendes Blutgefäss welches sich in die Chylustaschen ergiesst. Am Ende der Chylustaschen tritt ein Blutgefäss beiderseits aus den Chylustaschen hervor und geht in das Dorsalgefäss über. Eine grosse bogenförmige Testikelblase liegt an der Grenze des 10. und 11. Segmentes, schliesst die Hoden und Samentrichter sowie die Intestinalherzen des 11. Segmentes ein. Aus den Testikelblasen gehen seitlich die Samensäcke hervor die sich verdünnend, angeschmiegt an den Darm auch bis ins 30.—35. reichen (Abb. 4 C). Ovarien im 13. Segment, gross mit traubenförmig hängenden Eiern. Typhlosolis im 14. Segment beginnend.

Samentaschen im 9. und 10. Segment, vordere sackförmige Samentasche kleiner als die hintere, die ebenfalls länglich gestreckt ist. Ampulle ungefähr so gross wie der Stiel lang (Abb. 4 D).

Die neue Art steht dem *G. bresslaui* (MICHAELSEN, 1917) am nächsten. Unterscheidet sich von dieser in der Lage des Pubertätsfeldes, in der Form der perioesophagealen Testikelblasen und in der Länge der Samensäcke.

Die neue Art wird zu Ehren nach Herrn Dr. I. LOKSA, meinem lieben Freund und Kollegen benannt, mit ihm wurden die Sammlungen gemeinsam durchgeführt.

Fundort: Holotypus AF/615. Prov. Tungurahua, Pilaguin, 2900 m, Kultivierter Boden, 2. IV. 1987. leg. COLOMA, LOKSA et ZICSI. — Paratypen AF/598.54 Ex Fundort wie beim Holotypus. AF/600. 46 Ex. Prov. Chimborazo. In der Nähe von Cerca, Huan de Valesco, 3200 m, Wiesenboden, 3. IV. 1987. leg. LOKSA et ZICSI. AF/601. 4 Ex. Prov. Chimborazo. Chimborazo 4000 m Polstervegetation. 3. IV. 1987. leg. LOKSA, ZICSI et COLOMA. — AF/361. 2 + 4 juv. Ex. Prov. Cotopaxi. Zwischen Pujili und Zumbaqua, 4000 m. 16. II. 1986. leg. LOKSA et ZICSI. — AF/362. 13 + 5 juv. Ex. Prov. Cotopaxi. Cotopaxi 4100 m. 26. II. 1986. leg. BENAVIDES, LOKSA et ZICSI.

Glossodrilus seidlae sp. n. (Abb. 5)

Länge des Holotypus 40 mm, Breite 1,2 mm, Segmentzahl 107. Bei den übrigen Tieren Länge 35—40 mm, Breite 1,3—1,5 mm, Segmentzahl 101—110.

Farbe weiss. Epidermis sehr dünn, innere Organe durchschimmernd.

Kopflappen eingezogen, prolobisch. Segmente ungeringelt. Borsten entlang des Körpers eng gepaart. Borstendistanz vor dem Gürtel aa : ab : bc : : cd : dd = 11,5 : 1,75 : 6 : 1 : 20. Hinter dem Gürtel. aa : ab : bc : dd = = 15 : 1 : 5 : 1 : 20. Am Körperende aa : ab : bc : cd : dd = 16,1 : 1 : 5 : 1 :

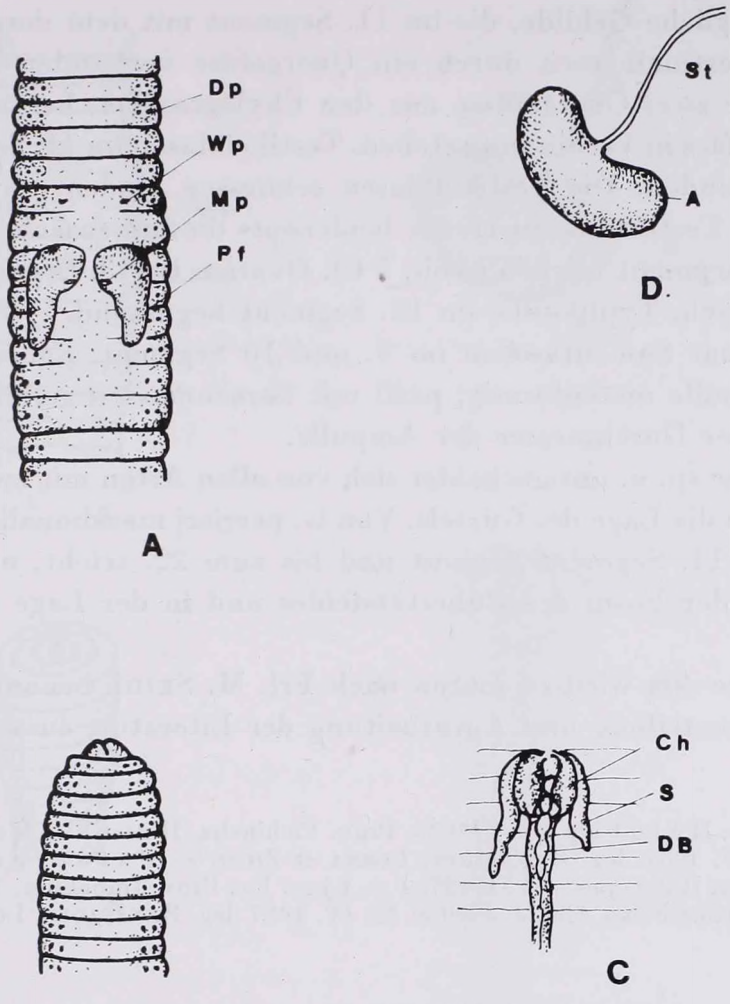


Abb. 5. *Glossodrilus seidlae* sp. n.: A = Ventralansicht des Gürtels: Dp = Drüsenpapillen, Wp = Weibliche Poren, Mp = Männliche Poren, Pf = Pubertätsfeld; B = Ende des Körpers; C = Männliche Geschlechtsorgane: Ch = Chylustaschen, S = Samensäcke, DB = Dorsales Blutgefäss; D = Samentasche: St = Stiel, A = Ampulle

: 8,3. Körperende ausgestülpt (Abb. 5 B). Borsten ab des 10.—14. Segmentes von hellen Drüsenpapillen umgeben.

Weibliche Poren auf dem 14. Segment, in der Mitte des Segmentes innerhalb der Borstenlinien aa. Männliche Poren auf Intersegmentalfurche 16/17, am unteren Rand der Ausbreitung des Pubertätsfeldes (Abb. 5 A).

Gürtel sattelförmig vom 14.—21. Segment, Pubertätsstreifen vom 16.—1/4 19. Segment, umgeben von einem Pubertätsfeld welches auf dem 16.—1/2 17. Segment ausgebreitet, nach hinten zu sich verengt. — Samentaschenporen 2 Paar auf Intersegmentalfurche 8/9 und 9/10 in der Borstenlinie cd.

Innere Organisation. Dissepimente 6/7 nicht verdickt, 7/8—9/10 schwach verdickt. Runder Muskelmagen im 6. Segment. Chylustaschen im 11.—13.

Segment, längliche Gebilde, die im 11. Segment mit dem dorsalen Blutgefäss und den Intestinalherzen durch ein Quergefäss verbunden sind. Am Ende treten wieder zwei Quergefässe aus den Chylustaschen hervor, die mit dem Dorsalblutgefäss in Verbindung stehen. Testikelblasen im 11. Segment, ventralmedian verbunden. Die Testikelblasen schliessen Hoden und Samentrichter ein. Aus den Testikelblasen treten beiderseits die Samensäcke hervor, die bis ins 14.—15. Segment reichen (Abb. 5 C). Ovarien im 13. Segment. Nephridien meganephridisch. Typhlosolis im 14. Segment beginnend.

Zwei Paar Samentaschen im 9. und 10 Segment, nahezu gleich grosse Gebilde, Ampulle nierenförmig, prall mit Samenmassen gefüllt. Stiel doppelt so lang wie der Durchmesser der Ampulle.

G. seidlae sp. n. unterscheidet sich von allen Arten mit zwei Paar Samentaschen durch die Lage des Gürtels. Von G. perrieri meridionalis, wo der Gürtel ebenfalls am 14. Segment beginnt und bis zum 22. reicht, unterscheidet sie sich noch in der Form des Pubertätsfeldes und in der Lage der männlichen Poren.

Die neue Art wird zu Ehren nach Frl. M. SEIDL benannt, die mir bei der Zusammenstellung und Ausarbeitung der Literatur, äusserst grosse Hilfe leistete.

Fundorte: Holotypus AF/625. Prov. Pichincha, Hinter San José de Minas (5 km), Bachufer. 21. IV. 1987. leg. BENAVIDES, LOKSA et ZICSI. — Paratypen. AF/626. 3 Ex. Fundort wie beim Holotypus. — AF/627. 1 + 4 juv. Ex. Prov. Imbabura, 30 km von Otavalo entfernt in Richtung Selva Alegre, 3900 m 22. IV. 1987. leg. BENAVIDES, LOKSA et ZICSI.

Glossodrilus mahnerti sp. n. (Abb. 6)

Länge des Holotypus 95 mm, Breite 3,5 mm, Segmentzahl 139. Bei den übrigen Tieren Länge: 80—105, Breite 3—4 mm, Segmentzahl 120—140.

Farbe weiss, Epidermis dünn, Darm dunkel durchschimmernd.

Kopflappen vom ersten Segment abgeschnürt, prolobisch. Segmente vor dem Gürtel ungeringelt, hinter dem Gürtel mehrfach geringelt. Borstenanordnung nicht genau erkannt, nur am Schwanzende sichtbar, eng gepaart. Borstendistanz aa : ab : bc : cd : dd = 30 : 1 : 9,8 : 1 : 4,5.

Weibliche Poren auf dem 14. Segment, in der Mitte des Segmentes, in Höhe des Pubertätsfeldes. Männliche Poren auf Intersegmentalfurche 17/18, am inneren Rand des Pubertätsfeldes.

Ringförmiger Gürtel vom 15.—21. Segment. Pubertätsfeld eiförmig 1/4 16.—1/4, 1/2 19. Segment (Abb. 6 A). Samentaschenporen 1 Paar auf Intersegmentalfurche 8/9. Ende des Schwanzes kolbenförmig verdickt (Abb. 6 B).

Innere Organisation. Dissepimente 6/7—10/11 sehr zart, kaum verdickt. Muskelmagen im 6. Segment rund. Lateralherzen im 7.—9. Segment, Intesti-

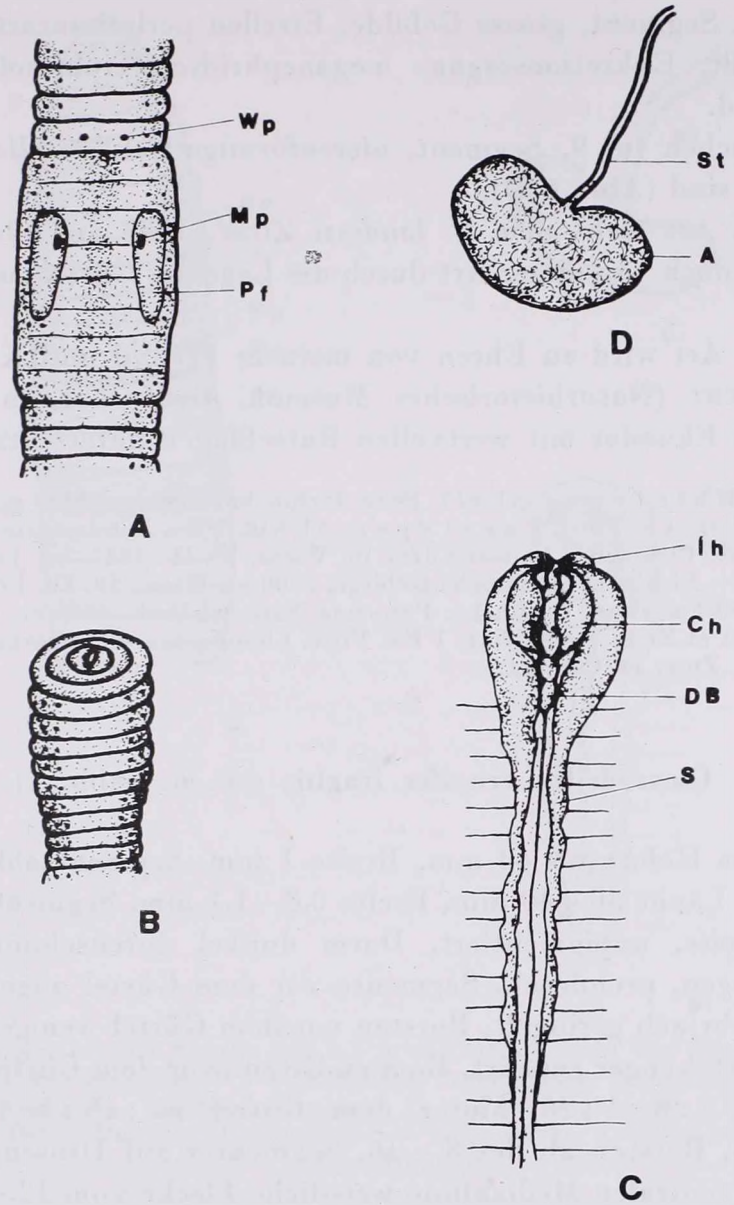


Abb. 6. *Glossodrilus mahnerti* sp. n.: A = Ventralansicht des Gürtels: Wp = Weibliche Poren, Mp = Männliche Poren, Pf = Pubertätsfeld, B = Ende des Körpers; C = Männliche Geschlechtsorgane: Ih = Intestinalherzen des 11. Segmentes, Ch = Chylustaschen, DB = Dorsales Blutgefäss, S = Samensäcke; D = Samentasche: St = Stiel, A = Ampulle

nalherzen im 10. und 11. Segment. Dorsales Blutgefäss mit den Intestinalherzen und den Chyustaschen im 11. Segment durch ein Quergefäss verbunden. Am Ende der Chylustaschen tritt beiderseits ein Blutgefäss aus den Taschen hervor und ergiesst sich in das Dorsalblutgefäss, welches hier perlschnurartig ausgebildet ist. Eine medianventral verbundene Testikelblase im 11. Segment, die die Hoden und Samentrichter einschliessen. Aus den Testikelblasen gehen beiderseits die Samensäcke hervor, die langestreckt, dem Darm angeschmiegt weit nach hinten, auch bis ins 30. oder 45. Segment reichen können (Abb 6 C).

Ovarien im 13. Segment, grosse Gebilde, Eizellen perlschnurartig sackförmig zusammengerollt. Exkretionsorgane meganephridsch. Tiphlosolis im 14. Segment beginnend.

Samentaschen im 9. Segment, nierenförmige Gebilde, die mit Spermamassen gefüllt sind (Abb. 6 D).

Die neue Art steht dem *G. landeszi* ZICSI, 1988 am nächsten, unterscheidet sich jedoch von dieser Art durch die Lage des Gürtels und der Pubertätsstreifen.

Die neue Art wird zu Ehren von meinem Freund und Kollegen Herrn Dr. V. MAHNERT (Naturhistorisches Museum, Genf) benannt, der unsere Sammelreise in Ekuador mit wertvollen Ratschlägen unterstützte.

Fundorte: H o l o t y p u s AF/617. Prov. Pichincha, Antisana 3500 m, Grasvegetation, 17. IV. 1987. leg. LOKSA et ZICSI. P a r a t y p e n: AF/618. 9 Ex. Fundort wie beim Holotypus. AF/619. 2 Ex. Prov. Pichincha, Antisana 3200 m, Wiese, 17. IV. 1987. leg. LOKSA et ZICSI. — AF/628. 1 Ex. Prov. Pichincha, Pichincha Gebirge, 3100 m, Wiese, 19. IV. 1987. leg. LOKSA et ZICSI. — AF/630. 3 Ex. Prov. Pichincha, Pasochoa National Park, 3700 m, 15. IV. 1987. leg. BENAVIDES, LOKSA et ZICSI. — AF/631. 1 Ex. Prov. Chimborazo, Chimborazo 3700 m, 3. IV. 1987. leg. LOKSA, ZICSI et COLOMA.

Glossodrilus crucifer fragilis ssp. n. (Abb. 7)

Länge des Holotypus 43 mm, Breite 1 mm, Segmentzahl 110. Bei den übrigen Tieren Länge 30—40 mm, Breite 0,8—1,1 mm, Segmentzahl 84—112.

Farbe weiss, unpigmentiert, Darm dunkel durchschimmernd. Kopflappen eingezogen, prolobisch. Segmente vor dem Gürtel ungeringelt, hinter dem Gürtel mehrfach geringelt. Borsten vor dem Gürtel weniger eng gepaart, hinter dem Gürtel enger gepaart. Borstendistanz vor dem Gürtel aa : ab : bc : : cd : dd = 15 : 3 : 8 : 1 : 26, hinter dem Gürtel aa : ab : bc : cd : dd = 20: : 1 : 4,8 : 1 : 23. Borsten ab des 8.—16. Segmentes auf Drüsenpapillen angeordnet, in der ventralen Medianlinie weissliche Flecke vom 12.—16. Segment sowie 19. und 21. Segment. Ein streifenförmiges Drüsenfeld erstreckt sich über das 18. Segment und geht auf die Hälfte des 19. Segmentes über.

Gürtel sattelförmig vom 15.—22. Segment. Pubertätsstreifen auf dem 18. Segment, beideseits etwas auf die benachbarten Segmente übergehend (Abb. 7 A).

Weibliche Poren auf dem 14. Segment, in der Mitte des Segmentes, innerhalb der Borstenlinie aa. Männliche Poren sitzen auf dem vorderen Teil des Streifens im 18. Segment. — Samentaschen ein Paar auf Intersegmentalfurche 8/9 oberhalb der Borstenlinie *b*.

Innere Organisation. Dissepimente 6/7—10/11 zart, nicht verdickt. Mächtiger, runder Muskelmagen im 6. Segment. Längliche Chylustaschen im 11.—13. Segment. Im 11. Segment geht aus dem Dorsalblutgefäss ein Quergefäss in die Chylustaschen und löst sich in diesen auf. Am Ende tritt ein

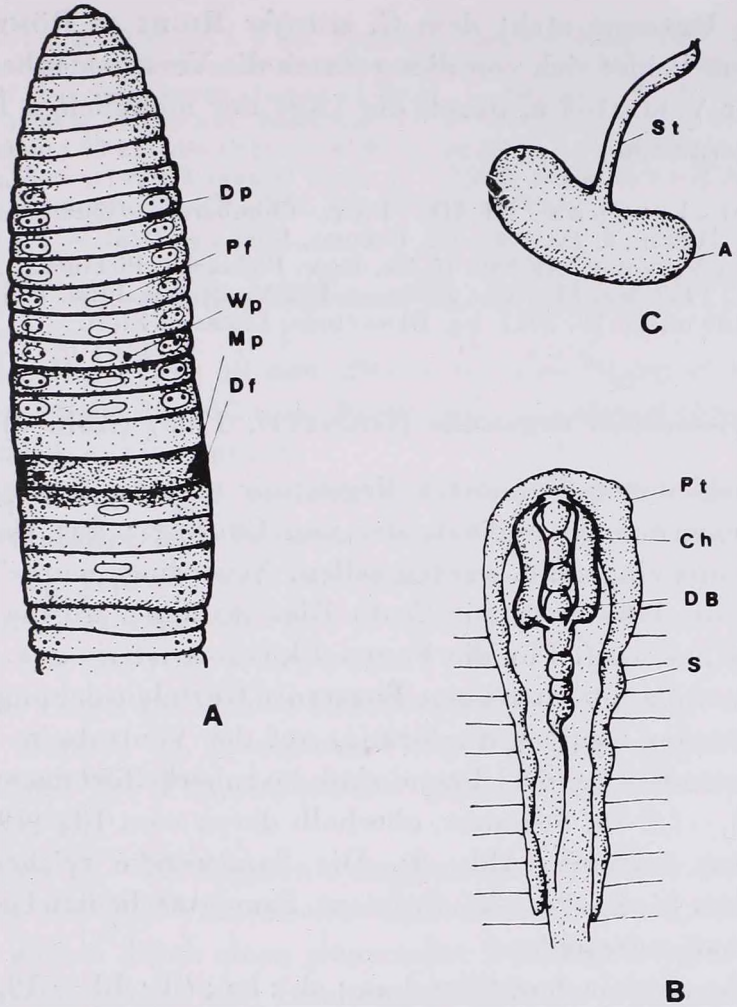


Abb. 7. *Glossodrilus crucifer fragilis* ssp. n.: A = Ventralansicht des Gürtels. Dp = Drüsenpapillen, Pf = Pubertätsfelder, Wp = Weibliche Poren, Mp = Männliche Poren, Df = Drüsenfeld; B = Männliche Geschlechtsorgane: Pt = Perioesophageale, Testikelblase, Ch = Chylustaschen. DB = Dorsales Blutgefäss, S = Samensäcke; C = Samentasche: St = Stiel, A = Ampulle

Blutgefäss aus den Chylustaschen aus und ergiesst sich wieder in das Dorsalblutgefäss, welches stark perlschnurartig angeschwollen ist. Lateralherzen im 7.—9. Segment, Intestinalherzen im 10. und 11. Segment. Die Intestinalherzen des 11. Segmentes stehen mit dem Dorsalgefäss und mit dem Blutgefäss der Chylustaschen in Verbindung. Ein Paar ventralmedian verbundene Testikelblasen im 11. Segment, die die Hoden und Samentrichter einschliessen. Aus diesen gehen beiderseits die Samensäcke hervor, die bis ins 17.—18. Segment reichen, manchmal sind sie zurückgebogen (Abb. 7 B). Ovarien im 13. Segment. Exkretionsorgan meganephridisch. Typhlosolis im 14. Segment beginnend.

Ein Paar Samentaschen im 9. Segment. Stiel anderthalbmal länger als der Durchmesser der Ampulle, pilzförmig (Abb. 7 C).

Die neue Unterart steht dem *G. crucifer* RIGHI et RÖMBKE, 1987 am nächsten. Unterscheidet sich von dieser durch die Verschiedenheit der Drüsenpölster von der Ventralseite, durch die Lage der männlichen Poren und die Form der Samentasche.

Fundort: Holotypus AF/616. Prov. Chimborazo, Chimborazo geschlossene Polstervegetation, 4100 m, 3. IV. 1987. leg. COLOMA, LOKSA et ZICSI. — Paratypen AF/597. 4 Ex. Fundort wie zuvor. AF/596. 10 Ex. Prov. Pichincha. Pichincha, 3100 m, Strauchvegetation, 19. IV. 1987. leg. LOKSA et ZICSI. — AF/595. 24. Ex. Prov. Pichincha, Nationalpark Pasochoa, 3100 m, 15. IV. 1987. leg. BENAVIDES, LOKSA et ZICSI.

Glossodrilus nemoralis (COGNETTI, 1905) (Abb. 8)

Von verschiedenen Fundorten liegen mir mehrere Exemplare vor die, mit einigen Bemerkungen ergänzt, der von COGNETTI aus Darien beschriebenen *G. nemoralis* eingereiht werden sollen. Neuerdings wurde diese Art von RIGHI & MERINO, 1987 auch aus Costa Rica erwähnt, wo die Beschreibung COGNETTI's ergänzt wird. Für die Fauna Ekuadors ist sie neu.

Meine Exemplare besitzen eine konstante Gürtelausdehung vom 15.—22. Segment, mehr oder weniger ringförmig, auf der Ventralseite weniger stark ausgebildet. Besonders kennzeichnend sind die tuberkelförmigen Ausbildungen auf dem 1/2 18.—1/2 19. Segment, oberhalb deren vom 18.—19. Segment ein Pubertätsstreifen verläuft (Abb. 8). Die Samensäcke reichen bei meinen Exemplaren auch bis ins 24.—25. Segment. Samentaschenstiel doppelt so lang wie die sackförmige Ampulle.

Borstendistanz vor dem Gürtel aa : ab : bc : cd : dd = 19,5 : 2 : 5,6 : 1 : 13,3, hinter dem Gürtel aa: ab: bc: cd: da = 11 : 1 : 31 : 11, am Körperende aa : ab : bc : cd : dd = 3 : 1 : 1,5 : 1 : 1,5.

Nach Cognetti (1906) soll sie der Art *G. excelsus* (COGNETTI, 1904) aus Ekuador am nächsten stehen, sie soll eventuell nur als Unterart von dieser betrachtet werden. Im vorliegenden reichen Material konnte ich kein einziges Tier mit *G. excelsus* identifizieren. Dies ist wahrscheinlich darauf zurückzuführen, dass *G. excelsus* anhand eines Exemplares beschrieben wurde.

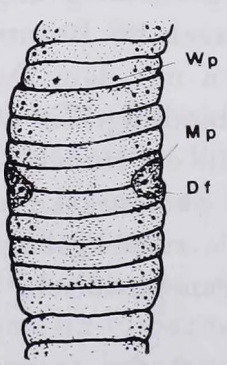


Abb. 8. *Glossodrilus nemoralis* (COGNETTI, 1905): Ventralseite des Gürtels: Wp = Weibliche Poren, Mp = Männliche Poren, Df = Drüsenfeld

Fundorte: AF/376—377. 4 Ex. Pasochoa National Park, 2800—3000 m, Wald und Bachrand, 6. II. 1986. leg. Loksa, Benavides et Zicsi. — AF/591—592. 6 Ex. Fundort wie zuvor, 15. I. 1987. leg. Benavides, Loksa et Zicsi. — AF/589—590. 4 Ex. Prov. Pichincha, Antisana 3200—3500 m, Wiese und Bachrand, 17. IV. 1987. leg. Loksa et Zicsi. — AF/593. 3 Ex. Prov. Imbabura 32 km von Otavalo in Richtung Selva Alegre, Paramo und Waldgrenze, 22. IV. 1987. leg. Benavides, Loksa et Zicsi. — AF/594. 6 Ex. Prov. Pichincha, Pichincha, 3100 m, Strauchvegetation, 19. IV. 1987. leg. Loksa et Zicsi.

Glossodrilus antisanae sp. n. (Abb. 9)

Länge des Holotypus 50 mm, Breite 1,2 mm, Segmentzahl 89. Bei den anderen Tieren Länge 45—52 mm, Breite 0,8—1,3 mm, Segmentzahl 89—94.

Farbe weiss, unpigmentiert.

Kopflappen eingezogen, prolobisch. Vordere Segmente ungeringelt, etwas wallförmig ineinandergelegt. Segmente hinter dem Gürtel mehrfach geringelt. Borsten sehr eng gepaart, am Vorderkörper schwer zu erkennen. Borstenditanz vor dem Gürtel aa : ab : bc : cd : dd = 12 : 1 : 4,4 : 1 : 16, hinter dem Gürtel aa : ab : bc : cd : dd = 25 : 1 : 6 : 1 : 25.

Weibliche Poren auf kleinen Erhebungen in der Mitte des 14. Segmentes, innerhalb der Borsten aa. Männliche Poren auf Intersegmentalfurche 16/17 am inneren Rand des Puberstätsfeldes (Abb. 9 A). Schwanz konisch ausgestülpt (Abb. 9 B).

Gürtel vom 15.—22. Segment, ringförmig. Auf der Dorsalseite kräftiger ausgebildet als auf der Ventralseite. Puberstätsfeld vom 16.—1/4, 1/2 18. Segment, von aussen durch einen glänzenden Pubertätsstreifen umgeben.

Samentaschenporen auf Intersegmentalfurrhe 9/10 in der Borstenlinie *cd*. Nephridilaporen in der Borstenlinie *b*.

Innere Organisation. Dissepimente 6/7—9/10 verdickt, 10/11 schwach verdickt. Grosser Muskelmagen im 6. Segment. Schlauchförmige Lateralherzen im 7.—9. Segment, grosse Intestinalherzen im 10. u. 11. Segment. Chylustaschen im 11. und 12. Segment, rundliche Gebilde, mit kleinem Stiel an den Oesophagus angeheftet. Aus dem Dorsalgefäss tritt ein Querblutgefäss im 11. Segment in die Chylustaschen aus, welches auch mit dem Intestinalherz des 11. Segmentes in Verbindung steht. Am Ende der Chylustaschen gehen wieder zwei Blutgefässe hervor die sich in das Dorsalblutgefäss ergiessen. Meistens grosse perioesophageale Testikelblasen im 11. Segment die ringförmig den oberen Teil der Chylustaschen umgeben, Hoden, Samentrichter und die Herzen des 11. Segmentes einschliessen. Aus den Testilkelblaen (Abb. 9 C) gehen beiderseits die Samensäcke hervor die bis in das 19., oder 23. Segment reichen. Mächtige Ovarien im 13. Segment, mit traubenförmig angeordneten Eizellen. Typhlosolis im 14. Segment beginnend. Exkretionsorgane meganephridisch.

Ein Paar Samentaschen im 10. Segment mit langem Stiel und birnenförmiger Ampulle.

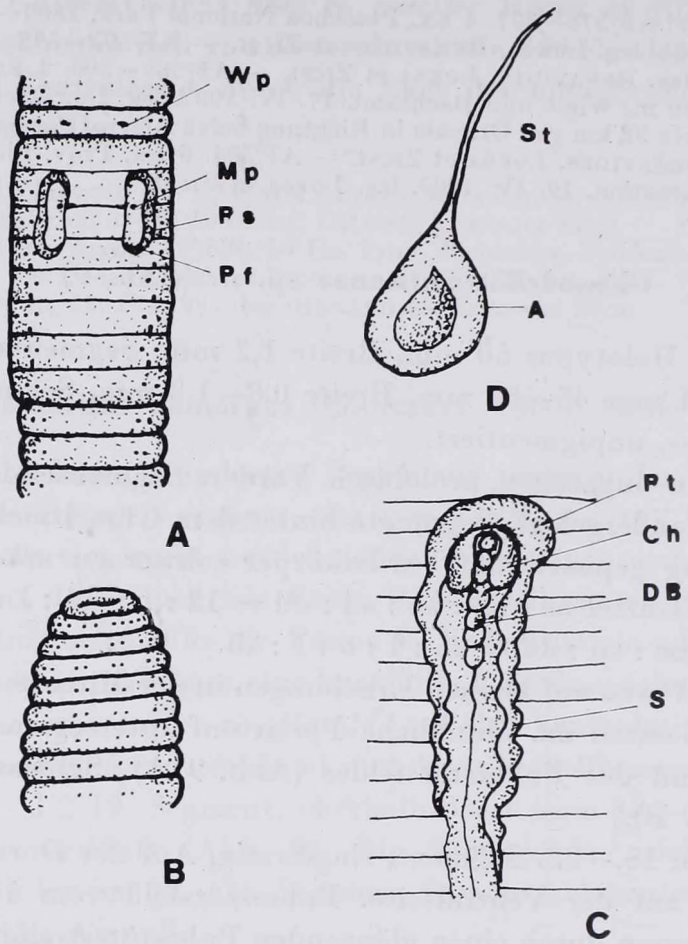


Abb. 9. *Glossodrilus antisanae* sp. n.: A = Ventralansicht des Gürtels: Wp = Weibliche Poren Mp = Männliche Poren, Ps = Pubertätsstreifen, Pf = Pubertätsfeld; B = Ende des Körpers; C = Männliche Geschlechtsorgane: Pt = Perioesophageale Testikelblasen, Ch = Chylustaschen, DB = Dorsales Blutgefäss, S = Samensäcke, D = Samentasche St = Stiel, A = Ampulle

Mit 1 Paar samentaschen im 10. Segment und mit ♂ Poren auf Intersegmentalfurche 16/17, unterscheidet sie sich von allen bisher beschriebenen Arten.

Fundorte: Holotypus AF/614. Prov. Pichincha. Antisana, 4200 m, 16. IV. 1987. leg. Loksa et Zicsi. — Paratypen. AF/602. 61 + 6 Ex. Fundort wie zuvor. AF/603. 2 Ex. Prov. Pichincha Antisana, 3500 m, Bachrand, 16. 4. 1987. leg. Loksa et Zicsi. — AF/604. 1 Ex. Prov. Pichincha, Pichincha vor Nono, 3200, 7. 4. 1987. leg. Zicsi et Loksa. — AF/605. 1 Ex. Prov. Pichincha, Pifo und Papallacta, 3900 m, Paramovegetation, 9. 4. 1987. leg. Loksa et Zicsi. — AF/606. 5 Ex. National Park Pasochoa Prov. Pichincha, Wald Bachrand, 15. 4. 187. leg. Benavides, Loksa et Zicsi.

Glossodrilus tuberculatus sp. n. (Abb. 10)

Länge des Holotypus 30 mm, Breite 1,1 mm, Segmentzahl 104. Bei den übrigen Tieren Länge 25—35 mm, Breite 0,9—1,2 mm, Segmentzahl 96—114.

Farbe weiss, unpigmentiert. Schwanz weiss, gedrungen (Abb. 10 B).

Kopflappen eingezogen, prolobisch. Segmente vor dem Gürtel ungeringelt. Borsten eng gepaart. Borstendistanz vor dem Gürtel aa : ab : bc : cd :

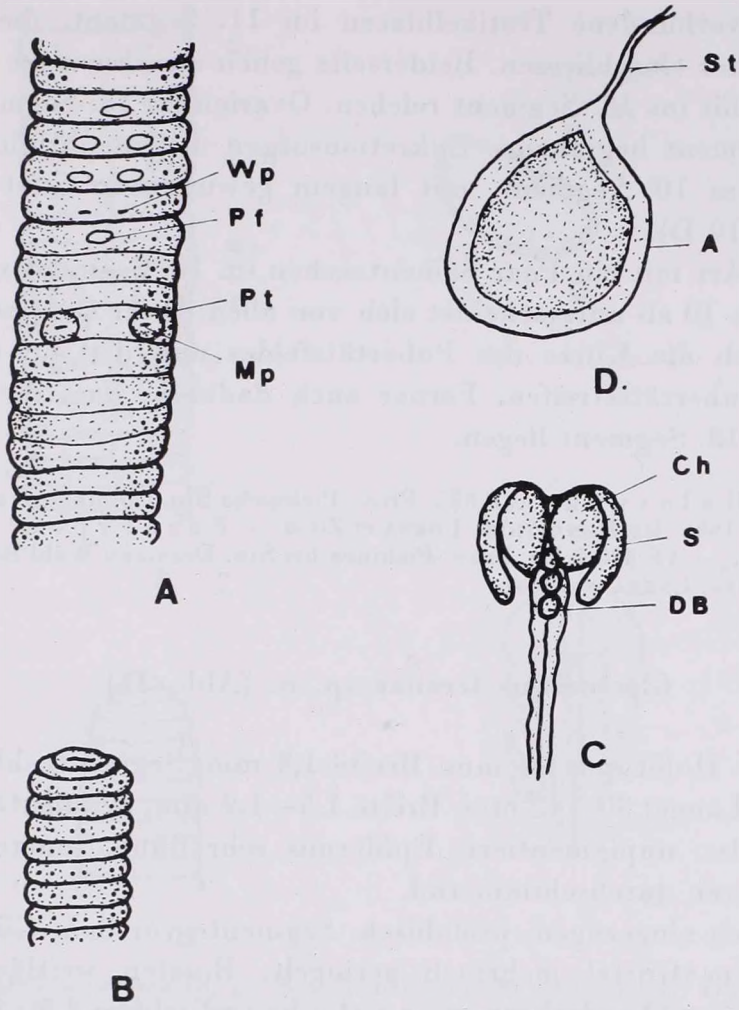


Abb. 10. *Glossodrilus tuberculatus* sp. n.: A = Ventralansicht des Gürtels: Wp = Weibliche Poren, Pf = Weisse Pubertätsfelder, MP = Männliche Poren, Pt = Pubertätstuberkel; B = Ende des Körpers; C = Männliche Geschlechtsorgane: Ch = Chylustaschen, S = Samensäcke, DB = Dorsales Blutgefäss; D = Samentasche: St = Stiel, A = Ampulle

: dd = 10 : 2 : 5,3 : 1 : 13,2, hinter dem Gürtel *aa* : ab : bc : cd : dd = 12,5 : : 1 : 4 : 1 : 12,5, am Körperende aa: ab: bc: cd: dd = 6,25 : 1 : 2,70 : 1 : 2,75.

Weibliche Poren auf dem 14. Segment in der Mitte (Abb. 10 A) des Segmentes, innerhalb der Borsten aa. Männliche Poren auf dem 18. Segment von einem Tuberkel umgeben. Pubertätsfeld auf das 18. Segment beschränkt. Gürtel vom 15.—22. Segment.

Samentaschenporen auf Intersegmentalfurche 9/10, auf einer kleinen Erhebung oberhalb der Borstenlinie *d*.

Innere Organisation. Dissepimente 6/7—9/10 zart verdickt. Muskelmagen im 6. Segment, rund und gross. Intestinalherzen im 10.—11. Segment Lateralherzen kleine Schlingen im 7.—9. Segment. Ein Paar eirunde Chylustaschen (Abb. 10 C) im 11. und 12. Segment, die vorne und hinten durch ein Querblutgefäss mit dem Dorsalblutgefäss in Verbindung stehen. Ein Paar

ventralmedian verbundene Testikelblasen im 11. Segment, die die Hoden und Samentrichter einschliessen. Beiderseits gehen aus ihnen die Samensäcke hervor, die nur bis ins 13. Segment reichen. Ovarien im 13. Segment. Typhlosolis im 14. Segment beginnend. Exkretionsorgan meganephridich. Ein Paar Samentaschen im 10. Segment, mit langem gewundenen Stiel und runder Ampulle (Abb. 10 D).

Die neue Art mit ein Paar Samentaschen im 10. Segment und Borstenanordnung aa $>$ 10 ab unterscheidet sich von allen dieser Gruppe angehörenden Arten durch die Kürze des Pubertätsfeldes und der auf ein Segment beschränkter Pubertätsstreifen. Ferner auch dadurch, dass die männlichen Poren auf dem 18. Segment liegen.

Fundorte: Holotypus AF/635. Prov. Pichincha Sto. Domingo Wald neben einem Kulturfeld, 20. II. 1986. leg BENAVIDES, LOKSA et ZICSI. — Paratypen: AF/378. 4 Ex. Fundort wie zuvor. — AF/380 5 Ex. Prov. Pichinca bei Sto. Domingo Wald Bachrand, 20. II. 1986. leg. BENAVIDES, LOKSA et ZICSI.

Glossodrilus teranae sp. n. (Abb. 11)

Länge des Holotypus 41 mm, Breite 1,8 mm, Segmentzahl 99. Bei den übrigen Tieren Länge: 30—42 mm, Breite 1,5—1,9 mm. Segmentzahl 89—103.

Farbe weiss, unpigmentiert, Epidermis sehr dünn, innere Organe bei den meisten Tieren durchschimmernd.

Kopflappen eingezogen, prolobisch. Segmente vor dem Gürtel ungeringelt, hinter dem Gürtel mehrfach geringelt. Borsten weitläufig gepaart. Borstendistanz am Vorderkörper aa : ab : bc : cd : dd = 3,5 : 1,9 : 1 : 1,25 : : 8,1, hinter dem Gürtel aa : ab : bc : cd : dd = 1,2 : 1 : 2 : 1,5 : 5. Borsten aa des 9.—14. Segmentes auf kleinen Drüsenpapillen angeordnet (Abb. 11 A).

Weibliche Poren auf dem 14. Segment, in der Mitte des Segmentes, der ventralen Medianlinie etwas genähert. Männliche Poren auf dem Pubertätsfeld, in der Intersegmentalfurche 17/18.

Gürtel vom 15.—21. Segment, sattelförmig bis ringförmig, auf der Dorsalseite stets kräftiger ausgebildet. Puberrtätsfeld und Pubertätsstreifen vom 1/n 16., 17.—19. 1/n 20. Segment. Die Entwicklung der Pubertätsstreifen bzw. die Grösse des Pubertätsfeldes hängt auch mit der Geschlechtsreife der Tiere zusammen, da die kürzeren Pubertätsfelder auch immer weniger entwickelte Gürtelorgane aufwiesen (Abb. 11 A). Körperende ausgestülpt (Abb. 11 B).

Innere Organisation. Dissepimente 6/7 sehr zart, 7/8—10/11 etwas deutlicher verdickt. Lateralherzen im 7.—9. Segment, Intestinalherzen im 10. und 11. Segment. Perioesophageale Testikelblasen sehr breit, bogenörmig (Abb. 11 C), auch einen Teil der Chylustaschen bedeckend, im 11. Segment. Chylustaschen im 11. und 12. Segment, die vorne und hinten mit dem Rücken-

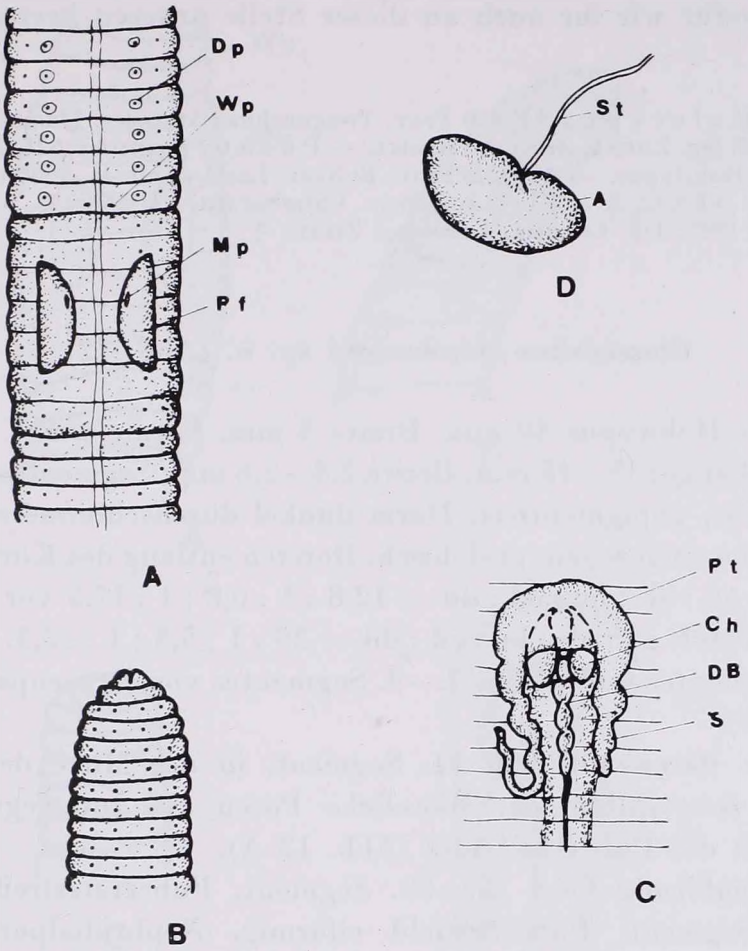


Abb. 11. *Glossodrilus teranae* sp. n.: A = Ventralansicht des Gürtels: Dp = Drüsenpapillen, Wp = Weibliche Poren, Mp = Männliche Poren, Pf = Pubertätsfeld B = Ende des Körpers; C = Männliche Geschlechtsorgane: Pr = Perioesophageale Testikelblase, Ch = Chylustaschen, DB = Dorsales Blutgefäss, S = Samensäcke; D = Samentasche: St = Stiel, A = Ampulle

blutgefäss in Verbindung stehen. Aus den Testikelblasen, die die Hoden und Samentrichter einschliessen, gehen beiderseits dicke Samensäcke hervor, die beim Holotypus bis ins 16.—19. Segment reichen. Bei den übrigen Tieren reichen sie auch bis ins 23. Segment. Zwei Ovarien hängen unterhalb des Darmes vom Dissepiment 12/13 an das 13. Segment, sind gross. Eizellen liegen perlschnurartig aneinander und bilden traubenförmige Anhänge. Typhlosolis im 14. Segment beginnend. Exkretionsorgane meganephridisch. Nierenförmige Samentaschen im 9. Segment (Abb. 11 D).

Die neue Art unterscheidet sich von den Arten mit einer Borstenanordnung *aa* < 5 *ab*, die über ein Paar Samentaschen im 10. Segment verfügen dadurch, dass der Gürtel nur bis zum 21. Segment reicht, die Samentaschen im 9. Segment liegen.

Die neue Art wird zu Ehren nach Frau Prof. Dr. Laura Arcos Terán, Katholische Universität, Quito benannt, die unsere Sammelreisen weitgehend

unterstützte, wofür wir ihr auch an dieser Stelle unseren besten Dank aussprechen.

Fundorte: H o l o t y p u s AF/620 Prov. Tungurahua, Arenales, Hacienda Cununyacu, 3600 m, 2. IV. 1987. leg. LOKSA, ZICSI et COLOMA. — P a r a t y p e n: AF/621. 12 + 2 juv. Ex. Fundort wie beim Holotypus. — AF/622. Prov. Bolivar, Las 4-esquinas, 3000 m, leg. COLOMA, LOKSA et ZICSI. — AF/632. 7 + 2 juv. Ex. Prov. Chimborazo, Chimborazo, 4100 m, Polstervegetation, 3. IV. 1987. leg. COLOMA, LOKSA et ZICSI.

Glossodrilus chimborazoi sp. n. (Abb. 12)

Länge des Holotypus 40 mm, Breite 3 mm, Segmentzahl 120. Bei den übrigen Tieren Länge: 35—45 mm, Breite 2,8—3,6 mm, Segmentzahl 110—130.

Farbe weiss, unpigmentiert, Darm dunkel durchschimmernd.

Kopflappen eingezogen, prolobisch. Borsten entlang des Körpers gepaart. Borstendistanz aa : ab : bc : cd : dd = 12,8 : 1 : 6,8 : 1 : 17,5 vor dem Gürtel; hinter dem Gürtel aa : ab : bc : cd : dd = 20 : 1 : 5,3 : 1 : 23,3. Borsten ab des 6.—10. Segmentes und cd des 7.—9. Segmentes von Drüsenpapillen umgeben (Abb. 12 B).

Weibliche Poren auf dem 14. Segment, in der Mitte des Segmentes innerhalb der Borstenlinie *aa*. Männliche Poren auf Intersegmentalfurche 18/19, innerhalb des Pubertätsfeldes (Abb. 12 A).

Gürtel ringförmig vom 15.—22. Segment, Pubertätsstreifen vom 1/2 17.—1/2 20. Segment, Pubertätsfeld eiförmig. Nephridialporen oberhalb Borstenlinie *b*. Samentaschenporen fehlen.

Innere Organisation. — Dissepimente 6/7—9/10 zart verdickt. Muskelmagen im 6. Segment. Lateralherzen im 7.—9. Segment, Intestinalherzen im 10. und 11. Segment. Chylustaschen im 11. und 12. Segment, mehr oder weniger rundlich, am Ende etwas verdünnt. Chylustaschen vorne und hinten durch ein Querblutgefäss mit dem Rückenblutgefäss verbunden. Perioesophageale Testikelblase im 11. Segment, die bogenförmig die Chylustaschen umringt. Hoden und Samentrichter sowie die Herzen des 11. Segmentes sind in die Testikelblasen eingeschlossen. (Bogenförmige Testikelblasen nicht bei allen Tieren ausgebildet.) (Abb. 12 D). Aus den Testikelblasen gehen beiderseits kräftige Samensäcke hervor die, die Dissepinte durchbrechend, dem Darm angeschmiegt nach hinten bis ins 23—24. Segment reichen (Holotypus). Bei den übrigen Tieren gehen sie bis ins 19. oder auch 27. Segment. Samenrinne verläuft innen bis zum drüsigen Pubertätsfeld und dringt in Höhe von Intersegmentalfurche 18/19 in dies Pubertätsfeld ein. Samentaschen nicht erkannt. Ovarien im 13. Segment. Typhlosolis im 14.—15. Segment beginnend.

Die neue Art unterscheidet sich von allen Arten ohne Samentaschen vor allem durch die Lage der Pubertätsstreifen und durch die Lage der männlichen Poren.

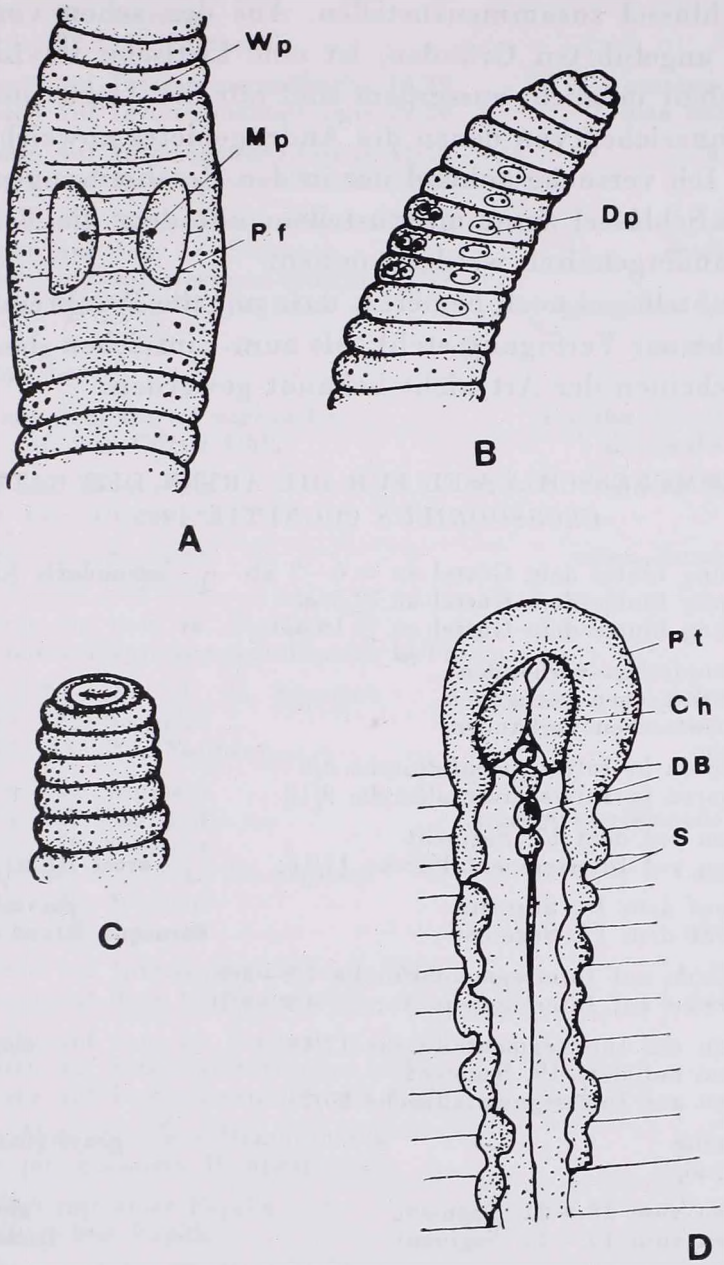


Abb. 12. *Glossodrilus chimborazoi* sp. n.: A = Ventralansicht des Gürtels: Wp = Weibliche Poren, Mp = Männliche Poren, Pf = Pubertätsfeld; B = Seitenansicht des Vorderkörpers: Dp = Drüsenpapillen; C = Ende des Körpers; D = Männliche Geschlechtsorgane: Pt = Perioesophageale Testikelblase, Ch = Chylustaschen, DB = Dorsales Blutgefäss, S = Samensäcke

Fundorte: H o l o t y p u s AF/609. Prov. Chimborazo, Chimborazo, 4100 m, Polstervegetation, 3. IV. 1987. leg. Coloma, Loksa et Zicsi. P a r a t y p e n: AF/607—608. 23 + 79 juv. Ex. Fundort wie zuvor, 4100—4300 m, 3. IV. 1987. leg. Coloma, Loksa et Zicsi. — AF/610 5 + 2 juv. Ex. Prov. Chimborazo, Chimborazo, 3700 m, 3. IV. 1987. leg. Coloma, Loksa et Zicsi.

*

Nachdem die Zahl der Arten bzw. Unterarten dieser Gattung, mit den jetzt neubeschriebenen Taxa, auf 53 gestiegen ist, ist es unerlässlich einen

Bestimmungsschlüssel zusammenzustellen. Aus den schon vorausgehend, in der Einleitung angeführten Gründen, ist eine kritische Revision der Arten zur Zeit noch nicht möglich, ausserdem sind mir die Arten aus Brasilien, die in gewissen Kennzeichen von denen des Andengebietes abweichen, überhaupt nicht bekannt. Ich versuche anhand der in den Beschreibungen fungierenden Merkmale einen Schlüssel zusammenzustellen, mit dem die Taxa so gut wie möglich auseinandergehalten werden können.

An dieser Stelle sei noch bemerkt, dass mir die Beschreibung einer Art: *G. uete uete* nicht zur Verfügung steht, bis zum Einreichen des Manuskriptes ist mir ein Erscheinen der Art nicht bekannt geworden.

BESTIMMUNGSSCHLÜSSEL FÜR DIE ARTEN DER GATTUNG *GLOSSODRILUS* COGNETTI, 1905

1	Borstenanordnung hinter dem Gürtel aa = 6—7 ab	**sucunduris** Righi et al., 1976
—	Borstenanordnung hinter dem Gürtel *aa* $\leqslant$ 5 *ab*	2
—	Borstenanordnung hinter dem Gürtel *aa* $\geqslant$ 10 *ab*	12
2	Ein Paar Samentaschen vorhanden	3
—	Zwei Paar Samentaschen vorhanden	6
—	Drei Paar Samentaschen vorhanden	11
3	Samentaschenporen in Intersegmentalfurche 8/9	**teranae** sp. n.
—	Samentaschenporen in Intersegmentalfurche 9/10	4
4	Männliche Poren auf dem 17. Segment	5
—	Männliche Poren auf Intersegmentalfurche 17/18.	**orosi** Righi et Merino, 1987
5	Pubertätsfeld auf dem 16. Segment	**parvus** Cognetti, 1905
—	Pubertätsfeld auf dem 17. Segment	**dorasque** Righi et Merino, 1987
6	Samentaschenporen auf Intersegmentalfurche 7/8—8/9	7
—	Samentaschenporen auf Intersegmentalfurche 8/9—9/10	10
7	Männliche Poren auf Intersegmentalfurche 17/18	**cigges** (Righi, 1970
—	Männliche Poren auf dem 19. Segment	**tico** Righi, 1982
—	Männliche Poren auf Intersegmentalfurche 20/21	8
8	Gürtel ringförming	**geayi** (Černosvitov, 1934)
—	Gürtel sattelförmig	9
9	Pubertätsstreifen vom 18.—21. Segment	**aiocaa** Righi, 1975
—	Pubertätsstreifen vom 19.—20. Segment	**freitasi** (Righi, 1971)
10	Männliche Poren auf Intersegmentalfurche 18/19	**hondaensis** (Michaelsen, 1900)
—	Männliche Poren auf Intersegmentalfurche 17/18	**crassicaudatus** (Cognetti, 1905)
11	Männliche Poren auf Intersegmentalfurche 17/18	**tinga** (Righi, 1971)
—	Männliche Poren auf Intersegmentalfurche 16/17	**mucupois** (Righi, 1970)
12	Samentaschen Fehlen	13
—	Ein Paar Samentaschenporen im 8/9 Segment	15
—	Ein Paar Samentaschenporen im 9/10 Segment	21
—	Zwei Paar Samentaschenporen im 7/8 u. 8/9 Segment	24
—	Zwei Paar Samentaschenporen im 8/9 u. 9/10 Segment	25
—	Zwei Paar Samentaschenporen im 11/12 u 12/13 Segment	**pan** Righi, 1984
—	Drei Paar Samentaschen im 7/8, 8/9 u. 9/10 Segment	33
13	Gürtel vom 15.—22. Segment	14
—	Gürtel vom 15.—21. Segment	**parecis** Righi et Ayres, 1975
14	Männliche Poren auf Intersegmentalfurche 16/17	**venancioi** Righi, 1982
—	Männliche Poren auf Intersegmentalfurche 18/19	**chimborazoi** sp. n.

15	Gürtel vom 14.—1/2 22, 22. Segment	16
—	Gürtel vom 15.—21. Segment	17
—	Gürtel vom 15.—22 (23). Segment	18
16	Männliche Poren auf Intersegmentalfurche 18/19	**excelsus** (COGNETTI, 1904)
—	Männliche Poren auf Intersegmentalfurche 19/20	**uete dithecae** RIGHI, 1988
17	Männliche Poren auf Intersegmentalfurche 16/17	**kaszabi** ZICSI, 1988
—	Männliche Poren auf Intersegmentalfurche 17/18	**mahnerti** sp. n.
18	Männliche Poren auf Intersegmentalfurche 17/18	**landeszi** ZICSI, 1988
—	Männliche Poren auf dem 18. Segment	**crucifer fragilis** ssp. n.
—	Männliche Poren auf Intersegmentalfurche 18/19	19
—	Männliche Poren auf dem 19. Segment	**peregrinus** (MICHAELSEN, 1897)
19	Gürtel ringförmig	**smithi** (COGNETTI, 1905)
—	Gürtel sattelförmig	20
20	Pubertäsfeld auf dem Gürtel vorhanden	**crucifer** RIGHI et RÖMBKE, 1987
—	Pubertätsfeld auf dem Gürtel fehlt	**nemoralis** (COGNETTI, 1905)
21	Samentaschen mit Divertikeln	**schuetti** (MICHAELSEN, 1918)
—	Samentaschen ohne Divertikel	22
22	Gürtel vom 15.—21. Segment	**cibca** RIGHI et MERINO, 1987
—	Gürtel vom 15.—22. Segment	23
23	Männliche Poren auf dem 18. Segment	**tuberculatus** sp. n.
—	Männliche Poren auf Intersegmentalfurche 16/17	**antisanae** sp. n.
24	Gürtel vom 1/2 16., 16.—24., 25. Segment	**antunesi** (RIGHI, 1971)
—	Gürtel vom 15.—22. Segment	**marabora** RIGHI, 1984
—	Gürtel vom 14., 15.—21. Segment	**mairaro** RIGHI, 1982
25	Gürtel vom 14.—21. Segment	**seidlae** sp. n.
—	Gürtel vom 14.—22. Segment	**perrieri meridionalis** (COGNETTI, 1904)
—	Gürtel vom 15.—21. Segment	26
—	Gürtel vom 1/2 16.,—1/2 22., 22. Segment	**arapaco** RIGHI, 1982
—	Gürtel vom 15.—22. Segment	27
—	Gürtel vom 15.—24. Segment	**oliveirae** RIGHI, 1982
26	Männliche Poren auf Intersegmentalfurche 16/17	**baloghi** ZICSI, 1988
—	Männliche Poren auf dem 17. Segment	**paolettii** RIGHI, 1984
27	Männliche Poren auf dem 16. Segment	**benavidesi** sp. n.
—	Männliche Poren auf Intersegmentfurche 16/17	28
—	Männliche Poren auf Intersegmentalfurche 17/18	32
28	Chylustaschen ohne dorsalem Membransack	29
—	Chylustaschen mit dorsalem Membransack	31
29	Pubertätsstreifen mit einer Papille	**papillatus** sp. n.
—	Pubertätsstreifen ohne Papille	30
30	Samensäcke kurz auf das 15. Segment beschränkt	**bresslaui** (MICHAELSEN, 1918)
—	Samensäcke weit nach hinten reichend	**loksai** sp. n.
31	Samentaschenporen in der Borstenlinie *b*	**itajo** (RIGHI, 1971)
—	Samentaschenporen in der Borstenlinie *cd*	**fontebonensis** RIGHI, 1988
32	Chylustaschen mit Membransack	**ortonae** RIGHI, 1980
—	Chylustaschen ohne Membransack	**perrieri perrieri** (COGNETTI, 1904)
33	Gürtel vom 1/2 13., 13.—22. Segment	**marcusae** (RIGHI, 1969)
—	Gürtel vom 15.—24. Segment	**schubarti** RIGHI, 1978
—	Gürtel vom 12.—22. Segment	34
34	Pubertätspapillen auf dem Pubertätsfeld fehlen	**tocantinensis** (RIGHI, 1972)
—	Pubertätspapillen auf dem Pubertätsfeld vorhanden	**tocantinensis pola** RIGHI, 1984

SCHRIFTTUM

ČERNOSVITOV, L. (1935): Les Oligochètes de la Guyane Française et d'autres Pays de l'Amérique du Sud. — Bull. Mus. Nat. Hist. Nat., (2) **6:** 47—59.

COGNETTI DE MARTIIS, L. (1904): Oligocheti dell'Ecuador. — Boll. Mus. Zool. Anat. comp. R. Univ. Torino, **19** (474): 1—18.

COGNETTI DE MARTIIS, L. (1905): Oligocheti raccolti nel Darien dal Dr. E. Festa. — Boll. Mus. Anat. comp. R. Univ. Torino, **20** (495): 1—7.

COGNETTI DE MARTIIS, L. (1906): Gli Oligocheti della regione Neotropicale II. — Mem. Accad. Torino, (2) **56:** 147—262.

MICHAELSEN, W. (1897): Organisation einiger neuer oder wenig bekannter Regenwürmer von Westindien und Südamerika. — Zool. Jb. Anat., **10:** 359—388.

MICHAELSEN, W. (1900): Die Terricolen-Fauna Columbiens. — Arch. Naturg., **66** (1): 231—266.

MICHAELSEN, W. (1918): Die Lumbriciden, mit besonderer Berücksichtigung der bisher als Familie Glossoscolecidae zusammengefassten Unterfamilien. — Zool. Jb. Syst., **41:** 1—398.

MICHAELSEN, W. (1927): Oligochaetenfauna Brasiliens. — Abh. Senckenb. Naturf. Ges., **40:** 369—374.

RIGHI, G. (1969): On some Brazilian Glossoscolecidae. — in: Beitr. zur Neotrop. Fauna, Stuttgart, Bd. **6,** Heft 2: 152—162.

RIGHI, G. (1970): Sôbre o gênero Andioscolex (Oligochaeta, Glossoscolecidae). — Rev. Brasil. Biol., **30** (3): 371—376.

RIGHI, G. (1971): Sôbre a Familia Glossoscolecidae (Oligochaera) no Brasil. — Arq. Zool., S. Paulo, **20** (1): 1—95.

RIGHI, G. (1972): Contribuição ao conhecimento dos Oligochaeta Brasileiros. — Pap. Avuls. Zool., S. Paulo, **25** (18): 149—166.

RIGHI, G. (1975): Some Oligochaeta from the Brazilian Amazonia. — Stud. Neotrop. Fauna, **10:** 77—96.

RIGHI, G. (1982a): Adições ao gênero Glossodrilus (Oligochaeta, Glossoscolecidae). — Revta bras. Zool., S. Paulo, **1** (1): 55—64.

RIGHI, G. (1982b): Oligochaeta, Glossoscolecidae, do Parque Nacional da Amazinia, Tapajós. — Rev. Brasil. Biol., **42** (1): 107—116.

RIGHI, G. (1984a): On some earthworms (Oligochaeta, Glossoscolecidae) from the Sierra Nevada de Santa Marta (Columbia). — in: T. VAN DEY HAMMAN & P. M. RUIZ: Studies on Tropical Andean Ecosystems, **2:** 455—468, J. Cramer, Berlin, 1984.

RIGHI, G. (1984b): Nova contribuição ao conhecimento dos Oligochaeta da Venezuela. — Pap. Avuls. Zool., S. Paulo, **35** (22): 243—256.

RIGHI, G. (1984c): Oligochaeta Megadrili da Região Centro-Oeste de Mato Grosso, Brasil. — Bolm. Zool. Univ., S. Paulo, **8:** 189—213.

RIGHI, G. (1988): Uma coleção de Oligochaeta da Amazônia Brasileira. — Pap. Avuls. Zool., S. Paulo, **36** (30): 337—351.

RIGHI, G. & AYRES, I. (1975): Alguns Oligochaeta sul Brasileiros. — Rev. Brasil. Biol., **35** (2): 309—316.

RIGHI, G., AYRES, I. & BITTENCOURT, E. (1976): Glossoscolecidae (Oligochaeta) do Instituto Nacional de Pesquisas da Amazinia. — Acta Amazonica, **6** (3): 335—367.

RIGHI, G., AYRES, I. & BITTENCOURT, E. (1978): Oligochaeta (Annalida) do Instituto Nacional de Pesquisas da Amazônia. — Acta Amazonica, **8** (3): 1—49.

RIGHI, G. & MERINO, J. F. (1987): Alguns Oligochaeta de Costa Rica. — Rev. Brasil. Biol., **47** (4): 535—548.

RIGHI, G. & RÖMBKE, I. (1987): Alguns Oligochaeta da Bolivia e do Peru. — Rev. Brasil. Biol., **47** (4): 523—533.

ZICSI, A. (1988): Neue Glossodrilus-Arten aus Ekuador (Oligochaeta, Glossoscolecidae). Regenwürmer aus Südamerika 4. — Acta Zool. Hung., **34:** 313—320.

ZICSI, A. & CSUZDI, Cs. (1987): Neue und bekannte Glossoscoleciden-Arten aus Südamerika. 2. (Oligochaeta: Glossoscolecidae). — Acta Zool. Hung., **33:** 269—275.

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

PRINTED IN HUNGARY

Akadémiai Kiadó és Nyomda Vállalat, Budapest

NOTES TO CONTRIBUTORS

I. PAPERS will be considered for publication in *Acta Zoologica* only if they have not previously been published or submitted for publication elsewhere. They may be written in English, French, German or Russian.

Papers should be submitted to

Prof. Dr. J. BALOGH
Zoosystematical and Ecological Institute
Eötvös Loránd University
H-1088 Budapest, Puskin utca 3, Hungary

Papers may be either articles with abstracts or short communications. Both should be as concise as possible, articles in general not exceeding 25 typed pages, short communications 8 typed pages.

II. MANUSCRIPTS

1. Papers should be submitted in *two copies.*

2. The text of papers must be of high stylistic standard, requiring minor corrections only.

3. Manuscripts should be typed double spaced on good quality paper, with generous margins.

4. The name of the author(s) and of the institutes where the work was carried out should appear on the first page of the manuscript.

5. *References* should be listed at the end of the paper in the following form:

BELLO, A. & GERAERT, E. (1972): Redescription of eight species belonging to the superfamily Tylenchoidea (Nematoda). — Nematologica, **18**: 190–200.

For books, please give the initials and family name of the author(s), title of the book, name of publisher, place and year of publication.

References to the literature in the text should be made using the name and date system.

6. *Captions* to illustrations should be listed on a separate sheet, not inserted in the text.

III. ILLUSTRATIONS AND TABLES

1. Each paper should be accompanied by two sets of illustrations, one of which must be ready for the blockmaker. The other set attached to the second copy of the manuscript may be rough drawings in pencil or photocopies.

2. Illustrations must not be inserted in the text.

3. All illustrations should be identified in blue pencil by the author's name, abbreviated title of the paper and figure number.

4. Tables should be typed on separate pages and have captions describing their content. Clear wording of column heads is advisable. Tables should be numbered in Roman numerals (I, II, etc.).

IV. RETURN OF MATERIAL

Owing to high postage costs, the Editorial Office cannot undertake to return *all* material not accepted for any reason for publication. Of papers to be revised (for not being in conformity with the above Notes or for other reasons) only *one* copy will be returned. Material rejected for lack of space or on account of the referees' opinion will not be returned to authors outside Europe.

CONTENTS

Six new nematode species from South America, I. Andrássy 1

Oribatid mites from Ecuador (Acari), II. P. Balogh 17

Fridericia Arten aus Marokko (Oligochaeta: Enchytraeidae). K. Dózsa-Farkas 29

Oribatids from the Southern Hemisphere (Acari: Oribatida). S. Mahunka 41

Braconidae (Hymenoptera) from Korea, X. J. Papp 81

A new apterous sphaerocerid fly from Thailand (Diptera: Sphaeroceridae). L. Papp ... 105

Taxonomic studies on the genus Autophila Hübner, 1823 (Lepidoptera: Noctuidae), II. L. Ronkay 111

A revision of the genus Cosmiella Verhoeff, 1902 (Dermaptera: Forficulidae). H. Steinmann 143

Weitere neue Glossodrilus-Arten aus Ekuador (Oligochaeta: Glossoscolecidae), Regenwürmer aus Südamerika 9. A. Zicsi 165

Index: 26 027

304.384

Acta Zoologica Hungarica

OLUME 35, NUMBERS 3–4, 1989

ITOR-IN-CHIEF
BALOGH

SISTANT EDITOR
PAPP

ITORIAL BOARD
ANDRÁSSY, L. GALLÉ, T. JERMY, I. LOKSA, S. MAHUNKA,
MATSKÁSI, Á. SOÓS, H. STEINMANN, A. ZICSI

kadémiai Kiadó, Budapest
TA ZOOL. HUNG. 35 (3–4) 191–430 (1989) HU ISSN 0236-7130

ACTA ZOOLOGICA HUNGARICA

A QUARTERLY OF THE HUNGARIAN ACADEMY OF SCIENCES

Acta Zoologica is published in yearly volumes of four issues by

AKADÉMIAI KIADÓ

Publishing House of the Hungarian Academy of Sciences
H-1054 Budapest, Alkotmány u. 21

Subscription information

Orders should be addressed to

KULTURA Foreign Trading Company
H-1389 Budapest, P.O. Box 149

or to its representatives abroad

"This periodical is included in the document delivery program THE GENUINE ARTICLE of the Institute of Scientific Information, Philadelphia. The articles published in the periodical are available through *The Genuine Article* at the Institute for Scientific Information, 3501 Market Street, Philadelphia PA 19104."

Acta Zoologica Hungarica is abstracted/indexed in AGRICOLA, Biological Abstracts, Bibliography of Agriculture, Chemical Abstracts, Current Contents — Agriculture, Biology and Environmental Sciences, Excerpta Medica, Horticultural Abstracts, Hydre — Index, Plant Breeding Abstracts, Nutrition Abstracts and Reviews

© *Akadémiai Kiadó, Budapest*

Acta Zoologica Hungarica 35 (3—4), pp. 191—203 (1989)

NEUE ENCHYTRAEIDEN-ARTEN (OLIGOCHAETA) AUS EKUADOR

K. Dózsa-Farkas

Lehrstuhl für Tiersystematik und Ökologie der Loránd-Eötvös-Universität, H-1088 Budapest, Puskin utca 3, Ungarn

(Eingegangen am 15. November, 1988)

(New Enchytraeid species, Oligochaeta, from Ecuador.) Author gives the description of 3 enchytraeid species, new for science, from Ecuador: *Cognettia zicsii* sp. n., *Hemienchytraeus loksai* sp. n. and *H. csuzdii* sp. n., furthermore the description of the characters of a problematic species, *Hemienchytraeus stephensoni* (Cognetti, 1927), new for the fauna of Ecuador. With 33 original figures.

Von der ungarischen Bodenzoologischen Expedition (Teilnehmer Prof. Dr. A. Zicsi, Doz. Dr. I. Loksa und Cs. Csuzdi) wurden mir in den letzten zwei Jahren aus Ekuador u. a. auch Bodenproben mit lebenden Enchytraeiden-Material zur Weiterverarbeitung mitgebracht. Ausserdem wurden Proben auch in Ekuador selbst mit der Methode O'Connor ausgelesen, und in Alkohol fixiert mir zur Bestimmung übergeben. Für ihre Bemühungen im Terrain sowie im Labor spreche ich den oben genannten Herren auch an dieser Stelle meinen besten Dank aus.

Aus den Bodenproben wurden die Tiere in einem Planktonnetz ausgewaschen und unter dem Stereomikroskop ausgelesen, anschliessend in vivo bestimmt. Nachher wurden die Tiere in 70% Alkohol fixiert. Die juvenilen Exemplare sind zur Weiterentwicklung in Zuchten, so wie dies bei dem Material aus Marokko bekanntgegeben wurde (Dózsa-Farkas 1988), aufbewahrt worden.

In vorliegender Arbeit werden vorausgehend erst drei, für die Wissenschaft neue Arten beschrieben. Ferner wird eine ausführliche Beschreibung auch von der problematischen Art *Hemienchytraeus stephensoni* (Cognetti, 1927), die neu für die Fauna Ekuadors ist, gegeben. Die Abbildungen und ihre Masse beziehen sich auf lebendes Material, doch werden meine Beobachtungen auch mit Färbung der Tiere in Haematoxylin, Boraxkarmin, und mit Untersuchungen in Nelkenöl ergänzt. Anschliessend sind auch diese Tiere in 70% Alkohol aufbewahrt worden.

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

Cognettia zicsii sp. n.
(Abb. 1—7)

Kleine Art. Holotypus: Länge 7.9 mm, Breite 0.31 mm, am Gürtel 0.36 mm, Segmentzahl 43. Bei den Paratypen: Länge 6.7—10.5 mm, Breite 0.28—0.35 mm, am Gürtel 0.31—0.42 mm (Breite wurde immer am VIII—IX. Segment gemessen). Segmentzahl 34—47. Zwei Exemplare waren kürzer: ein am Körperende verletztes Tier mit 17 Segmenten, das unverletzte aber deutlich mit verkürztem Körperende betrug 27 Segmente (letzteres bei der Cognettia oft auftretender Fragmentation zufolge).

Kopfporus 0/I, Dorsalporen fehlen. Farbe weisslich. Borsten s-förmig: 3—3 : 3—3, vorne 60—73 μ lang, die grösste Breite 5 μ, hinten etwas grösser: 80—84 μ, Breite ca. 6 μ. Bortsen fehlen im XII. Segment. Clitellum XII—$^1/_2$ XIII Segment, Drüsenzellen sind unregelmässig angeordnet.

Gehirn (Abb. 1) 1.5-mal länger als breit, hinten wenig eingeschnitten. Peptonephridien, oesophageal und intestinal Divertikeln für die Gattung kennzeichnend, fehlend. Drei primäre (im IV—VI. Segment) und zwei sekundäre (am IV/V und V/VI Dissepiment) Septaldrüsen vorhanden, keine von ihnen sind dorsal miteinander verschmolzen (Abb. 2). Im Coelom meisstens sehr wenige Lymphocyten vorhanden, nur am Ende des Körpers sind sie häufiger. Sie sind durchsichtig, mit verschieden gestaltetem Umriss, oval oder mit lang ausgezogener Spitze (Abb. 6), 14—18 μ, maximal 30—35 μ. Das erste Nephridium liegt im VII. Segment. Nephridien sind für die Gattung kennzeichnend; Anteseptal besteht nur aus dem Trichter, Ausführungsduktus entspring vorne, nahe am Dissepiment, ventral (Abb. 5). Rückengefäss entspringt im XIV. Segment. Blut farblos. Chloragogenzellen 7—10 μ lang und granuliert, am Darm bilden die zerstreuten Zellen eine dünne Schicht.

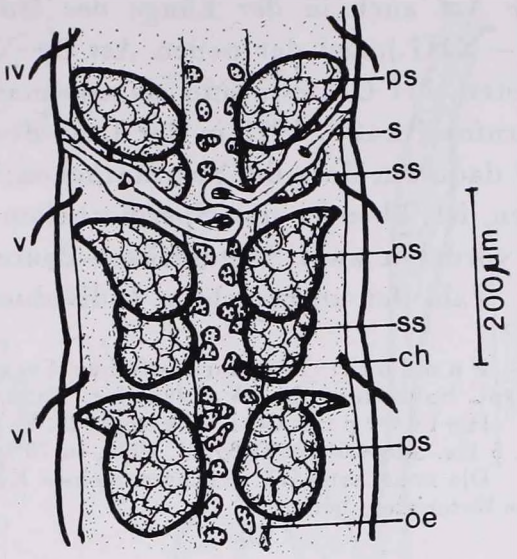
Vesicula seminalis fehlen. Samentrichter (Abb. 4) sind zylindrisch, ca. 4-mal länger als breit, Länge 140—240 μ. Kragen gut zu erkennen, ungefähr so breit wie der Körper des Trichters. Samenleiter dünn und lang, liegt im XII—XIII. Segment, eine lose Rolle bildend. Penialbulben sind oval und kompakt, 84—89 × 40—48 μ (Abb. 7).

Spermatheken (Abb. 3) besitzen keine Verbindung mit dem Darm, sie liegen frei im Coelom des V. Segments. Sie bestehen aus einem relativ kurzen (50—60 μ lang) und dicken (21—28 μ) Ausführungsductus, in dem der Ausführungskanal gut zu erkennen ist. Bei der Öffnung mit einer Drüse. Ausführungsductus bulbusförmig ausgebreitet (28—25 μ breit) und geht ental in eine längere sackförmige Ampulle über, in der sich Samenfäden befinden.

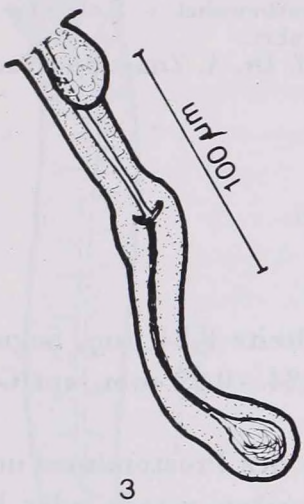
Die neue Art steht *C. lapponica* NURMINEN, 1965 am nächsten, insbesondere in Hinsicht der Septaldrüsen und der Spermatheken, obwohl das Verhältnis des Ausführungsductus zur Ampulle nicht 1 : 3, sondern bei *C. zicsii* 1 : 2 beträgt.



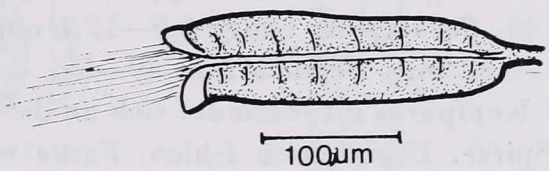
1



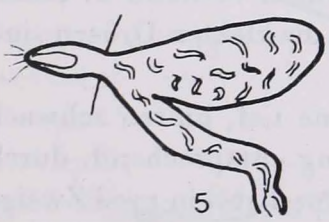
2



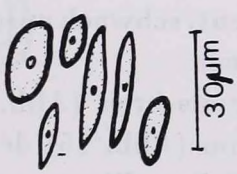
3



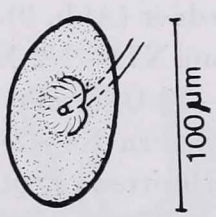
4



5



6



7

Abb. 1—7. *Cognettia zicsii* sp. n.: 1 = Gehirn, 2 = IV—VI. Segment: ch = Chloragogenzellen, oe = Oesophagus, ps = primäre Septaldrüsen, ss = secundäre Septaldrüsen, s = Spermatheka, 3 = Spermatheka, 4 = Samentrichter, 5 = Nephridium, 6 = Lymphocyten, 7 = Peniabulbus

Die neue Art ist in Bezug der Länge und Segmentzahl grösser, auch der Spermatrichter ist länger (4-mal länger als breit), bei *C. lapponica* ist der Trichter kleiner, nur 2—2.5-mal länger. Ausserdem unterscheidet sich die

neue Art auch in der Länge des Rückengefässes (bei NURMINEN's Art im XII—XIII.), bei der neuen Art im XIV. Segment, sowie in der Grösse der Borsten, bei *C. zicsii* sind sie zweimal so lang. Die neue Art ähnelt auch *C. hibernica* HEALY, 1975 in der Lage des Gürtels vom XII—$^1/_2$ XIII. Segment, und dadurch, dass die Spermatheken im V. Segment liegen. *C. hibernica* hingegen ist kleiner, die Spermatheken sind von anderer Form, ferner sind die vorderen zwei Septaldrüsen-Paare paarweise miteinander verschmolzen.

Zahl der untersuchten Individuen 6 + 3 juv. Ex.

Fundort: Ekuador, zwischen Cuenca und Loja, ca. 4000 m, 52 km von Cuenca entfernt, Sphagnum, 26. IV. 1988; leg. ZICSI et CSUZDI.

Holotypus CO 1. Abgetötet 26. V. 1988, in Alkohol aufbewahrt. — Paratypen: P 20. 5 Ex. Abgetötet am 29. V. 1988, in 70% Alkohol aufbewahrt.

Die neue Art wird zu Ehren meines Kollegens, von Prof. Dr. A. ZICSI, dem Sammler dieses Materiales, benannt.

Hemienchytraeus loksai sp. n.
(Abb. 8—15)

Mittelgrosse Art. Holotypus: Länge 12 mm, Breite 0.24 mm, Segmentzahl 48. Paratypen: Länge 8.9—12,4 mm, Breite 0.24—0.29 mm, am Gürtel 0.25—0.32 mm. Segmentzahl 49—55.

Kopfporus 0/I, befindet sich an der Dorsalseite des Prostomiums unweit der Spitze. Dorsalporen fehlen. Farbe weisslich. Borsten gerade oder leicht sigmoid: 2—2 : 2—2. Länge der Borsten am Vorderkörper 31—35 μ, und 3—4 μ dick, am Ende des Körpers etwas grösser, 40—45 μ lang, und 4—5 μ dick. Bortsen fehlen im XII. Segment. Hautdrüsen schwach gebildet, nur am gefärbten Präparat besser zu erkennen: eine grössere Querreihe zwischen den Borstenbündeln und daneben 6—8 Einzeldrüsen in jedem Segment in Reihen angeordnet (Abb. 9). Am Kopflappen viele, winzige Drüsen vorhanden. Clitellum vom XII—1/2 XIII. Segment, schwach ausgebildet, die kleinen Drüsen sind in 30—36 Querreihen angeordnet.

Gehirn 1.5—2-mal länger als breit (Abb. 8). Vorne tief, hinten schwach eingeschnitten. Peptonephridium (Abb. 15) der Gattung entsprechend, durch einen walzenförmigen basalen Teil an Pharynx gebunden, distal in zwei Zweige geteilt, die sich wieder verzweigen, und in 2—3 Äste enden. Die drei primären Septaldrüsen sind oberhalb des Darmes paarweise miteinander verschmolzen. Daneben befinden sich am IV/V, V/VI, VI/VII. Dissepiment drei sekundäre Septaldrüsen. Lymphocyten discoid, 30—35 μ lang, und 15—21 μ breit, 3 μ dick, fein granuliert, im Durchlicht hellbraun (Abb. 10). Erstes Nephridien-Paar liegt im V/VI. Dissepiment. Verhältnis Anteseptal zu Postseptal 1 : 2. Zellige Zwischenmasse deutlich entwickelt. Ausführungskanal entspringt ventral, im hinteren Teil des Körpers jedoch posteroventral (Abb. 14). Rücken-

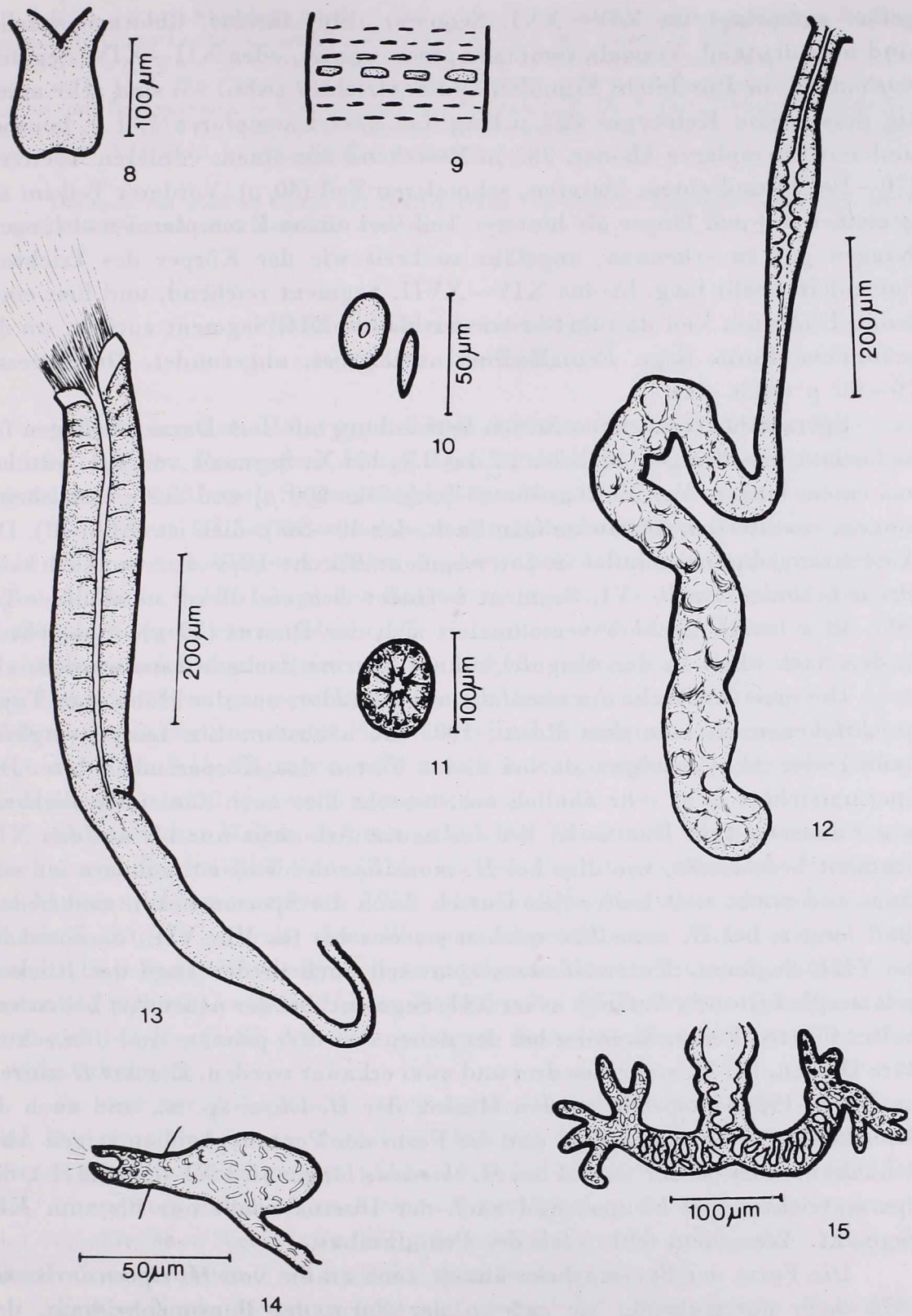


Abb. 8—15. *Hemienchytraeus loksai* sp. n. 8 = Gehirn, 9 = Hautdrüsen, 10 = Lymphocyten, 11 = Penialbulbus, 12 = Spermatheka, 13 = Samentrichter, 14 = Nephridium, 15 = Peptonephridium

gefäss entspringt im XIV—XVI. Segment. Blut farblos. Chloragogenzellen sind unbedeutend. Vesicula seminalis gross, von X. oder XII—XIV. Segment vorhanden, in Durchlicht bräunlich. Samentrichter (Abb. 13) sind sehr mächtig gross, beim Holotypus 822 μ lang, bei zwei Exemplaren 700 μ, bei zwei anderen Exemplaren kleiner, 385 μ. Bestehend aus einem vorderen, breiteren (70—100 μ) und einem hinteren, schmaleren Teil (30 μ). Vorderer Teil im allgemeinen 1,8-mal länger als hinterer Teil (bei einem Exemplar 3-mal länger). Kragen gut zu erkennen, ungefähr so breit wie der Körper des Trichters. Samenleiter sehr lang, bis ins XIV—XVII. Segment reichend, und hier einen Knäuel bildend. Von da führt er wieder bis ins XII. Segment zurück, wo der männliche Porus liegt. Penialbulbus mittelgross, abgerundet, Durchmesser 70—90 μ (Abb. 11).

Spermatheken besitzen keinen Verbindung mit dem Darm, sie liegen frei in Coelom und dringen auch bis in das IX. bis X. Segment vor. Sie bestehen aus einem langen Ausführungsductus (ungefähr 500 μ) und aus einem ebenso langen, erweiterten, dünnwandigen Sack, der 40—90 μ dick ist (Abb. 12). Der Ausführungsductus mündet in Intersegmentalfurche IV/V aus, wo sich keine Drüse befindet. Im V—VI. Segment befindet sich ein dicker muskulöser Teil (35—38 μ breit), nachher verschmälert sich der Ductus (30 μ), und geht so in den Sack über. In der Ampulle konnte Sperma nachgewiesen werden.

Die neue Art steht der ebenfalls aus Ekuador, aus der Höhle Los Tayos beschriebenen *H. mauriliae* Righi, 1981 am nächsten. Ein Längenvergleich kann leider nicht erfolgen, da bei diesen Tieren das Körperende fehlte. Der Spermatrichter sieht sehr ähnlich aus, besteht hier auch aus einem dickeren und dünneren Teil. Ductus ist bei der neuen Art nicht nur bis auf das XII. Segment beschränkt, wie dies bei *H. mauriliae* der Fall ist, sondern ist sehr lang, und reicht weit hinter den Gürtel. Auch die Spermatheken sind bedeutend länger, bei *H. mauriliae* reichen sie nur bis ins VI—VII., maximal bis ins VIII. Segment. Unterschiede zeigen sich auch in der Lage des Rückengefässes, bei Righi's Art liegt es im XII. Segment, bei der neuen Art bedeutend weiter hinten. Ferner konnten bei der neuen Art drei primäre und drei sekundäre Drüsen, bei *H. mauriliae* drei und zwei erkannt werden. Die Art *H. shirensis* Bell, 1954 entspricht in den Massen der *H. loksai* sp. n., und auch die Anordnung der Spermatheken und die Form der Peptonephridien zeigen Ähnlichkeiten, doch ist der Gürtel bei *H. shirensis* länger (1/2 XI—1/2 XIII.), der Spermatrichter viel kleiner, und auch der Ductus reicht nur bis zum XII. Segment. Ausserdem fehlt auch der Penialbulbus.

Die Form der Spermatheke ähnelt auch an die von *H. cipoensis* Righi, 1973 doch unterscheidet sie sich in der Form der Peptonephridium, den Septaldrüsen und in der Lage des Spermatrichters. Der Penialbulbus fehlt ebenfalls.

Zahl der untersuchten Individuen: 5 + 2 juv. Ex.

Fundort: Ekuador, Antisana Vulkan, am Ufer des Rio Antisana, 4300 m, Paramo-Vegetation, in der Laubstreu und im Moos. 16. IV. 1987, leg. LOKSA et ZICSI.

Holotypus H. 1. Abgetötet 26. IV. 1988, in 70% Alkohol aufbewahrt. — Paratypen: P. 18. 1. Ein Exemplar abgetötet 30. IV. 1988 in 70% Alkohol, gefärbt mit Haematoxylin und Boraxcarmin, in Kanadabalsam aufbewahrt. P. 18. 2. Drei Exemplare abgetötet am 30. IV. und 18. VII. 1988, in 70% Alkohol aufbewahrt. P. 18. 3. Ein juv. Exemplar, abgetötet am 20. VII. 1988, in 70% Alkohol aufbewahrt.

Die neue Art wird zu Ehren mit bestem Dank von meinem Kollegen Herrn Doz. Dr. I. LOKSA, dem Sammler des Materiales, benannt.

Hemienchytraeus csuzdii sp. n.
(Abb. 16—23)

Sehr kleine Art. Holotypus: Länge 3.5 mm, Breite 0.14 mm, Segmentzahl 27. Bei den Paratypen: Länge 2.5—3.9 mm, Breite 0.16—0.24 mm (am Gürtel 0.17—0.25 mm), Segmentzahl (20)—24—28.

Kopfporus 0/I befindet sich auf der Dorsalseite des Prostomiums, unweit der Spitze. Dorsalporen fehlen. Farbe weisslich. Borsten gerade oder leicht sigmoid: 2—2 : 2—2. Länge der Borsten vorne 25—31 μ, und 2.5 μ dick, am Ende des Körpers etwas grösser, 35—50 μ lang und in der Mitte 5.5 μ dick. Hautdrüsen sehr kleine Drüsen in 8—10 Querreihen, eine Reihe in der Linie der Borsten etwas grösser. Diese Drüsen liessen sich mit Neutralrot nicht färben, sie waren nur durch Haematoxylin-Färbung zu erkennen. Clitellum liegt auf dem XII. Segment, sehr schwach ausgebildet, die kleinen Drüsen sind ungefähr in 30 Querreihen angeordnet.

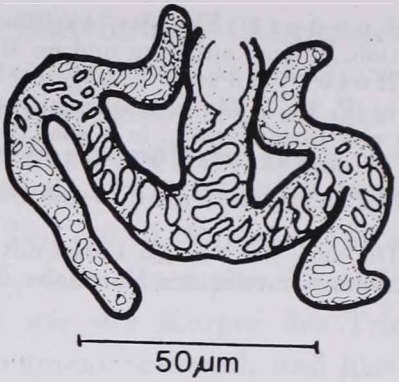
Gehirn etwas länger als breit (Abb. 16). Vorne tief, hinten schwach eingeschnitten. Peptonephridium (Abb. 17) den Peptonephridien von *H. bifurcatus* NIELSEN et CHRISTENSEN, 1959 sehr ähnlich. Mit einem walzenförmigen Basalteil (20—25 μ breit) dem Pharynx angeschlossen, distal in zwei Teile geteilt (15 μ breit) die wieder in je zwei, ebenso lange oder noch längere Äste enden (12 μ breit), während diese letzteren bei *H. bifurcatus* granuliert sind setzt sich bei *H. csuzdii* der stark gebogene Kanal in diesen fort, und ist deutlich zu erkennen.

Es sind nur drei primäre, aber keine sekundären Septaldrüsen vorhanden. Die erste sind immer dorsal miteinander verschmolzen, die zweiten und dritten können verschmolzen (Abb. 19) oder nicht verschmolzen (Abb. 18) sein, am meisten haben sie auch einen Ventrallappen. Lymphocyten sind oval, von verschiedenen Ausmassen, die grösseren sind etwas spitzer (18—29 μ), die kleineren abgerundet (7—13 μ), fein granuliert (Abb. 21).

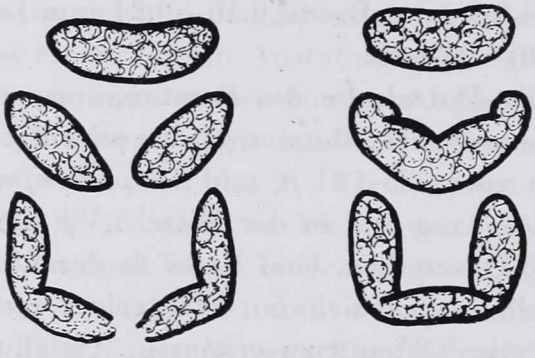
Erstes Nephridienpaar liegt auf dem V/VI. Dissepiment. Postseptal 1.5—2-mal länger als Anteseptal. Ausführungskanal entspringt vorne ventral, und hinten posteroventral (Abb. 20). Die zellige Zwischenmasse ist gut entwickelt. Rückengefäss entspringt im XIII—XIV. Segment. Blut farblos.



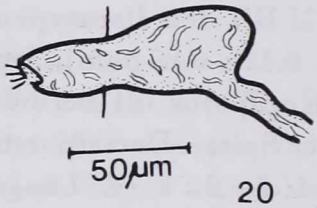
16



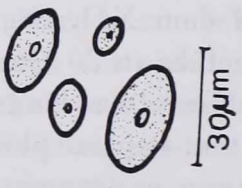
17



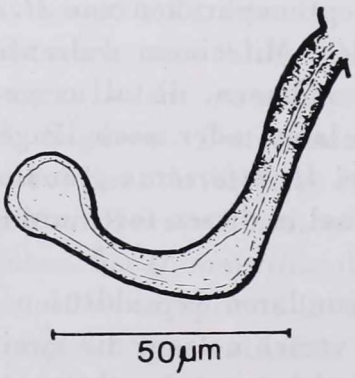
18 19



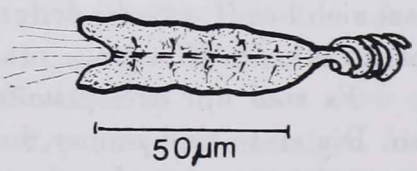
20



21



22



23

Abb. 16—23. *Hemienchytraeus csuzdii* sp. n. 16 = Gehirn, 17 = Peptonephridium, 18—19 = Variationen der Septaldrüsen, 20 = Nephridium, 21 = Lymphocyten, 22 = Spermatheka, 23 = Samentrichter

Chloragogenzellen auffallend, im Durchlicht dunkel, vom V. Segment vorhanden, bis zum Clitellum bilden sie eine relativ grössere Schicht (ca. 21 μ dick), nach dem Clitellum viel dünner (ca. 10 μ dick), die Zellen sind heller.

Vesicula seminalis nicht vorhanden. Samentrichter (Abb. 23) zylindrisch, klein und dünn, Länge 1/3 des Körperdurchmessers. Bei Geschlechtsreife 4-mal länger als breit, sonst auch kürzer. Kragen nicht abgesondert. Samenleiter meistens spiralförmig fest aufgerollt, oder unregelmässig gewunden in Coelom des XII. Segmentes. Penialbulbus sehr klein, rund, Durchmesser 15—32 μ.

Spermatheken der Gattung entsprechend, besitzen keine Verbindung mit dem Darm, sie liegen frei in Coelom. Sie bestehen aus einem Ausführungsductus, der sich im IV/V. Segment öffnet, wo sich keine Drüse befindet. Ental etwas bulbusartig ausgebreitet, und endet im V. Segment in eine 17—20 μ breite dünnwandige Ampulle. Häufig ist Bulbus und Ampulle sehr schwer zu erkennen, da sie nicht auffallend sind, und zwischen den Septaldrüsen auf die andere Seite hinüberreichen. In der Ampulle kein Spermium zu erkennen. Vollkommene Länge der Spermatheke 75—120 μ (Abb. 22).

Vier ähnliche, kleine Arten sind aus dieser Gattung beschrieben worden. Von diesen seht die neue Art der *H. bifurcatus* Nielsen et Christensen, 1959 am nächsten, insbesondere in der Form der Peptonephridien, wie dies bereits erwähnt wurde. Unterscheidet sich aber von ihr dadurch, dass sie kleiner ist (maximale Länge 3.9 mm, bei *H. bifurcatus* 10 mm), die Spermatheke kürzer ist, und, dass der Gürtel bedeutend kräftiger ausgebildet ist. Der Art *H. solimonensis* Righi, 1978 ähnelt sie dadurch, dass die Spermatheken ebenfalls im V. Segment liegen, doch ist letztere Art etwas grösser, erstes Nephridium beginnt um ein Segment weiter hinten, Samentrichter gut zu erkennen, und besitzt einen Kragen. Der grösste Unterschied besteht darin, dass *H. solimonensis* drei primäre und zwei sekundäre Septaldrüsen besitzt, während bei *H. csuzdii* die sekundären Drüsen fehlen. Von den beiden anderen kleinen Arten unterscheidet sie sich von *H. kallikotosus* Dash et Thambi, 1978 dadurch, dass sie etwas grösser (26—36 Segment, 7—10 mm), die Form der Spermatheken anderes, und auch die Form der Peptonephridien ganz verschieden ist. *H. brasiliensis* (Cognetti, 1900) ist so spärlich beschrieben, dass ein Vergleich mit dieser Art nicht möglich war.

Zahl der untersuchten Exemplare: 13 (während der Untersuchung sind von diesen zwei Exemplaren zugrunde gegangen).

Fundort: Ekuador, zwischen Quito und Santo Domingo, 71 km von Quito entfernt, 2500 m, am Ufer eines Teiches, im Detritus. Prov. Pichincha. 24. IV. 1988, leg. Zicsi et Csuzdi.

Holotypus H. 2. Abgetötet am 6. IX. 1988, in 70% Alkohol aufbewahrt. — Paratypen: P. 19. 1. Ein Exemplar mit Boraxcarmin gefärbt und in Kanadabalsam aufbewahrt. P. 19. 2. 9 Exemplare in 70% Alkohol aufbewahrt.

Die neue Art wird zu Ehren meines jungen Kollegens von Herrn Cs. Csuzdi, dem Sammler dieses Materiales, benannt.

Hemienchytraeus stephensoni (Cognetti, 1927)
(Abb. 24—33)

Černosvitov (1934) ist der Meinung, dass seine *Enchytraeus myrmecophilus* Čern., 1930 aus Süd-Amerika, sowie die Arten *E. cavicola* Steph., 1924 und *E. rangoonensis* Steph., 1931 aus Indien und Burma unter dem Namen *Hemienchytraeus stephensoni* (Cognetti, 1927) nom. n. synonymisiert werden müssen. Im späteren stellte Černosvitov (1939) an Hand von Material aus Bolivien (Titicaca-See) fest, dass es sich um eine sehr variable Art handelt, und gibt eine ausführliche, ergänzende Beschreibung der Art an. Chtistoffersen (1979) befasst sich an Hand von eigenem Material aus Brasilien eingehend mit dieser Art, und beschreibt vier Variationen. Er bemerkt dabei, dass es sich um eine Artengruppe handelt, die auch mehrere Arten beherbergen kann.

Auf Grund meiner bisherigen Kenntnisse schliesse ich mich der Meinung von Christoffersen an, insbesondere die ergänzende Beschreibung von Černosvitov aus Bolivien in Betracht ziehend, auf Grund deren es mir unmöglich erscheint diese Art der vorausgehenden Art einzureihen. Vor allem deswegen, weil die Gestalt der Spermatheken eine ganz andere Form besitzt. Da noch weitere Probleme dieser Art zu klären wären, soll die von mir als *H. stephensoni* betrachtete Art ausführlich beschreiben werden.

Kleine Art. Länge 6.2—8.3 mm, Breite 0.22—0.30 mm, am Gürtel 0.27—0.38 mm, Segmentzahl 30—38.

Kopfporus 0/I befindet sich auf der Dorsalseite des Prostomiums, unweit der Spitze. Dorsalporen fehlen. Farbe weisslich. Borsten gerade, an beiden Enden etwas gegensätzlich gebogen: 2—2 (3) : 2—2, sehr selten können auch 3 Borsten in einem Bündel sein. Länge der Borsten vorne 30—44 μ, und 4—5 μ dick, in allgemeinen vom XXII. Segment beginnend, auffallend grösser, am Ende des Körpers 70—84 μ lang, und 5—5.7 μ breit. Im XII. Segment fehlen die Borsten. Hautdrüsen schwach ausgebildet, 1—3 Reihen im Segment, bestehen aus isoliert stehenden, granulierten Zellen (Abb. 24), die nur Neutralrot gefärbt, in vivo erkannt werden können. Clitellum vom XII—1/2 XIII. Segment, sehr stark entwickelt, mit unregelmässig angeordneten oder dicht nebeneinander stehenden, im Durchlicht dunkel granuliert erscheinenden Drüsen besetzt, die nur in der Umgebung der männlichen und weiblichen Poren fehlen (Abb. 25). Nach der Fortpflanzungszeit ist der Gürtel nicht so auffallend, und die Rudimente der Drüsen scheinen in Querreihen angeordnet zu sein.

Gehirn 1.5-mal länger als breit (Abb. 26), vorne tief, hinten schwach eingeschnitten. Peptonephridium (Abb. 27) der Gattung entsprechend durch einen walzenförmigen Basalteil dem Pharynx angeschlossen, distal in zwei Äste verzweigt, die länger als der Basalteil sind, sämtliche enden in 2—3 verhältnismässig langen Ästen.

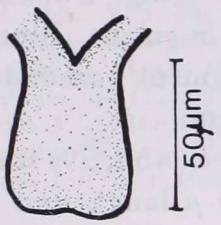
MAGYAR TUDOMÁNYOS AKADÉMIA



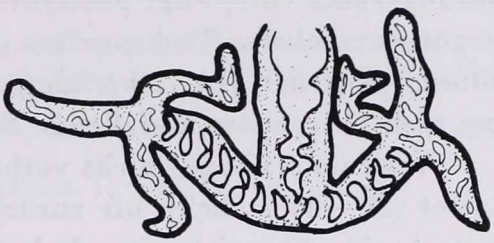
24



25



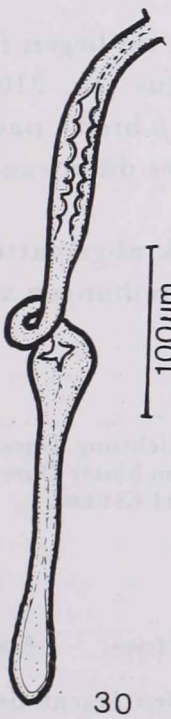
26



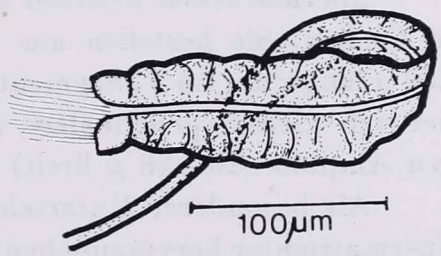
27



28



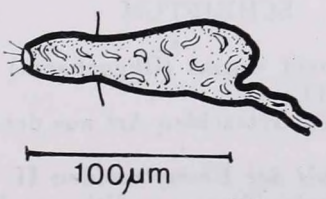
30



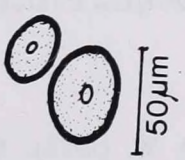
29



31



32



33

Abb. 24—33. *Hemienchytraeus stephensoni* (Cognetti 1927): 24 = Hautdrüsen, 25 = Drüsen des Clitellums und Penialbulben, 26 = Gehirn, 27 = Peptonephridium, 28 = Penialbulbus, 29 = Samentrichter, 30 = Spermatheka, 31 = Nephridium am Vorderkörper, 32 = Nephridium am Hinterkörper, 33 = Lymphocyten

Drei primäre (IV—VI. Segment) und zwei sekundäre (IV/V—V/VI) Septaldrüsen vorhanden. Die ersten zwei primären Septaldrüsen sind dorsal miteinander verschmolzen, das dritte Paar frei oder verschmolzen. Lymphocyten sind diskoid oder oval, fein granuliert, etwas verschieden gross, 28—42 μ lang, und 20—33 μ breit (Abb. 33). Das erste Nephridienpaar liegt auf VI/VII. Dissepiment. Vorne Postseptal der Nephridien 1.4—1.5-mal länger als Anteseptal, der Ausführungskanal entspringt ventral, in der Nähe des Septums (Abb. 31). Hinten Postseptal etwas länger, ca. 1.7—2-mal länger als Anteseptal, Ausführungskanal entspringt posteroventral (Abb. 32). Die zellige Zwischenmasse ist gut entwickelt, Rückengefäss entspringt im XIV. Segment. Blut farblos. Chloragogenzellen (14—20 μ lang) sind vom V—VI. Segment vorhanden, es ist eine nicht besonders auffallende Schicht auf dem Darm.

Vesicula seminalis nicht vorhanden. Samentrichter (Abb. 29) stark abgeplattet (20—24 μ dick), oft zurückgebogen (180—350 μ lang), und ca. 50 μ breit, 4—5(—6)-mal länger als breit, verjüngen sich nach hinten zu. Kragen deutlich so breit wie der Körper des Trichters. Nach der Fortpflanzungsperiode ist nicht nur der Gürtel, sondern auch der Spermatrichter kleiner, ca. 140 μ lang, und 40 μ breit. Samenleiter (6 μ Durchmesser) lang, manchmal unregelmässig gerollt, manchmal spiralförmig gewunden im Coelom des XIII. Segmentes. Penialbulbus klein, 40—50 μ Durchmesser (Abb. 28).

Spermatheken besitzen keine Verbindung mit dem Darm, sie liegen frei in Coelom. Sie bestehen aus einem längeren Ausführungsductus (ca. 210—280 μ lang), der im V. Segment sich bulbusförmig ausbreitet (40 μ breit), nachher sich wieder verschmälert, und im VI.—VII. Segment in einer dünnwandigen Ampulle (26—28 μ breit) endet (Abb. 30).

Als besonderer Unterschied wäre in erster Linie der stark abgeplattete Spermatrichter hervorzuheben. Dies wurde bisher bei den Beschreibungen von *H. stephensoni* nicht erwähnt.

Zahl der untersuchten Individuen: 13+3 juv. Ex.

Fundort: 1. Ekuador, Prov. Napo, 8 km von Lago Agrio in Richtung Dureno, Streu aus dem Urwald. 10. V. 1988, leg. Zicsi et Csuzdi. — 2. Prov. Napo, 2 km hinter Dureno, bei der zweiten Pontonbrücke. Streu aus dem Urwald. 10. V. 1988, leg. Zicsi et Csuzdi.

SCHRIFTUM

Bell, A W. (1954): Some Enchytraeid worms (Oligochaeta) from East Africa. — Trans. Amer. Micro. Soc. **73:** 297—311.

Černosvitov, L. (1930): Eine neue Enchytraeiden-Art aus den Ameisenhaufen Argentiniens. — Zool. Anz. **88:** 85—89.

Černosvitov, L. (1934): Zur Kenntnis der Enchytraeiden II. — Zool. Anz. **105:** 295—305.

Černosvitov, L. (1939): The Percy Sladen Trust expedition to Lake Titicaca. VI. Oligochaeta. — Trans. Linn. Soc. London. **3** (1): 81—116.

Christoffersen M. (1979): Some Enchytraeidae (Oligochaeta) from Serra do Mar, Sao Paulo, Brasil. — Bolm. Zool. Univ. S. Paulo. **4:** 39—52.

Cognetti, L. (1900): Contributo alla conoscenza degli oligocheti neotropicali. — Boll. Mus. Zool. Anat. Torino. **15** (369): 1—3.

COGNETTI, L. (1927): Lumbricidi dei Carpazi. — Boll. Mus. Zool. Anat. Comp. R. Univ. Genova **2**, 7 (10): 1—8.

DASH, M. C. & THAMBI, A. V. (1978): A taxonomic study of Enchytraeidae (Olig.) from grassland soil of southern Orissa, India. — Rev. Ecol. Biol. Sol. **15** (1): 129—134.

DÓZSA-FARKAS, K. (1988): Fridericia berninii sp. n. und weitere Angaben über die Enchytraeiden-Fauna (Olig.) der Balearen. — Acta Zool. Hung. **34** (4): 339—344.

HEALY, B. (1975): A description of five new species of Enchytraeidae from Ireland. — Zool. J. Linn. Soc. 56, 4: 315—326.

NIELSEN, C. O. & CHRISTENSEN, B. (1959): The Enchytraeidae. Critical revision and taxonomy of European species. (Studies on Enchytraeidae VII. — *Nat. Jutl.* **8—9:** 1—160.

NURMINEN, M. (1965): Enchytraeids (Oligochaeta) from northern Norway and western Lapland. — Ann. Zool. Fenn. **2:** 11—15.

RIGHI, G. (1973): Sobre Trés Espécies Brasileiras de Enchytraeidae (Oligochaeta). — Bol. Zool. Biol. Mar. N. S. **30:** 469—482.

RIGHI, G. (1978): Notas sobre os Oligochaeta da Amazonia. — Acta Amazonica. **8** (3): 485—488.

RIGHI, G. (1981): Alguns Oligochaeta cavernicolas do Equador. — Papéis Avulsos de Zool. S. Paulo. **34** (22): 235—249.

STEPHENSON, J. (1924): Oligochaeta of the Siju Cave, Garo Hills, Assam. — Rec. Ind. Mus. Calcutta. **26:** 1—135.

STEPHENSON, J. (1931): Description of Indian Oligochaeta. — Ibid. **33** (2): 173—202.

Acta Zoologica Hungarica 35 (3—4), pp. 205—210 (1989)

DATA TO THE THYSANOPTERA FAUNA OF ETHIOPIA

G. JENSER

Plant Protection Institute, Hungarian Academy of Sciences
H-1525 Budapest, pf. 102, Hungary

Fourteen species of Thysanoptera found in Ethiopia are listed together with locality and other pertaining data. Nine species are new for the Ethiopian fauna. *Chiridothrips fabiani* is described as a new species.

DR. A. DEMETER had the opportunity in the year of 1980 to make a zoological collecting trip in Ethiopia (DEMETER 1982). He also collected Thysanoptera species. Subsequently I give new data to the Thysanoptera fauna of Ethiopia. When referring to the geographical distribution of the collected species, I extensively relied on the works of BAGNALL (1913), BHATTI (1973), FAURE (1957, 1959), HARTWIG (1952), JACOT-GUILLARMOD (1971, 1974), JENSER (1984), MOULTON (1928), MORISON (1958), MOUND (1965), PELIKÁN (1984), PRIESNER (1950, 1960) and ZUR STRASSEN (1967, 1970).

List of the species

THRIPIDAE

Aptinothrips rufus (HALIDAY, 1836) — Akaki river, Addis Ababa, 2 ♀ 6. Oct., 4 ♀ 13. Nov. First record for the fauna of Ethiopia. — Geographical distribution: Holarctic.

Chirothrips ah GIRAULT, 1929 — Ambo, 1 ♀ 23. Nov. First record for the fauna of Ethiopia. — Geographical distribution: Australia.

Chirothrips mexicanus D. L. CRAWFORD, 1909 — Sodere, 19 ♀ 17—18. Nov. First record for the fauna of Ethiopia. — Geographical distribution: Central and South America, South Africa, West Indies, Pacific.

Helionothrips stephaniae HOOD, 1937 — Addis Ababa 2 ♀ 13. Nov.; Lake Langano 1 ♀ 12. Oct. First record for the fauna of Ethiopia. — Geographical distribution: Central and South Africa.

Hercinothrips aethiopiae MOUND, 1966 — Akaki river, Addis Ababa, 1 ♀ 13. Nov. — Geographical distribution: Ethiopia.

Hercinothrips brunneus HOOD, 1940 — Akaki river, Addis Ababa 4 ♀ 13. Nov. First record for the fauna of Ethiopia. — Geographical distribution: South Africa.

Hydatothrips adolfifriederici KARNY, 1912 — Akaki river, Addis Ababa 1 ♂ 2 ♀ 13. Nov. First record for the fauna of Ethiopia. — Geographical distribution: South Africa.

Phibalothrips peringueyi (FAURE, 1925) — Lake Langano 1 ♀ 12. Oct. First record for the fauna of Ethiopia. — Geographical distribution: South Africa, India.

PHLAEOTHRIPIDAE

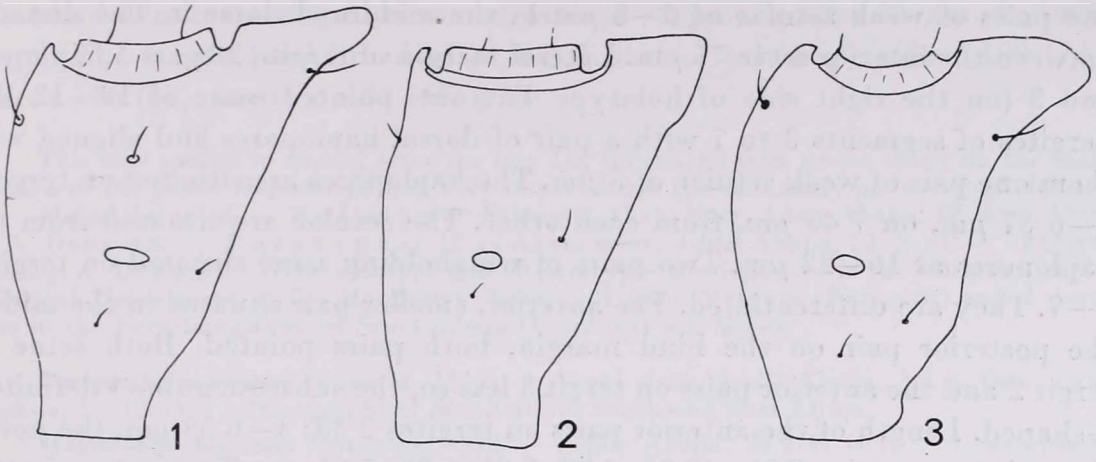
Chiridothrips fabiani sp. n.
(Figs 1—3)

D i a g n o s i s — A dark brown species of medium to large size. Length of body 2.2 mm. Antennal segment II distinctly produced at outer apex like in Chirothrips. Antennal segment III with 2, segment IV with 4 sense cones. Setae of body are transparent. Postocular seta moderately developed, 30 μm long, pointed. Antero-marginal seta of prothorax minute, scarcely perceptible, the epimeral and postero-angular setae well developed. Subbasal setae of the fore wings blunt, they are located triangularly. Accessory fringe cilia absent. Fustis short. Tube roughly as long as head.

D e s c r i p t i o n — The body almost uniformly dark brown. The legs dark brown, only apical part of fore legs and fore tarsi are yellowish brown. Antennal segment I brown, II about as dark as I in basal half, gradually becoming paler towards apex, which is greyish yellow, III and IV greyish yellow, V and VI even darker, VII and VIII grey, but paler than I. Fore wings hyaline, except for the scale and the patch in front of it, bearing the subbasal setae. The setae of body are transparent. The tube is the darkest part of the whole body becoming paler towards its apex.

Head 180 μm long and 178 μm broad. Interantennal projection 30 μm. Its lateral margins approximately parallel, slightly constricted towards the base, smooth without any stout setae. Vertex smooth without any distinct sculpture. Eyes occupy 40—43% of the sides of the head. Its lateral length 83 μm, its diameter 65 μm, rounded. Postocular setae pointed, 30 μm long, situated 25 μm far from eyes, not reaching the contour of head. The mouth cone broadly rounded. Maxillarly stylet slender. Maxillary bridge narrow, 5 μm broad, 58 μm long. Antennae rather long and slender, total length 384 μm. Length (and width) of antennal segments: I 38 (43); II 57, maximum diagonal dimension 73 μm (Fig. 1); III 50 (31.5); IV 48 (33); V 48 (28); VI 45 (23); VII 47 (21); VIII 50 (13). Sense cones formula (inner + outer) on segments: III 1 + 1; IV 2 + 2; V 1 + 1; VI 1 + 1. Length of sense cones on segments: III 16.4; IV 17; V 15; VI 12.6 μ. The shape of segments: II strongly asymmetrical drawn out to a blunt point on outer apical angle, inner side concave, outer side slightly convex, with conspicuous subapical setae, III infundibuliform base, IV approximately spherical, pedicellate at base, V and VI elongated, pedicellate at base, terminal antennal joints slender, distinctly separated.

Prothorax length 205 μm, width at anterior margin 192 μm, and at posterior margin 372 μm. Dorsum smooth, finely punctured. All setae are blunt. Length of antero-angular setae 35.3 μm, antero-marginal minute,



Figs 1—3. Antennal segment II of *Chiridothrips* species: 1 = *Ch. fabiani* sp. n., 2 = *Ch. hartwigi* FAURE and 3 = *Ch. indicus* RAMAKRISHNA AYYAR et MARGABANDHU

scarcely perceptible, 4 μm, medio-lateral very short, 12 μm, epimeral 78 μm, postero-angular 57 μm. Praepectus developed, divided, 50 μm wide, probasisternum well developed, 96 μm wide, 44 μm long, width of prospinasternum 88 μm. Pterothorax wide, 403 μm, length 370 μm. Mesonotal plate short and very broad, 254 μm wide and 99 μm long with fine polygonal reticulation on its anterior third. Near to its anterior-margin (19 μm) one pair of haplopores, distance between them 131 μm. On its lateral margin one pair of setulae of 23 μm, on the posterior margin 3 pairs of weak setulae, the distance between the interior pair 63 μm. Metanotum with fine polygonal reticulation with 3 pairs of weak setulae on the antero-angular and one pair of discal setae about 17 μm long, distance between them 84 μm. Wings fully developed, slightly narrowed at the middle. Length 920 μm, width at the basal part 118 μm, at the middle 68 μm, at apical part 87 μm. Their fringe hairs smooth, accessory fringe cilia missing. Subbasal setae blunt, arranged in a triangle. Length of basal setae: I 25 μm; II 41 μm; III 54 μm, their distance from one another: I—II 13 μm; I—III 27 μm; II—III 22 μm. Fore legs with femora enlarged, apical margin somewhat raised, tooth-like, length 186 μm, width 117 μm. Tibia length 100 μm, width at apical third 58 μm, tarsus length 73 μm, middle femora 126 μm, tibia 113 μm with one apical setae of 48 μm, tarsus 75 μm, hind femora 189 μm, tibia 163 μm with one apical setae of 58 μm, tarsus 88 μm.

Abdomen. Pelta nearly subtriangular with polygonal reticulation. Its length 100 μm and its hind margin 170 μm long. The distance between the haplopores of pelta 80 μm. Segment I bears one long, blunt lateral seta of 50 μm. Lateral margin of segment III—VII bears one short stout and pointed seta of 12—15 μm and one long and blunt seta on the posterior angle, their lengths on segments III 50; IV 63; V 70; VI 98; VII 120 μm. Tergite 2 bears

one pairs of weak setulae of 6—8 μm in the middle of dorsum. The distance between the interior setae 75 μm. Lateral margin of tergite 2 bears 1 haplopore and 3 (on the right side of holotype 4) stout, pointed setae of 10—12 μm. Tergites of segments 3 to 7 with a pair of dorsal haplopores and aligned with them one pair of weak setulae of 5 μm. The haplopores are situated on tergites 3—6 37 μm, on 7 45 μm, from each other. The setulae are situated from the haplopores at 16—22 μm. Two pairs of wingholding setae situated on tergites 2—7. They are differentiated. The anterior, smaller pair situated in the middle the posterior pair on the hind margin, both pairs pointed. Both setae on tergit 2 and the anterior pairs on tergit 3 less so, the subsequent ones definitely S-shaped. Length of the anterior pairs on tergites 2 33; 3—6 53 μm, the posterior pairs on tergite 2 50— 3 85; 4 88; 5 91; 6 88; 7 65 μm. Two pairs of setae placed on the postero-lateral angles of tergites 2—7 about half way between posterior wing-holding setae and postero-lateral angle. The length of interior pair of large conspicuous blunt setae on tergite 2 75; 3 75; 4 85; 5 85; 6 88; 7 88 μm. The length of exterior short, pointed setae on tergites 2—7 17—21 μm. On 3—7 at the middle of lateral margin one stout, pointed setae of 12 μm. Tergite 8 bears two pairs of haplopores, one of them situated at the anterior-angle of tergite, the other in the middle of the dorsum, the distance of the latter 72 μm. Six weak setulae of 10—12 μm arranged in one row in the middle of dorsum and aligned with them one pair of pointed dorso-ventral setae of 25 μm, and one pair of stigmata, at the posterior angle, one pair of long setae of 100 μm, blunt, close to the hind margin of tergite one pair of pointed setae of 38 μm, and on the lateral margin one pair of pointed setae of 25 μm. Tergite 9 bears one pair of haplopores on the dorsum, distance between them 48 μm, and between of them one pair of setulae of 10 μm, distance between latter 25 μm, 3 pairs of long, blunt setae on the posterior margin of tergite: I 88; II 100; III 113 μm, and between them 3 short pointed setulae of 12—22 μm. On sternites II—VII 16—19 accessory setulae of 7—15 μm in a regular transverse row. Two pairs of pointed setulae placed near (12—15 μm) the posterior margin. The length (and distance between them) of the interior pair of setae on sternites: II 38 (126); III 38 (132); IV 38 (150); V 62 (167); VI 68 (167); VII 62 (148) μm. The exterior pairs of setulae 10 μm long, their distance from the interior pairs 30—45 μm. Tubus length 199 μm, breadth at basal part 75 μm, at apical part 34 μm. Anal setae 137 μm long.

Two species of this genus have been known: *Ch. indicus* RAMAKRISHNA AYYAR et MARGABANDHU (1939) from India and *Ch. hartwigi* FAURE (1959) from South Africa (South Rhodesia). The new species differs from the other species of the genus inter alia by the shape of antennal segment II (Fig. 1). The second segment unambiguous but more strongly produced at outer apical angle than in both other species. The maximum diagonal dimension of antennal segment II of *fabiani* 73 μm, *indicus* 50 μm, *hartwigi* 53 μm. The length

of medio-lateral seta of prothorax of *fabiani* 12 μm, *indicus* 25 μm, *hartwigi* 37 μm. The length (and breadth) at basal part of tubus of *fabiani* 190 (73), *indicus* 176 (63), *hartwigi* 182 (68) μm.

This new species in named after the late Dr. GYULA FÁBIÁN whose study on the male genitalia of the genus *Haplothrips* was very important in the taxonomy of thysanopterology.

Material studied — Holotype: Ethiopia, Akaki river, Addis Ababa, 30. Sept. 1988. leg. A. DEMETER. — Paratypes: 12 ♀♀ Akaki river, Addis Ababa, 23. Sept. — 13. Nov. 1988. leg. A. DEMETER. — The holotype and 10 paratypes are deposited in the collection of the Zoological Department of the Hungarian Natural History Museum (Budapest) and 2 paratypes in the Forschungsinstitut Senckenberg (Frankfurt am Main).

Compsothrips reuteri (TRYBOM, 1913) — Akaki river, Addis Ababa, 3 ♀ 6. Oct.; Lake Langano, 2 ♀ 12. Oct. — Geographical distribution: South and East Africa.

Haplothrips biformis MOULTON, 1928 — Addis Ababa, 20 ♀ 6. Oct. — Geographical distribution: Ethiopia.

Haplothrips flavicinctus (KARNY, 1910) — Lake Langano, 9 ♂ 10 ♀ 12—15. Oct. First record for the fauna Ethiopia. — Geographical distribution: Mediterranean, Central Asia (Afghanistan).

Haplothrips strigae PRIESNER, 1934 — Addis Ababa, 6 ♀ 23—30. Sept.; Awash river, Awash National Park, 6 ♀ 8. Nov.; Gebre Gurache 1 ♂ 18. Oct.; Lake Hora, Debre Zeit, 2 ♀ 2. Dec.; Menagesha forest, Mount Wuchacha, 13 ♀ 3. Dec.; Sodere, 1 ♀ 17. Nov. First record for the fauna of Ethiopia. — Geographical distribution: Cameroons, Egypt, Sudan.

Liothrips laingi MOULTON, 1928 — Fiche, 1 ♀ 18. Oct.; Menagesha forest, Mount Wuchacha, 2 ♂ 5 ♀ 3. Dec. — Geographical distribution: Ethiopia.

* * *

Acknowledgements — I thank Dr. R. ZUR STRASSEN (Forschungsinstitut Senckenberg, Frankfurt am Main) for his help in the determination, his advice and for making available the paratype of *Chiridothrips* species.

REFERENCES

BAGNALL, R. S. (1913): Brief descriptions of new Thysanoptera — I. — Ann. Mag. nat. Hist. **8:** 290—291.

BHATTI, J. S. (1973): A preliminary revision of Sericothrips Haliday, sensu lat., and related genera, with a revised concept of the Tribe Sericothripini (Thysanoptera: Thripidae). — Orient. Insects. **7** (3): 403—449.

DEMETER, A. (1982): A general report on a collecting trips to Ethiopia. — Misc. zool. hung. **1:** 139—150.

FAURE, J. C. (1957): South African Thysanoptera. — 6. — J. Ent. Soc. S. Afr. **20** (1): 79—105.

FAURE, J. C. (1959): Thysanoptera of Africa — 1. — J. Ent. Soc. S. Afr. **22** (1): 201—228.

HARTWIG, E. K. (1952): Taxonomic studies of South African Thysanoptera, including genitalia, statistics and a revision of Trybom's types. — Ent. Memoirs **2** (11): 341—499.

JACOT-GUILLARMOD, C. F. (1971): Catalogue of the Thysanoptera of the World. Part. 2. — Ann. Cape Prov. Mus. (Nat. Hist.) **7:** 217—515.

JACOT-GUILLARMOD, C. F. (1974): Catalogue of the Thysanoptera of the World. Part 3. — Ann. Cape Prov. Mus. (Nat. Hist.) **7:** 517—976.

JENSER, G. (1984): Data to the Thysanoptera fauna of Afghanistan. — Folia ent. hung. **45** (2): 105—108.

MORISON, G. D. (1958): Thysanoptera from South-West Arabia and Ethiopia. — J. Linn. Soc. Zool. 1956—58. **43:** 587—598.

MOULTON, D. (1928): Thysanoptera from Abyssinia. — Ann. Mag. nat. Hist. **10** (2): 227—248.

MOUND, L. A. (1965): The genus Hercinothrips (Thysanoptera) with one new species. — Ann. Mag. nat. Hist. Ser 13. **8:** 243—247.

PELIKÁN, J. (1984): Thysanopteren aus der Mongolei, III. — Annls hist.—nat. Mus. natn. Hung. **76:** 109—128.

PRIESNER, H. (1950): Further studies in Haplothrips and allied Genera. — Bull. Soc. Fouad Ier Entom. **34:** 69—120.

PRIESNER, H. (1960): A monograph of the Thysanoptera on the Egyptian deserts. Publication de l'Institut du Desert d'Egypte. No. 13. El Matria Cairo. pp. 549.

RAMAKRISHNA AYYAR, T. V. & MARGABANDHU, V. (1939): Notes on new and known Indian Thysanoptera. — Rec. Indian Mus. **41:** 21—33.

STRASSEN, R. ZUR (1967): Studies on the genus Chirothrips Haliday (Thysanoptera: Thripidae) with descriptions of new species. — J. Ent. Soc. S. Afr. **29:** 23—43.

STRASSEN, R. zur (1970): Eine neue Liothrips-Art aus Aethiopien (Thytanoptera). — Bull. l'I.F.A.N. Ser. A. **32** (3): 824—831.

Acta Zoologica Hungarica 35 (3—4), pp. 211—220 (1989)

ADDENDA TO THE MILLIPEDE FAUNA OF VIETNAM (DIPLOPODA)*

Z. Korsós and S. I. Golovatch

Zoological Department, Hungarian Natural History Museum
H-1088 Budapest, Baross utca 13, Hungary
A. N. Severtzov Institute of Evolutionary Ecology and Animal Ecology,
Leninsky prospect 33, 117071 Moscow, USSR

(Received 16 December, 1988)

A new genus, *Paratylopus* gen. n., and three new species, *Tylopus tamdaoensis* sp. n., *Paratylopus strongylosomoides* sp. n. and *Vaulogerodesmus mahunkai* sp. n., are described from recent Vietnamese collectings. Records of other species are also included from further samples. With 14 original figures.

The Vietnamese millipede fauna is certainly far from well-known, judging alone from Golovatch's (1983a) catalogue of the Diplopoda of Vietnam. No wonder that practically any representative collection of diplopods from this country contains new and poorly-known taxa. The recent trips of Mahunka & Oláh (1986) and Mészáros, Oláh & Vásárhelyi (1987) have turned out to be no exception. Therefore, with the aim of determining part of their material, as well as several additional samples kept at the Hungarian Natural History Museum, Budapest (HNHM), the Institute of Zoology, Warszawa (IZW), and the Zoological Museum, Copenhagen (ZMUC), we are privileged to put on record not only certain unpublished novelties concerning the millipede fauna of Vietnam, but also a genus and three species new to science.

Material treated herein is shared among the collections of the Zoological Department of the HNHM, ZMUC, Zoological Museum of the Moscow State University, Moscow (ZMMU), IZW, and Senckenberg Museum, Frankfurt/M (SMF).

GLOMERIDA

Peplomeris magna Golovatch, 1983 — Localities: Vietnam, Prov. Ninh binh, Cuc phuong, forest clearing, 18. May 1980, (No. 311), leg. G. Topál, 1 ♂, 1 ♀ (HNHM), 1 ♂ (ZMMU), — Same locality, 2—7. June 1966, leg. R. Bielawski et B. Pisarski, 2 ♂♂, 1 ♀ (IZW 52/66). — Remarks: This species has been described from Cuc phuong Reserve in Vietnam (Golovatch 1983b), the only lowland patch of primary rain forest in the entire northern part of Vietnam preserved up to now. The topotypes at hand agree very well with the original description, though sometimes the background coloration is a bit darker, rusty brown.

* Hungarian zoological studies in Vietnam, No. 12.

POLYDESMIDA

Paradoxosomatidae

Helicorthomorpha holstii (POCOCK, 1895) — Localities: Vietnam, Prov. Ninh binh, Cuc phuong, forest clearing, 5. May 1966, (No. 252), leg. G. TOPÁL, 1 ♂ (HNHM). — Same locality, 18. May 1980, (No. 311), leg. G. TOPÁL, 1 ♂ (HNHM). — Vietnam, Cat ba Island, Ang soi, 2 m a.s.l., 15. May 1987, (No. 152), leg. I. MATSKÁSI, J. OLÁH et G. TOPÁL, 1 ♂, 2 juv. (HNHM). — Remarks: This species is known to be widespread in Southeast Asia, in Vietnam in particular (GOLOVATCH 1983a, 1984), being probably associated with human activities.

Szechuanella grandis GOLOVATCH, 1984 — Localities: Vietnam, Prov. Ninh binh, Cuc phuong, 18. May 1966, (No. 386), leg. G. TOPÁL, 1 ♂ (HNHM). — Same locality, 2. Jun. 1966, leg. R. BIELAWSKI et B. PISARSKI, ♂♂ and ♀♀ (IZW 52/66). — Remarks: This species has been described from Cuc phuong Reserve (GOLOVATCH 1984). New topotypical material agrees well with the original description.

Vietnamorpha spiralis GOLOVATCH, 1984 — Locality: Vietnam, Prov. Ninh binh, Cuc phuong, 2—11. Jun. 1966, leg. R. BIELAWSKI et B. PISARSKI, 3 ♂♂ (IZW 52/66). — Remarks: This species has been described from Cuc phuong Reserve (GOLOVATCH 1984). New topotypical material agrees well with the original description.

Tylopus hilaroides GOLOVATCH, 1984 — Locality: Vietnam, Prov. Ninh binh, Cuc phuong, 400 m, 17. Oct. 1986, (No. 66), leg. F. MÉSZÁROS, J. OLÁH et T. VÁSÁRHELYI, 1 ♂ and 2 ♀♀ (HNHM). — Remarks: This species has been described from Cuc phuong Reserve (GOLOVATCH 1984). New topotypical material agrees well with the original description.

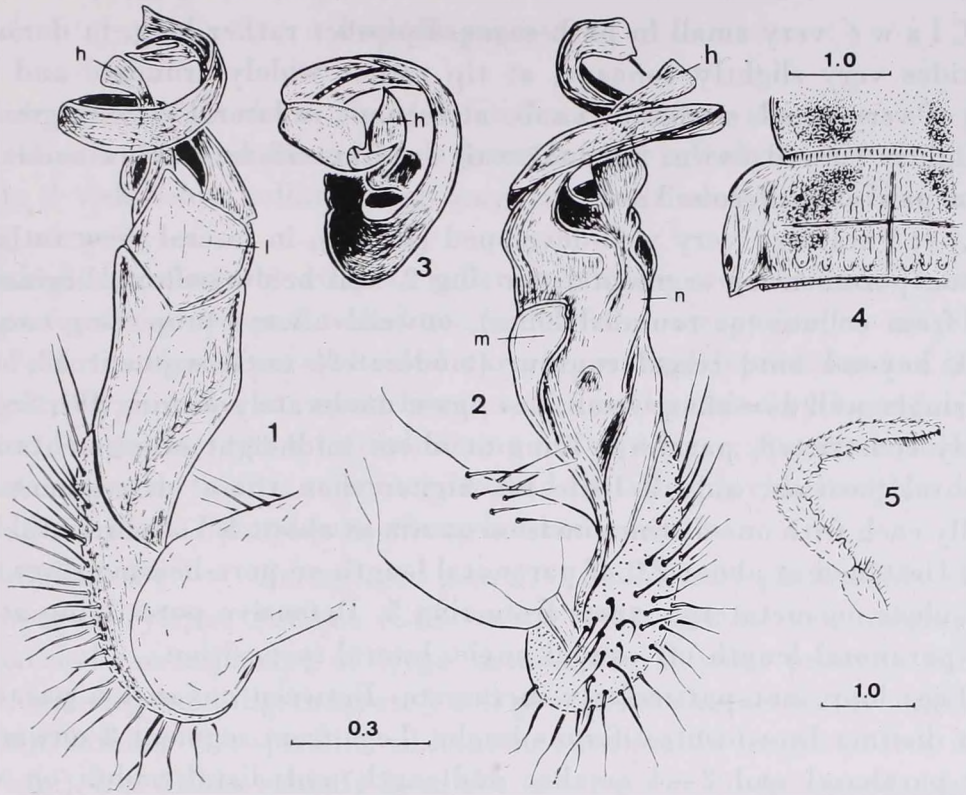
Tylopus tamdaoensis sp. n.
(Figs 1—5)

Localities: Vietnam, Prov. Vinh phu, Tam dao, N from the village, singling from under stones and barks, 21. Jan. 1986. (No. 27), leg. S. MAHUNKA et J. OLÁH, 9 ♂♂ (including holotype), 5 ♀♀. — Same locality, from under stones, 20. Jan. 1986. (No. 19), leg. S. MAHUNKA et J. OLÁH, 3 ♂♂, 1 ♀. — Same locality, ca. 800—1200 m, subtropical rain forest, 12—22 Apr. 1986, leg. S. I. GOLOVATCH et L. MEDVEDEV, 2 ♂♂, 1 ♀. — Material examined: 21 specimens.

Holotype male, 8 male and 5 female paratypes are deposited in the HNHM, 3 ♂♂ and 2 ♀♀ paratypes in ZMMU, 1 ♂ paratype in ZMUC and 1 ♂ paratype in SMF.

Diagnosis — The new species is undoubtedly another member of the *nodulipes*-group of *Tylopus*, recently defined by GOLOVATCH (1984). It seems to be especially closely related to both *T. crassipes* GOLOVATCH, 1984 and *T. nodulipes* (ATTEMS, 1953) also known from Vietnam, but clearly differs from both of them by the peculiar pattern of noduli on the male legs, conspicuous shape of the gonopod tibiotarsus, and some other particulars of gonopod structure (GOLOVATCH 1984).

Description — Length (♂) 27—29, (♀) 31—35 mm, width on midbody pro- and metazona 2.0—2.3 (♂), 3.0—3.5 (♀) and 3.1—3.3 (♂), 3.6—4.1 (♀) mm, respectively. — Coloration from dark to pale brownish, cream to dark marble brown with darker brownish-marble head, collum, pairs of paramedian spots on both pro- and metazona declining slightly toward telson, and sides beneath paranota. Isthmus dividing antennal sockets, tip of antennae (distal half of or entire joint 6 and basal half of joint 7) especially dark



Figs 1—5. *Tylopus tamdaoensis* sp. n.: 1—2 = left gonopod of holotype, lateral and medial views, respectively, 3 = end of tibiotarsus, ventral view, 4 = dorsal view of 7th segment, 5 = 26th leg. — Scales in mm

brown. Legs, ventrum and paranota whitish. Femora and tarsi of particularly colored males can be pale marble-brownish.

H e a d considerably narrower than collum or midbody segments, collum a bit narrower than 2nd ring (subequal to 5th), both rings 3 and 4 subequal in width, from ring 6 body parallel-sided until segment 16, from ring 17 gently and gradually tapering toward telson. A n t e n n a e rather long and slender, slightly clavate, in situ almost reaching end of ring 2.

Bases of m e t a t e r g a l s e t a e as paler dots, on collum 4+4 and 2+2 in two arched rows, on rings 2—4 as 2+2 and 2+2 (3+3), on subsequent terga 2+2 and 3+3 (divided by sulcus) until ring 16, with anterior row little by little disappearing and posterior row situated on increasingly oblong knobs, on rings 17—19 already no traces of anterior row and 4+4 or 5+5 oblong knobs of posterior row. Setae rather long and simple, about a quarter to third of metatergal length, mostly missing. Metaterga rather finely rugose. Axial line noticeable already from collum. Proterga and sides finely punctured, suture dividing pro- and metazona deeply longitudinally striate. Pleural keels present from ring 2 (minute there), always with a small caudal beak, onward declining to come to naught until segments 13—14, still onward only as a minute swelling or knob until segment 16.

Claws very small in both sexes. Epiproct rather long, in dorsal view with sides very slightly concave, at tip rather widely truncate and carries a pair of very small, setiferous knobs at corners, in lateral view finger-shaped and slightly curved down. Subanal scale subtrapeziform, with a caudal paramedian pair of setiferous knobs.

♂♂: Paraterga very well-developed (Fig. 4), in lateral view rather thin (even on pore-bearing segments), on ring 2 well below collum, beginning already from collum (as rounded lobes), onward always projecting caudad as a beak beyond hind tergal contour (moderately until segment 13, onward increasingly well as a sharp beak, but again moderately on ring 19). Segments strongly constricted, paraterga lying at about midheight of segments in subhorizontal position, only a little bit higher than those on segments 5—9, laterally each with one distinct incision at rim at about 1/3 of paranotal length, a little flattened at about 2/3 of paranotal length on pore-bearing rings. Transverse sulcus on metaterga starts from ring 5. Defensive pores lying at about 1/3 of paranotal length off caudal angle, lateral in position.

Legs long, not particularly incrassate. Between coxae 4 a paramedian pair of distinct brownish setiferous knobs. Legs from segment 8 onward with bigger parabasal and 2—4 smaller midlength and distal noduli on ventral side of femora, one on postfemora, 1—2 on tibiae, and one parabasal on tarsi. This pattern goes until segment 17, completely declining on 18th. On hindmost noduligerous legs prefemur may also carry one small nodulus. Tarsal brushes present (Fig. 5).

Gonopods (Figs 1—3) rather complex. Coxite rather long, subcylindrical, with a group of setae on ventral side. Telopodite suberect, stout. Prefemoral part densely setose, well-demarcated from acropodite. Femorite with slight evidence of torsion and several depressions, more or less parallel-sided, well-demarcated from postfemoral part by a sulcus, from inner side with a characteristic lobe "m", whereas swelling "n" is highly inconspicuous. Postfemoral part with a distinct lateral lamina "l", a tortiled and high, membranous process "h", and a spiralled, membranous, relatively long, distinctly bifid tibiotarsus sheathing a free solenomerite of subequal length. Seminal groove runs entirely along medial side of telopodite.

♀♀: Paranota less developed, sloping down as if continuing the convex outline of dorsum. Paranota lying within tergal contour on collum and segments 5—14, onwards only very modestly projecting caudad beak-like beyond the contour.

Legs more slender, pleural keels less developed, on 8—9th segments already hardly traceable, as a minute beak only on rings 3—5. Legs and sterna without modifications.

Paratylopus gen. n.

Sulciferini of medium size (about 2 cm long), with relatively poorly developed paranota and pleural keels (even in male). Body highly moniliform. Paranota 2 well below collum. Legs long, in male noduligerous, first leg-pair without adenostyles.

Gonopods relatively simple, suberect, rather stout. Coxite relatively short; prefemur setose and well-demarcated from acropodite by an oblique suture. Femorite almost parallel-sided, carrying several depressions and seminal groove entirely mesally; sat apart from postfemoral portion by a good, oblique cingulum. Postfemur with a lateral lamina "l" and large, spiralled tibiotarsus subequal in length to free solenomerite and distally provided with a lobule.

Type-species: *Paratylopus strongylosomoides* sp. n.

R e m a r k s — *Paratylopus* gen. n. is doubtlessly particularly close to the sympatric *Tylopus* JEEKEL (GOLOVATCH 1984 and above), judging from both external (arrangement of tergal setae, pleural keels present, paranota distinct, male legs noduligerous, etc.) and gonopodal characters (general shape, presence of lamina "l", spiralled tibiotarsus subequal in length to free solenomerite, etc.), but differs sharply from the latter genus in the considerably less developed paranota and pleural keels, complete absence of any distinct gonopostfemoral processes, and underdeveloped inner gonofemoral lamina "m".

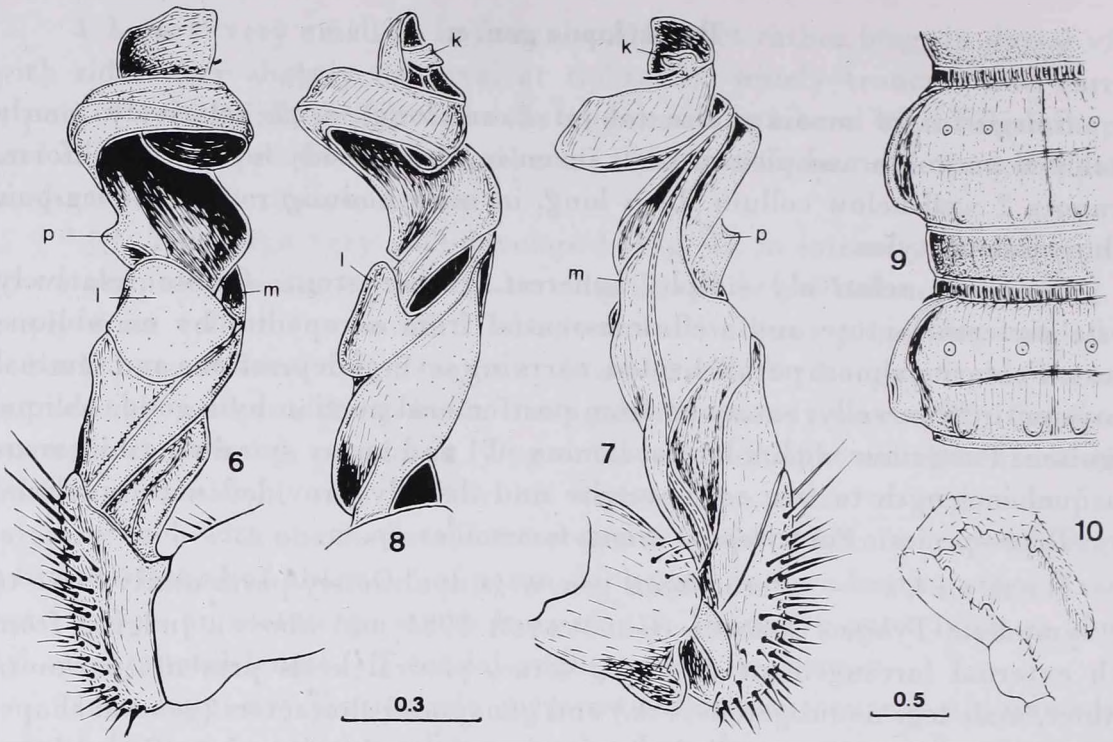
Paratylopus strongylosomoides sp. n.
(Figs 6—10)

L o c a l i t y: Vietnam, Prov. Vinh phu, Tam dao, N of the village, singling from under stones and barks, 21. Jan. 1986. (No. 27), leg. S. MAHUNKA et J. OLÁH, 1 ♂ (holotype). Material examined: 1 specimen. — H o l o t y p e: the above specimen, deposited in the Zool. Dept. of the HNHM.

D e s c r i p t i o n — Length ca. 21 mm, width of midbody pro- and metazona 1.9 and 2.2 mm, respectively. — C o l o r a t i o n uniformly brownish, darker brown sutures dividing pro- and metazona, and joints 5—6 of antennae, paler legs (whitish, except for tarsi which are very pale brownish). Antennae in situ reaching to end of segment 3, long, slender, slightly clavate.

H e a d subequal to collum, both a bit narrower than segment 2 and subequal to segments 3—4, but again a bit narrower than segment 5, from where the highly moniliform body becoming parallel-sided until segment 17, onward very moderately and gently tapering.

P a r a t e r g a very moderately developed (Fig. 9), beginning already from collum, generally subhorizontal except for segments 2—4, on 2nd segment especially well oblique and situated far below collum, set rather low (at about midheight of metasoma), thinly rimmed on poreless segments, much more



Figs 6—10. *Paratylopus strongylosomoides* gen. et sp. n.: 6—8 = left gonopod of holotype, lateral, medial and dorsal views, respectively, 9 = dorsal view of 6th and 7th segments, 10 = 10th leg. — Scales in mm

thickly rimmed on pore-bearing rings, without any lateral incisions, roundly outlined in dorsal view, lying always within hind tergal contour, never projecting beak-like beyond it except for segments 18—19, where projecting a bit in the form of poor knobs; caudal angle usually rounded, obtuse. Pores large, lying dorso-laterally, situated at 1/4 to 1/5 of paranotal length off caudal angle. Transverse sulcus on metaterga traceable already on ring 2, particularly well-developed from ring 5. Tergal setae missing, traceable only as poor knobs arranged in two usual rows of 2+2 and 2+2 at least from tergum 3 (possibly even from tergum 2) until segment 8, onward until 16th ring as 2+2 and 3+3, with knobs of anterior row gradually reducing almost to naught, and knobs of posterior row becoming increasingly evident and oblong, on segments 17—18 already 4+4 knobs in posterior row. Tergal surface relatively smooth (except for the setiferous knobs), finely shagreened, rather shining. Axial line evident on collum and subsequent metazona. Pleural keels very poorly developed, starting from ring 4, never beak-shaped, gradually coming to naught until segment 7, onward almost (on segment 8) or entirely (on subsequent rings) missing even as swellings. Epiproct relatively short, in dorsal view conical, with straight sides, apically rather broadly truncate, devoid of any knobs, in lateral view finger-shaped and straight. Subanal scale subtrapeziform, rounded.

Between leg-pair 4 a high, subquadrate, setose lamina with a paramedian pair of tooth-shaped noduli behind it. — Legs very long, distinctly incrassate, gradually growing in length and slendering toward telson, claws rather short, tarsal brushes present, from leg-pair 5 with distinct noduli: one bigger parabasal and one smaller distal on femur, one paramedial on postfemur, from leg-pair 6 same pattern but also one parabasal nodulus on tibia and tarsus each until leg-pairs of segment 14; from 15th ring noduli decrease so that on 17th and particularly on 18th almost entirely missing (Fig. 10).

Gonopods (Figs 6—8) not too complicated. Coxite relatively short, subcylindrical, with a ventral group of setae and inner cannula. Telopodite suberect, rather stout. Prefemoral portion heavily setose, well-demarcated from acropodite. Femorite with slight evidence of torsion and several oblique depressions, more or less parallel-sided, well-demarcated by an oblique sulcus from postfemoral portion, from inner side with vestigial "m". Postfemoral part with a distinct lateral lobe "l", without any processes. Tibiotarsus very well spiralled, membranous, parabasally with a ventral projection "p", sheathing entirely free solenomerite with lamina medialis and lamina lateralis, both (especially l.l.) well-developed. Lamina lateralis subequal in length to solenomerite, distally carrying a conspicuous lobule "k".

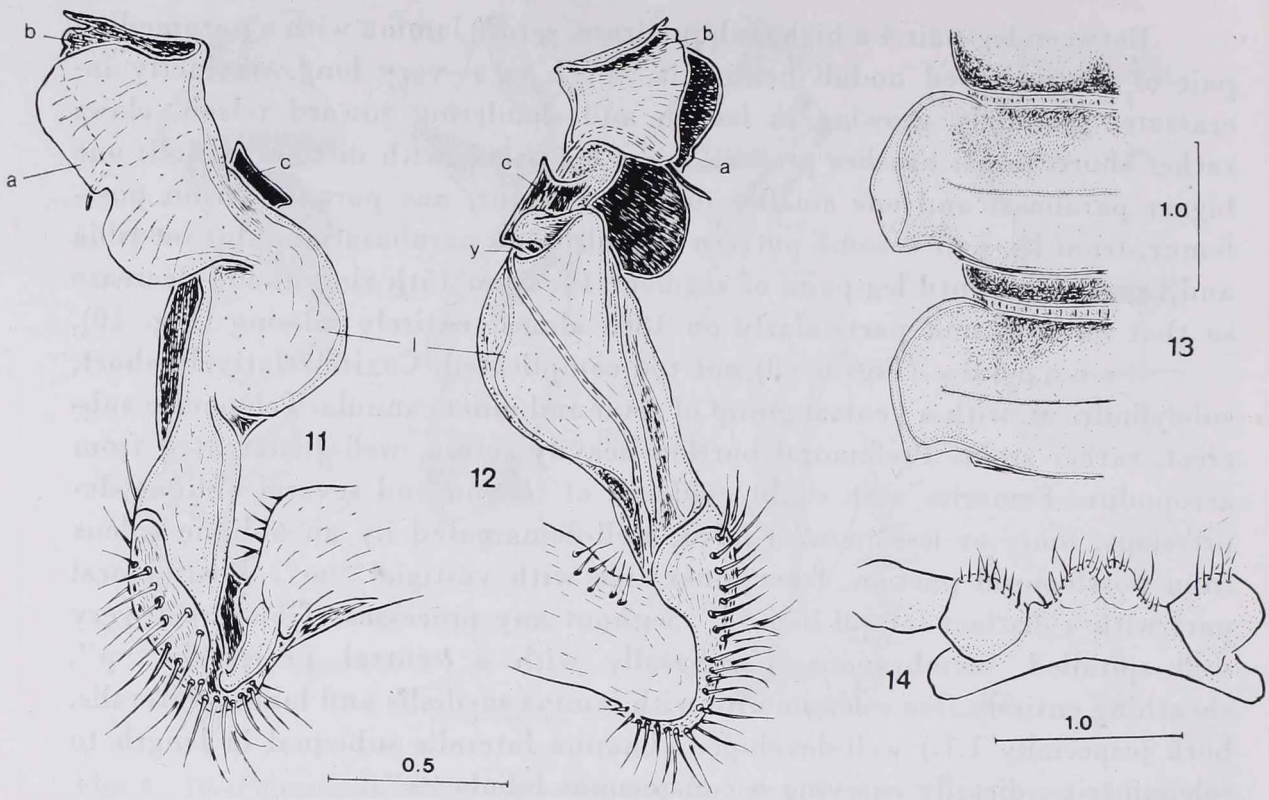
Vaulogerodesmus mahunkai sp. n.
(Figs 11—14)

Localities: Vietnam, Prov. Vinh phu, Tam dao, singling from under stones, 20. Jan. 1986. (No. 19), leg. S. MAHUNKA et J. OLÁH, 3 ♂♂ (including holotype) and 4 ♀♀. — Same locality, N of the village, singling from under stones and barks, 21. Jan. 1986. (No. 27), leg. S. MAHUNKA et J. OLÁH, 1 ♀. — Same locality, 800—1200 m. subtropical rain forest, 12—22. Apr. 1986., leg. S. I. GOLOVATCH, 5 ♂♂ and 2 ♀♀. — Vietnam, Prov. Ninh binh, Cuc phuong, 400 m, 18. Oct. 1986. (No. 71), leg. F. MÉSZÁROS, J. OLÁH et T. VÁSÁRHELYI, 1 ♂ and 1 ♀. — Material examined: 17 specimens.

Holotype male, 3 male and 5 female paratypes are deposited in the HNHM, 3 ♂♂ and 2 ♀♀ in ZMMU, 1♂ and 1 ♀ paratypes in ZMUC, and 1 ♂ paratype in SMF.

Diagnosis — The new species is generally similar to both hitherto known species of *Vaulogerodesmus*, *pictus* BRÖLEMANN, 1916 and *dawydoffiae* (ATTEMS, 1953). It differs from both of them in the particularly well-developed gonopod tibiotarsus, especially the proximal and distal lobes of lamina medialis. The shape of lamina lateralis is very similar to the other two species. *Vaulogerodesmus pictus* has been described from North Vietnam but its size is considerably smaller; *V. dawydoffiae* is known from the central part of South Vietnam, but its gonopod femur is parallel-sided and the sternum of the 5th segment is provided with two apically notched processes (ATTEMS 1953 and HOFFMAN 1973).

Description — Length (♂) 37—40, (♀) 41—48 mm, width on midbody pro- and metazona 2.7—3.0 (♂), 3.7—4.1 (♀) and 3.9—4.1 (♂), 4.7—5.0



Figs 11—14. *Vaulogerodesmus mahunkai* sp. n.: 11—12 = right gonopod of holotype, medial and lateral views, 13 = dorsal view of 7th and 8th segments of a paratype male from Tam dao, 14 = sternite of holotype between leg-pair 4, anterior view. — Scales in mm

(♀) mm, respectively. — Coloration cream to dark brown with blackish-brown head, pairs of paramedian spots on each metazonite from 4th or 5th onwards, and sides of prozonite. Anterior half of collum, tip of antennae (distal half of joint 6 and proximal half of joint 7), posterior half of each prozonite and anterior half of each metazonite from 4th or 5th onwards especially dark brown. Median spots on metazona, legs, ventrum and paranota light yellowish or whitish.

Head considerably narrower than collum or midbody segments, 2nd ring a bit broader than collum and subequal to ring 5, both rings 3 and 4 subequal in width, from ring 6 body parallel-sided until segment 16, from ring 17 gradually tapering toward telson. — Antennae long and strong, slightly clavate.

Metaterga without setae, smooth and dull (Fig. 13); longitudinal axial line noticeable already from collum, clearly visible from ring 4 onwards on both pro- and metazona; metaterga with deep transversal sulcus starting from ring 4 but strong only from ring 5; suture dividing pro- and metazona deeply longitudinally striate. Paraterga well-developed, on ring 2 well below collum, gradually rising on rings 3 to 5, onwards lying in horizontal position at about midheight of segments in lateral view, projecting caudad as a weak

beak only, usually not surpassing hind tergal contour, always lacking any lateral incision. On pore-bearing segments paraterga laterally flattened, defensive pores at about 1/3 of paranotal length off caudal angle.

Legs long, strong tarsal brushes present, claws very small in both sexes. Epiproct relatively short, in dorsal view with sides slightly concave, at tip rather widely truncate with two setae, carrying a pair of very small and usually setiferous knobs at corners, in lateral view slightly curved down, with a weak concavity ventrally. Anal valves with 2+2 setae, subanal plate subtriangular, with 2 setae.

♂♂: Antennae long, in situ reaching to metazonite of ring 3. Pleural keels very small, visible on segments 2—7, with small caudal beak, coming to naught onwards. Sternite of ring 5 with two small paramedian setiferous knobs (Fig. 14).

Gonopods not too complicated (Figs 11—12). Coxite rather thick and short, with several setae on ventral side. Prefemur densely setose, well-demarcated from acropodite. Femorite stout, flattened, with a clear torsion and with broad dorsal lobe (1). Postfemoral part well-demarcated from the femur on lateral side by a strong sulcus ("y", following BRÖLEMANN's [1916] designations), with a distinct and characteristic lamina lateralis (c). Solenomerite free, sheathed from one side by a large, broad, slightly divided proximal lobe (a) of lamina medialis, from the other side by a smaller distal lobe (b) of lamina medialis, this latter with a small additional pointed lamella, laterally leaning out. Seminal groove starts on mesal side, immediately at the base of femorite turning laterally, then going entirely on lateral side, obliquely to anterior face of tibiotarsus.

♀♀: Antennae shorter than those of males, in situ just reaching to ring 3. Paraterga a little but not markedly less developed, pleural keels hardly traceable, only on rings 2 and 3, as a very small swelling or naught on ring 4 and onwards. Sternite of 5th segment without any modification.

* * *

Acknowledgements — We are indebted to Dr. S. MAHUNKA for his help during preparation of the manuscript. Thanks are due to G. TOPÁL for providing information about Vietnamese localities and to H. ENGHOFF for making possible to include several new records in the present paper. Main part of the research was carried out through scientific agreement between the Soviet and Hungarian Academy of Sciences.

REFERENCES

ATTEMS, C. (1953): Myriopoden von Indochina. Expedition von C. Dawydoff (1938—1939). — Mém. Mus. natn. Hist. nat. Paris (n. s.), **5A**: 133—230.

BRÖLEMANN, H. W. (1916): Essai de classification des polydesmiens (myriapodes). — Ann. Soc. ent. France, **84**: 523—608.

GOLOVATCH, S. I. (1983a): Millipedes (Diplopoda) of the fauna of Vietnam. — In: Fauna and Animal Ecology of Vietnam. Moscow, „Nauka" Publ., pp. 178—186 (in Russian).

GOLOVATCH, S. I. (1983b): On several new Glomeridae (Diplopoda) from Indochina. — Annls hist.-nat. Mus. natn. hung., **75:** 107—116.

GOLOVATCH, S. I. (1984): Contributions to the millipede fauna of Vietnam (Diplopoda) II. — Acta zool. hung., **30:** 53—77.

HOFFMAN, R. L. (1973): Descriptions and allocation of new or poorly known genera and species of Paradoxosomatidae from south-eastern Asia (Diplopoda: Polydesmida). — J. nat. Hist., **7:** 361—389.

MAHUNKA, S. & J. OLÁH (1986): Hungarian zoological studies in Vietnam 1. The outline of the research programme and the report of the first collecting trip in 1986. — Folia ent. hung., **47:** 103—107.

MÉSZÁROS, F., J. OLÁH & T. VÁSÁRHELYI (1987): Report on a collecting trip to Vietnam in 1986. — Folia ent. hung., **48:** 265—269.

Acta Zoologica Hungarica 35 (3—4), pp. 221—234 (1989)

SOME STEGANACARUS EWING, 1917 SPECIES (ACARI: ORIBATIDA) FROM TURKEY

S. MAHUNKA and L. MIKO

Zoological Department, Hungarian Natural History Museum, H-1088 Budapest, Baross utca 13, Hungary

Slovak Academy of Sciences, Centre of Biological-Ecological Sciences, branch for Ecology of Agricultural landscape, 04000 Kosice, Kukorelliho 10, Czechoslovakia

(Received 1 December, 1988)

Description and redescription of ptychoid Oribatid species from Turkey are given. Three species, *Steganacarus barborae* sp. n., *Steganacarus danae* sp. n. and *Steganacarus lazitanicus* sp. n., are new to science. One other species, *Steganacarus punctulatus* SERGIENKO, 1985, is also studied and discussed. With 36 original figures.

In the course of study of some soil samples collected by DR. L. MIKO in Turkey, it appeared that they were very rich in ptychoid Oribatids. The large number of *Steganacarus* EWING, 1917 species was also surprising. We have elaborated this material and in this paper we give the description of four species, three of which being new to science and the fourth one known so far only from the Ukraine. This material was collected in the mountain chain Kuzey Anadolu Daglari, north of Anatolia. The altitude of the mountain (4000 m above sea level) permits the recognition of a very clear zonal system (from the sea level with an evergreen oak forest to the subalpine, alpine zones).

The exact locality data are given below. Under the specific descriptions we only give the respective numbers referring to any one sample except the locality of the holotype.

LIST OF LOCALITIES

Nos 5—6. Turkey, Kackar Daglari, Siedlung Kovrun, cca 1900 m, 2. VII. 1987. — Samples from wet litter with underlying soil from *Rhododendron luteum* (above the timberline), leg. L. MIKO.

No. 17. Turkey, Kackar Daglari, Siedlung Kovrun, cca 1800 m, 2. VII. 1987. — Sample from wet litter, moss pads and lichens with underlying soil in a coniferous forest (mostly *Picea orientalis*), leg. L. MIKO.

No. 21. Turkey, Kackar Daglari, Village Ayder, cca 1000 m, 1. VII. 1987. — Sample from litter and soil from a mixed forest *(Picea orientalis* and *Fagus orientalis)*, leg. L. MIKO.

Nos 22—23. Turkey. Kackar Daglari, Village Ayder, cca 1200 m, 1. VII. 1987. — Samples from wet litter with underlying soil in a coniferous forest (mostly *Picea orientalis*), leg. L. MIKO.

Steganacarus barborae sp. n.
(Figs 1—9)

Measurements — Length of aspis: 230 (280) 325 μm, length of notogaster: 406 (580) 663 μm, height of notogaster: 228 (328) 436 μm.

A s p i s : Median crista present, but only scarcely protruding from the outline in lateral view (Fig. 1). Lateral carina not observable, lateral rim well developed. Anterior and median surface ornamented by large alveoli, while posteriorly the sculpture consisting of longitudinal ridges (Fig. 8). Prodorsal setae — with the exception of the exobothridial one — thick, well spiculate or ciliate, setae in: 108(148)173 μm, they are about twice the length of setae *le*, characteristically bent to the dorsal surface (Fig. 1). Sensillus long, slender, many times curving and bearing some spicules on its distal end.

N o t o g a s t e r : Surface coarsely alveolate. All fifteen pairs of notogastral setae being of the same shape, erect, thick, their distal end well spinose, or spiculate (Fig. 4) but of variable length, the longest h_1 and ps_1: 103(136) 155 μm, the shortest ps_4: 48(70)80 μm. Setae c_1 and c_3 originating on collar line, c_2 far from it. The insertion of the vestigial setae (f_1, f_2) and two pairs of lyrifissure (*ia*, *im*) observable.

V e n t r a l r e g i o n : Nine pairs of genital setae arranged in two rows, all slightly blunt at tip and approximately equal in length (Fig. 3). On the ano-adanal plates arising four pairs of long (x) and one pair (ad_3) of short setae. The four pairs on the inner margin decreasing in length from the x_1 to the x_4 pairs. All well observable, spiculate or roughened (Fig. 2).

G n a t h o s o m a : It has the typical form; palpal setal formula: 2—2—7+1.

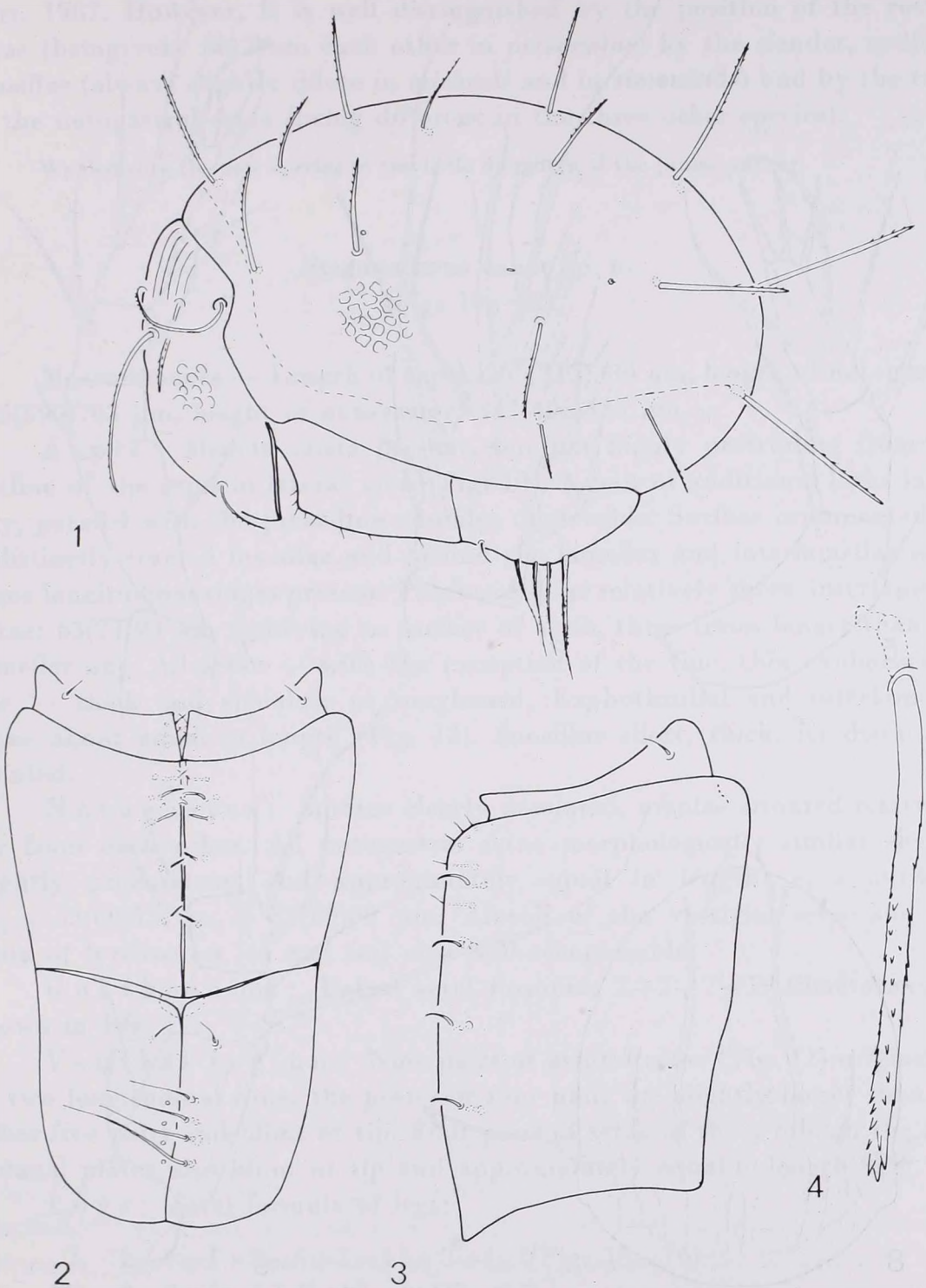
L e g s : All legs with the typical setal formulae:

I. 1—4—2+2—5+1—17+3—1 (Figs 6, 9)
IV. 2—2—1—2+1—10—1 (Fig. 7)

Teeth on inner surface of claws not conspicuously large. Seta *d* on genu 1 and tibia 1 are hardly observable.

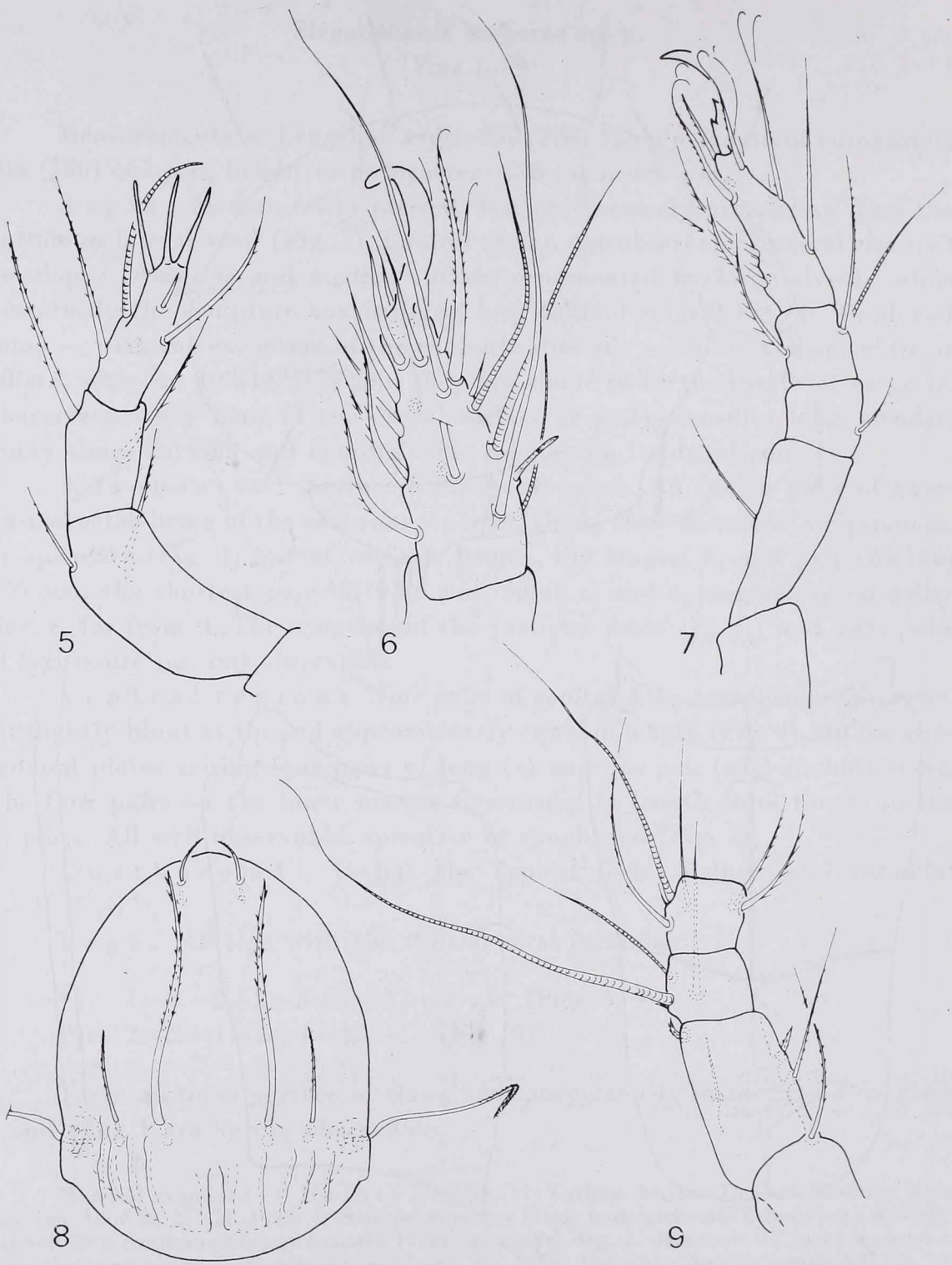
Material examined — H o l o t y p e: No. 17: Turkey, Kackar Daglari, Siedlung Kovrun, cca. 1800 m. 2. VII. 1987. — Sample from wet litter, moss pads and lichens with underlying soil in a coniferous forest (mostly Picea orientalis), leg. L. MIKO. — 12 p a r a t y p e s: from the same sample; other paratypes from: No. 5—6; 1 sample: No. 22: 4 samples; No. 23: 10 samples. — Holotype (1353-HO-89) and 7 paratypes (1353—PO—89): deposited in the HNHM,* 19 paratypes in the CLM,** 1 paratype in the MHNG.***

* Hungarian Natural History Museum, Budapest, with identification number of the specimens in the Collection of Arachnida.
** In the collection of the junior author: L. MIKO.
*** Museum d'Histoire naturelle, Genève.



Figs 1—4. *Steganacarus barborae* sp. n.: 1 = lateral view, 2 = anogenital region, 3 = genital plate, 4 = seta c_1

R e m a r k s : The new species is well characterized by the long and curved sensillus, by the ano-adanal setae, gradually decreasing length anteriorly, and especially by the long, rigid, but characteristically recurved, inter-



Figs 5—9. *Steganacarus barborae* sp. n.: 5 = palp, 6 = tarsus of leg 1, 7 = leg 4, 8 = aspis from dorsal view, 9 = basal part of leg 1

lamellar setae. Based upon these characters the species belongs to the "magnus-species group". It is close to *Steganacarus personatus* NIEDBALA, 1983, *S. michaeli* BERNINI et AVANZATI, 1987 and *S. simonettae* BERNINI et AVAN-

ZATI, 1987. However, it is well distinguished by the position of the rostral setae (being very far from each other in *personatus*) by the slender, setiform sensillus (always slightly dilate in *michaeli* and in *simonettae*) and by the ratio of the notogastral setae (being different in the three other species).

We dedicate the new species to the little daughter of the junior author.

Steganacarus danae sp. n.
(Figs 10—22)

Measurements — Length of aspis: 265(315)380 μm, length of notogaster: 485(590)703 μm, height of notogaster: 347(406)525 μm.

A s p i s : Median crista present, but not highly protruding from the outline of the aspis in lateral view (Fig. 10). A pair of additional laths laterally, parallel with the preceding one also observable. Surface ornamented by indistinctly framed foveolae and behind the lamellar and interlamellar setae some longitudinal ridges present. Prodorsal setae relatively short, interlamellar setae: 63(77)93 μm recurving to surface of aspis, three times longer than the lamellar one. All setae — with the exception of the fine, thin exobothridial one — thick and spiculose or roughened. Exobothridial and interlamellar setae about equal in length (Fig. 13). Sensillus short, thick, its distal end pointed.

N o t o g a s t e r : Surface clearly areolated, areolae situated relatively far from each other. All notogastral setae morphologically similar slender slightly procumbent and approximately equal in length: $c_1 = 53(64)75$, $ps_1 = 53(60)73$, $ps_4 = 55(60)68$ μm. Alveoli of the vestigial setae and two pairs of lyrifissures (*ia* and *im*) also well recognizable.

G n a t h o s o m a : Palpal setal formula: 2—2—7+1. Chaetotaxy as shown in Fig. 17.

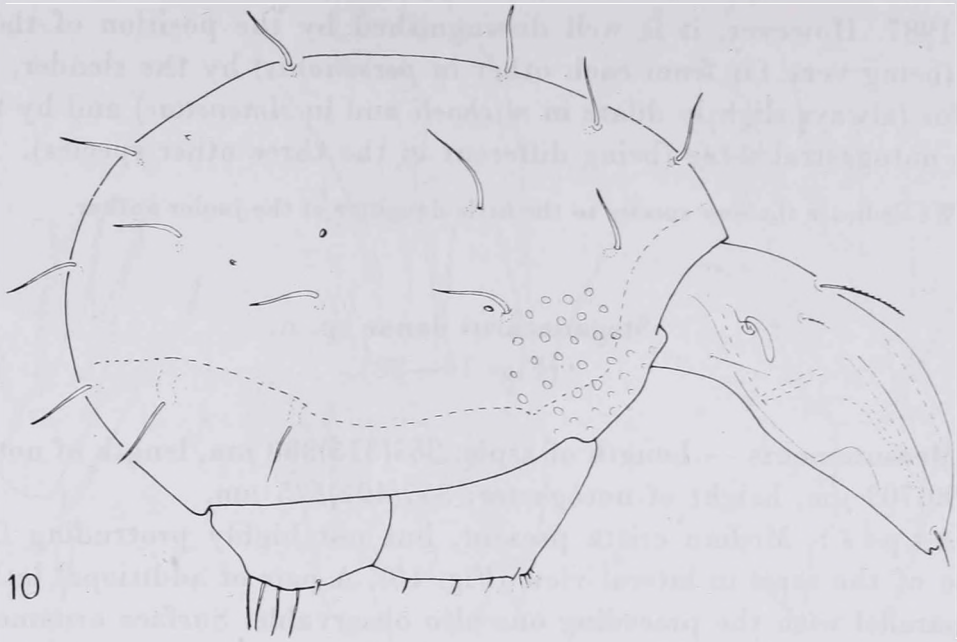
V e n t r a l r e g i o n : Nine pairs of genital setae (Fig. 11) originating in two longitudinal rows, the posterior four pairs are slightly larger than the other five pairs and blunt at tip. Four pairs of setae of the *x*-row on the ano--adanal plates also blunt at tip and approximately equal in length (Fig. 12).

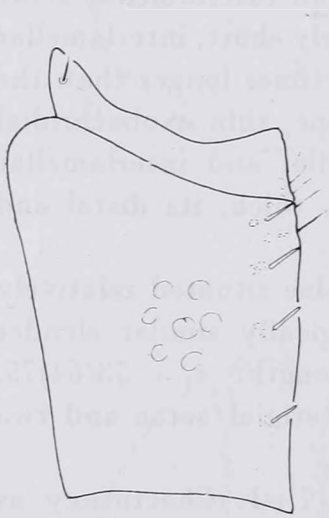
L e g s : Setal formula of legs:

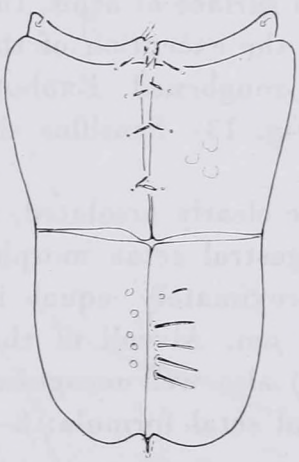
I. 1—4—1+2—5+1—17+3—1 (Figs 15—16)
IV. 2—2—1—2+1—10—1 (Fig. 14)

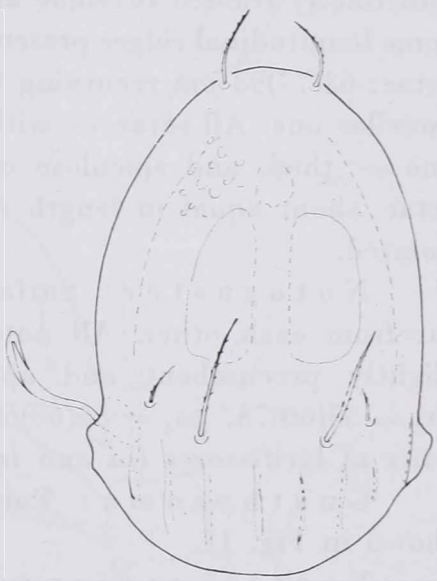
Seta *d* on genu and tibia 1 very short, hardly observable.

Material examined — H o l o t y p e: No. 17: Turkey, Kackar Daglari, Siedlung Kovrun, cca. 1800 m, 2. VII. 1987. — Sample from wet litter, moss pads and lichens with underlying soil in a coniferous forest (mostly *Picea orientalis*), — leg. L. MIKO. — 9 p a r a t y p e s: from the same sample. — Holotype (1354—HO—89) and 3 paratypes (1354—PO—89) deposited in the: HNHM, 5 paratypes in the CLM, 1 paratype in the MHNG.







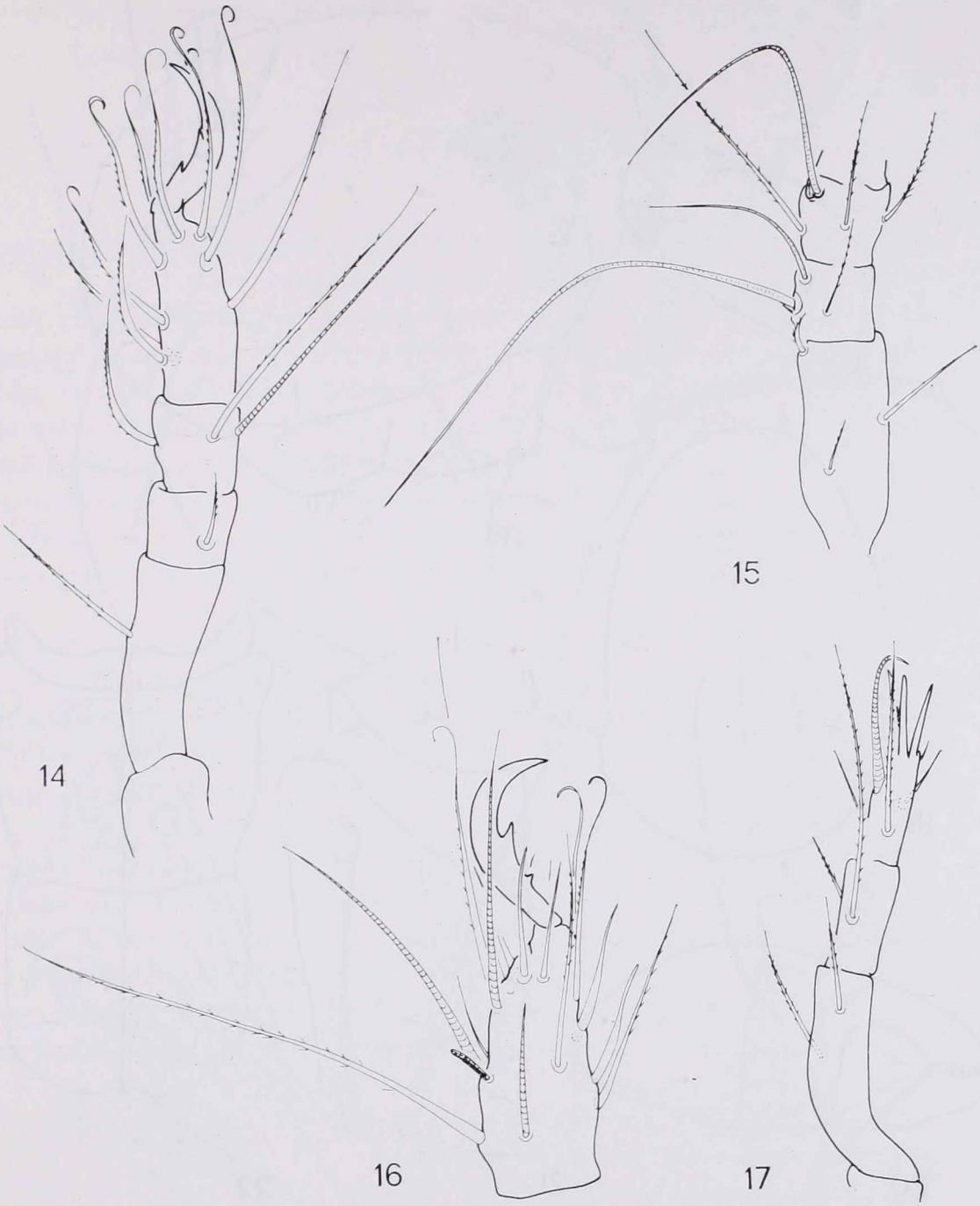


Figs 10—13. *Steganacarus danae* sp. n.: 10 = lateral view, 11 = genital plate, 12 = anogenital leg 1, 17 = palp

R e m a r k s : The new species belongs to the "*brevipilus*" group, which is characterized by the short and dilated sensillus and the characteristically short ano-adanal setae (equal in length or their length gradually decreases posteriorly).

The following species belong to this group:

Steganacarus brevipilus (BERLESE, 1923)
coniunctus NIEDBALA, 1983
danae sp. n.
lasithiensis MAHUNKA, 1979
lazitanicus sp. n.
partruelis NIEDBALA, 1983



Figs 14—17. *Steganacarus danae* sp. n.: 14 = leg 4, 15 = basal part of leg 1, 16 = tasus of leg 1, 17 = palp.

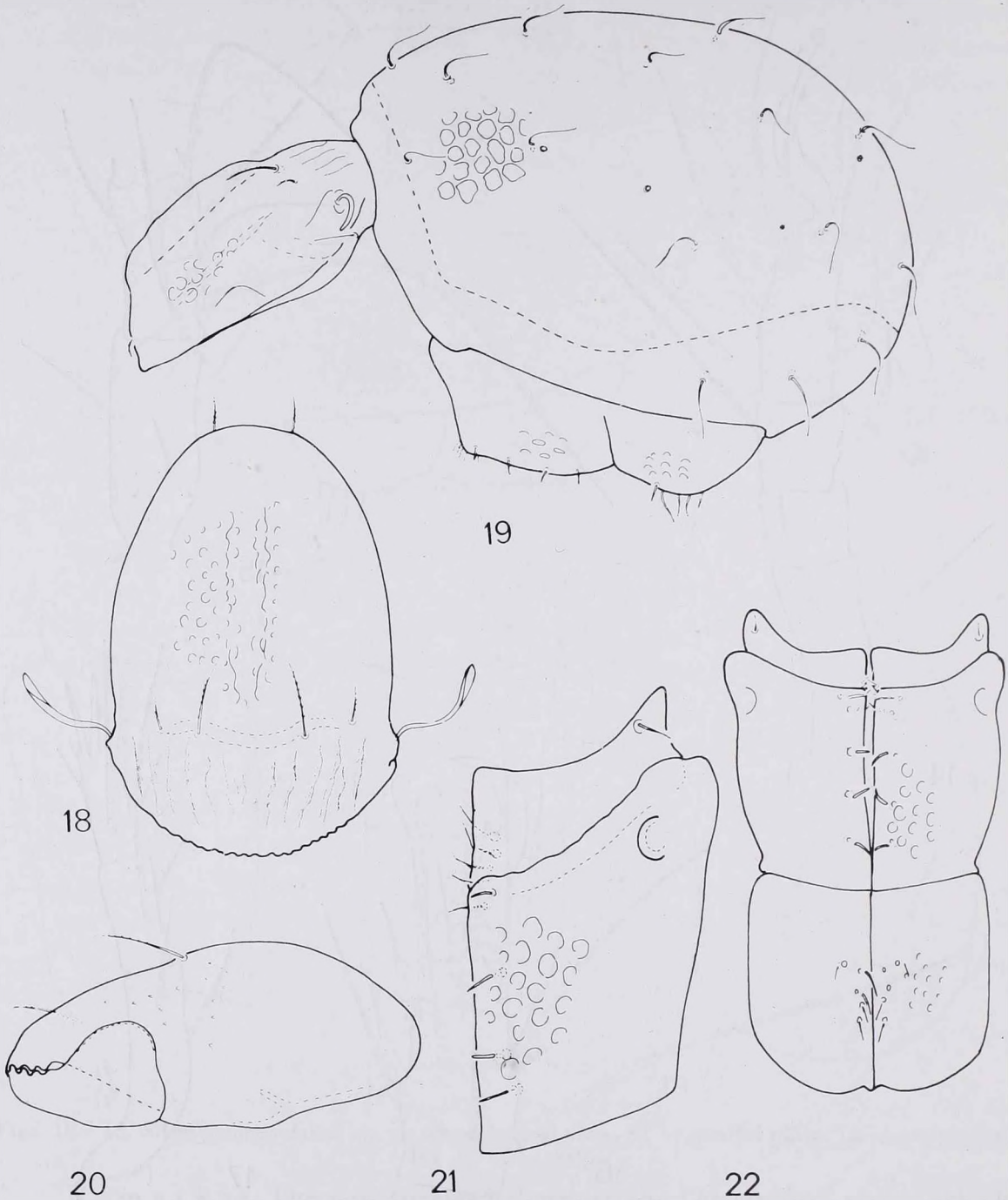
KEY TO SPECIES

1 (4) Notogaster with sharp median edge.
2 (3) Notogastral setae setiform, without flagellate end. Notogastral surface ornamented by normal alveoli

brevipilus (BERLESE, 1923)

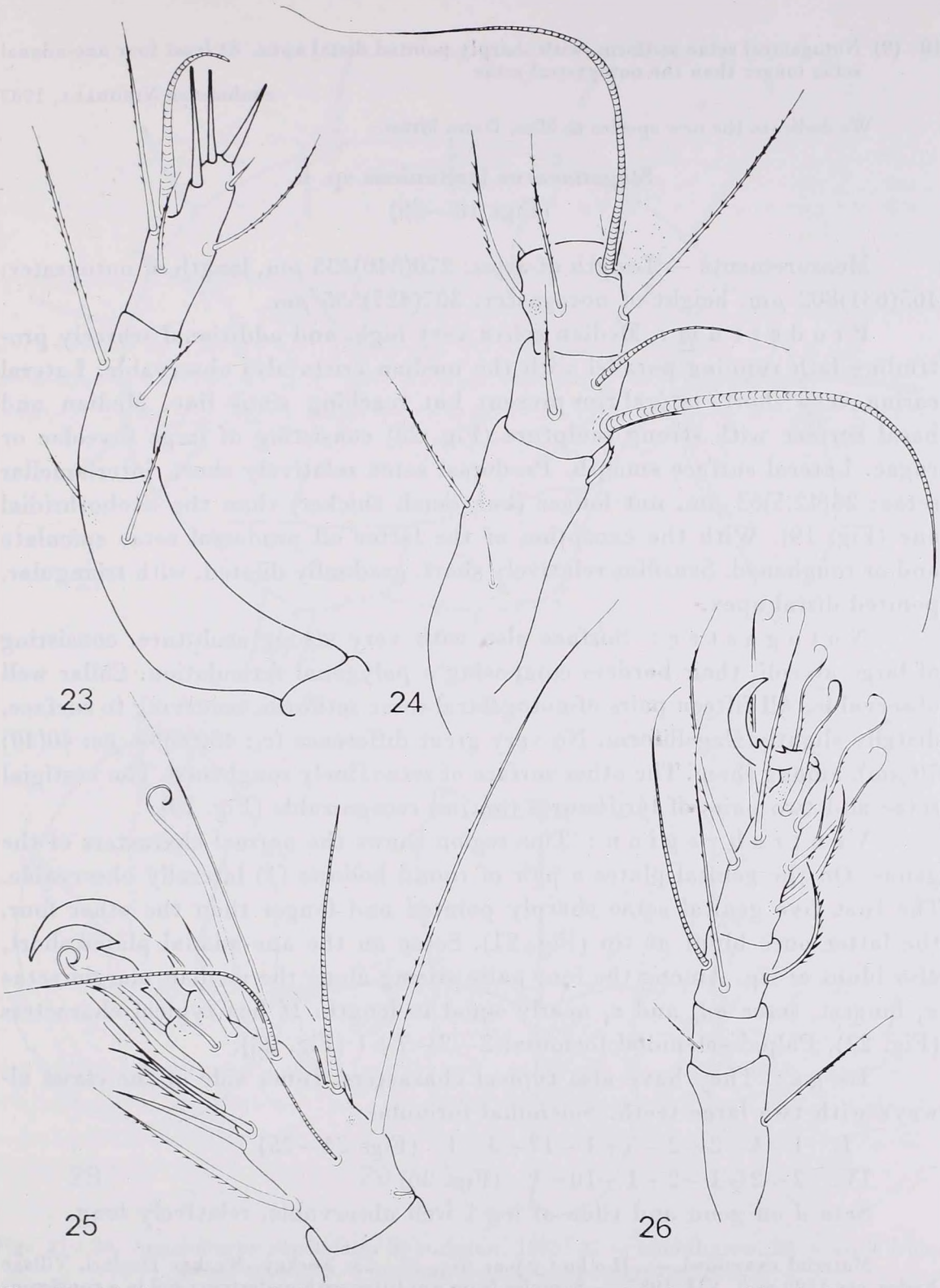
3 (2) Notogastral setae very long, with flagellate distal end. Surface of the notogaster ornamented by very large alveoli, they compose a polygonal sculpture

lasithiensis MAHUNKA, 1979



Figs 18—22. *Steganacarus lazitanicus* sp. n.: 18 = aspis from dorsal view, 19 = lateral view, 20: chelicera, 21 = genital plate, 22 = anogenital region

4 (1) Notogaster without sharp median edge.
5 (8) Notogastral setae setiform, recurving to body surface. Length of ano-adanal setae gradually decreasing posteriorly.
6 (7) Surface of the notogaster ornamented by very large alveoli, they compose a polygonal network. Lateral carinae on prodorsum very short
lazithanicus sp. n.
7 (6) Notogastral surface only foveolate, without polygonal network. Lateral carinae on prodorsum long
patruelis NIEDBALA, 1983



Figs 23—26. *Steganacarus lazitanicus* sp. n.: 23 = palp, 24 = basal part of leg 1, 25 = tarsus of leg 1, 26 = leg 4

8 (5) Notogastral setae setiform or spiniform, they are at least partly erect.
9 (10) Notogastral setae spiniform, blunt at tip. Ano-adanal setae always shorter than the shorter notogastral ones

danae sp. n.

10 (9) Notogastral setae setiform, with sharply pointed distal apex. At least four ano-adanal setae longer than the notogastral setae

coniunctus NIEDBALA, 1983

We dedicate the new species to MRS. DANA MIKO.

Steganacarus lazitanicus sp. n.
(Figs 18—26)

Measurements — Length of aspis: 270(340)435 μm, length of notogaster: 465(631)802 μm, height of notogaster: 307(427)535 μm.

P r o d o r s u m : Median crista very high, and additional scarcely protruding lath running parallel with the median crista also observable. Lateral carina very short, lateral rim present but reaching sinus line. Median and basal surface with strong sculpture (Fig. 28) consisting of large foveolae or rugae. Lateral surface smooth. Prodorsal setae relatively short, interlamellar setae: 25(42.5)63 μm, not longer (but much thicker) than the exobothridial one (Fig. 19). With the exception of the latter all prodorsal setae spiculate and/or roughened. Sensillus relatively short, gradually dilated, with triangular, pointed distal apex.

N o t o g a s t e r : Surface also with very strong sculpture, consisting of large alveoli, their borders composing a polygonal reticulation. Collar well observable. All fifteen pairs of notogastral setae setiform, recurving to surface, distally slightly flagelliform. No very great difference (c_1: 45(66)90, *ps*: 40(49)70 μm), among them. The other surface of setae finely roughened. The vestigial setae and two pairs of lyrifissures (*ia*, *im*) recognizable (Fig. 19).

V e n t r a l r e g i o n : This region shows the normal characters of the genus. On the genital plates a pair of round hollows (?) laterally observable. The first five genital setae sharply pointed and longer than the other four, the latter ones blunt at tip (Fig. 21). Setae on the ano-adanal plates short, also blunt at tip. Among the four pairs arising along the median margin setae x_1 longest, setae ad_3 and x_4 nearly equal in length. It has typical characters (Fig. 22). Palpal solenidial formula: 2—2—7+1 (Fig. 23).

L e g s : They have also typical characters. Inner side of the claws always with two large teeth. Solenidial formulae:

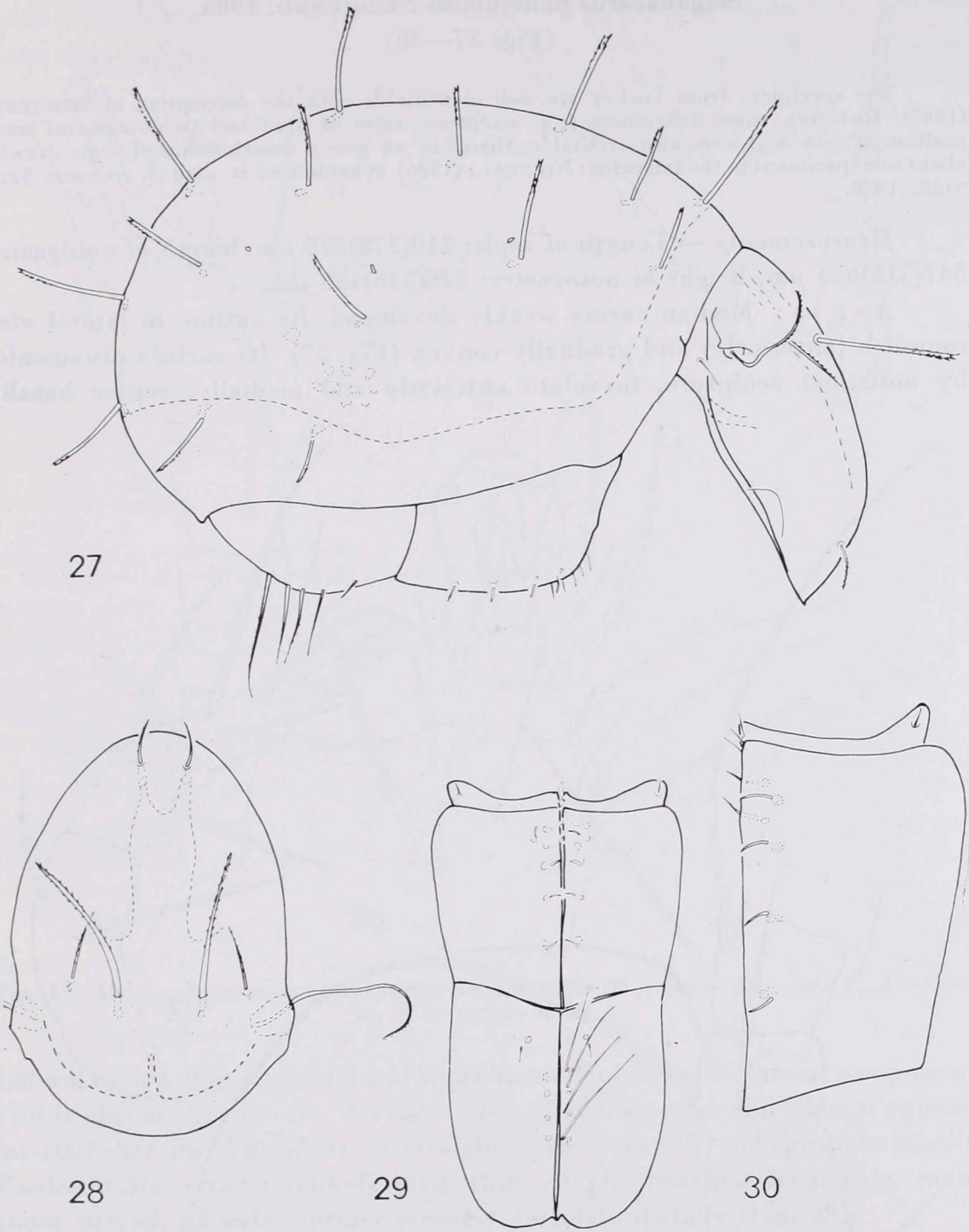
I. 1—4—2+2—5+1—17+3—1 (Figs 24—25)

IV. 2—2—1—2+1—10—1 (Fig. 26)

Seta *d* on genu and tibia of leg I well observable, relatively long.

Material examined — H o l o t y p e: No. 22—23: Turkey, Kackar Daglari, Village Ayder, cca 1200 m, 1. VII. 1987. — Samples from wet litter with underlying soil in a coniferous forest (mostly Picea orientalis), leg. L. MIKO. — 28 p a r a t y p e s: from the same sample. — Holotype (1355-HO-89) and 7 paratypes (1355-PO-89) deposited in the HNHM, 20 paratypes in the CLM, 1 paratype in the MHNG.

R e m a r k s : See the remarks after the description of *Steganacarus danae* sp. n.



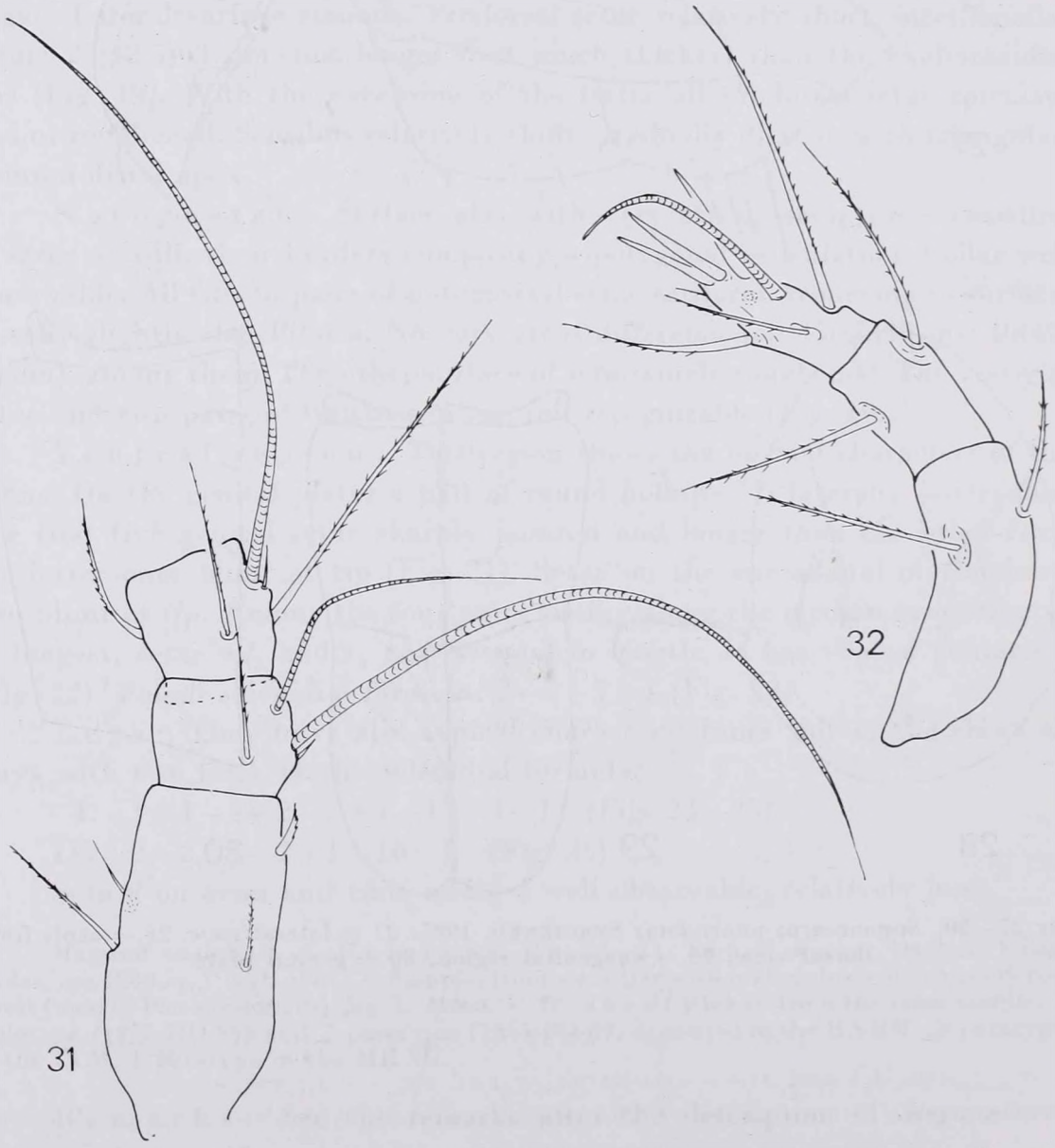
Figs 27—30. *Steganacarus punctulatus* SERGIENKO, 1985: 27 = lateral view, 28 = aspis from dorsal view, 29 = anogenital region, 30 = genital plate

Steganacarus punctulatus SERGIENKO, 1985
(Figs 27—36)

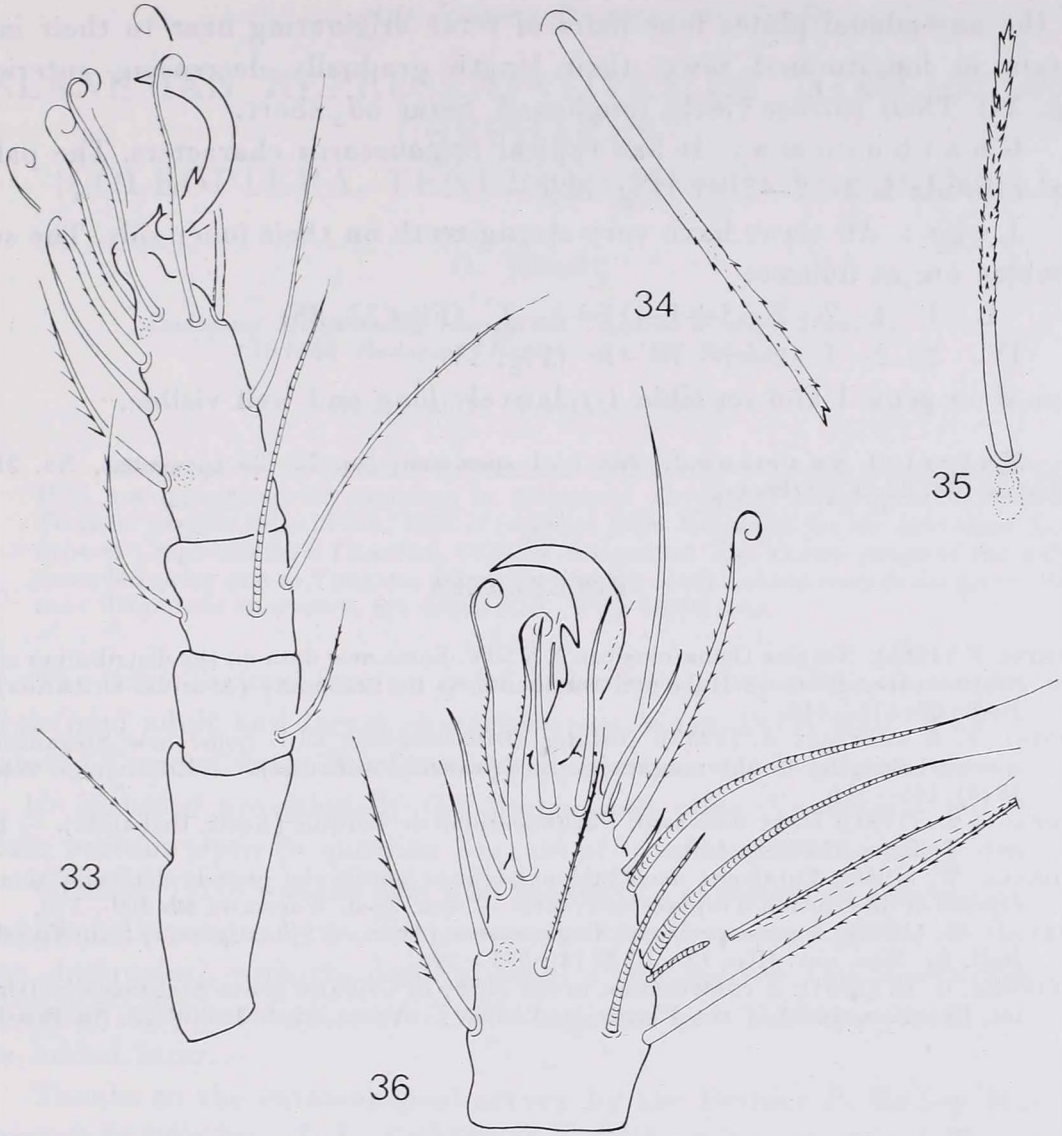
The specimens from Turkey are well identifiable with the description of SERGIENKO (1985). However, some differences (e.g. sculpture, ratio of prodorsal to notogastral setae, position of seta ad_3) were also verifiable, therefore we give a description and some drawing about our specimens in the following. NIEDBALA (1986) synonimised it with *S. spinosus* SELLNICK, 1920.

Measurements — Length of aspis: 210(278)325 μm, length of notogaster: 347(515)653 μm, height of notogaster: 248(336)436 μm.

A s p i s : Median carina weakly developed, its outline in lateral view roundish (anteriorly) and gradually convex (Fig. 27). Its surface ornamented by indistinct sculpture, foveolate anteriorly and medially, rugose basally.



Figs 31—32. *Steganacarus punctulatus* SERGIENKO, 1985: 31 = basal part of leg 1, 32 = palp



Figs 33—36. *Steganacarus punctulatus* SERGIENKO, 1985: 33 = leg 4, 34 = seta c_1, 35 = seta *in*, 36 = tarsus of leg 1

Lateral carina absent, rostral and sinus line well observable, lateral rim present, visible also at the rostrum. All three pairs of median setae spiculate or spinose, interlamellar one (Fig. 35) erect, straight, spinose distally and spiculate basally. Exobothridial setae relatively long, thin, simple. Sensillus long, thin, many times curved, its outer surface strongly spiculate distally (Fig. 28).

N o t o g a s t e r : Fine punctulation and an indistinct foveolate sculpture observable. The fifteen pairs of notogastral setae are all similar to the interlamellar one, their length very variable: *in*: (78(102)135 μm, c_1: 68(95) 128 μm, ps_1: 52(97)130 μm, ps_4: 38(58)73 μm. The insertion of the vestigial setae (f_1 and f_2) and the lyrifissurae *ia* and *im* visible laterally.

V e n t r a l r e g i o n : The nine pairs of genital setae arising in two rows; four pairs (g_6—g_9) slightly thicker, longer, than the others (Fig. 30).

On the ano-adanal plates four pairs of setae originating near to their inner margin in longitudinal rows, their length gradually decreasing anteriorly (Fig. 29). Their surface finely roughened. Setae ad_3 short.

G n a t h o s o m a : It has typical *Steganacarus* characters. The palpal setal formula is 2—2—7+1 (Fig. 32).

L e g s : All claws have very strong teeth on their inner side. The setal formulae are as follows:

I. 1—4—2+2—5+1—17+3—1 (Figs 31, 36)

IV. 2—2—1—2+1—10—1 (Fig. 33)

Setae *d* on genu 1 and on tibia 1 relatively long and well visible.

M a t e r i a l e x a m i n e d: No. 6: 1 specimen; No. 17: 26 specimens, No. 21: 4 specimens; No. 22: 3 specimens.

REFERENCES

BERNINI, F. (1986): Notulae Oribatologicae XXXIV. Some new data on the distribution of the Steganacarus genus in Italy and comments on its taxonomy (Acarida, Oribatida). — Redia **69:** 377—416.

BERNINI, F. & AVANZATI A. (1987): Notulae Oribatologicae XLI. Some new Steganacarus species belonging to the magnus group (Acarida, Oribatida). — Internat. J. Acarol. **13** (3): 165—176.

NIEDBALA, W. (1981): Deux nouveaux Phthiracaridae de Turquie (Acari, Oribatida). — Bull. ent. Pologne **51:** 501—510.

NIEDBALA, W. (1986): Catalogue des Phthiracaroidea (Acari), clef pour la détermination des espèces et description d'espèces nouvelles. — Ann. Zool. Warszawa **40:** 309—370.

PARRY, B. W. (1978): A new species of Steganacarus (Acari, Cryptostigmata) from Israel. — Bull. Br. Mus. nat. Hist. (Zool.) **33** (4): 231—296.

SERGIENKO, G. D. (1985): A contribution to the study of Oribatid genus Steganacarus (Oribatei, Phthiracaridae) of the Ukrainian Fauna. — Vestn. zool. **3:** 30—37. (in Russian.)

Acta Zoologica Hungarica 35 (3—4), pp. 235—254 (1989)

MELANESIAN REPRESENTATIVES OF TOXICUM AND CRYPHAEUS (COLEOPTERA, TENEBRIONIDAE: TOXICINI)

O. MERKL

Zoological Department, Hungarian Natural History Museum, H-1088 Budapest, Baross utca 13, Hungary

(Received 15 November, 1988)

Four species of *Toxicum* LATREILLE, 1802 and five species of *Cryphaeus* KLUG, 1933 are recognized as occurring in Melanesia. *Cryphaeus vacca* sp. n. is described. *Toxicum gazellae* SCHAUFUSS, 1885 is recorded from Melanesia for the first time. Lectotype of *Cryphaeus biroi* (KASZAB, 1939) is designated. The known range of the tribe is extended as far east as Vanuatu. Identification keys and locality records are given. Pertinent diagnostic characters are illustrated. With 68 figures.

The tribe *Toxicini* forms a quite distinctive group of *Tenebrionidae* with well-defined adult and larval characters (see WATT 1974: 400). WATT (1974) separated *Toxicini* from *Tenebrioninae* and proposed a new subfamily *Toxicinae*. He included provisionally the Madagascan tribe *Nycteropini* but left its certain position open to question because of insufficient knowledge of larvae.

GEBIEN (1920) was the first who produced a summary of Papuan *Toxicini* in which he mentioned two *Toxicum* and three *Cryphaeus* (under the generic name *Anthracias*), with the description of a new species. One new *Cryphaeus*, also under *Anthracias* (KASZAB 1939) and one new *Toxicum* (KASZAB 1956) were added later.

Thanks to the entomological survey by the Bernice P. Bishop Museum (initiated by the late J. L. GRESSITT), a fairly rich material of *Toxicini* is available from New Guinea and the other islands of Melanesia. Identification of this material and that of other institutions resulted in the recognition of two further species occurring in the area. One of them was proved to be new and the other is recorded from Melanesia for the first time.

This paper is devoted to enumerate the species of *Toxicini* in Melanesia, to outline the distribution of the species based upon both label data and literature sources, to provide identification keys to the species and to summarize as well as depict the diagnostic features of both sexes.

AREA INVESTIGATED

The area investigated covers most parts of Melanesia (Fig. 1). This anthropologically defined region is not entirely equivalent to the zoogeographically defined Papuan Subregion, which includes also Maluku and Northern Queensland. However, the term „Melanesia" was chosen for this study instead of "Papuan Subregion" because (1) material available to me from

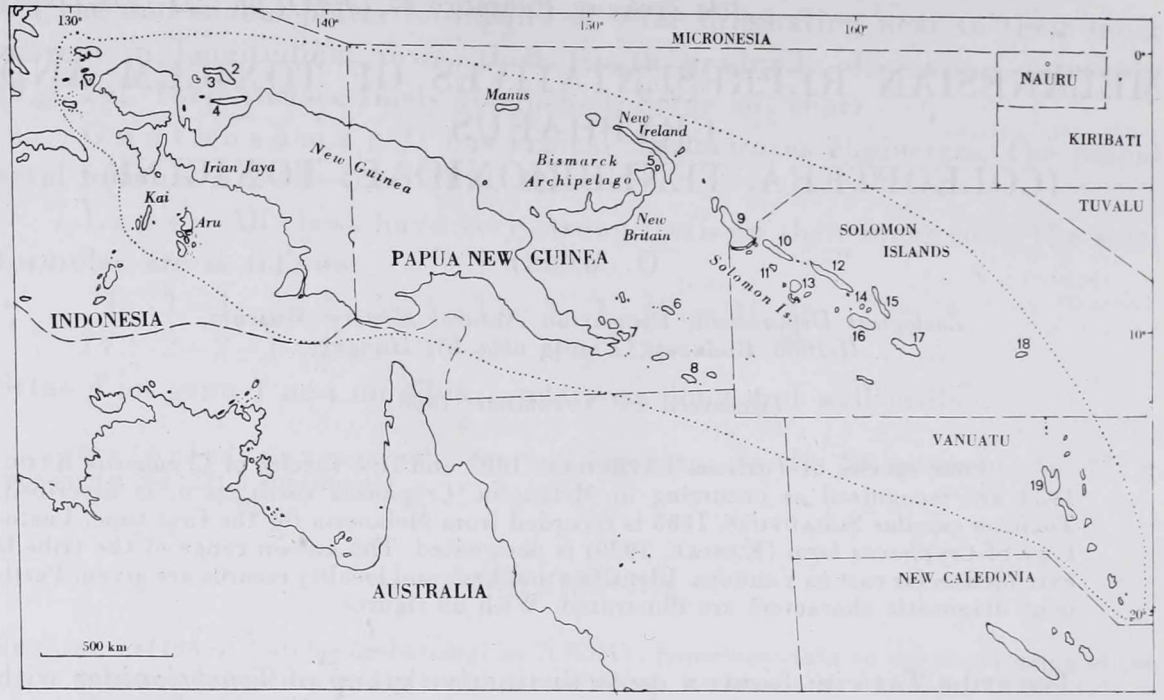


Fig. 1. Map of the western part of Melanesia. Dotted line delimits area investigated. Dashed lines represent state borders. Numerals indicate smaller islands or island groups mentioned in the text: 1 = Salawati, 2 = Biak, 3 = Korido, 4 = Japen, 5 = Duke of York, 6 = Woodlark, 7 = Normanby, 8 = Misima, 9 = Bougainville, 10 = Choiseul, 11 = Vella Lavella, 12 = Isabel (= Santa Ysabel); 13 = New Georgia Group, 14 = Florida Group, 15 = Malaita, 16 = Guadalcanal, 17 = San Cristobal, 18 = Santa Cruz, 19 = Espiritu Santo

Maluku is too little for a thorough analysis and (2) Australian *Toxicinae* are worth studying separately, since this area has only two species in common with Melanesia.

However, anthropologically considered parts of Maluku, Kai and Aru are included in this paper because they have two toxicine species in common with New Guinea. Two important eastern Melanesian areas, New Caledonia and Fiji, are excluded, because the tribe appears to be absent beyond Vanuatu.

PRESENTATION OF DATA

For the material studied, the locality, the date of collecting and the name of collector(s) are submitted followed by the number of specimens and the abbreviation of depository in parentheses. For the abundant *Toxicum quadricorne*, only the localities and the number of specimens kept in the respective depositories are listed.

Locality records are grouped in accordance with political units (states, then provinces or divisions). The known range of the species however, is given in geographical terms.

The following four-letter acronyms are used in the text for sources of material (the names of individuals responsible for the loan of specimens follow the names of institution):

BMNH—British Museum (Natural History), London, United Kingdom. Mr. L. Jessop.
BPBM—Bernice Pauahi Bishop Museum, Honolulu, HI, USA. Dr. G. A. Samuelson.
HNHM—Hungarian Natural History Museum, Budapest, Hungary.
MCZC—Museum of Comparative Zoology, Harvard University, Cambridge, MASS, USA. Dr. S. R. Shaw.
MHNG—Muséum d'Histoire Naturelle, Geneva, Switzerland. Dr. Cl. Besuchet and Dr. I. Löbl.
MNHB—Museum für Naturkunde, Humboldt Universität, Berlin, German Democratic Republic. Dr. Fr. Hieke.
MNHM—Muséum National d'Histoire Naturelle, Paris, France. Dr. Cl. Girard.
NMBS—Naturhistorisches Museum, Basel, Switzerland. Dr. M. Brancucci.

RNHN—Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands. Dr. J. KRIKKEN.
RWHO—Richard W. Hornabrook's private collection, Wellington, New Zealand. Dr. R. W. HORNABROOK and Dr. R. G. ORDISH.
SAMA—South Australian Museum, Adelaide, SA, Australia. Dr. E. G. MATTHEWS.
ZFMK—Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Federal Republic of Germany. Dr. H. ROER.
ZMUA—Zoölogisch Museum, Universiteit van Amsterdam, Amsterdam, The Netherlands. Dr. B. BRUGGE.

Some measurements are indicated by the following abbreviations in the text: PL = pronotal length measured along longitudinal midline; PW = pronotal width measured at the widest point of pronotum; EL = elytral length measured along suture; EW = elytral width measured at the widest point of the two elytra combined.

DIAGNOSTIC FEATURES OF THE TRIBE AND KEY TO GENERA

General shape of *Toxicini* is elongate, subparallel-sided, gently convex in cross section, showing some resemblance to that of members of genus *Tenebrio* and allies. The last three or four segments of antennae form a distinct, flattened club. Males have horns on the head, while females have supraorbital swellings. The elytra are striate-punctate, rarely the striae are irregular. The surface of pronotum and elytra is usually covered by an effaceable velutinous coating, which obscures the sculpture.

Members of *Toxicini* have been associated with woody vegetation. Larval development takes place in decaying trunks and adults are found in the same habitat.

The tribe comprises two genera which are to be keyed out as follows:

1 (2) Eyes more or less deeply indented by epistomal canthi but not completely divided (Figs 2—17). Head of males with two supraorbital and (1)—2—(3)* epistomal horns (Figs 2—5, 10—13). Supraorbital horns fringed with yellowish hairs
Toxicum LATREILLE, 1802

2 (1) Eyes completely divided by epistomal canthi (Figs 37—48). Head of males with two glabrous supraorbital horns; epistomal horns absent (Figs 35—44)
Cryphaeus KLUG, 1933

Toxicum LATREILLE, 1802

Toxicum LATREILLE, 1802: 297; type species: *Toxicum richesianum* LATREILLE, 1804, designated by LATREILLE, 1810: 428.**

Species of *Toxicum* are known to occur in continental Asia (China, India, Indochina) and all major islands and island groups of Southeastern Asia (as far north as Japan) as well as in Melanesia (as far east as Vanuatu) and Australia. A widely-distributed species has been reported from some islands of Micronesia as well.

* CARTER (1914) described *Toxicum quinquecornutum* from New South Wales which has three (one longer medial and two shorter lateral) epistomal horns.

** Complete reference list and synonymies of toxicine taxa have been compiled in GEBIEN's (1938—42) catalogue. The literature sources given by him is not recited in this paper.

KEY TO THE MELANESIAN SPECIES OF *TOXICUM*

1 (2) Epistomal canthi enchroaching on eyes to 1/3 (Figs 3, 7). ♂: Epistoma with one horn (Figs 2—3). ♀: Epistoma distinctly convex (Fig. 6)

biroi KASZAB, 1956

2 (1) Epistomal canthi enchroaching on eyes to about 1/2 (Figs 5, 9, 11, 13, 15, 17). ♂: Epistoma with two horns (Figs 4—5, 10—13). ♀: Epistoma less convex to plane (Figs 8, 14, 16).

3 (4) Antennal club three-segmented (Fig. 25). Pronotum widest just anterior to middle, arcuately sided (Fig. 26). Pronotal punctures rather uniform in size and regularly scattered. ♂: Supraorbital horns rather short, stout, incurved (Fig. 4). Fore femora with a blunt inner protrusion in basal half. ♀: Cranial punctures uniform in size and regularly scattered (Fig. 8)

punctipenne PASCOE, 1866

4 (3) Antennal club four-segmented (Figs 29, 33). Pronotum widest at base, subparallel-sided (Figs 30, 34). ♂: Supraorbital horns longer and slenderer, slightly incurved to diverging (Figs 10, 12). Fore femora simple. ♀: Cranial punctation irregular.

5 (6) Larger in average (11.5—16.0 mm). ♂: Supraorbital horns long, slightly incurved to subparallel in frontal view (Fig. 10); pointing onwards in lateral view (Fig. 11). ♀: Supraorbital swellings angulate, surface between them feebly concave to plane; epistoma nearly impunctate (Figs 14—15)

gazellae SCHAUFUSS, 1885

6 (5) Smaller in average (9.7—14.2 mm). ♂: Supraorbital horns shorter, diverging in frontal view (Fig. 12); pointing backwards in lateral view (Fig. 13). ♀: Supraorbital swellings rounded; surface between them distinctly impressed; epistoma distinctly punctate (Figs 16—17)

quadricorne (FABRICIUS 1801)

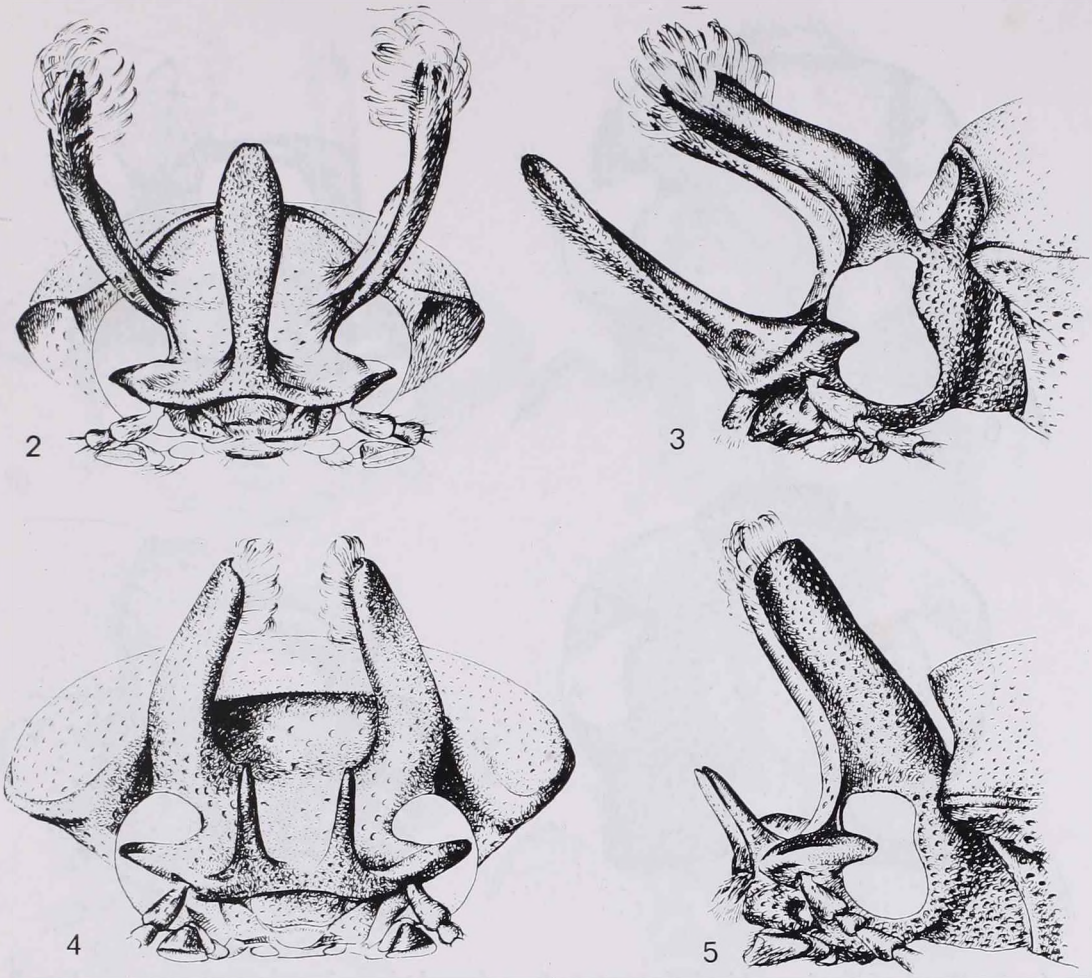
Toxicum biroi KASZAB, 1956
(Figs 2—3, 6—7, 18—22)

Toxicum Birói KASZAB, 1956: 97 (described from Siwi, Arfak-Gebirge in New Guinea).

Diagnostic features — Black; legs red. Eyes indented about 1/3 by epistomal canthi (Figs 3, 7). Pronotal punctation irregular. Length 10.5—12.5 mm.

♂: Epistoma one-horned. Epistomal horn about as long as supraorbital ones, lanceolate, coarsely rugulose-punctate; anterior surface with short and scanty pubescence. Supraorbital horns rather long and slender, diverging, then nearly parallel in frontal view (Fig. 2); pointing onwards in lateral view (Fig. 3); fringe of hairs extending from apex to first 1/3 on inner side. Dorsal cranial concavity with very few obsolete punctures. Antennal club three--segmented; segment IX considerably (nearly twice) wider than VIII, segments VII and VIII subequal in size (Fig. 20). Pronotum subparallel-sided (Fig. 22); PW/PL = 1.34. EL/EW = 1.87. Aedeagus: Figs 18—19.

♀: Epistoma distinctly convex, finely and sparsely punctured; cranial surface nearly plane to slightly concave; with coarse, irregular punctures at various distances from one another (Fig. 6). Supraorbital swellings barely prominent onwards in lateral view (Fig. 7). Antennal club rather four-segmented; segment IX a bit wider than VIII, segment VII considerably narrower than VIII (Fig. 21).

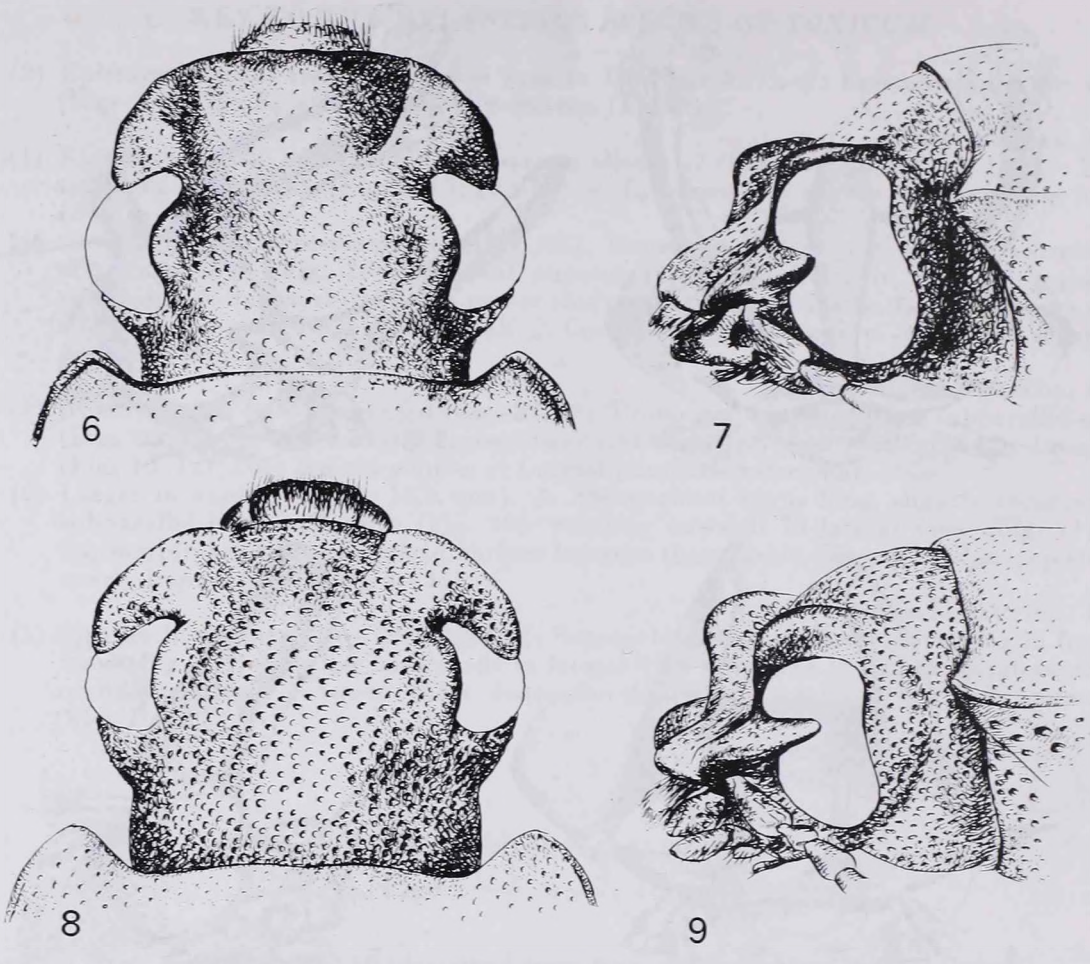


Figs 2—3. Head of *Toxicum biroi* KASZAB ♂: 2 = frontal view, 3 = lateral view. — Figs 4—5. Head of *Toxicum punctipenne* PASCOE ♂: 4 = frontal view, 5 = lateral view

Specimens examined — INDONESIA. Irian Jaya Province: Ajamaroe, 10. VI. 1952, op licht, L. D. Brongersma & W. J. Roosdorp (1, RNHN); Arfak-Gebirge, Siwi (♂ holotype, ♂paratype, HNHM); id., 800 m, 4. V. 1928, E. Mayr S. G. (3, MNHB; 1, HNHM ex MNHB); Star Range, West Sibil, 1260 m, 14. VIII. 1959, Neth. New Guinea Exp., Lewengbon (1, RNHN). — PAPUA NEW GUINEA. Eastern Highlands Province: Okapa, Awande, 8. II. 1964, R. Hornabrook (1, RWHO); Morobe Province: Wau, 1200 m, 1. V. 1962, J. Sedlacek (1, BPBM). Western Province: Fly River, Kiunga, 18—23. VIII. 1957, W. W. Brandt (L, BPBM); id., 23. VII—2. VIII. 1969, J. Balogh (I, HNHM); id., VIII. 1969, J. & M. Sedlacek (2, BPBM).

Distribution — In the area investigated: New Guinea mainland. Out of the area investigated: Maluku (Ternate, near Halmahera) (one specimen in ZFMK).

Remarks — The single-horned epistoma distinguishes the males of this species from those of any other Melanesian congeners. Some Indomalayan species of *Toxicum* have also one epistomal horn, but their horn is considerably widened and more or less deeply notched at the apex. Females can be identified by the eyes that are indented to one-third by epistomal canthi.



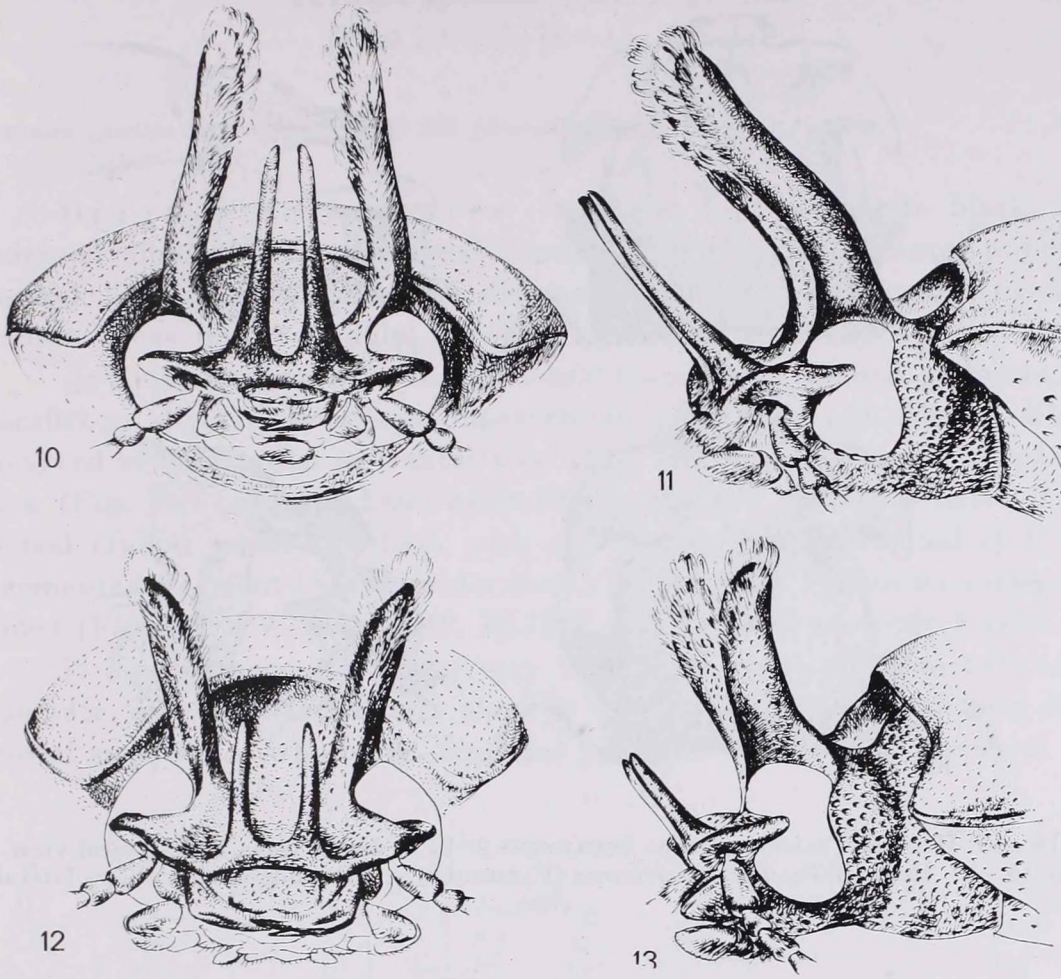
Figs 6—7. Head of *Toxicum biroi* KASZAB ♀: 6 = dorsal view; 7 = lateral view. — Figs 8—9. Head of *Toxicum punctipenne* PASCOE ♀: 9 = dorsal view, 8 = lateral view

Toxicum punctipenne PASCOE, 1866
(Figs 4—5, 8—9, 23—26)

Toxicum punctipenne PASCOE, 1866: 454 (described from Australia); KASZAB 1970: 258.

Diagnostic features: Black; legs black. Eyes indented about 1/2 by epistomal canthi (Figs 5, 9). Pronotal punctation regular. Length 9.5—12.0 mm.

♂: Epistoma two-horned. Epistomal horns much shorter than supraorbital ones, straight, slightly diverging, pointing onwards, glabrous. Supraorbital horns rather short and stout, incurved in frontal view (Fig. 4); pointing upwards in lateral view (Fig. 5); fringe of hairs extending from apex to first 2/5 on inner side. Dorsal cranial concavity with a few coarse punctures. Antennal club 3-segmented; segment IX distinctly wider than VIII (Fig. 25). Pronotum widest just anterior to middle, sides arcuate (Fig. 26); PW/PL = 1.31.

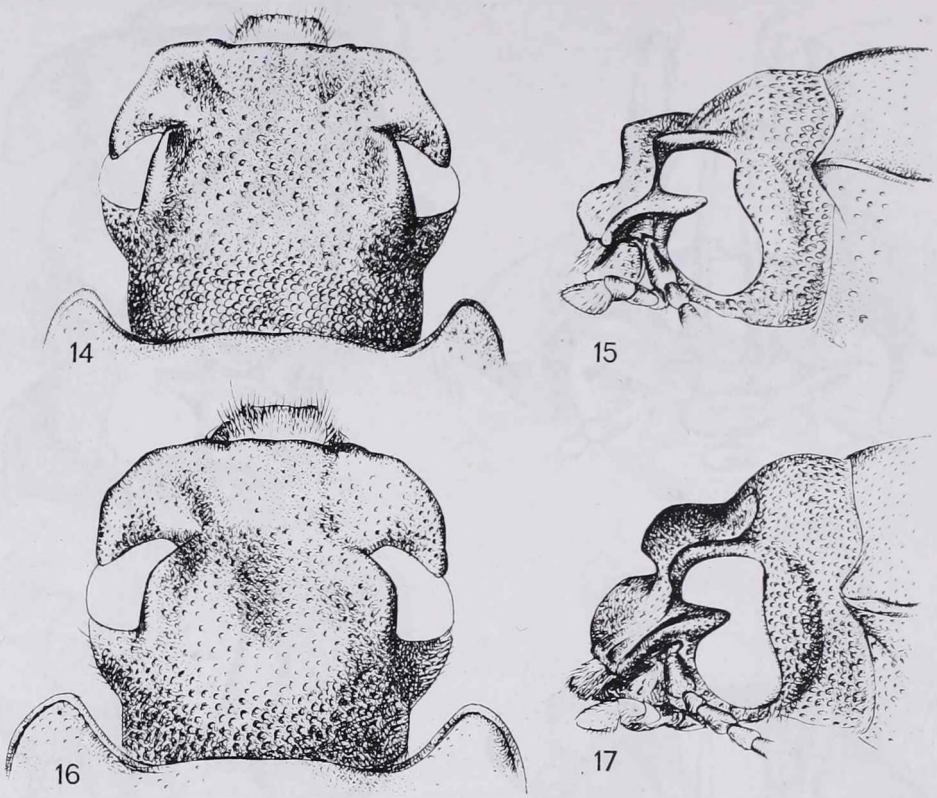


Figs 10—11. Head of *Toxicum gazellae* SCHAUFUSS ♂: 10 = frontal view, 11 = lateral view. — Figs 12—13. Head of *Toxicum quadricorne* (Fabricius) ♂: 12 = frontal view, 13 = lateral view

EL/EW = 1.79. Fore femora with a blunt (often indistinct) protrusion in the inner edge a little basad to the middle. Aedeagus: see Figs 23—24.

♀: Epistoma nearly plane, finely and sparsely punctured; cranial surface plane between supraorbital swellings, with coarse, uniform, round punctures separated regularly by about one puncture diameter (Fig. 8). Supraorbital swellings rounded in lateral view (Fig. 9). Antennal club three-segmented, similar to that of male. Fore femora simple in the inner edge.

Specimens examined — INDONESIA. Irian Jaya Province: Eramboe, 80 km ex Merauke, 5. II. 1960, TC. Maa (1, BPBM); Tanah Merah, 17 m, 11. IV. 1959, Noth. New Guinea Exp., C. B. Nicolas (1, RNHN). Malaku Province: Aru Is., Ureiunig, 1884, C. Ribbe (2, MNHB; 2, ZMUA); Key [= Kai] Is. (6, HNHM; 9, MNHB; 3, ZMUA). — PAPUA NEW GUINEA. Central Province: Brown River, 23. X. 1960, J. L. Gressitt (1, BPBM); id., II. 1975, R. Hornabrook (1, RWHO); id., 40 km N of Port Moresby, 6—8. IV. 1965, J. Balogh & J. J. H. Szent-Iványi (1, HNHM); Port Moresby, Finsch (1, MNHB); Port Moresby, Brown River, 17—18. VIII. 1968, I. Loksa (1, HNHM); Port Moresby, Boroko, 5. I. 1958, J. J. H. Szent-Iványi (1, HNHM); Koitaki, 1500', X—XI. 1928, Pemberton (1, BPBM); Redscar Bay,



Figs 14—15. Head of *Toxicum gazellae* SCHAUFUSS ♀: 14 = dorsal view, 15 = lateral view. — Figs 16—17. Head of *Toxicum quadricorne* (FABRICIUS) ♀: 16 = dorsal view, 17 = lateral view

1894 (1, HNHM); Aroa Estate, W of Redscar Bay, 1 m, 30. IX. 1958, J. L. Gressitt (1, BPBM); Sogeri Subd., Catalina Estate, 3. VIII. 1962, in rotten logs, J. J. H. Szent-Iványi (1, HNHM); between Vanapa and Brown River, ca. 28 mls N of Port Moresby, 2. IV. 1965, J. Balogh & J. J H. Szent-Iványi (4, HNHM). Gulf Province: Iriri, nr. Kerema, 7. V. 1959, C. D. Michener (2, BPBM). Western Province: Fly River, 1876—77, L. M. D'Albertis (2, MNHM; 1, ZFMK); Morehead, 10. II. 1974, R. Hornabrook (2, RWHO; 1, HNHM ex RWHO). — No more exact locality: Nouvelle Guinée, 1891 (2, MNHM); id., 1892 (13, MNHN).

D i s t r i b u t i o n — In the area investigated: New Guinea mainland (southern lowlands only!). Out of the area investigated: eastern parts of Australia, from Queensland to Victoria (rather frequent, many specimens in collections).

R e m a r k s — The stout, incurved supraorbital horns and the not so considerably transverse pronotum with regular punctation separate males from those of congeners. Females may be recognized by the conspicuously regular cranial punctation and also by the characteristic shape and sculpture of pronotum.

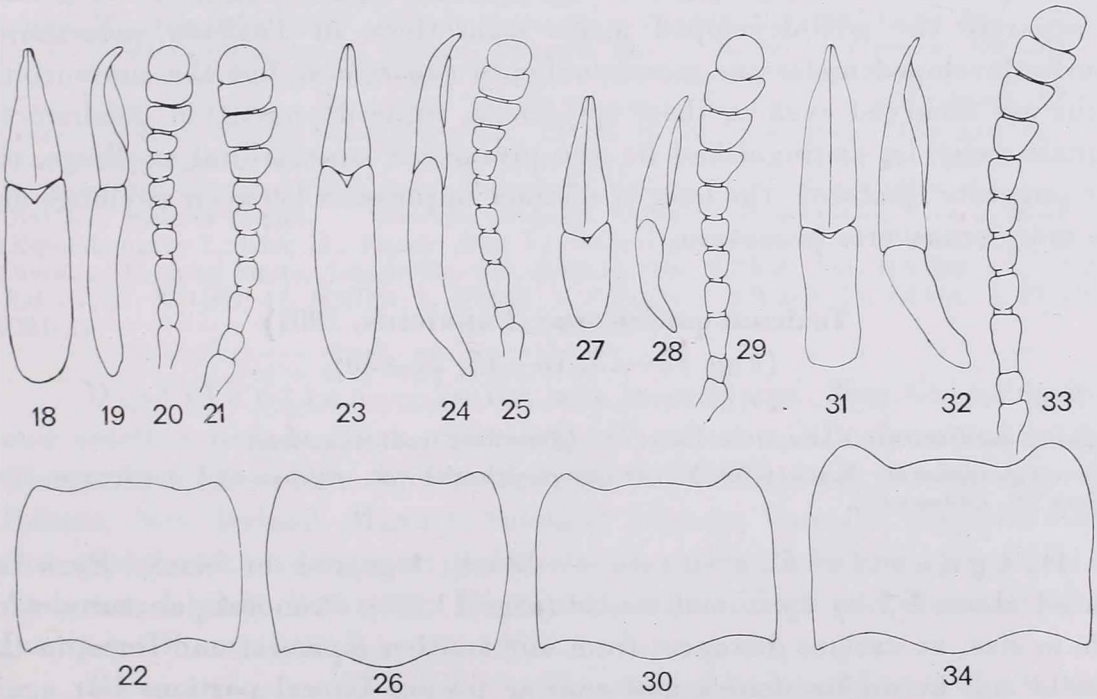
Toxicum gazellae SCHAUFUSS, 1885
(Figs 10—11, 14—15, 31—34)

Toxicum gazellae SCHAUFUSS, 1885: 201 (described from Celebes).

Diagnostic features — Black; legs reddish to black. Eyes indented about 1/2 by epistomal canthi (Figs 11, 15). Pronotal punctures variable in size and at various distances from one another (by extensive smooth areas in the middle). Length 11.5—16.0 mm.

♂: Epistoma two-horned. Epistomal horns long, slender, glabrous, subparallel or slightly diverging. Supraorbital horns long and slender, slightly incurved to subparallel in frontal view (Fig. 10); pointing onwards in lateral view (Fig. 11); fringe of hairs extending from apex to 1/2 on anterior side. Dorsal cranial concavity deep, with a few punctures. Antennal club four-segmented; segment IX a bit wider than VIII (Fig. 33). Pronotum subparallel-sided (Fig. 34); PW/PL = 1.49. EL/EW = 1.76. Aedeagus: see Figs 31—32.

♀: Epistoma nearly plane, very finely and obsoletely punctate to impunctate; cranial surface nearly plane to very weakly concave between supraorbital swellings, with coarse, irregular punctures at various distances from



Figs 18—22. *Toxicum biroi* KASZAB: 18 = aedeagus, dorsal view, 19 = aedeagus, lateral view, 20 = antenna of ♂, 21 = antenna of ♀, 22 = pronotum. — Figs 23—26. *Toxicum punctipenne* PASCOE: 23 = aedeagus, dorsal view, 24 = aedeagus, lateral view, 25 = antenna of ♂, 26 = pronotum. — Figs 27—30. *Toxicum quadricorne* (Fabricius): 27 = aedeagus, dorsal view, 28 = aedeagus, lateral view, 29 = antenna of ♂, 30 = pronotum. — Figs 31—34. *Toxicum gazellae* SCHAUFUSS: 31 = aedeagus, dorsal view, 32 = aedeagus, lateral view, 33 = antenna of ♂, 34 = pronotum

Specimens examined — INDONESIA. Irian Jaya Province: Anday (1, ZFMK); Arfak (4, ZFMK); Arfak-Gebirge, Siwi (1, HNHM); id., 800 m, IV—V. 1928, E. Mayr (1, MNHB); Baie du Geelvink, 1878, Raffray & Maindron (3, MNHN); Has [?] (1, ZFMK); Hollandia, VII. 1938, Neth. Ind.-Amer. New Guinea Exp., L. J. Toxopeus (1, RNHN); Salwaty [= Salawati] (3, ZFMK); Swart Val., Karabaka, 1300 m, 7. XI. 1958, J. L. Gressitt (2, BPBM; 1, HNHM ex BPBM); id., 17. XI. 1958, J. L. Gressitt (2, BPBM); Waris, S of Hollandia, 450—500 m, 24—31. VIII. 1959, T. C. Maa (1, BPBM). — PAPUA NEW GUINEA. Eastern New Britain Province: Mope, 9. II. 1936, P. Jos. Schneider (1, HNHM). — East Sepik Province: Hunsteinspitze, Kaiserin Augustafluss-Expedition, Lager V, 27—28. VII. 1912, S. G. Bürgers (1, MNHB). — Madang Province: Finisterre Range, Saidor, Gabumi Village, 1—21 VII. 1958, W. W. Brandt (2, BPBM; 1, HNHM ex BPBM). — Morobe Province: Garaina, 830 m, 13—15. I. 1968, J. & M. Sedlacek (1, BPBM); Sattelberg (1, MNHB). — Oro [= Northern] Province: Kokoda, 16. IV. 1958, on corky bark of senile rubber tree, W. E. Casey (1, HNHM); Mt. Alexander to Mt. Nisbet, II. 1896, Anthony (1, HNHM). — Sandaun [= West Sepik] Province: Torricelli Mts., Mokaj Village, 750 m, 8—15. XII. 1958, W. W. Brandt (1, BPBM); Torricelli Mts., Nengian Village, 17—24. XI. 1958, W. W. Brandt (3, BPBM; 1, HNHM ex BPBM). — Western Province: Kiunga, Fly River, 15—21. VII. 1957, W. W. Brandt (1, BPBM); id., 8—10. VIII. 1957, W. W. Brandt (2 BPBM); id., 21—24. X. 1957, W. W. Brandt (1, BPBM); id., 23. VII—2. VIII. 1969, J. Balogh (6, HNHM).

one another (Fig. 14). Supraorbital swellings distinctly protruded forwards in lateral view (Fig. 15). Antennal club as in the male.

Distribution — In the area investigated: New Guinea mainland; Salawati; New Britain. Out of the area investigated: Sulawesi (Gebien 1938—42); Sula (2 specimens in NMBS).

Remarks — Described from Sulawesi, this species was hitherto unknown from Melanesia proper. Due to the development of horns it is easy to separate the well-developed males from those of *Toxicum quadricorne*. Poorly developed males are more similar to *quadricorne* but the supraorbital horns are incurved even in these specimens, while divergent in *quadricorne*. Females may be distinguished by the prominent supraorbital swellings, the less punctate epistoma, the lack of distinct impression between swellings and the more transverse pronotum.

Toxicum quadricorne (Fabricius, 1801)
(Figs 12—13, 16—17, 27—30)

Trogosita quadricornis Fabricius, 1801: 153 (described from Sumatra).
Toxicum quadricorne: Kaszab 1970: 259 (as *quadricorne* var. *rufipes* and *quadricorne* var. *rufipes* ab. *andaiensis*).

Diagnostic features — Black; legs red to black. Eyes indented about 1/2 by epistomal canthi (Figs 13, 17). Pronotal punctures variable in size, at various distances from one another (sparsest and finest in the middle and becoming denser and coarser toward lateral portions but again sparser and finer along sides). Length 9.7—14.2 mm.

♂: Epistoma two-horned. Epistomal horns rather short, slender, glabrous, parallel. Supraorbital horns moderately long, stout, diverging in frontal view (Fig. 12); pointing backwards in lateral view (Fig. 13); fringe of hairs extending from apex to 1/2 on anterior side. Dorsal cranial concavity deep,

with a few punctures. Antennal club four-segmented; segment IX a little wider than VIII (Fig. 29). Pronotum subparallel-sided (Fig. 30); PW/PL = =1.37. EL/EW = 1.82. Aedeagus: see Figs 27—28.

♀: Epistoma nearly plane, finely but distinctly punctate; cranial surface deeply impressed between supraorbital swellings, forming a distinct pit; with coarse, irregular punctures at various distances from one another (Fig. 16). Supraorbital swellings rounded in lateral view (Fig. 17). Antennal club as in the male.

Specimens examined — INDONESIA. Irian Jaya Province: Biak; Bokondini, 40 km N of Baliem Valley; Guega, W of Swart Valley; Hollandia-Binnen; Humboldt Bay; Ifar, Cyclops Mts; Mt. Gyifrie; Nabire; Salawati; Sarmi; Siwi, Arfak Mts.; Swart Valley, Karubaka: Vogelkop, Kebar Valley, W of Manokwari. — PAPUA NEW GUINEA. Central Province: Brown River; Koitaki; Moroka; Owen Stanley Range, Goilala, Loloipa; id., Goilala, Tapini; Port Moresby; Redscar Bay; Rigo; Vanapa; between Vanapa and Brown River. — Eastern Highlands Province: Okapa. — East New Britain Province: Gazelle Peninsula, Upper Warangoi, Illugi. — East Sepik Province: Mailu; Maprik. — Gulf Province: Iriri, nr Kerema. — Madang Province: Erima; Friedrich-Wilhelmshafen; Kar Kar; Madang; Stephansort. — Manus Province: Rossum. — Milne Bay Province: Milne Bay; Misima I.,; Normanby I., Wakaiuna, Sewa Bay; Woodlark I. (Murua), Kulumadu Hill. — Morobe Province: Bubia; Bukawa; Bulldog Road; Bulolo; Bulolo River; Bulolo-Watut; Busu River; Finschhafen; S of Garaina; Komba; Kui; Lae; Lambaeb, Salawaket Range; Markham River; Mt. Missim; Nami Creek; Sattelberg; Simbang; Waing, ca 18 m of Lae; Wau; Wau, Kunai Creek. — New Ireland Province: "Camp Bishop", 15 km up Kait R.; Gilingil Pl'n; Kandan; Lower Kait R. — North Solomons [= Bougainville] Province: Kukugai; Kokure; Mutahi, 18 km SE Tinput; Togerao. — Oro [= Northern] Province: Bisi; Cape Killerton; Kokoda; Kokoda-Pitoki; Mamoo Plantation; Mt. Alexander to Mt. Nisbet; Popondetta; Popondetta Dist., Gona Rd. — Sandaun [= West Sepik] Province: Mt. Lucreu; Torricelli Mts. — Simbu [= Chimbu] Province: Karimui. — Western Province: Kiunga; Olsobip. — Western Highlands Province: Baiyer River; Wum, Upper Jimi V. — West New Britain Province: Ulamona. — SOLOMON ISLANDS. Central Division: Florida Group (Nggela I., Boroni; Savo); Guadalcanal (Honiara, Mt. Austen; Kiwi Creek; Kukum; Mamara; Visate); Isabel (Kia; Rasa; Regi; Tatamba; Tigora). — Eastern Division: San Cristobal (Kira Kira; Napagiwae); Santa Cruz (Manga; Ree I.). — Malaita Divi ion: Malaita (Dala). — Western Division: Choiseul (Malangono); New Georgia Group (Kolombangara I., Iriri; id., Pepele; Giro I.); Vella Lavella (Kow). — VANUATU. Northern Division: Espiritu Santo, Luganville. (48, BMNH; 398, BPBM; 154, HNHM; 27, MCZC; 1, MHNG; 27, MNHB; 47, MNHN; 1, NMBS; 3, RNHN; 6, RWHO; 24, SAMA; 2, ZFMK; 21, ZMUA).

Distribution — In the area investigated: New Guinea mainland and satellite islands (Biak, Salawati); Woodlark; D'Entrecasteaux Islands (Normanby); Louisiade Archipelago (Misima); Bismarck Archipelago (New Britain, New Ireland, Manus); Solomon Islands; Vanuatu (Espiritu Santo). Out of the area investigated: Indomalayan realm (Indochina, Sunda Islands, Andaman Islands, Sulawesi); Micronesia (Palau, Truk and Marshall Islands, Ponape) (Blair 1940, Kaszab 1985).

Remarks — This is by far the most widespread and in the Melanesia the most common species of *Toxicum*. Gebien (1920) stated that the var. *rufipes* Kirsch, 1875 is characteristic for New Guinea and he listed it later (Gebien 1938—42) as a subspecies. However, I have found that none of the characters stated to distinguish the "subspecies" from the "nominate form" actually holds. All of these characters (smaller size, lesser developed horns,

red legs, more convex elytral intervals) do occur in extra-Melanesian populations, too. The species is now recorded from Vanuatu for the first time; this locality is at the same time the easternmost occurrence of the tribe *Toxicini*.

Cryphaeus KLUG, 1933

Cryphaeus KLUG, 1933: 19; type species: *Cryphaeus aries* KLUG, 1933, by original monotypy.

Composite distribution of species of *Cryphaeus* embraces Palearctic (southeastern Europe, Soviet Far East, Korea, Japan), Afrotropical (including Malagasy) and Indomalayan (China, India, Indochina, continental islands) realms as well as Melanesia (eastwards to the Solomons) and Australia (unidentified specimens belonging probably to new species).

KEY TO THE MELANESIAN SPECIES OF *CRYPHAEUS*

1 (2) Antennal club four-segmented (Fig. 51). Epistomal canthi rounded, without sinuation (Fig. 47). Body rather broad, small. ♂: Supraorbital horns rather long, slender, incurved, cranium with an indistinctly bordered, shining but punctate concavity between horns (Fig. 37)
nudicornis (FAIRMAIRE, 1883)

2 (1) Antennal club three-segmented (Figs 55, 59, 63, 67). Epistomal canthi more or less sinuate (Figs 45—46, 48).

3 (6) Body rather broad, larger (8.8—18.5 mm). Punctural rows on elytra irregular. Pronotal sides arcuate, sinuate before acute posterolateral angles (Figs 56, 60). Pronotal punctation coarse, dense, subcontiguous. ♂: Supraorbital horns short and stout, situated far from each other; cranium without distinctly bordered concavity between horns (Figs 41, 43).

4 (5) Much larger in average (13.0—18.5 mm). Pronotum and elytra narrower. ♂: Supraorbital horns shorter, subparallel to slightly diverging in frontal view (Fig. 41)
irregularis (GEBIEN, 1920)

5 (4) Much smaller in average (8.8—10.5 mm). Pronotum and elytra broader. ♂: Supraorbital horns longer, slightly diverging then incurved in frontal view (Fig. 43)
vacca sp. n.

6 (3) Body slenderer, smaller (7.1—10.5 mm). Elytral punctures arranged to regular rows. Pronotal sides subparallel to slightly diverging anteriorly, posterolateral angles less acute (Figs 64, 68). Pronotal punctation fine and sparse. ♂: Supraorbital horns longer and slenderer, incurved, close to each other; cranium with a distinctly bordered, shining and impunctate concavity between horns (Fig. 39).

7 (8) Pronotum unicolorous black; legs red. Pronotum subparallel-sided (Fig. 64)
biroi (KASZAB, 1939)

8 (7) Pronotum Cinnabarine red, often with a black marking along midline; legs black. Pronotum subcordiform (Figs 36, 68)
chevrolati (MONTROUZIER, 1855)

Cryqhaeus nudicornis (FAIRMAIRE, 1883)
(Figs 37—38, 47, 49—52)

Toxicum nudicorne FAIRMAIRE, 1883: 25 (described from the Duke of York I. in the Bismarck Archipelago).

Diagnostic features — Black; antennal club and tibiae sometimes reddish. Epistoma finely and sparsely punctate, shallowly emarginate

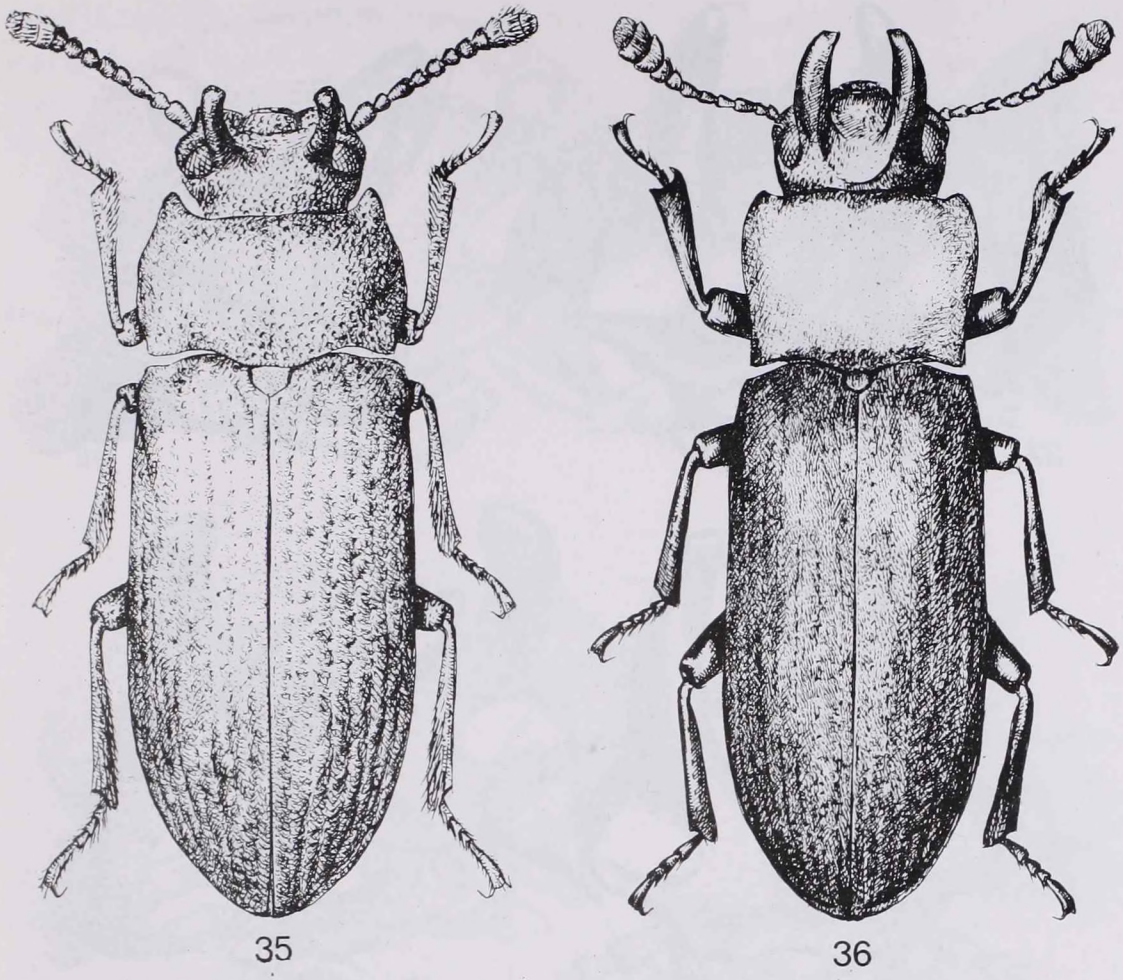


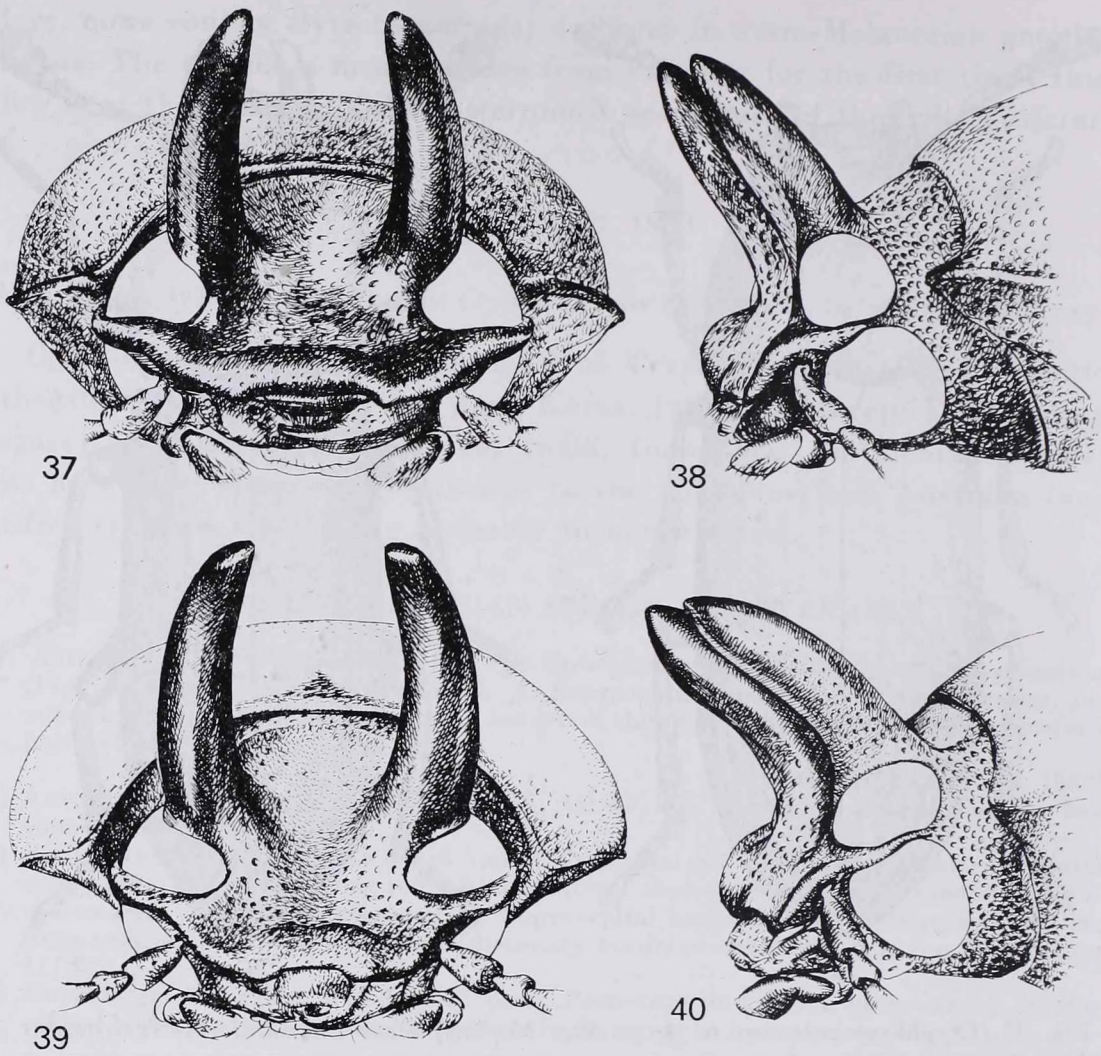
Fig. 35. *Cryphaeus vacca* sp. n. ♂. — Fig. 36. *Cryphaeus chevrolati* (MONTROUZIER) ♂.

with rounded canthi (Fig. 47). Antennal club four-segmented; segment VIII much wider than VII (Fig. 51). Pronotum subparallel-sided (Fig. 52); PW/PL = 1.65; pronotal punctation coarse and rather dense, distances among punctures about equal to their diameter. Punctural rows on elytra regular; EL/EW = 1.77. Length 7.0—9.8 mm.

♂: Supraorbital horns rather long, weakly incurved in frontal view (Fig. 37); pointing onwards in lateral view (Fig. 38). Dorsal cranial concavity shallow, indistinctly bordered posteriorly, punctate but shining in the middle. Aedeagus: see Figs 49—50.

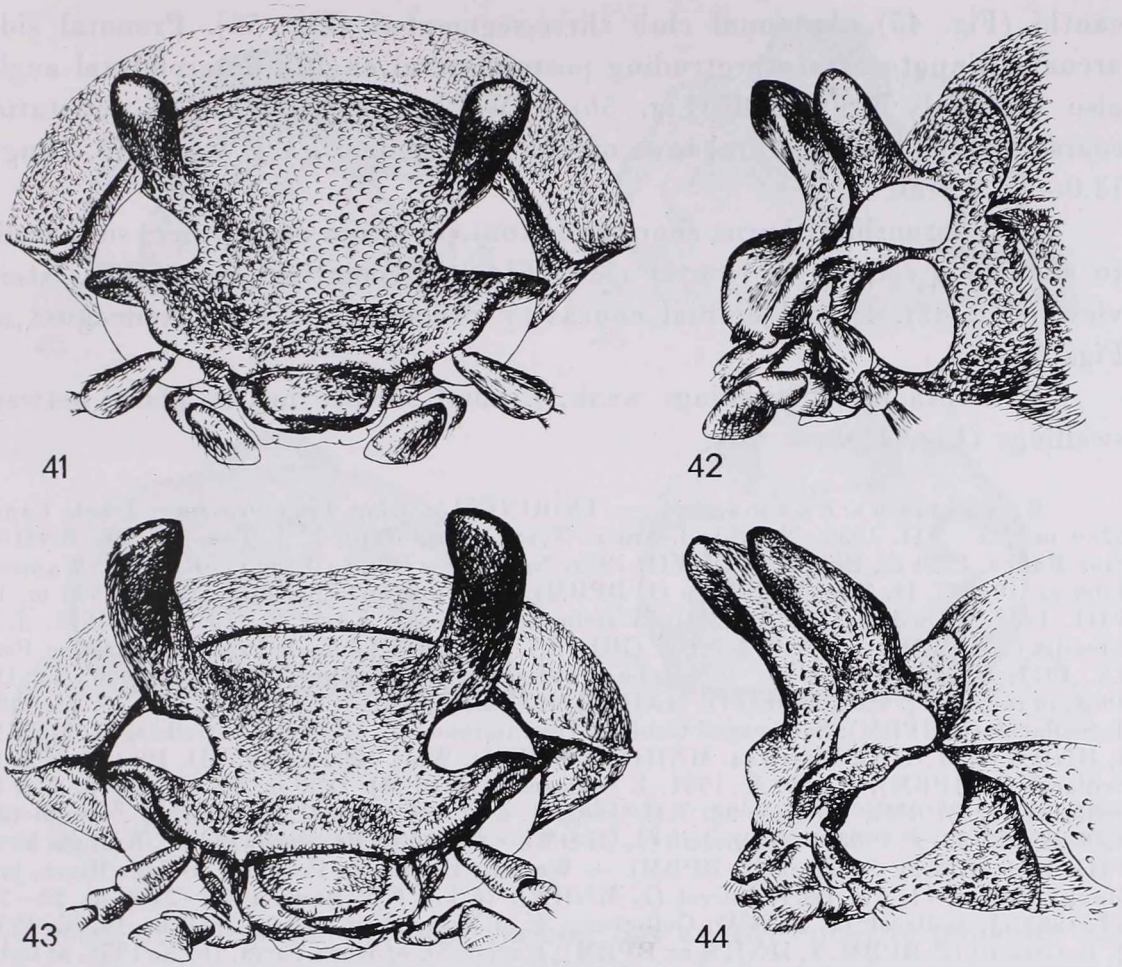
♀: Cranial surface weakly concave between supraorbital swellings, with coarse punctures; distances among them much less than their diameter (Fig. 47).

Specimens examined — PAPUA NEW GUINEA. East New Britain Province: Gaulim, 150 m, 21. X. 1962, J. & M. Sedlacek (1, BPBM); Gazelle Pen., Talliligap, 300 m, 17—18. XII. 1962, J. Sedlacek (1, BPBM); id., Upper Warangoi, 250—600 m, 28—30. XI. 1962, J. Sedlacek (2, BPBM); id., id., Araburn, 250 m, 28. XI. 1962, J. Sedlacek (9, BPBM; 4, HNHM ex BPBM); id., id., Illugi, 230 m, 25, XI—15. XII. 1962, J. Sedlacek (8, BPBM; 6,



Figs 37—38. Head of *Cryphaeus nudicornis* (FAIRMAIRE) ♂: 37 = frontal view, 38 = lateral view. — Figs 39—40. Head of *Cryphaeus chevrolati* (MONTROUZIER) ♂: 39 = frontal view, 40 = lateral view

HNHM ex BPBM); Mope, 14. II. 1937, P. Jos. Schneider (4, HNHM). — Manus Province: Rossum, 35—125 m, 29. VI. 1959, J. L. Gressitt (2, BPBM). — New Ireland Province: Gilingil Pl'n, 2 m, 4—17. VII. 1956, E. J. Ford Jr. (5, BPBM; 2, HNHM ex BPBM); Kandan, 1. I. 1960, W. W. Brandt (2, BPBM; 1, HNHM ex BPBM). — West New Britain Province: Silango, Nakanai Mts., 150 m, 22. VII.—3. VIII. 1956, E. J. Ford Jr. (7, BPBM; 2, HNHM ex BPBM). — Not exactly traced in New Britain: Ralum, 5. VI. 1896, E. Dahl S. (1, MNHB); id., 18. VI. 1896 (1, MNHB). — SOLOMON ISLANDS. Central Division: Florida Group, Big Nggela, I. 1964, sandfly, P. J. Greenslade (2, BMNH; 2, HNHM ex BMNH); id., Nggela I., Haleta, 0—50 m, 15. X. 1964, R. Straatman (2, BPBM); id., Savo, 4. IV. 1962, P. Greenslade (2, BMNH BMNH); id., id., 20. XII. 1962 (1, HNHM); Guadalcanal, Betikama R., VIII. 1960, W. W. Brandt (3, BPBM); id., Honiara, Kukum, 20. III. 1962, P. J. M. Greenslade (2, BMNH); id., id., id., 25. VII. 1962, P. Greenslade (1, BMNH); id., id., id., 16. I. 1963, P. Greenslade (1, HNHM); id., Mt. Austen, 19. IX. 1962, P. J. M. Greenslade (1, BMNH); id., Tambalia, 35 km W Honiara, 30 m, 22—25. V. 1964, J. Sedlacek (1, BPBM); id., Tenaru, 27. II. 1967, P. G. Fenemore (L, BMNH); Guadalcanal, no closer locality, J. A. Kusche (4, BPBM); Isabel, Bisega, 29. II. 1962, P. Greenslade (2, BMNH; 1, HNHM ex BMNH); id., Tatamba, 0—50 m, 15. IX. 1964, R. Straatman (1, BPBM). — Malaita Divison: Malaita, 2—5 km N of Dala, 80—250 m, 22. V. 1964, J. M. Sedlacek (2, BPBM). — Western Division: New Georgia Group, Kolombangara, Hunda, 20. VIII. 1963, P. Greenslade (1, BMNH). — Doubtful record: Nouvelle Guinée, 1892 (2, MNHN).



Figs 41—42. Head of *Cryphaeus irregularis* (GEBIEN) ♂: 41 = frontal view, 42 = lateral view. — Figs 43—44. Head of *Cryphaeus vacca* ♂: 43 = frontal view, 44 = lateral view

Distribution — In the area investigated: Bismarck Archipelago (New Britain, New Ireland, Manus, Duke of York); Solomon Islands.

Remarks — The four-segmented club of antennae clearly separates this species from Melanesian congeners. It resembles very much *Cryphaeus gazella* (FABRICIUS, 1798) inhabiting South Asia eastwards to Maluku, but the latter has the pronotum arcuately tapering anteriorly.

Cryphaeus irregularis (GEBIEN, 1920)
(Figs 41—42, 45, 53—56)

Anthracias irregularis GEBIEN, 1920: 310 (described from Sattelberg and Simbang in New Guinea).

Diagnostic features — Black. Cranial surface coarsely, subcontiguously punctate. Epistoma with punctures a bit finer than those of cranium, very weakly emarginate with sinuate, upturned, nearly lobiform

canthi (Fig. 45). Antennal club three-segmented (Fig. 55). Pronotal sides arcuate, sinuate before protruding posterolateral angles; anterolateral angles also distinctly protruded (Fig. 56); PW/PL = 1.42; pronotal punctation coarse and dense. Punctural rows on elytra irregular; EL/EW = 2.13. Length 13.0—18.5 mm.

♂: Supraorbital horns short and stout, far from each other; subparallel to slightly diverging in frontal view (Fig. 41); pointing upwards in lateral view (Fig. 42). Dorsal cranial concavity practically absent. Aedeagus: see Figs 53—54.

♀: Supraorbital swellings weak. Cranial surface nearly plane between swellings (Fig. 45).

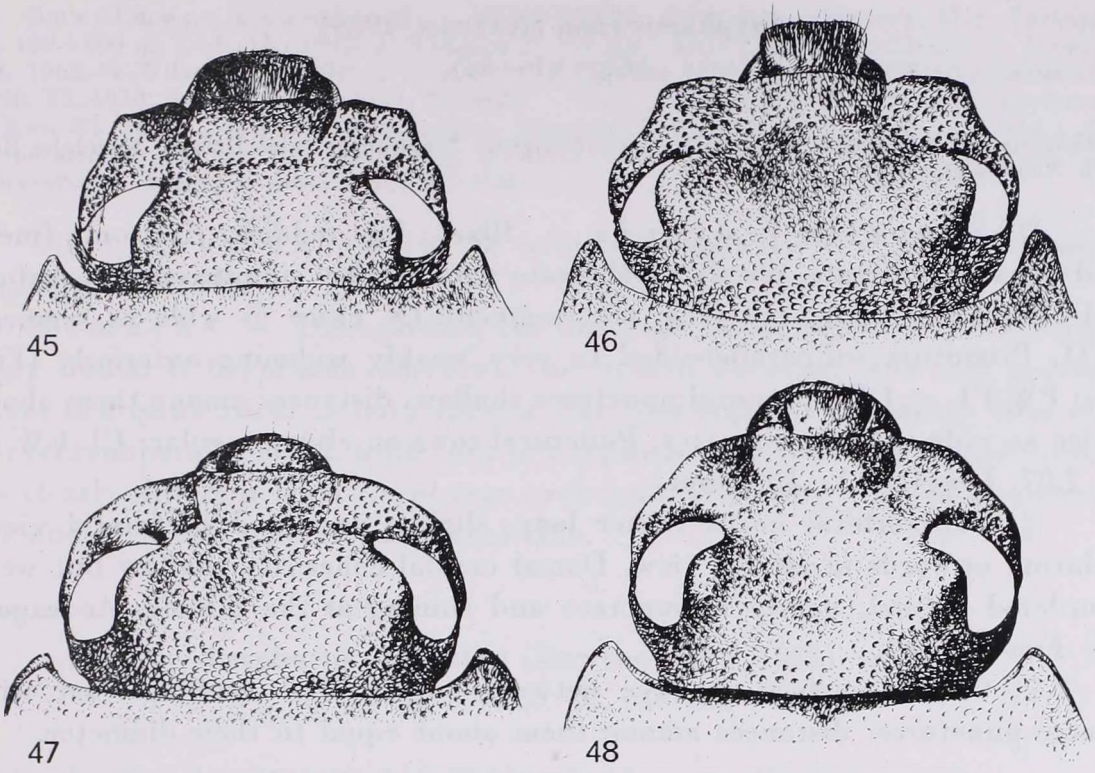
Specimens examined — INDONESIA. Irian Jaya Province: Iebele Camp, 2250 m, XI—XII. 1938, Neth.-Ind.-Amer. New Guinea Exp., L. J. Toxopeus (1, RNHN); Star Range, 1220 m, Bivak 36, 28. VII. 1959, Neth. New Guinea Exp. (1, RNHN); Wamena, 1700 m, 10—25. II. 1960, T. C. Maa (1, BPBM); Wisselmeren, Enarotadi, 1800—1900 m, 10. VIII. 1962, J. Sedlacek (1, BPBM); Wisselmeren, Houda, Kamo V., 13. VIII. 1955, J. L. Gressitt (1, BPBM). — PAPUA NEW GUINEA. Eastern Highlands Province: Kassem Pass, IX. 1971, R. Hornabrook (1, — Morobe Province: near Bainding Village, ca 3000', 14. III. 1967, in rainforest, T. L. Fenner (1, HNHM); Mt. Kaindi, Nami Ck., 1700 m, 22—30. VI. 1968, J. Sedlacek (1, BPBM); Saruwaged Gebirge, Ogerammang (2, HNHM); Sattelberg (3, MNHM; 1, HNHM ex MNHB); Wareo (4, MNHB; 1, HNHM); Wau, 1200 m, 26. VII. 1961, J. & J. H. Sedlacek (1, BPBM); id., 29. X. 1961, J. Sedlacek (1, BPBM); 1300 m, 26. VII. 1965, J. & M. Sedlacek (1, BPBM); 1700 m, 28. XII. 1961, J. & M. Sedlacek (1, BPBM); id., Kunai Ck., 1500 m, 28—30. V. 1963, P. Shanahan (1, BPBM). — Western Province: Fly R., Kiunga, 35 m, VIII. 1969, J. & M. Sedlacek (2, BPBM). — Western Highlands Province: Baiyer River, près Mount Hagen, 11. IV. 1969, Jolivet (1, MNHN); 16 km NW Banz, 1700—2100 m, 28—29. VI. 1963, J. Sedlacek (1, BPBM); Goiburung, E of Korn Farm, 1560—1650 m, 16. X. 1958, J. L. Gressitt (2, BPBM; 1, HNHM ex BPBM); Hagen, SE of Korn Farm, 16. X. 1958, at light, J. L. Gressitt (1, BPBM). — No more exact locality in New Guinea: (3, ZMUA).

Distribution — In the area investigated: New Guinea mainland.

Remarks — This is the largest of all described species of *Cryphaeus*.

Cryphaeus vacca sp. n.
(Figs 35, 43—44, 46, 57—60)

Description — Dull black, legs sometimes reddish; dorsal surface glabrous, interspaces of punctures microreticulate. Body relatively broad, moderately convex. Head coarsely and densely punctate; distances among punctures about equal to their diameter; punctures of cranium and epistoma subequal in size; epistoma straight anteriorly, with sinuate, upturned canthi (Fig. 46). Antennal club three-segmented (Fig. 59); segment IX nearly twice as wide as segment VIII. Mentum subcordiform. Pronotum moderately convex, distinctly transverse (Fig. 60); PW/PL = 1.53; with a weak midlongitudinal impression; sides arcuate, weakly sinuate just before posterolateral angles; anterolateral angles lobiformly protruded; pronotal punctures coarse



Figs 45—48. Head of ♀♀, dorsal view: 45 = *Cryphaeus irregularis* (GEBIEN), 46 = *Cryphaeus vacca* sp. n., 47 = *Cryphaeus nudicornis* (FAIRMAIRE), 48 = *Cryphaeus chevrolati* (MONTRUZIER)

and deep, distances among them various, but usually equal to puncture diameter. Elytra moderately elongate; EL/EW = 1.69; elytral punctures much finer than those of pronotum, irregularly scattered, in some places in elytral disc arranged in irregular rows. Ventral surface and legs without any modification. Length 8.8—10.5 mm.

♂: Supraorbital horns rather short and stout, situated far from each other; slightly diverging but apically incurved in frontal view (Fig. 43); pointing onwards in lateral view (Fig. 44). Cranium without distinct impressed concavity between horns. Aedeagus: see Figs 57—58. Habitus: see Fig. 35.

♀: Supraorbital swellings small, rounded; cranial surface nearly plane between swellings (Fig. 46).

Type specimens — Holotype, ♂, labelled as follows: "NEW GUINEA: NETH. Ifar, 400—550 m. June 23, 1959"; "T. C. Maa Collector BISHOP". Deposited in BPBM. — Paratypes (total 9 specimens). INDONESIA. Irian Jaya Province: Ifar, labelled as holotype (1 ♂, 3 ♀♀, BPBM; 1 ♂, 2 ♀♀, HNHM ex BPBM); Vogelkop, Kebar Val., W of Manokwari, 550 m, 4—31. I. 1962, light trap, S. &L. Quate (1 ♂, BPBM). — PAPUA NEW GUINEA. Western Province: Kiunga, 35 m, VIII. 1969, J. & M. Sedlacek (1 ♀, BPBM).

Distribution — New Guinea mainland.

Remarks — This species is closely related to *Cryphaeus irregularis*, but its size is much smaller, its pronotum and its elytra are broader and the supraorbital horns of the male are considerably more developed.

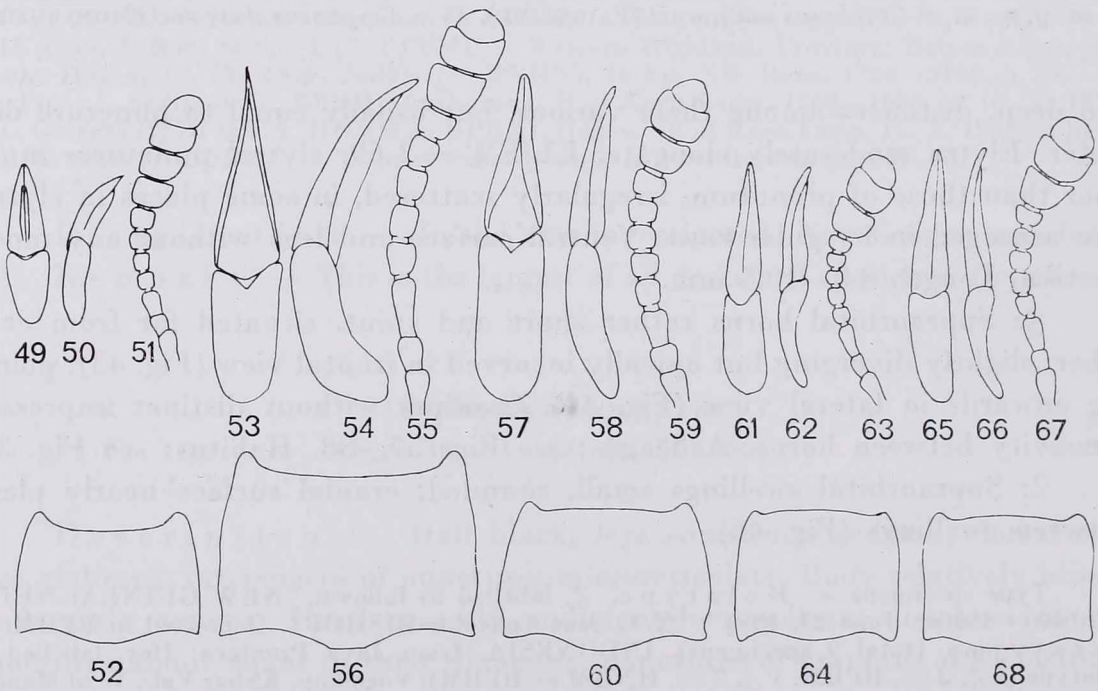
Cryphaeus biroi (KASZAB, 1939)
(Figs 61—64)

Anthracias Birói KASZAB, 1939: 225 (described from Stephansort and Erima, Astrolabe Bay in New Guinea)

Diagnostic features — Black; legs reddish. Epistoma finely and densely punctate, deeply emarginate with weakly sinuate canthi. Antennal club three-segmented (Fig. 63); segment IX twice as wide as segment VIII. Pronotum subparallel-sided to very weakly widening anteriorly (Fig. 64); PW/PL = 1.28; pronotal punctures shallow, distances among them about twice as wide as their diameter. Punctural rows on elytra regular; EL/EW = = 2.07. Length 7.1—10.1 mm.

♂: Supraorbital horns rather long, slightly incurved in frontal view; pointing onwards in lateral view. Dorsal cranial concavity shallow but well-bordered behind, nearly impunctate and shining at the middle. Aedeagus: see Figs 61—62.

♀: Cranial surface concave between supraorbital swellings; set with coarse punctures; distances among them about equal to their diameter.



Figs 49—52. *Cryphaeus nudicornis* (FAIRMAIRE): 49 = aedeagus, dorsal view, 50 = aedeagus, lateral view, 51 = antenna of ♂, 52 = pronotum. — Figs 53—56. *Cryphaeus irregularis* (GEBIEN): 53 = aedeagus, dorsal view, 54 = aedeagus, lateral view, 55 = antenna of ♂, 56 = pronotum. — Figs 57—60. *Cryphaeus vacca* sp.n.: 57 = aedeagus, dorsal view, 58 = aedeagus, lateral view, 59 = antenna of ♂, 60 = pronotum. — Figs 61—64. *Cryphaeus biroi* (KASZAB): 61 = aedeagus, dorsal view, 62 = aedeagus, lateral view, 63 = antenna of ♂, 64 = pronotum. — Figs 65—68. *Cryphaeus chevrolati* (MONTROUZIER): 65 = aedeagus, dorsal view, 66 = aedeagus, lateral view, 67 = antenna of ♂, 68 = pronotum

Specimens examined — INDONESIA. Irian Jaya Province: Ifar, Cyclops Mts., 400—800 m, 7—9. IX. 1962, J. Sedlacek (1, BPBM); Japen I., SSE Sumberbaba, Dawai R., X. 1962, N. Wilson (2, BPBM); I. Korido, 1878, Raffray & Maindron (2, MNHN); Samberi, 25—28. VI. 1910, S. G. Moszkowski (1, MNHB). — Papua NEW GUINEA. Madang Province: Kar Kar, XI. 1968 (2, RWHO); Stephansort, Astrolabe Bay, 1897, Biró (♂ lectotype and 1 ♂, 4 ♀♀, paralectotypes, herewith designated, HNHM); Erima, Astrolabe Bay, 1897, Biró (2 ♀♀, paralectotypes, herewith designated, HNHM).

Distribution — In the area investigated: New Guinea mainland; Japen; Korido.

Remarks — Disregarding the different colour pattern, this species is very similar to *Cryphaeus chevrolati*. The form of antennal club and aedeagus are nearly identical in both species. The pronotum of *Cryphaeus biroi* is, however, subparallel-sided, while that of *Cryphaeus chevrolati* is subcordiform. It is clearly different from *Cryphaeus nudicornis* in having a much slenderer body and a three-segmented antennal club.

Cryphaeus chevrolati (Montrouzier, 1855)
(Figs 36, 39—40, 48, 65—68)

Toxicum chevrolati Montrouzier, 1855: 30 (described from the Woodlark Island).

Diagnostic features — Black; pronotum cinnabarine red, often with a black midlongitudinal stripe widening anteriorly and posteriorly; antennae and legs black. Epistoma very finely punctured, deeply emarginate, with weakly sinuate canthi. (Fig. 48) Antennal club three-segmented (Fig. 67); segment IX nearly twice as wide as segment VIII. Pronotum subcordiform, i.e. slightly widening anteriorly and sinuate laterally before posterolateral angles (Fig. 68); PW/PL = 1.29; pronotal punctures small and shallow, distances among them several times larger than their diameter. Punctural rows on elytra regular; EL/EW = 2.11. Length 8.1—10.5 mm.

♂: Supraorbital horns rather long, slightly incurved in frontal view (Fig. 39); pointing onwards in lateral view (Fig. 40). Dorsal cranial concavity shallow but well-bordered behind, nearly impunctate and shining at the middle. Aedeagus: see Figs 65—66. Habitus: see Fig. 36.

♀: Cranial surface concave between supraorbital swellings; set with coarse punctures; distances among them variable but mostly about equal to their diameter (Fig. 48).

Specimens examined — INDONESIA. Irian Jaya Province: Baie de Geelwink, 1878, Raffray & Maindron (3, MNHN); Baie de Humboldt et Dorey, 1906, O. K. Pasteur (2, MNHN); Nabire, 5—50 m, 25. VIII.—2. IX. 1962, J. Sedlacek (3, BPBM; 1, HNHM ex BPBM); I. Salawati, 1878, Raffray & Maindron (1, MNHN); Vogelkop, Donowaria, 2. VI. 1959, T. C. Maa (1, BPBM); Vogelkop, Kebar Val., W of Manokwari, 550 m, 4—31. I. 1962, S. Quate (3, BPBM; 2, HNHM ex BPBM). — Maluku Province: Aru I., Ureiuning, 1884, C. Ribbe (2, MNHB); Key Is. (2, HNHM; 4, MNHB). — PAPUA NEW GUINEA. Central Province: Moroka, 2800 ft, IX. 1895, (1, HNHM). — East Sepik Province: Mailu, VII. 1895, Anthony (2, HNHM). — Morobe Province: Bulolo, 700 m, 26. XI. 1959, J. & M. Sedlacek

(1, BPBM); Eloa R., 1050 m. 30 m S Wau, J. H. Sedlacek (2, BPBM); Kuper Range, 200—700 m, 24. I. 1969, J. Sedlacek (1, BPBM); Markham River, 50 m, 20—25. I. 1962, J., J. H. & M. Sedlacek, G. Monteith & Native Collectors (2, BPBM). — Oro [= Northern] Province: Popondetta Dist., Jumbora, 23. X. 1963, P. Shanahan (1, BPBM). — Simbu [= Chimbu] Province:. Karimui, 1000 m, II. 1974, J. H. Sedlacek (1, HNHM). — Western Province: Kiunga, Fly river, 11—14. VII. 1957, W. W. Brandt (3, BPBM); id., 28—31. VIII. 1957 (1, BPBM); id., 1—3. IX. 1957 (2, BPBM); id., 35 m, VIII. 1969, J. M. Sedlacek (13, BPBM; 8, HNHM ex BPBM); Kiunga, 23. VII.—2. VIII. 1969, J. Balogh (1, HNHM); Oriomo Govt. Sta., 26—28. X. 1960, J. L. Gressitt (1, BPBM).

Distribution — In the area investigated: New Guinea mainland; Salawati; Woodlark (Montrouzier, 1855); Kai; Aru. Out of the area investigated: Damar I. near Halmahera (one specimen in HNHM); Amboina (four specimens in BPBM); Northern Queensland (two specimens in HNHM).

Remarks — The red pronotum makes this species unmistakable; there is no other species of *Toxicini* having similar colour pattern.

* * *

Acknowledgements — My sincere thanks are due to the curators and others mentioned in the "Presentation of data" for sending materials. I am indebted to Mr. János Pál for excellent production of Figs 2—17 and 35—48. I am also grateful to Dr. Dénes Balázs who provided me the most up-to-date map of Papua New Guinea.

REFERENCES

Blair, K. G. (1940): Coleoptera from the Caroline Islands. — Occ. Pap. B. P. Bishop Mus. **16** (6): 131—157.

Carter, H. J. (1914): Revision of the subfamily Tenebrioninae, family Tenebrionidae (Australian species: with descriptions of new species of Tenebrionidae and Cyphaleinae). — Proc. Linn. Soc. N.S.W. **39** (1): 44—86.

Fabricius, J. Ch. (1801): Systema eleutheratorum secundum ordines, genera, species adiectis synonymis, locis, observationibus, descriptionibus. I. — Kiliae: 506 pp.

Fairmaire, L. (1883): Essai sur les Coléoptères de l'Archipel de la Nouvelle-Bretagne. — Ann. Soc. ent. Belg. **27** (2): 1—58.

Gebien, H. (1920): Coleoptera Tenebrionidae. — Nova Guinea **13** (3): 213—500.

Gebien, H. (1938—42): Katalog der Tenebrioniden, Teil II. — Mitt. münch. ent. Ges. **28—32:** 370—744 [repaged].

Kaszab, Z. (1939): Tenebrioniden aus Neu-Guinea. — Nova Guinea (n. s.) **3:** 185—267.

Kaszab, Z. (1956): Neue Tenebrioniden (Coleoptera) aus der papuanischen und aus der indomalayischen Region. — Annls hist. - nat. Mus. natn. hung. (s. n.) **7:** 93—108.

Kaszab, Z. (1970): The Scientific Results of the Hungarian Soil Zoological Expeditions to New Guinea. Tenebrionidae (Coleoptera). — Annls hist. - nat. Mus. natn. hung. **62:** 257—280.

Kaszab, Z. (1985): Beiträge zur Kenntnis der pazifischen Tenebrioniden (Coleoptera). — Folia ent. hung. **46** (1): 23—63.

Klug, Fr. (1833): Bericht über eine auf Madagascar veranstaltete Sammlung von Insecten aus der Ordnung Coleoptera. — Berlin: 135 pp.

Latreille, P. A. (1802): Histoire naturelle, générale et particulière des Crustacés et des Insectes. III. — Paris: 476 pp. [Not seen].

Latreille, P. A. (1810): Considérations générales sur l'ordre naturel des animaux composant les classes des Crustacés, des Arachnides et des Insectes avec un tableau méthodique de leurs genres disposés en familles. — Paris: 444 pp.

Montrouzier, P. (1855): Essai sur la Faune de l'Ile de Woodlark ou Moiou. — Ann. Soc. imp. d'agr. de Lyon (ser. 2) **7** (1): 1—114. [Not seen].

Pascoe, F. P. (1866): Notices of new or little-known Genera and Species of Coleoptera. — J. Ent. London **2:** 443—493.

Schaufuss, L. W (1885): Beitrag zur Fauna der Niederländischen Besitzungen aus den Sunda-Inseln. — Horae Soc. ent. Rossiae **19:** 183—209.

Watt, J. Ch. (1974): A revised subfamily classification of Tenebrionidae (Coleoptera). — N. Zealand J. Zool. **1** (4): 381—452.

Acta Zoologica Hungarica 35 (3—4), pp. 255—293 (1989)

THIRTY-FIVE NEW HYDROPTILID SPECIES FROM VIETNAM (TRICHOPTERA, HYDROPTILIDAE)*

J. Oláh

Fish Culture Research Institute, H-5541 Szarvas, pf. 47, Hungary

(Received 20 April, 1988)

Thirty-five new hydroptilid species and one new genus from Vietnam are described and figured with detailed genital and thoracic drawings: *Stactobia bienda* sp. n., *S. thacla* sp. n., *S. trungcha* sp. n., *S. banra* sp. n., *Plethus sigiama* sp. n., *P. banchaia* sp. n., *P. roreta* sp. n., *P. toana* sp. n., *Chrysotrichia choliona* sp. n., *C. monga* sp. n., *Catoxyethira vedonga* sp. n., *Scelotrichia thingana* sp. n., *S. toira* sp. n., *S. rincorama* sp. n., *S. thunama* sp. n., *Microptila hintama* sp. n., *M. xepada* sp. n., *Vietrichia* gen. nov., *Vietrichia linghia* sp. n., *Ugandatrichia hairanga* sp. n., *U. honga* sp. n., *U. sanana* sp. n., *Hydroptila thiba* sp. n., *H. gaya* sp. n., *H. thisa* sp. n., *H. thaphena* sp. n., *H. thuna* sp. n., *H. gapdoi* sp. n., *H. ngaythibaya* sp. n., *H. sidong* sp. n., *H. giama* sp. n., *Oxyethira datra* sp. n., *Orthotrichia luonga* sp. n., *O. momanga* sp. n., *O. bencana* sp. n., *O. suchiara* sp. n., *Oxyethira bogambara* Schmid known from Sri Lanka, *Orthotrichia indica* Martynov known from Burma and Sri Lanka and *Orthotrichia tragetti* Mosely known from Palearctis have been recorded from Vietnam. With 38 (155) original figures.

Introduction — This is my third paper on caddisflies of Vietnam based upon the material which I collected during three trips in this still very neglected area. The details of the collecting trips have already been published (Mahunka & Oláh 1986, Oláh 1987). Altogether thirty-eight hydroptilid species were collected and only three species were previously known. Thirty--five species and one genus are new and their descriptions follow. All the types are deposited in the Hungarian Natural History Museum, Budapest. Right wings of holotypes are mounted as dry microscopic preparations. Caustic--potash treated abdomen of holotypes and the remaining parts of their bodies are stored separately in single air-tight vials filled with 70% ethanol.

Stactobia bienda sp. n.
(Fig. 1)

Male (in alcohol). Uniform small dark animal. Forewing 1.6, hindwing 1.4 mm. Head and thoracic structures typical for the genus. Antennae 18--segmented. Foreleg tibiae have no spurs. Spur formula 024. This is the second species of the genus having no spurs on the foreleg tibiae.

* Hungarian zoological studies in Vietnam, No. 10.

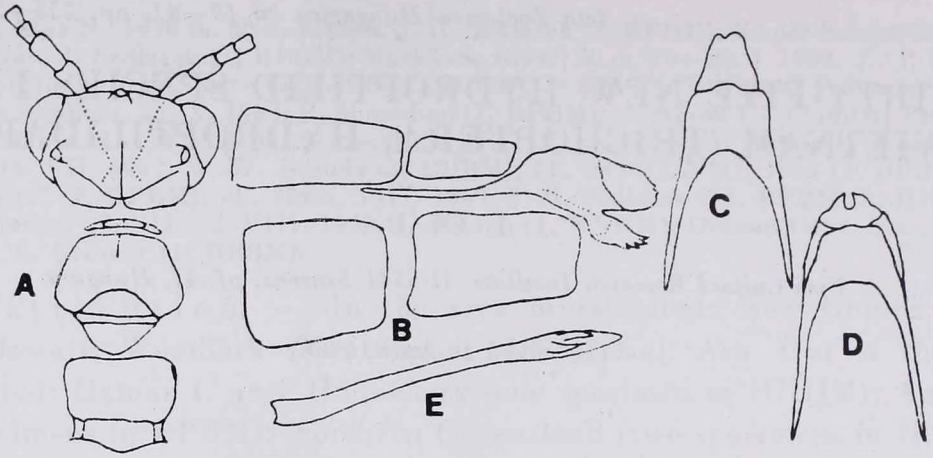


Fig. 1. *Stactobia bienda* sp. n.: A = head and thorax, dorsal, B = male genitalia, lateral, C = dorsal, D = ventral, E = phallic apparatus, lateral

Male genitalia — Seventh sternite has no ventral process. Eighth sternite several times enlarged compared to its tergite. Ninth tergite subtriangular with long anterior apodeme. Its ventral margin heavily sclerotized, directed to inferior appendages. Inferior appendages triangular in lateral aspect bearing several small, strong spines. As seen in ventral aspect, the appendages fused, their distal ends separated, forming a circular excision. Tenth segment forms a membraneous hood over the phallic apparatus, which is a simple tube with almost invisible spine-like processes subapically.

This is the only *Stactobia* species which has no ventral process on the seventh sternite. This process had a diagnostic value for the genus. However, the head and thoracic structures, and especially the resemblance of the genitalia to *S. thacla*, however, clearly relate this species to the genus Stactobia. The lack of ventral process can be observed in other hydroptilid genera, as well. The disappearance of this process inspired me to name this species. To disappear: biendi in Vietnamese.

Holotype ♂: Vietnam, Cucphuong, 400 m a.s.l. 18. X. 1986. Singled along a karstic spring brook. — 3 ♂ paratypes, same data as holotype.

Stactobia thacla sp. n.
(Fig. 2)

Male (in alcohol). Uniform dark animal. Forewing 1.4, hindwing 1.1 mm. Antennae 18-segmented. Spur formula 024. There is no spur on the foreleg tibia neither of the holotype nor of the paratype, although examined very carefully after caustic potash treatment and at higher magnification. This is the third species of the genus having no spurs on the foreleg tibiae. Only *S. radovanovici* Schmid was known so far with spur formula 024.

Male genitalia — Seventh tergite and sternite equal in size. The process on sternite more slender, not dilated distally. Eighth tergite small, somewhat elongate. Eighth sternite well developed, robust, its distal margin densely stocked with long, stout spines. It seems to serve the function of ninth sternite which is completely reduced. Ninth tergite subtriangular and

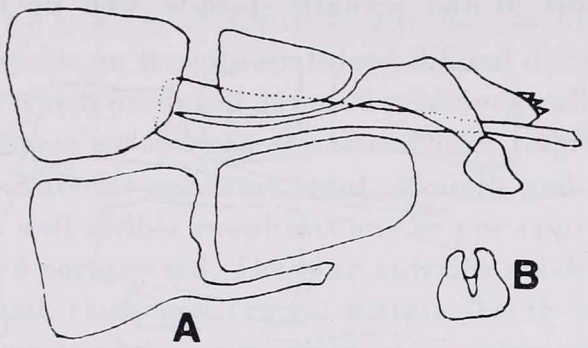


Fig. 2. *Stactobia thacla* sp. n.: A = male genitalia, lateral, B = inferior appendages, ventral

not rectangular like in *S. trungcha*. Its anteriolateral apodeme upcurving, not straight. There is no posterio-lateral apophysis. The whole posterior body of the tergite produced downward giving support for the inferior appendages. Tenth tergite forms a membraneous hood over the phallic apparatus bearing some small spines distally. Inferior appendages strongly sclerotized, subreniform in lateral aspect. Fused basally and forming a deep circular excision distally. No additional process attached. Phallic apparatus simple tube broadening anteriad.

This tiny black caddisfly was flying together with *S. trungcha* at the upper region of Quang Chu stream. However, their population was very small. A total of 109 specimens of *Stactobia* were collected during two days by sweeping the vegetation along the stream. Only two specimens belonged to this species, while the other 107 specimens represented the dominant *S. trungcha*. *Stactobia thacla* belongs also to the *nielseni*-group and it is close to *S. trungcha* and especially to *S. bienda*. The differences are well defined especially in the form of ninth tergite and inferior appendages. In *S. bienda* the ventral process on seventh sternite has been lost, the inferior appendages are supplied with short strong spines and the tenth segment has no spines. I named this species using the Vietnamese word for stream: thac la.

Holotype ♂: Vietnam, Bac Thai Province, Quang Chu village, 24—25. V. 1987. Singled along the upper part of the main stream of the village. — 1 ♂ paratype, same data as holotype.

Stactobia trungcha sp. n.
(Fig. 3)

Male (in alcohol). General colour piceous. Forewing 1.2, hindwing 1.0 mm long. Antennae 18-segmented. Spur formula 124.

Male genitalia — Seventh tergite and sternite almost equal, regular. The process of the seventh sternite well developed with slightly

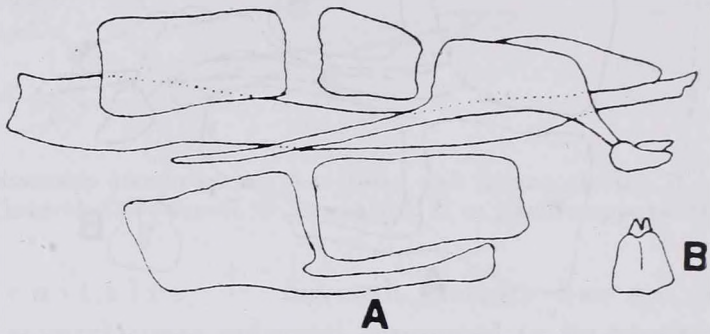


Fig. 3. *Stactobia trungcha* sp. n.: A = male genitalia, lateral, B = inferior appendages, ventral

dilated apex. Eighth tergite small, about half of the eighth sternite. Both without pronounced apodeme. However, the distal border of the eighth sternite stocked with stout, strong and long spines reaching the end of the small inferior appendages.

Ninth tergite almost rectangular in lateral aspect with a pair of long straight anterio-lateral apodeme, almost twice as long as the tergite itself. The ninth tergite produced also into a shorter posterio-lateral pair of apodeme or apophysis giving support for the small inferior appendages. Ninth sternite almost reduced, any structure below the pleural area hardly visible. Ninth tergite deeply excised in dorsal aspect. Tenth tergite forming a long membraneous hood over the phallic apparatus and covering the deep excision of the ninth tergite. Inferior appendages small, fused, a pair of small process with ventrally divided lips located on dorsal position. Phallic apparatus simple rod, narrowing distally.

This small black animal was very abundant at the upper region of Quang Chu stream. Due to the enlarged eighth sternite and the absence of any visible subgenital appendages, as well as to the general form of the ninth tergite, this species belongs to the nielseni-group. The form and arrangement of the inferior appendages and the simplified phallic apparatus differentiate it from the known species of the group. The general deltoid configuration of these small animals running zig-zag underneath the leaves inspired me to give their name. Delta: trungchan in Vietnamese.

Holotype ♂: Vietnam, Bac Thai Province, Quang Chu village 24—25. V. 1987. Singled along the upper part of the main stream of the village. At the end of the dry season the only stream with water in the area. — A total of 106 ♂ paratypes, same data as holotype.

Stactobia banra sp. n.
(Fig. 4)

Male (in alcohol). Medium size dark *Stactobia*. Forewing 1.9, hindwing 1.7 mm. Antennae 18-segmented. Spur formula 024. This is the fourth species in the genus without spur on the foreleg tibia.

Male genitalia — Seventh tergite half as broad as sternite in lateral aspect. The process on sternite spatulate, dilated distally. Eighth tergite smaller than sternite which produced anteriad medioventrally, reaching almost the origin of the process on seventh sternite. Ninth tergite most developed among the sclerites. Anterior apodeme stout, straight and much longer than the tergite itself. No well visible apophysis on the posterioventral corner. The tergite itself produced cornerward. The long anterior apodeme continues into the strongly sclerotized, thickened ventral margin. Tenth segment sclerotized forming downward curving lobes surrounding the rather robust phallic apparatus. Inferior appendages reniform laterally with more sclerotized ventral hump. Their shape is similar also in ventral aspect. They are well separated. Subgenital appendages present but very small and almost completely fused except their ventral tip. Phallic apparatus considerably developed and armed with long, slender ventral and stout curved subterminal spines.

Because of the thickened tenth segment and somewhat backward located inferior appendages this species belongs to the *martynovi*-group. This is the first species in this group without spur on foreleg tibia. The other three species, *S. radovanovici* Schmid, *S. thacla* sp. n. and *S. bienda* sp. n. without

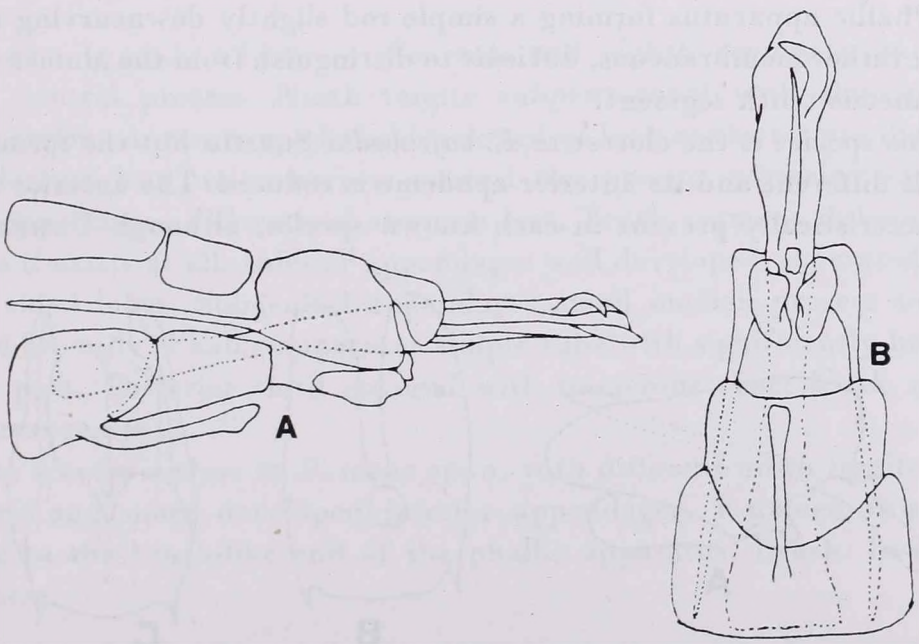


Fig. 4. *Stactobia banra* sp. n.: A = male genitalia, lateral, B = ventral

this spur belong to the *nielseni*-group. Within the *martynovi*-group *S. banra* resembles to *S. martynovi*, but subgenital appendages, inferior appendages and phallic apparatus differ. I name this species to remember the trickling water of the tiny spring on the steep stony wall with its typical madicolous habitat. Spring: ban ra in Vietnamese.

Holotype ♂: Ha Son Binh Province, Vietnam, Hoa Binh, 31. I. 1986. Singled at a small spring waterfall. — 2 ♂ paratypes same data as holotype.

Plethus sigiama sp. n.
(Fig. 5)

Male (in alcohol). Small dark animal. Forewing 1.7, hindwing 1.3 mm. Head and thoracic structures similar to *Stactobia*. Postoccipital lobes somewhat shorter however. Antennae 18-segmented. Spur formula 123 and not 023 as known for all described species of the genus. The spur on foreleg tibia is well developed and clearly visible.

Male genitalia — Seventh and eighth segments unmodified without ventral process. Ninth tergite subtriangular laterally. Anterior apodeme reduced into a small tapering process. The tergite deeply cut dorsally forming two long lobes with a spherical sinus at their basement. Ninth sternite lost. Inferior appendages robust lobes as visible both in lateral and ventral aspects. Both ninth tergite and inferior appendages heavily sclerotized and cover invisible, small subgenital appendages. However, these have particular shape as visible from beneath, especially if inferior appendages removed backward. Phallic apparatus forming a simple rod slightly downcurving anteriad. Its apex rather membraneous, difficult to distinguish from the almost vestigial, membraneous tenth segment.

This species is the closest to *P. vajrabodhi* SCHMID but the form of ninth tergite is different and its anterior apodeme is reduced. The anterior apodeme is characteristically present in each known species, although ULMER's draw-

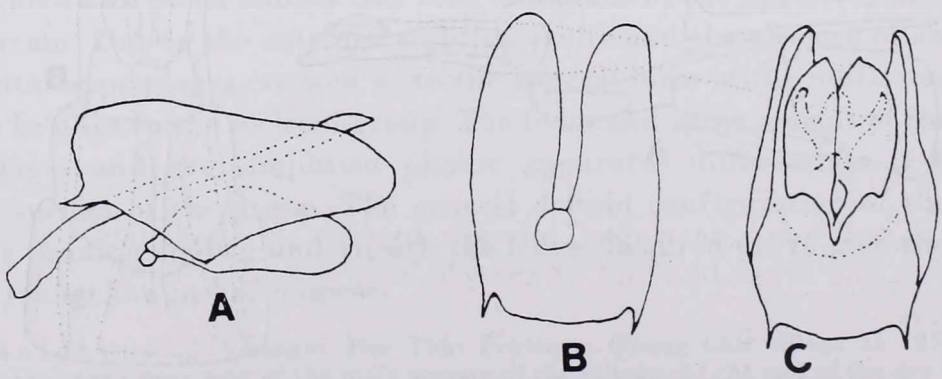


Fig. 5. *Plethus sigiama* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral

ings are not informative enough. I name the species accordingly. Reduction: si giam in Vietnamese.

Holotype ♂: Vietnam, Hoabinh, Ha Son Binh Province, 27. X. 1986. Singled at a small spring waterfall.

Plethus banchaia sp. n.
(Fig. 6)

Male (in alcohol). Dark animal. Alive shining black. Antennae 18-segmented. Forewing 2, hindwing 1.8 mm. Spur formula 123 deviating from the known, described species, but similar to other species described here.

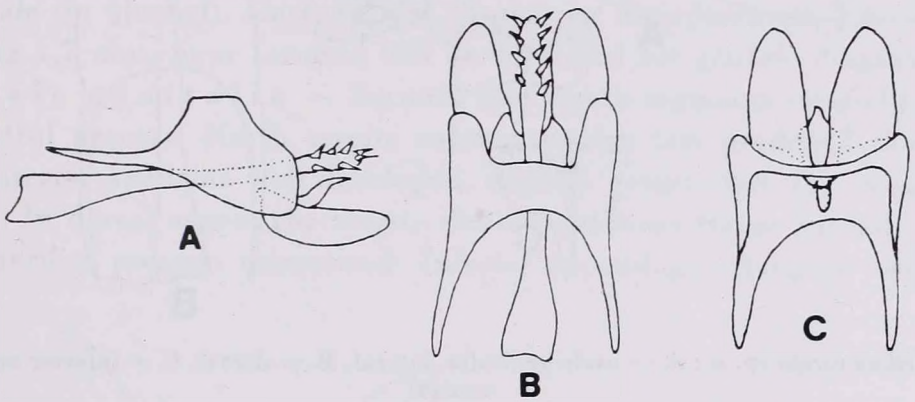


Fig. 6. *Plethus banchaia* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral

Male genitalia — Seventh and eighth segments unmodified without ventral process. Ninth tergite subpentagonal with sinuous dorso--apical portion. Anterior apodeme developed as long as the tergite itself. Half of the dorsum lost and a narrow ventral rim present posteriad supporting inferior appendages. Sclerotized sternum lost. Tenth segment dubious, membraneous if exists at all. Inferior appendages well developed, separated, almost parallel sided lobes. Subgenital appendages small median process somewhat S-shaped laterally. Phallic apparatus simple tube with significantly broadened anterior part. Posterior third covered with numerous short black spines in linear arrangement.

The species is close to *P. toana* sp. n. with different ninth tergite, phallic apparatus and more developed inferior appendages. I named this species referring to the brush-like end of the phallic apparatus. Brush: ban chai in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 1300 m a.s.l. 11. X. 1986. Singled at the main stream. The animal was sitting underneath a palm leaf.

Plethus roreta sp. n.
(Fig. 7)

Male (in alcohol). Dark animal. Alive shining black. Antennae 18-segmented. Forewing 1.9, hindwing 1.6 mm. Spur formula 123.

Male genitalia — Seventh and eighth segments unmodified without ventral process. Ninth tergite rounded ovoid with long anterior apo-

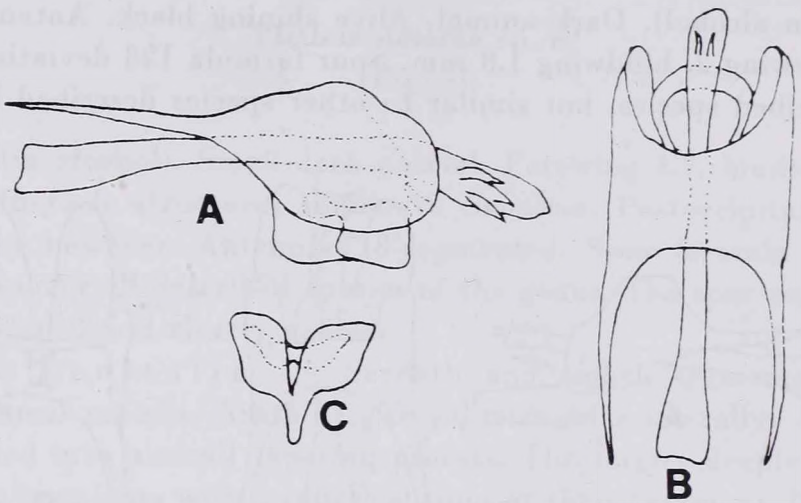


Fig. 7. *Plethus roreta* sp. n.: A = male genitalia, lateral, B = dorsal, C = inferior appendages, ventral

deme which forms an unusually thin ending. Most of the dorsum present and sclerotized but a deep half spherical excision posteriad. Sclerotized ninth sternite present. Inferior appendages heavily sclerotized, rectangular. Separated lobes join basally into a long median apodeme which ends with a spherical small ventrally flattened plate. Superimposing the lobes of the inferior appendages a dark heavily sclerotized transverse band visible below the ventral portion of the ring-like subgenital appendages. Subgenital plate forming a chitinized complete ring around the phallic apparatus. The ventral portion of this ring broadened, more developed. Phallic apparatus tube-like with spine-like, less sclerotized inclusions in its distal part.

This abundant *Plethus* species is closer to *P. bodikaruwa* SCHMID but its ninth tergite is rounded ovoid and not long. It also differs in all structural parts of genital apparatus. When I first examined the *Plethus* material from Vietnam, I had trouble with the generic status of species having spur formula of 123 instead of 023 described for all of the known species. However, accepting the general interpretation of spur formula and wing venation features as being less important in generic diagnosis, and at the same time giving more importance to more reliable features such as male and female genitalia, head and

thoracic structures, the position of these species becomes evident in the genus *Plethus*. This inspired me to name the first collected species accordingly. Evident: roret in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 1300 m a.s.l. 21. I. 1987. Singled at the main stream. — 1 ♂ paratype. Same data as holotype. 2 ♂ paratypes. Same stream, 11. X. 1987. Singled along main stream. Animals were sitting under leaves or running zig-zag on the upper surface of leaves. 7 ♂ paratypes. Singled at the big waterfall of the same stream, 16. X. 1986. 1 ♂ paratype. Singled at a small left tributary of the same stream, 10. V. 1987. 7 ♂ paratypes. Singled at the waterfall of the same stream, 11. V. 1987.

Plethus toana sp. n.
(Fig. 8)

Male (in alcohol). Dark animal. Antennae 18-segmented. Forewing 1.9, hindwing 1.7 mm. Spur formula 023 as described for generic diagnosis.

Male genitalia — Seventh and eighth segments unmodified without ventral process. Ninth tergite subrectangular but produced dorsoposteriad. Anterior apodeme well developed, slightly longer than the tergite itself, straight. In dorsal aspect the tergite clearly quadrate frame without dorsum. Ninth sternite present, sclerotized. Inferior appendages elongate lobes, sepa-

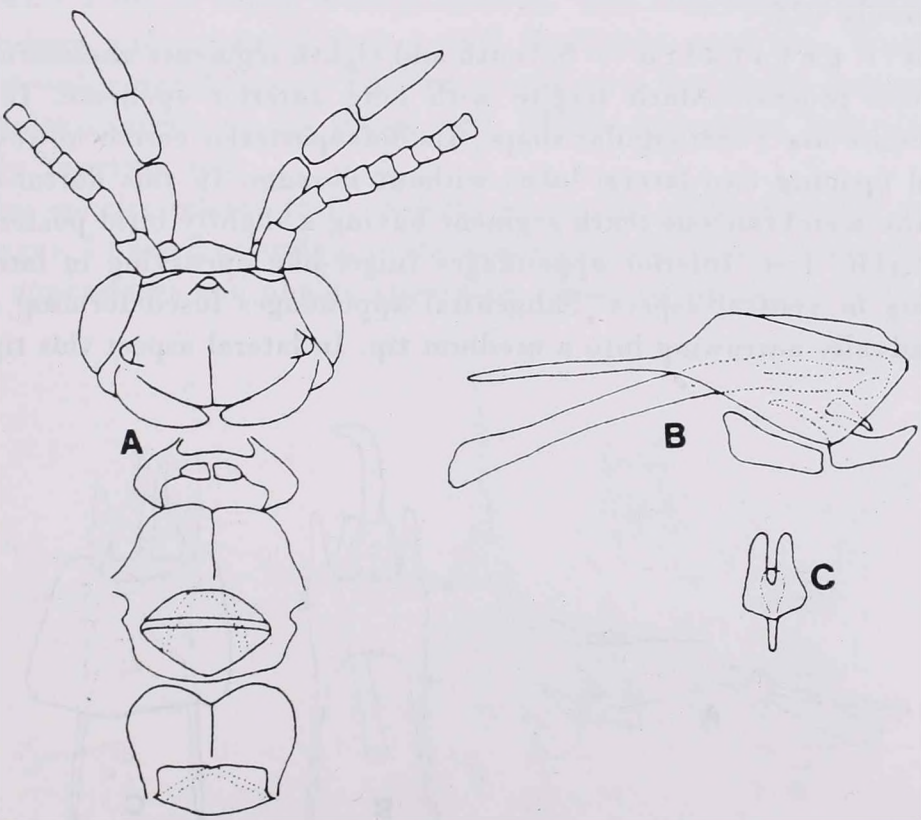


Fig. 8. *Plethus toana* sp. n.: A = head and thorax, dorsal, B = male genitalia, lateral, C = = inferior appendages, ventral

rated, their base fused and produced into a well developed median apodeme. Subgenital appendages present, small, paired, partially fused lobes inside the ninth tergite. Tenth segment present membraneous covering the empty dorsum of the ninth tergite. Phallic apparatus tube-like, broadened anteriad. Its distal third enlarged, membraneous, a sclerotized dorsoventrally flattened concave plate located at its ventral tip. It seems however to be attached to the lateral walls of the ninth tergite.

This species is close to *P. cruciatus* ULMER from Sumatra but the form of inferior appendages different and its anterior apodeme on ninth tergite is much longer. I named this species referring to the nice quadratic configuration of the dorsal frame of the ninth tergite. Quadrate: toana in Vietnamese.

H o l o t y p e ♂: Vietnam, Tamdao, 1300 m a.s.l. 11. X. 1986. Singled along the main stream. The animal was resting on a stone exposed to sun. — 1 ♂ p a r a t y p e same data as holotype. The second paratype ♂ was collected next year, 10. V. 1987, along the same stream.

Chrysotrichia choliona sp. n.
(Fig. 9)

Male (in alcohol). Small dark animal. Forewing 1.5, hindwing 1.2 mm. Spur formula 024.

M a l e g e n i t a l i a — Seventh and eighth segments unmodified without ventral process. Ninth tergite with long anterior apodeme. In lateral aspect tergite has a rectangular shape. Its dorsoposterior corner however very produced forming two lateral lobes without dorsum. In this dorsal excision located the membraneous tenth segment having a slightly bifid posterior end. Ninth sternite lost. Inferior appendages finger-like upcurving in lateral and outcurving in ventral aspect. Subgenital appendages fused forming a broad plate gradually narrowing into a medium tip. In lateral aspect this tip down-

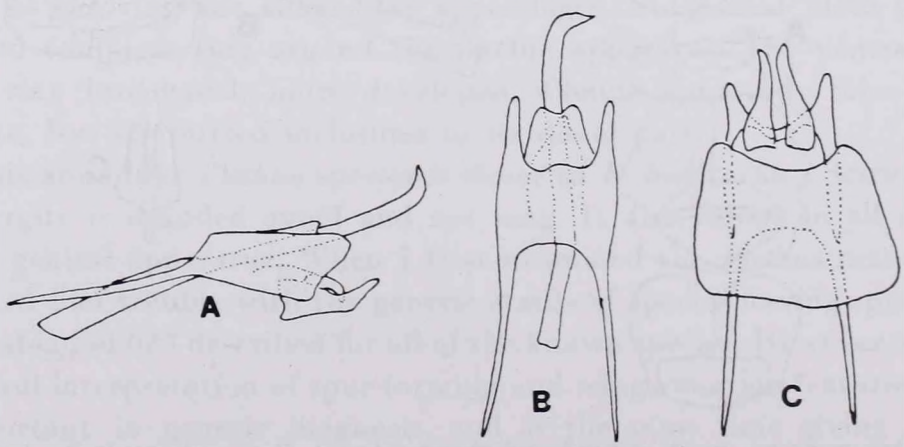


Fig. 9. *Chrysotrichia choliona* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral

curving. Phallic apparatus a simple rod, its tapering distal end rectangularly curved.

This species is similar to *C. monga* sp. n., but with well developed and visible subgenital appendages. Its ninth tergite and phallic apparatus are formed differently. Its name refers to the curved apex of the phallic apparatus. Curve: cho lion khuc in Vietnamese.

Holotype ♂: Vietnam, Son La Province, Moc Chau, 24—26. X. 1986. Singled at a spring brook.

Chrysotrichia monga sp. n.
(Fig. 10)

Male (in alcohol). Small dark animal. Forewing 1.3, hindwing 1.1 mm. Spur formula 024.

Male genitalia — Seventh and eighth segments unmodified without ventral process. Ninth tergite with a long anterior apodeme, almost three times longer than the tergite. Tergite produced at the ventroposterior corner bearing long spines on the very tips. Ninth sternite completely lost. Inferior appendages long slender finger-like paired process attaching to the ninth tergite with a dorsal hump around midway. This finger-like processes fused at their base and produced into a well developed apodeme. Tenth tergite almost invisible membraneous forming a hood over the phallic apparatus with an irregular excision on its dorsal end. Phallic apparatus long simple but gradually tapering rod.

This species related to *C. choliona* sp. n. but without visible subgenital appendages. I named according to the long structural units: anterior apodeme, inferior appendages and phallic apparatus. Long: mong moi in Vietnamese.

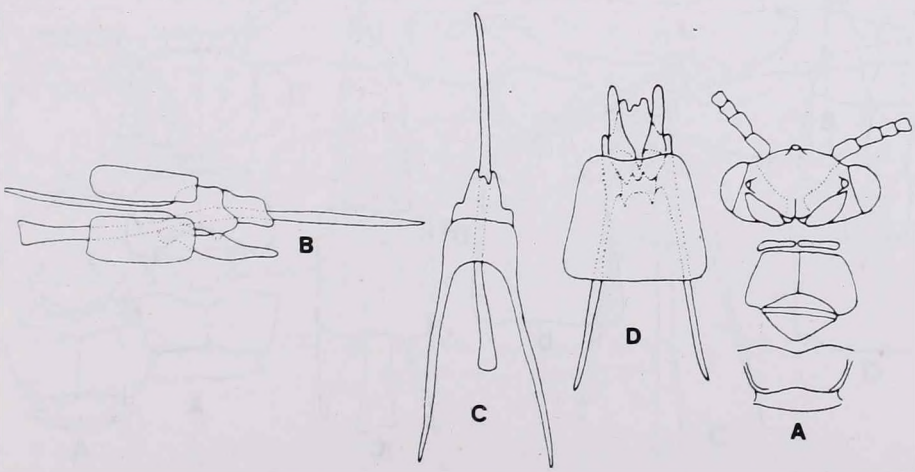


Fig. 10. *Chrysotrichia monga* sp. n.: A = head and thorax, dorsal, B = male genitalia, lateral, C = dorsal, D = ventral

Holotype ♂: Vietnam, Cucphuong, 400 m a.s.l. 18. X. 1986. Singled at a small karstic spring brook. 1 ♂ paratype. Vietnam, Bac Thai Province Quang Chu, 24—25. V. 1987. Singled at the upper part of the main stream of the village.

Catoxyethira vedonga sp. n.
(Fig. 11)

Male (in alcohol). Small dark animal. Forewing 1.9, hindwing 1.6 mm. Antennae 18-segmented. Spur formula 134.

Male genitalia — Eighth tergite quadrangular from above. Eighth sternum more enlarged. Its apico-mesal margin produced into a medium long robust process pointed in lateral and blunt in ventral aspects. From the side its upper apical angle produced first forwards then with a sharp angle backwards into a long spine running parallel with the phallic apparatus inside the half tube-like long hood of the membraneous tenth segment. These spines somewhat longer than the tenth segment. Ninth tergite long triangular, gradually narrowing into the anterior apodeme and the posterio-ventral body. Inferior appendages sinuous downcurving with ventrally bilobed apex. Phallic apparatus simple tube which broadened anteriorly and having a downcurving pointed apex.

The genus is known from Africa with six species. This is its first occurrence from another continent. The generic diagnosis is evident on the basis of spur formula, head and thoracic structure and especially according to the peculiarities of the very specialized genital structures which is the main diagnostic feature of the genus. However, this new species is different from all known African species in the details of the genital structures. *Hydroptila*

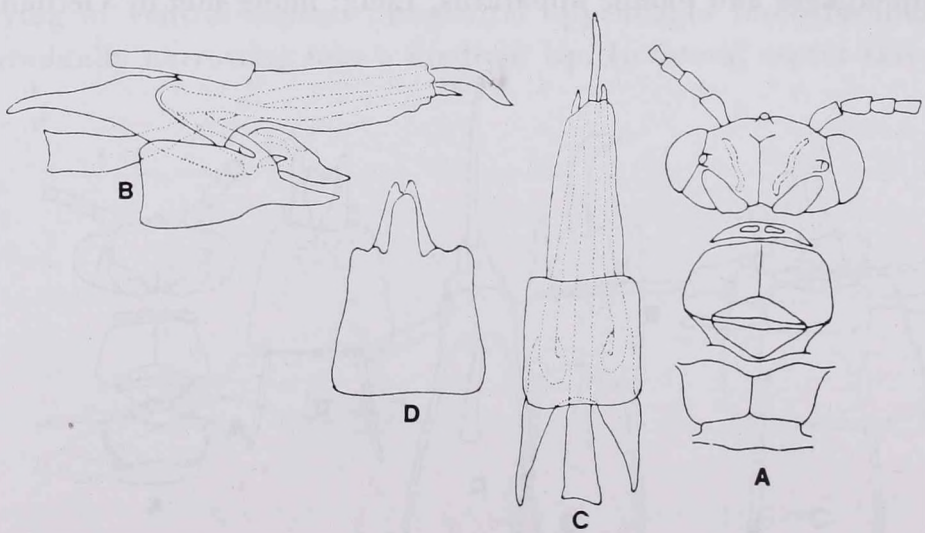


Fig. 11. *Catoxyethira vedonga* sp. n.: A = head and thorax, dorsal, B = male genitalia, lateral, C = dorsal, D = ventral

formosae IVATA from Taiwan was described from the larva and case only and recently transferred to the genus *Catoxyethira* until examination of additional material including adults can establish its true identity. The discovery of my new *Catoxyethira* species from Vietnam supports the generic status of *C. formosae* as well. The valid occurrence of the genus in the Oriental inspired me to name this species. Eastern: ve phiong dong in Vietnamese.

Holotype ♂: Vietnam, Cucphuong, 400 m a.s.l. 18. X. 1986. Singled along a karstic spring brook in the rainforest of the national park. — 1 ♂ paratype. Same data as holotype.

Scelotrichia thingana sp. n.
(Fig. 12)

Male (in alcohol). Small black animal. Forewing 1.8, hindwing 17.0 mm. Antennae 18-segmented. Spur formula 024. There is no visible small process on fore tibiae.

Male genitalia — Ninth tergite triangular in lateral aspect, rounded quadrangular in dorsal aspect without posterior excision. Anterior apodeme two and a half times longer than the tergite itself. The basic structure of the inferior appendages similar to *S. toira*, but the dorsoapical corner without process. Tenth tergite almost invisible. Phallic apparatus simple.

Species close to *S. toira* but ninth tergite triangular, phallic apparatus without distal spines or processes. This is the smallest *Scelotrichia* species and I named it accordingly. Minute: thingan in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 200 m a.s.l. 12. X. 1986. Singled in dark shadow among bushes at the main stream collecting the tributaries from the high mountains of Tamdao. — 36 ♂ paratypes, 21. I. 1986. 19 ♂ paratypes, 11. X. 1986. 4 ♂ paratypes, 16. X. 1986. 6 ♂ paratypes 10. V. 1987. Along the main stream of Tamdao.

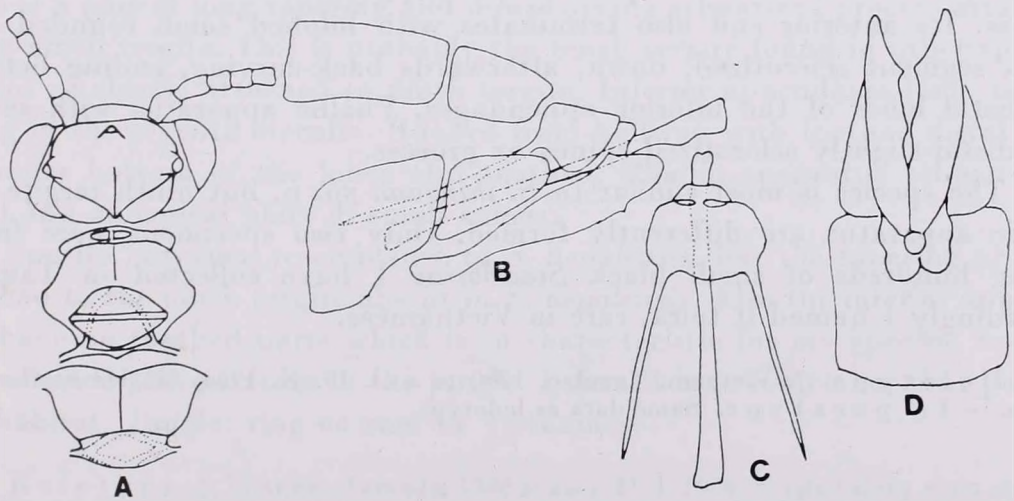


Fig. 12. *Scelotrichia thingana* sp. n.: A = head and thorax, dorsal, B = male genitalia, lateral, C = dorsal, D = ventral

Scelotrichia toira sp. n.
(Fig. 13)

Male (in alcohol). Medium size dark animal. Forewing 2, hindwing 1.9 mm. Spur formula 024. The small process on fore-tibiae invisible.

Male genitalia — Ninth tergite rounded posteriorly in lateral aspect and excised half spherically in dorsal aspect. Anterior apodeme almost

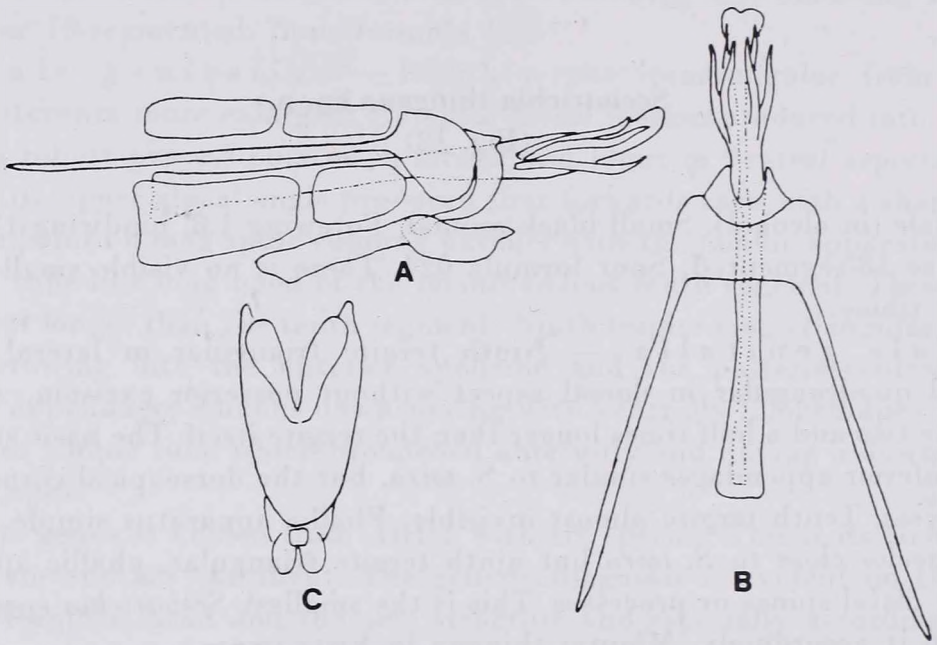


Fig. 13. *Scelotrichia toira* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral

four times longer the tergite itself. Inferior appendages enlarged, terminating on seventh sternite, bilobed distally and supplied with a small dorsoapical process. Its anterior end also terminates with bilobed small rounded unit. Tenth segment sclerotized, down, afterwards back-curving, ending between the distal lobes of the inferior appendages. Phallic apparatus with several long distal slightly sclerotized spines or process.

The species is most similar to *S. thingana* sp. n. but ninth tergite and phallic apparatus are differently formed. Only two specimens were found, among hundreds of small black *Stactobiini* I have collected in Tamdao. Accordingly I named it toira, rare in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 1300 m a.s.l. 15. X. 1986. Singled at the main stream. — 1 ♂ paratype. Same data as holotype.

Scelotrichia rincorama sp. n.
(Fig. 14)

Male (in alcohol). Largest species in the genus found in Vietnam. Dark, Forewing 2.4, hindwing 2 mm. Antennae 18-segmented. Spur formula 024. There is no visible small process on fore tibiae even after caustic potash clearkance and under higher magnification.

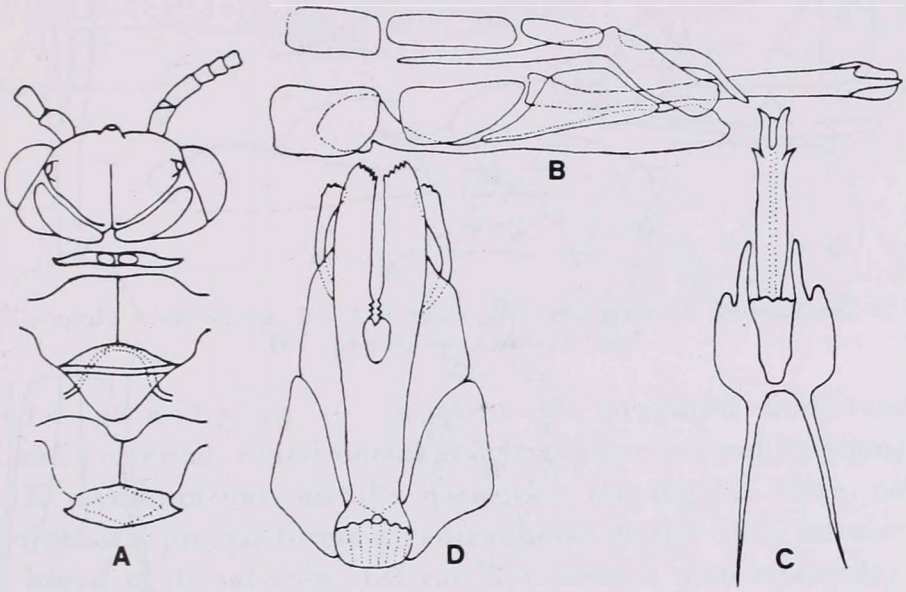


Fig. 14. *Scelotrichia rincorama* sp. n.: A = head and thorax, dorsal, B = male genitalia, lateral, C = dorsal, D = ventral

M a l e g e n i t a l i a — Ninth tergite elongated and deeply excised on dorsum. Anterior apodeme moved median-ward usually lateral in other species. There is a pair of long tapering and downcurving sclerotized process attached to the ninth tergite. This is probably the tenth tergite found in other species but not so clearly attached to ninth tergite. Inferior appendages long, terminating in the seventh sternite. Bilobed from halfway with toothed distal end. The inner bottom of the lobes also toothed. Phallic apparatus robust with apical and subapical pairs of small spines.

Species has some resemblance to *S. nepalensis*, but the tapering process attached to the ninth tergite absent in *S. nepalensis*. Also the inferior appendages have no toothed parts which is so characteristic for my species. Species was collected along stream in the jungle. I named it to remember that particular habitat. Jungle: ring co ram in Vietnamese.

H o l o t y p e ♂: Vietnam, Tamdao, 1300 m a.s.l. 21. I. 1986. Singled along main stream. — 2 ♂ p a r a t y p e s, same data as holotype. 5 ♂ paratypes, 16. X. 1986. 4 ♂ paratypes, 10. V. 1987. Along the same stream.

Scelotrichia thunama sp. n.
(Fig. 15)

Male (in alcohol). Medium size dark animal. Forewing 2.1, hindwing 2 mm. Antennae 18-segmented. Spur formula 024. I was unable to detect any small reduced subspherical process on fore-tibiae.

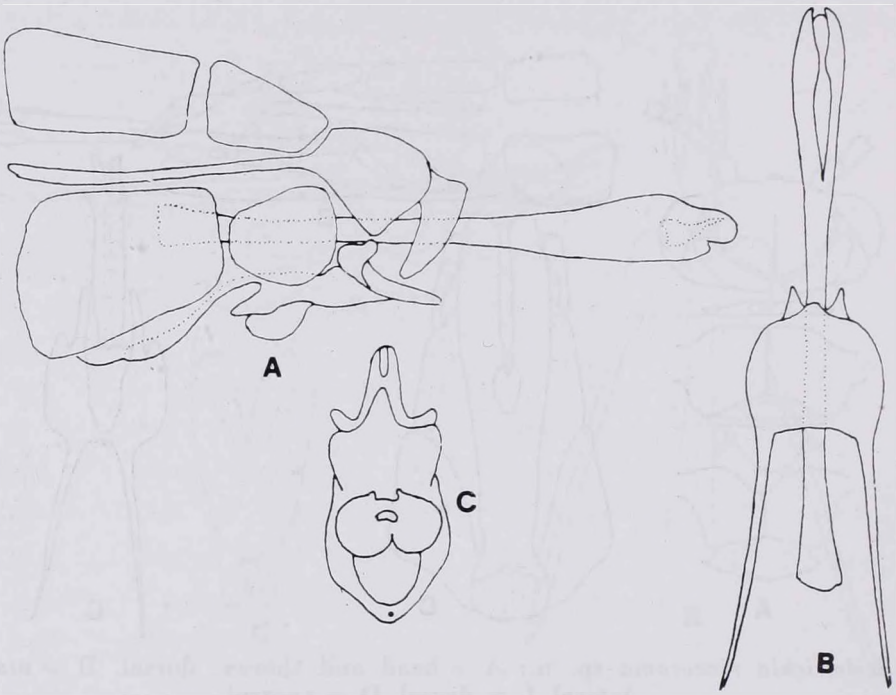


Fig. 15. *Scelotrichia thunama* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral

M a l e g e n i t a l i a — Ninth tergite subtriangular with a long anterior apodeme. Inferior appendages very complex and enlarged (the main feature of the genus), prolonged ventrally as a unique plate terminating on sternite seven. The configuration of this complex is peculiar for the species. Its trilobed ending is characteristic. Tenth tergite forms two sclerotized downward directed lobes surrounding the phallic apparatus and visible from above as two tapering process. Phallic apparatus broadening distally composed of two lobes as visible in dorsal aspect.

This species has the most complex inferior appendages among the known specis, differing from all of them. It was the last, fifth species I have found in my material collected in Vietnam. Accordingly I named it thus nam fifth in Vietnamese.

H o l o t y p e ♂: Vietnam, Cucphuong, 400 m a.s.l. 18. X. 1986. Singled along a small karstic brook in the rainforest. — 7 ♂ p a r a t y p e s. Same data as holotype.

Microptila hintama sp. n.
(Fig. 16)

Male (in alcohol). Dark brown animal. 3 ocelli present. Antennae 20--segmented. Mesoscutellum short, anterior margin convex and not diamond--shaped. Spur formula 034. Length and largest width of forewing 2.1 and 0.5, those of hindwing 1.7 and 0.4 mm, respectively.

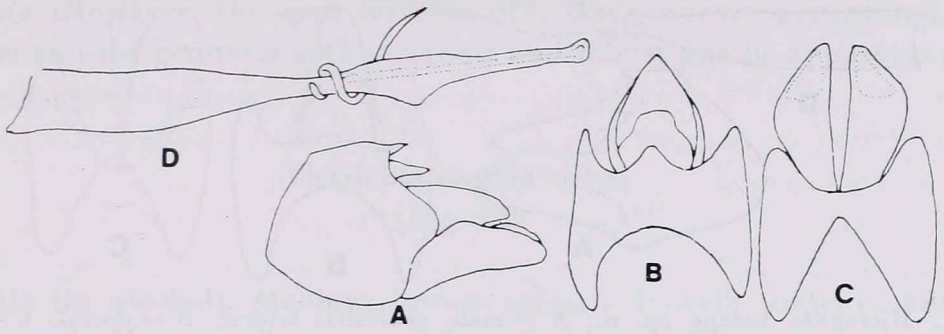


Fig. 16. *Microptila hintama* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

Male genitalia — Segment IX produced midlaterally both anteriad and posteriad, round dorsal and triangular ventral excisions present. Segment X membraneous, distally narrowing rectangular plate, not clearly visible. Subgenital process forms a ventral hood shorter then inferior appendages and brood in dorsal view. Inferior appendages with triangular less pigmented and somewhat elevated area on their top. Phallic apparatus with paramer encircling twice the shaft. Basal half of the distal portion forms a ventral triangular broadening. Ejaculatory duct dark-pigmented, tip enlarged.

Species is very close to *M. xedapa* sp. n. but subgenital process is shorter and boarder, phallic apparatus has an almost triangular broadening on its distal portion and the triangular area on the top of the inferior appendages is more characteristic. This inspired the name triangle: hinh tam giac in Vietnamese.

Holotype ♂: Vietnam, Hoabinh, 20 km from the city in the direction of Tanlac, 27. X. 1986. Singled along a small stream under trees. — Paratypes 2 ♂: same data as holotype.

Microptila xedapa sp. n.
(Fig. 17)

Male (in alcohol). Dark brown animal. 3 ocelli present. Antennae 20-segmented. Mesoscutellum short, anterior margin convex. Spur formula 034. Length and largest width of forewing 2.0 and 0.4 mm those of hindwing 1.6 and 0.3 mm, respectively.

Male genitalia — Segment IX almost subtriangular, excised roundly dorsally and triangularly ventrally. Segment X membraneous long rectangular plate. Subgenital process forming a ventral hood as long as inferior appendages and long triangular in dorsal view. Inferior appendages with circular, less pigmented and somewhat elevated area on their top. Phallic

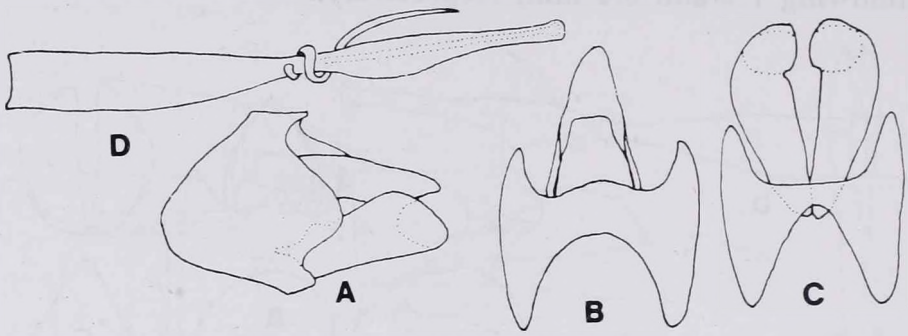


Fig. 17. *Microptila xedapa* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

apparatus with paramer encircling twice the shaft. Basal half of the distal portion broadening. Ejaculatory duct dark pigmented with enlarged tip.

This species is very close to *M. hintama* sp. n. but subgenital plate is longer, narrower and inferior appendages have characteristic, almost regular cycles on their tops. This gives the species also the name. Cycle: xedap in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 1300 m a.s.l. 16. X. 1986. Singled at the waterfall of the main stream. — Paratypes 7 ♂: same data as holotype. Paratypes 2 ♂: Vietnam, Tamdao, 1300 m a.s.l. 10. V. 1987. singled along main stream. Paratype 1 ♂: Vietnam, Tamdao, 1300 m a.s.l. 11. V. 1987. singled at the waterfall of the main stream.

Vietrichia gen. n.

Ocelli present, 3. Anterior tentorial arms reduced to fine strands medially. Antennae short, 18-segmented both in male and female. Basal and second segments enlarged, terminal shorter than penultimate and conical. Postoccipital lobes unmodified, setose, elongate. Mesoscutellum convexly pentagonal without transverse suture. Metascutellum almost triangular. Wings lanceolate, apices acute, anterior wings without jugal lobes. Spurs 024. Outer apical spur on midtibia very small. Female genitalia a simple telescopic oviscapt.

Male genitalia simplified, phallic apparatus short without titillator. There is no apicomesal process on the last abdominal sternite except sternite VII which bears a very short and blunt one.

Type species *Vietrichia linghia* gen. et sp. n. — Accepting a simplified approach and applying MARSHALL's key to tribes (1979), *Vietrichia* genus being without transverse suture on mesoscutellum, without thread-like aedeagus, without bracteoles and with symmetrical genitalia, belongs to tribe *Hydroptilini*. Within the tribe the simplified genital structure, the short antennae with only 18-segments both in male and female, the thoracic structure relate this genus to the *Agraylea* genus group and stands closer to genus *Microptila*. However, the spur formula 024, the convexly pentagonal mesoscutellum and the genitalia with the short and robust phallic apparatus isolate it as a new genus.

Vietrichia linghia sp. n.
(Fig. 18)

Male (in alcohol). Medium brown animal. 3 ocelli present. Antennae 18-segmented. Mesoscutellum convexly pentagonal. Wing neuration rather complete on forewing. Forks 2 and 3 present. Hindwing venation reduced. Spurs 024. Length and largest width of forewing 1.7 and 0.2, those of hindwing 1.2 and 0.15 mm, respectively.

Male genitalia — Segment VIII unmodified. Segment IX forms a complete ring, triangular in lateral aspects excised both dorsad and ventrad. On the dorsum a quadratic unpigmented area is present. Segment X is a simple

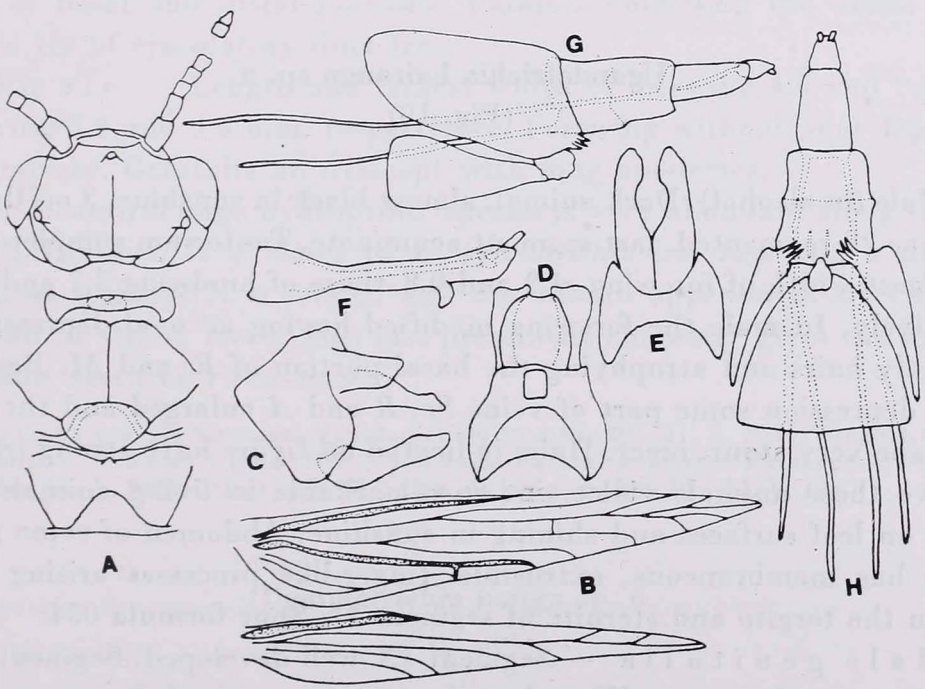


Fig. 18. *Vietrichia linghia* sp. n.: A = female head and thorax, dorsal, B = male wings, C = male genitalia, lateral, D = dorsal, E = ventral, F = phallic apparatus, lateral, G = female genitalia, lateral, H = ventral

hood, more sclerotized laterad. A heavily sclerotized pair of subgenital process broadening apically in dorsal aspect is very conspicuous. Inferior appendages long, fused on the basal half. Phallic apparatus short, robust without both titillator and paramer and with a downcurving small subapical ventral lobe. Ejaculatory duct clearly protruding and surrounded with a small sclerite in the apex of the aedeagus.

Female genitalia — Simple telescopic oviscapt. Segment X with short apodeme. Segment IX has the longest apodeme. Segment VIII with medium long apodeme and divided midway with lateroventral rim. Tergite VII supplied with strong spines on the lateroapical angle. Ventral sclerite present on the apical areae of sternite VII. A pair of pigmented sclerites present ventrad in segment VIII.

A single male specimen of this rare animal was collected in January during my first collecting trip at a small waterfall exposed to direct sunshine. The same site was revisited during my second trip in October of the same year 1986, and, again, only a single female, was found despite a careful, systematic search. Visits to similar type of habitats nearby the locus typicus and several other similar habitats in North Vietnam resulted in no more animals. I named this species remembering their diminishing populations in these delicate biotopes. Veteran: linh gie in Vietnamese.

Holotype ♂: Vietnam, Hoabinh, 20 km in the direction of Tanlac along the road at a small waterfall. 31. I. 1986. Singled. — Allotype ♀: same data as holotype but 27. X. 1986.

Ugandatrichia hairanga sp. n.
(Fig. 19)

Male (in alcohol). Dark animal, almost black in sunshine. 3 ocelli present. Antennae 28-segmented, last segment acuminate. Tentorium complete. Length and largest width of forewing, 4.2 and 0.8, those of hindwing 3.7 and 0.5 mm, respectively. In male the forewing modified having an oval depression filled with scaly hairs and atrophying the basal portion of R_s and M. Besides this special depression some part of veins Sc, R and A enlarged and the hairs on membrane very stout, erect. Hairs indicated on figure have strong iridescence and give these animals violet tint so remarkable in living animals running zig-zag on leaf surfaces and shining in sunshine. Abdomen of some male but not all has membraneous, extrusible, finger-like processes arising laterally between the tergite and sternite of segment II. Spur formula 034.

Male genitalia — Segment IX well developed. Segment X fused to the dorsum of segment IX and produced into a pair of down-curved hooks with more sclerotized apex surrounding the phallic apparatus. Subgenital process forms a finger-like median lobe located up in the dorsum thus housing

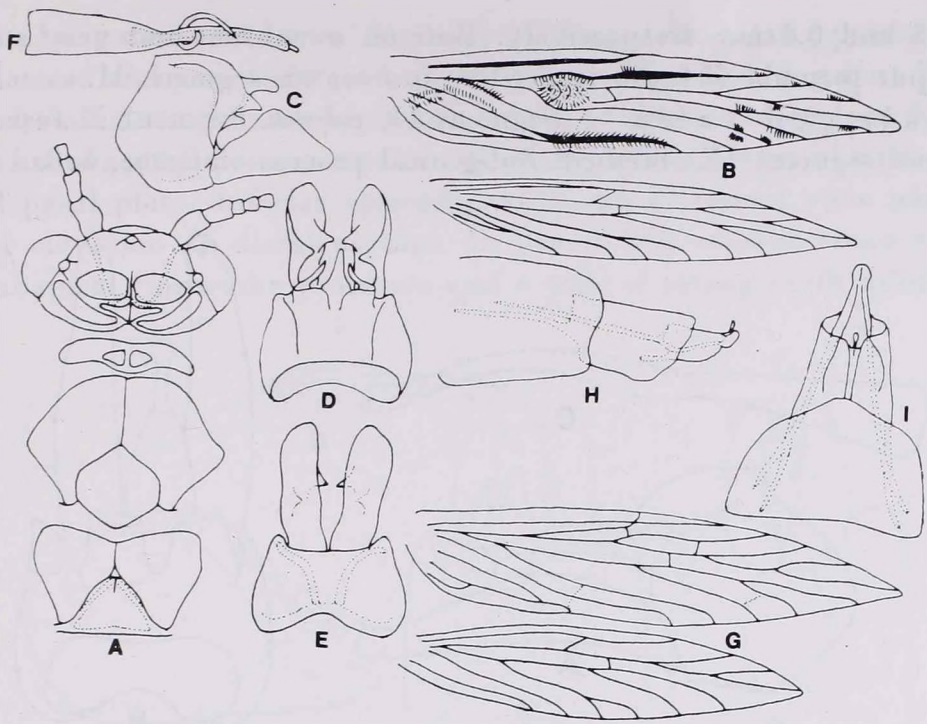


Fig. 19. *Ugandatrichia hairanga* sp. n.: A = male head and thorax, dorsal, B = male wings, C = male genitalia, lateral, D = dorsal, E = ventral, F = phallic apparatus, lateral, G = female wings, H = female genitalia, lateral, I = ventral

the phallic apparatus also in the dorsum. Inferior appendages triangular in lateral view and armed with two strong teeth inner side. Phallic apparatus consists of basal and distal portions. Paramer encircling the distal portion once. The tip of ejaculatory duct free.

F e m a l e — Length and largest width of forewing 4.0 and 0.8, those of hindwing 3.4 and 0.6 mm, respectively. Forewing without oval depression, veins complete. Genitalia an oviscapt with long apodemes.

This beautiful large hydroptilid species is very abundant along the main stream of Tamdao. It is closer to *U. cyanotrichia* but forewing is different, the hook on segment X is smaller and the inferior appendages are triangular with a pair of strong teeth. This last prominent character gives the name hai rang double teeth in Vietnamese.

H o l o t y p e ♂: Vietnam, Tamdao, 1300 m a.s.l. 20—21. I. 1986. Singled along the main stream. — P a r a t y p e s 109 ♂ 9 ♀: same data as holotype. Paratypes 57 ♂ 10 ♀: as holotype but 11. X. 1986. Paratypes 27 ♂ 19 ♀: as holotype but 10—12. V. 1987.

Ugandatrichia honga sp. n.

(Fig. 20)

Male (in alcohol). Dark brown animal. 3 ocelli present. Antennae 28--segmented. Length and largest width of forewing 3.0 and 0.6, those of hind-

wing 2.5 and 0.4 mm, respectively. Hair on membrane not very stout and erect. Spur formula 034. No finger-like process on segment II.

Male genitalia — Segment IX robust. Segment X fused to the dorsum of segment IX, bilobed. Subgenital process elongate, broad basally,

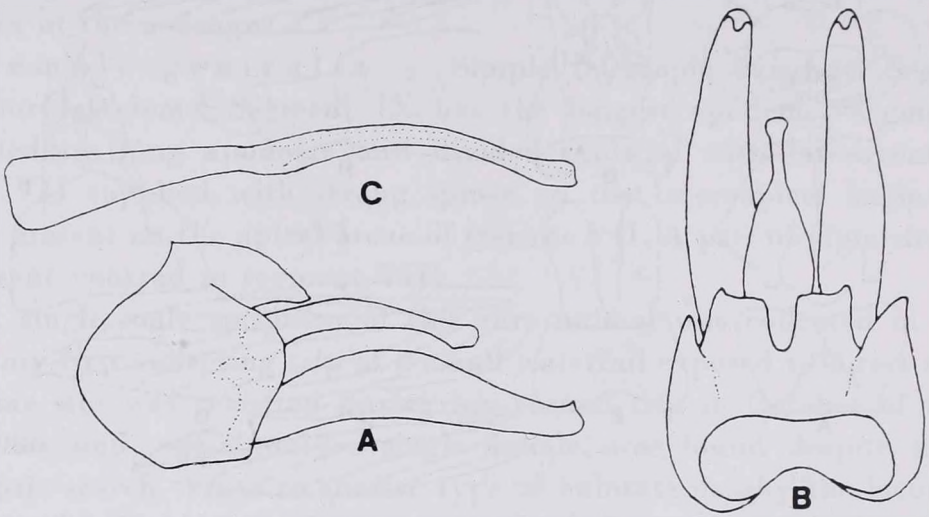


Fig. 20. *Ugandatrichia honga* sp. n.: A = male genitalia, lateral, B = dorsal, C = phallic apparatus, lateral

narrow distally with clavate ending. Inferior appendages very long, upcurving subapically. Phallic apparatus simple without paramer.

This species is so close to *U. nikataruwa* SCHMID described from Sri Lanka, that it is difficult to distinguish between them. However, segment X is more acuminate in lateral view, subgenital process is clavate, and inferior appendages have an upcurving apex. Their abdomen with pink tint gives the name, mau hong pink in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 200 m a.s.l. 13. X. 1986. Singled along a small tributary of the main stream. — Paratype 1 ♂: same data as holotype. Paratypes 6 ♂ 3 ♀: Vietnam, Hoabinh, 20 km from the city in the direction of Tanlac, 27. X. 1986. Singled along a small stream.

Ugandatrichia sanana sp. n.
(Fig. 21)

Male (in alcohol). Dark brown animal. 3 ocelli present. Antennae broken. Length and largest width of forewing 3.3 and 0.6, those of hindwing 2.9 and 0.4 mm, respectively. There is no modified area on forewing. Hairs on membrane very stout, erect. Membraneous, extrusible finger-like process on segment II absent on holotype, but a pair of sclerotized pouches present on pleurit IV, visible in the cleared abdomen. Spur formula 034.

Male genitalia — Segment IX long, triangularly produced both anteriolaterad and posteriolaterad. Dorsum less sclerotized. Segment X deeply excised forming two lateral lobes and a pair of downcurving long hook-like processes. Subgenital process consists of a long median finger-like process and a broad basal plate. Inferior appendages clavate in lateral view with small irregular elevation on distal portion. In dorsal and ventral views a pair of small subapical finger-like processes and a pair of strong teeth around mid-

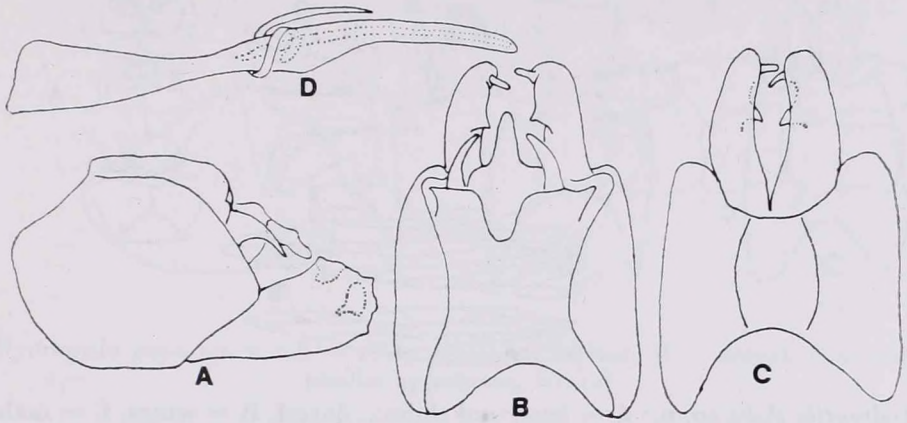


Fig. 21. *Ugandatrichia sanana* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

way visible. Phallic apparatus with basal and distal portions and with a paramere encircling one and a half times the shaft. The distal portion has a broadened basal region. Ejaculatory duct well visible.

Species is close to *U. cyanotrichia ?* and *U. hairanga* sp. n. but without modified forewing and with different tenth tergite and inferior appendages. It was a toothsome luck to catch this single specimen of this beautiful species. I named accordingly. Toothsome: sanch an in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 800 m a.s.l. 15. X. 1986. Singled in a small stream exposed to strong sunshine. The animal was sitting under a palm leaf.

Hydroptila thiba sp. n.
(Fig. 22)

Male (in alcohol). General colour light brown. Antennae 25-segmented. Postoccipital lobes modified as caps concealing scent organs. In holotype scent organs appear only as spiny area in the bottom of the cavity and on the inner surface of the cap. Length and largest width of forewing 2.4 and 0.4, those of hindwing 2.0 and 0.3 mm, respectively. Abdominal sternite VII with a short apicomesal process. Spur formula 024.

Male genitalia — Tergite VIII with two groups of dorsodistal spines each containing 3—4 long, strong black spines. Segment IX semiovoid with well developed laterodistal process. Segment X sclerotized, deeply bilobed. Inferior appendages and subgenital processes with similar form, especially in ventral view. Phallic apparatus with paramere encircling twice the

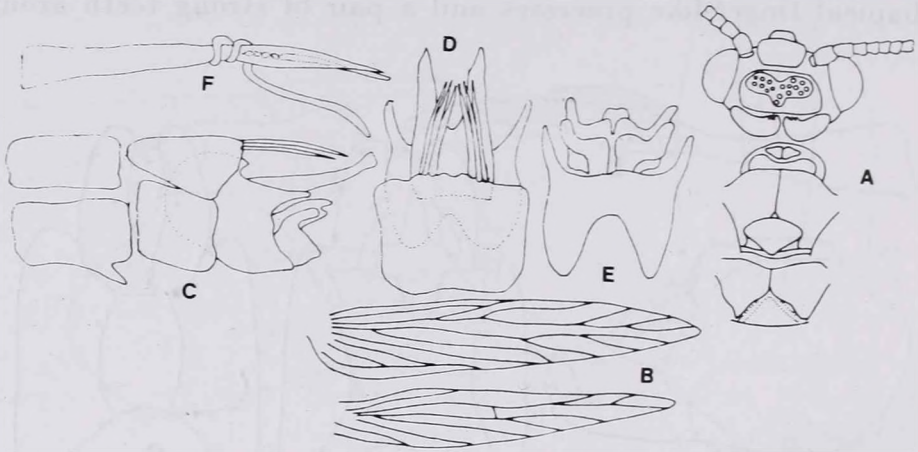


Fig. 22. *Hydroptila thiba* sp. n.: A = head and thorax, dorsal, B = wings, C = male genitalia, lateral, D = dorsal, E = ventral, F = phallic apparatus, lateral

shaft and continuing in a long filament. Filament leaving the genital chamber and hanging outside, above the subgenital process and below the laterodistal process of segment IX on the left side. Ejaculatory duct free on the top of the phallus and somehow spiralled inside the distal portion of the phallus.

It is rather difficult to relate this abundant species to any known group. I named according to the collection day of the holotype. Tuesday: thiba in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 21. I. 1986. Singled. — Paratype ♂: Vietnam Tamdao, 21. I. 1986. Singled. Paratypes 8 ♂: Vietnam, Hoabinh, 20 km from the city in the direction of Tanlac. Singled at waterfall. Paratypes 9 ♂: Vietnam, Tamdao, 1300 m a.s.l. 11. X. 1986. Singled along the main stream. Paratypes 3 ♂: Vietnam, Tamdao, 1300 m a.s.l. 16. X. 1986. Singled at the waterfall of the main stream. Paratypes 2 ♂: Vietnam, Hoabinh, 20 km from the city in the direction of Tanlac, 27. X. 1986. Singled along a small stream in a forest. Paratypes 2 ♂: Vietnam, Tamdao, 1300 m a.s.l. 10. V. 1987. Singled along the main stream.

Hydroptila gaya sp. n.
(Fig. 23)

Male (in alcohol). General colour light brown. Antennae 26-segmented. Length and largest width of forewing 2.4 and 0.4, those of hindwing 2.1 and 0.3 mm, respectively. Abdominal sternite VIII has a very small apicomesal process. Spur formula 024.

Male genitalia — Segment IX subtriangular. Segment X less sclerotized broadening distally. Inferior appendages consist of a larger, less sclerotized dorsal arm and a more sclerotized ventral arm. Both have a slightly excised tip. Subgenital process forming a downcurving pair of sclerotized unit dominates over the genitalic structures. Phallic apparatus has a robust basal

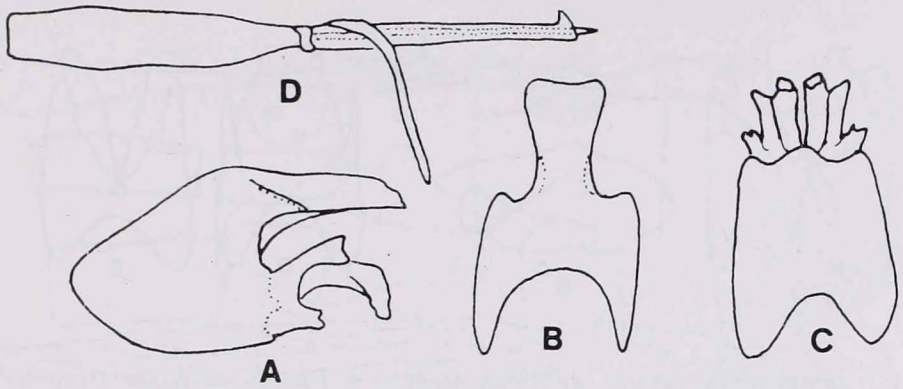


Fig. 23. *Hydroptila gaya* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

and a slender distal portion. The tip of the distal portion recurved into a hook and the tip of the ejaculatory duct protruded.

This species may relate to *H. thiba* sp. n. but the arrangement and form of appendages are different. I named it referring to its small size. Small: gay in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 200 m a.s.l. 13. X. 1986. Singled along a small tributary of the main stream. — Paratype 1 ♂: same data as holotype. Paratypes 2 ♂: Vietnam, Cucphuong, 100 m a.s.l. 19. X. 1986. Singled in the shadow of bushes along a small stream. Paratypes 4 ♂: Vietnam, Cucphuong, 400 m a.s.l. 17. X. 1986. Light leg. Paratype 1 ♂: Vietnam, Hoabinh, towards Dabac, 21. X. 1986. Singled. Paratypes 27 ♂: Vietnam, Hoabinh, towards Dabac, 21. X. 1986. Light leg. Paratype ♂: Vietnam, Bac Thai Province, Quang Chu, 24—25. 1987. Singled. Paratypes 8 ♂: Vietnam, Hoabinh, 30. I. 1986. Singled.

Hydroptila thisa sp. n.
(Fig. 24)

Male (in alcohol). General colour brown. Antennae 26-segmented. Post-occipital lobes modified as hinged caps concealing scent organs supplied with distal brush of hairs. Length and largest width of forewing 2.7 and 0.4, those of hindwing 2.3 and 0.3 mm, respectively. Abdominal sternite VII has a very short apicomesal process. Spur formula 024.

Male genitalia — Segment IX has a triangular body with a well developed laterodistal triangular lobe. Dorsally more excised than ventrally. Segment X forms a large hood with a more sclerotized basal portion. Inferior

appendages partly covered by the laterodistal lobe of segment IX and have a clavate form. In ventral view they are armed with three small dark pointed teeth. A similar tooth visible also on the laterodistal lobe of segment IX. No visible subgenital process or plate developed. Phallic apparatus with paramere encircling once the shaft and continuing into a long tapering filament. There is a large claw-like subapical process on the distal portion.

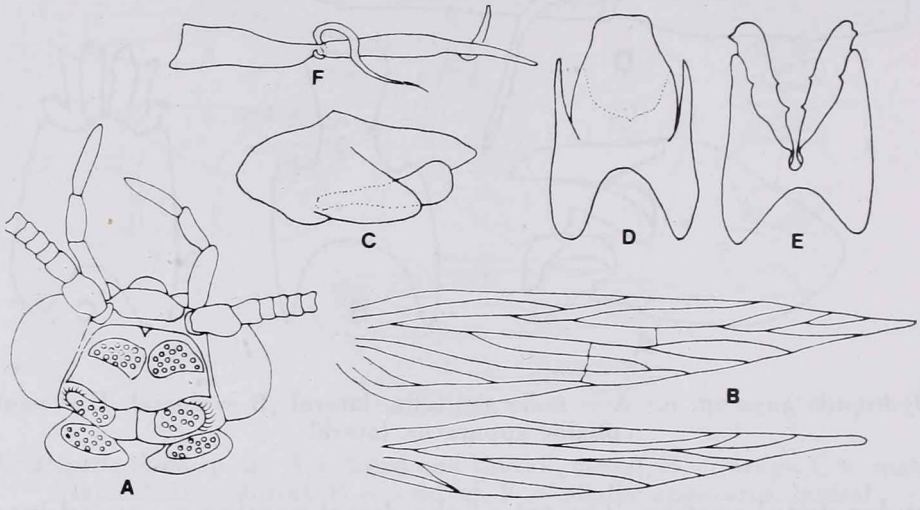


Fig. 24. *Hydroptila thisa* sp. n.: A = head, dorsal, B = wings, C = male genitalia, lateral, D = dorsal, E = ventral, F = phallic apparatus, lateral

It is difficult to relate this species to the known species groups. The characteristic laterodistal lobe of segment IX is present in "*uncinata*" group, but the species in this group have more complex processes. I named this species using the day specimens were collected. Friday: thi sau in Vietnamese.

Holotype ♂: Vietnam, Hoabinh, 8 km from the city in the direction of Dabac, 31. I. 1986. Light leg. — Paratype 1 ♂: Vietnam, Hoabinh, 2 km from the city in the direction of Dabac, 30. I. 1986. Singled. Paratype 1 ♂: Vietnam, Moc Chau, 25. X. 1986. Light leg.

Hydroptila thaphena sp. n.
(Fig. 25)

Male (in alcohol). General colour medium brown. Antennae 33-segmented; 23—29 segments darker. Length and largest width of forewing 2.1 and 0.4, those of hindwing 1.9 and 0.3 mm, respectively. Seventh abdominal sternite with a short tapering apicomesal process.

Male genitalia — Tergite and sternite VIII almost equal. Segment IX halfway retracted within VIII. This half of the segment subtriangular without anterolateral apodeme. The uncovered distal half of segment IX produced into a rectangular lobe. In dorsal view equally deeply excised both

anteriad and posteriad. In ventral view more excised posteriad, housing the specially formed robust inferior appendages. Segment X almost invisible. Short dubious membrane visible only in the bottom of the dorsoapical excision. Subgenital process forms also a short but complete plate connecting the lateral walls of segment IX. Phallic apparatus long; extending anteriorly into segment VI. Basal portion gradually broadening anteriad. Paramere

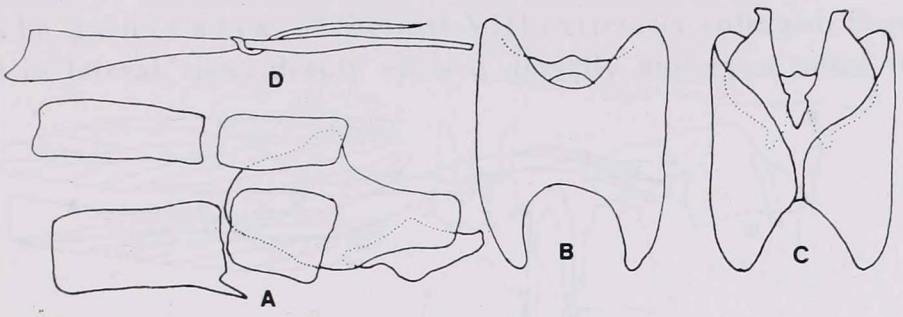


Fig. 25. *Hydroptila thaphena* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

present; spiralled once completely around shaft and almost as long as the distal portion.

Genital structure has some resemblance to *H. thisa* sp. n., especially the well developed lateral lobes on segment IX. The most reduced segment X is however, a very special case. The downward produced segment IX and inferior appendages suggested to name this species. Down: thap hen in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 200 m a.s.l. 12. X. 1986. Light leg.

Hydroptila thuna sp.
(Fig. 26)

Male (in alcohol). General colour light brown. Antennae 28-segmented. Postoccipital lobes modified as hinged caps concealing scent organs. After removing the caps scent organs appear as simple membraneous sacs without tuft. Length and largest width of forewing 2.8 and 0.4, those of hindwing 2.5 and 0.3 mm, respectively. Spur formula 024. Abdominal sternite VII with a short, tapering apicomesal process.

M a l e g e n i t a l i a — Tergite and sternite VIII about equal. Segment IX triangular in lateral view and deeply excised both dorsad and ventrad. Segment X well developed, membraneous, apex slightly bilobed. Inferior appendages slightly broadening along the distal half in lateral view and more narrowing in ventral view. Their dorsodistal tip tapering and dark pigmented.

There is a dark pigmented small spot also around the ventral corner. Subgenital process is a real plate with a very acute tapering median process. Phallic apparatus with a medium sized basal portion and a two-partite distal portion. One part represents the free ejaculatory duct but with acute tip. An additional very thin filament visible on the distal portion. This may be a continuation of the paramere encircling once around shaft and separating the basal and distal parts.

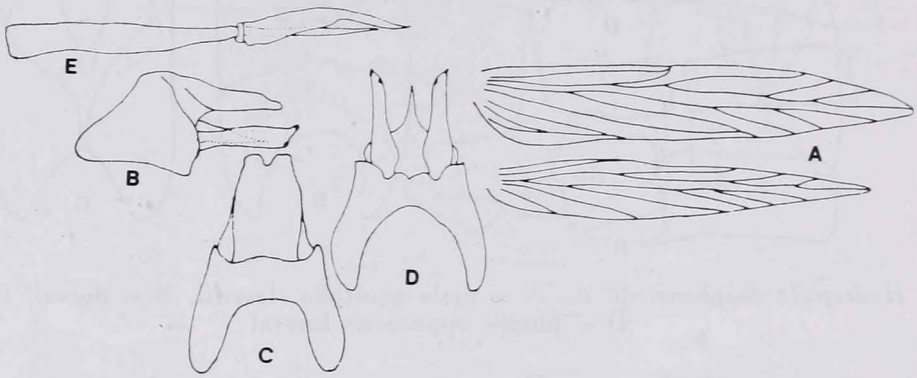


Fig. 26. *Hydroptila thuna* sp. n.: A = wings, B = male genitalia, lateral, C = dorsal, D = ventral, E = phallic apparatus, lateral

Besides Vietnam I have collected and examined paratypes from India, which were almost identical with the holotype. This widely distributed species belongs to "*sparsa*" or "*consimilis*" groups, which are very close to each other. The "*sparsa*" group is a very large Palaearctic group, while the "*consimilis*" group is a Nearctic group. Nevertheless due to the form of segment IX without lateral distal process, and that of the subgenital plate with median process, as well as the more complex phallic apparatus, this species is close to the Nearctic "*consimilis*" group than to the Palaearctic "*sparsa*" group. It seems to be the first Palaearctic member of the "*consimilis*" group. I named this species using the Vietnamese word thuman: thursday in English.

Holotype ♂: Vietnam, Hoabinh, 8 km from Hoabinh in the direction of Dabac, singled at small stream, 30. I. 1986. — Paratypes 5 ♂: Vietnam, Ngoclac, 26. I. 1986. Singled and light leg. Paratypes 2 ♂: Vietnam, Tamdao, 200 m a.s.l., 12. X. 1986. Light leg. Paratype ♂: Vietnam, Cucphuong, 100 m a.s.l. 19. X. 1986. Singled in deep shadow of bushes along a stream. Paratypes 8 ♂: Vietnam, Cucphuong, 400 m a.s.l., 17. X. 1986. Light leg. Paratype 1 ♂: Vietnam, Mocchau, 25. X. 1986. Light leg. Paratypes 27 ♂: Vietnam, Hoabinh, 8 km from Hoabinh in the direction of Dabac. Light leg. Paratypes 21 ♂: Vietnam, Bac Thai Province, Phuluong, River Dongdat, 26. V. 1987. Light leg. Paratypes 2 ♂: Vietnam, Cat Ba Island, Goi stream, 17. V. 1987. Singled. Paratype 1 ♂: India, Bhubaneswar, II. 1985. Light leg. Paratypes 3 ♂: India, Bhubaneswar, 26—30. II. 1987. Light leg. Paratypes 11 ♂: India, Chilika Lake, Barkul, 21—22. II. 1987. Light leg.

Hydroptila gapdoi sp. n.
(Fig. 27)

Male (in alcohol). General colour brown. Antennae 22-segmented. Length and largest width of forewing 2.0 and 0.3, those of hindwing 1.8 and 0.2 mm, respectively. Abdominal sternite VII has no apicomesal process. Spur formula 024.

Male genitalia — Sternite VIII extremely enlarged. Segment IX halfovoid in lateral view, deeply excised dorsally and even more ventrally,

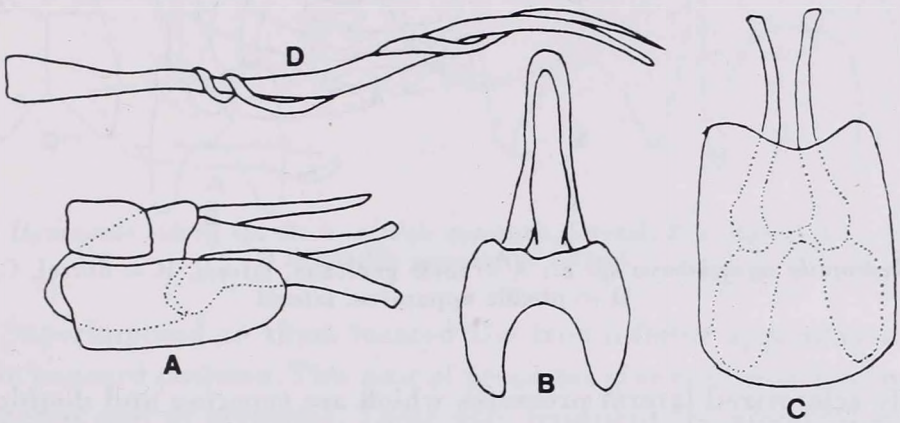


Fig. 27. *Hydroptila gapdoi* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

in both cases anteriad. Segment X composed of a double long plate, the lower being larger. Inferior appendages form a pair of long rods. Phallic apparatus with a much shorter basal portion. Paramere encircling three times along the whole length of the distal portion.

This species has some resemblance to *H. ngaythibaya* sp. n. but it is difficult to relate it to any groups. I named it referring to the double plate dorsum. Double — gap doi in Vietnamese.

Holotype ♂: Vietnam, Tamdao, 200 m a.s.l. 11. X. 1986. Singled in the dark shadow among bushes along the main stream.

Hydroptila ngaythibaya sp. n.
(Fig. 28)

Male (in alcohol). General colour light brown. Antennae 24-segmented. Segments 12—17 lighter. Postoccipital lobes modified as hinged caps concealing scent organs which are present in the cavity of holotype as reniform sacs bearing brush-like dense hairs on their distal ends. Length and largest

width of forewing 2.2 and 0.3, those of hindwing 1.9—0.2 mm, respectively. There is only a very small pointed apicomesal process on abdominal sternite VII. Spur formula 024.

Male genitalia — Segment IX halfovoid with a laterodistal downcurving process. Segment X consists of a membraneous median lobe with a more sclerotized central tapering and upcurving single process also a pair

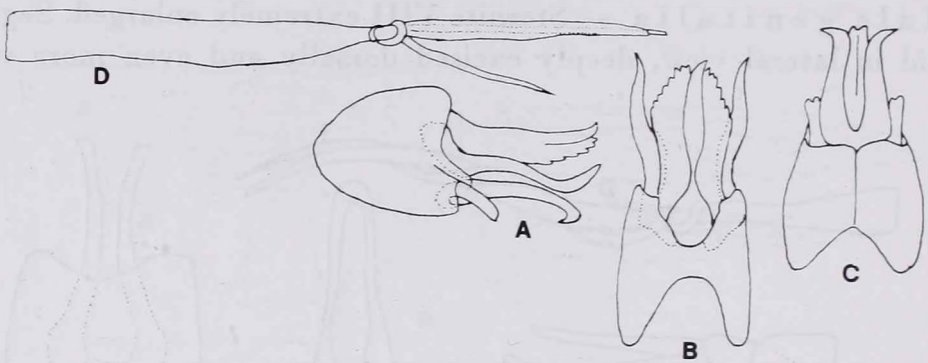


Fig. 28. *Hydroptila ngaythibaya* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

of heavily sclerotized lateral processes which are tapering and double curving. Inferior appendages with a characteristic outcurving apex and a pair of short processes somehow attached to their base. Subgenital processes fused into a long plate. Phallic apparatus forms a long robust basal portion and a slender distal portion with ejaculatory duct protruding around tip. Paramere encircling the shaft twice and continuing into an acute filament.

This abundant species belongs to the "*dikirilagoda*" group, a small group known from Sri Lanka. It is closest to *H. mitirigalla* SCHMID, but differs in all structural units. The basic architecture of the genitalia, however is similar. I named the species referring to the day the holotype was collected. Saturday: ngay thi bay in Vietnamese.

Holotype ♂: Vietnam, Ngoclac, 25. I. 1986. Light leg. — Paratype 1 ♂: Vietnam, Cucphuong, 400 m a.s.l. 17. X. 1986. Light leg. Paratypes 3 ♂: Vietnam, Hoabinh, towards Dabac, 21. X. 1986. Light leg. Paratype 1 ♂: Vietnam, Bac Thai Province, Phuluong, Dongdar River, 26. V. 1987. Light leg.

Hydroptila sidong sp. n.
(Fig. 29)

Male (in alcohol). General colour light brown. Postoccipital lobes of ♂ head modified as hinged caps concealing scent organs. Antennae 32-segmented. Length and largest width of forewing 2.0 and 0.4, those of hindwing 1.8 and

0.3 mm, respectively. Abdominal sternite VII with a robust apicomesal process. Spur formula 024.

M a l e g e n i t a l i a — Tergite and sternite VIII about equal; tergite somehow modified into serrated laterodistal margin. Segment IX subtriangular with a short anterior tapering apodeme; apicoventral portion produced into a pair of special lobes appearing as superior appendages, but sutures not

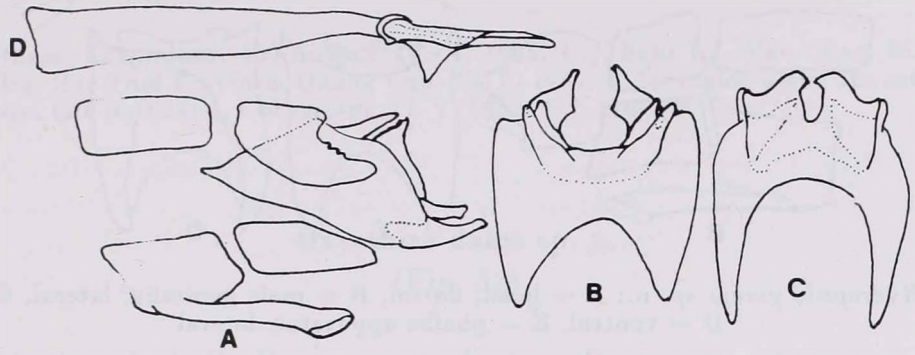


Fig. 29. *Hydroptila sidong* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

obvious. Superimposed to them located the true inferior appendages running together in concord position. This pair of processes give continuation to produce dorsal superior pair of processes. These may represent the modified subgenital processes and run together again in a concordant position with the uppermost pair of digitate processes. This last process appears as part of segment IX or as residual segment X. Phallic apparatus consists of a well developed basal portion and a small but more complex distal portion. Small paramere encircling once around shaft. The distal portion forms an unusual triangular flake.

In basic genital structure this species is similar to *H. giama* sp. n. and may represent a separate new species group. The concordant position of appendages gives it the name: Concord — sidong in Vietnamese.

H o l o t y p e ♂: Vietnam, Tamdao, 200 m a.s.l. 12. X. 1986. Light leg.

Hydroptila giama sp. n.
(Fig. 30)

Male (in alcohol). General colour brown. Postoccipital lobes of ♂ head modified as hinged caps concealing scent organs. In holotype scent organs protruded and well developed with long tuft. Length and largest width of forewing 2.6 and 0.5, those of hindwing 2.3 and 0.4 mm, respectively. Abdominal sternite VII with robust apicomesal processes.

M a l e g e n i t a l i a — Tergite and sternite VIII equal. Segment IX produced narrowing both lateroanteriad and lateroposteriad. Segment X very

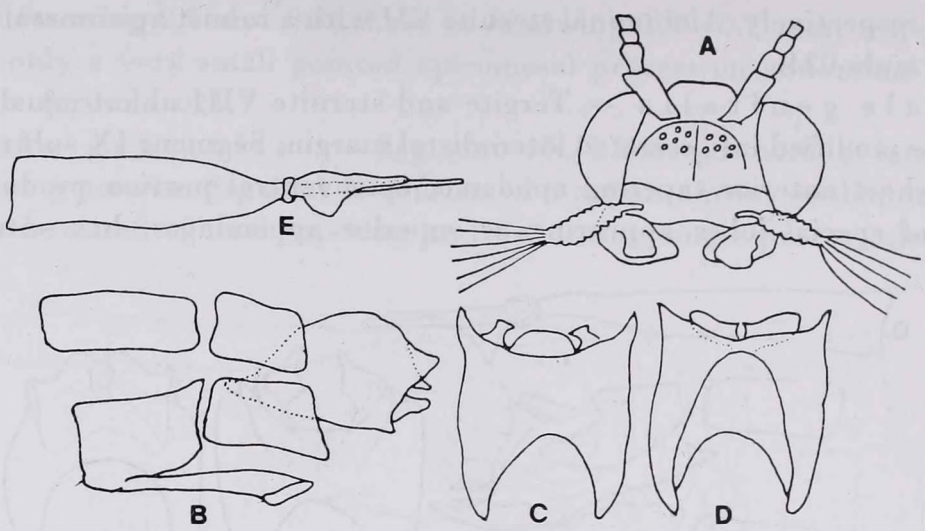


Fig. 30. *Hydroptila giama* sp. n.: A = head, dorsal, B = male genitalia, lateral, C = dorsal, D = ventral, E = phallic apparatus, lateral

short membraneous, almost reduced. Inferior appendages forming a pair of broad plates in ventral view. A second pair of processes located above the inferior appendages and around the usual position of the subgenital processes. Their tips well sclerotized, broadened and flattened in dorsal view. Phallic apparatus forming a robust basal portion and an unusually developed distal portion. The latter consisting of the shaft with a ventral, broad triangular flake and the thin, free part of the ejaculatory duct. Small paramere present encircling only once the shaft.

This species may form a new species group with *H. sidong* sp. n. The reduction of appendages inspired me to name this species. To reduce: giam in Vietnamese.

H o l o t y p e ♂: Vietnam, Tamdao, 1300 m a.s.l. 11. X. 1986. Singled by sweeping along the main stream. — P a r a t y p e s 2 ♂: same data as holotype. Paratype 1 ♂: Vietnam, Tamdao, 1300 m a.s.l. 10. V. 1987. Singled along the small left tributary of the main stream. Paratype 1 ♂: Vietnam, Tamdao, 1300 m a.s.l., 10. V. 1987. Singled along the main stream.

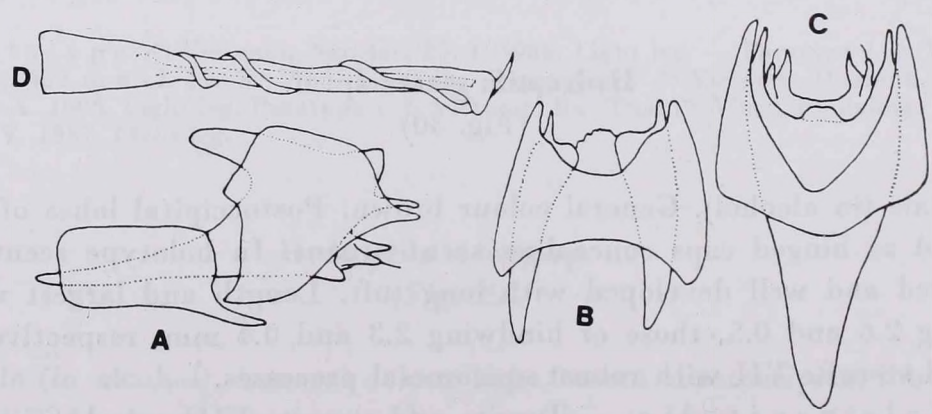


Fig. 31. *Oxyethira bogambara* SCHMID: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

Oxyethira bogambara SCHMID
(Fig. 31)

Species was described and known only from Sri Lanka (SCHMID 1958). Specimens from Vietnam are almost identical with the holotype based upon its drawing. Its taxonomical position was reestablished by KELLEY (1984) in the "*ramosa*" group.

Vietnam, Cucphuong, 400 m a.s.l. 18. X. 1986. 1 ♂, light leg. Moc Chan, 25. X. 1986. 3 ♂, light leg. Bac Thai Province, Quang Chu, 25. V. 1987. 1 ♂. Singled along the main stream of the village. Cat Ba Island, Goi stream, 17. V. 1987. 1 ♂. Singled.

Oxyethira datra sp. n.
(Fig. 32)

Male (in alcohol). Brown animal. 3 ocelli present. Antennae broken. Mesoscutellum with anterior margin convex. Spur formula 034. Length and largest width of forewing 2.3 and 0.4, those of hindwing 2.0 and 0.3 mm, respectively.

M a l e g e n i t a l i a — Sternite VII with a small slender and pointed apicomesal process. Segment VIII forming a complete cylinder with apicoventral excision only. Segment IX withdrawn into segment VIII and also forming an almost complete cylinder. Segment X not visible. Subgenital appendages developed, heavily sclerotized and separated. Inferior appendages fused. A pair of membraneous processes terminating in a short apical seta visible weakly at the base of the subgenital appendages. Phallic apparatus unusually complex. Band-like paramere spiralling three times and ending in a complex head. An additional filament arises around midway on the distal portion.

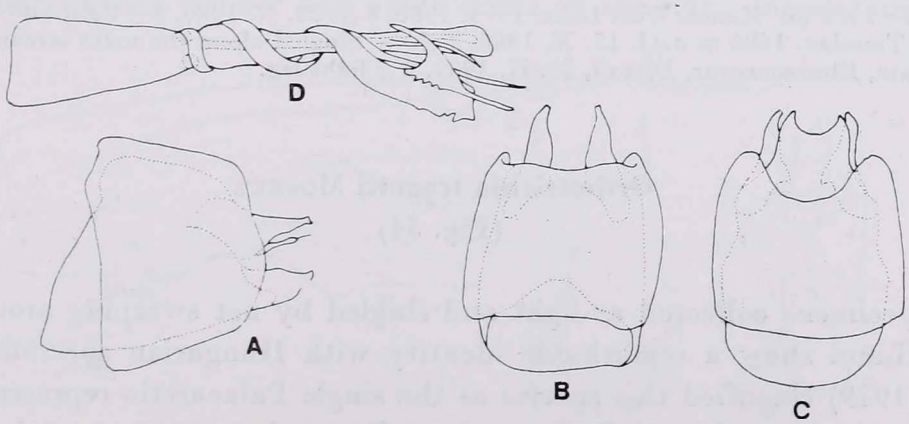


Fig. 32. *Oxyethira datra* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = = phallic apparatus, lateral

This species belongs to the "*flavicornis*" group. It is closest to *O. ecornuta*, but easy to distinguish based upon the complex phallic apparatus. I named the species to emphasize the composite nature of the phallic apparatus. Compose: datra in Vietnamese.

H o l o t y p e ♂: Vietnam, Cucphuong, 400 m a.s.l. 17. X. 1986. Light leg.

Orthotrichia indica MARTYNOV
(Fig. 33)

This species was described by MARTYNOV (1935) from Shan States of Burma and found again by SCHMID (1958) in Sri Lanka. In Vietnam I have collected by light and sweeping along the West Lake of Hanoi and, what is

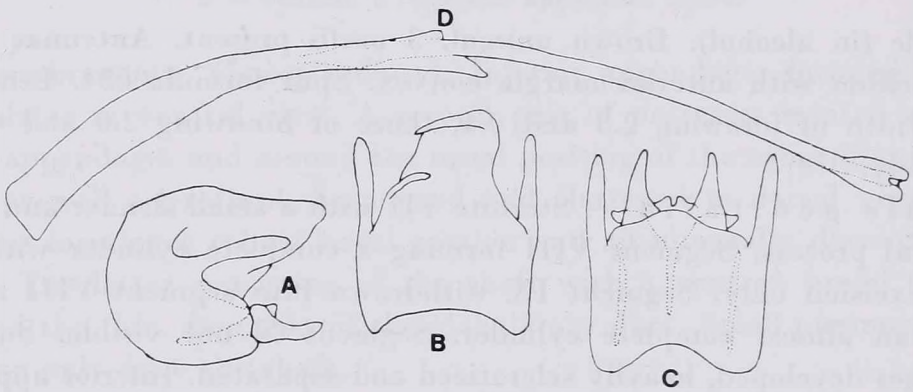


Fig. 33. *Orthotrichia indica* MARTYNOV: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

unusual, by sweeping along a typical mountain stream 1300 m a.s.l. at Tamdao. In 1987 collected two males in Orissa State of India by light in a marsh.

V i e t n a m, Hanoi, West Lake, 19. I. 1986. 8 ♂, 28. X. 1986. 4 ♂ light and singled leg. Vietnam, Tamdao, 1300 m a.s.l. 15. X. 1986. 1 ♂. — Singled along the main stream I n d i a, Orissa State, Bhubaneswar, Dhauli, 20. II. 1987. 2 ♂ light leg.

Orthotrichia tragetti MOSELY
(Fig. 34)

Specimens collected at light and singled by net sweeping around West Lake, Hanoi show a remarkable identity with Hungarian specimens. MARSHALL (1979) classified this species as the single Palaearctic representative of the Nearctic "*aegerfasciella*" group. According to her statement "the group is characterized by the lateral development of the asymetrical inferior append-

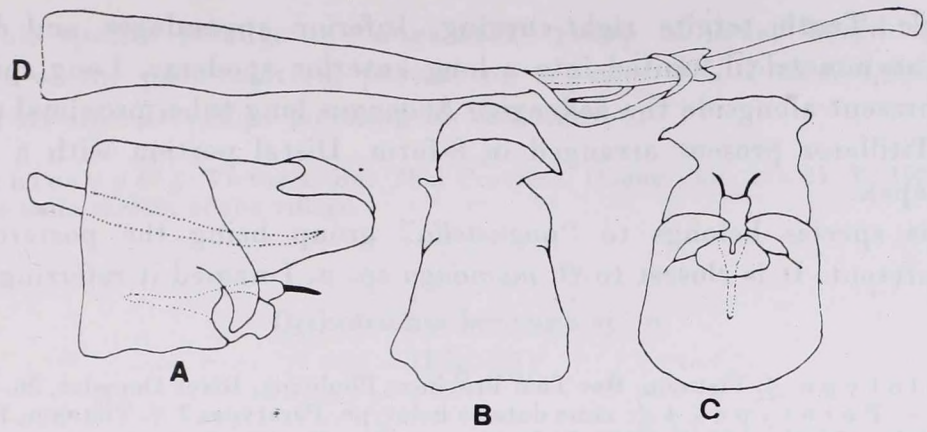


Fig. 34. *Orthotrichia tragetti* MOSELY: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

ages". The inferior appendages of *O. tragetti*, however, are located rather median and completely symmetrical. Its phylogenetic position or even its tentative place in species groups is still obscure and needs a more comprehensive treatment of this genus.

Vietnam, Hanoi, West Lake, 28. X. 1986. 61 ♂ 63 ♀. Singled and light leg.

Orthotrichia luonga sp. n.

(Fig. 35)

Male (in alcohol). Small, brown animal. Length and largest width of forewing 2.1 and 0.4, those of hindwing 1.8 and 0.3 mm, respectively. A small pointed process present only on sternite VI.

Male genitalia — Segment IX fused and characterized with a deep ventral excision, located on the right side. Pronounced asymmetry. Posterolateral processes digitate broader in lateral aspect with long single spines. A dorsolateral slender long spine arises on the right dorsolateral ante-

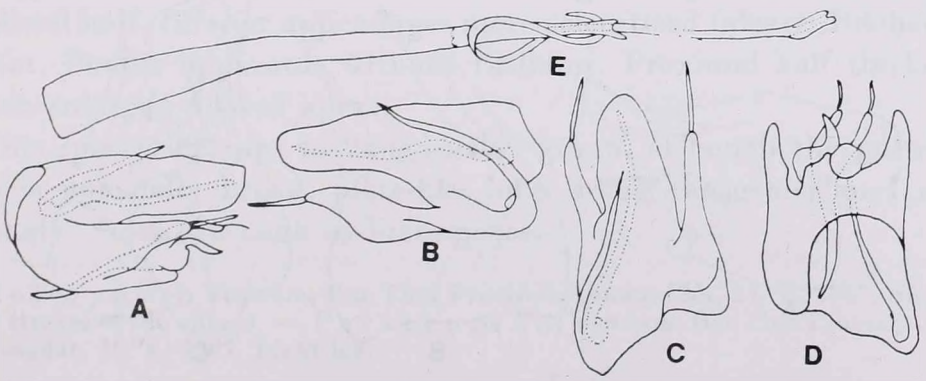


Fig. 35. *Orthotrichia luonga* sp. n.: A = male genitalia, left lateral, B = right lateral, C = — dorsal, D = ventral, E = phallic apparatus, lateral

rior angle. Tenth tergite right-curving. Inferior appendages and bilobed process, asymmetrical, united into a long anterior apodeme. Long spiniform sclerite present alongside the aedeagus. Aedeagus long tube, proximal portion robust. Titillator present arranged in 8-form. Distal portion with a dilated bilobed apex.

This species belongs to "*angustella*" group being the posterolateral process present. It is closest to *O. momanga* sp. n. I named it referring to the district.

H o l o t y p e ♂: Vietnam, Bac Thai Province, Phuluong, River Dongdat, 26. V. 1987. Light leg. — P a r a t y p e s 4 ♂: same data as holotype. Paratypes 2 ♂: Vietnam, Hoabinh, in the direction of Dabac, 21. X. 1986. Light leg.

Orthotrichia momanga sp. n.
(Fig. 36)

Male (in alcohol). Large light brown *Orthotrichia*. Length and largest width of forewing 2.5 and 0.5, those of hindwing 2.2 and 0.3 mm, respectively.

M a l e g e n i t a l i a — Similarly small blunt apicomesal process present both on sternite VI and VII. Segment IX fused with asymmetrical anteriolateral excision on both sides. Posterolateral processes well developed, long digitate. Tergite X less sclerotized, left curving. Inferior appendages trilobed, forming a rather complex structure with the bilobed process producing a long apodeme. A long spiniform sclerite present alongside the aedeagus which is a long tube with titillator remained partly detached inside the segment IX of the holotype during withdrawal the aedeagus. There is a small ventral lobe although indistinct midway on the distal portion.

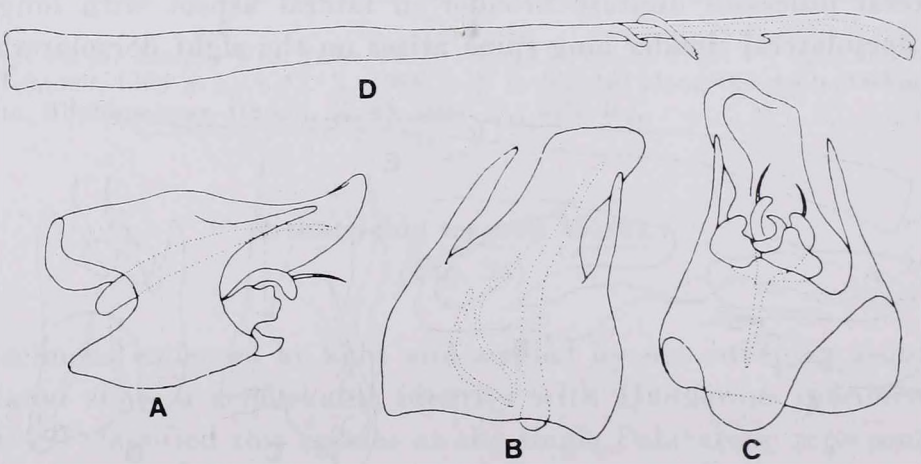


Fig. 36. *Orthotrichia momanga* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

This species belongs to "*angustella*" group at least based upon the presence of the posterolateral process on segment IX. I named this species to refer its size. Develop: momang in Vietnamese.

Holotype ♂: Vietnam, Bac Thai Province, Quang Chu, 24—25. V. 1987. Singled along the main stream of the village.

Orthotrichia bencana sp. n.
(Fig. 37)

Male (in alcohol). Small yellow animal. Length and largest width of forewing 2.3 and 0.4, those of hindwing 2.0 and 0.3 mm, respectively.

Male genitalia — Asymmetrical. Robust median process with stout setae present on sternite VII. Segment VIII unmodified. Segment IX

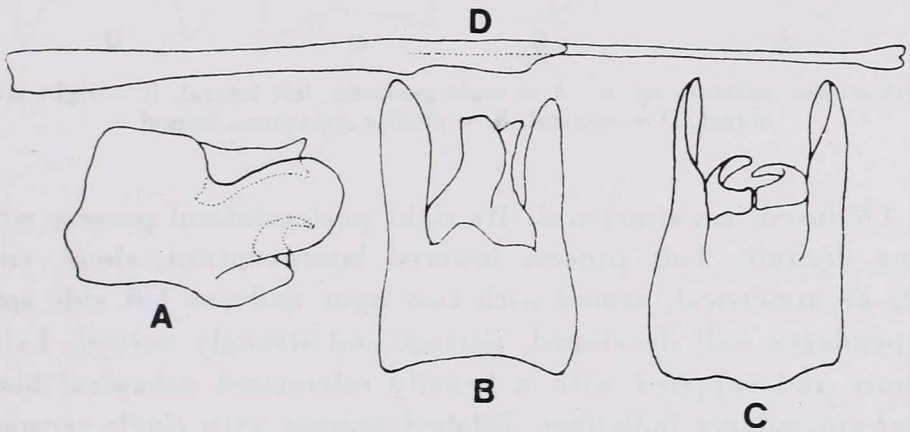


Fig. 37. *Orthotrichia bencana* sp. n.: A = male genitalia, lateral, B = dorsal, C = ventral, D = phallic apparatus, lateral

fused. Two broad posterolateral plate dominating over the whole genital structure. Posteroventrum of segment IX thickened. Tergite X bilobed with narrower distal half. Inferior appendages more sclerotized falcate. Bilobed process indistinct. Phallic apparatus without titillator. Proximal half thicker, distal half with enlarged dilated apex.

This species belongs to "*angustella*" group, although the posterolateral process is unusually broad, plate-like lobe siding the genitalia. I named it accordingly. Side: ben canh in Vietnamese.

Holotype ♂: Vietnam, Bac Thai Province, Quang Chu, 24. V. 1987. Singled along the main stream of the village. — Paratypes 3′♂: Vietnam, Bac Thai Province, Phuluong, River Dongdat, 26. V. 1987. Light leg.

Orthotrichia suchiara sp. n.
(Fig. 38)

Male (in alcohol). Light brown animal. Length and largest width of forewing 2.4 and 0.4, those of hindwing 2.1 and 0.3 mm, respectively.

Male genitalia — Characteristically asymmetrical. Longer median process on sternite VII, smaller on sternite VI. Segment VIII unmodified.

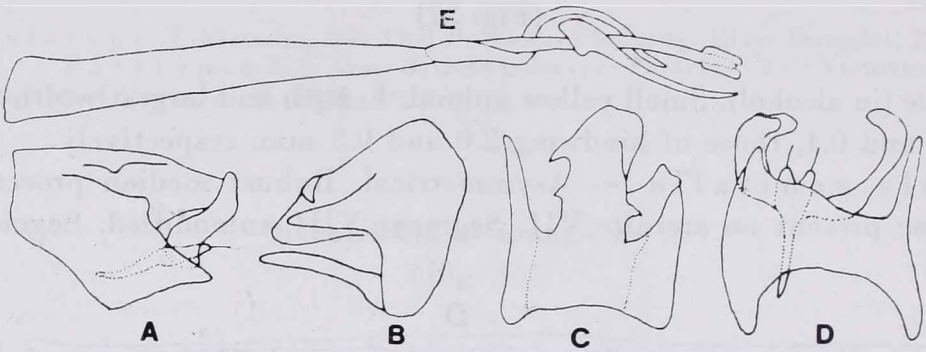


Fig. 38. *Orthotrichia suchiara* sp. n.: A = male genitalia, left lateral, B = right lateral, C = dorsal, D = ventral, E = phallic apparatus, lateral

Segment IX fused, asymmetrical. Its right posterolateral process well developed, long digitate. Left process lowered lateroventrad, short, triangular. Tergite X asymmetrical, armed with two right and one left side spines. Inferior appendages well developed, porrect and strongly curved. Left arm is more robust and supplied with a heavily sclerotized subapical blunt lobe. Subgenital appendages indistinct. Bilobed process with single terminal setae present, continuing in a long apodeme. Beneath tergite X is a long slender spine-like sclerite alongside the aedeagus. In holotype it was withdrawn together with the aedeagus. Aedeagus long, proximal half longer. Distal half forms a regular narrow tube with enlarged apex. Near the junction of the proximal and distal halves arises a slender, spiral titillator.

This species has a remarkable similarity with *O. costalis* but posterolateral processes of segment IX inversely developed. Tergite X has different spine arrangement and left inferior appendages S-form. I named this species to note its separation from *O. costalis*. Separation: su chiare in Vietnamese.

Holotype ♂: Vietnam, Ngoclac, 26. I. 1986. Singled along a stony stream. — Paratypes 2 ♂: Vietnam, Cucphuong, 100 m a.s.l. 19. X. 1986. Singled in dark shadow of bushes along a small river. Paratype 1 ♂: Vietnam, Cucphuong, 400 m a.s.l. 17. X. 1986. Light leg. Paratype 1 ♂: Vietnam, Hoabinh in the direction of Dabac, 21. X. 1986. Light leg.

REFERENCES

KELLEY, R. W. (1984): Phylogeny, morphology and classification of the micro-caddisfly genus Oxyethira Eaton (Trichoptera; Hydroptilidae). — Trans. Amer. Ent. Soc. **110:** 435—463.

MAHUNKA, S. &.OLÁH, J. (1986): Hungarian zoological studies in Vietnam. 1. The outline of the research programme and the report of first collecting trip in 1986. — Folia ent. hung. **47** (1—2): 103—107.

MARSHALL, J. E. (1979): A review of the genera of the Hydroptilidae (Trichoptera). — Bull. Br. Mus. (Nat. Hist.) Entomol. **39** (3): 135—239.

MARTYNOV, A. B. (1935): On a collection of Trichoptera from the Indian Museum. Part I. Annulipalpia. — Rec. Ind. Mus. **37:** 93—209.

OLÁH, J. (1987): Seven new Rhyacophila from Vietnam (Trichoptera, Rhyacophilidae). — Folia ent. hung. **48;** 141—149.

SCHMID, F. (1958): Trichoptères de Ceylon. — Arch. f. Hydrobiol. **54** (1—2): 1—173.

Acta Zoologica Hungarica 35 (3—4), pp. 295—326 (1989)

BRACONIDAE (HYMENOPTERA) FROM KOREA, XI.

J. Papp

Zoological Department, Hungarian Natural History Museum,
H-1088 Budapest, Baross utca 13, Hungary

(Received 15 November 1988)

Twenty-nine Braconid species representing the subfamily Cheloninae are reported from Korea. Eight species are described as new to science: *Ascogaster nilena* sp. n., *Microchelonus endomius* sp. n., *M. hurtus* sp. n., *M. mitigatus* sp. n., *M. paucifossa* sp. n., *M. plenus* sp. n., *M. puerilis* sp. n., *Phanerotoma offensa* sp. n., *Ph. pedra* sp. n. and *Phanerotomella bellula* sp. n. The majority of the species are new to the fauna of Korea. The wasp material serving for the present elaboration is deposited in the Hungarian Natural History Museum, Budapest. With 85 original figures.

1. List of the species

Twenty-nine species of Braconidae belonging to the subfamily *Cheloninae* are reported from Korea (i.e. the Democratic People's Republic of Korea). Detailed collecting data are given for every species and, where necessary, completed with taxonomical as well as zoogeographical notes. The Braconid material was collected by the staff-members of the Hungarian Natural History Museum (Budapest) during collecting trips to North Korea in the years 1970—1987.

For each species of the list the localities are indicated with the numbers given in the original itinerary of the collecting trips (see Folia ent. hung. 1971—1987 vol. 24-48); subsequently the numbers are enumerated in the increasing sequence of the numerals completed with the locality names and collecting time data:

No. 136. Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 3 August 1971 — Singled material at lamp.
No. 138. Same locality, 4 August 1971 — Same method.
No. 143. Same locality, 6 August 1971 — Same method.
No. 153. Prov. South Pyongan: De-sang san, 12 km NE from Pyongyan, 8 August 1971 — Netting the grass and shrub levels of deciduous-coniferous forest.
No. 160. Prov. South Pyongan: Lyong-ak san, 14 km W from Pyongyan, 11 August 1971 — Netting in coniferous-deciduous forest.
No. 161. Same locality and collecting datum — Moss sample of *Acari* and *Tardigrada* of a coniferous-deciduous forest extracted by Berlese apparatus.
No. 164. Prov. South Pyongan: Sa-gam, 45 km N from Pyongyan, 12 August 1971 — Netting on shrubs, weeds and grass of riverside.
No. 166. Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 12 August 1971 — Caught in Malaise-trap.

No. 181. Prov. South Pyongan: Bongwa-ri, on the riverside of Te-dong in rudimental vegetation with *Robinia pseudacacia* trees and shrubs, about 45 km E of Pyongyan, 16—17 August 1971 — Caught in Malaise-trap.
No. 196. Prov. Ryang-gang: Chann-pay plateau, Sam-zi-yan, 1500 m, 24 August 1971 — Netted in the vegetation of a devastated forest.
No. 225. Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 31 August 1971. — Caught in Malaise-trap.
No. 229. Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 1 September 1971 — Caught in Malaise-trap.
No. 231. Prov. South Pyongan: Za-mo san, 60 km NE from Pyongyan, 2 September 1971 — Netting in sweet chestnut *(Castania crenata)* forest in nature conservancy field.
No. 234. Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 2 September 1971 — Caught in Malaise-trap.
No. 237. Same locality, 4 September 1971 — Same method.
No. 243. Same locality, 6—7 September 1971 — Same method.
No. 251. Kaesong: Mts Pakyon, Pakyon popo, 27 km NE of Kaesong, 500 m, 9 September 1971 — Netting from bushes, shrubs and grass in deciduous forest in the environs of the waterfall.
No. 257. Kaesong: Mts Pakyon, Pakyon popo, 27 km NE of Kaesong, garden of Pakyon rest home, 10—12 September 1971 — Caught in Malaise-trap.
No. 273. Prov. South Pyongan: Nam-po, 19 July 1975, 11—13.30^h — Netting in the shrub level of a *Robinia-Castanea* wood.
No. 276. Prov. Ryang-gang: Hyesan, room of Hotel Hyesan, 22 July 1975, 20—23.30^h — Collected at MV lamp.
No. 281. Prov. Ryang-gang: Chann-pay plateau, 24 km NW of Sam-zi-yan along the road to Mt. Pektusan, 2000 m, 24 July 1975 — Netting in more or less devastated clearings of *Larix-Betula* forest.
No. 285. Prov. Ryang-gang: Chann-pay plateau, Sam-zi-yan, 1700 m, 24 July 1975, 16——18.30^h, cloudy weather with full moonlight, 20 °C — Singled material at MV lamp.
No. 288. Prov. Ryang-gang: Chann-pay plateau, Mt. Pektusan, Mu-do-bong, 2100—2200 m, 25 July 1975, 10—13^h — Netting in the upper forest level from shrubby and grass vegetation.
No. 293. Prov. Ryang-gang: Hyesan, Mt. Ze-dong, 1150 m, 26 July 1975, 10—13.30^h, sunny weather with cloudy sky, 28 °C. — Netting material at the edge of a *Larix* wood shrubby level.
No. 296. Prov. Ryang-gang: river Karim, 10 km NEE from Bochonbo, 1100 m, 27 July 1975, 12.30—16.30^h, sunny and warm weather, 32 °C. — Netted material in the shrubby vegetation along the river in a deep valley.
No. 314. Prov. Gang-von: district On-dzong, Kum-gang san, Sam-il po, 4 August 1975, 17—18^h, sunny weather with clouds, 29 °C. — Netted material on shrubby vegetation of a coniferous wood.
No. 315. Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 4 August 1975, 20—0.30^h, 26 °C. — Collected at MV lamp in a coniferous-locust tree wood.
No. 317. Prov. Gang-von: district On-dzong, Kum-gang san, along Okru-dong, 300—600 m, 5 August 1975, 14.30—16^h, cloudy weather with some sunshine, 24 °C. — Netted along the pathway on shrubby and soft-stemmed vegetation.
No. 319. Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 5 August 1975, 20—01^h, 22 °C. — Collected at MV lamp in a coniferous-locust tree wood.
No. 320. Same locality, 4—6 August 1975 — Caught in Malaise-trap.
No. 322. Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 6 August 1975, 20—4.30^h. — Collected at MV lamp in a coniferous-locust tree wood.
No. 324. Prov. Gang-von: district On-dzong, Kum-gang san, along Ok-ru dong, 250—300 m, 7 August 1975, 15.30—17^h, cloudy weather with some sunshine, 22 °C. — Netted material in a coniferous forest on rich soft-stemmed and shrubby vegetation.
No. 325. Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 7 August 1975, rainy weather, 20—2.30^h. — Collected at MV lamp in a coniferous-locust tree wood.
No. 332. De Sang-san, 10 km NE of Pyongyan, 1 July 1977. — Confined, rather stony area. Coniferous wood *(Pinus densifolia)* mixed with some *Acer* sp., undergrowth very sparse.
No. 343. Tesson, water basin, about 35 km SW from Pyongyan, 4 July 1977. — In the neigh-

bourhood a coniferous wood mixed with *Robinia* trees; netting in the grass and shrub levels of the wood.

No. 354. Kum-gang san (= Diamond Mountains): Hotel Kum-gang at village Ontsong, 9 July 1977. — Caught in Malaise-trap erected at a clearing in the forest.

No. 363. Kum-gang san (= Diamond Mountains): 3—4 km S of Hotel Kum-gang, 12 July 1977. — Netting in a shrubby and grass vegetation at the edge of the forest growing on the right side of the pathway to the waterfall Guriong.

No. 371. Mt. Pektusan: wooded environs of the Sam-zi-yan hotel, 18 July 1977. — Caught in Malaise-trap erected about 2 km N from the hotel on the left side of the road to Explosion Lake.

No. 372. Same locality and collecting datum. — Netting in the grass vegetation on the left side of the road to the Explosion Lake, about 2—6 km from the hotel.

No. 374. Mt. Pektusan: wooden environs of the Sam-zi-yan hotel, 19 July 1977. — Netting in shrubby and grass vegetation about 16 km E of the hotel at the edge of a coniferous wood growing on the left side of the road to Musan.

No. 380. Mt. Pektusan: Mupo, brook Dehongdan, 20 July 1977. — Netting in grass vegetation along the brook.

No. 384. Sa Gam, water basin and inundation area of a river, about 30—40 km N of Pyongyang, 5 July 1977. — In the neighbourhood a mixed coniferous-*Robinia* wood; netting in grass vegetation and on willow bushes growing along the riverside.

No. 423. North Hwanghe Prov.: Sariwon, 28 September 1978. — Collecting at mixed light in hotel's window (20—22^h).

No. 525. South Pyongan Prov.: Lake Taesong-ho, 13 September 1979. — Singled and netted in a coniferous-deciduous forest (*Pinus*, *Juniperus*, *Castanea*, *Salix*, *Populus* etc. and ruderals).

No. 663. Chagang Prov.: Mt. Myohyang-san, Hotel Myohyang, 13 September 1980. — Singled in the vicinity of the hotel, mainly lamps standing around the hotel.

No. 673. Same locality, 14 September 1980. — Same method.

No. 729. Kangwon Prov.: Wonsan, 20 September 1980. — Netting in the park Songdowon, mainly around a small pond.

No. 793. North Pyongan Prov.: Mt. Myohyang, Hotel Myohyang-san, 14 July 1982. — Collecting from white sheet illuminated by mixed light and at an other place by two black lamps (20.30—04.30^h).

No. 829. Same locality, 18 July 1982. — Same method.

No. 870. Pyongyang City: Mt. Ryongak, 27 July 1982. — Singled material around lampshades near Mangyongdae Children's Union Camp (21—23.30^h).

No. 923. Pyongyang City: Mt. Daesong, 17 May 1985. — Night collecting at blended light (250 W) by using a Honda generator, from 20^h till 22^h.

Thanks to the kindness of Dr. P. BERON the Braconid material collected by the Bulgarian entomologists, Drs P. BERON and A. POPOV (Zoological Institute, Bulgarian Academy of Sciences, Sofia), in North Korea was also at my disposal for elaboration; their collecting localities are specified below:

No. 3—4. North Pyongan Prov.: Myohyang san, 18 August 1982.
No. 8. Kaesong, 28 August 1982.
No. 11. North Pyongan Prov.: Myohyang san, 14 August 1982.
No. 12. Kanwon Prov.: Kum-gang san, environs of Hotel, 20 August 1982.

Ascogaster albitarsus REINHARD, 1867 — My specimens (1 ♀ + 1 ♂) from Korea agree well with the redescription given by HUDDLESTON (1984). Antenna with 33 joints, carapace broadening posteriorly very faintly. Ivory colour of bases of the hind tibia and basitarsus of 1 ♂ hardly distinct. — Reported from Ireland, Germany, Poland, Sweden and Finland. New to the fauna of Korea.

Localities — 1 ♂: No. 281. 1 ♀: No. 285.

Ascogaster consobrina CURTIS, 1837 — Outside Europe (here in several countries) listed only from Japan. New to the fauna of Korea.

Locality — 1 ♀ + 3 ♂: No. 343.

Ascogaster formosensis SONAN, 1932 (? = *A. longicornis* HUDDLESTON, 1984, junior name) — Based on the original descriptions the two names seem to refer to the same species. The form *formosensis* was described from Taiwan whereas the form *longicornis* from Japan. New to the fauna of Korea.

Localities — 1 ♀: No. 251. 1 ♂: No. 257. 1 ♂: No. 317.

Ascogaster nilena sp. n.: see p. 302.

Ascogaster quadridentata WESMAEL, 1835 — Localities: 1 ♀: No. 138. 2 ♀: No. 166. 1 ♀: No. 231. 1 ♀: No. 243.

Ascogaster reticulata WATANABE, 1967 — As the describer, Prof. CH. WATANABE already mentioned, some series have entirely black carapace, while others have black carapace with yellow marking at its base. The majority of the Korean specimens belongs to the latter group (only 5 out of the 27 specimens are fully black). HUDDLESTON (1984) reported a single yellow spotted specimen also from Korea. — Distribution: Japan, Czechoslovakia. New to the fauna of Korea.

Localities — 5 ♀: No. 225. 4 ♀: No. 229. 6 ♀: No. 234. 7 ♀: No. 237. 5 ♀: No. 243.

Ascogaster rufipes (LATREILLE, 1809) — Mesosoma in lateral view less long, 1.5 times as long as high (usually almost twice longer). Otherwise agreeing with the European forms. — Frequent in Europe and the USSR. New to the fauna of Korea.

Locality — 1 ♀: No. 320.

Ascogaster varipes WESMAEL, 1835 — Frequent to common in Europe and the USSR. New to the fauna of Korea.

Localities — 1 ♀: No. 161. 1 ♀: No. 181. 2 ♀: No. 281.

Appendix

Ascogaster WESMAEL 1835 species of the East Palaearctic Region: USSR (E of the river Yenisei), Mongolia, China (N of the river Yangtze), Korea, Japan

acutiventris TOBIAS, 1986: USSR, (Far East)
albitarsus REINHARD, 1867: Korea
annularis (NEES, 1816): USSR (E Siberia)
arisanica SONAN, 1932: Japan
bidentula WESMAEL, 1835: USSR (Far East), Japan
= atamiensis ASHMEAD, 1906
canifrons WESMAEL, 1835: Mongolia
consobrina CURTIS, 1837: Korea, Japan
cuneiventris TOBIAS, 1986: USSR (Far East)
dispar FAHRINGER, 1934: Mongolia
= kozlovi TOBIAS, 1972
= spinifer TOBIAS, 1964
exigua HUDDLESTON, 1984: Mongolia
flavomaculata TOBIAS, 1986: USSR (Far East)
formosensis SONAN, 1932: Korea (and Taiwan)
longicornis HUDDLESTON, 1984
?= *formosensis* SONAN, 1932, sen. name
nachitshevanica ABDINBEKOVA, 1969: Mongolia
nilena sp. n.: Korea
perkinsi HUDDLESTON, 1984: Japan
quadridentata WESMAEL, 1835: Mongolia, Korea, Japan
= epinotiae WATANABE, 1937
reticulata WATANABE, 1967: Korea, Japan
rufidens WESMAEL, 1835: USSR (Far East)
rufipes (LATREILLE, 1809): USSR (Far East), Korea
semenovi TELENGA, 1941: Mongolia, Japan
= kyushuensis YONEDA, 1978
varipes WESMAEL, 1835: USSR, Korea

Chelonus moriokensis WATANABE, 1937 — Described and up to now known only from Japan. New to the fauna of Korea.

Localities — 2 ♀: No. 196. 1 ♀: No. 729. 1 ♀: No. 793.

Microchelonus contractus (NEES, 1816) — Locality: 1 ♂: No. 288.

Microchelonus endemius sp. n.: see p. 304.

Microchelonus fenestratus (NEES, 1816) — Frequent in Europe. New to the fauna of Korea.

Locality — 1 ♀: No. 354.

Microchelonus hurtus sp. n.: see p. 306.

Microchelonus microphthalmus (WESMAEL, 1838) (= *Chelonus exilis* MARSHALL, 1885) — Localities: 2 ♀: No. 372. 4 ♂: No. 374. 2 ♀: No. 380.

Microchelonus mitigatus sp. n.: see p. 308.

Microchelonus paucifossa sp. n.: see p. 310.

Microchelonus pectiniphorae (CUSHMAN, 1931) — Localities: 1 ♀: No. 225. 1 ♂: No. 273.

Microchelonus plenus sp. n.: see p. 312.

Microchelonus puerilis sp. n.: see p. 314.

Appendix

Microchelonus SZÉPLIGETI, 1908 species of the East Palaearctic Region: USSR (E of the river Yenisei), Mongolia, China (N of the river Yangtze), Korea, Japan

abditus (TOBIAS, 1961): USSR (Far East)
agathis PAPP, 1971: Mongolia
amurensis TOBIAS, 1984: USSR (Far East)
angustiventris TOBIAS, 1986c: USSR (Far East)
apicalis PAPP, 1971: Mongolia
atripes (THOMSON, 1874): Mongolia
= cunctator PAPP, 1971
belokobylskiji TOBIAS, 1984: USSR (Far East)
brevigenis (TOBIAS, 1964): Mongolia
carinatikovi SHENEFELT, 1973: USSR (Far East)
= carinata (SHESTAKOV, 1940 nec PROVANCHER, 1881)
changaicus (TOBIAS, 1972): Mongolia
contractus (NEES, 1816): USSR (East Siberia), Korea
dilatus PAPP, 1971: Mongolia
elegantulus TOBIAS, 1986c: USSR (Far East)
elongatus PAP, 1971: Mongolia
endomius sp. n.: Korea
excavatus (TOBIAS, 1972): Mongolia
fenestratus (NEES, 1816): USSR (Far East), Mongolia, Korea
flavipalpis (SZÉPLIGETI, 1896): USSR (Far East)
?fortispinus (CAMERON, 1906)
hurtus sp. n.: Korea
kamtshaticus Tobias, 1986b: USSR (Far East)
kozlovi (TOBIAS, 1961): USSR (East Siberia), Mongolia
laticeps (TOBIAS, 1972): Mongolia
latifunis TOBIAS, 1986a: USSR (Far East)
longipes TOBIAS, 1984: USSR (Far East: Kunashir island)
luzhetzkji (TOBIAS, 1966): Mongolia
magnipunctus TOBIAS, 1984: USSR (Far East)
marshakovi TOBIAS, 1986c: USSR (Far East)
microphthalmus (WESMAEL, 1838): Mongolia, Korea
= exilis (MARSHALL, 1885)
mirabilis (TOBIAS, 1972): Mongolia
mitigatus sp. n.: Korea
mongolicus (TELENGA, 1941): Mongolia
?= *fenestratus* (NEES, 1816) sen. name
nitens (REINHARD, 1867): Mongolia
ovalis TOBIAS, 1984: USSR (Far East)
palpator TOBIAS, 1986a: USSR (Far East)
parcicornis (HERRICH-SCHÄFFER, 1838): Mongolia
= rectus PAPP, 1971
paucifossa sp. n.: Korea
pectiniphorae (CUSHMAN, 1931): USSR (Far East), China, Korea, Japan
plenus sp. n.: Korea
puerilis sp. n.: Korea
pusilloides (TOBIAS, 1972): Mongolia
rimulosus (THOMSON, 1874): Mongolia
= rimatus (SZÉPLIGETI, 1896)
risorius (REINHARD, 1867): Mongolia
?= *magnifissus* TOBIAS, 1986a jun. name
rubens (TOBIAS, 1972): Mongolia
saksauli (TOBIAS, 1972): Mongolia
semenovi TOBIAS, 1986: USSR (European part, Ural Mts)
septemdecimplex TOBIAS, 1986a: USSR (Kamchatka)
subfenestratus TOBIAS, 1984: USSR (Far East)
subtilistriatus PAPP, 1971: Mongolia
?sulcatus (JURINE, 1807): ?USSR („Siberia")
zaitzevi (TOBIAS, 1972): Mongolia

Phanerotoma acuminata SZÉPLIGETI, 1908 — Listed in Hungary, Czechoslovakia, Italy and the USSR (Ukraine, Kazakhstan, Soviet Middle Asia). New to the fauna of Korea.
Locality — 2 ♂: No. 11.

Phanerotoma antennalis ŠNOFLÁK, 1951 — As ZETTEL (1987) recently pointed out the species was frequently misidentified as *Ph. dentata* (PANZER). Described from Czechoslovakia (from several localities) and reported from Austria where it is a frequent species. Supposedly distributed in the Palaearctic Region. New to the fauna of Korea.
Localities — 1 ♂: No. 136. 1 ♀: No. 160. 1 ♂: No. 319. 1 ♂: No. 324. 1 ♀: No. 663. 1 ♀: No. 673. — 1 ♀ + 1 ♂: No. 3. 1 ♀ + 3 ♂: No. 11. 1 ♀: No. 8. 1 ♀ + 1 ♂: No. 12.

Phanerotoma bilinea LYLE, 1924 (= *Ph. gregori* ŠNOFLÁK, 1951) — Ground colour of body usually yellow to faintly brownish yellow, third tergite brown to blackish brown. 1 ♀ (loc. No. 319) and 1 ♂ (loc. No. 363) represent a melanic form: head blackish except rusty brown clypeus, latero-posterior margin (1 ♀) or posterior margin (1 ♂) of second tergite black. — Distributed sporadically in the Palaearctic Region. Listed in England, Czechoslovakia, Hungary and the USSR (Moldavia, Azerbaidzhan). New to the fauna of Korea.

Localities — 1 ♀: No. 251. 1 ♀: No. 273. 1 ♀: No. 315. 2 ♀: No. 317. 2 ♀ + 1 ♂: No. 319. 5 ♀: No. 325. 1 ♂: No. 363. — 1 ♂: No. 4. 1 ♀: No. 11. 2 ♀: No. 12.

Phanerotoma dentata (PANZER, 1805) — The specimens represent a light form. Third tergite yellowish brown or brown. Otherwise similar to the European forms.

Localities — 1 ♀: No. 153. 1 ♀ (det. ZETTEL): No. 160. 1 ♀: No. 525. — 2 ♀: No. 3. 2 ♀: No. 8. 1 ♀: No. 11.

Phanerotoma diversa (WALKER, 1874) — In SHENEFELT's world catalogue of Braconidae (1973: 923—924) the name "*Chelonus diversus*" is placed in synonymy with *Ph. planifrons* (NEES) following WATANABE's original synonymization (1937: 79). Mr. Z. ZETTEL (Vienna), working on a revision of the *Phanerotoma* species of the Old World, was kind enough to impart to me personally ("pers. comm.") that the name *diversus* represents a valid species within the genus *Phanerotoma*. Thus H. ZETTEL has the priority in this taxonomic re-validation. Furthermore, since my knowledge of the species *diversus* is based upon a few Korean specimens identified by him in 1988 during his visit in the Museum of Budapest, his name is indicated in the subsequent list after the relevant specimens. — Supposedly a widely distributed species in the East Palaearctic Region (and in the Oriental Region, as well). New to the fauna of Korea.

Localities — 1 ♂: No. 164. 1 ♀ (det. Zettel): No. 257. 1 ♀ (det. Zettel): No. 273. 1 ♀: No. 276. 1 ♀ + 1 ♂ (1 ♂ det. Zettel): 293. 1 ♀: No. 296. 4 ♀: No. 314. 1 ♀: No. 315. 1 ♀: No. 317. 3 ♀ + 1 ♂ (1 ♀ + 1 ♂ det. Zettel): No. 319. 1 ♀ (det. Zettel): No. 322. 16 ♀ (5 ♀ det. Zettel): No. 325. 1 ♀ (det. Zettel): No. 384. 1 ♀ (det. Zettel): No. 423. 1 ♀: No. 673. 1 ♀: No. 829. 1 ♀: No. 923. — 2 ♀ + 1 ♂ (1 ♀ + 1 ♂ det. Zettel): No. 3. 2 ♀: No. 8. 7 ♀ + 11 ♂ (1 ♀ + 6 ♂ det. Zettel): No. 11. 2 ♀: No. 12.

Phanerotoma flavitestacea FISCHER, 1959 — Distributed in the Mediterranean subregion, found also in Hungary. New to the fauna of Korea.

Localities — 1 ♀: No. 663. — 1 ♂: No. 3. 1 ♀ + 1 ♂: No. 11.

Phanerotoma fracta KOKUJEV, 1903 — Supposedly widely distributed in the Palaearctic Region. New to the fauna of Korea.

Locality — 1 ♀: No. 276.

Phanerotoma offensa sp. n.: see p. 316.

Phanerotoma pedra sp. n.: see p. 318.

Phanerotoma producta WATANABE, 1937 — Antenna with 22 (3 ♀) and 23 joints (3 ♀ + + 1 ♂). Contrarily to the original description third tergite of the male less pointed, the figure given by WATANABE (1937: 81 and Plate V: fig. 13) depicts the dorsal view of the female metasoma (and not that of the male). — Hitherto known only from Japan. New to the fauna of Korea.

Localities — 1 ♀: No. 143. 1 ♀: No. 319. 1 ♀: No. 322. 2 ♀ + 3 ♂: No. 325. 1 ♀: No. 870. — 2 ♀: No. 11.

Phanerotoma waitzbaueri ZETTEL, 1987 — Described recently from Austria. New to the fauna of Korea.

Locality — 1 ♂ (det. Zettel): No. 371.

Appendix

Phanerotoma WESMAEL, 1838 species of the East Palaearctic Region: USSR (E of the river Yenisei), Mongolia, China (N of the river Yangtze), Korea, Japan

acuminata SZÉPLIGETI, 1908: Mongolia, Korea
antennalis ŠNOFLÁK, 1951: Korea
bilinea LYLE, 1924: Korea
dentata (PANZER, 1805): Korea, Japan
diversa (WALKER, 1874): Mongolia, Korea, Japan
= picta ŠNOFLÁK, 1951
excisa PAPP, 1971
?= ♀: *fracta* KOKUJEV, 1903 sen. name
♂: *katkowi* KOKUJEV, 1900 sen. name

flava ASHMEAD, 1906: China, Korea, Japan
flavitestacea FISCHER, 1959: Korea
fracta KOKUJEV, 1903: USSR (Far East), Mongolia
genalis TOBIAS, 1974: Mongolia
gracilis TOBIAS, 1970: USSR (Far East)
grapholithae MUESEBECK, 1933: China, Korea, Japan
katkowi KOKUJEV, 1900: Mongolia
kobdensis TOBIAS, 1972: Mongolia
kozlovi SHESTAKOV, 1940: Mongolia
issonota TOBIAS, 1972: Mongolia
minuta KOKUJEV, 1903: China, Mongolia, Korea
obscura ŠNOFLÁK, 1951: USSR (Far East)
offensa sp. n.: Korea
parva KOKUJEV, 1903: Mongolia
pedra sp. n.: Korea
potanini KOKUJEV, 1895: Mongolia
= zaidamensis SHESTAKOV, 1930
producta WATANABE, 1937: Korea, Japan
sculptifrons TOBIAS, 1970: USSR (Far East)
ussuriensis TELENGA, 1941: USSR (Far East)
waitzbaueri ZETTEL, 1987: Korea

Phanerotomella bellula sp. n.: see p. 321.

Phanerotomella nigra SZÉPLIGETI, 1900 — The single female specimen from Korea is conspecific with the representatives from Hungary and Bulgaria, though a few deviations are to be established:

Korean female	European females
1. Face below antennal socket very finely aciculate, otherwise almost smooth.	1. Face transversely rugulo-striate.
2. Scape and pedicel yellow.	2. Scape and pedicel brownish to brown.
3. Metasoma less broad, indistinctly broader than mesosoma between tegulae; 1.7 times as long as broad at second tergite.	3. Metasoma broad, distinctly, i.e. one-fourth broader than mesosoma between tegulae; 1.4—1.5 times as long as broad at second tergite.

Locality — 1 ♀: No. 332. — Reported from Austria, Czechoslovakia and Hungary. New to the fauna of Korea.

Phanerotomella ?orientalis TOBIAS, 1986 — The single female specimen agrees with the original description given by TOBIAS (1986b) except three features: (1) The proportional lengths of pterostigma to radial cell (along metacarpal vein) are after the description as 1.2 times longer for radial cell over pterostigma and after the figure of fore wing (Fig. 1 in TOBIAS 1986b: 5) 1.1 times longer for pterostigma over radial cell; the Korean specimen represents the first version, i. e. radial cell along metacarp 1.3 times as long as pterostigma. (2) Body black; flagellum brownish, scape + pedicel, palpi, mandibel, legs and first tergite brownish yellow; the Korean specimen, quite the contrary, with lemon yellow corporal colour, only ocellar field as well as a pair of small spots close behind tegulae black, and a pair of small spots antero-laterally on third tergite brown. (3) Body (female) 2.3 mm (holotype) and 3 mm long (Korean specimen). A comparison of the two specimens is necessary to decide whether they represent two different species or there are only colour deviations between them therefore they belong to the same species as I have interpreted them here. — In 1988 Mr. H. Zettel (Vienna) had named my Korean specimen female as "aff. mariae Bjelokob.".

Locality — 1 ♀: No. 315.

Appendix

Phanerotomella SZÉPLIGETI, 1900 species of the East Palaearctic Region: USSR (E of the river Yenisei), Mongolia China (N of the river Yangtze), Korea, Japan

The species of the genus *Phanerotomella* SZÉPLIGETI are distributed both in the temperate and tropical realms of the Old World. Up to now no species has been reported from the American continent. The majority of the species of the Palaearctic Region is known from its western half. In the eastern half out of the six species recorded so far four were described recently, and the seventh species is mine. The seven species are listed below:

bellula sp. n.: Korea
mariae BELOKOBYLSKIJ, 1986: USSR (Far East)
nigra SZÉPLIGETI, 1900: Korea
orientalis TOBIAS, 1986b: USSR (Far East)
pulchra FAHRINGER, 1934: China
tobiasi BELOKOBYLSKIJ, 1986: USSR (Far East)
variareolata BELOKOBYLSKIJ, 1986: USSR (Far East)

2. Description of the new species

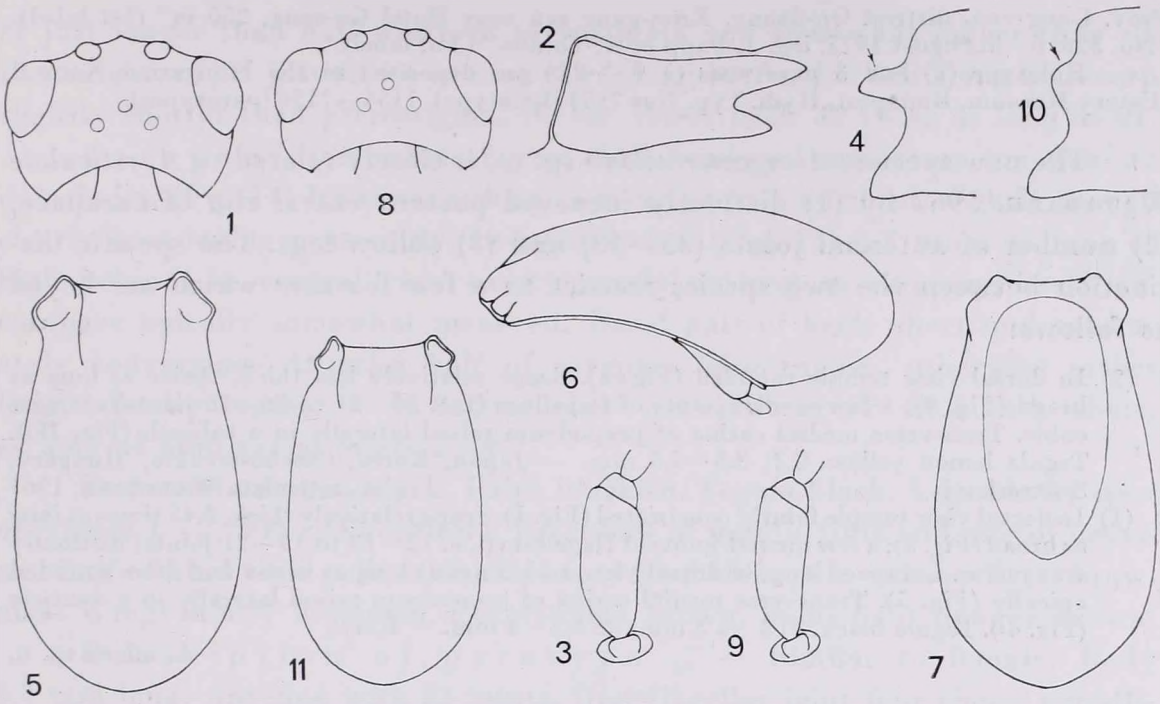
Ascogaster nilena sp. n. ♀
(Figs 1—7)

Description of the holotype ♀ — Body 4 mm long. Head in dorsal view (Fig. 1) 1.7 times as broad as long, eye somewhat longer than temple, latter faintly constricted, occiput excavated. Eye in lateral view 1.6 times as high as wide, temple slightly wider than eye. Ocelli relatively large and round, distance between fore and a hind ocelli equal with diameter of an ocellus, OOL slightly longer than POL. Face 1.5 times as wide as high. Clypeus 1.58 times as wide below as high medially, its lower margin medially rather indistinctly pointed. Malar space one-fifth longer than base of mandible, cheek in frontal view rounded. Mandible strongly twisted (Fig. 2). Head rugose; clypeus punctate and shiny, interspaces about 1.5—2 times longer than diameter of puntures, — Antenna as long as body, with 40 joints, distally somewhat dilated. Scape relatively thick, 2.45 times as long as broad, apically obliquely truncate (Fig. 3). First flagellar joint thrice as long as broad, further joints gradually shortening and joints 12—13 to 19—21 somewhat dilated, i.e. flagellar joints 12—13 to 19—21 transverse, slightly broader than long; last ten joints attenuating, penultimate joint 1.3 times as long as broad.

Mesosoma in lateral view 1.5 times as long as high, in dorsal view head just broader than mesosoma between tegulae. Notaulix and sternaulix indistinct. Transverse median carina of propodeum raised laterally in a denticle (Fig. 4). Mesosoma strongly rugose to rugose, mesonotum behind and scutellum with longitudinal rugae. — Outer surface of hind coxa strigulate. Hind femur 3.7 times as long as broad, hind tibia slightly longer than hind femur. Hind basitarsus just shorter than tarsal joints 2—5.

Fore wing shorter than body. Pterostigma 2.5 times as long as wide, issuing radial vein distally from its middle; *r1* long, one-fourth shorter than width of pterostigma, *r2* slightly shorter than *r1*, *r3* straight and ending far before tip of wing. Radial cell along metacarp somewhat shorter than length of pterostigma. *N. rec.* postfurcal. *d2* five times as long as *d1*.

Carapace in dorsal view (Fig. 5) somewhat shorter than head and mesosoma together, 1.85 times as long as broad, broadest behind its middle, apically rounded; in lateral view (Fig. 6) 2.3 times as long as high behind; in ventral view (Fig. 7) cavity one-third shorter than carapace itself, i.e. carapace apico-ventrally distinctly incurved. Pair of basal keels short and parallel. Carapace rugose, anteriorly rather areolate-rugose. — Ovipositor sheath in lateral view as long as second joint of hind tarsus.



Figs 1—7. *Ascogaster nilena* sp. n.: 1 = head in dorsal view, 2 = mandibel, 3 = scape and pedicel, 4 = denticle of propodeum in lateral view, 5 = carapace in dorsal view, 6 = carapace in lateral view, 7 = carapace in ventral view. — Figs 8—11. *A. reticulata* WATANABE: 8 = head in dorsal view, 9 = scape and pedicel, 10 = tubercle of propodeum in lateral view, 11 = carapace in dorsal view

Ground colour of body black. Palpi yellow. Scape and pedicel brownish yellow, flagellum darkening brownish yellow, apically blackish. Tegula black, parategula brownish yellow. Legs yellow, tarsi infuscate. Distal two-thirds of hind femur and tibia blackish to black. Basal third of carapace lemon yellow. Wings subhyaline, pterostigma and veins brown.

Description of the paratypes, 1 ♀ + 2 ♂:

♀. Body 4.3 mm long. Antenna with 34 joints, flagellum more dilated at 9—10 to 20—21 joints, i.e. these joints clearly transverse, 1.4 (—1.3) times as broad as long. A melanic form: carapace fully black, hind coxa black, femora 1—2 and tibia 2 with blackish suffusion, ground colour of antenna rather brownish. Otherwise agreeing with the holotype ♀. — ♂. Body 3.8——4 mm long. Antenna (1 ♂) somewhat longer than body, not dilated, i.e. all joints longer than broad. Yellow spot of carapace smaller, extending on its basal fourth. Hind coxa black, apically yellow. Otherwise agreeing with the female.

Host unknown.

Localities — Holotype ♀: "Korea, Prov. Ryang-gang, Chann-Pay plateau, Mt. Pektusan, Mu-do-bong, 2100—2200 m" (1st label); "No. 288, 25 July 1975, leg. J. Papp et A. Vojnits" (2nd label). — 1 ♀ paratype: "Korea: Prov. Kanwon: Kum-gang san, environs of Hotel" (1st label); "20. VIII. 1982, leg. Beron et Popov, No. 12" (2nd label). — 1 ♂ paratype: "Korea, Prov. South Pyongan: Lyong-ak san, 14 km W of Pyongyan" (1st label); "No. 300., 30 July 1975, leg. J. Papp et A. Vojnits" (2nd label). — 1 ♂ paratype: "Korea,

Prov. Gang-von, district On-dzong, Kum-gang san near Hotel Go-song, 250 m" (1st label); "No. 326, 6—8 August 1975, leg. J. Papp et A. Vojnits" (2nd label).

Holotype (♀) and 3 paratypes (1 ♀ + 2♂) are deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. Nos 7153 (holotype), 7154—7156 (paratypes).

The new species, *Ascogaster nilena* sp. n., is closely related to *A. reticulate* WATANABE, 1967 by (1) distinctly incurved posteroventral rim of carapace, (2) number of antennal joints (35—40) and (3) yellow legs. The specific distinction between the two species restrict to a few features which are keyed as follows:

1 (2) In dorsal view temple rounded (Fig. 8). Scape relatively less thick, thrice as long as broad (Fig. 9); a few medial joints of flagellum (i. e. 20—21 to 26—28 joints) at most cubic. Transverse medial carina of propodeum raised laterally in a tubercle (Fig. 10↓). Tegula lemon yellow. ♀♂: 3.5—5.5 mm. — Japan, Korea, Czechoslovakia, Hungary, Switzerland **A. reticulata** WATANABE, 1967

2 (1) In dorsal view temple faintly constricted (Fig. 1). Scape relatively thick, 2.45 times as long as broad (Fig. 3); a few medial joints of flagellum (i. e. 12—13 to 19—21 joints) distinctly transverse. Carapace long, in dorsal view 1.85 times as long as broad and more rounded apically (Fig. 5). Transverse medial carina of propodeum raised laterally in a denticle (Fig. 4↓). Tegula black. ♀: 4—4.3 mm, ♂: 3.8—4 mm. — Korea **A. nilena** sp. n.

Microchelonus endomius sp. n. ♀♂
(Figs 12—16)

Description of the holotype ♀ — Body 3.8 mm long. Head in dorsal view (Fig. 12) cubic, 1.68 times broader than long, temple somewhat longer than eye and moderately rounded, occiput deeply excavated. Eye in lateral view (Fig. 13) 2.2 times as high as wide, temple almost twice as wide as eye. Ocelli small, distance between fore and a hind ocelli just shorter than whereas POL twice as long as greatest diameter of an ocellus; hind imaginary tangent to fore ocellus touching hind pair of ocelli; OOL one third longer than POL (Fig. 12). Face twice wider than high, inner margin of eyes parallel. Clypeus 1.5 times wider than high, its lower margin convex. Malar space about one-third longer than basal width of mandible. Head rugose; clypeus punctate, interspaces mostly greater than punctures; frontal scrobe almost smooth. — Antenna almost as long as body, first flagellar joint 3.6 times as long as broad, further joints gradually shortening and attenuating so that penultimate joint clearly 2.5 times as long as broad.

Mesosoma in lateral view 1.3 times as long as high. In dorsal view head somewhat broader than mesosoma between tegulae. Mesosoma rugose to strongly rugose, scutellum less sculptured with smooth fields. Propodeum with a pair of lateral tubercles. — Hind femur 3.2 times as long as broad, broadest at its middle; hind tibia and tarsus equal in length; basitarsus of hind leg as long as tarsal joints 2—5.

Fore wing somewhat shorter than body. Pterostigma 2.8 times as long as wide and as long as metacarp, issuing radial vein from its middle;

r1 just longer than half width of pterostigma and somewhat longer than *r2*, *r3* straight, *cuqu1* just thrice as long as *r2*; length of radial cell along metacarp slightly shorter than pterostigma. *N. rec.* interstitial; *d2* twice as long as *d1*.

C a r a p a c e somewhat shorter than head and mesosoma together, in dorsal view (Fig. 14) 1.8 times as long as broad at its hind third, slightly though clearly broadening posteriorly; in lateral view (Fig. 15) 2.7 times as long as high behind; in ventral view cavity nearly as long as carapace itself, i.e. carapace apically somewhat incurved. Basal pair of keels short and moderately converging. Anterior half of carapace strio-rugose, otherwise rather longitudinally rugose. — In lateral view o v i p o s i t o r s h e a t h short, as long as hind tarsal joints 2—4.

Body and antenna black. Palps blackish. Tegula black. Legs black; apex of femora 1—2, fore tibia entirely, basal half of middle tibia and ring of proximal half of hind tibia yellow(ish). Spurs of hind tibia pale yellow. Tarsi brownish. Wings faintly brownish. Pterostigma brown, veins light opaque brown.

D e s c r i p t i o n o f p a r a t y p e ♂ — Similar to female. Body 3.7 mm long. Antenna with 23 joints, first flagellar joint four times, penultimate joint clearly twice as long as broad. Apical foramen of carapace twice wider than high (Fig. 16) and as wide as hind tarsal joints 2—5. Carapace in dorsal view just twice as long as broad, in lateral view 2.7 times as long as high at its hind third.

Host unknown.

Locality — H o l o t y p e ♀ and 1 ♂ paratype: "Korea, Mt. Pektusan, environs Sam-ziyan hotel, wood, 18—20 VII 1977" (1st label); "No. 374 — netting in grasses, DELY & DRASKOVITS" (2nd label).

Holotype and one paratype are deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7157 (holotype) and 7158 (paratype)

The new species, *Microchelonus endomius* sp. n., is related to *M. septemdecimplex* TOBIAS, 1986 and *M. excavatus* (TOBIAS, 1972) by their cubic head in dorsal view distinctly less than twice as broad as long, temple longer than eye), they can be separated by the following key:

(6) Females.

(5) Carapace in dorsal view broadest about its middle and apically with a small tubercle (Fig. 18). In dorsal view temple not constricted (Figs 17, 19). Antenna short, about as long as head + mesosoma together, its penultimate joint either cubic or at most somewhat longer than broad.

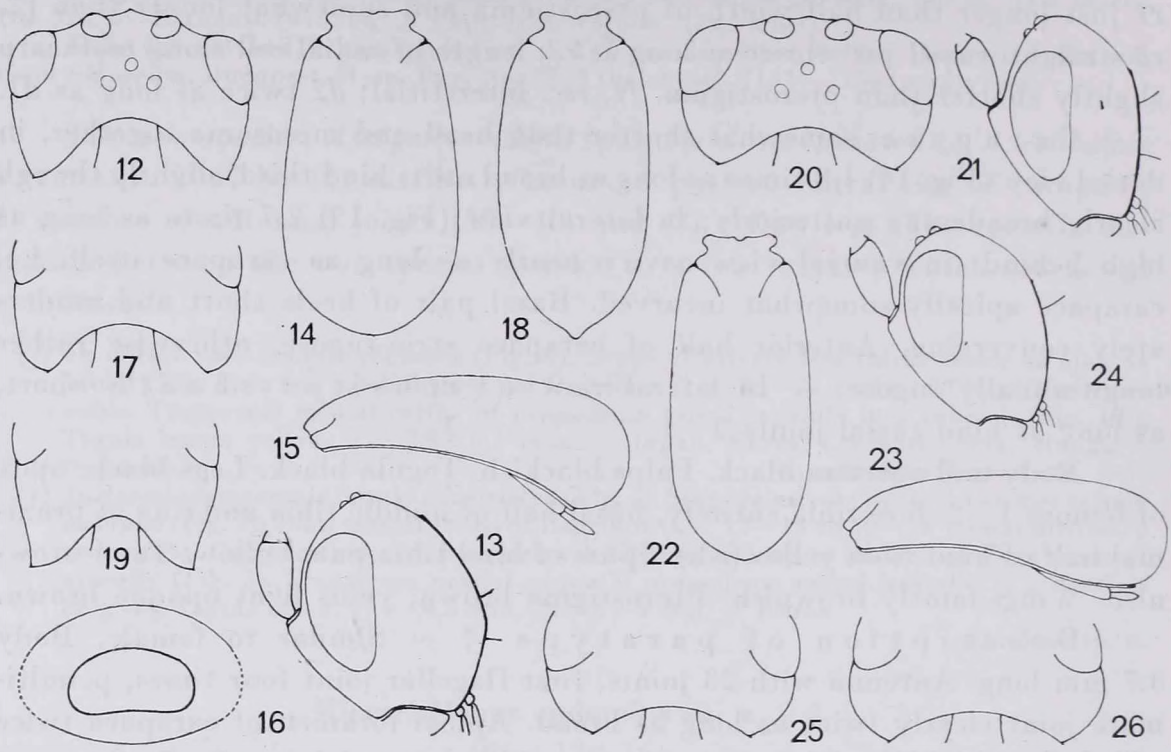
(4) Antenna with 17 joints. Mesosoma in lateral view 1.5 times as long as high. Pterostigma 1.4 times as long as radial cell along metacarp. Carapace in dorsal view slightly less than twice as long as broad, strio-rugose on its anterior two-thirds. 3—3.1 mm. — USSR: Kamchatka

M. septemdecimplex TOBIAS, 1986

(3) Antenna with 16 joints. Mesosoma in lateral view 1.6—1.8 times as long as high. Pterostigma 1.2—1.3 times as long as radial cell along metacarp. Carapace in dorsal view (Fig. 18) 2.1 (—2.3) times as long as broad, rather strio-rugulose on its anterior third. 2.6—3.2 mm. — Mongolia, USSR (European part), Hungary

M. excavatus (TOBIAS, 1972)

(2) Carapace in dorsal view broadest at its hind third and apically without a tubercle (Fig. 14); in lateral view 2.7 times as long as its hind third (Fig. 15). Antenna long, almost as



Figs 12—16. *Microchelonus endomius* sp. n.: 12 = head in dorsal view, 13 = head in lateral view, 14 = carapace in dorsal view, 15 = carapace in lateral view, 16 = foramen of male carapace. — Figs 17—18. *M. excavatus* TOBIAS: 17 = temple in dorsal view, 18 = carapace in dorsal view. — Fig. 19. *M. septemdecimplex* TOBIAS: temple in dorsal view (after TOBIAS 1986b). — Figs 20—23. *M. hurtus* sp. n.: 20 = head in dorsal view, 21 = head in lateral view, 22 = = carapace in dorsal view, 23 = carapace in lateral view. — Fig. 24. *M. basalis* (CURTIS): head in lateral view. — Fig. 25. *M. pectiniphorae* (CUSHMAN): temple in dorsal view. — Fig. 26. *M. flavipalpis* (SZÉPLIGETI): temple in dorsal view

long as body, its penultimate joint clearly 2.5 times as long as broad. 3.8 mm. — Korea
M. endomius sp. n.

6 (1) Males (♂ of *M. septemdecimplex* unknown).

7 (8) Apical foramen of carapace small, as wide as length of second joint of hind tarsus. Carapace in dorsal view 2.2 times as long as broad, in lateral view four times as long as high behind. Penultimate joint of antenna 1.5 times as long as broad. 3—3.1 mm
M. excavatus (TOBIAS, 1972)

8 (7) Apical foramen of carapace large, as wide as length of 2—5 joints of hind tarsus (Fig. 16). Carapace in dorsal view just twice as long as broad, in lateral view 2.7 times as long as high behind. Penultimate joint of antenna clearly twice as long as broad. 3.7 mm
M. endomius sp. n.

Microchelonus hurtus sp. n. ♀
(Figs 20—23)

Description of the holotype ♀ — Body 2.8 mm long. Head in dorsal view (Fig. 20) just less than twice as broad as long, eye as long as temple, latter rounded, occiput deeply excavated. Eye in lateral view 2.2 times as high as wide, temple somewhat wider than eye and not broadening ventrally (Fig. 21). Ocelli small, distance between fore and a hind ocelli slightly greater, whereas POL clearly twice greater than greatest diameter of

an ocellus; OOL somewhat longer than POL (Fig. 20). Face one-third wider than high, inner margin of eyes just subparallel. Clypeus about one-third wider than high, its lower margin truncate medially. Malar space as long as basal width of mandible. Head strio-rugose, clypeus subpunctate. — Antenna as long as head, mesosoma and fore third of carapace. First flagellar joint 3.75 times as long as apically broad, further joints shortening and joints 8—13 somewhat club-form thickening, penultimate joint subcubic, i.e. just longer than broad.

Mesosoma elongated, in lateral view 1.8 times as long as high. In dorsal view head about one-third broader than mesosoma between tegulae. Mesosoma rugose, scutellum almost smooth, propodeum with a pair of small lateral tubercles. — Hind femur thrice as long as broad, broadest at its middle. Hind tibia and tarsus equal in length; basitarsus of hind leg as long as tarsal joints 2—4.

Fore wing shorter than body. Pterostigma 2.3 times as long as wide and somewhat shorter than metacarp, issuing radial vein distally from its middle; *r1* one-third as long as width of pterostigma and as long as *r2*, *r3* straight, *cuqu1* just less than thrice as long as *r2*; length of radial cell along metacarp slightly shorter than pterostigma. *N. rec.* interstitial; *d2* 2.2 times as long as *d1*.

Carapace as long as head and mesosoma together, in dorsal view (Fig. 22) twice as long as broad, broadest behind its middle; in lateral view (Fig. 23) one-third higher behind than basally (at hind margin of yellow spot); in ventral view cavity almost as long as carapace itself, i.e. carapace apically hardly incurved. Basal pair of keels short and converging. Carapace rugose-rugulose, anteriorly with longitudinal elements. — In lateral view ovipositor sheath very short, as long as hind tarsal joint 2.

Body black. Scape and pedicel yellow, flagellum blackish brown. Tegula black, parategula brown. Basal third of carapace whitish, between keels blackish brown. Legs vivid yellow; outer side of hind coxa and distal third as well as base of hind tibia blackish, ring of hind tibia pale yellow. Distal end of hind tibia dark, otherwise pale yellow. Hind tarsus blackish fumous. Wings hyaline; pterostigma brown, basally together with parastigma pale yellow; veins opaque brownish.

♂ and host unknown.

Locality — Holotype ♀: "Korea, Prov. South Pyongan, Pyongyan, Hotel garden, 4 Sept. 1971" (1st label); "No. 237, leg. S. HORVATOVICH et J. PAPP" (2nd label).

Holotype is deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7159.

The new species, *Microchelonus hurtus* sp. n., stands nearest to *M. basalis* (CURTIS, 1837), *M. pectiniphorae* (CUSHMAN, 1931) and *M. flavipalpis* (SZÉPLIGETI, 1896). They are characterized by yellow basal carapace and

short antenna (at most as long as head and mesosoma together). The four species can be distinguished by the following key:

1 (4) Body small, its length under 3 mm. Carapace in lateral view at most one-third higher behind than basally (at hind margin of yellow spot) (Fig. 23). Striate elements of carapace sculpture less expressed. Male unknown.

2 (3) Mesosoma less elongated, in lateral view 1.6 times as long as high. Scutellum rugose, similarly to mesonotum. In lateral view temple one-third wider than eye and broadening ventrally (Fig. 24). Carapace in lateral view only somewhat higher behind than basally. Legs black, fore tibia yellow. ♀: 2.5 mm. — England
M. basalis (CURTIS, 1837)

3 (2) Mesosoma elongated, 1.8 times as long as high. Scutellum almost smooth. In lateral view temple only somewhat wider than eye and not broadening ventrally (Fig. 21). Carapace in lateral view one-third higher behind than basally (Fig. 23). Head in dorsal view just less than twice as broad as long. Legs yellow; outer side of hind coxa and distal third of tibiae 2—3 blackish. ♀: 2.8 mm. — Korea **M. hurtus** sp. n.

4 (1) Body large, its length more than 3 mm. Carapace in lateral view twice higher behind than basally (at hind margin of yellow spot) (Fig. 27). Striate elements of carapace sculpture more expressed. Male known.

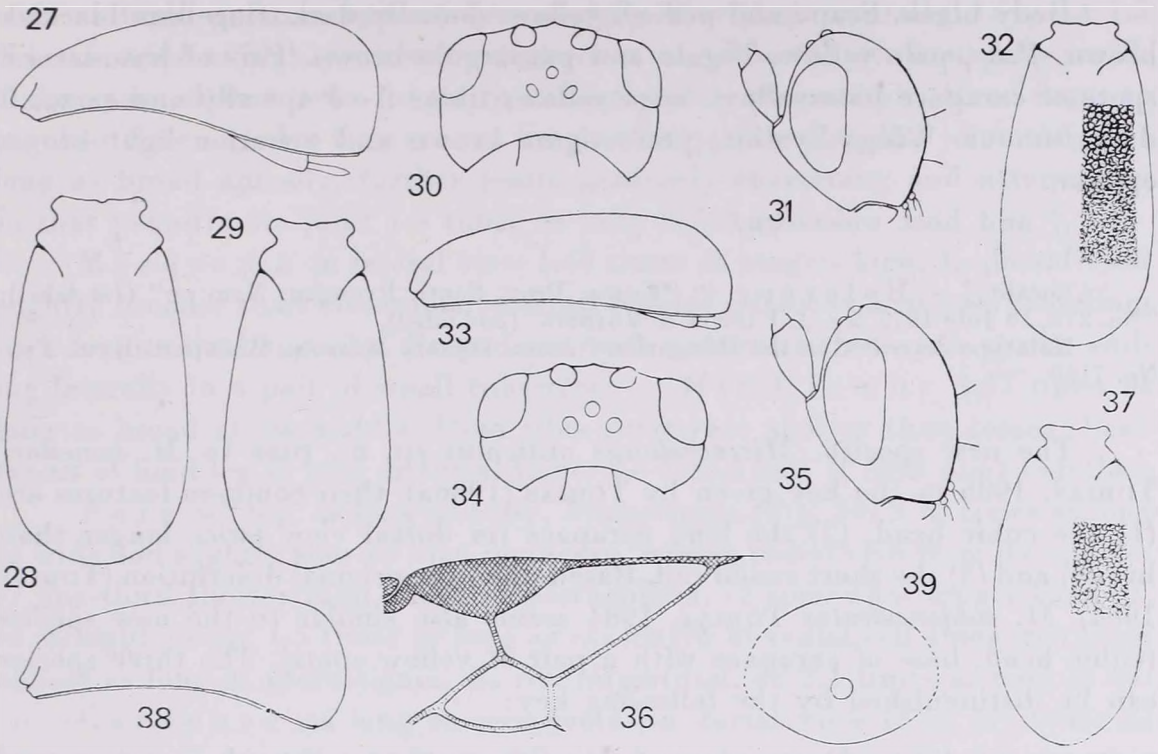
5 (6) In dorsal view temple rather contracted (Fig. 25). Carapace less narrowing basally, 1.35—1.4 times as long as broad and its hind breadth just one-third greater than its basal breadth (Fig. 28). Hind femur black. Ring of hind tibia whitish. Apical foramen of male carapace thrice wider than high, and as wide as tarsal joints 2—3. ♀: 4—4.2 mm, ♂: 3.8 mm. — China, Japan, Korea, USSR: Far East Territory
M. pectiniphorae (CUSHMAN, 1931)

6 (5) In dorsal view temple rather rounded (Fig. 26). Carapace more narrowing basally, 1.5(—1.6) times as long as broad and its hind breadth clearly one-third greater than its basal breadth (Fig. 29). Hind femur more or less yellow. Ring of hind tibia yellowish. Apical foramen of male carapace large, four times wider than high and as wide as hind tarsal joints 2—5. ♀: 3—4 mm, ♂: 3.8 mm. — Hungary, USSR: European part and Far East Territory **M. flavipalpis** (SZÉPLIGETI, 1896)

Microchelonus mitigatus sp. n. ♀
(Figs 30—33)

D e s c r i p t i o n o f t h e h o l o t y p e ♀ — Body 3 mm long. H e a d in dorsal view (Fig. 30) subcubic, 1.6 times as broad as long, eye slightly shorter than temple, latter weakly rounded, i.e. nearly straight, occiput excavated. Eye in lateral view (Fig. 31) twice as high as wide, temple one-third wider than eye. Ocelli small and round, distance between fore and a hind ocelli as long as diameter of an ocellus whereas POL nearly twice as long as that; OOL just less than twice as long as POL (Fig. 30). Face 1.5 times wider than high, inner margin of eyes just subparallel. Clypeus clearly 1.5 times wider than high, its lower margin moderately convex. Malar space as long as basal width of mandible. Head evenly and densely rugulose, clypeus almost smooth and shiny. — A n t e n n a as long as head, mesosoma and anterior third of carapace together. First flagellar joint 3.6 times as long as broad apically, further joints gradually shortening and joints 7—11 somewhat thickening, penultimate joint 1.5 times as long as broad.

M e s o s o m a in lateral view 1.3 times as long as high. In dorsal view head slightly broader than mesosoma between tegulae. Mesosoma rugose-



Figs 27—28. *Microchelonus pectiniphorae* (CUSHMAN): 27 = carapace in lateral view, 28 = = carapace in dorsal view. — Fig. 29. *M. flavipalpis* (SZÉPLIGETI): carapace in dorsal view. — Figs 30—33. *M. mitigatus* sp. n.: 30 = head in dorsal view, 31 = head in lateral view, 32 = = carapace in dorsal view with indication of sculpture, 33 = carapace in lateral view. — Figs 34—39. *M. paucifossa* sp. n.: 34 = head in dorsal view, 35 = head in lateral view, 36 = distal part of right fore wing, 37 = carapace in dorsal view with indication of sculpture, 38 = carapace in lateral view, 39 = foramen of male carapace

-rugulose; scutellum densely punctate, interspaces shorter than punctures, shiny; propodeum with a pair of small lateral tubercles. — Hind femur 3.2 times as long as broad, broadest at middle. Hind tibia and tarsus equal in length; basitarsus of hind leg as long as tarsal joints 2—4.

Fore wing one-fifth shorter than body. Pterostigma 2.7 times as long as wide and issuing radial vein distally from its middle; *r1* half as long as width of pterostigma and *r2* one-fourth longer than *r1*, *r3* straight, *cuqu1* 2.5 times as long as *r2*; length of radial cell along metacarp two-fifths shorter than pterostigma. *N. rec.* interstitial. *d2* thrice as long as *d1*.

Carapace as long as head and mesosoma together, in dorsal view (Fig. 32) twice longer than broad, broadest behind its middle; in lateral view (Fig. 33) only somewhat higher behind than basally; in ventral view cavity almost as long as carapace itself, i.e. carapace apically hardly incurved. Basal pair of keels short and converging. Carapace antero-posteriorly areolate to densely rugose (Fig. 32). In lateral view ovipositor sheath short, as long as hind tarsal joints 3—4.

Body black. Scape and pedicel yellow, dorsally dark, flagellum blackish brown. Palpi pale yellow. Tegula and parategula brown. Pair of baso-lateral spots of carapace pale yellow. Legs yellow; tibiae 2—3 apically and tarsus 3 dark fumous. Wings hyaline, pterostigma brown and venation light brown opaque.

♂ and host unknown.

Locality — Holotype ♀: "Korea, Prov. South Pyongan, Nam po" (1st label); "No. 273, 19 July 1975, leg. J. PAPP et A. VOJNITS" (2nd label).

Holotype deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7160.

The new species, *Microchelonus mitigatus* sp. n., runs to *M. semenovi* TOBIAS, 1986 in the key given by TOBIAS (1986a), their common features are (1) the cubic head, (2) the long carapace (in dorsal view twice longer than broad) and (3) the short radial cell. Based upon the original description (TOBIAS 1984) *M. subfenestratus* TOBIAS, 1984 seems also similar to the new species (cubic head, base of carapace with a pair of yellow spots). The three species can be distinguished by the following key:

1 (2) Carapace less long, in dorsal view 1.6 times longer than broad, broadest at its middle (Fig. 8 in TOBIAS 1984: 86). Temple in dorsal view gradually rounded (Fig. 7 1. c.). Penultimate joint of antenna cubic. Hind femur black. ♀: 3.4 mm. — USSR: Far East Maritime Territory

M. subfenestratus TOBIAS, 1984

2 (1) Carapace long, in dorsal view twice as long as broad, broadest behind its middle. Temple in dorsal view weakly rounded, nearly straight (Fig. 30). Penultimate joint of antenna about twice longer than broad. Hind femur either black (*M. semenovi*) or yellow (*M. mitigatus*).

3 (4) Head above and mesosoma roughly rugose, clypeus with dense punctation, dull, carapace strongly strio-rugose. Carapace in dorsal view (Fig. 196: 8 in TOBIAS 1986a: 330) clearly broadening posteriorly. Hind femur four times as long as broad, black. ♀♂: 4—4.5 mm. — USSR: European Russia, Ural Mts

M. semenovi TOBIAS, 1986

4 (3) Head above rugulose, mesosoma rugose-rugulose, clypeus almost smooth and shiny, carapace rugose (Fig. 32). Carapace in dorsal view (Fig. 32) less clearly broadening posteriorly. Hind femur 3.2 times as long as broad, yellow. ♀: 3 mm. — Korea

M. mitigatus sp. n.

Microchelonus paucifossa sp. n. ♂

(Figs 34—39)

Description of the holotype ♂ — Body 3.6 mm long. Head in dorsal view (Fig. 34) twice as broad as long, eye one-fourth longer than temple, latter strongly rounded, occiput excavated. Eye in lateral view (Fig. 35) slightly more than twice as high as wide, temple one-fifth wider than eye, broadening ventrally. Ocelli (Fig. 34) large and almost round, distance between fore and a hind ocelli half as long as, whereas POL almost twice as long as diameter of an ocellus, OOL 1.5 times as long as POL. Face twice as

wide as high, inner margin of eyes slightly diverging ventrally. Clypeus 1.5 times as wide as high, its lower margin convex; tentorial pits unusually small. Malar space almost twice longer than basal width of mandible. Head rugo- to rugulo-striate. — Antenna as long as body; first flagellar joint thrice as long as broad apically, further joints gradually shortening and attenuating so that penultimate joint 1.5 times as long as broad.

Mesosoma in lateral view 1.43 times as long as high. In dorsal view slightly broader than mesosoma between tegulae. Mesosoma rugose, scutellum with longitudinal rugosity. Propodeum with a distinct transverse carina ending laterally in a pair of small tubercles. — Hind femur 3.57 times as long as broad at its middle. Hind tibia somewhat shorter than tarsus; basitarsus of hind leg as long as tarsal joints 2—4 and half of fifth joint together.

Fore wing as long as body. Pterostigma (Fig. 36) 2.75 times as long as wide and slightly shorter than metacarp, issuing radial vein from its middle; *r1* one-third shorter than width of pterostigma, *r2* somewhat longer than *r1*, *r3* straight, *cuqu1* 1.5 times as long as *r2*; length of radial cell along metacarp almost as long as pterostigma. *N. rec.* interstitial, *d2* 2.4 times as long as *d1*.

Carapace as long as mesosoma, in dorsal view (Fig. 37) twice as long as broad, broadest at its middle; in lateral view (Fig. 38) 2.6 times as long as high behind and about one-third higher behind than at its basal third; in ventral view cavity almost as long as carapace itself, i.e. carapace hardly incurved ventrally. Basal pair of carapace short and converging. Carapace rugose (Fig. 37), apically rather densely rugo-rugulose. — Apical foramen (Fig. 39) very small, round, its diameter as long as fourth joint of fore tarsus.

Body and antenna black. Palpi yellowish. Tegula black, parategula brown. Carapace basally on its declivous lateral part with a pair of yellow spots. Legs black with yellow pattern. Fore femur basally and apically yellow(ish), otherwise blackish to black. Middle and hind femora basally yellow(ish). Fore and middle tibiae yellow. Ring of hind tibia yellow. Tarsi 1—2 yellow with brownish tint, tarsus 3 blackish. Wings faintly fumous, pterostigma and veins brown.

♀ and host unknown.

Locality — Holotype ♂: "Korea, Mt. Pektusan, environs Sam-zi-yan hotel, lake shore, 19. VII. 1977" (1st label); "No. 376, netting in grasses, DELY & DRASKOVITS" (2nd label).

Holotype is deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7161.

The new species, *Microchelonus paucifossa* sp. n. ♂, runs to *M. minifossa* TOBIAS, 1986 with the help of TOBIAS's key (1986a) and to *M. moldavicus* TOBIAS, 1986 based upon its original description (TOBIAS 1986d). The males of the three species can be distinguished by the following key:

1 (2) In dorsal view temple distinctly shorter than eye, i. e. eye one-fourth longer than temple, latter strongly rounded (Fig. 34). Radial cell along metacarpal vein as long as pterostigma (Fig. 36). Antenna with 26 joints. Ventral cavity almost as long as carapace itself. Carapace basally on its declivous lateral part with a pair of yellow spots. 3.6 mm. — Korea

M. paucifossa sp. n.

2 (1) In dorsal view temple longer than eye, temple less strongly rounded. Radial cell along metacarpal vein clearly shorter than pterostigma. Antenna with 17—18 joints (*M. moldavicus*, that of *M. minifossa* not indicated).

3 (4) In dorsal view temple 1.5 times as long as eye and moderately rounded (Fig. 1 in TOBIAS 1986d: 10). Mesonotum rugose. 2.5—2.8 mm. — USSR: Moldavia

M. moldavicus TOBIAS, 1986

4 (3) In dorsal view temple hardly longer than eye and more rounded (Fig. 196: 6 in TOBIAS 1986a: 330). Mesonotum roughly rugose. 3.3 mm. Further distinctive features not to be established due to lack of a detailed description of *M. minifossa*. — USSR: Moldavia

M. minifossa TOBIAS, 1986

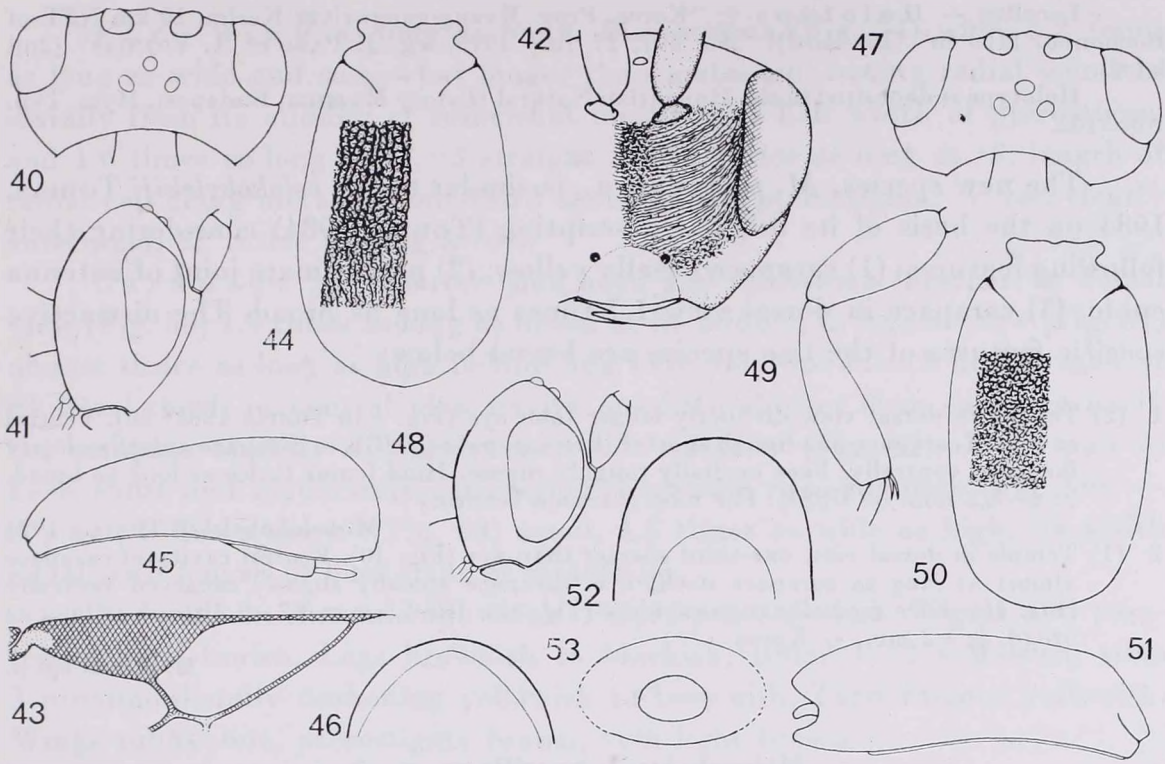
Microchelonus plenus sp. n. ♀
(Figs 40—46)

D e s c r i p t i o n o f t h e h o l o t y p e ♀ — Body 3.2 mm long. H e a d in dorsal view (Fig. 40) transverse, twice as broad as long, eye one--third longer than temple, latter constricted, occiput excavated. Eye in lateral view (Fig. 41) twice as high as wide, temple just wider than eye. Ocelli small and somewhat elliptical, distance between fore and a hind ocelli equal with whereas POL twice as long as greatest diameter of hind ocellus, OOL just less than twice as long as POL (Fig. 40). Face 1.7—1.8 times as wide as high, inner margin of eyes parallel. Clypeus 1.7 times wider than high, its lower margin convex. Malar space one-fourth longer than basal width of mandible. Face medially rugo-rugulose, otherwise concentric striolate (Fig. 42), head above strio-rugulose, temple rugulo-uneven. Clypeus uneven to smooth, shiny. — A n t e n n a almost as long as body. First flagellar joint just less than thrice as long as broad apically, further joints gradually shortening, joints 8—13 slightly thickening, penultimate joint 1.25 times as long as broad.

M e s o s o m a in lateral view 1.25 times as long as high. In dorsal view head somewhat broader than mesosoma between tegulae. Mesosoma rugose, scutellum medially rugulo-uneven; propodeum with a pair of small lateral tubercles. — H i n d f e m u r 3.7—3.8 times as long as broad, broadest behind its middle. Hind tibia and tarsus equal in length; basitarsus of hind leg as long as tarsal joints 2—4.

F o r e w i n g one-sixth shorter than body. Pterostigma (Fig. 43) 2.5 times as long as wide and issuing radial vein distally from its middle; *r1* just longer than width of pterostigma and slightly longer than *r2*, *r3* straight, *cuqu1* four times as long as *r2*; length of radial cell along metacarp one-fifth shorter than pterostigma. *N. rec.* interstitial, *d2* thrice as long as *d1*.

C a r a p a c e slightly shorter than head and mesosoma together, in dorsal view (Fig. 44) 1.7 times as long as broad near behind its middle; in



Figs 40—46. *Microchelonus plenus* sp. n.: 40 = head in dorsal view, 41 = head in lateral view, 42 = head in frontal view with indication of sculpture of face, 43 = distal part of right fore wing, 44 = carapace in dorsal view with indication of sculpture, 45 = carapace in lateral view, 46 = apical end of carapace in ventral view. — Figs 47—53. *M. puerilis* sp. n.: 47 = head in dorsal view, 48 = head in lateral view, 49 = femur + tibia, 50 = carapace in dorsal view with indication of sculpture, 51 = carapace in lateral view, 52 = apical end of carapace in ventral view, 53 = foramen of male carapace

lateral view (Fig. 45) 2.8 times as long as high and one-third higher behind than basally; in ventral view cavity almost as long as carapace itself, i.e. carapace apically slightly incurved ventrally (Fig. 46). Basal pair of keels short and converging. Carapace antero-posteriorly rugose to rugulose, anteriorly with longitudinal as well as areolate elements (Fig. 44). — In lateral view ovipositor sheath short, as long as hind tarsal joints 4—5 without claws.

Body black. Scape blackish brown, pedicel and flagellar joints 1—4 yellow, rest of flagellum blackish brown. Palpi light yellow, last joints darkening. Tegula and parategula brown. Basal fourth of carapace straw yellow, between keels blackish. Legs black with yellow pattern. Apex of coxae, trochanters, fore femur and tibia yellow, inner side of fore femur black(ish), middle tibia yellowish, distally dark, hind tibia blackish with a faint and small yellowish ring proximally. Tarsi dark, fore tarsus rather yellowish. Wings faintly fumous, pterostigma brown with a small yellow basal spot, venation light opaque brown.

♂ and host unknown.

Locality — Holotype ♀: "Korea, Prov. Ryang-gang: river Karim, 10 km NEE of Bochonbo, 1100 m" (1st label); "No. 297, 27 July 1975, leg. J. Papp et A. Vojnits" (2nd label).

Holotype is deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7162.

The new species, *M. plenus* sp. n., is similar to *M. belokobylskiji* Tobias, 1984 on the basis of its original description (Tobias 1984) considering their following features: (1) carapace basally yellow, (2) penultimate joint of antenna cubic, (3) carapace in dorsal view 1.7 times as long as broad. The distinctive specific features of the two species are keyed below:

1 (2) Temple in dorsal view distinctly longer than eye (Fig. 4 in Tobias 1984: 86). Ventral cavity of carapace one-fourth shorter than carapace itself, i. e. carapace apically clearly incurved ventrally. Face medially roughly rugose. Hind femur thrice as long as broad. ♀: 4—4,2 mm. — USSR: Far East Martime Territory

M. belokobylskiji Tobias, 1984

2 (1) Temple in dorsal view one-third shorter than eye (Fig. 40). Ventral cavity of carapace almost as long as carapace itself, i. e. carapace apically slightly incurved ventrally (Fig. 46). Face medially rugo-rugulose (Fig. 42). Hind femur 3.7—3.8 times as long as broad. ♀: 3.2 mm. — Korea

M. plenus sp. n.

Microchelonus puerilis sp. n. ♂
(Figs 47—54)

Description of the holotype ♂ — Body 2.3 mm long. Head in dorsal view (Fig. 47) transverse, twice broader than long, eye twice as long as temple, latter strongly rounded or almost constricted, occiput excavated. Eye in lateral view (Fig. 48) 1.6 times as high as wide and 1.33 times wider than temple. Ocelli relatively large and round, distance between fore and a hind ocelli nearly half as long as whereas POL longer than diameter of hind ocellus, hind imaginary tangent to fore ocellus just touching pair of hind ocelli; OOL almost twice as long as POL (Fig. 47). Face distinctly 1.5 times as wide as high, inner margin of eyes slightly diverging ventrally. Clypeus twice as wide as high, its lower margin moderately convex. Malar space as long as basal width of mandible. Head rugulose, face transversely rugulose. — Antenna as long as body and with 20 joints. First flagellar joint 3.6 times as long as broad, further joints gradually shortening and attenuating so that penultimate joint twice as long as broad.

Mesosoma in lateral view 1.4 times as long as high. In dorsal view head one-fourth broader than mesosoma between tegulae. Mesosoma rugose, scutellum almost smooth. Propodeum with a pair of relatively strong lateral tubercles. — Hind femur 2.5 times as long as broad, broadest at its middle; hind tibia thickened distally, thrice broader apically than basally (Fig. 49); hind tibia and tarsus equal in length, hind basitarsus as long as tarsal joints 2—4.

Fore wing as long as body. Pterostigma (Fig. 54) wide, 2.2 times as long as wide and somewhat longer than metacarp, issuing radial vein less distally from its middle; *r1* somewhat longer than half width of pterostigma and 1.6 times as long as *r2*, *r3* straight, *cuqu1* thrice as long as *r2*; length of radial cell along metacarp one-third shorter than pterostigma. *N. rec.* clearly antefurcal, *d2* thrice as long as *d1*.

Carapace just shorter than head and mesosoma together, in dorsal view (Fig. 50) 1.9 times as long as broad at its middle; in lateral view (Fig. 51) almost thrice as long as high behind and here only one-fourth higher than at its basal third; in ventral view cavity one-fifth shorter than carapace itself, i.e. carapace apically distinctly incurved ventrally (Fig. 52). Basal pair of keels short and moderately converging. Carapace rugo-rugulose (Fig. 50). — Apical foramen (Fig. 53) small, 1.5 times as wide as high, its width equal with length of basitarsus of middle leg.

Body black. Antenna brownish. Palpi light brownish. Tegula and parategula dark brown. Legs brownish to blackish, tibiae 1—2 yellowish, tibia 3 proximo-distally darkening yellowish to brownish. Tarsi fumous yellowish. Wings subhyaline, pterostigma brown, vein light brown.

♀ and host unknown.

Locality — Holotype ♂: "Korea, Sa Gam, 30—40 km N Pyongyan, water basin. wood, 5. VII. 1977" (1st label); "No. 347 — netting in grasses, DELY & DRASKOVITS" (2nd label).

Holotype is deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7163.

The new species, *Microchelonus puerilis* sp. n., is related to *M. pusillus* (SZÉPLIGETI, 1908), *M. denticulatus* TOBIAS, 1986 and *M. tuberculiventris* TOBIAS, 1986 by the small corporal size, long carapace, small apical foramen of carapace one-and-a-half (to twice as wide as high, Figs 53 and 58) and short radial cell. The distinction of the males of the four species are expounded in the subsequent key:

1 (4) Apical end of carapace above foramen without tubercle (Fig. 50, see also Fig. 196: 5 in TOBIAS 1986a: 330). Carapace in dorsal view 1.8—1.9 times as long as broad; in ventral view cavity one-fifth to one-sixth shorter than carapace itself, i. e. carapace apico-ventrally distinctly incurved (Fig. 52). Antenna with 20 joints.

2 (3) Head in dorsal view (Fig. 56) less transverse, 1.8 times as broad as long; head between temples a little bit broader than between eyes, i. e. temple slightly protruding from outline of head; temple slightly longer than eye; in lateral view (Fig. 57) temple 1.3 (—1.4) times wider than eye. Hind femur less thickened, thrice as long as broad. Pterostigma (Fig. 55) long, 2.9—3.3 times as long as wide, issuing radial vein more distally. Hind tibia evenly dark brown. 2.6 mm. — Hungary, (?)Finland, (?)USSR: Sochi. (? = *M. furtivus* TOBIAS, 1986)*

M. pusillus (SZÉPLIGETI, 1908)

* On the basis of the characterization of *M. furtivus* within the key by TOBIAS (1986a, p. 332 and 327—332) the name *M. furtivus* TOBIAS, 1986 (junior name) seems to refer to the species *M. pusillus* (SZÉPLIGETI, 1908) (senior name). The supposed synonymy has to be authenticated by examination and comparison of the type-series of the two taxa.

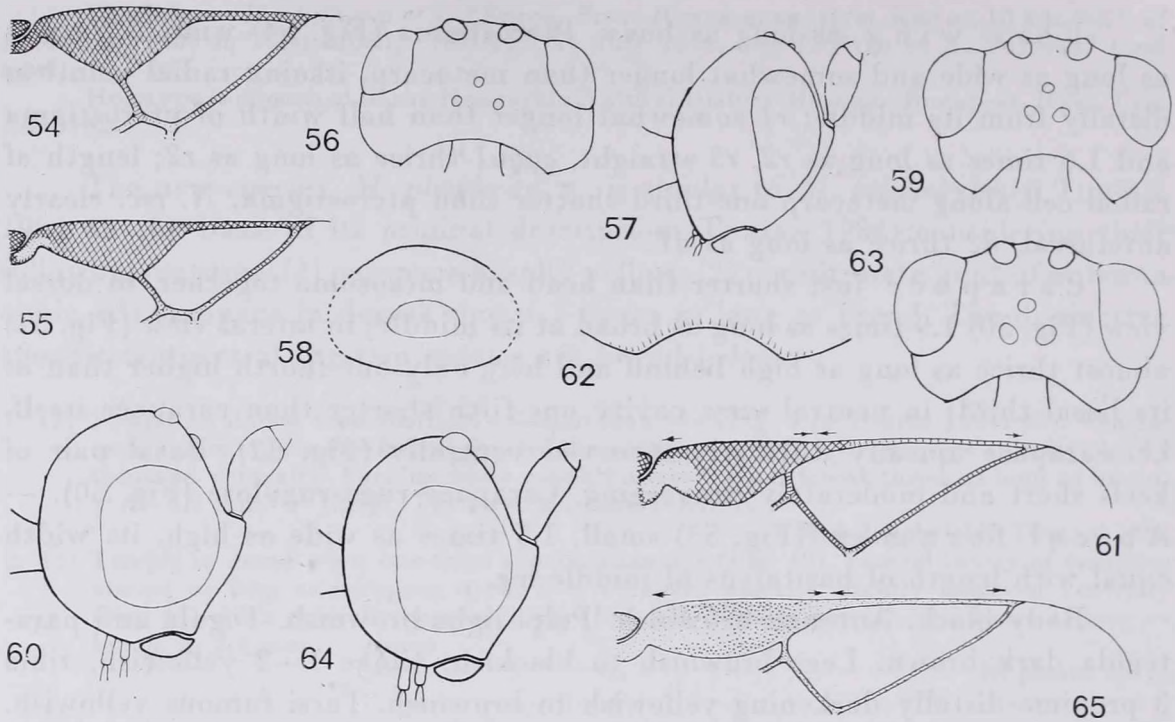


Fig. 54. *Microchelonus puerilis* sp. n.: distal part of right fore wing. — Figs 55—58. *M. pusillus* (Szépligeti): 55 = distal part of right fore wing, 56 = head in dorsal view, 57 = head in lateral view, 58 = foramen of male carapace. — Figs 59—62. *Phanerotoma offensa* sp. n.:59 = = head in dorsal view, 60 = head in lateral view, 61 = distal part of right fore wing, 62 = hind rim of third tergite. — Figs 63—65. *Ph. minuta* Kokujev: 63 = head in dorsal view, 64 = head in lateral view, 65 = distal part of right fore wing

3 (2) Head in dorsal view (Fig. 47) transverse, twice as broad as long; head between temples less broad than between eyes, i. e. temple strongly rounded; temple half as long as eye; in lateral view (Fig. 48) temple one-fourth shorter than width of eye. Hind femur more thickened, 2.5 times as long as broad. Pterostigma (Fig. 54) wide, 2.2 times as long as wide, issuing radial vein less distally. Hind tibia proximo-distally darkening yellowish to brownish. 2.3 mm. — Korea

M. puerilis sp. n.

4 (1) Apical end of carapace above foramen with a small tubercle (Fig. 196 : 5 l.c.). Carapace in dorsal view 2—2.5 times as long as broad. Length of ventral cavity of carapace as well as number of antennal joints not indicated in the original description (i.e. not given in the key) by Tobias (1986a).

5 (6) Hind tibia evenly dark. 1.6—1.8 mm. — USSR: Moldavia

M. denticulatus Tobias, 1986

6 (5) Hind tibia dark, its basal half more or less yellowish. 2—2.4 mm. — USSR: European part

M. tuberculiventris Tobias, 1986

Phanerotoma offensa sp. n. ♀
(Figs 59—62)

Description of the holotype ♀ — Body 3.8 mm long. Head in dorsal view (Fig. 59) 1.7 times as broad as long, eye somewhat protruding from outline of head and twice as long as temple, latter rounded,

occiput deeply excavated. Eye in lateral view (Fig. 60) almost round, slightly higher than wide, temple along bisecting imaginary line of eye just more than half as wide as eye, temple narrowing ventrally. Ocelli small and close to each other, OOL 2.25 times as long as greatest diameter of a hind elliptic ocellus, OOL 4.4 times as long as POL. Face just twice as wide close below toruli as high, inner margin of eye diverging ventrally. Clypeus 2.28 times as wide as high, its lower margin with a pair of very small denticules. Base of mandible 1.66 times as long as shortest malar space. Distance between tentorial pits 1.4 times longer than that between lowest marginal point of eye and tentorial pit. Head rugose, temple below rather rugulose, clypeus smooth and shiny. — Antenna somewhat shorter than body, with 23 joints. First flagellar joint thrice as long as broad, further joints gradually shortening and attenuating so that penultimate joint almost twice as long as broad, last 7—8 joints bead-like.

Mesosoma in lateral view 1.35 times as long as high. In dorsal view head one-third (or 1.46 times) broader than mesosoma between tegulae. Mesonotum rugose (similar to head) and scutellum densely rugulose, dull. Propodeum rugulo-uneven and subshiny, with a transverse carina, antero-medially and laterally carinulated. — Hind femur 3.8 times as long as broad, broadest at its middle. Hind basitarsus as long as tarsal joints 2—4. Hind coxa granularly uneven, subshiny.

Fore wing somewhat shorter than body. Pterostigma (Fig. 61) 2.76 times as long as wide, metacarpal vein 1.3 times longer than pterostigma; *r1* short, i.e. one-fourth as long as width of pterostigma, *r2* four times as long as *r1*, *r3* slightly arched and approaching tip of wing; *cuqu1* about one-third longer than *r2*; *n. rec.* interstitial, *d2* twice as long as *d1*.

Carapace in dorsal view as long as mesosoma and slightly broader than mesosoma, 1.7 times as long as broad. First tergite 1.4 times wider behind than long medially, pair of converging basal keels reaching middle of tergite. Second tergite shorter than first tergite, twice wider behind than long medially. Third tergite as long as first tergite, rounded and its rim apically widely concave (Fig. 62). Carapace rugo-striate, interspaces uneven and subshiny. — Ovipositor sheath short, as long as fourth joint of hind tarsus.

Body yellow. Ocellar field and spot close to tegula black; polished antero-transverse field of metanotum brown. Hind half of first tergite and second tergite medially whitish. Legs yellowish white, hind femur apically faintly brownish, distal third of hind tibia blackish brown to brown, basally together with hind femur yellowish. Wings hyaline, pterostigma brownish basally with yellowish white spot. Vein yellow to brownish, metacarp yellowish white.

Description of 2 ♀ paratypes — Quite identical with the holotype. Body 3.8 mm (1 ♀ loc. No. 12) and 4 mm (1 ♀ loc. No. 351). OOL

2.25—2.5 times as long as greatest diameter of a hind elliptic ocellus. Pterostigma (1 ♀) thrice as long as wide, blackish brown; radial vein along metacarpal vein 1.4 times (1 ♀ loc. No. 351) and 1.5 times (1 ♀ loc. No. 12) as long as pterostigma.

♂ and host unknown.

Localities — Holotype ♀: "Korea, Prov. South Pyongan, Lyong-ak san, 25 km W of Pyongyan, 31 August 1971" (1st label); "No. 224, leg. S. HORVATOVICH et J. PAPP" (2nd label). — 1 ♀ paratype: "Korea, Kum-gang san, Ontsong, 9—11 VII. 1977" (1st label); "No. 351 — light trap, DELY & DRASKOVITS" (2nd label). — 1 ♀ paratype: "Korea: Prov. Kanwon: Kum-gang san, environs of Hotel" (1st label); "No. 12, 20. VIII. 1982, leg. BERON et POPOV" (2nd label).

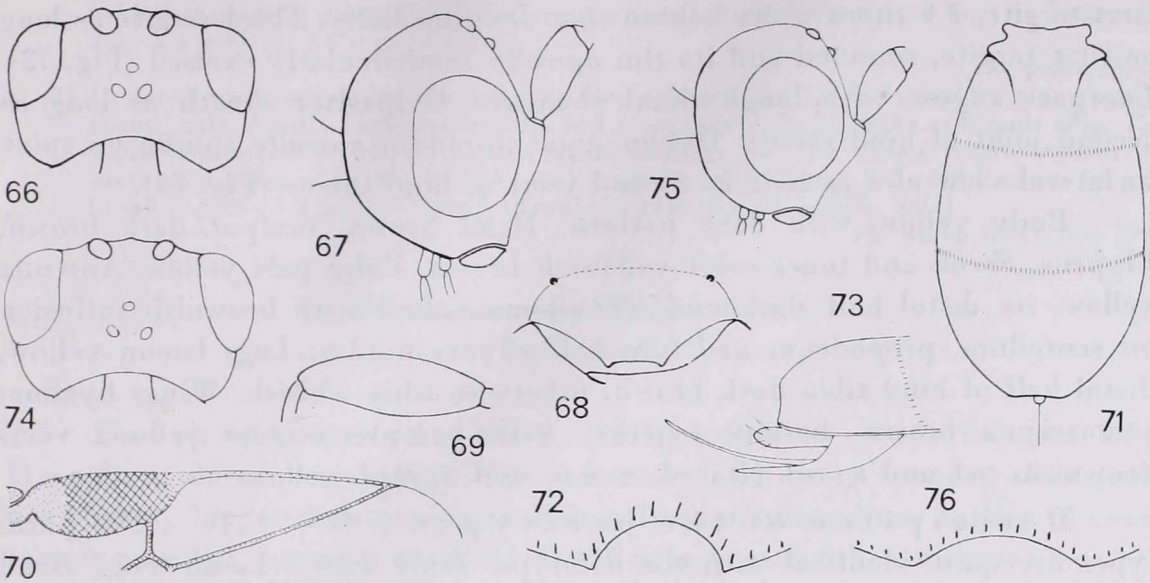
Holotype and two ♀ paratypes are deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. Nos 7164 (holotype) and 7165—7166 (paratypes).

The new species, *Phanerotoma offensa* sp. n., seems to be closely related to *Ph. minuta* KOKUJEV, 1903, their common features are (1) short temple, (2) short *rl* and (3) evenly yellow(ish) body. The differences between the two species are as follows:

Ph. offensa sp. n.	*Ph. minuta* KOKUJEV
1. Radial cell long, along metacarp 1.3—1.5 times as long as pterostigma, radial vein approaching tip of wing (Fig. 61).	1. Radial cell less long, along metacarp either about as long as or slightly longer than pterostigma, radial vein ending rather far before tip of wing (Fig. 65).
2. Ocelli small, OOL 2.25—2.5 times as long as greatest diameter of a hind ocellus (Fig. 59).	2. Ocelli large, OOL 1.5—1.6 times as long as greatest diameter of a hind ocellus (Fig. 63).
3. In dorsal view temple less short, eye twice as long as temple; occiput somewhat more excavated (Fig. 59).	3. In dorsal view temple short, eye thrice as long as temple; occiput somewhat less excavated (Fig. 63).
4. In lateral view temple gradually narrowing ventrally (Fig. 60).	4. In lateral view temple hardly narrowing ventrally (Fig. 64).
5. Mesopleuron evenly and densely coriaceous, dull.	5. Mesopleuron densely punctate to punctate, medially above sternaulus almost smooth, shiny to subshiny.

Phanerotoma pedra sp. n. ♀♂
(Figs 66—73)

Description of the holotype ♀ — Body 3.3 mm long. Head in dorsal view (Fig. 66) 1.7 times as broad as long, eye not protruding from outline of head and 1.4 times as long as temple, latter rounded, occiput excavated. Eye in lateral view (Fig. 67) 1.28 times higher than wide and 1.47 times wider than temple, latter narrowing ventrally. Ocelli near to each other, hind pair of ocelli elliptic and somewhat greater than almost round fore ocellus, OOL 4 times as long as greatest diameter of a hind ocellus, OOL just less than five times as long as POL (Fig. 66). Face close below toruli 1.87 times as wide as high, inner margin of eyes diverging ventrally. Clypeus 2.3 times wider than high, its lower margin with a pair of denticules (Fig. 68). Basal



Figs 66—73. *Phanerotoma pedra* sp. n.: 66 = head in dorsal view, 67 = head in lateral view, 68 = clypeus, 69 = hind femur, 70 = distal part of right fore wing, 71 = metasoma in dorsal view, 72 = apical rim of third tergite, 73 = distal end of carapace with hypopygium and ovipositor sheath. — Figs 74—76. *Ph. parva* KOKUJEV: 74 = head in dorsal view, 75 = head in lateral view, 76 = apical rim of third tergite

width of manible somewhat longer than shortest malar space. Distance between tentorial pits 1.48 times longer than that between lower margin of eye and tentorial pit. Head rugulose, clypeus uneven, head above around ocelli coriaceous, temple subrugulose with striate elements. — Antenna somewhat shorter than body, with 23 joints. First flagellar joint 3.6 times as long as broad, further joints gradually shortening and attenuating so that 19th joint 1.37 times as long as broad, penultimate three joints bead-like.

Mesosoma in lateral view 1.87 times as long as high. In dorsal view head 1.2 times wider than mesosoma between tegulae. Mesonotum densely rugulose and dull, scutellum densely granulate and subshiny, mesopleuron antero-posteriorly densely rugulose to granulate, propodeum rugose with a transverse carina. Hind femur somewhat thick, thrice as long as broad, broadest at its middle (Fig. 69). Hind basitarsus as long as tarsal joints 2—4. Hind coxa uneven, subshiny.

Fore wing somewhat shorter than body. Pterostigma (Fig. 70) 2.5 times as long as wide, metacarpal vein one-fifth longer than length of pterostigma; *r1* half as long as width of pterostigma and 1.6 times longer than *r2*, *r3* straight and approaching tip of wing, *cuqu1* 3.37 times longer than *r1*; *1. rec.* interstitial, *d2* 2.3 times as long as *d1*.

Carapace in dorsal view (Fig. 71) as long as mesosoma and slightly broader than that, 1.76 times as long as broad at its second suture. First tergite 1.52 times wider behind than long medially, pair of converging basal keels reaching beyond middle of tergite. Second tergite slightly shorter than

first tergite, 1.8 times wider behind than long medially. Third tergite as long as first tergite, rounded and its rim apically semicircularly excised (Fig. 72). Carapace rugose with longitudinal elements. Ovipositor sheath as long as second joint of hind tarsus. Hypopygium produced apically spiniform, spine in lateral view also as long as second joint of hind tarsus (Fig. 73).

Body yellow with dark pattern. Head brown, occiput dark brown. Clypeus, cheek and inner orbit yellowish brown. Palpi pale yellow. Antenna yellow, its distal half darkening. Mesosoma yellow with brownish suffusion on scutellum, propodeum and fore half of mesonotum. Legs lemon yellow, distal half of hind tibia dark brown, otherwise tibia whitish. Wings hyaline; pterostigma brown, basally together with parapterostigma yellow; veins brownish, *cu1* and *n. rec.* effaced, *n. bas.* and *n. med.* yellow.

Description of the paratypes (5 ♀ + 1 ♂) — The paratypes are quite identical with the holotype. Body 3.3—3.4 mm long. Head in dorsal view 1.6—1.7 times as broad as long. Second tergite 1.8—2 times wider behind than long medially. Head of 1 ♀ paratype (loc. No. 322) slightly less brown and occiput not dark brown, with more yellowish brown pattern on vertex, temple and face. Head and mesosoma of 2 ♂ paratypes (loc. Nos 315 and 322) are almost yellow with faint brownish fumous pattern.

Host unknown.

Localities — Holotype ♀ + 1 ♂ paratype: "Korea, Prov. Gang-von, district On-dzong, Kum-gang san, near Hotel Gosong, 250 m" (1st label); "No. 315, 4 August 1975, leg. J. PAPP et A. VOJNITS" (2nd label). — 1 ♂ paratype: "Korea, Prov. South Pyongan: Lyong-ak san, 14 km W of Pyongan" (1st label); "No. 300, 30 July 1975, leg. J. PAPP et A. VOJNITS" (2nd label). — 3 ♀ paratypes: "Korea, Prov. Pyong-sung, Bek-sung-li, Za-mo san, 60 km NE of Pyongyan" (1st label); "No. 304" (2 ♀) and "No. 305" (1 ♀) "1 August 1975, leg. J. PAPP et A. VOJNITS" (2nd label). — 1 ♀ paratype: "Korea, Prov. Gang-von, district On-dzong, Kum-gang san, along Ok-ru dong, 300—600 m" (1st label); "No. 317, 5 August 1975, leg. J. PAPP et A. VOJNITS" (2nd label) — 1 ♀ + 1 ♂ paratypes: "Korea, Prov. Gang-von, district On-dzong, Kum-gang san, near Hotel Go-song, 250 m" (1st label); "No. 322, 6 August 1975, leg. J. PAPP et A. VOJNITS" (2nd label).

Holotype (♀) and eight paratypes (5 ♀ + 3 ♂) are deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. Nos 7167 (holotype), 7168—7175 (paratypes).

The new species, *Phanerotoma pedra* sp. n., stands nearest to *Ph. parva* KOKUJEV, 1903 and to *Ph. gracilis* TOBIAS, 1970; their features in common are (1) short temple, (2) antenna with 23 joints, (3) *r1* and *r2* short and equal in length. The distinction of the three species is keyed below:

1 (2) Radial vein reaching tip of wing. First tergite as long as second tergite. Third femur four times as long as broad. Mesosoma as high as broad between tegulae. Body brownish yellow. ♂: 2.5 mm, ♀ unknown. — USSR (Far East Territory)
Ph. gracilis TOBIAS, 1970

2 (1) Radial vein ending far before tip of wing (Fig. 70). First tergite longer than second tergite. Third femur shorter, less than four times as long as broad. Mesosoma either as in *gracilis* or else.

3 (4) In dorsal view temple one-third shorter than eye (Fig. 66), in lateral view eye about one-fourth higher than wide and about half to one-third wider than temple (Fig. 67). Third tergite apically excised (Fig. 72), second tergite less transverse, 1.8—2 times wider

behind than long medially. Hind femur somewhat thick, thrice as long as broad. ♀: 3.3—3.4 mm, ♂: 2.9 mm. — Korea

Ph. pedra sp. n.

4 (3) In dorsal view temple less than half as long as eye (Fig. 74), in lateral view eye nearly round, only slightly higher than wide and more than twice as wide as temple (Fig. 75). Third tergite apically not or at most faintly excised (Fig. 76), second tergite transverse, more than twice wider behind than long medially. Hind femur 3.2—3.3 times as long as broad. ♀♂: 3—3.3 mm. — USSR (Transcaucasus, Soviet Middle Asia)

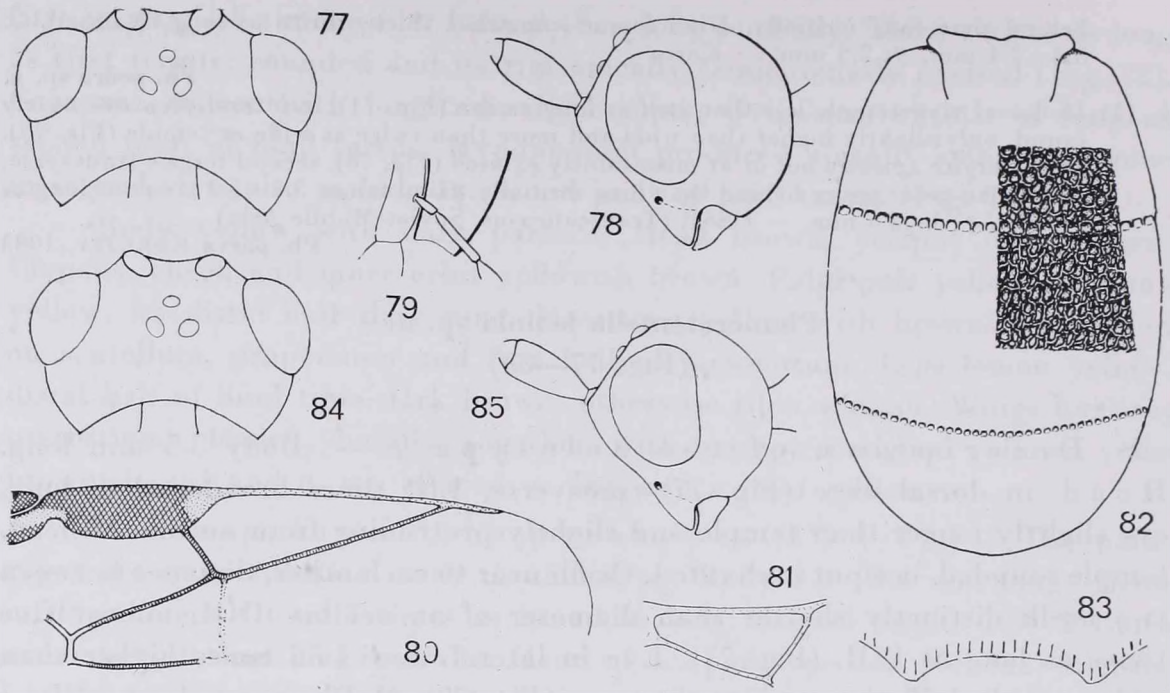
Ph. parva KOKUJEV, 1903

Phanerotomella bellula sp. n. ♀
(Figs 77—83)

Description of the holotype ♀ — Body 5.5 mm long. Head in dorsal view (Fig. 77) transverse, 1.62 times broader than long, eye slightly longer than temple and slightly protruding from outline of head, temple rounded, occiput excavated. Ocelli near to each other, distance between two ocelli distinctly shorter than diameter of an ocellus. OOL almost five times as long as POL (Fig. 77). Eye in lateral view 1.52 times higher than wide, temple 1.13 times wider than eye (Fig. 78). Malar space about as long as basal width of mandible. Face 1.7 times wider above than high medially, inner margin of eyes somewhat diverging ventrally. Clypeus 1.9 times wider than high, its lower margin almost evenly arched; tentorial pits just nearer to lower margin of eye than to each other. Head behind (temple + occiput) margined, temporal carina not meeting hypostomal carina (Fig. 79). Head evenly and densely reticulate-punctate; sculpture of face medially roughened; clypeus with fine and disperse punctation, interspaces smooth. — Antenna filiform and one-third longer than body, with 54 joints. First flagellar joint 4.3 times as long as apically broad and just longer than second joint, further joints gradually shortening and attenuating so that penultimate joint twice as long as broad.

Mesosoma in lateral view 1.6 times as long as high. Mesonotum between tegulae somewhat less wide than head. Prescutellar furrow with seven crenulae; axille almost entirely and metanotum fully porcate. Pronotum, mesonotum and mesopleuron densely reticulate-punctate similar to that of head. Mesonotum behind with confluent punctation, interspaces forming striate elements. Scutellum punctate, interspaces smooth and shiny. Propodeum areolate-rugose with four small tubercles, median pair of tubercles somewhat smaller than lateral ones. — Hind coxa almost as long as tergites 1—2. Hind femur 4.3 times as long as broad and somewhat shorter than hind tibia; latter distally not so thick than hind femur medially. Hind basitarsus relatively long, as long as tarsal joints 2—5, basitarsus thrice as long as second tarsal joint.

Fore wing somewhat shorter than body. Pterostigma (Fig. 80) 3.57 times as long as its greatest width, issuing radial vein clearly distally



Figs 77—83. *Phanerotomella bellula* sp. n.: 77 = head in dorsal view, 78 = head in lateral view, 79 = temporal and hypostomal carinae, 80 = distal part of right fore wing, 81 = nervellus of hind wing, 82 = carapace in dorsal view with indication of its sculpture, 83 = apical rim of carapace (♀). — Figs 84—85. *Ph. sinensis* ZETTEL (in litt.): 84 = head in dorsal view (after ZETTEL in litt.), 85 = head in lateral view (after ZETTEL in litt.)

from its middle; length of radial cell along metacarp one-sixth longer than pterostigma, *r1* slightly longer than width of pterostigma at joining point of radial vein, *r2* very short, as long as its own width, i.e. *Cu2* not petiolate; *r3* ending distinctly before tip of wing; second section of metacarp (or metacarp beyond tip of *R*) as long as *r1*. *N. rec.* postfurcal. *N. bas.* and *cu1* issuing near to very near each other from proximal part of parastigma. *d2* 4.37 times as long as *d1*, brachial cell distally and behind open. Nervellus (of hind wing) straight, at its base diffracted (Fig. 81).

Carapace one-fifth shorter than mesosoma, slightly broader at second tergite than mesosoma between tegulae. First tergite (Fig. 82) distinctly, i.e. 1.68 times wider behind than long medially, with a pair of short and parallel keels, between keels surface uneven to rugulose. Second tergite 1.66 times wider at its base than long medially, slightly longer than first tergite and 1.68 times longer than third tergite. Suture between tergites 1—2 somewhat more distinct than that between tergites 2—3, both suture crenulated. Apical rim of carapace produced laterally in a pair of blunt tubercles (Fig. 83). In lateral view ovipositor sheath very short, as long as fourth joint of hind tarsus. Tergites 1—3 areolate-rugose (Fig. 82, similar to that of propodeum), sculpture of tergite 3 somewhat weaker than that of tergites 1—2.

Ground colour of body black abundantly ornamented with brownish to yellow, pale or straw yellow colour. Mandible brownish, palpi pale

yellow. Clypeus along its lower margin deep brown. Scape and pedicel yellowish, their outer side with more or less dark suffusion. Flagellum blackish or brownish, below always brownish or brownish yellowish. Tegulae brownish yellow or yellow. Prescutellar furrow and axille brownish. Metanotum yellow(ish), in its middle deep brown. Margin of mesopleuron yellowish brown. Hind end of propodeum and base of first tergite yellow(ish); basal third of first tergite brown(ish). Rim of carapace and sternites as well as hypopygium and ovipositor sheath straw yellow. — Legs tricoloured; coxae and trochanters pale yellow, outside of hind coxa brownish or blackish; femora 1—2 brown(ish), femur 3 black and all femora basally and apically ring-like yellow(ish); tibiae 1—2 brown(ish) to yellowish, tibia 3 black(ish) and basally as well as apically yellow(ish), tarsi yellowish; hind basitarsus blackish, basally and apically yellowish. — Wings brownish fumous. Pterostigma dark brown to brownish with basal small yellow spot, veins brown (*r1—3*, *Cu2*), brownish to yellowish.

Description of the paralectotypes (17 ♀) — Similar to the holotype. Body 5.2—6 mm long. Head in dorsal view 1.5—1.66 times broader than long. Eye in lateral view 1.5—1.55 times higher than wide, temple 1.1—1.2 times wider than eye. Face 1.6—1.7 (—1.75) times wider above than high medially. Clypeus 1.7—1.9 times wider than high. Antenna with 54—56 joints, first flagellar joint 3.7—4.3 times as long as apically broad and just to one-sixth longer than second joint. Hind coxa about as long as tergites 1—2. Hind femur 4.3—4.7 (—4.8) times as long as broad. Pterostigma 3.1—3.6 times as long as its greatest width. Second section of metacarp as long as to shorter than *r1*. *d2* 4.3—5 times as long as *d1*. First tergite 1.6—1.75 wider behind than long medially. Second tergite 1.5—1.6 times wider at its base than long medially, 1.1—1.2 times longer than first tergite and 1.6——1.8 times longer than third tergite.

♂ and host unknown.

Taxonomic remark — As I indicated in the preceding description the radial vein consists of three sections though the second section or *r2* is very short — a feature being contrary to the concept of the genus *Phanerotomella* Szépligeti with extinct *r2*. Nonetheless, the new species is placed in this genus based upon the following consideration and a comparison to the sister-genus *Phanerotoma* Wesmael:

Phanerotomella Szépl.	*Phanerotoma* Wesm.
1. *r2* either extinct or very short, in the latter case much shorter than *r1* (Fig. 80).	1. *r2* always present, at least as long as, but usually longer than *r1*.
2. Lower margin of clypeus without denticules (or tubercles).	2. Lower margin of clypeus with denticules (or tubercles).
3. Antenna usually with 30 or more joints.	3. Antenna usually with less than 30 joints.
4. Outer side of brachial cell postero-distally open.	4. Outer side of brachial cell closed.

Localities — Holotype (♀) and 2 ♀ paratypes: "Korea, Prov. Gang-von, district On-dzong, Kum-gang san, near Hotel Go-song, 250 m" (1st label); "No. 319, 5 August 1975, leg. J. PAPP et A. VOJNITS" (2nd label). — 7 ♀ paratypes: Data of first label as before, "No. 315, 4 August 1975, leg. J. PAPP et A. VOJNITS" (2nd label). — 1 ♀ paratype: "Korea, Prov. Gang-von, district On-dzong, Kum-gang san, along Ok-ru dong, 300—600 m" (1st label); "No. 317, 5 August 1975, leg. J. PAPP et A. VOJNITS" (2nd label). — 7 ♀ paratypes: Data of first label as in holotype (No. 319), "No. 322, 6 August 1975, leg. J. PAPP et A. VOJNITS" (2nd label).

Holotype (♀) and 17 ♀ paratypes are deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7176 (holotype) and 7177—7193 (paratypes).

The new species, *Phanerotomella bellula* sp. n., seems to be most closely related to *Ph. orientalis* TOBIAS, 1986 (USSR: Far East Maritime Territory), the two species can be distinguished by the following features:

Ph. bellula sp. n.	*Ph. orientalis* TOBIAS
1. Body (5.5—)6 mm long.	1. Body 2.3 mm long.
2. Head and mesosoma reticulate-punctate, tergites areolate-rugose (Fig. 82).;	2. Head, mesosoma and tergites weakly reticulate and partly with rather weak punctation.
3. Temple in dorsal view rounded (Fig. 77).	3. Temple in dorsal view strongly rounded-constricted.
4. Antenna 54-56 jointed, every joint longer than broad.	4. Antenna 21 jointed, 10th to 15th joints cubic, further joints hardly longer than broad.
5. Body black; metanotum laterally, hind end of propodeum and base of first tergite yellow(ish). Legs blackish to brown with yellowish pattern, coxae and trochanters pale yellow with brownish suffusion (3rd coxa !). Wings brownish fumous.	5. Body black; margin of eye and side of mesosoma reddish, first tergite brownish yellow. Legs also brownish yellow, hind tibia and tarsus brown. Wings hyaline.

Based upon the original description of *Phanerotomella variareolata* BELOKOBYLSKIJ, 1986 (USSR: Far East Maritime Territory), this species also seems to be similar to my new species. However, they are separated by the following features:

Ph. bellula sp. n.	*Ph. variareolata* BELOK.
1. Body (5.5—)6 mm long.	1. Body 2.6—2.7 mm long.
2. Antenna with 54-56 joints. First flagellar joint four times as long as broad apically, further joints shortening but every joint longer than broad.	2. Antenna with 28 joints. First flagellar joint thrice as long as broad apically, middle joints hardly longer than broad.
3. Second tergite somewhat, i.e. 1.1 times, as long as first tergite, latter distinctly, i.e. 1.7—1.8 times, wider at hind than long medially (Fig. 82).	3. First tergite 1.2 times longer than second tergite, first tergite 1.2 times wider at hind than long medially (Fig. 12 in BELOKOBYLSKIJ 1986: 45).
4. First joint of hind tarsus relatively long, as long as further four joints together, first joint almost thrice longer than second joint.	4. First joint of hind tarsus relatively less long, as long as next three joints together, first joint 2.5 times longer than second joint.
5. Head and mesosoma reticulate-punctate, tergites areolate-rugose (Fig. 82).	5. Head and mesosoma weakly reticulate, tergites with rather strong reticulate sculpture.
6. Body black with yellow(ish) ornament on metanotum and meeting area of propodeum and first tergite.	6. Body light reddish brown with black pattern on propodeum and eventually on mesopleuron, tergites black with light pattern on middle of tergites 1—2.

7. Head in dorsal view less transverse, 1.5—1.66 times as broad as long (Fig. 77); occipital and hypostomal carinae not meeting at their ends (Fig. 79).

7. Head in dorsal view transverse, almost twice as broad as long (Fig. 13 in BELOKOBYLSKIJ l. c.); occipital and hypostomal carinae meeting at their ends.

Remark — MR. H. ZETTEL (Naturhistorisches Museum, Wien) was kind enough to call my attention to his new *Phanerotomella* species which he had described under the name *Ph. sinensis* sp. n. (in litt.) from China (Gungdong, Ding-Hu Mts.); his paper will be published in the journal Linzer biol. Beitr. in 1989 (or 1990). My new species, *Ph. bellula* sp. n., seems to be very closely related to ZETTEL's species *Ph. sinensis* sp. n. (in litt.), on the basis of its description the two species are distinguished by the following features:

Ph. bellula sp. n.

1. Head in dorsal view (Fig. 77) somewhat less transverse, 1.5—1.66 times as broad as long; eye as long as or slightly longer than temple.
2. Temple in lateral view (Fig. 78) 1.1—1.2 times wider than eye.
3. Second tergite less transverse 1.5—1.6 times wider at its base than long medially, 1.6—1.8 times as long as third tergite (Fig. 82).
4. Longer (or inner) spur of middle tibia half as long as basitarsus.
5. Mesosoma and carapace black, metanotum and base of carapace yellow(ish).

Ph. sinensis sp. n. (ZETTEL, in litt.)

1. Head in dorsal view (Fig. 84) transverse, 1.8 times as broad as long; eye one-third longer than temple.
2. Eye in lateral view (Fig. 85) somewhat wider than temple.
3. Second tergite more transverse, 1.7—1.8 times wider at its base than long medially, and slightly longer than third tergite.
4. Longer (or inner) spur of middle tibia longer than half of basitarsus.
5. Mesosoma and base of carapace light reddish brown, middle of tergites 2 and 3 black, their margin yellow.

REFERENCES

(BELOKOBYLSKIJ, S. A.) Белокобыльский, С. А. (1986): Phanerotomella Szépligeti, 1900 — новый для фауны Далънего Востока СССР род наездников-браконид из подсемейства Cheloninae (Hymenoptera, Braconidae). — Перепонч. Вост. Сиб. Далън. Вост. p. 41—48.

FISCHER, M. (1968): Über gezüchtete Raupenwespen (Hymenoptera, Braconidae). — Pflanzenschutz-Berichte **38** (7—8): 97—140.

HARRIS, R. A. (1979): A glossary of surface sculpturing. — Occas. Papers Entom. No. **28:** 1—31.

HUDDLESTON, T. (1984): The Palaearctic species of Ascogaster (Hymenoptera: Braconidae). — Bull. Br. Mus. nat. Hist. (Ent.) **49** (5): 341—392.

KOKUJEV, N. (1903): Hymenoptera asiatica nova. I. — Rev. Russe Ent. **3:** 285—288.

SHENEFELT, R. D. (1973): Braconidae 6, Cheloninae. — Hym. Cat. (n. ed.) pars **10:** 813—936.

ŠNOFLÁK, J. (1951): La monographie de Phanerotoma Wesm. et de Phanerotomella Szépl. (Hym.—Bracon.) de la Tchécoslovaquie. — Ent. Listy **13** (1950): 5—33.

(TOBIAS, V. I.) Тобиас, В. И. (1961): К познанию фаны наездников-браконид Сибири. Дальнево Восто и Монголии (Hymenoptera, Braconidae). — Изв. Сибирс. Отдел. Акад. Н. СССР № **11**: 121—129.

(TOBIAS, V. I.) Тобиас, В. И. (1970): Новые виды наездник-браконид (Hymenoptera, Braconidae) с Дальнево Востока. — Новые и Малоизв. Виды Фауны Сибири **3**: 77—81.

(TOBIAS, V. I.) Тобиас, В. И. (1972): Новые виды Браконид (Hymenoptera, Braconidae) из Монголии. — Насекомые Монголии **1**: 585—612.

(TOBIAS, V. I.) Тобиас, В. И. (1984): Дальневосточные виды рода Microchelonus Szépl. (Hymenoptera, Braconidae, Cheloninae) с желтыми абдоминальными пятнами. — Сист. Насек. Дальн. Вост. p. 84—93.

(Tobias, V. I.) Тобиас, В. И. (1985): Два новых вида браконид рода Microchelonus Szépl. (Hymenoptera, Braconidae) с Кавказа. — Энт. Обозр. **64** (4): 823—826.
(Tobias, V. I.) Тобиас, В. И. (1986a): 27 Отряд Hymenoptera Перепончатокрылые. Семейство Braconidae — Бракониды. — Опред. Насек. Европ. Ч. СССР **III/4**: 1—501.
(Tobias, V. I.) Тобиас, В. И. (1986b): Новые виды подсемейства Cheloninae (Hymenoptera, Braconidae) с Дальнево Востока СССР. — Труды Зоол. Инст. АН. СССР **159**: 3—17.
(Tobias, V. I.) Тобиас, В. И. (1986c): Новые виды рода Microchelonus Szépl. (Hymenoptera, Braconidae) с Дальнево Востока СССР. — Перепонч. Вост. Сиб. Дальн. Вост. p. 22—27.
(Tobias, V. I.) Тобиас, В. И. (1986d): Два новых вида рода Microchelonus Szépl. (Hymenoptera, Braconidae) из Молдавии. — Энтомофаги Вредителей Сада (Кишинев) p. 9—14.
Watanabe, C. (1937): A contribution to the knowledge of the braconid fauna of the Empire of Japan. — J. Fac. Agric. Hokkaido Univ. **42:** 1—188 + I—V plates.
Watanabe, C. (1976): Description of a new species of the genus Ascogaster Wesmael and notes on synonymy of Apanteles species (Hymenoptera, Braconidae). — Ins. Matsum. **29** (2): 41—44.
Yoneda, Y. (1978): A new species of the genus Ascogaster Wesmael (Hymenoptera, Braconidae) from Japan. — Kontyû (Tokyo) **46** (2): 291—296.
Zettel, H. (1987): Beitrag zur Kenntnis der Sigalphinen- und Cheloninen-Fauna in Österreich (Hymenoptera, Braconidae). — Linzer biol. Beitr. **19** (2): 359—376.

Acta Zoologica Hungarica 35 (3–4), pp. 327–338 (1989)

REVISION OF THE SPECIES OF PTEROGRAMMOIDES L. PAPP (DIPTERA, SPHAEROCERIDAE)

L. PAPP

Zoological Department, Hungarian Natural History Museum
H-1088 Budapest, Baross utca 13, Hungary

(Received 10 November, 1988)

The three species of *Pterogrammoides* L. PAPP, 1972 heretofore known (all from Papua and New Britain) are revised and the genus is redefined based upon the characteristics of the male genitalia. Two new species, *P. indica* sp. n. (India) and *P. thaii* sp. n. (Thailand) are described. The importance of the apomorphic features found in the structure of male genitalia are emphasized. With 33 original figures.

The genus *Pterogrammoides* L. PAPP, 1972 was proposed to include three species of small limosinine sphaerocerids with acutely pointed flagellomere and strongly declinate wings of reduced venation. All those species are terricolous in forest soils of New Guinea (Papua) and New Britain. The species and their description have attracted little attention (possibly due to lack of newly collected material). In his monograph of the Australian Sphaeroceridae RICHARDS (1973: 401) declared (without studying specimens): "His new genus Pterogrammoides with three new species, I should regard at most as a subgenus of Leptocera very close to Pterogramma but with third antennal segment very acutely pointed." The taxa have been included in the new Catalog of the Australasian/Oceanian Diptera (MARSHALL in EVENHUIS 1989); there is no more reference on them.

During a study trip to the Genève Museum, I found some very interesting specimens, obviously members of this genus but new species from India and Thailand. This finding has much widened the known distribution of the genus. It gave a good opportunity to study the genitalia of the *Pterogrammoides* species, I failed to do in the original description. Studies on genitalia revealed some surprising apomorphic features, therefore I felt bound to amplify the generic diagnosis.

The specimens (all but one are type-specimens) are deposited in the Département d'entomologie, Muséum d'Histoire naturelle Genève (MHNG) and in the Zoological Department of the Hungarian Natural History Museum, Budapest (HNHM).

Acknowledgement — I sincerely thank DR. CLAUDE BESUCHET and DR. IVAN LÖBL (MHNG) for placing this sphaerocerid material at my disposal.

Pterogrammoides L. PAPP, 1972

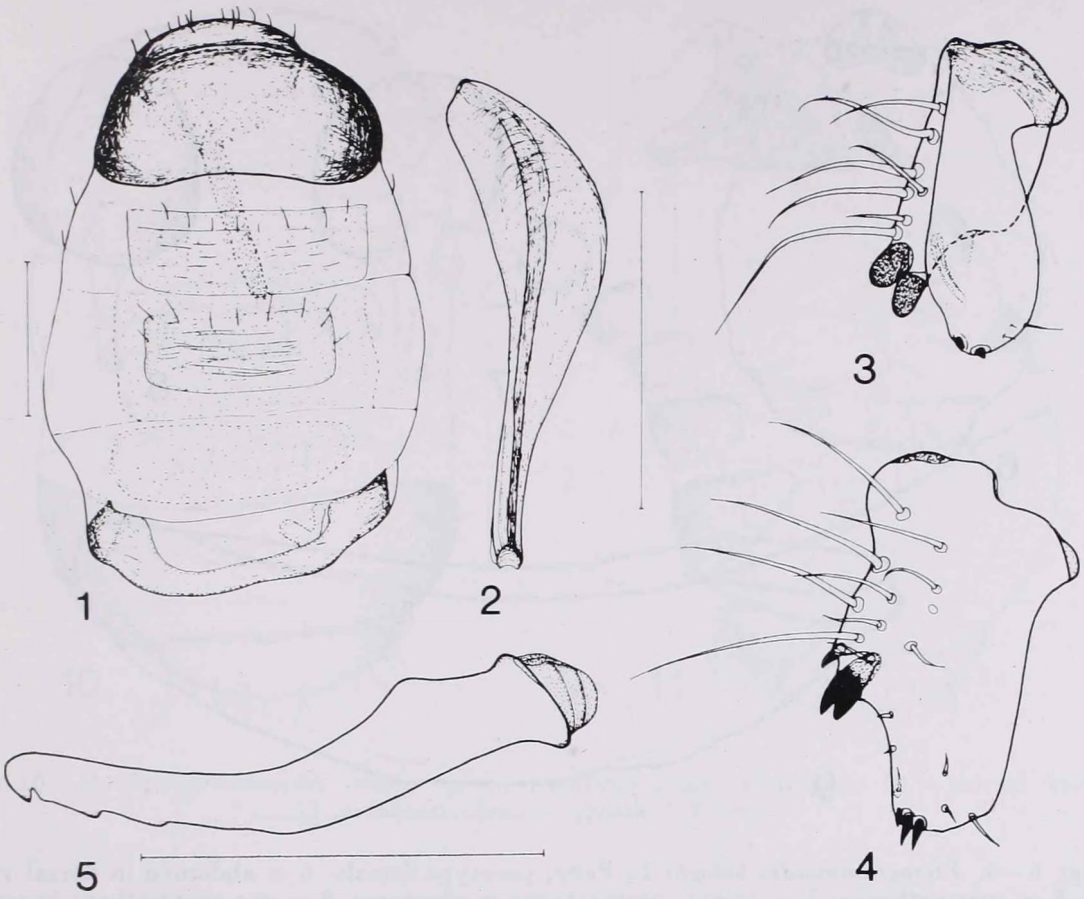
PAPP, 1972: Acta zool. hung., 18: 103, type-species: *Pterogrammoides baloghi* L. PAPP, 1972: l. c.: 105 (orig. des.). — Gender: masculine.

Diagnosis of the genus (features published in its original description are not repeated here). — Thoracic bristles better interpreted as 2 *np* and 1 *sa* (instead of 1 *np* and 2 *sa*), posterior *np* being prealar, almost supraalar in position. One of the most characteristic body features, the declination of wings (which follow downward curvature of abdomen) is not a unique apomorphic feature among the sphaerocerid species: this has been observed e.g. in some undescribed species of the Oriental *Biroina* RICH.

Male genitalia (and abdomen) — Preabdominal sterna and terga weakly sclerotized (Figs 1, 2, 11 etc.), S5 asymmetrical with smaller bristles only; postabdominal-pregenital sclerites (S6 and S7, cf. ROHÁČEK 1982, 1983) large to very large, semiglobular together with periandrium; periandrium with small bristles only; gonostylus (= surstylus) undivided but with a posteromedial process (Figs 4, 15, 32, 33); gonostylus with 2 (exceptionally 1) posterior thorns; aedeagal apodeme extremely large, projecting into 4th abdominal segment (e.g. Fig. 11); hypandrium long but thin, wide V-shaped; basiphallus/phallophore simple; distiphallus robust, bulbous or very wide (in longipennis); postgonite slightly or angulately bent; no ejaculatory apodeme; aedeagal complex with a sclerotized structure dorsally to basiphallus, which is in direct contact with phallus through a long micropubescent sack ventrally to that sclerotized "box", tentatively named as "ejaculatory pump" below; this ejaculatory pump with insertion of numerous muscles (Fig. 20).

Female abdomen and genitalia — Sclerotization of terga and sterna variable from indistinct (Fig. 6) to distinct though weak (Figs 21—22); cerci small; T10 and S10 small and hardly sclerotized; T8 of various forms: small and undivided in *P. baloghi*, very large and bipartite in *P. poecilosomus*; 3 spermathecae (2+1) with large compact accessory glands; wall of spermathecae (sclerotization) very weak and as a consequence, their shape is quite different when in water or when in glycerine (Fig. 8, vs. Fig. 7, Fig. 23 vs. Fig. 25)*; spermathecae short ovoid and comparatively large ca. 0.1 mm long; eggs extremely large (0.43 mm compared to 1.0 mm body length of female imagos), consequently few in number.

* This fact may have a retrospective effect on our judgement on some old drawings of spermathecae of other sphaerocerid species, too. It is strongly recommended that spermathecae be drawn in water (covered on slide) in the future.



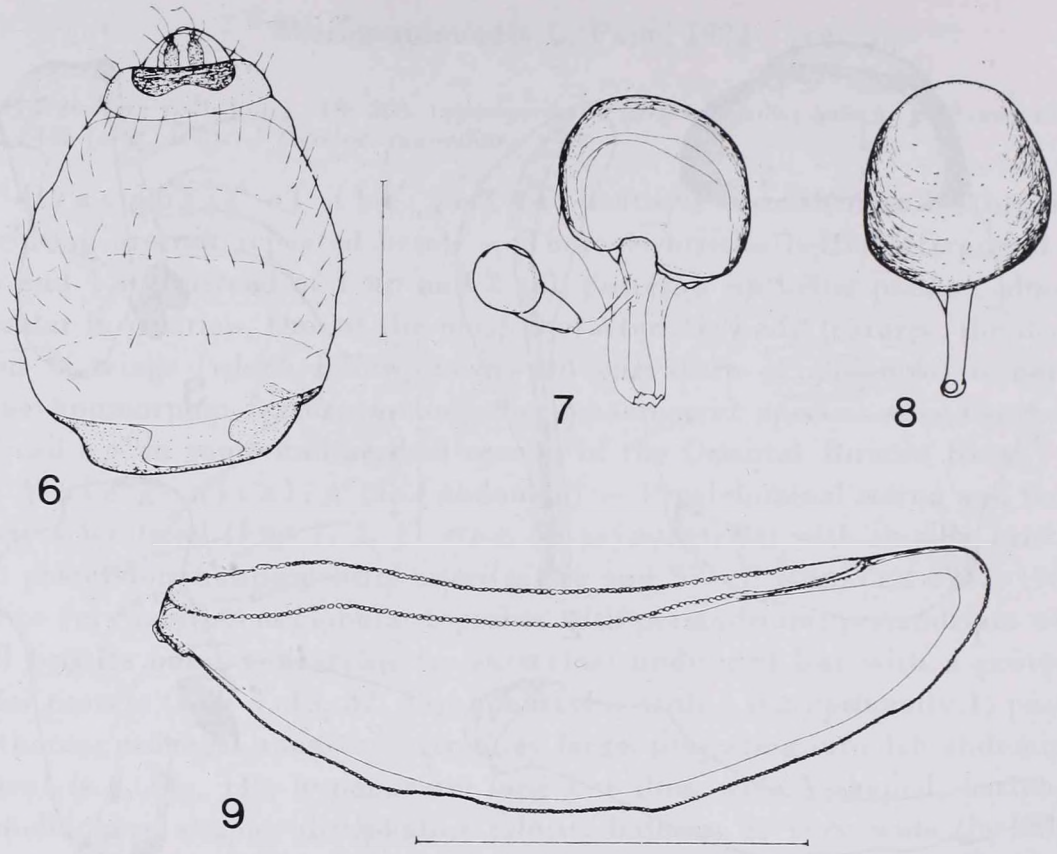
Figs 1—5. *Pterogrammoides baloghi* L. PAPP, paratype male: 1 = abdomen in dorsal view, 2 = aedeagal apodeme, lateral view, 3—4 = gonostylus: 3 = caudal view, 4 = lateral (outer) view. 5 = postgonite, — Scales: 0.1 mm for Figs 3—5, 0.2 mm for Figs 1 and 2

Pterogrammoides baloghi L. PAPP, 1972
(Figs 1—9)

PAPP, 1972: Acta zool. hung. 18: 105, 109 (key).

Material studied: holotype male (HNHM, in its original description misprinted as female) and 8 male and 3 female paratypes (HNHM); for locality data see its description.

Additions to its original description — Male: Abdominal terga 3—5 weakly chitinized but not indistinct, postabdominal-pregenital sclerites (S6—S7) rather large but smaller than in indica sp. n. or in thaii sp. n. Periandrium with minute bristles only (Fig. 1). Gonostylus (Figs 3—4) longer than wide in lateral view apically with two thornlets but without dense long apical hairs, posteral thorns large and flat (Fig. 3, cf. Fig. 4); posteromedial process of gonostylus wide and rounded with two minute thornlets apically. Aedeagal complex large, aedeagal apodeme reaching into the 4th abdominal segment (Figs 1—2). Gonostylar bristles much longer than those on periandrium. Subanal plates with 2 pairs of long bristles (as long as gonostylus). Postgonite long, slightly bent in its whole length, apex blunt and rounded (Fig. 5), poste-



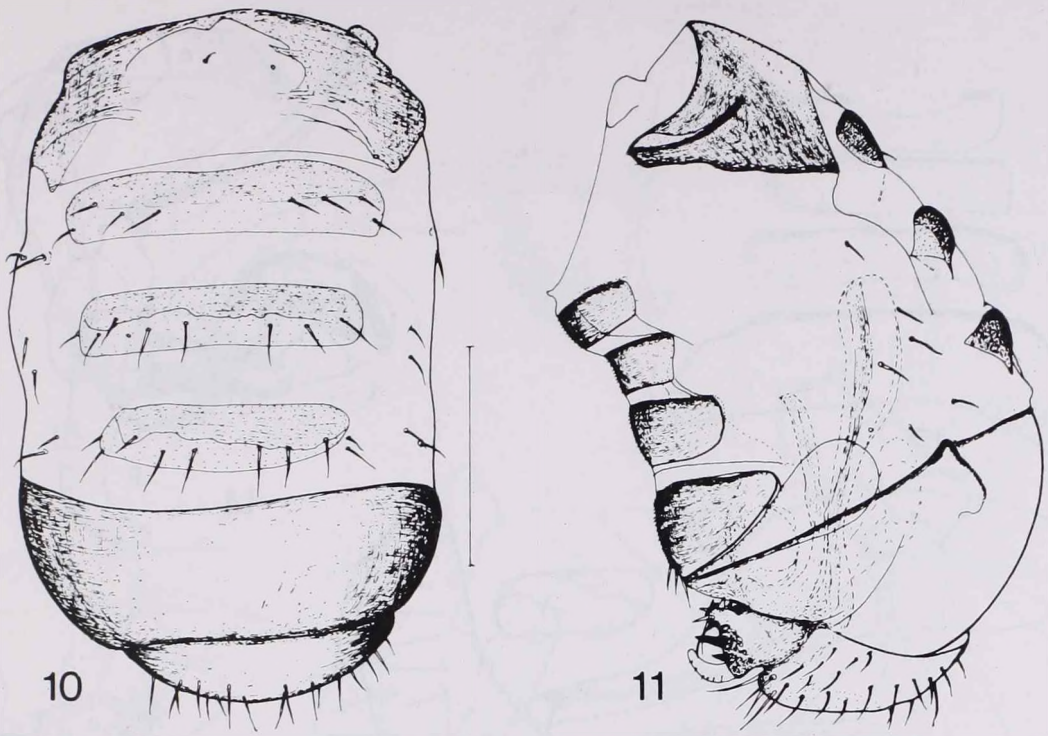
Figs 6—9. *Pterogrammoides baloghi* L. PAPP, paratype female: 6 = abdomen in dorsal view, 7—8 = spermathecae: 7 = paired spermathecae in glycerene, 8 = one spermatheca in water, 9 = egg in lateral view. — Scales: 0.2 mm for Fig. 6 and for Figs 7—9

rior margin serrate. — F e m a l e: Preabdominal segments hardly sclerotized (Fig. 6) except for tergites 1 + 2, abdominal bristles rather short. T8 small and not bipartite with four marginal bristles. T10 and S10 very weakly sclerotized. Cerci small, apex blunt, with one moderately long but thin hair and with some short hairs. Spermathecae comparatively large, short ovoid (Fig. 8), 0.11 mm long when in water, in glycerine they turn into a semiglobular form (Fig. 7) or their length reduces to 1/4 of its original, consequently spermathecal wall must be very thin (cf. generic diagnosis above). Eggs (Fig. 9) very large, 0.43 mm long when laid down, chorion with fine microsculpture.

The length of its imagos is slightly more than that given in its original description, i.e. 0.9—1.05 mm.

Pterogrammoides indica sp. n.
(Figs 10—15)

Measurements in mm: body length 1.05 (holotype male), 0.97 (paratype male); length of wing (from base to tip) 0.85 (holotype), 0.77 (paratype); width of wing 0.33 and 0.31, respectively.



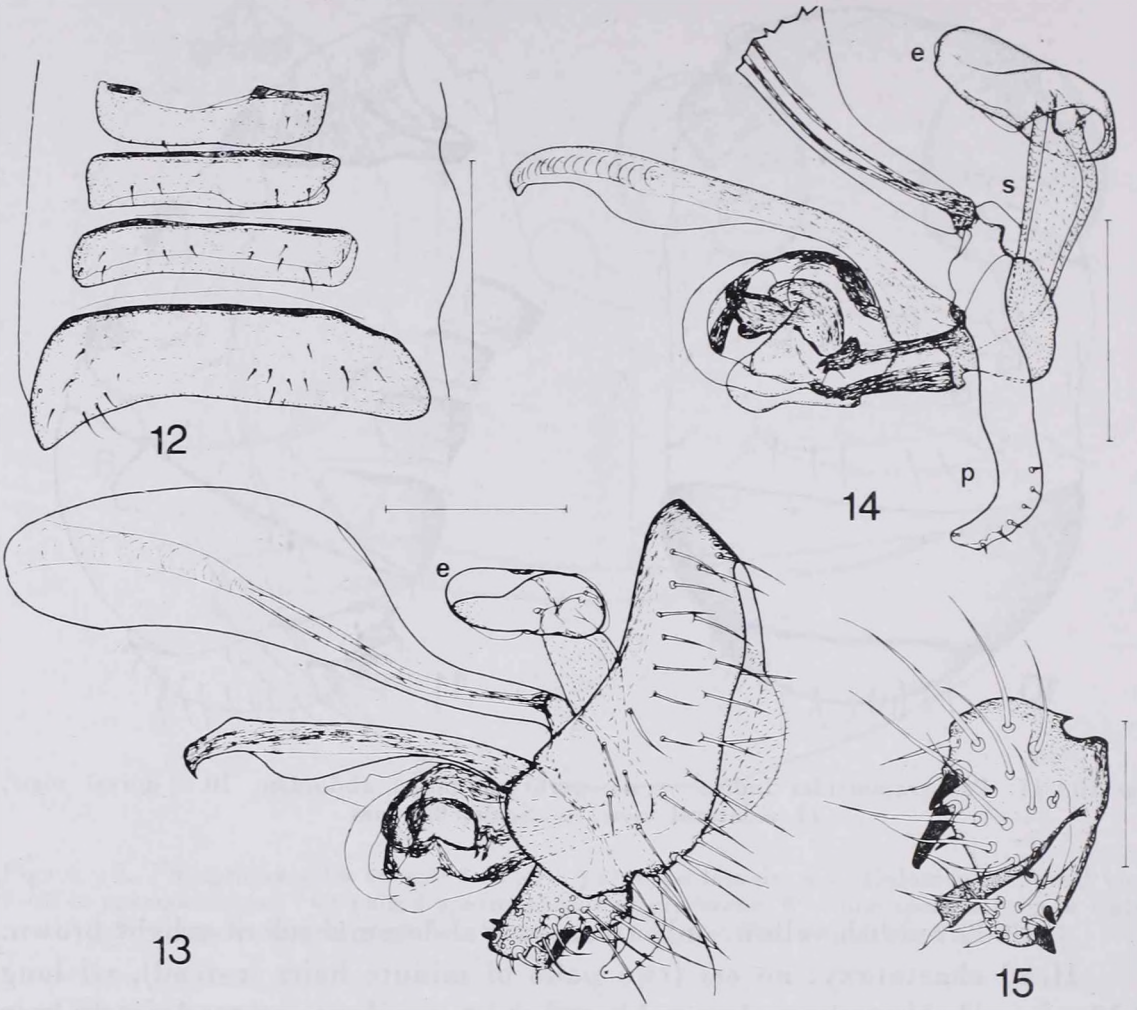
Figs 10—11. *Pterogrammoides indica* sp. n., paratype male, abdomen: 10 = dorsal view; 11 = lateral view. — Scale: 0.2 mm

♂. Body reddish yellow, only tibiae and abdominal sclerites light brown.

Head chaetotaxy: no *ors* (two pairs of minute hairs instead), *vti* long (0.12 mm on holotype), *vte* very weak and short, *oc* minute, *vi* moderately long but thin, peristomals and 2—3 hairs on genae very short and thin. Facial plate with a projecting, more or less bulbous carina at about middle. Ocelli present. Pedicel with a thin but comparatively long, ventrally directed seta, scape with a wreath of long bristles. First flagellomere (third antennal joint) elongate and continued into an apical, conical apex, whole flagellomere covered with long (0.03 mm) cilia. Arista long (0.48 mm) with scattered but comparatively long pilosity. Two or three pairs of minute hairs in *if* position.

Mesonotum unicolorous, reddish yellow or light brown in weak illumination. Thoracic chaetotaxy: very short *h*, 2 *np* (posterior one in a prealar position), 1 *prsut*, 1 very long, 0.18 mm supraalar, 1 small postalar, 2 strong *dc* (anterior pair slightly incurving), 2 strong *sc* pairs. One minute sternopleural; 2 *acmi* rows of scattered short setae.

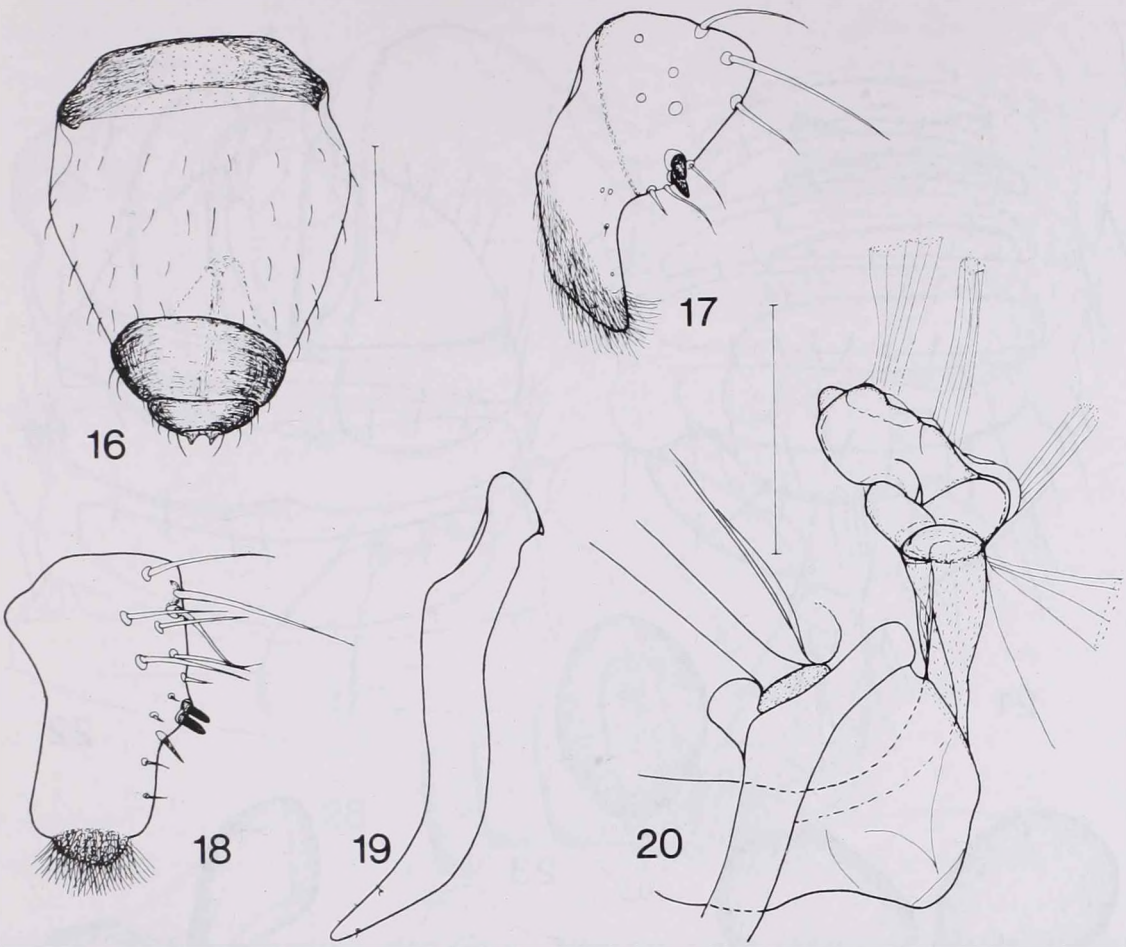
Legs short and thick. Mid femora ventrobasally with two rows of 5—6 short but rather strong bristles, no *va* on mid tibia but its apical third with antero- and postero-ventral rows of short dark bristles, 1 short *ad* in the proximal third and 1 strong *d* at apical 4/5. Hind coxae ventrally covered by dense short bristles. Hind tibia with a short curved *va* spur.



Figs 12—15. *Pterogrammoides indica* sp. n., paratype male: 12 = pregenital sternites, 13 = = genitalia in lateral view, 14 = aedeagal complex, lateral view (aedeagal apodeme omitted); 15 = gonostylus, sublateral view (e = ejaculatory pump, s = sack, p = postgonite). — Scales: 0.2 mm for Fig. 12, 0.1 mm for Figs 13 and 14, 0.05 mm for Fig. 15

Wings light brown, strongly downcurved, just overreaching abdominal apex. Costa with long thin bristles, no stronger bristles basally. Only vein r_{4+5} fully developed, other veins (incl. r_1) present only in the basal 1/5 to 1/4 of wing. Alula short, pointed with very long cilia. Halteres wax-yellow.

Abdomen much downcurved (Fig. 11), preabdominal sclerites weakly chitinized (Figs 10—12), tergites 3—5 small but distinct (Fig. 10), postabdominal-pregenital sclerites (S6—S7) enormously big (Fig. 11). S5 asymmetrical (Fig. 12), with small setae only. Aedeagal apodeme exceptionally large (Figs 11, 13), hypandrium rather large. Postgonites (Fig. 14) moderately long and strongly curved, apex blunt, its curved part posteriorly with a row of small setulae (Fig. 14). Distiphallus rather large, bulbous, ejaculatory pump of an intricate form (Fig. 14), its ventral sack with minute microtrichia. Gonostylus (Fig. 15) with two anteroapical thorns, posteromedial process rather



Figs 16—20. *Pterogrammoides longipennis* L. PAPP, holotype male: 16 = abdomen in dorsal view, 17—18 = gonostylus: 17 = caudal view, 18: lateral view, 19 = postgonite laterally, 20 = ejaculatory pump and basiphallus, lateral view. — Scales: 0.2 mm for Fig. 16 and 0.05 mm for Figs 17—20, respectively

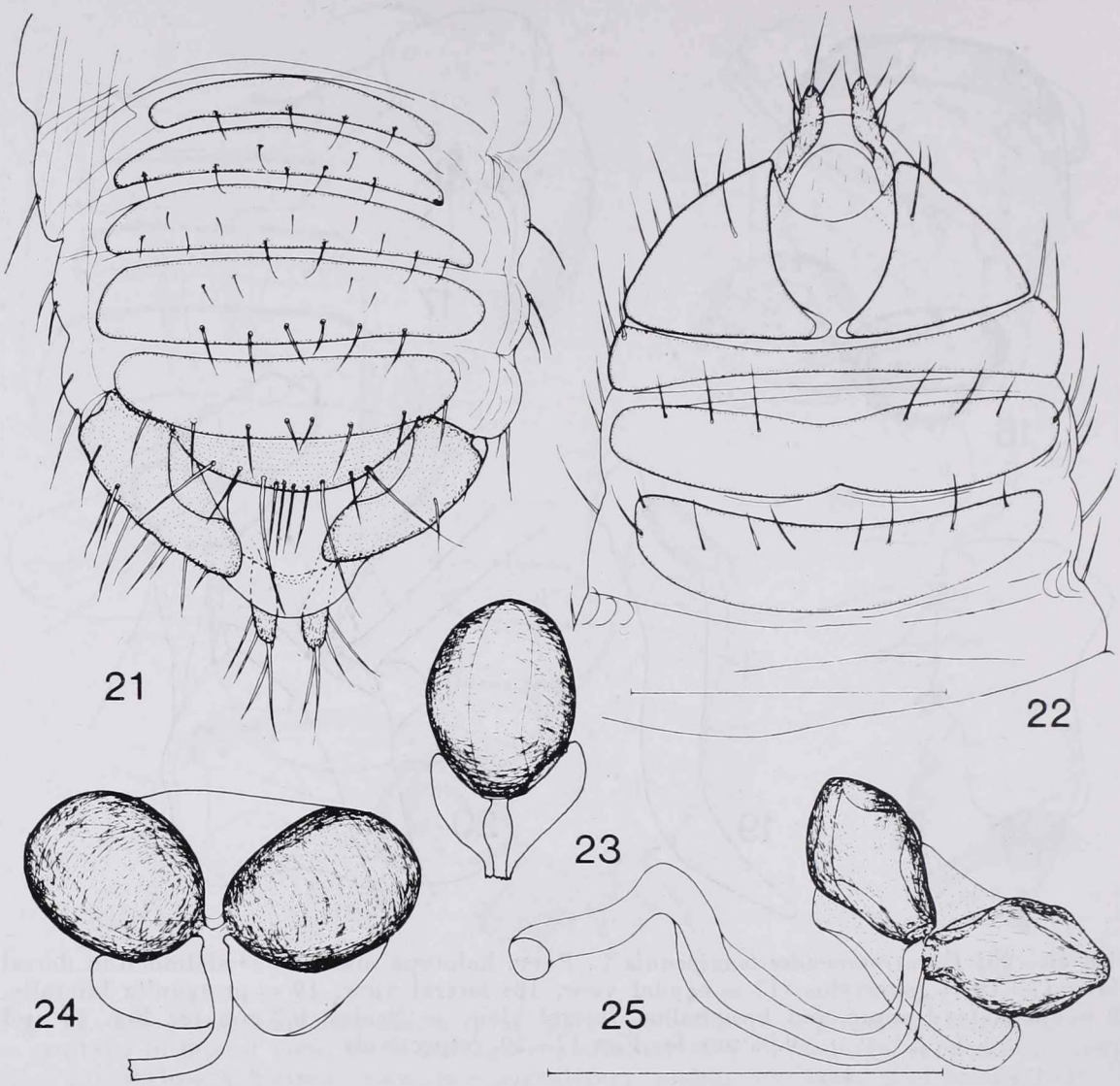
narrow, posteral thorns uneven: one of them moderately long, the other one very large.

Female unknown.

Holotype male (MHNG): India, Meghalaya, Garo Hills, Rongrengiri, 400 m, 3. XI. 1978, leg. C. BESUCHET et I. LÖBL (No. 39/b: "Tamisage en forêt, au pied de grands arbes"). — Paratype male (HNHM): India, West Bengal, Darjeeling distr., Sukna, 200 m, 7. X. 1978, leg. C. BESUCHET et I. LÖBL (No. 2/b.: "Tamisage en forêt").

The type-specimens were originally preserved in alcohol; they were removed into canada balsam (prepared on a cover glass, abdomen separated). The paratype is poorly preserved (right antenna lost, right fore leg lost, also head severely damaged).

The differentiating diagnosis is involved in the key below.



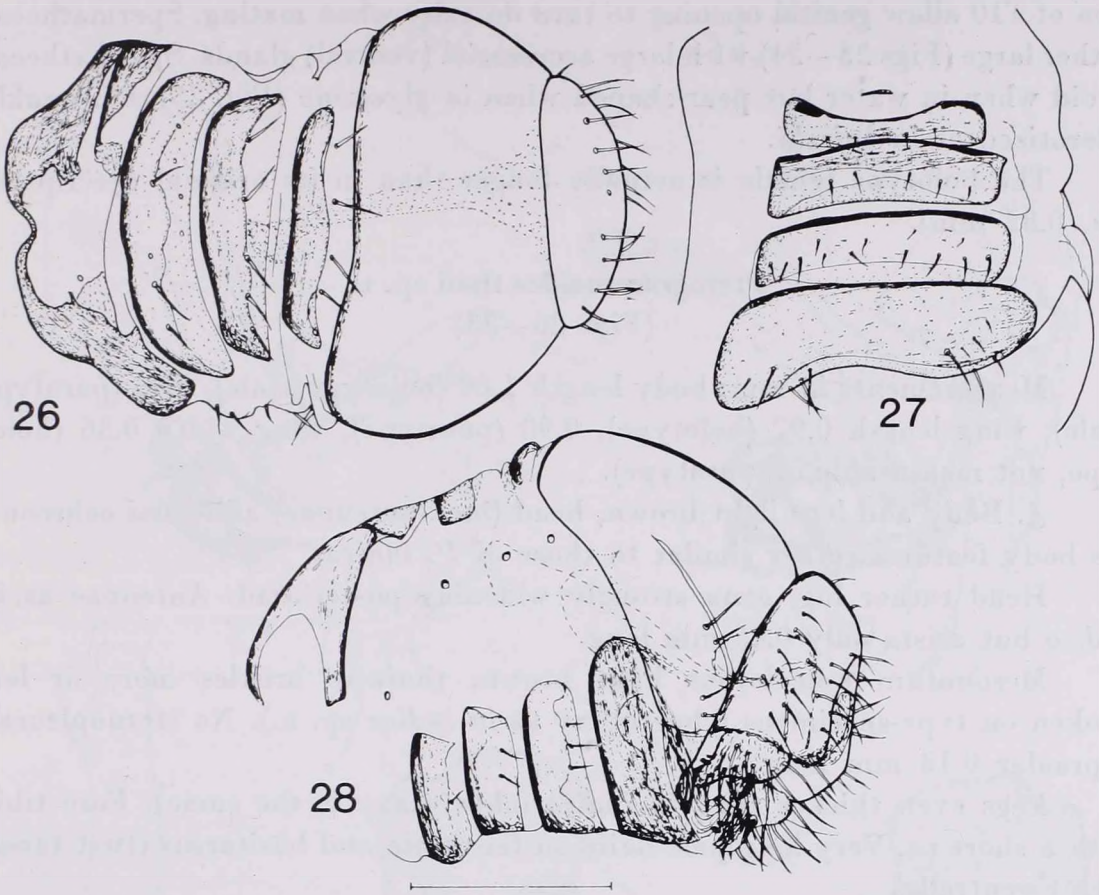
Figs 21—25. *Pte. ogrammoides poecilosomus* L. PAPP, holotype female: 21—22 = abdomen: 21 = ventral view, 22 = dorsal view, 23—25 = spermathecae with accessorial glands: 23 = paired spermathecae in water, 24 = unpaired spermatheca in water, 25 = paired spermathecae in glycerine. — Scales: 0.2 mm for Figs 21—22, 0.1 mm for Figs 23—25

Pterogrammoides longipennis L. PAPP, 1972
(Figs 16—20)

PAPP 1972: Acta zool. hung. 18: 108, 109 (key).

Material studied: holotype male (HNHM): nicely preserved though somewhat fainted in alcohol; additional material: 1 ♀: (MHNG): "Nouvelle Bretagne: Pomio; tamisage sous arbre pourri, alt. n/mer, 9. VII. 1979, leg JOHN D. BOURNE (NG-28-79)" (Winkler extraction).

Additions to its original description — Abdomen weakly sclerotized (Fig. 16), only T1+2 of the preabdominal tergites distinct, postabdomen much smaller than in *indica* (Fig. 16, cf. Fig. 10). Gonostylus rather simple (Figs 17—18), apically without bristles, anterior lobe with com-



Figs 26—28. *Pterogrammoides thaii* sp. n., paratype male, abdomen: 26 = dorsal view, 27 = pregenital sternites in ventral view, 28 = sublateral view. — Scale: 0.2 mm

paratively long dense hairs, posteral thorn very small. Postgonite (Fig. 19) bent but not angulately as in *indica*, without distinct setulae, its apex tapering though not sharp. Ejaculatory pump (Fig. 20) rather complex and large with insertion of numerous muscles, its ventral sack small, its wall thin.

The holotype is slightly larger than given in its original description, i.e. ca 0.85 mm.

Pterogrammoides poecilosomus L. Papp, 1972

Papp 1972: Acta zool. hung. 18: 107, 109 (key).

Material studied: holotype female (HNHM).

Additions of its original description: abdominal sclerites weakly sclerotized but distinct (Figs 21—22), S8 small but with numerous long bristles. T8 bipartite and enormously big (Fig. 22), bristles moderately long. T10 and S10 very weakly sclerotized. Cerci small with 4—5 rather long but thin bristles (Fig. 22). The large space between the two parts of T8 and the weak sclerotiza-

tion of T10 allow genital opening to turn dorsally when mating. Spermathecae rather large (Figs 23—24) with large accessorial (ventral) glands. Spermathecae ovoid when in water but pear-shaped when in glycerine (Fig. 25), i.e. weakly sclerotized as in *baloghi*.

The holotype female is actually longer than in its original description (ca. 0.82 mm).

Pterogrammoides thaii sp. n.
(Figt 26—33)

Measurements in mm: body length 1.00 (holotype male), 0.95 (paratype male), wing length 0.97 (holotype), 0.90 (paratype), wing width 0.36 (holotype, not measurable on paratype).

♂. Body and legs light brown, head (incl. antennae) and tarsi ochreous. Its body features rather similar to those of *P. indica*.

Head rather big, gena strongly widening posteriorad. Antennae as in *indica* but arista only 0.45 mm long.

Mesonotum unicolorous light brown, thoracic bristles more or less broken on type-specimens (chaetotaxy as in *indica* sp. n.). No sternopleural, supraalar 0.13 mm long.

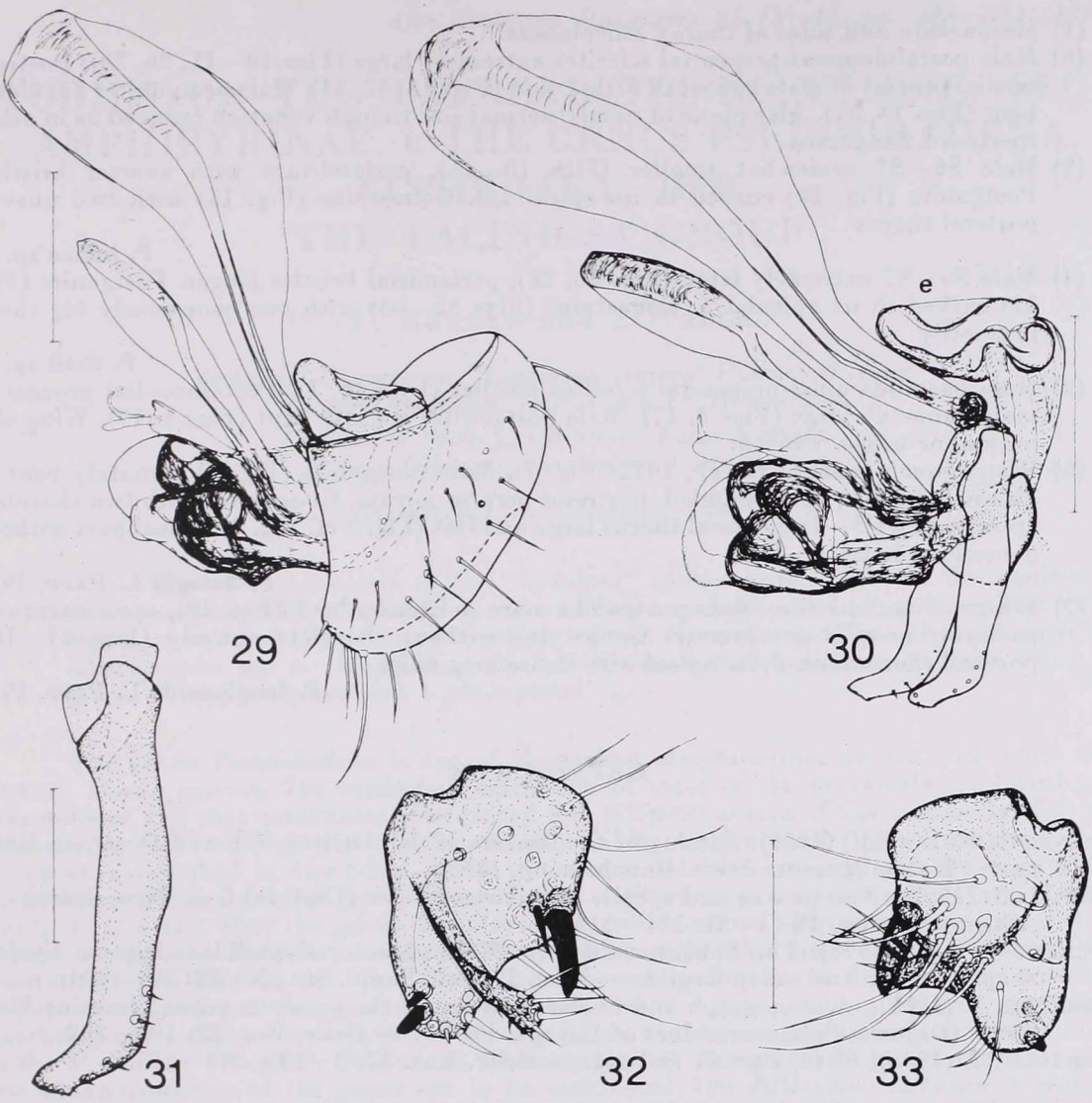
Legs even thicker than in *indica* (chaetotaxy is the same). Fore tibia with a short *va*. Very long pale hairs on fore tibia and basitarsus (first tarsomere) ventrally.

Wings light brown, almost straight alar plane. Veins reduced as in other species but wing comparatively long, much overreaching abdominal apex. Halteres whitish.

Preabdominal sclerites (both terga and sterna) reduced (Figs 26—28) but less reduced than in its relatives. Postabdominal-pregenital sclerites (S6—S7) extremely large (largest in the genus) (Figs 26, 28), genital shell (periandrium) also large, its bristles somewhat longer than in *indica* sp. n. (Fig. 26). Preabdominal sterna wrinkled, S5 strongly asymmetrical with moderately long bristles (Fig. 27, cf. Fig. 12). Aedeagal apodeme (Figs 29—30) extremely large, hypandrium thin but long. Distiphallus short but thick, bulbous and swollen (Fig. 30). Postgonite (Fig. 31) almost straight in its basal 4/5 and angulately bent in its apical fifth, apex blunt and wide, small setulae on its apical part posteriorly. Ejaculatory pump (Fig. 30) similar to that of *indica* sp. n. Gonostylus (Figs 32—33) short as in *indica* sp. n., its posteromedial process long and thin, apical thorns similar to those of *indica*, but posteral thorns different: one of the thorns extremely large, the other one indistinct (a bristle instead).

Female unknown.

Holotype male (MHNG): Thailand, Province de Chanthaburi, Khao Sabap National Park, environs de Phlin Waterfalls, 150—300 m, 23—24. XI. 1986, leg. D. H. BURCKHARDT



Figs 29—33. *Pterogrammoides thaii* sp. n., paratype male, genitalia: 29 = lateral view, 30 = aedeagal complex in lateral view, 31 = postgonite, 32—33 = gonostylus: 32 = lateral (inner) view, 33 = lateral (outer) view (e = ejaculatory pump). — Scales: 0.1 mm for Figs 29—30, 0.05 mm for Figs 31—33.

et I. Löbl (No. 27a: "tamisage de débris végétaux et de mousses à proximité de cours d'eau"). — Paratype male (HNHM): Thailand, Province de Phetchaburi, Kaeng Krachan National Park, 450 m, 19. XI. 1985, à 35 km de "Headquarters", leg. D. H. Burckhardt et I. Löbl (No. 26: "tamisages de débris végétaux dans la forêt").

The type-specimens were originally preserved in alcohol; during this study they were removed into canada balsam (prepared on a cover glass, abdomen separated). The paratype is very poorly preserved (wings almost completely lost, only costal area of the left wing is preserved); genitalia are dissected and preserved in canada balsam between two cover glasses.

KEY TO SPECIES

1 (2) Mesonotum with pattern, one light spot each on anepisternum and anepimeron. Female T8 bipartite, extremely large (Fig. 22). One rather long *ors*, no sternopleural. Wings rather dark brown, especially along venation

P. poecilosomus L. Papp, 1972

2 (1) Mesonotum and sides of thorax unicolorous.
3 (6) Male postabdominal-pregenital sclerites extremely large (Figs 10—11, 26, 28). Posteromedial process of male gonostyli rather thin (Figs 15, 32, 33). Male postgonites angularly bent (Figs 14, 31). Alar plane of nearly normal size though venation reduced as in other species of the genus.
4 (5) Male S6—S7 somewhat smaller (Figs 10—11), periandrium with shorter bristles. Postgonite (Fig. 14) curved in its apical 1/3. Gonostylus (Fig. 15) with two uneven posteral thorns

P. indica sp. n.

5 (4) Male S6—S7 extremely large (Figs 26, 28), periandrial bristles longer. Postgonite (Fig. 31) curved in its apical 1/5. Gonostylus (Figs 32—33) with one enormously big thorn posterally

P. thaii sp. n.

6 (3) Male postabdominal-pregenital sclerites smaller (Figs 16, 1). Posteromedial process of male gonostyli large (Figs 3, 17). Male postgonites slightly bent (Figs 5, 19). Wing size normal or wings reduced.
7 (8) Wings much reduced (PAPP, 1972: Fig. 1). Male postgonite (Fig. 5) arcuately bent in its whole length, apex rounded, posterior margin serrate. Gonostylus with two thornlets apically (Figs 3—4), posteral thorns large and flat (Fig. 3 cf. Fig. 4), apical part without dense long hairs

P. baloghi L. PAPP, 1972

8 (7) Wings of normal size. Male postgonite more definitely bent (Fig. 19), apex narrower, posterior margin not serrate. Gonostylus without thornlets apically (Figs 17—18), posteral thorn normal, its apical with dense long hairs

P. longipennis L. PAPP, 1972

REFERENCES

EVENHUIS, N. L. (Ed.) (1989): Catalog of the Diptera of the Australasian and Oceanian Regions — Bishop Museum Press, Honolulu, pp. 1155.

PAPP, L. J. (1972): New genera and species of Sphaeroceridae (Diptera) from New Guinea. — Acta zool. hung. **18** (1—2): 101—115.

RICHARDS, O. W. (1973): The Sphaeroceridae (= Borboridae or Cypselidae; Diptera Cyclorrhapha) of the Australian Region. — Aust. J. Zool., Suppl. Ser., No. **22:** 297—401.

ROHÁČEK, J. (1982): A monograph and re-classification of the previous genus Limosina Macquart (Diptera, Sphaeroceridae) of Europe. Part I. — Beitr. Ent. **32:** 195—282.

ROHÁČEK, J. (1983): ditto, Part II and III. — Beitr. Ent. **33:** 3—195, 203—255.

Acta Zoologica Hungarica 35 (3—4), pp. 339—353 (1989)

STUDIES ON THE PALAEARCTIC NOCTUIDAE. SECT. AMPHIPYRINAE, I. THE GENUS PSEUDOHADENA ALPHERAKY, 1889. THE LACINIOSA GROUP

L. RONKAY and Z. VARGA

Zoological Department, Hungarian Natural History Museum
H-1088 Budapest, Baross utca 13, Hungary
Institute of Zoology, University Lajos Kossuth
H-4010 Debrecen, Egyetem tér 1, Hungary

(Received 15th November, 1988)

The characterization of the "*laciniosa*" species group with the descriptions of one new species (*P. calligrapha* sp. n.) and four new subspecies (*P. gnorima hololampra* ssp. n.: Armenia, *P. gnorima peregovitsi* ssp. n.: Mongolia and Tien-Shan, *P. laciniosa odontographa* ssp. n.: Mongolia, and *P. laciniosa hethitica* ssp. n.: Anatolia centr.) is given. With 18 figures and 1 photoplate.

The genus *Pseudohadena* is one of the richest *Amphipyrinae* genera with more than twenty known species. The taxonomic relegation of some of the previously published taxa was dubious and they sometimes were placed into different genera of this subfamily. The best example for this confusion is the *laciniosa* group as the two previously known members of the group were described in two other genera (*Chloantha* and *Rhizogramma*) and the more widely distributed species, *laciniosa* was considered as an *Actinotia* even in recent papers (e.g. HACKER 1987). It is a fact that the genus *Pseudohadena* still contains species belonging to distinct groups of species which may be very different from each other both by their external and genital features. But, on the other hand, the different groups can be derived from known or hypothetical ancestors. Sometimes a special character of a group can appear in a member of another group (cf. the characteristic reversible harpe of the *laciniosa* group can also be found in the *P. indigna* group: *P. indigna*, *P. schlumbergeri*, *P. stenoptera*) Although there are only few synapomorphies of the genus are to be mentioned, the differences between it and the genera *Actinotia* HÜBNER, (1821) 1816 and *Auchmis* HÜBNER, (1821) 1816 (= *Rhizogramma* LEDERER, 1857) are well discernible. *Actinotia* (s. l.) is a very heterogeneous taxon consisting of three groups of species distinguishable at a generic level. The true *Actinotia* is represented by two species: *polyodon* (CLERK, 1759) and *intermedia* BREMER, 1856 which have the wing pattern more or less similar to those of the members of the *laciniosa* group, but the configuration of the genitalia of both sexes is very dissimilar, displaying no relationships with any *Pseudohadena* species. The genus *Auchmis* can be characterized — beside the typical colouration of wings — by the configuration of the male genitalia: they have well-developed cucullus and corona, harpe and ampulla and a simple, upturned vesica. On the basis of these genital features this genus was considered for a long time as a noctuine genus related to *Diarsia* HÜBNER, (1821) 1816. This opinion is not correct: the similarities between the mentioned genera fairly reveal the fact that virtually the same, essentially plesiomorphic groundplan of the male genitalia can appear on different evolutionary lines. A further argument against the noctuine relationship of *Auchmis* is the presence of abdominal coremata.

The specific features of the *laciniosa* group are as follows:

1. A very characteristic pattern; the orbicular spot is very narrow, oblique and flattened, the claviform is elongate, the reniform is curved, moon-shaped. The antemedial and subterminal lines are meandering with sagittiform spots, the postmedial line is obsolescent or deleted.

2. The abdominal coremata are present.
3. The male genitalia have reduced cucullus and corona but show a characteristic, elongate and spine-like costal processus. The valvae are elongate, the harpe is slightly spatulate, usually curved, its basis long and strong and the harpe is reversible around the axis of the basis (see Figs 1—15). The fultura inferior is strong and wide, deltoidal or fan-shaped with a manubrium-like apical part.
4. The aedeagus is cylindrical, the vesica covered densely with fine spiculi. The homogenous field of spiculi can be divided into three groups in the more derived taxa.
5. The ovipositor is strong and very wide but relatively short, the ductus bursae is more or less tubular and sclerotized. The apex bursae is well--differentiated and rugulose, the corpus bursae with four ribbon-like signa.

By the morphological characteristics of the genitalia the *laciniosa* group is allied to the *P. indigna* CHRISTOPH—*schlumbergeri* PÜNGELER—*stenoptera* BOURSIN line, although the members of the latter group have a characteristic terminal cornutus in the vesica, rounded, short signa in corpus bursae and the wing pattern strongly differs in the two related groups.

Synopsis of the species

calligrapha sp. n.
laciniosa (CHRISTOPH, 1887)
laciniosa odontographa ssp. n.
laciniosa hethitica ssp. n.
gnorima (PÜNGELER, 1906)
gnorima hololampra ssp. n.
gnorima peregovitsi ssp.n.

THE PHYLOGENY OF THE GROUP

The apomorphies of the whole group are the reduced cucullus and corona, the general configuration of the fultura inferior and the reversible harpe which is a common feature with the *indigna* group. The first stage of speciation is the dichotomy of the *laciniosa* and the *gnorima* lines. The main changes are as follows: the costal processus of the valva becomes wider and flattened, the homogeneous field of spiculi in the vesica is arranged into three distinct parts since the originally unarticulated sac of the vesica forms three diverticles, and the aedeagus became much longer and tubular. During the further evolutionary steps the main configuration of the male genitalia had not modified, consequently the genitalia of the related taxa remains very similar on both lines. The specific differences can be found in the shape of the fultura inferior, the shape and width of basis of the harpe and the different terminal part of the harpe. On the *gnorima* line the basis of the harpe become stronger and wider and the harpe partly loses its reversibility. On the *laciniosa* line the shape of the fultura inferior has modified from an originally "gnorimoid", mainly deltoidal

shape into a wide, fan-shaped one. The terminal part of the harpe is more or less spatulate in the older forms and the basis of it is strong. In cases of the derived taxa the harpe is not or weakly spatulate and the basis of the harpe is less sclerotized, so the harpe stands more close to the plain of the valva.

The evolutionary scale of these changes is very problematic to estimate. The very small differences in the genitalia as compared with those of the allied species and subspecies suggest very recent changes and a recent group. But, by the high similarity between the seemingly most ancestral known species *(calligrapha)* and the more evolved forms of the *laciniosa* line and as the two lines display a very special dichotomy, so, the hypothesis appears to be dubious. Yet it is very probable that there was a period in the evolution of the *gnorima* line when the changes were more intensive and this period was connected with the expansion of the arid or eremic habitats which led to the disjunction in the range of this species.

KEY FOR THE SPECIES BASED ON THE EXTERNAL CHARACTERISTICS

1 (2) Postmedial line entirely absent, underside of wings whitish, without any pattern
calligrapha sp. n.

2 (1) Postmedial line at least at costa present, underside with a more or less developed pattern

3 (8) Underside shiny ochreous-grey with veins covered by dark brown; apical part of subterminal line strong, running nearly continuously from apex to reniform

4 (7) Alar expanse smaller (under 40 mm), fore wing very shiny with intensive pattern

5 (6) Ground colour of fore wing fawn-brown with a violaceous or pinkish shine, postmedial line present
gnorima hololampra ssp. n.

6 (5) Ground color lighter brown with ochreous bronze shine, lower part of postmedial line. deleted
gnorima gnorima PÜNGELER

7 (4) Alar expanse larger (41—43 mm), fore wing less bright, more unicolorous
gnorima peregovitsi ssp. n.

8 (3) Underside darker grey-brown, veins without strong and sharp dark brown covering

9 (10) Ground colour of fore wing dark grey-brown, inner area of hind wing strongly suffused with brown
laciniosa odontographa ssp. n.

10 (9) Ground colour much lighter, ochreous-brown or ochreous-grey, inner area of hind wing whitish ochreous

11 (12) Ground colour very light, ochreous-grey with irregular darker irroration in medial and marginal fields
laciniosa hethitica ssp. n.

12 (11) Ground colour more brownish, wing pattern less mosaic-like
laciniosa laciniosa CHRISTOPH

KEY FOR THE SPECIES BASED ON THE CONFIGURATION OF THE MALE GENITALIA

1 (6) Aedeagus long, vesica with three bundles of fine, spiculiform cornuti

2 (3) Fultura inferior deltoidal with very long, sclerotized apical processus (Fig. 10)
gnorima gnorima PÜNGELER

3 (2) Fultura inferior triangular with shorter apical processus (Figs 12, 14)

4 (5) Vesica curved into a regular arch (Fig. 15)
gnorima peregovitsi ssp. n.

5 (4) Vesica curved into a more elongated arch (Fig. 13)
gnorima hololampra ssp. n.

6 (1) Aedeagus shorter with a homogeneous field of fine, spiculiform cornuti
17 (8) Fultura inferior with two holes at basis of apical processus; valva with costal part of apex forms a larger extension
calligrapha sp. n.
8 (7) Fultura inferior without incisions, apical processus shorter with less sclerotized tip; costal part of apex forming only a small peak
9 (10) Harpe strongly spatulate with heavily sclerotized basis
laciniosa odontographa ssp. n.
10 (9) Harpe less spatulate, its basis weaker
laciniosa laciniosa CHRISTOPH and **laciniosa hethitica** ssp. n.

KEY FOR THE SPECIES BASED ON THE CONFIGURATION OF THE FEMALE GENITALIA

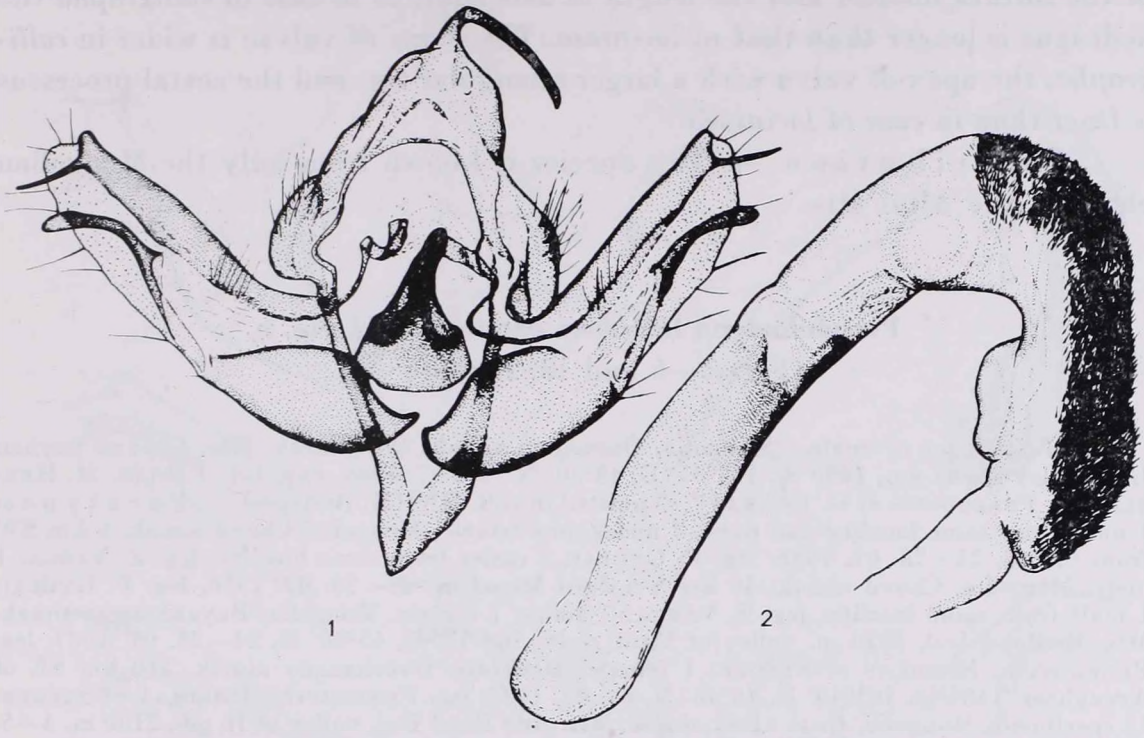
1 (2) Ostium membranous, ostial lobes very small
laciniosa CHRISTOPH and its subspecies
2 (1) Ostium large, sclerotized, ostial lobes large and conical
gnorima PÜNGELER and its subspecies
(The female of *calligrapha* is unknown)

Systematic part

Pseudohadena calligrapha sp. n.
(Figs 1—2, Plate: 1—2)

Holotype: male, "Mongolia, Chovd aimak, 6 km SW from Chovd, 25—28.07.1986, leg. Z. Varga"; slide No. 2196 RONKAY. Deposited in coll. VARGA (Debrecen). — Paratype: male, Mongolia, Bayanhongor aimak, Mts. Ih Bogd Uul, 1850 m, valley of Pitut river, 100°13′ E, 45°00′ N, leg. PEREGOVITS, HREBLAY et STÉGER; slide No. 2763 RONKAY. Deposited in coll. Hungarian Natural History Museum, Budapest (= HNHM).

Description — Alar expanse 34—35 mm, length of fore wing 15-16 mm. Head and thorax light, ochreous slate-grey, vertex with a blackish tuft, palpi laterally dark brown. Collar and thorax with scattered dark hairs, tegulae with blackish edges. Abdomen ochreous grey, dorsal crest reduced to a somewhat darker tuft on first segment. Ground colour of fore wing light ochreous slate grey with some silvery or olive grey shade. Transversal lines very obsolete, only some parts of antemedial line visible below cell. Dark streak of submedian fold short, blackish; claviform spot large and conspicuous, whitish with dark brown inner line. Orbicular and reniform stigmata well--defined, flattened, encircled with blackish grey and whitish lines. Orbicular oblique, long, partly conjoined with moon-shaped reniform. Median area and some parts of cell irrorated with light brown of velvet shade, veins covered with whitish and/or blackish. Subterminal line broken into two parts, absent in tornus; a dark grey-brown shadow with some darker arrowhead spots. Veins covered blackish in marginal field, terminal line fine, black, inner part of cilia ochreous-whitish, outer part olive-brown, spotted with whitish. Hind wing light ochreous-brown with wide darker marginal suffusion, cellular lunule



Figs 1—2. *Pseudohadena calligrapha* sp. n.: Holotype, Mongolia

absent, terminal line diffuse, brown, cilia pure ochreous-white. Underside of wings light ochreous-grey, scarcely irrorated with darker grey, cellular lunule of fore wing visible. Inner part of fore wing slightly diaphanous. Cilia of fore wing spotted with grey-brown, unicolorous on hind wing.

Male genitalia (Figs 1—2): uncus long and slender, tegumen relatively wide, penicular lobes wide and densely hairy, vinculum V-shaped. Fultura inferior with a characteristic shape, its basal part subtriangular with two hollows, apical part elongate, rostrum-like with heavily sclerotized apex. Valvae elongate, costal margin strong, terminally with a rounded triangular tip and a long, pin-shaped processus erected obliquely upwards. Sacculus short and rounded, clavus absent. Harpe reversible, long and arcuate, distally slightly spatulate; its basis long and strong. Aedeagus cylindrical, moderately long, distal part slightly stronger on ventral side. Proximal part of vesica tubular with some sclerotized rugae ventrally, distal part reclinate, its outer part densely covered with fine spiculi from the arch to ductus ejaculatorius. Inner edge of arch with a small, globular diverticle.

Specific differences and taxonomic position — The new species has an intermediate appearance between the *laciniosa* and *gnorima* lines, by the main external features it is more similar to the species of the *gnorima* line, but the configuration of the male genitalia is very near to that of *laciniosa*. The most important differences can be found in the shape

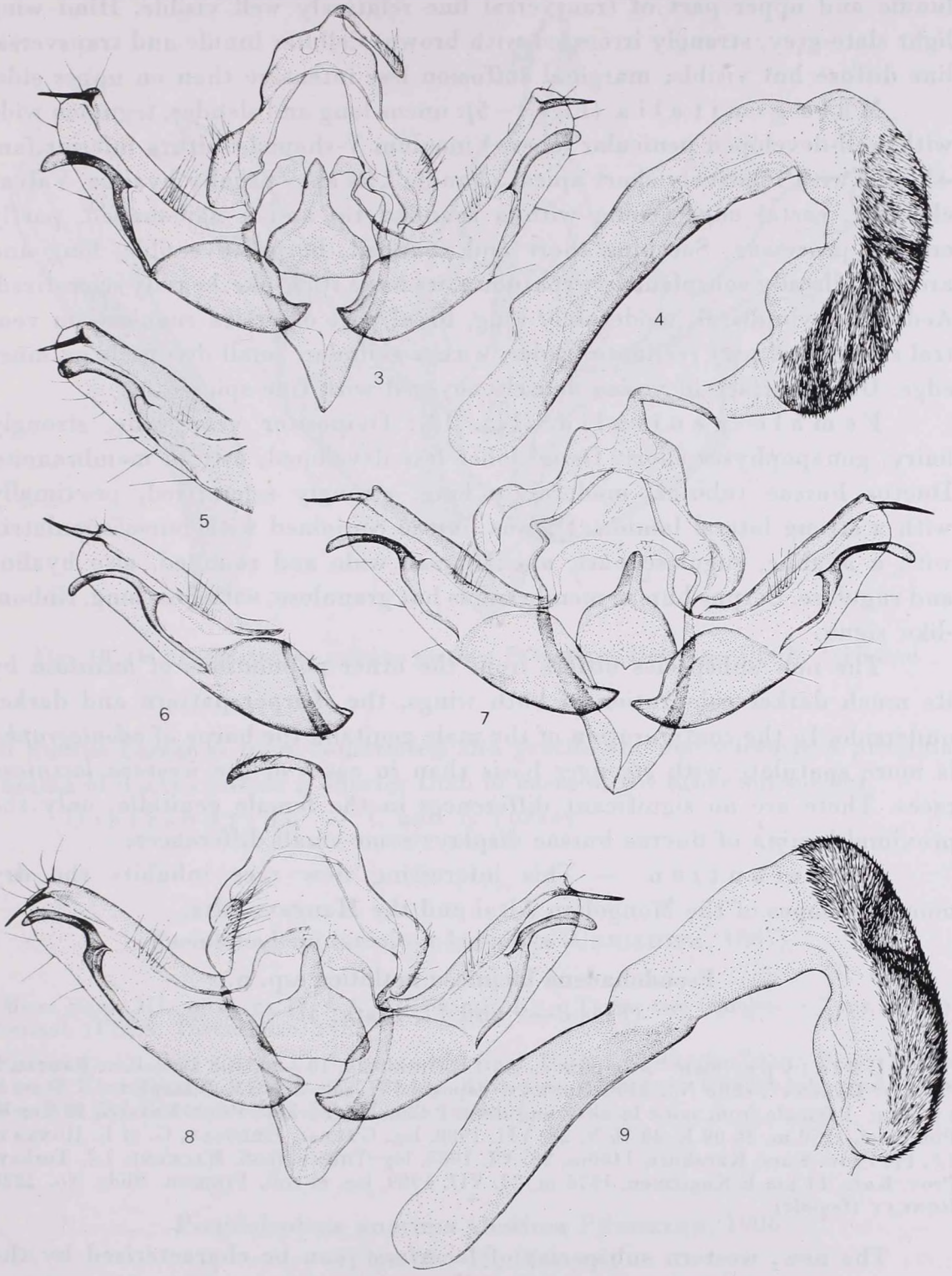
of the fultura inferior and the length of aedeagus, as in case of *calligrapha* the aedeagus is longer than that of *laciniosa*. The shape of valvae is wider in *calligrapha*, the apex of valva with a larger triangular tip, and the costal processus is finer than in case of *laciniosa*.

Distribution — This species is known from only the Mongolian chain of the Altai Mts.

Pseudohadena laciniosa odontographa ssp. n.
(Figs 3—5 and 18, Plate: 5—6)

Holotype: male, "Mongolia, Ömnögovi aimak, Govi Altay, Mts. Gurvan Sayhan Uul, valley Alyut am, 2400 m, 103°55′ E, 43°30′ N" 23. 07. 1986, exp. Gy. Fábián, M. Hreblay, L. Peregovits et G. Ronkay", deposited in coll. HNHM, Budapest. — Paratypes: 1 male from same locality and data, 2 males, one female, Mongolia, Chovd aimak, 6 km SW from Chovd, 25—28. 07. 1986, leg. P. Gyulai; 2 males from same locality, leg. Z. Varga; 1 male, Mongolia, Chovd aimak, 40 km S toward Manchan, 28—29. 07. 1986, leg. P. Gyulai; 1 male from same locality, leg. Z. Varga; 7 males, 1 female, Mongolia, Bayanhongor aimak, Mts. Ih Bogd Uul, 1850 m, valley of Pitut river, 100°13′ E, 45°00′ N, 24—25. 07. 1987, leg. Peregovits, Hreblay et Stéger; 1 female, Mongolia, Övörhangay aimak, 110 km SE of Arvayheer, 1400 m, 101°40′ E, 45°48′ N, 28. 07. 1987, leg. Peregovits, Hreblay et Stéger. 13 specimens, Mongolia, Govi Altay aimak, Mts. Adz Bogd Uul, valley of Ih gol, 2100 m, 4—5. VIII. 1988, leg. Peregovits et Varga; 1 male, Mongolia, Ömnögovi aimak, Mts. Gurvan Sayhan Uul, valley Yulin am, 2300 m, 28. VII. 1988, leg. Peregovits et Varga; 35 specimens, Mongolia, Govi Altay aimak, Govi Altay, 6 km S of Tögrög, 7. VIII. 1988, leg. Peregovits et Varga. Slides Nos 2158, 2195, 2221, 2550 Ronkay (males), 2277 Ronkay (female). The paratypes are deposited in the colls of the collectors, HNHM Budapest, S. Kovács (Szeged, Hungary), M. Fibiger (Sorø), A. Moberg (Stockholm), H. Hacker (Staffelstein), J. Plante (Martigny), E. Vartian (Vienna).

Description — Alar expanse 31—35 mm, length of fore wing 14—16,5 mm. Head, collar and thorax brown-grey, palpi and tegulae with blackish lines, collar with some scattered dark brown hairs. Abdomen lighter, ochreous-grey, dorsal crest only a dark tuft on first segment. Ground colour of fore wing ochreous or brownish grey, basal and medial field suffused with shiny brown. Veins covered with dark brown in medial and marginal area. Antemedial line strongly sinuous, double, filled with grey, streak of submedian fold short, blackish. Stigmata flattened, conspicuous, encircled with whitish, their filling ochreous with a brownish inner annulus. Postmedial line usually pale and obsolescent but its upper arch always visible; grey, double, its filling lighter than ground colour. Subterminal line whitish, meandering, defined by a wide brown stripe and some blackish arrowhead spots on inner side; obsolescent or deleted in tornus. Terminal line black, cilia dark brown with ochreous basal line and small spots at veins. Hind wing greyish-brown with some ochreous shine, marginal area — and sometimes basal field — strongly suffused with brown. Cellular lunule less visible, cilia ochreous-whitish with a discontinuous brown line. Underside of fore wing dark brownish-grey, inner area slightly transparent, marginal area with lighter grey irroration. Cellular



Figs 3—9. 3—5 = *Pseudohadena laciniosa odontographa* ssp. n.: Paratypes, Mongolia. — 6—7 = *P. laciniosa laciniosa* CHRISTOPH (6 = Afghanistan, 7 = USSR, Issyk-Kul). — 8—9 = = *P. laciniosa hethitica* ssp. n.: Holotype, Turkey

lunule and upper part of transversal line relatively well visible. Hind wing light slate-grey, strongly irrorated with brown. Cellular lunule and transversal line diffuse but visible, marginal suffusion less intensive than on upper side.

Male genitalia (Figs 3—5): uncus long and slender, tegumen wide with well-developed penicular lobes. Vinculum V-shaped, fultura inferior fan-shaped with relatively short apical „handle", its apex usually hyaline. Valvae elongate, costal edge strong with a rounded tip and a nail-shaped, partly erected processus. Sacculus short and rounded, harpe reversible, long and arcuate, distally conspicuously spatulate; its basis stick-like, heavily sclerotized. Aedeagus cylindrical, moderately long, basal part of vesica rugulose on ventral side, distal part reclinate, wider, with a globular, small diverticle on inner edge. Outer surface of vesica densely covered with fine spiculi.

Female genitalia (Fig. 18): Ovipositor very wide, strongly hairy, gonapophyses short. Ostial lobes less developed, ostium membranous. Ductus bursae tubular, moderately long, strongly sclerotized, proximally with a strong lateral lamina. Ductus bursae conjoined with bursa copulatrix with a hyaline, rugulose part, apex bursae wide and rounded, also hyaline and rugulose. Corpus bursae membranous but granulose, with four long, ribbon-like signa.

The new subspecies differs from the other populations of *laciniosa* by its much darker colouration of both wings, the sharper pattern and darker underside. In the configuration of the male genitalia the harpe of *odontographa* is more spatulate with stronger basis than in cases of the western *laciniosa* races. There are no significant differences in the female genitalia, only the proximal lamina of ductus bursae displays some small differences.

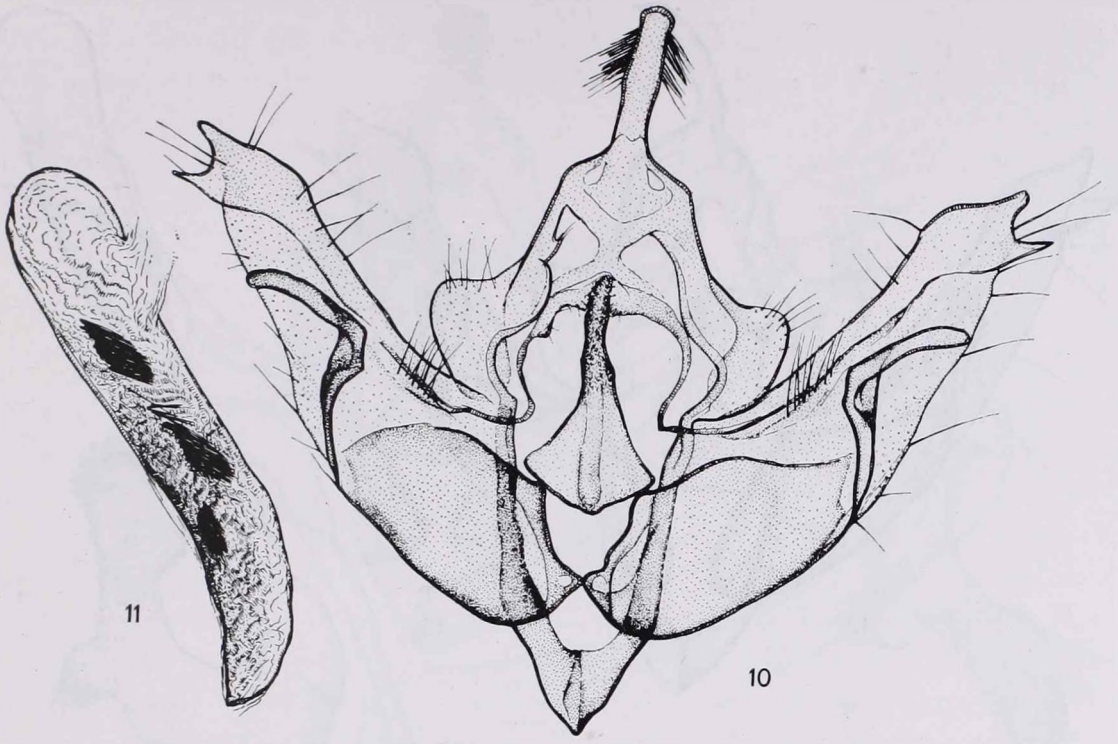
Distribution — This interesting new race inhabits the dry montane slopes of the Mongolian Altai and the Hangayn Mts.

Pseudohadena laciniosa hethitica ssp. n.
(Figs 8—9 and 17, Plate: 3)

Holotype: male "Asia min. c., Ak-Ch.-Tschiftlik, 10—20. Juli 28, coll. v. BARTHA", "coll. v. BARTHA", slide No. 2160 RONKAY, deposited in coll. HNHM Budapest. — Paratypes: 1 female from same locality and data, 2 females, Turkey, Prov. Kayseri, 20 km W Pinarbasi, 1250 m, 36 09 E, 38 36 N, 28. VII, 1988, leg. GYULAI, HREBLAY, G. et L. RONKAY. 1♂, 1♀, Prov. Kars, Karakurt, 1400m, 26. VI. 1985, leg. THÖNY, (coll. HACKER); 1♂, Turkey, Prov. Kars, 14 km E Kagizman, 1575 m, 23. VII. 1989, leg. et coll. FIBIGER. Slide No. 2220 RONKAY (female).

The new, western subspecies of *laciniosa* can be characterized by the ground colour of wings being lighter than in other races, the pattern of fore wing strongly mosaic-like, the underside of wings pale, without a dark greyish suffusion in the inner areas.

In the configuration of the male genitalia (Figs 8—9) it has a less developed and slender harpe, in the female genitalia (Fig. 17) the posterior part



Figs 10—11. *Pseudohadena gnorima gnorima* PÜNGELER: Holotype, USSR, Askhabad

of ductus bursae is more constricted and gracile and the sclerotized proximal lamina of ductus bursae is shorter than in cases of the other subspecies.

Distribution — C and E Turkey

Pseudohadena laciniosa laciniosa (CHRISTOPH, 1887)

(Mem. Rom., III., p. 77, pl. IV, f. 4. — *Chloantha l.*) — Types: two females. — Type locality: Germob (USSR, Turkmenian SSR).

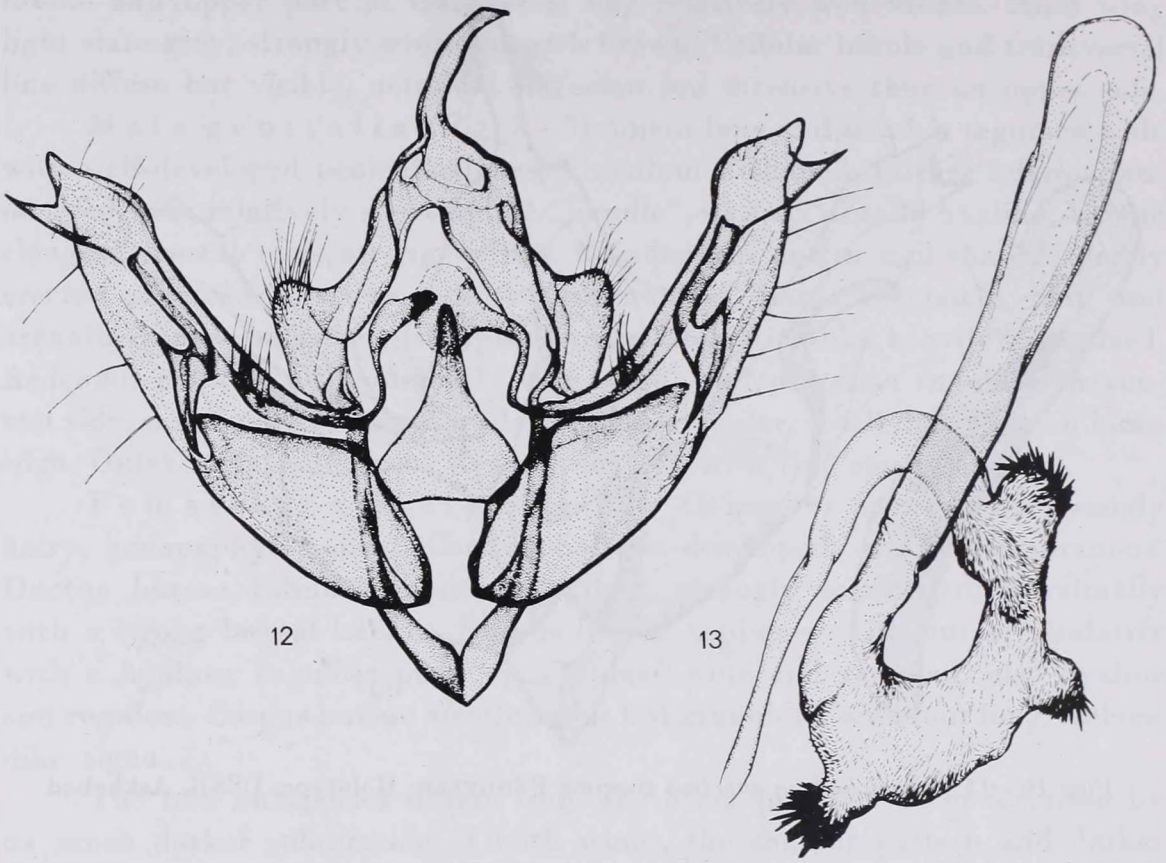
Examined material — specimens from Issyk-Kul; Afghanistan: Prov. Paktia, Ahmad Khel (Djadji), 2400 m, 2.7.72, leg. BRADE et NAUMANN; USSR, Askhabad. Slides Nos WM 283 BOURSIN, 4522, 5261 VARGA (males).!

Pseudohadena gnorima gnorima PÜNGELER, 1906
(Figs 10—11, Plate: 4)

(IRIS, 19: 220, pl. VIII, f. 6 — *Rhizogramma g.*)

Type: male, "Asia centr., Aschabad" (on the backside: "gnorima Püng. ♂, Original, abgebildet Iris 1906, 5/05 v. Tancré"; "Type gnorima Püng. ♀ (!sic)" (red label), "Preparation No. MB 370 Ch. Boursin", "Zool. Mus. Berlin" (yellow label).

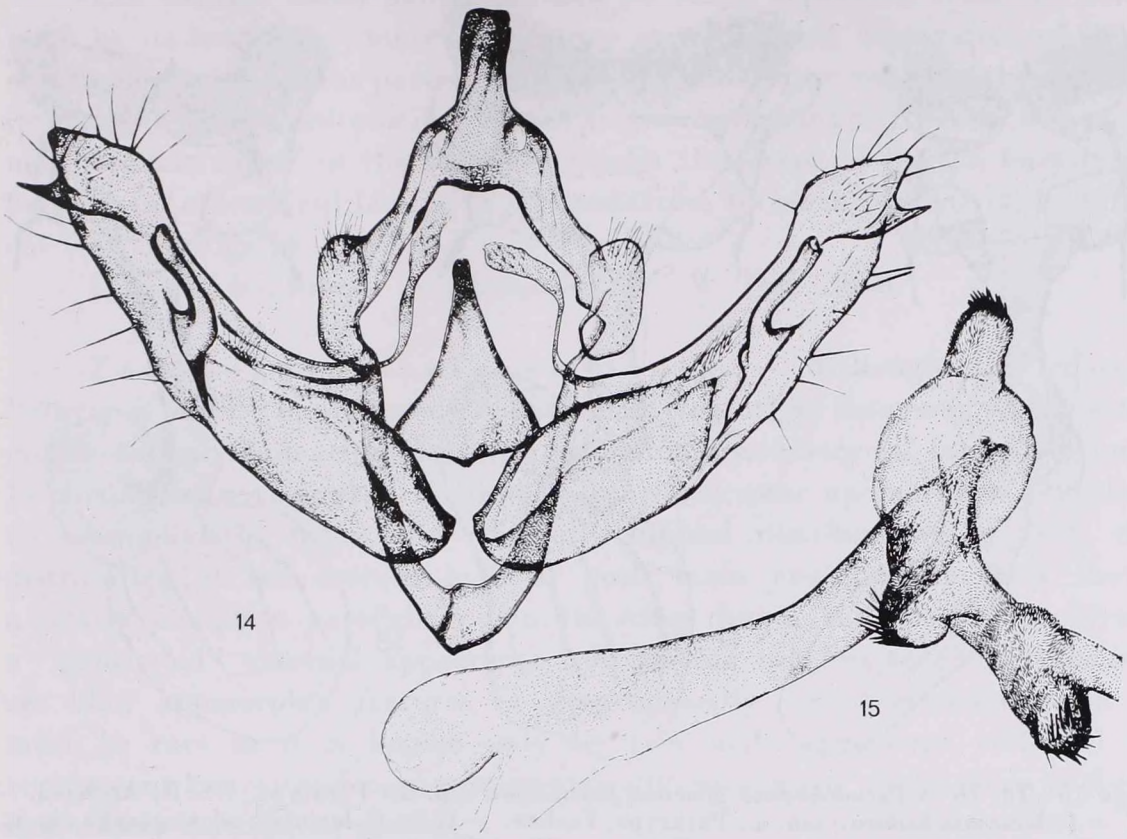
Type locality: Askhabad (USSR; Turkmenian SSR).



Figs 12—13. *Pseudohadena gnorima hololampra* ssp. n.: Paratype, USSR, Armenia

D e s c r i p t i o n — Alar expanse 39 mm, length of fore wing 18 mm. Head and thorax light ochreous-brown, palpi and tegulae with blackish edges. Ground colour of fore wing light fawnish with a fine ochreous-bronze shine, especially in inner and median areas. Veins covered with dark brown, inner margin and marginal area irrorated with light grey. Antemedial line strongly sinuous, double, defined by blackish on outer side. Claviform spot large, whitish, with blackish outline. Postmedial line represented by a short arch at costa, orbicular spot very long, oblique and flattened; whitish with a brown line inside, encircled partly by dark brown. Reniform spot arcuate, narrow, moon-shaped, filled with brown and defined by white. Subterminal line strongly wavy, whitish with dark brown arrowheads, upper part of it deeply expanded to median field, terminal line fine, black. Cilia light brown with some whitish spots at veins. Hind wing light ochreous with wide darker marginal suffusion and covering of veins, cilia whitish. Underside of wings light, shiny ochreous with dark covering on veins, expecially in case of hind wing. Medial part of fore wing slightly transparent, shadows of stigmata well visible.

M a l e g e n i t a l i a (Figs 10—11): uncus moderately long with rounded apex, tegumen wide, penicular lobes large. Vinculum strong, V-shaped,



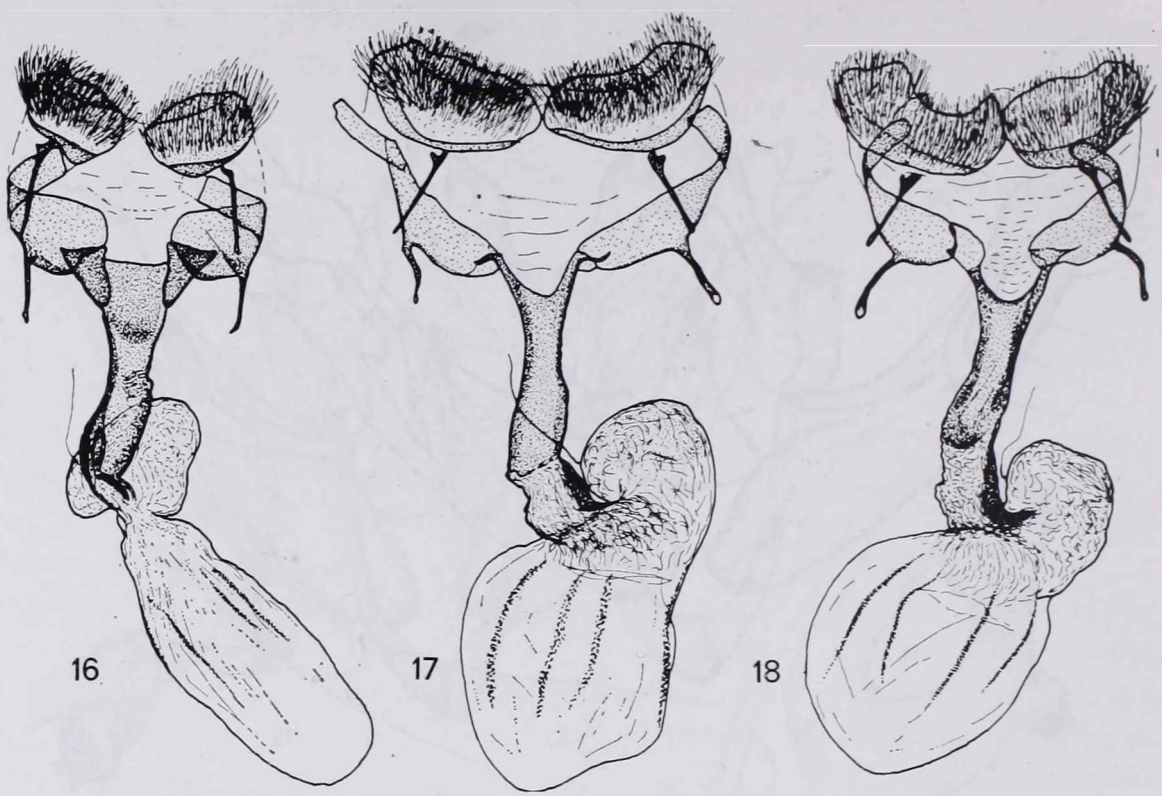
Figs 14—15. *Pseudohadena gnorima peregovitsi* ssp. n.: Paratype, Mongolia

fultura inferior deltoidal with a very long and strong apical processus. Valvae large and strong, its costal part strongly sclerotized with pointed tip and a wide, acute processus. Sacculus strong, harpe less reversible, finger-like. its basis relatively wide. Aedeagus long, cylindrical, distally slightly curved, vesica with three bundles of long spiculi (unfortunately the walls of the aedeagus was broken in different places, so we did not try to evert the vesica).

Pseudohadena gnorima hololampra ssp. n.
(Figs 12—13 and 16, Plate: 8—9)

Holotype: male, "1. u. 2. VIII. 1976, Russ. Armenien, Geghard, 1700 m, 40 km ostl. Eriwan, KASY et VARTIAN." Deposited in coll. VARTIAN, Vienna. — Paratypes: 10 males and females from same locality and data, coll. VARTIAN, VARGA and HNHM Budapest. Slides Nos 2691 RONKAY (male), 2761 RONKAY (female).

The western subspecies of *gnorima* differs from the nominate race by the following features: it has the smallest wingspan: 36—37.5 mm, length of fore wing 17—17.5 mm. Its ground colour is darker with a pinkish-violaceous shine, its postmedial line well discernible, the characteristic ochreous-bronze



Figs 16—18. 16 = *Pseudohadena gnorima hololampra* ssp. n.: Paratype, USSR, Armenia. — 17 = *P. laciniosa hethitica* ssp. n.: Paratype, Turkey. — 18 = *P. laciniosa odontographa* ssp. n.: Paratype, Mongolia

shine of *gnorima gnorima* is absent. The hind wing of the male is more unicolorously suffused with brown in *hololampra* than in *gnorima*. In the configuration of the male genitalia there are two visible differences, as follows: the shape of the fultura inferior and the structure of the basal part of the harpe (Fig. 12) differ in the two related taxa. In addition, the valvae of *gnorima* are significantly larger, but the slide of the latter is strongly compressed.

Distribution — The subspecies is known only from the type-locality, Geghard (USSR, Armenian SSR).

Pseudohadena gnorima peregovitsi ssp. n.
(Figs 14—15, Plate: 7)

Holotype: male "Mongolia, Govi Altay aimak, Mts. Adz Bogd Uul, valley Ih gol, 2100 m, 4—5. VIII. 1988, leg. PEREGOVITS et VARGA", deposited in coll. HNHM Budapest (by L. PEREGOVITS). — Paratypes: 5 males from same locality and data. 1 male, Mongolia, Govi Altay aimak, Mts. Chasagt chajrchan Uul, 2350 m, 8. VIII. 1988, leg. PEREGOVITS et VARGA.

A female specimen of this subspecies has been collected by Mr. I. KOSTYUK in the W Tien Shan, Thalasski Alatau, Reserve Aksu-Dzhabagli, 1700 m, 21. VII. 1986. Although this specimen is very similar externally to the Mongolians, we desist to designate it as a paratype of the taxon.

Slides Nos 2806 RONKAY, 5224 VARGA (males), 2842 RONKAY (female).

The Central Asian subspecies can be easily separated from the other races by its larger size, more unicolorous and less shiny colouration of wings and the less conspicuous pattern of both sides of the fore wing. In the configuration of the male genitalia it is similar to *g. hololampra* but the vesica shows a more regular curve, in the female genitalia the shape of ductus bursae, especially the sclerotized lamina of its connection to bursa copulatrix, is different (see the Figs 14—15).

Distribution — Mongolia SW, W Tien Shan.

Zoogeographical comments — Although the concept "center of origin" implies some hypothetical (tentative) moments, we see some morphological tendencies, suggesting possible area-historical interpretations. Important to note is that the whole group has some apomorphies revealing its monophyletic origin and originally limited distribution. In fact, the distribution of the derived taxa of both main evolutionary lines shows a nearly complete parallelism. On the other hand, the species displaying a "gnorimoid" external appearance and having the less specialized (*laciniosa* like) apomorphic features is geographically very restricted (and it must be rare as it is known only by two male specimens collected in very recent times) and occurs sympatrically with a ssp. of the more evolved and widely distributed species.

The geographic tendencies of the two phyletic lines are nearly the same. The *gnorima* line shows a stronger morphological deviation and areal fragmentation, the other retained a larger geographic continuity connected with a slighter geographic differentation. The members of the *gnorima* line seem to be more specialized in an ecological sense, too, being restricted to widely isolated xeromontane habitats, while the other one is fairly distributed in montane steppe areas from Mongolia to Anatolia. One may assume that the distribution of the former line was heavily fragmented by the Pleistocene—Post-Pleistocene general aridization of the Transcaspian and Turkestan regions.

* * *

Acknowledgement — We would like to express our thanks to Prof. Dr. H.-J. Hannemann and Dr. W. Mey (Berlin), Mrs. E. Vartian (Vienna), Prof. C. Naumann (Bielefeld), Dr. V. I. Kuznetsov and Dr. I. L. Sukhareva (Leningrad), and the Humboldt Foundation (Bonn) for their intensive help in our studies. We are very grateful also to Dr. L. Gozmány and L. Peregovits for helping in the preparation of the paper.

REFERENCES

Boursin, Ch. (1970): Description de 40 espèces nouvelles de Noctuidae Trifinae paléarctiques et de deux genres nouveaux des sous-familles Noctuinae and Amphipyrinae. — Entomops **18:** 45—79.

Christoph, E. (1887): Lepidoptera aus dem Achal-Tekke-Gebiete. III. — Mém. Rom. **3:** 50—125.

Fibiger, M. & al. (1989, in press): Faunistica Lepidopterorum Europaeorum. Noctuidae. Vol. I.

HACKER, H., KUHNA, P. & GROSS, F. J. (1986): 4. Beitrag zur systematischen Erfassung der Noctuidae der Türkei. Beschreibung neuer Taxa, Erkenntnisse zur Systematik der kleinasiatischen Arten und faunistisch bemerkenswerte Funde aus den Aufsammlungen von Gross und Kuhna aus en Jahren 1968—1984 (Lepidoptera, Noctuidae). — Mitt. münchn. ent. Ges. **76:** 79—141.

HACKER, H. (1987): Siebenter Beitrag zur systematischen Erfassung der Noctuidae der Türkei. Beschreibung neuer Taxa und bemerkenswerte Funde aus neuen Aufsammlungen (Lepidoptera). — Atalanta **11:** 121—167.

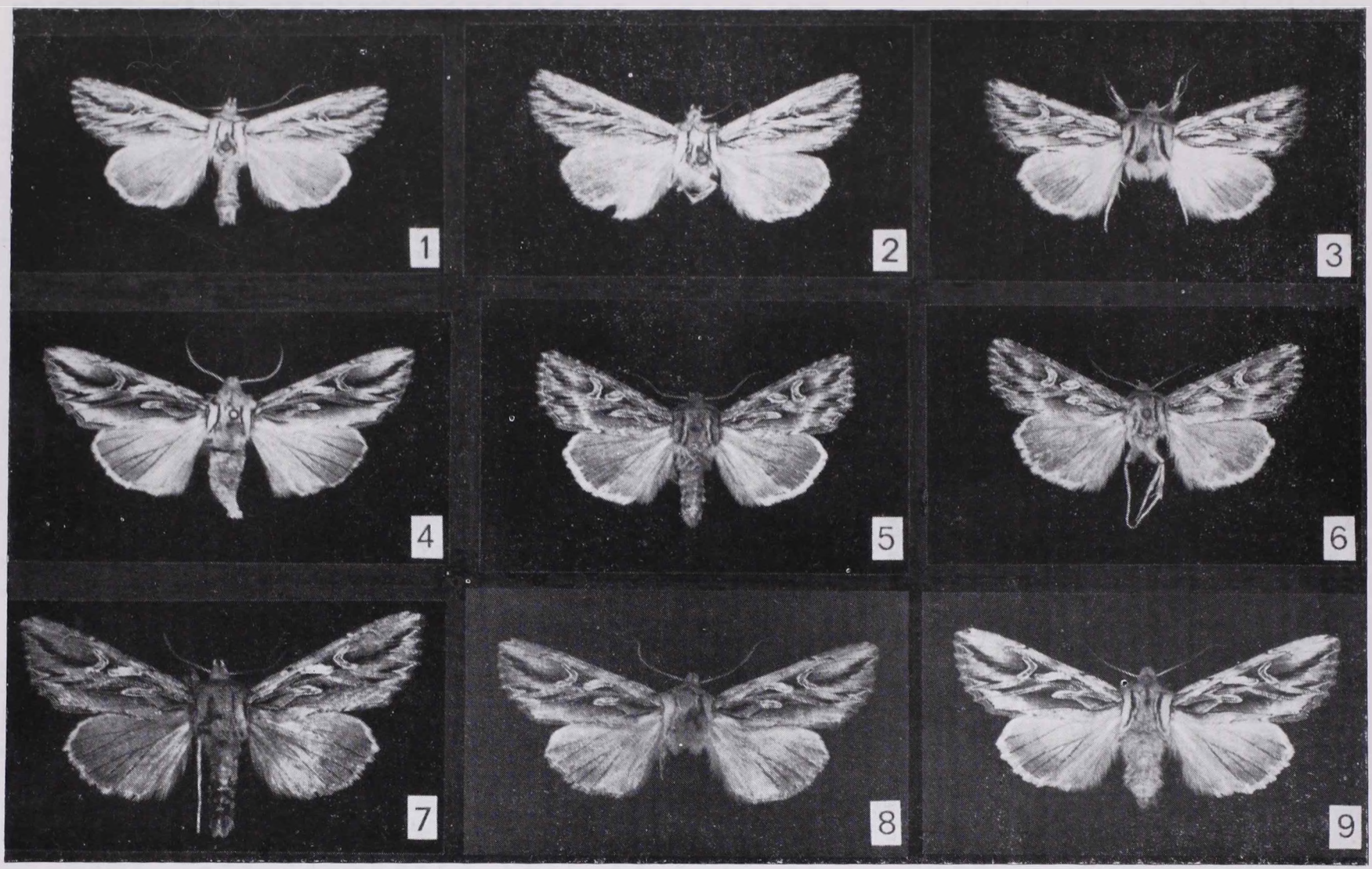
HACKER, H., HUBER, K. & KUHNA, P. (1988): Achter Beitrag zur systematischen Erfassung der Noctuidae der Türkei. Beschreibung von sechs neuen Taxa und Notizen über bemerkenswerte Funde aus neueren Aufsammlungen (Lepidoptera). — Atalanta **18:** 339—369.

KUZNETSOV, V. I. (1960): On the fauna and biology of Lepidoptera of the Western Kopet-Dagh. — Trudi zool. inst. acad. sci. USSR **27:** 11—93. (in Russian).

PÜNGELER, R. (1906): Neue palaearctische Macrolepidopteren. — D. ent. Z. Iris **19:** 216—226.

STAUDINGER, O. & REBEL, H. (1901): Catalog der Lepidopteren des palaearctischen Faunengebietes. — Berlin, Friedlander and Sohn.

WAGNER, F. (1930): Weiterer Beitrag zur Lepidopteren-Fauna Inner-Anatoliens. — Mitt. münchn. ent. Ges. **19** (2—4): 57—80.



1. *Pseudohadena calligrapha* sp. n.: Paratype, Mongolia; 2. *Pseudohadena calligrapha* sp. n.: Holotype, Mongolia; 3. *Pseudohadena laciniosa hethitica* ssp. n.: Holotype, Turkey; 4. *Pseudohadena gnorima gnorima* PÜNGELER: Holotype, USSR, Askhabad; 5. *Pseudohadena laciniosa odontographa* ssp. n.: Holotype, Mongolia; 6. *Pseudohadena laciniosa odontographa* ssp. n.: Paratype, Mongolia 7. *Pseudohadena gnorima peregovitsi* ssp. n.: Holotype, Mongolia; 8. *Pseudohadena gnorima hololampra* ssp. n.: Paratype, USSR, Armenia; 9. *Pseudohadena gnorima hololampra* ssp. n.: Paratype, USSR, Armenia



Acta Zoologica Hungarica 35 (3—4), pp. 355—412 (1989)

IDENTIFICATION KEYS TO THE GENERA OF OPPIIDAE GRANDJEAN, 1951 (ACARI: ORIBATEI)

L. S. SUBIAS and P. BALOGH

Cátedra de Entomologia, Faculdad de Biológia — Universidad Complutense de Madrid, España

Zoosystematical and Ecological Institute, Eötvös Loránd University, H-1088 Budapest, Puskin utca 3, Hungary

(Received 7th December, 1988)

Authors reviewed the Oppiid genera of the World, incuding 11 valid subfamilies, 115 genera, 53 subgenera in comprehensive keys. A systematical catalogue of genera and subgenera with their type-species given. An alphabetical catalogue of the genera and subgenera followed by the species belonging to the given genus, altogether about 710 species with more synonyms are listed. With 104 original figures.

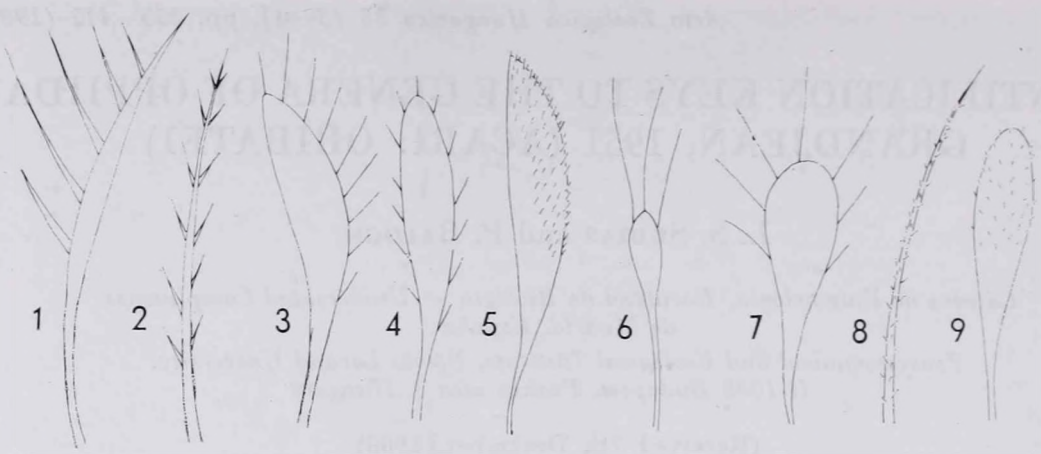
The family Oppiidae GRANDJEAN, 1951 is one of the richest families of the order *Oribatida* in both the number and the abundance of its species. Oppiids occur in almost all terrestrial habitats worldwide and they are especially profusely represented in soil, litter and moss samples. Species number of the family is above 700, while the number of valid genera and subgenera is ca 157. In J. BALOGH's (1983) paper "A partial revision of the Oppiidae GRANDJEAN, 1954 (Acari: Oribatei)" 112 genera were characterized in codified tables, in identification keys as well as in short diagnoses illustrated by more than 200 figures. The author emphasized that he carried out a partial revision only, since part of the oppiid species which had been described by that time were not included in his new system.

The aim of our present work is to improve and revise J. BALOGH's (1983) system and — as far as possible — to complete it. More than five years have since that publication which is a long time in the recent development of oribatidology. Not only a large number of new taxa has been described since then but the evaluation of the supraspecific categories and the assessment of some of the morphological features have changed, as well. Several subfamilies in the family Oppiidae in J. BALOGH's system have to be excluded. These are as follows: *Borhidiinae, Cuneoppiinae, Chavininae, Rioppiinae* (Lyroppiinae), *Granuloppiinae, Quadroppiinae, Hexoppiinae, Papillonotinae, Teratoppiinae, Sternoppiinae, Machuellinae* and *Trizetinae.* It has become necessary to accept proposals for synonymization of several genera, for lowering the status of some other genera to subgenera and setting up new genera and subgenera. All these resulted in a new system in which we have attempted to place every adequately described species properly. Having studied numerous samples from all the zoogeographical realms, we presume that the number of the undescribed oppiid species is probably very high and thus our taxonomical knowledge cannot be sufficient in every respect for designing a clear picture of this family. Consequently, the aim of our present work cannot be but modest: we strived to produce simple and short identification keys for our colleagues to identify oppiid species to the generic or subgeneric level, i.e. to reach a point where the literature referring to species is usable.

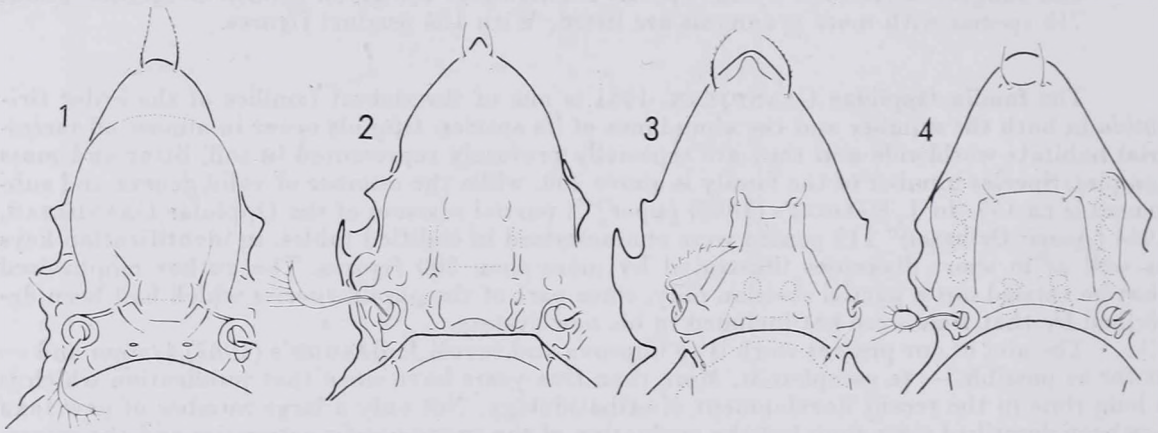
As a consequence of the major changes in J. BALOGH's (1983) system all identification keys have been revised. However, the drawings in that work were still found to be usable, so those drawings are not repeated here. Drawings of newly described genera are given at the end of this paper. Therefore references to drawings in the identification keys refer partly to BALOGH's drawings partly to our ones.

In the first part of this paper our identification keys are published, preceded by a short terminological instruction. The second part is a systematical catalogue followed by an alphabetical catalogue of the genera and subgenera with their type-species. The generic names are followed by the names of species which belong to the given genus. The specific names with a question mark denote species with questionable generic relegation.

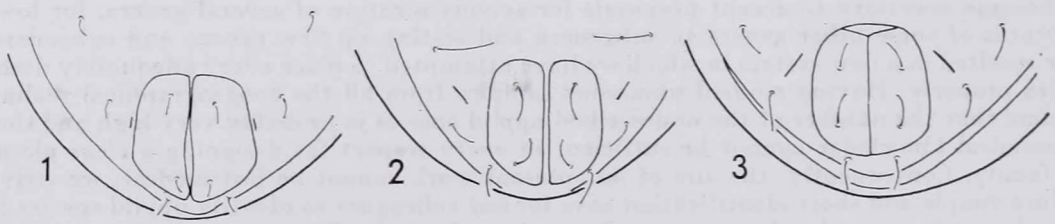
Our special thanks are due to J. BALOGH for reading and improving our manuscript. He was always ready to discuss any problems during the preparation of this paper.



Types of sensilli: 1=pectinate, 2= bipectinate, 3= ciliate, 4= biciliate, 5= scopulate, 6= radiate, 7= radiate, 8= aciculate, 9= aciculate



Types of prodorsal structures: 1= costulae, 2= costulae, 3= lamellar/translamellar crests, 0= lamellar/translamellar lines



Position of fissurae iad: 1= paraanal, 2= direct apoanal, 3= inverse apoanal

IDENTIFICATION KEY TO SUBFAMILIES

Oppiidae GRANDJEAN, 1951

1 (2) Genital and anal plates large, very near to each other, occupying almost the whole length of ventral plate. Sensillus dilated, fusiform, aciculate. Lamellar lines absent. Setae c_2 well developed. Fissurae *iad* paraanal

Antilloppiinae MAHUNKA, 1985

2 (1) Genital and anal plates usually of normal length and well separated
3 (4) Epimeres III + IV long, reach far beyond the genital plates; apodemata IV absent. Sensillus either pectinate or radiate. Usually with lamellar lines. Setae c_2 absent or disappearing. Fissurae *iad* different of type

Pulchroppiinae BALOGH, 1983

4 (3) Epimeres III + IV usually normal of size, if exceptionally long, apodemata IV always present
5 (8) Crista notogastral present and/or the setae c_2 well developed. Sometimes with one pair of interbothridial tubercles. Fissurae *iad* usually paraanal. Sensillus of different type
6 (7) Lamellar costulae absent exceptionally lamellar lines present. Ten pairs of notogastral setae

Medioppiinae SUBIAS et MINGUEZ, 1985

7 (6) Lamellar costulae present

Oppiellinae SENICZAK, 1975

8 (5) Crista notogastral absent. Setae c_2 either absent or less developed than the remaining notogastral setae. Interbothridial tubercles usually absent
9 (12) Anterior margin of notogaster with one pair of protruding humeral processes. Interbothridial region either with costulae or with lamellar and translamellar crest
10 (11) Anterior margin of notogaster without protruding humeral processes. Interbothridial region with costulae. Translamellar crest usually more delevoped than lamellar ones. Fissurae iad paraanal. Nine pairs of notogastral setae (without the setae c_2)

Mystroppiinae BALOGH, 1983

11 (10) Anterior margin of notogaster usually with well developed protruding humeral processes. Interbothridial region without costulae. Lamellar crests usually more developed than translamellar one. Fissurae *iad* of different types

Oxyoppiinae SUBIAS subfam. n.

12 (9) Anterior margin of notogaster neither with protruding humeral processes nor with interbothridial costula with lamellar and/or with translamellar lines
13 (16) Fissurae *iad* inverse apoanal
14 (15) Sensillus never pectinate or radiate or ciliate (either setiform, or lanceolate, or fusiform, or dilated, or globular)

Lanceoppiinae BALOGH, 1983

15 (14) Sensillus either pectinate, or radiate, or ciliate

Brachioppiinae SUBIAS subfam. n.

16 (13) Fissurae *iad* either paraanal, or direct apoanal
17 (18) Lamellar and translamellar lines absent. Sensillus never pectinate, or radiate, or ciliate (exceptionally bifurcate)

Oppiinae GRANDJEAN, 1951

18 (17) Lamellar and/or translamellar lines present (if absent: sensillus either pectinate or ciliate)
19 (20) Translamellar line an/or lamellar line usually present and together with lamellar lines forming a more or less distinct arch. Rostrum usually tridentate. Nine pairs of notogastral setae (without setae c_2). Six pairs of genital setae

Arcoppiinae BALOGH, 1983

20 (19) Translamellar line, if present, never forming a more or less distinct arch. Sensillus either pectinate, or radiate, or ciliate. Four or five pairs of genital setae. Usually three pairs of bright spots between the interlamellar setae

Multioppiinae BALOGH, 1983

IDENTIFICATION KEYS TO GENERA

Antilloppiinae MAHUNKA, 1985

1 (2) 12 pairs of notogastral setae (Figs 1–2). (= *Antilloppia* MAHUNKA, 1985)

Neoppia (Neoppia) BHATTACAHRYA et BANERJEE, 1981

2 (1) 10 pairs of notogastral setae (Figs 3–4)

Neoppia (Joboppia) RUIZ, MINGUEZ et SUBIAS, 1988

Pulchroppiinae BALOGH, 1983

1 (4) Fissurae *iad* direct apoanal. Sensillus pectinate. Five pairs of genital setae. Setae ad_1 usually postanal
2 (3) Nine pairs of notogastral setae (without setae c_2) (Figs 20.7)
Pulchroppia (Pulchroppia) HAMMER, 1980
3 (2) Twelve pairs of notogastral setae (without setae c_2) (Figs 5—6)
Pulchroppia (Multipulchroppia) SUBIAS subgen. n.
4 (1) Fissurae *iad* inverse apoanal. Sensillus radiate. Six pairs of genital setae. Setae ad_1 paraanal (Figs 7—8)
Varioppia MAHUNKA, 1985

Medioppiinae SUBIAS et MINGUEZ, 1985

1 (6) Fissurae *iad* inverse apoanal. Setae c_2 absent or disappearing
2 (3) Sensillus pectinate. Rostrum bidentate. Six pairs of genital setae. Setae ad_1 paraanal (Figs 15.10)
Ramuloppia BALOGH, 1961
3 (2) Sensillus either fusiform or globular, short. Rostrum not dentate. Four pairs of genital setae. Setae ad_1 postanal
4 (5) Sensillus fusiform, ciliate. Rostrum not acuminate (Figs 25.15)
Solenoppia (Solenoppia) HAMMER, 1968
5 (4) Sensillus globular, smooth. Rostrum obtusely acuminate (Figs 9—10)
Solenoppia (Campbelloppia) LUXTON, 1985
6 (1) Fissurae *iad* paraanal
7 (20) Anterior margin of notogaster with crista, i. e. either with recurrent crests, lines on anterior part of notogaster, or sclerotized apophyses attending from dorsosejugal suture to basal part of prodorsum
8 (15) Anterior margin of notogaster with recurrent crests or lines
9 (10) Four pairs of genital setae. Rostrum with broad median tooth. Sensillus fusiform, ciliate (Fig. 9.16)
Rhinoppia BALOGH, 1983
10 (9) Five or six pairs of genital setae
11 (12) Sensillus globular. Setae c_2 extremely long. Setae ad_1 paraanal. Five pairs of genital setae (Figs 9.8)
Miroppia HAMMER, 1968
12 (11) Sensillus lanceolate or fusiform, pectinate or ciliate or aciculate Setae ad_1 postanal
13 (14) Sensillus pectinate or fusiform and ciliate. Usually six pairs of genital setae. (Figs 11—12). (= *Kunoppia* MAHUNKA, 1987)
Medioppia SUBIAS et MINGUEZ, 1985
14 (13) Sensillus lanceolate, usually aciculate. Five or six pairs of genital setae. Shoulder with rudimentary humeral process (Fig. 13)
Medioxyoppia SUBIAS gen. n.
15 (8) Anterior margin of notogaster with sclerotized apophysis running from dorososejugal suture to basal part of prodorsum
16 (17) Dorsosejugal suture protruding and pointed medially. Notogastral setae very long. Rostrum tridentate. Sensillus fusiform, ciliate (Figs 14—15)
Epimerella KULIEV, 1967
17 (16) Anterior part of notogaster narrowing, but the dorsosejugal suture never pointed medially. Notogastral setae medium long
18 (19) Sensillus fusiform, ciliate, Setae c_2 disappearing or absent. Rostrum tridentate. Prodorsum with crossing lines (Figs 16—17)
Serratoppia SUBIAS et MINGUEZ, 1985
19 (18) Sensillus globular. Setae c_2 similar to the other notogastral setae. Rostrum not dentate (Figs 9.7)
Microppia BALOGH, 1983
20 (7) Anterior margin of notogaster neither with recurrent crest, lines nor sclerotized apophyses running from dorsosejugal suture to basal part of prodorsum. Setae c_2 similar to the remaining notogastral setae. Setae ad_3 preanal. Fissurae *iad* anterior paraanal
21 (22) Five pairs of genital setae. Sensillus fusiform, ciliate (Figs 22.3)
Congoppia BALOGH, 1983
22 (21) Four pairs of genital setae. Sensillus globular, Setae *la* before *lm*

23 (24) Dorsosejugal suture more or less straight (Figs 25.5)
Discoppia (Discoppia) BALOGH, 1983
24 (23) Dorsosejugal suture arched (Figs 18—19)
Discoppia (Cylindroppia) SUBIAS et RODRIGUEZ, 1986

Oppiellinae SENICZAK, 1975

1 (10) Dorsosejugal suture straight or slightly arched, anterior part of notogaster never penetrated into the basal part of prodorsum, Crista present. Sensillus usually fusiform, ciliate
2 (5) Lateral branch of crista straight, extending far back almost to half length of notogaster
3 (4) One pair of aggenital setae. Rostrum not dentate. Translamellar line present (Fig 20)
Tuberoppia GOLOSOVA, 1974
4 (3) Three pairs of aggenital setae. Rostrum tridentate (Figs 21—22)
Autoppia GOLOSOVA et KARPPINEN, 1983
5 (2) Lateral branch of crista S-shaped, short
6 (7) Anterior margin of notogaster without protruding humeral processes. Usually with six pairs of genital setae (Figs 23—24)
Lauroppia SUBIAS et RODRIGUEZ, 1986
7 (6) Anterior margin of notogaster with protruding humeral processes. Five pairs of genital setae
8 (9) Outer angle of crista rounded (Figs 9.12) **Oppiella (Oppiella)** JACOT, 1937
9 (8) Outer angle of crista with spur (Figs 9.14)
Oppiella (Perspicuoppia) PÉREZ-IÑIGO, 1971
10 (1) Dorsosejugal suture convex; parabolic or semicircular; penetrated deeply into the basal part of prodorsum. Crista present or absent
11 (12) Shoulders with a pair of pointed processes directed anteriad. Thirteen pairs of notogastral setae, five pairs of genital. Sensillus pectinate setae (Figs 9.10)
Neostrinatina MAHUNKA, 1980
12 (11) Shoulder either without pointed processes or with poorly developed ones
13 (18) Setae c_2 poorly developed. Sensillus setiform or lanceolate, either smooth or ciliate or ciliato-pectinate. Five pairs of genital setae
14 (15) Neither heterotrichy nor oligotrichy notogastral. Sensillus smooth. Rostra setae near to each other on a small naso (Figs 9.3). (= *Cosmoppia* BALOGH, 1983)
Disorrhina HULL, 1916
15 (14) Oligotrichy and/or heterotrichy present; less than nine pairs of notogastral setae. Sensillus ciliate or ciliatopectinate
16 (17) Rostrum not dentate. Two pairs of notogastral setae (*la* and *lm*) extremely long, the remaining very short. Setae ad_1 paraanal (Figs 9.4). (= *Parasynoppia* AOKI, 1983)
Elaphoppia BALOGH 1983
17 (16) Rostrum tridentate. Four pairs of medium long notogastral setae arranged in two longitudinal rows; three pairs of posteromarginal setae (p_1 to p_3) somewhat shorter. Setae ad_1 postanal (Figs 9.15)
Ptiloppia BALOGH, 1983
18 (13) Setae c_2 well developed; of the same size and length as the remaining notogastral setae. Sensillus fusiform or globular, ciliate or radiate.
19 (20) Sensillus fusiform-lanceolate. Five pairs of genital setae (Figs 25—26)
Liacaroppia SUBIAS et RODRIGUEZ, 1986
20 (19) Sensillus either pectinate, or radiate, or fusiform-ciliate, or globular
21 (22) Three pairs of aggenital setae. Sensillus pectinate. Five pairs of genital setae (Figs 9.18)
Tripiloppia HAMMER, 1968
22 (21) One pair of aggenital setae (exceptionally about fifteen pairs)
23 (32) Five pairs of genital setae. Sensillus either fusiform-ciliate or globular
24 (29) Crista absent. Dorsosejugal suture continuous. Rostrum not dentate. Lamellar setae much nearer to interlamellar setae than to rostral setae
25 (26) About fifteen pairs of aggenital setae (Figs 9.11)
Neotrichoppia (Neotrichoppia) SUBIAS et ITURRONDOBEITIA, 1980
26 (25) One pair of aggenital setae
27 (28) Thirteen or fourteen pairs of notogastral setae (Fig. 27)
Neotrichoppia (Ancestroppia) SUBIAS et RODRIGUEZ, 1986
28 (27) Ten pairs of notogastral setae (Figs 28—29)
Neotrichoppia (Confinoppia) SUBIAS et RODRIGUEZ, 1986a

29 (24) Dorsosejugal suture either with crista (i. e. with two pointed humeral processes and narrow arch medially), or with a small medial gap. Rostrum tridentate
30 (31) Dorsosejugal suture with two humeral processes and a narrow arch medially. Sensillus globular, smooth (Figs 9.1)
Belloppia HAMMER, 1968
31 (30) Dorsosejugal suture with a small medial gap. Sensillus fusiform, ciliate (Figs 9.5)
Hypogeoppia SUBIAS, 1981
32 (23) Four pairs of genital setae. Sensillus either radiate or globular and aciculate
33 (34) Sensillus radiate. Postrum tridentate (Figs 9.2)
Berniniella BALOGH, 1983
34 (33) Sensillus globular and aciculate. Rostrum usually not dentate (Figs 9.9). (= *Moritziella* BALOGH, 1983)
Moritzoppia SUBIAS et RODRIGUEZ, 1988

Mystroppiinae BALOGH, 1983

1 (2) Six pairs of genital setae. Sensillus pectinate (Figs 30—31)
Rugoppia MAHUNKA, 1986
2 (1) Four or five pairs of genital setae
3 (4) Four pairs of genital setae. Sensillus fusiform and scopulate. Notogastral setae dilated (Figs 11.4) **Stachyoppia** BALOGH, 1961
4 (3) Five pairs of genital setae
5 (6) Sensillus radiate. Chelicerae very large (Figs 22.2)
Cheloppia HAMMER, 1971
6 (5) Sensillus either lanceolate or fusiform; either ciliate or scopulate
7 (12) Notogastral setae dilated. Sensillus scopulate
8 (9) Setae ad_1 paraanal; apodemata IV absent (Figs 11.3)
Mystroppia BALOGH, 1959
9 (8) Setae ad_1 postanal; apodemata IV present
10 (11) Prodorsum with prolamellar ridge. Notogaster with fine longitudinal lines (Figs 11.5)
Striatoppia BALOGH, 1958
11 (10) Prodorsum without prolamellar ridge. Notogaster without fine longitudinal lines (Figs 11.2)
Corynoppia BALOGH, 1983
12 (7) Notogastral setae setiform, exceptionally hardly dilated
13 (14) Sensillus scopulate. Two pairs of bright spots between interbothridial ribs (Fig 32)
Karenella (Glabroppia) SUBIAS et RODRIGUEZ, 1986
14 (13) Sensillus either lanceolate or fusiform; either aciculate or ciliate
15 (16) Sensillus either lanceolate or fusiform, aciculate. Usually three pairs of bright spots between the interbothridial ribs (Figs 24.5)
Karenella (Karenella) HAMMER, 1962
16 (15) Sensillus fusiform and ciliate. Two pairs of light spots between interbotridial ribs (Figs 33—34)
Karenella (Stakarenoppia) SUBIAS et RODRIGUEZ, 1986

Oxyoppiinae subfam. n.

1 (4) Twelve or thirteen pairs of notogastral setae. Sensillus pectinate. Fissurae *iad* paraanal. Five pairs of genital setae
2 (3) Two pairs of pointed processes on the dorsosejugal suture (Figs 35—36)
Baloghoppia MAHUNKA, 1983
3 (2) Without paired processes on the dorsosejugal suture (Figs 9.6)
Mahunkella BALOGH, 1983
4 (1) Nine or ten pairs of notogastral setae
5 (32) Humeral processes usually well developed
6 (7) Notogastral setae dilated. Sensillus scopulate. Six pairs of genital setae. Fissurae *iad* direct apoanal (Figs 11.1)
Acroppia BALOGH, 1983
7 (6) Notogastral setae setiform
8 (19) Sensillus either setiform or lanceolate, fusiform and either pectinate or aciculate. Translamellar crest absent

9 (12) Sensillus aciculate
10 (11) Sensillus setiform. Fissurae *iad* inverse apoanal. Five pairs of genital setae. Notogaster finely lineate (Figs 37—38)
Lineoppia J. BALOGH et P. BALOGH, 1983
11 (10) Sensillus lanceolate-fusiform. Fissurae *iad* direct apoanal. Six pairs of genital setae (Figs 9.13)
Oxyoppia (Oxyoppia) BALOGH et MAHUNKA, 1969
12 (9) Sensillus pectinate
13 (14) Posterior part of notogaster with a pair of cap-shaped excrescences. Fissurae *iad* direct apoanal. Five pairs of genital setae (Figs 9.17)
Sacculoppia BALOGH et MAHUNKA, 1968
14 (13) Posterior part of notogaster without cap-shaped excrescences
15 (16) Dorsosejugal suture straight. Setae ad_1 paraanal. Fissurae *iad* paraanal. Six pairs of genital setae (Figs 15.5)
Hammerella BALOGH, 1983
16 (15) Dorsosejugal suture convex. Setae ad_1 postanal. Fissurae *iad* of different types
17 (18) Five or six pairs of genital setae. Fissurae *iad* paraanal or direct apoanal. Notogastral setae large (Figs 39—40)
Oxyoppia (Dzarogneta) KULIEV, 1978
18 (17) Four pairs of genital setae. Fissurae *iad* direct apoanal. Median part of dorsosejugal suture with three corniculi (Figs 95—96)
Foveolatoppia MAHUNKA, 1988
19 (8) Sensillus fusiform; either ciliate, or scopulate; or globular and aciculate. Usually with translamellar crest
20 (23) Sensillus scopulate. Fissurae *iad* paraanal
21 (22) Six pairs of genital setae. Setae c_2 absent, or only with their alveoli represented (Figs 41—42)
Separatoppia MAHUNKA, 1983
22 (21) Four pairs of genital setae. Setae c_2 present (Figs 43—44)
Oxyoppia (Aciculoppia) SUBIAS et RODRIGUEZ, 1986
23 (20) Sensillus either fusiform, or globular; either ciliate or aciculate. Fissurae *iad* usually direct apoanal
24 (25) Prodorsum with well developed lamellar crests. Sensillus fusiform and ciliate. Five or six pairs of genital setae (Figs 45—46)
25 (24) Prodorsum without lamellar crests, at most with lamellar lines. Sensillus either globular or fusiform; aciculate or ciliate. Setae *la* far before setae *lm*
26 (29) Sensillus globular and aciculate
27 (28) Four pairs of genital setae (Figs 25.9) **Subiasella (Subiasella)** BALOGH, 1983
28 (27) Five pairs of genital setae (Figs 47—48)
Subiasella (Lucioppia) MAHUNKA, 1985
29 (26) Sensillus fusiform or globular, and either ciliate or radiate
30 (31) Six pairs of genital setae. Rostrum bidentate (Figs 97—98)
Subiasella (Dividoppia) MAHUNKA, 1987
31 (30) Five pairs of genital setae (Figs 49—50). (= *Pararectoppia* MAHUNKA, 1987)
Subiasella (Lalmoppia) SUBIAS et RODRIGUEZ, 1986
32 (5) Humeral processes disappearing. Fissurae *iad* paraanal. Sensillus either setiform and aciculate or pectinate
33 (34) Six pairs of genital setae. Translamellar crest well developed. Setae c_2 only with their alveoli represented. Sensillus pectinate (Figs 51—52)
Oxybrachyoppia SUBIAS gen. n.
34 (33) Five pairs of genital setae. Translamellar crest absent. Setae c_2 present. Sensillus setiform and aciculate (Fig 53)
Oxyoppioides SUBIAS et MINGUEZ, 1985

Lanceoppiinae BALOGH, 1983
(= *Globoppiinae*, = *Basiloppiinae*, = *Gycloppiinae*)

1 (28) Six pairs of genital setae
2 (7) Sensillus globular with longer or shorter stalk
3 (4) Lamellar and translamellar lines absent. Setae *la* originate about on the same level as setae *lm* (Figs 17.3)
Globoppia HAMMER, 1962

4 (3) Lamellar and translamellar lines present. Setae *la* originate before setae *lm*
5 (6) Setae c_2 much smaller than the remaining notogastral setae but present (Figs 54—55)
Membranoppia (Pravoppia) LUXTON, 1985
6 (5) Setae c_2 absent, only with their alveoli represented. Bothridium with a sclerotized "point" (Figs 17.4)
Membranoppia (Membranoppia) HAMMER, 1968
7 (2) Sensillus setiform, lanceolate or elongately fusiform
8 (9) Notogastral oligotrichy: less than nine pairs of notogastral setae. Sensillus elongately fusiform (Figs 56—57)
Geminoppia J. BALOGH et P. BALOGH, 1983
9 (8) Nine pairs of notogastral setae (without setae c_2)
10 (15) Setae *la* originating before setae *lm*
11 (12) Sensillus setiform. Interlamellar setae absent (Figs 16.7)
Trematoppia BALOGH, 1962
12 (11) Sensillus lanceolate or elongately fusiform
13 (14) Lamellar and translamellar lines in quadrangular configuration present (Figs 58—59)
Lanceoppia (Baioppia) LUXTON, 1985
14 (13) Translamellar and/or lamellar lines absent (Figs 60—61)
Lanceoppia (Lancelalmoppia) SUBIAS subgen. n.
15 (10) Setae *la* and *lm* originate on the same niveau or setae *la* farther back
16 (17) Rostrum with two lateral lobes. Sensillus lanceolate (Figs 16.4)
Loboppia BALOGH, 1983
17 (16) Rostrum without lateral lobes
18 (19) Notogastral setae vestigial disappearing. Lamellar-translamellar lines horseshoe-like (Figs 17.5)
Otoppia BALOGH, 1983
19 (18) Notogastral setae well developed
20 (21) Two sclerotized tubercles behind the interlamellar setae. Lamellar and translamellar lines in quadrangular configuration (Figs 62—63)
Lanceoppia (Bicristoppia) SUBIAS subgen. n.
21 (20) No sclerotized tubercles behind the interlamellar setae. Lamellar and translamellar lines either absent or not in quadrangular configuration
22 (27) Lamellar lines convergent or absent
23 (24) Lamellar lines convergent, well developed (Figs 16.1)
Lanceoppia (Convergoppia) BALOGH, 1983
24 (23) Lamellar and translamellar lines absent or disappearing, but in this case the translamellar line more visible than the lamellar lines
25 (26) Sensillus lanceolate or lanceolate-fusiform, smooth. Setae *la* originating on the same niveau than setae *lm*, or slightly before. Interlamellar setae present or absent (Figs 16.3)
Lanceoppia (Lanceoppia) HAMMER, 1962
26 (25) Sensillus setiform or setiform-lanceolate, aciculate. Setae *la* behind setae *lm*. Rostrum without teeth or tridentate (Figs 16.5). (= *Tectoppiella* MAHUNKA, 1984)
Setoppia BALOGH, 1983
27 (22) Lamellar and translamellar lines horseshoe-like. Rostrum either not incised or tridentate. Interlamellar setae either absent or present (Figs 16.2)
Lanceoppia (Hamoppia) HAMMER, 1968
28 (1) Five or four pairs of genital setae
29 (30) Sensillus globular with longer or shorter stalk. Four pairs of genital setae. Bothridium with inner "labium" (Figs 25.10)
Operculoppia HAMMER, 1968
30 (29) Sensillus lanceolate or elongately fusiform
31 (32) Twelve pairs of notogastral setae (without c_2). Sensillus lanceolate. Five pairs of genital setae (Figs 24.6)
Polyoppia HAMMER, 1968
32 (31) Nine or less pairs of notogastral setae (without c_2).
33 (34) Notogastral oligotrichy: five (or more?) pairs of notogastral setae. Sensillus fusiform. Five pairs of genital setae (Figs 24.1)
Basiloppia BALOGH, 1983
34 (33) Notogaster with nine pairs of setae (without setae c_2). Sensillus lanceolate
35 (36) Five pairs of genital setae. Lamellar setae nearer to interlamellar setae than to rostral setae (Figs 24.3)
Drepanoppia BALOGH, 1983

36 (35) Four pairs of genital setae. Lamellar setae nearer to rostral setae than to interlamellar setae
37 (38) Lamellar and translamellar lines absent (Figs 25.4)
Cycloppia BALOGH, 1983
38 (37) Lamellar and translamellar lines present and forming an ∩-shaped arch.
39 (40) Notogastral setae very short; c_2 as long as the remaining notogastral setae. Notogastral setae *la* originate far before *lm* (Figs 25.8)
Laminoppia HAMMER, 1968
40 (39) Notogastral setae not very short; setae c_2 absent or disappearing
41 (42) Sensillus lanceolate, short. Bothridium with inner "labium" (Figs 25.1)
Acutoppia BALOGH, 1983
42 (41) Sensillus setiform-lanceolate, long. Interlamellar setae very short (Figs 25.13)
Processoppia BALOGH, 1983

Brachioppiinae SUBIAS subfam. n.

1 (12) Six pairs of genital setae. Nine pairs of notogastral setae (without setae c_2)
2 (7) Sensillus fusiform or lanceolate, ciliate.
3 (6) Sensillus fusiform, ciliate (unilaterally).
4 (5) Translamellar line present. Rostrum tridentate (Figs 15.2)
Austroppia BALOGH, 1983
5 (4) Translamellar line absent. Rostrum not dentate (Figs 15.8)
Pletzenoppia BALOGH, 1983
6 (3) Sensillus lanceolate: biciliate. Lamellar and translamellar lines present (Figs 16.6)
Setuloppia BALOGH, 1983
7 (2) Sensillus pectinate or radiate
8 (11) Setae ad_1 postanal. Setae *la* far before *lm*. Sensillus setiform or lanceolate, extremely long and pectinate. Lamellar and translamellar lines absent
9 (10) Notogastral heterotrichy: setae *la* and *lm* much longer than the remaining notogastral setae. Lamellar setae much nearer to interlamellar setae than to rostral setae (Figs 15.4)
Ctenoppia BALOGH, 1983
10 (9) Notogastral heterotrichy absent. Distance between the lamellar and rostral setae about the same as between the lamellar and interlamellar setae (Figs 15.6)
Kokoppia BALOGH, 1983
11 (8) Setae ad_1 paraanal. Setae *la* originate at the same niveau as setae *lm* (Figs 15.3)
Brachioppia HAMMER, 1961
12 (1) Four or five pairs of genital setae
13 (14) Twelve pairs of notogastral setae. Five pairs of genital setae. Setae ad_1 paraanal (Figs 20.5)
Gittella HAMMER, 1961
14 (13) Nine or ten pairs of notogastral setae.
15 (16) Setae ad_1 paraanal. Sensillus setiform, very long; pectinate, Lamellar and translamellar lines absent. Five pairs of genital setae (Figs 23.6)
Trapezoppia BALOGH et MAHUNKA, 1969
16 (15) Setae ad_1 postanal
17 (18) Five pairs of genital setae (Figs 20.2)
Brachioppiella (Brachioppiella) HAMMER, 1962
18 (17) Four pairs of genital setae
19 (20) Sensillus fusiform-lanceolate; pectinate (Figs 25.6)
Brachioppiella (Gressittoppia) BALOGH, 1983
20 (19) Sensillus long, lanceolate, pectinate. Translamellar line present
21 (22) Rostrum not dentate (Figs 25.3)
Brassoppia (Brassoppia) BALOGH, 1987
22 (21) Rostrum bidentate (Figs 25.12)
Brassoppia (Plaesioppia) BALOGH, 1983

Oppiinae Grandjean, 1951
(= *Tectoppiinae*, = *Exanthoppiinae*)

1 (2) Sensillus setiform, long, bifurcate. Five pairs of genital setae (Figs 64—65)
Sphagnoppia J. BALOGH et P. BALOGH, 1986
2 (1) Sensillus not bifurcate

3 (8) Six pairs of genital setae
4 (7) Interlamellar setae well developed. Setae ad_1 paraanal. Notogastral oligotrichy and/or heterotrichy
5 (6) Sensillus globular. Fissurae *iad* paraanal (Figs 17.2)
Heteroppia BALOGH, 1970
6 (5) Sensillus lanceolate. Fissurae *iad* direct apoanal (Figs 13.1)
Tectoppia WALLWORK, 1961
7 (4) Interlamellar setae absent. Setae ad_1 postanal. Sensillus fusiform or globular (Figs 66—67)
Amerioppia HAMMER, 1961
8 (3) Four or five pairs of genital setae
9 (20) Sensillus globular or club-shaped
10 (19) Interlamellar setae well developed
11 (12) Twelve pairs of notogastral setae (without setae c_2). Setae p_1 large, more or less dilated. Five pairs of genital setae (Figs 17.1)
Aeroppia HAMMER, 1961
12 (11) Nine pairs of notogastral setae (without setae c_2)
13 (18) Five pairs of genital setae
14 (15) Body densely granulate. Apodemata IV absent (Figs 68—69)
Exanthoppia J. BALOGH et P. BALOGH, 1983
15 (14) Body smooth. Apodemata IV present
16 (17) Setae ad_1 paraanal. Notogastral heterotrichy: setae *p*- and *p*f very small; the remaining notogastral setae (seven pairs) very long. One pair strong teeth behind bothrydia (Figs 93—94)
Vietoppia (Vietoppia) MAHUNKA, 1988
17 (16) Setae ad_1 postanal. Notogastral heterotrichy absent (Figs 70—71)
Vietoppia (Paraglobоppia) SUBIAS subgen. n.
18 (13) Four pairs of genital setae. Lamellar setae much nearer to rostral setae than interlamellar setae (Fig 72)
Laroppia SUBIAS gen. n.
19 (10) Interlamellar setae absent. Five pairs of genital setae (Figs 73—74)
Neoamerioppia (Ameriglobоppia) subgen. n.
20 (9) Sensillus setiform, or lanceolate or elongately fusiform
21 (22) Strong notogastral neotrichy: about 32 pairs of notogastral setae. Sensillus lanceolate-fusiform. Prodorsum and ventral region granulate (Figs 75—76)
Pluritrichoppia SUBIAS et ARILLO, 1988
22 (21) Thirteen or less pairs of notogastral setae
23 (30) Thirteen or twelve pairs of notogastral setae
24 (25) Interlamellar setae absent. Sensillus fusiform, long. Five pairs of genital setae (Figs 21.2)
Erioppia BALOGH, 1983
25 (24) Interlamellar setae present
26 (29) Five pairs of genital setae
27 (28) Notogastral heterotrichy. Sensillus lanceolate-fusiform (Figs 23.3)
Fusuloppia BALOGH, 1983
28 (27) Notogastral setae of the same length (except setae c_2). Sensillus setiform (Figs 23.4)
Niloppia BALOGH, 1983
29 (26) Four pairs of genital setae. Sensillus lanceolate. Apodemata IV absent (Figs 25.17)
Xenoppia MAHUNKA, 1982
30 (23) Ten or less pairs of notogastral setae
31 (36) Interlamellar setae absent. Five pairs of genital setae
32 (33) Oligotrichy and heterotrichy notogastral: less than nine pairs of partly very long, partly extremely small notogastral setae. Sensillus setiform (Figs 21.3)
Oligoppia BALOGH, 1983
33 (32) Nine pairs of notogastral setae (without setae c_2)
34 (35) Setae ad_1 paraanal. Notogastral heterotrichy: three pairs of very long, six pairs of extremely short notogastral setae. Sensillus lanceolate (Figs 24.4)
Goyoppia BALOGH, 1983
35 (34) Setae ad_1 postanal. Notogastral heterotrichy absent. Sensillus lanceolate or elongately fusiform (Figs 21.1)
Neoamerioppia (Neoamerioppia) SUBIAS gen. n.
36 (31) Interlamellar setae present
37 (40) Five pairs of genital setae
38 (39) Sensillus setiform or setiform-lanceolate. Notogastral heterotrichy: five or six pairs of

long notogastral setae (Figs 77—78). (= *Antennoppia* MAHUNKA, 1983, = *Daedaloppia* HAUSER et MAHUNKA, 1983)

Lasiobelba AOKI, 1969

39 (38) Sensillus elongately fusiform or fusiform-lanceolate (Figs 23.5). (= *Dameosoma* PAOLI, 1908, = *Cilioppia* BALOGH, 1983)

Oppia C. L. KOCH, 1836

40 (37) Four pairs of genital setae. Sensillus setiform or setiform-lanceolate

41 (42) Notogastral setae disappearing. Lamellar setae nearer to rostral setae than to interlamellar setae (Figs 25.2)

Aethioppia BALOGH, 1983

42 (41) Notogastral setae well developed. Lamellar setae nearer to interlamellar setae than to rostral setae (Figs 25.11)

Paroppia HAMMER, 1968

Arcoppiinae BALOGH, 1983

1 (6) Sensillus globular or club-shaped

2 (5) Sensillus smooth. Rostrum tridentate

3 (4) Sensillus globular (Figs 79—80)

Similoppia (Similoppia) MAHUNKA, 1983

4 (3) Sensillus fusiform (Figs 81—82)

Similoppia (Reductoppia) P. BALOGH, 1984

5 (2) Sensillus fusiform, short, distally aciculate. Rostrum bidentate (Figs 83—84)

Basidoppia MAHUNKA, 1983

6 (1) Sensillus pectinate or radiate

7 (8) Sensillus radiate (in extreme case only with one setiform or flagellate branch). Rostrum tridentate (Figs 15.1)

Arcoppia HAMMER, 1977

8 (7) Sensillus pectinate

9 (10) Rostrum not dentate. Lamellar and translamellar lines absent. Epimeres 3 + 4 very long (Figs 15.9)

Porrhoppia BALOGH, 1970

10 (9) Rostrum tridentate. Translamellar line present

11 (12) Setae ad_1 paraanal. Epimeres 3 + 4 very long (Figs 15.7)

Mimoppia BALOGH, 1983

12 (11) Setae ad_1 postanal. Epimeres 3 = 4 normal (Figs 15.11). (= *Wallworkella* BALOGH, 1983)

Wallworkoppia SUBIAS nom. n.

Multioppiinae BALOGH, 1983

1 (8) Fissurae *iad* direct apoanal. Five pairs of genital setae

2 (3) Twelve pairs of notogastral setae. Apodemata IV absent, thus epimeres III + IV fused with the ventral plate (apodemata IV sometimes only disappearing). Sensillus fusiform, ciliate (Figs 22.8)

Pulchroppiella BALOGH, 1983

3 (2) Nine pairs of notogastral setae (without setae c_2)

4 (5) Sensillus pectinate. Setae c_2 of the same type and length as the remaining notogastral setae or disappearing. Apodemata fused behind genital plates, thus genital plates closed in epimeres III + IV, before apodemata IV (Figs 20.3)

Cryptoppia CSISZÁR, 1961

5 (4) Sensillus fusiform, ciliate.

6 (7) Setae ad_3 far ahead, near to apodemata, about on the same level as the aggenital setae. Rostral setae near to each other (Figs 22.11)

Uroppia BALOGH, 1983

7 (6) Setae ad_3 behind aggenital setae (Figs 85—86)

Graptoppia (Apograptoppia) SUBIAS et RODRIGUEZ, 1985

8 (1) Fissurae *iad* paraanal

9 (10) Notogastral oligotrichy and heterotrichy: four pairs of very long, three (?) pairs of short notogastral setae. Lamellar and translamellar lines absent. Five pairs of genital setae. Sensillus pectinate (Figs 20.6)

Octoppia BALOGH et MAHUNKA, 1969

10 (9) Notogaster with nine to twelve pairs of setae (without setae c_2)

11 (36) Notogaster with nine pairs of setae (without setae c_2)

12 (33) Interlamellar setae present
13 (30) Setae *la* about on the same level as setae *lm* or behind
14 (17) Four pairs of genital setae
15 (16) Sensillus radiate. Lamellar and translamellar lines absent (Figs 25.7)
Helioppia BALOGH, 1983
16 (15) Sensillus fusiform, ciliate. Translamellar line well developed (Figs 25.16)
Graptoppia (Stenoppia) BALOGH, 1983
17 (14) Five pairs of genital setae
18 (19) Notogastral heterotrichy: five pairs of long notogastral setae. Translamellar line absent. Sensillus lanceolate, ciliate. Bright spots between the interlamellar setae absent (Figs 24)
Condyloppia BALOGH, 1983
19 (18) Notogastral setae of the same length. Translamellar line mostly well visible. Bright spots between the interlamellar setae present
20 (21) Two pairs of bright spots between the interlamellar setae (exceptionally one pair). Sensillus fusiform, ciliate (Figs 22.5). (= *Frondoppia* MAHUNKA, 1983)
Graptoppia (Graptoppia) BALOGH, 1983
21 (20) Three pairs of bright spots between the interlamellar setae (sometimes hardly visible)
22 (23) Rostral setae straight, their apical half divergent. Sensillus fusiform (Figs 22.10)
Ramusella (Rectoppia) SUBIAS, 1980
23 (22) Rostral setae slightly arched or knee-bent, their apical half converging
24 (25) Rostral setae knee-bent, their alveoli near each other. Sensillus fusiform and ciliate or pectinate (Figs 22.9). (= *Alcioppia* BALOGH, 1983, = *Amolops* HULL, 1916, = *Bioppia* MAHUNKA, 1983)
Ramusella (Ramusella) HAMMER, 1962
25 (24) Rostral setae more or less arched, their alveoli more or less far from each other
26 (27) Lamellar setae originate nearer to rostral setae, than to interlamellar setae. Rostral setae originate on the margin of rostrum. Sensillus radiate (Figs 103—104)
Ramusella (Sabahoppia) MAHUNKA, 1987
27 (26) Lamellar setae originate on the half way or nearer to interlamellar than to rostral setae
28 (29) Sensillus fusiform-lanceolate, biciliate (Fig 87)
Ramusella (Insculptoppiella) SUBIAS et RODRIGUEZ, 1986
29 (28) Sensillus fusiform, either unilaterally ciliate or pectinate (Figs 22.6)
Ramusella (Insculptoppia) SUBIAS, 1980
30 (13) Setae *la* before setae *lm*. Sensillus fusiform, ciliate. Five pairs of genital setae
31 (32) Setae ad_1 paraanal. Two pairs of bright spots between the interlamellar setae. Sensillus fusiform, ciliate, with flagellate tip (Figs 22.4)
Cubaoppia BALOGH, 1983
32 (31) Setae ad_1 postanal. Three pairs of bright spots between the interlamellar setae (Figs 88—89)
Ramuselloppia SUBIAS et RODRIGUEZ, 1986
33 (12) Interlamellar setae absent
34 (35) Sensillus lanceolate-fusiform and biciliate. Five pairs of genital setae (Figs 90—91)
Pseudoamerioppia SUBIAS gen. n.
35 (34) Sensillus fusiform and unilaterally ciliate. Four pairs of genital setae (Fig 92)
Intermedioppia SUBIAS et RODRIGUEZ, 1987
36 (11) Notogaster with ten to twelve pairs of setae (without c_2).Five pairs of genital setae
37 (38) Notogaster with ten pairs of setae (without setae c_2). Sensillus fusiform, ciliate (Figs 22.1)
Anomaloppia SUBIAS, 1978
38 (37) Notogaster with twelve pairs of setae (without setae c_2)
39 (40) Sensillus globular and radiate-ciliate. Two pairs of bright spots between the interlamellar setae (Figs 99—100)
Javieroppia MINGUEZ et SUBIAS, 1986
40 (39) Sensillus fusiform or lanceolate, ciliate or pectinate. Mostly with three pairs of light spots between the interlamellar setae
41 (42) Sensillus lanceolate, ciliate (Figs 101—102)
Multioppia (Multilanceoppia) subgen. n.
42 (41) Sensillus fusiform, ciliate or pectinate
43 (44) Sensillus pectinate with bifurcate branches (Figs 20.4)
Multioppia (Furculoppia) BALOGH, 1983
44 (43) Sensillus fusiform, ciliate or pectinate but never with bifurcate branches (Figs 22.7)
Multioppia (Multioppia) HAMMER, 1961

SYSTEMATICAL LIST OF GENERA

Antilloppiinae MAHUNKA, 1985

Neoppia (Neoppia) BATTACHARYA et BANERJEE, 1981
Type-species: *Neoppia minuta* BATTACHARYA et BANERJEE, 1981
Neoppia (Joboppia) RUIZ, MINGUEZ et SUBIAS (in litt.)
Type-species: *Neoppia (Joboppia) dichosa* RUIZ, MINGUEZ et SUBIAS (in litt.)

Pulchroppiinae BALOGH, 1983

Pulchroppia (Pulchroppia) HAMMER, 1980
Type-species: *Pulchroppia elegans* HAMMER, 1980
Pulchroppia (Multipulchroppia) SUBIAS n. subgen.
Type-species: *Multioppia berndthauseri* MAHUNKA, 1978
Varioppia MAHUNKA, 1985
Type-species: *Varioppia radiata* MAHUNKA, 1985

Medioppiinae SUBIAS et MINGUEZ, 1985

Ramuloppia BALOGH, 1961
Type-species: *Oppia ramiseta* BALOGH, 1959
Solenoppia (Solenoppia) HAMMER, 1968
Type-species: *Solenoppia grandjeani* HAMMER, 1968
Solenoppia (Campbelloppia) LUXTON, 1985
Type-species: *Oppia diaphora* WALLWORK, 1964
Rhinoppia BALOGH, 1983
Type-species: *Oppia nasuta* MORITZ, 1965
Miroppia HAMMER, 1968
Type-species: *Miroppia zealandica* HAMMER, 1968
Medioppia SUBIAS et MINGUEZ, 1985
Type-species: *Oppia media* MIHELČIČ, 1956
Medioxyoppia SUBIAS gen. n.
Type-species: *Oppia yuwana* AOKI, 1983
Epimerella KULIEV, 1967
Type-species: *Oppia smirnovi* KULIEV, 1962
Serratoppia SUBIAS et MINGUEZ, 1985
Type-species: *Oppia serrata* MIHELČIČ, 1956
Microppia BALOGH, 1983
Type-species: *Dameosoma minus* PAOLI, 1908
Congoppia BALOGH, 1983
Type-species: *Oppia deboissezoni* BALOGH et MAHUNKA, 1966
Discoppia (Discoppia) BALOGH, 1983
Type-species: *Oppia limae* BALOGH et MAHUNKA, 1974
Discoppia (Cylindroppia) SUBIAS et RODRIGUEZ, 1986
Type-species: *Oppia minus cylindrica* PÉREZ-INIGO, 1965

Oppiellinae SENICZAK, 1975

Tuberoppia GOLOSOVA, 1974
Type-species: *Oppia rotundata* GOLOSOVA, 1970
Autoppia GOLOSOVA et KARPPINEN, 1983
Type-species: *Autoppia algicola* GOLOSOVA et KARPPINNEN, 1983
Lauroppia SUBIAS et RODRIGUEZ, 1986
Type-species: *Dameosoma fallax* PAOLI, 1908

Oppiella (Oppiella) JACOT, 1937
Type-species: *Eremaeus novus* OUDEMANS, 1902

Oppiella (Perspicuoppia) PÉREZ-INIGO, 1971
Type-species: *Oppia perspicua* MIHELČIČ, 1956

Neostrinatina MAHUNKA, 1980
Type-species: *Neostrinatina mixoppia* MAHUNKA, 1980

Dissorhina HULL, 1916
Type-species: *Eremaeus ornatus* OUDEMANS, 1900

Elaphoppia BALOGH, 1983
Type-species: *Oppia quadripilosa* BALOGH, 1960

Ptiloppia BALOGH, 1983
Type-species: *Oppiella bulanovae* HAMMER, 1968

Liacaroppia SUBIAS et RODRIGUEZ, 1986
Type-species: *Oppiella doryphoros* J. BALOGH et P. BALOGH, 1983

Tripiloppia HAMMER, 1968
Type-species: *Tripiloppia aokii* HAMMER, 1968

Neotrichoppia (Neotrichoppia) SUBIAS et ITURRONDOBEITIA, 1980
Type-species: *Neotrichoppia pseudoconfinis* SUBIAS et ITURRONDOBEITIA, 1980

Neotrichoppia (Ancestroppia) SUBIAS et RODRIGUEZ, 1986
Type-species: *Neotrichoppia* (*Ancestroppia*) *berninii* SUBIAS et RODRIGUEZ, 1986

Neotrichoppia (Confinoppia) SUBIAS et RODRIGUEZ, 1986
Type-species: *Dameosoma confine* PAOLI, 1908

Belloppia HAMMER, 1968
Type-species: *Belloppia wallworki* HAMMER, 1968

Hypogeoppia SUBIAS, 1981
Type-species: *Hypogeoppia terricola* SUBIAS, 1981

Berniniella BALOGH, 1983
Type-species: *Oppia aeoliana* BERNINI, 1973

Moritzoppia SUBIAS et RODRIGUEZ, 1988
Type-species: *Oppia keilbachi* MORITZ, 1969

Mystroppiinae BALOGH, 1983

Rugoppia MAHUNKA, 1986
Type-species: *Rugoppia luisiae* MAHUNKA, 1986

Stachyoppia BALOGH, 1961
Type-species: *Stachyoppia muscicola* BALOGH, 1961

Cheloppia HAMMER, 1971
Type-species: *Cheloppia hyalina* HAMMER, 1971

Mystroppia BALOGH, 1959
Type-species: *Mystroppia sellnicki* BALOGH, 1959

Striatoppia BALOGH, 1958
Type-species: *Striatoppia machadoi* BALOGH, 1958

Corynoppia BALOGH, 1983
Type-species: *Stachyoppia ?kosarovi* JELEVA, 1962

Karenella (Glabroppia) SUBIAS et RODRIGUEZ, 1986

Karenella (Karenella) HAMMER, 1962
Type-species: *Karenella lobata* HAMMER, 1962

Karenella (Stakarenoppia) SUBIAS et RODRIGUEZ, 1986
Type-species: *Stachyoppia granulosa* SUBIAS et SARKAR, 1983

Oxyoppiinae SUBIAS subfam. n.

Baloghoppia MAHUNKA, 1983
Type-species: *Baloghoppia dentata* MAHUNKA, 1983

Mahunkella BALOGH, 1983
Type-species: *Oppiella transitoria* BALOGH et MAHUNKA, 1977

Acroppia BALOGH, 1983
Type-species: *Stachyoppia processigera* BALOGH et MAHUNKA, 1967
Lineoppia J. BALOGH et P. BALOGH, 1983
Type-species: *Lineoppia frouini* J. BALOGH et P. BALOGH, 1983
Oxyoppia (Oxyoppia) BALOGH et MAHUNKA, 1969
Type-species: *Oppia spinosa* HAMMER, 1958
Sacculoppia BALOGH et MAHUNKA, 1968
Type-species: *Sacculoppia singularis* BALOGH et MAHUNKA, 1968
Hammerella BALOGH, 1983
Type-species: *Brachioppiella gracilis* HAMMER, 1977
Oxyoppia (Dzarogneta) KULIEV, 1978
Type-species: *Oppia dubia* KULIEV, 1966
Separatoppia MAHUNKA, 1983
Type-species: *Oppia africana* EVANS, 1953
Oxyoppia (Aciculoppia) SUBIAS et RODRIGUEZ, 1986
Type-species: *Oxyoppia? genavensium* MAHUNKA, 1982
Oxyoppia (Oxyoppiella) SUBIAS et RODRIGUEZ, 1986
Type-species: *Oppiella polynesia* HAMMER, 1972
Subiasella (Subiasella) BALOGH, 1983
Type-species: *Oppia exiguus* HAMMER, 1971
Subiasella (Lucioppia) MAHUNKA, 1985
Type-species: *Lucioppia hauseri* MAHUNKA, 1985
Subiasella (Dividoppia) MAHUNKA, 1987
Type-species: *Dividoppia aperta* MAHUNKA, 1987
Subiasella (Lalmoppia) SUBIAS et RODRIGUEZ, 1986
Type-species: *?Oppia ventronodosa* HAMMER, 1962
Oxybrachioppia SUBIAS gen. n.
Type-species: *Brachyoppiella ctenifera barbata* CHOI, 1986
Oxyoppioides SUBIAS et MINGUEZ, 1985
Type-species *Dameosoma decipiens* PAOLI, 1908

Lanceoppiinae BALOGH, 1983

Globoppia HAMMER, 1962
Type-species: *Globoppia intermedia* HAMMER, 1962
Membranoppia (Pravoppia) LUXTON, 1985
Type-species: *Oppia disjuncta* WALLWORK, 1964
Membranoppia (Membranoppia) HAMMER, 1968
Type-species: *Membranoppia krivolutskyi* HAMMER, 1968
Geminoppia J. BALOGH et P. BALOGH, 1983
Type-species: *Geminoppia papineaui* J. BALOGH et P. BALOGH, 1983
Trematoppia BALOGH, 1962
Type-species: *Trematoppia cristipes* BALOGH, 1962
Lanceoppia (Baioppia) LUXTON, 1985
Type-species: *Lanceoppia moritzi* HAMMER, 1968
Lanceoppia (Lancelalmoppia) SUBIAS subgen. n.
Type-species: *Oppia perezinigoi* HAMMER, 1968
Loboppia BALOGH, 1983
Type-species: *Oppia covarrubiasi* HAMMER, 1968
Otoppia BALOGH, 1983
Type-species: *Oppia midas* BALOGH, 1962
Lanceoppia (Bicristoppia) SUBIAS subgen. n.
Type-species: *Oppia bicristata* HAMMER, 1962
Lanceoppia (Convergoppia) BALOGH, 1983
Type-species: *Oppia pletzeni* HAMMER, 1968
Lanceoppia (Lanceoppia) HAMMER, 1962
Type-species: *Lanceoppia hexapili* HAMMER, 1962

Setoppia BALOGH, 1983
Type-species: *Oppia toeroeki* BALOGH, 1982

Lanceoppia (Hamoppia) HAMMER, 1968
Type-species: *Hamoppia lionsi* HAMMER, 1968

Operculoppia HAMMER, 1968
Type-species: *Operculoppia kunsti* HAMMER, 1968

Polyoppia HAMMER, 1968
Type-species: *Polyoppia baloghi*, HAMMER, 1968

Basiloppia BALOGH, 1983
Type-species: *Oppia hexatricha* BALOGH et MAHUNKA, 1975

Drepanoppia BALOGH, 1983
Type-species: *Oppia falxa* KOK, 1967

Cycloppia BALOGH, 1983
Type-species: *Oppia restata* AOKI, 1963

Laminoppia HAMMER, 1968
Type-species: *Laminoppia blocki* HAMMER, 1968

Acutoppia BALOGH, 1983
Type-species: *Operculoppia crassiseta* HAMMER, 1968

Processoppia BALOGH, 1983
Type-species: *Oppia oudemansi* HAMMER, 1968

Brachioppiinae SUBIAS subfam. n.

Austroppia BALOGH, 1983
Type-species: *Oppia ?magellanis* HAMMER, 1962

Pletzenoppia BALOGH, 1983
Type-species: *Oppia pletzenae* KOK, 1967

Setuloppia BALOGH, 1983
Type-species: *Oppia newelli* HAMMER, 1968

Ctenoppia BALOGH, 1983
Type-species: *Oppia variopectinata* BALOGH et MAHUNKA, 1975

Kokoppia BALOGH, 1983
Type-species: *Brachioppia longisetosa* KOK, 1967

Brachioppia HAMMER, 1961
Type-species: *Brachioppia cuscensis* HAMMER, 1961

Gittella HAMMER, 1961
Type-species: *Gittella punctata* HAMMER, 1961

Trapezoppia BALOGH et MAHUNKA, 1969
Type-species: *Trapezoppia longipectinata* BALOGH et MAHUNKA, 1969

Brachioppiella (Brachioppiella) HAMMER, 1962
Type-species: *Brachioppiella periculosa* HAMMER, 1962

Brachioppiella (Grassittoppia) BALOGH, 1983
Type-species: *Brachioppia moresonensis* KOK, 1967

Brassoppia (Brassoppia) BALOGH, 1983
Type-species: *Oppia brassi* BALOGH, 1981

Brassoppia (Plaesioppia) BALOGH, 1983
Type-species: *Brachioppiella peullaensis* HAMMER, 1962

Oppiinae GRANDJEAN, 1951

Sphagnoppia J. BALOGH et P. BALOGH, 1986
Type-species: *Sphagnoppia biflagellata* J. BALOGH et P. BALOGH, 1986

Heteroppia BALOGH, 1970
Type-species: *Heteroppia globigera* BALOGH, 1970

Tectoppia WALLWORK, 1961
Type-species: *Tectoppia nigricans* WALLWORK, 1961

Amerioppia HAMMER, 1961
Type-species: *Amerioppia rudentigera* HAMMER, 1961
Aeroppia HAMMER, 1961
Type-species: *Aeroppia peruensis* HAMMER, 1961
Exanthoppia J. BALOGH et P. BALOGH, 1983
Type-species: *Exanthoppia ornatissima* J. BALOGH et P. BALOGH, 1983
Vietoppia (Vietoppia) MAHUNKA, 1988
Type-species: *Vietoppia hungarorum* MAHUNKA, 1988
Vietoppia (Paragloboppia) SUBIAS subgen. n.
Type-species: *Oppia diversiseta* MAHUNKA, 1985
Laroppia SUBIAS gen. n.
Type-species: *Oppia petiolata* WALLWORK, 1977
Neoamerioppia (Amerigloboppia) SUBIAS subgen. n.
Type-species: *Amerioppia espeletiarum* P. BALOGH, 1984
Pluritrichoppia SUBIAS et ARILLO, 1988
Type-species: *Pluritrichoppia insolita* SUBIAS et ARILLO, 1988
Erioppia BALOGH, 1983
Type-species: *Multioppia problematica* BALOGH, 1966
Fusuloppia BALOGH, 1983
Type-species: *Oppia simplex* BALOGH, 1962
Niloppia BALOGH, 1983
Type-species: *Oppia sticta* POPP, 1960
Xenoppia MAHUNKA, 1982
Type-species: *Xenoppia brevipila* MAHUNKA, 1982
Oligoppia BALOGH, 1983
Type-species: *Amerioppia octocoma* HAMMER, 1973
Goyoppia BALOGH, 1983
Type-species: *Oppia sexpilosa* BALOGH, 1960
Neoamerioppia (Neoamerioppia) SUBIAS gen. n.
Type-species: *Amerioppia decemsetosa* HAMMER, 1973
Lasiobelba AOKI, 1959
Type-species: *Lasiobelba remota* AOKI, 1959
Oppia C. L. KOCH, 1836
Type-species: *Oppia nitens* C. L. KOCH, 1836
Aethioppia BALOGH, 1983
Type-species: *Oppia bacilligera* BALOGH, 1962
Paroppia HAMMER, 1968
Type-species: *Paroppia lebruni* HAMMER, 1968

Arcoppiinae BALOGH, 1983

Similoppia (Similoppia) MAHUNKA, 1983
Type-species: *Similoppia halterata* MAHUNKA, 1983
Similoppia (Reductoppia) P. BALOGH, 1984
Type-species: *Reductoppia espeletiae* P. BALOGH, 1984
Basidoppia MAHUNKA, 1983
Type-species: *Basidoppia basidii* MAHUNKA, 1983
Arcoppia HAMMER, 1977
Type-species: *Arcoppia brachyramosa* HAMMER, 1977
Porrhoppia BALOGH, 1970
Type-species: *Porrhoppia crux* BALOGH, 1970
Mimoppia BALOGH, 1983
Type-species: *Oppia tenuiseta* WALLWORK, 1961
Wallworkoppia SUBIAS nom. n.
Type-species: *Oppia trimucronata* WALLWORK, 1961

Multioppiinae BALOGH, 1983

Pulchroppiella BALOGH, 1983
Type-species: *Oppia plurisetosa* MIHELČIČ, 1956

Cryptoppia CSISZÁR, 1961
Type-species: *Cryptoppia elongata* CSISZÁR, 1961

Uroppia BALOGH, 1983
Type-species: *Oppia akusiensis* WALLWORK, 1961

Graptoppia (Apograptoppia) SUBIAS et RODRIGUEZ, 1985
Type-species: *Dameosoma foveolatum* PAOLI, 1908

Octoppia BALOGH et MAHUNKA, 1969
Type-species: *Octoppia irmayi* BALOGH et MAHUNKA, 1969

Helioppia BALOGH, 1983
Type-species: *Oppia sol* BALOGH, 1958

Graptoppia (Stenoppia) BALOGH, 1983
Type-species: *Oppia italica* BERNINI, 1973

Condyloppia BALOGH, 1983
Type-species: *Oppia condylifer* HAMMER, 1980

Graptoppia (Graptoppia) BALOGH, 1983
Type-species: *Graptoppia* (*Graptoppia*) *paraanalis* SUBIAS et RODRIGUEZ, 1985

Ramusella (Rectoppia) SUBIAS, 1980
Type-species: *Oppia mihelcici* PÉREZ-INIGO, 1965

Ramusella (Ramusella) HAMMER, 1962
Type-species: *Ramusella puertomonttensis* HAMMER, 1962

Ramusella (Sabahoppia) MAHUNKA, 1987
Type-species: *Sabahoppia hauseri* MAHUNKA, 1987

Ramusella (Insculptoppiella) SUBIAS et RODRIGUEZ, 1986
Type-species: *Oppia alfonsii* BERNINI, 1980

Ramusella (Insculptoppia) SUBIAS, 1980
Type-species: *Dameosoma insculptum* PAOLI, 1908

Cubaoppia BALOGH, 1983
Type-species: *Oppia fusisetosa* BALOGH et MAHUNKA, 1980

Ramuselloppia SUBIAS et RODRIGEZ, 1986
Type-species: *Ramuselloppia anomala* SUBIAS et RODRIGUEZ, 1986

Pseudoamerioppia SUBIAS gen. n.
Type-species: *Oppia barrancensis paraguayensis* BALOGH et MAHUNKA, 1981

Intermedioppia SUBIAS et RODRIGUEZ, 1987
Type-species: *Oppia alvarezi* PÉREZ-INIGO, 1982

Anomaloppia SUBIAS, 1978
Type-species: *Anomaloppia canariensis* SUBIAS, 1978

Javieroppia MINGUEZ et SUBIAS, 1986
Type-species: *Javieroppia cervus* MINGUEZ et SUBIAS, 1986

Multioppia (Multilanceoppia) SUBIAS subgen. n.
Type-species: *Multioppia ramulifera carpatica* SCHALK, 1966

Multioppia (Furculoppia) BALOGH, 1983
Type-species: *Oppia ramulifera* KUNST, 1959

Multioppia (Multioppia) HAMMER, 1961
Type-species: *Multioppia radiata* HAMMER, 1961

ALPHABETIC LIST OF GENERA, SUBGENERA AND SPECIES

(Aciculoppia) → Oxyoppia

Acroppia BALOGH, 1983 (Figs 11.1)
Type-species: Stachyoppia processigera BALOGH et MAHUNKA, 1967 — W. Africa, Indonesia, Philippines, New Guinea

Stachyoppia amazonica BALOGH et MAHUNKA, 1969 — Amazonia
Acroppia antillensis MAHUNKA, 1984 — Antilles
Stachyoppia curvispina MAHUNKA, 1983 — Brazil
Stachyoppia translamellata BALOGH et MAHUNKA, 1966 — W. Africa

Acutoppia BALOGH, 1983 (Figs 25.1)
Type-species: Operculoppia crassiseta HAMMER, 1968 — New Zealand
Operculoppia jelevae HAMMER, 1968 — New Zealand

Aeroppia HAMMER, 1961 (Figs 17.1)
Type-species: Aeroppia peruensis HAMMER, 1961 — Peru
Aeroppia adjacens MAHUNKA, 1984 — Antilles
Aeroppia asymmetrica MAHUNKA, 1984 — Antilles
Aeroppia clavatum HIGGINS, 1966 — Guayana
Belba concolor var. vacua BERLESE, 1888 — Brazil, Argentina
Belba floridana BANKS, 1896 — N. America
(= *Oribata consimilis* BANKS, 1910 — N. America)
Aeroppia hammerae MAHUNKA, 1984 — Antilles
Aeroppia insularis HIGGINS, 1966 — Dominica
Damaeus magnipilosus EWING, 1909 — N. America
(= *Aeroppia columbiana* HAMMER, 1961 — N. America)
Aeroppia nasalis MAHUNKA, 1984 — Paraguay
Aeroppia sculpturata, MAHUNKA, 1985 — Antilles

Aethioppia BALOGH, 1983 (Figs 25.2)
Type-species: Oppia bacilligera BALOGH, 1962 — E. Africa
Xenoppia oligochaeta MAHUNKA, 1984 — Tanzania
Oppia spinipes BALOGH, 1962 — Madagascar

Alcioppia Balogh, 1983 = **Ramusella (Ramusella)** HAMMER, 1962

(Ameriglioppia) → Neoamerioppia

Amerioppia HAMMER, 1961 (Figs 66—67)
Type-species: Amerioppia rudentigera HAMMER, 1961 — Peru
Oppia meruensis BALOGH, 1961 — E. Africa

Amolops HULL, 1916 = **Oppia** C. L. KOCH, 1836

(Ancestroppia) → Neotrichoppia

Anomaloppia SUBIAS, 1978 (Figs 22.1)
Type-species: Anomaloppia canariensis SUBIAS, 1978 — Canary Islands
(?) Oppia chitinofincta KULIJEV, 1962 — USSR (Caucasus)
Anomaloppia differens MAHUNKA et TOPERCER, 1983 — Czecho-slovakia
(?) Oppia dispariseta HAMMER, 1958 — Argentina
(?) Oppia manifera HAMMER, 1955 — Alaska, Finland, USSR (Siberia)
Insculptoppia peregovitsi MAHUNKA, 1986 — Tanzania

Antennoppia MAHUNKA, 1983 = **Lasiobelba** AOKI, 1959

Antilloppia MAHUNKA, 1985 = **Neoppia** BHATTACHARYA et BANERJEE, 1981

(Apograptoppia) → Graptoppia

Arcoppia HAMMER, 1977 (Figs 15.1)
Type-species: Arcoppia brachyramosa HAMMER, 1977 — NW. Pakistan
Arcoppia aequivoca SUBIAS nom. n.
(= *Arcoppia sabahensis* MAHUNKA, 1988 nom. praeocc. — Borneo)
(?) Oppia angolensis BALOGH, 1961 — W. Africa
(?) Oppia angolensis radiata WALLWORK, 1961 — Ghana
Dameosoma arcuale BERLESE, 1913 — Java
Dameosoma arcuale var. robustius BERLESE, 1913 — Java
Arcoppia arcualis curtiseta RODRIGUEZ et SUBIAS, 1984 — New Zealand, Fiji, Tonga
(= *Arcoppia arcualis novaezealandiae* J. BALOGH et P. BALOGH, 1986)
Arcoppia arcualis enghoffi RODRIGUEZ et SUBIAS, 1984 — Brazil
Arcoppia arcualis novaeguineae J. BALOGH et P. BALOGH, 1986 — New Guinea
Oppia arcualis sinensis MAHUNKA, 1976 — Hong-Kong
Arcoppia bacilligera MAHUNKA, 1983 — Tanzania
Arcoppia baloghi SUBIAS, 1984 — Vietnam, Philippines, Thailand
(= ? Oppia viperea AOKI, 1959 — Japan, Korea)

Arcoppia bidentata HAMMER, 1980 — Java
Arcoppia bidentata sabahensis MAHUNKA, 1987 — Borneo
Arcoppia biflagellata J. BALOGH et P. BALOGH, 1986 — Fiji
Arcoppia confusa SUBIAS nom. n.
(= *Arcoppia robusta* MAHUNKA, 1988 nom. praeocc. — Borneo)
Oppia corniculifera MAHUNKA, 1978 — Mauritius
(?) Oppia cronus JACOT, 1934 — Hawaii
Arcoppia cronus papua J. BALOGH et P. BALOGH, 1986 — New Guinea
Arcoppia curtipila J. BALOGH et P. BALOGH, 1986 — New Guinea
Oppia dechambrierorum MAHUNKA, 1983 — Mexico
Dameosoma dissimile BERLESE, 1905 — Java
Dameosoma dissimiloides SELLNICK, 1925 — Java
Oppia fenestralis WALLWORK, 1961 — W. Africa, India
Arcoppia fenestralis orientalis J. BALOGH et P. BALOGH, 1986 — New Guinea
Oppia grucheti MAHUNKA, 1978 — Réunion
Arcoppia guineana PÉREZ-INIGO, 1981 — Annobon Island (W. Africa)
Arcoppia hammerae RODRIGUEZ et SUBIAS, 1984 — Java, Vietnam, Philipines
Arcoppia incerta J. BALOGH et P. BALOGH, 1983 — Australia
Arcoppia kaindicola J. BALOGH et P. BALOGH, 1986 — New Guinea
Arcoppia longisetosa J. BALOGH, 1982 — wueensland
Arcoppia mahunkai SUBIAS, 1984 — Canary Is.
Arcoppia mcadami J. BALOGH et P. BALOGH, 1986 — New Guinea
Arcoppia pergeli MAHUNKA, 1982 — Ethiopia
Arcoppia perezinigoi SUBIAS, 1984 — Canary Is.
Arcoppia perisi SUBIAS, 1984 — Canary Is.
Arcoppia praearcuata J. BALOGH et P. BALOGH, 1986 — New Guinea
Arcoppia rangifer J. BALOGH et P. BALOGH, 1986 — New Guinea
Arcoppia rotunda HAMMER, 1980 — Java
Oppia rugosa MAHUNKA, 1973 — Rhodesia
Pletzenoppia (?) semicostulata MAHUNKA, 1985 — S. Africa
Oppia serrulata BALOGH et MAHUNKA, 1980 — Cuba
Oppia (?) tripartita HAMMER, 1961 — Peru
(= *Oppia gilva* WALLWORK, 1961 — W. Africa)
Arcoppia varia HAMMER, 1980 — Java, Brazil
Arcoppia vittata HAMMER, 1980 — Java
Arcoppia waterhousei J. BALOGH et P. BALOGH, 1983 — Australia
Oppia winkleri HAMMER, 1968 — New Zealand, Tahiti

Austroppia BALOGH, 1983 (Figs 15.2)
Type-species: Notaspis crozetensis RICHTERS, 1908 — Antarctic and Sub-antarctic areas
(= *Oppia crozetensis anareensis* DALENIUS et WILSON, 1958)
(? = *Oppia? magellanis* HAMMER, 1962)
Brachioppiella petrohuensis HAMMER, 1962 — S. Chile, S. Argentina (Patagonia)

Autoppia GOLOSOVA et KARPPINNEN, 1983 (Figs 21—22)
Type-species: Autoppia algicola GOLOSOVA et KARPPINNEN, 1983 — Far East (Sakhalin Is.)

(Baioppia) → Lanceoppia

Baloghoppia MAHUNKA, 1983 (Figs 35—36)
Type-species: Baloghoppia dentata MAHUNKA, 1983 — Brazil

Basidoppia MAHUNKA, 1983 (Figs 83—84)
Type-species: Basidoppia basidii MAHUNKA, 1983 — Tanzania
Oppia demeteri MAHUNKA, 1982 — Ethiopia
Basidoppia psyla MAHUNKA, 1983 — Tanzania

Basiloppia BALOGH, 1983 (Figs 24.1)
Type-species: Oppia hexatricha BALOGH et MAHUNKA, 1974 — Queensland

Belloppia HAMMER, 1968 (Figs 9.1)
Type-species: Belloppia wallworki HAMMER, 1968 — New Zealand, Tasmania
Oppia beemanensis WALLWORK, 1964 — Campbell Is.
Belloppia evansi HAMMER, 1968 — New Zealand
Belloppia shealsi HAMMER, 1968 — New Zealand

Berniniella BALOGH, 1983 (Figs 9.2)
Type-species: Oppia aeoliana BERNINI, 1973 — W. Mediterranean
Oppia azerbeidjanica KULIEV, 1972 — USSR (Caucasus)
Dameosoma bicarinatum PAOLI, 1908 — Palaearctic Region
Berniniella carinatissima SUBIAS, RODRIGUEZ et MINGUEZ, 1987 — Spain
Berniniella coronata MAHUNKA et PAOLETTI, 1984 — Italy
Berniniella extrudens SUBIAS, RODRIGUEZ et MINGUEZ, 1987 — Spain
Oppia hauseri MAHUNKA, 1974 — Greece, Spain
Oppia hungarica BAYOUMI, 1979 — Hungary
Oppia inornata MIHELČIČ, 1957 — Spain
(= *Oppia simplex* MIHELČIČ, 1956 — Spain)
(= *Oppia triconica* MIHELČIČ, 1956 — Spain)
Berniniella intrudens SUBIAS, RODRIGUEZ et MINGUEZ, 1987 — Spain
Oppia jahnae SELLNICK, 1961 — Austria, USSR (European part, Caucasus, Crimea)
Berniniella latidens SUBIAS, RODRIGUEZ et MINGUEZ, 1987 — Spain
Oppia lunaris EVANS, 1952 — Great Britain
Oppia minuta BULANOVA—ZACHVATKINA, 1964 — USSR (European part, Roumania)
Berniniella parasigma ITURRONDOBEITIA, 1987 — Spain
Oppiella rafalski OPŁOTNA et RAJSKI, 1983 — Poland, USSR (European part, Caucasus, Crimea)
Oppia serratirostris GOLOSOVA, 1970 — Far East (Siberia)
Oppia sigma STRENZKE, 1951 — Europe, USSR (Caucasus, Crimea, Central Asia)
Oppia sigma conjuncta STRENZKE, 1951 — Central Europe
Oppia silvatica VASILIU et CALUGAR, 1976 — Roumania
Oppia tequila MAHUNKA, 1983 — Mexico
Oppia tichomirovae RJABININ, 1974 — Far East

(Bicristoppia) → Lanceoppia

Bioppia MAHUNKA, 1983 = **Ramusella (Ramusella)** HAMMER, 1962

Brachioppia HAMMER, 1961 (Figs 15.3)
Type-species: Brachioppia cuscencis HAMMER, 1961 — Peru, Argentina, Antilles, India
Brachioppia cajamarcensis HAMMER, 1961 — Peru
Brachioppia deliciosa HAMMER, 1961 — Peru, Paraguay
Brachioppia excrescens MAHUNKA, 1985 — S. Africa
Oppia guarani BALOGH et MAHUNKA, 1981 — Paraguay
Brachioppia koki MAHUNKA, 1985 — S. Africa
Brachioppia palmata MAHUNKA, 1985 — S. Africa
Oppia pseudocostulata BALOGH et MAHUNKA, 1969 — Bolivia, Brazil
Oppia triglochin BALOGH et MAHUNKA, 1977 — Brazil
(?) Dameosoma triramosum SELLNICK, 1923 — Brazil
Brachioppia tropicalis PÉREZ-IÑGO et BAGGIO, 1980 — Brazil

Brachioppiella (Brachioppiella) HAMMER, 1962 (Figs 20.2)
Type-species: Brachioppiella periculosa HAMMER, 1962 — Chile, Argentina
Oppia biseriata BALOGH et MAHUNKA, 1975 — Queensland
Brachioppiella hannecarti J. BALOGH et P. BALOGH, 1983 — New Caledonia
Brachioppia higginsi HAMMER, 1968 — New Zealand
Oppia nasalis EVANS, 1953 — E. Africa
Brachioppiella rajskii HAMMER, 1968 — New Zealand
(?) Oppia ramosa KARPPINEN, 1966 — Guinea
Oppia tenuicoma HAMMER, 1958 — Bolivia, Peru
Brachioppiella triramosa HAMMER, 1962 — Chile
Brachioppia walkeri HAMMER, 1968 — New Zealand

Brachioppiella (Gressittoppia) BALOGH, 1983 (Figs 25.6)
Type-species: Brachioppia moresonensis KOK, 1967 — S. Africa
Oppia baderi HAMMER, 1968 — New Zealand
Oppia corallifera MAHUNKA, 1985 — S. Africa
(?) Brachioppia hartensteini HAMMER, 1968 — New Zealand
Brachioppia orkneyensis KOK, 1967 — Orkney Is. (S. Africa)
Oppia (?) pepitensis HAMMER, 1962 — Chile (Tierra del Fuego)
Oppia pepitensis brevipectinata COVARRUBIAS, 1968 — Antarctis

Brassoppia (Brassoppia) BALOGH, 1983 (Figs 25.3)
Type-species: Oppia brassi BALOGH, 1982 — Queensland
Brassoppia lamellata J. BALOGH et P. BALOGH, 1986 — New Guinea

Brassoppia (Plaesioppia) BALOGH, 1983 (Figs 25.12)
Type-species: Brachioppiella peullaensis HAMMER, 1962 — Chile

(Campbelloppia) → Solenoppia

Cheloppia HAMMER, 1971 (Figs 22.2)
Type-species: Cheloppia hyalina HAMMER, 1971 — Fiji
Cheloppia americana MAHUNKA, 1985 — Antilles

Cilioppia BALOGH, 1983 = **Oppia** C. L. KOCH, 1836

Condyloppia Balogh, 1983 (Figs 24.2)
Type-species: Oppia condylifer HAMMER, 1979 — Java
Oppia pilosella BALOGH, 1959 — W. Africa
Oppia pilosella longiseta WALLWORK, 1964 — Tchad

(Confinoppia) → Neotrichoppia

Congoppia Balogh, 1983 (Figs 22.3)
Type-species: Oppia deboissezoni BALOGH et MAHUNKA, 1966 — W. Africa
Congoppia extrema MAHUNKA, 1987 — Nigeria

(Convergoppia) → Lanceoppia

Corynoppia BALOGH, 1983 (Figs 11.2)
Type-species: Stachyoppia (?) kosarovi JELEVA, 1962 — S. Europe, USSR (Caucasus, Crimea)
Corynoppia foliatoides SUBIAS et RODRIGUEZ, 1986 — Spain
Damaeolus foliatus MIHELČIČ, 1957 — Spain
Stachyoppia kosarovi matritensis PÉREZ-IÑIGO, 1967 — Spain

Cosmoppia BALOGH, 1983 = **Dissorhina** HULL, 1916

Cryptoppia CSISZÁR, 1961 (Figs 20.3)
Type-species: Cryptoppia elongata CSISZÁR, 1961 — Java
Cryptoppia brevisetiger ZAI-GEN, AOKI et XIAO-ZU, 1984 — China
Pulchroppia elegans MAHUNKA, 1988, — Borneo

Ctenoppia BALOGH, 1983 (Figs 15.4)
Type-species: Oppia variopectinata BALOGH et MAHUNKA, 1975 — Queensland
Oppia eupectinata BALOGH et MAHUNKA, 1975 — Queensland

Cubaoppia BALOGH, 1983 (Figs 22.4)
Type-species: Oppia fusisetosa BALOGH et MAHUNKA, 1980 — Cuba

Cycloppia BALOGH, 1983 (Figs 25.4)
Type-species: Oppia restata AOKI, 1963 — Japan
(= *Lanceoppia simplex* SUZUKI, 1973)
Cycloppia latisternum J. BALOGH et P. BALOGH, 1986 — New Guinea
Oppia szentirmayi BALOGH, 1970 — New Guinea

(Cylindroppia) → Discoppia

Daedaloppia HAUSER et MAHUNKA, 1983 = **Lasiobelba** AOKI, 1959

Dameosoma BERLESE, 1887 = **Oppia** C. L. KOCH, 1836

Discoppia (Cylindroppia) SUBIAS et RODRIGUEZ, 1986 (Figs 18—19)
Type-species: Oppia minus cylindrica PÉREZ-IÑIGO, 1965 — S. Palaearctic Region
(= *Oppia sitnikoviae* SHEREEF, 1976 — Egypt)
(= ? *Oppia agricola* FUJIKAWA, 1982 — Japan 1985)
(= ? *Oppia bifidus* BAYOMI et AL-KHALIFA — Saudi-Arabia)
(= ? *Oppia casuarina* ABDEL HAMID et al., 1983 — Saudi-Arabia
Discoppia (Cylindroppia) cylindrica rostroincisa, SUBIAS et RODRIGUEZ, 1986 — Spain
Discoppia (Cylindroppia) pentasetata SUBIAS et RODRIGUEZ, 1986 — Java
(?) Oppia tenuis HAMMER, 1958 — Argentina

Discoppia (Discoppia) BALOGH, 1983 (Figs 25.5)
Type-species: Oppia limae BALOGH et MAHUNKA, 1974 — Malaysia

Dissorhina HULL, 1916 (Figs 9.3)
Type-species: Eremaeus ornatus OUDEMANS, 1900 — Holarctis
(= *Dameosoma captator* HULL, 1915)
(= *Dameosoma tricarinatum* PAOLI, 1908)

(= *Dameosoma vetula* HULL, 1914)
Oppia bolei TARMAN, 1958 — Yugoslavia
Oppia ornata longipilosa KUNHT, 1958, — Bulgaria, Italia
Oppia ornata peloponnesiaca MAHUNKA, 1980 — Greece, Spain
Oppia ornata tunisica MAHUNKA, 1980 — Tunisia
Oppia tricarinatoides DUBININA et al., 1966 — Bulgaria
Dameosoma tricarinatum var. corniculatum PAOLI, 1908 — Italy, Great Britain
tricarinatum var. globosum PAOLI, 1908 — Bulgaria, Italy, USA (Florida)

(Dividoppia) → Subiasella

Drepanoppia Balogh, 1983 (Figs 24.3)
Type-species: Oppia falxa KOK, 1967 — S. Africa

(Dzarogneta) → Oxyoppia

Elaphoppia Balogh, 1983 (Figs 9.4)
Type-species: Oppia quadripilosa BALOGH, 1960 — Madagascar
Elaphoppia lapelerii J. BALOGH et P. BALOGH, 1983 — New Caledonia
Parasynoppia longisensillata AOKI, 1983 — Japan, Korea

Epimerella KULIEV, 1967 (Figs 14—15)
Type-species: Oppia smirnovi KULIEV, 1962 — USSR (Azerbaijan)
Epimerella smirnovi var. longisetosa KULIEV, 1987 — South USSR (European part)

Erioppia BALOGH, 1983 (Figs 21.2)
Type-species: Multioppia problematica BALOGH, 1966 — E. Africa
Erioppia problematica pacifica J. BALOGH et P. BALOGH, 1986 — Samoa

Exanthoppia J. BALOGH et P. BALOGH, 1983 (Figs 68—69)
Type-species: Exanthoppia ornatissima J. BALOGH et P. BALOGH, 1983 — Hawaii

Foveolatoppia MAHUNKA, 1988 (Figs 95—96)
Type-species: Foveolatoppia foveolata MAHUNKA, 1988 — Borneo

Frondoppia MAHUNKA, 1983 = **Graptoppia (Graptoppia)** BALOGH, 1983

Fusuloppia BALOGH, 1983 (Figs 23.3)
Type-species: Oppia simplex BALOGH, 1962 — Madagascar
(?) Oppia fusuligera BALOGH, 1962 — E. Africa

Geminoppia J. BALOGH et P. BALOGH, 1983 (Figs 56—57)
Type-species: Geminoppia papineaui J. BALOGH et P. BALOGH, 1983 — New Caledonia
Tectoppiella ansifera MAHUNKA, 1985 — S. Africa

Gittella HAMMER, 1961 (Figs 20.5)
Type-species: Gittella punctata HAMMER, 1961 — Peru
Pulchroppiella flagellata MAHUNKA, 1983 — Brazil
Multioppia maxima BALOGH et MAHUNKA, 1981 — Paraguay

(Glabroppia) → Karenella

Globoppia HAMMER, 1962 (Figs 17.3)
Type-species: Globoppia intermedia HAMMER, 1962 — Chile, Argentina (Tierra del Fuego)
Globoppia brinoni J. BALOGH et P. BALOGH, 1983 — New Caledonia
Dameosoma (?) cochlearium PAOLI, 1908 — S. America
Pletzenoppia (?) curviclavata MAHUNKA, 1985 — S. Africa
Globoppia gibba MAHUNKA, 1984 — S. Africa
Globoppia gressitti WALLWORK, 1964 — Campbell Is.
Oppia heterotricha BALOGH et MAHUNKA, 1969 — Bolivia
Globoppia intermedia longiseta WALLWORK, 1970 — Sub-antarctic Region
Oppia kovacsi BALOGH et CSISZÁR, 1963 — Argentina (Patagonia)
(?) Oppia latifasciata WILLMANN, 1931 — Sumatra
Globoppia (?) maior HAMMER, 1962 — Chile, Argentina (Patagonia, Tierra del Fuego)
Globoppia minor HAMMER, 1962 — Chile, Argentina (Tierra del Fuego)
Globoppia nidicola HAMMER, 1968 — New Zealand

Goyoppia BALOGH, 1983 (Figs 24.4)
Type-species: Oppia sexpilosa BALOGH, 1960 — Madagascar
Oppia longissima ZAI-GEN, 1987 — China
Oppia sagami AOKI, 1984 — Japan, Korea

Graptoppia (Apograptoppia) SUBIAS et RODRIGUEZ, 1985 (Figs 85—86)
Type-species: Dameosoma foveolatum PAOLI, 1908 — Italy

Graptoppia (Graptoppia) BALOGH, 1983 (Figs 22.5)
Type-species: Graptoppia (Graptoppia) paraanalis SUBIAS et RODRIGUEZ, 1985 — Palearctics
(= *Oppia* cf. *foveolata* sensu Bernini, 1973)
Frondoppia exigua MAHUNKA, 1983 — Brazil
Stenoppia italica quinquepilosa MORELL, 1987 — Spain
Oppia nukusia SHTANCHAEVA, 1984 — South USSR
Oppia parva KOK, 1967 — S. Africa, Spain
Oppia sundensis HAMMER, 1980 — Java, Borneo

Graptoppia (Stenoppia) BALOGH, 1983 (Figs 25.6)
Type-species: Oppia italica BERNINI, 1973 — Italy, Spain
(= *Oppia heterotricha* BERNINI, 1969)
Graptoppia africana MAHUNKA, 1987 — Nigeria
Oppia (?) angusta HAMMER, 1962 — Chile (Tierra del Fuego, Argentina, Patagonia)
(?) Oppia (?) multicorrugata HAMMER, 1962 — Chile
Brachioppia quathlambae KOK, 1967 — S. Africa
(?) Oppia senegalensis MAHUNKA, 1975 — W. Africa

(Gressittoppia) → Brachioppiella

Hammerella BALOGH, 1983 (Figs 15.5)
Type-species: Brachioppiella gracilis HAMMER, 1977 — NW Pakistan

(Hamoppia) → Lanceoppia

Helioppia BALOGH, 1983 (Figs 25.7)
Type-species: Oppia sol Balogh, 1958 — W. Africa, Kenyia

Heteroppia BALOGH, 1970 (Figs 17.2)
Type-species: Heteroppia globigera BALOGH, 1970 — Ceylon
(?) Oppia orthodactyla WILLMANN, 1931 — Java
Globoppia (Aeroppia) pauciseta HAMMEN, 1971 — Fiji, Philippines

Hypogeoppia SUBIAS, 1981 (Figs 9.5)
Type-species: Hypogeoppia terricola SUBIAS, 1981 — Spain
Oppia exempta MIHELČIČ, 1958 — Austria, USSR (Caucasia)
Dameosoma hypogeum PAOLI, 1908 — Italy, France
Hypogeoppia salmanticensis MORELL, 1987 — Spain

Intermedioppia SUBIAS et RODRIGUEZ, 1987 (Fig 92)
Type-species: Oppia alvarezi PÉREZ-INIGO, 1982 — Annobon Is. (W. Africa)

(Insculptoppia) → Ramusella

(Insculptoppiella) → Ramusella

Javieroppia MINGUEZ et SUBIAS, 1986 (Figs 99—100)
Type-species: Javieroppia cervus MINGUEZ et SUBIAS, 1986 — Spain

(Joboppia) → Neoppia

Karenella (Glabroppia) SUBIAS et MINGUEZ, 1986 (Fig 32)
Type-species: Oppia minutisetosa HAMMER, 1982 — Indonesia
Oppia cohici BALOGH et MAHUNKA, 1966 — W. Africa

Karenella (Karenella) HAMMER, 1962 (Figs 24.5)
Type-species: Karenella lobata HAMMER, 1962 — Chile
Oppia acuta CSISZÁR, 1961 — Java
Oppia lanceoseta BALOGH, 1959 — W. Africa
Oppia lanceoseta occidentalis WALLWORK, 1961 — Ghana
Oppia lanceosetoides HAMMER, 1971 — Fiji
Corynoppia turgiseta MAHUNKA, 1985 — Antilles

Karenella (Stakarenoppia) SUBIAS et RODRIGUEZ, 1986 (Figs 34—35)
Type-species: Stachyoppia granulosa SUBIAS et SARKAR, 1983 — India

Kokoppia BALOGH, 1983 (Figs 15.6)
Type-species: Brachioppia longisetosa KOK, 1967 — S. Africa
(?) Cryptoppia dendricola JELEVA et VU, 1987 — Vietnam

Oppia dudichi BALOGH, 1982 — Queensland
Oppia euramosa BALOGH et MAHUNKA, 1969 — Brazil
(?) Arcoppia gracilis WOAS, 1986 — El Salvador
Brachioppia pectinata — KOK, 1967 — S. Africa
Brachioppiella rafalskii HAMMER, 1968 — New Zealand

Kunoppia MAHUNKA, 1987 = **Medioppia** SUBIAS et MINGUEZ, 1985

(Lalmoppia) → Subiasella

Laminoppia HAMMER, 1968 (Figs 25.8)
Type-species: Laminoppia blocki HAMMER, 1968 — New Zealand

(Lancelalmoppia) → Lanceoppia

Lanceoppia (Baioppia) LUXTON, 1985 (Figs 58—59)
Type-species: Lanceoppia moritzi HAMMER, 1968 — New Zealand
Lanceoppia luxtoni HAMMER, 1968 — New Zealand

Lanceoppia (Bicristoppia) SUBIAS subgen. n. (Figs 62—63)
Type-species: Oppia bicristata HAMMER, 1962 — Patagonia
Oppia (?) binodosa HAMMER, 1962 — Chile
Oppia feideri HAMMER, 1968 — New Zealand

Lanceoppia (Convergoppia) BALOGH, 1983 (Figs 16.1)
Type-species: Oppia pletzeni HAMMER, 1968 — New Zealand
(?) Lanceoppia ewingi HAMMER, 1968 — New Zealand
(?) Pletzenoppia (?) rattura MAHUNKA, 1985 — S. Africa
(?) Lanceoppia schusteri HAMMER, 1968 — New Zealand

Lanceoppia (Hamoppia) HAMMER, 1968 (Figs 16.2)
Type-species: Hamoppia lionsi HAMMER, 1968 — New Zealand
(?) Lanceoppia schweizeri HAMMER, 1968 — New Zealand
(?) Oppia soosi BALOGH, 1982 — Queensland
Hamoppia thamdrupi HAMMER, 1968 — New Zealand
(?) Oppia turki HAMMER, 1968 — New Zealand

Lanceoppia (Lancelalmoppia) SUBIAS subgen. n. (Figs 60—61)
Type-species: Oppia perezinigoi HAMMER, 1968 — New Zealand
Lanceoppia banksi HAMMER, 1968 — New Zealand
Lanceoppia berlesei HAMMER, 1968 — New Zealand
Oppia nodosa HAMMER, 1958 — Argentina, India
Lanceoppia (?) thori HAMMER, 1968 — New Zealand
Lanceoppia vaneki HAMMER, 1968 — New Zealand

Lanceoppia (Lanceoppia) HAMMER, 1962 (Figs 16.3)
Type-species: Lanceoppia hexapili HAMMER, 1962 — Chile
Lanceoppia becki HAMMER, 1968 — New Zealand
Lanceoppia bertheti HAMMER, 1968 — New Zealand
Lanceoppia csiszarae HAMMER, 1968 — New Zealand
Oppia haarlovi HAMMER, 1968 — New Zealand
Lanceoppia jacoti HAMMER, 1968 — New Zealand
Lanceoppia knuellei HAMMER, 1968 — New Zealand
Oppia lancearia BALOGH et MAHUNKA, 1975 — Queensland
Lanceoppia maerkeli HAMMER, 1968 — New Zealand
Lanceoppia menkei HAMMER, 1968 — New Zealand
Oppia microlancearia BALOGH et MAHUNKA, 1975 — Queensland
(?) Oppia microtricha BALOGH et MAHUNKA, 1975 — Queensland
Oppia microtrichoides BALOGH et MAHUNKA, 1975 — Queensland
Lanceoppia piffli HAMMER, 1968 — New Zealand
Lanceoppia poppi HAMMER, 1968 — New Zealand
Lanceoppia ramsayi HAMMER, 1968 — New Zealand
(?) Lanceoppia rigidiseta HAMMER, 1968 — New Zealand
Lanceoppia sellnicki HAMMER, 1968 — New Zealand
Lanceoppia seydi HAMMER, 1968 — New Zealand
Lanceoppia strenzkei HAMMER, 1968 — New Zealand
Pletzenoppia (?) translucens MAHUNKA, 1985 — S. Africa
Lanceoppia vanderhammeni HAMMER, 1968 — New Zealand
Lanceoppia willmanni HAMMER, 1968 — New Zealand
(?) Lanceoppia woodringi HAMMER, 1968 — New Zealand

Laroppia SUBIAS gen. n. (Fig. 72)
Type-species: Oppia petiolata WALLWORK, 1977 — St. Helena

Lasiobelba AOKI, 1959 (Figs 77—78)
Type-species: Lasiobelba remota AOKI, 1959 — Japan, Korea
(?) Oppia abchasica TARBA, 1974 — USSR, Caucasus
(?) Dameosoma capilligerum BERLESE, 1916 — E. Africa
Oppia gibbosa MAHUNKA, 1985 — Malavi, Angola
Antennoppia granulata MAHUNKA, 1986 — Tanzania
Oppia heterosa WALLWORK, 1964 — Tchad (W. Africa)
(?) Oppia incisirostra WOAS, 1986 — El Salvador
Lasiobelba insignis BALOGH, 1970 — New Guinea
Antennoppia major MAHUNKA, 1983 — Tanzania
Antennoppia minor MAHUNKA, 1983 — Tanzania
Lasiobelba quadriseta SUBIAS nom. n.
(for *Daedaloplia sp.* HAUSER et MAHUNKA, 1983 — Greece)
(?) Damaeus rigidus EWING, 1909 — USA
Oppia rubida WALLWORK, 1977 — St. Helena
(?) Dameosoma subnitidum SELLNICK, 1924 — Brazil
Antennoppia trichoseta MAHUNKA, 1983 — Tanzania
Dameosoma ultraciliata JACOT, 1934 — Hawaii, Polynesia
Lasiobelba vietnamica BALOGH, 1983 — Vietnam
Antennoppia yoshii MAHUNKA, 1987 — Borneo

Lauroppia SUBIAS et RODRIGUEZ, 1986 (Figs 23—24)
Type-species: Dameosoma fallax PAOLI, 1908 — Holarctis
(= *Oppiella dubia* HAMMER, 1962 — Chile, New Zealand)
Oppia carniolica TARMAN, 1958 — Yugoslavia
(?) Oppia compositocarinata MIHELČIČ, 1958 — Austria
(?) Mahunkella decempectinata FUJIKAWA, 1986 — Japan
Oppia dentata GOLOSOVA et KARPPINEN, 1985 — Mongolia
Oppia denticulata GRISHINA, 1980 — USSR, (Siberia)
Oppiella distincta VASILIU et CALUGAR, 1981 — Roumania
Oppia doris E. PÉREZ-INIGO, 1978 — Spain
Oppia falcata marginedentata STRENZKE, 1951 — Central Europe
Dameosoma falcatum PAOLI, 1908 — Palearctis
Dameosoma falcatum var. maritimum WILLMANN, 1929 — Holarctis
(= *Oppia fissurata* HAMMEN, 1952 — Canada)
Eremaeus longilamellatus var. neerlandica OUDEMANS, 1900 — Palaearctis
Oppia maritima acuminata acuminata STRENZKE, 1951 — Europe, Greenland, Alaska
Oppia maritima carinthiaca MIHELČIČ, 1963 — Austria
Oppia notabilis GOLOSOVA et KARPPINEN, 1983 — USSR (Far East)
Belloppia orientalis ZAI-GEN et ZHAO-YI, 1988 — China
Hypogeoppia quadrituberculata MAHUNKA, 1987 — Hungary
Lauroppia similifallax SUBIAS et MINGUEZ, 1986 — Spain
Lauroppia tenuipectinata SUBIAS et RODRIGUEZ, 1988 — Spain
Dameosoma translamellatum WILLMANN, 1923 — Holarctis
Oppiella trapezoides GRISHINA, 1981 — USSR
Oppiella volcanensis HAMMER, 1962 — Chile

Liacaroppia SUBIAS et RODRIGUEZ, 1986 (Figs 25—26)
Type-species: Oppiella doryphoros J. BALOGH et P. BALOGH, 1983 — Hawaii

Lineoppia J. BALOGH et P. BALOGH, 1983 (Figs 37—38)
Type-species: Lineoppia frouini J. BALOGH et P. BALOGH, 1983 — New Caledonia
Oxyoppia mastax BALOGH et MAHUNKA, 1977 — Bolivia, Paraguay

Loboppia BALOGH, 1983 (Figs 16.4)
Type-species: Oppia covarrubiasi HAMMER, 1968 — New Zealand

(Lucioppia) → Subiasella

Mahunkella BALOGH, 1983 (Figs 9.6)
Type-species: Oppiella transitoria BALOGH et MAHUNKA, 1977 — Brazil

Medioppia SUBIAS et MINGUEZ, 1985 (Figs 11—12)
Type-species: Oppia media MIHELČIČ, 1956 — South Europe, South USSR

Dameosoma fallax var. obsoletum PAOLI, 1908 — Palaearctis, Greenland, New Zealand
(= *Dameosoma vitrinum* HULL, 1914)
Kunoppia hygrophila MAHUNKA, 1987 — Hungary
(?) Oppia lamellata GOLOSOVA et KARPPINEN, 1985 — Mongolia
Oppia loksai SCHALK, 1966 — Roumania
Oppia melisi VALLE, 1949 — Italy, Spain
Medioppia minidentata SUBIAS et RODRIGUEZ, 1988 — Spain
Oppia parva LOMBARDINI, 1952 — Italy
Eremaeus subpectinatus OUDEMANS, 1900 — Holarctis
(= *Oppia bulanovae* KULIEV, 1962)
(= *Oppia globosa* MIHELČIČ, 1956)
(= *Oppia paoliana* COOREMAN, 1941)
(= *Beba [Dameosoma] pectinata* "lapsus" BERLESE, 1892)
(= *Oppia zachvatkini* KULIEV, 1962)
Medioppia tridentata SUBIAS et MINGUEZ, 1985 — Spain
Oppia tuberculata BULANOVA-ZACHVATKINA, 1964 — USSR
Oppia vera MIHELČIČ, 1956 — Spain, Roumania

Medioxyoppia SUBIAS gen. n. (Fig 13)
Type-species: Oppia yuvana AOKI, 1983 — Japan
Oppia actirostrata AOKI, 1983 — Japan
Oxyoppia acuta AOKI, 1984 — Japan
(?) Oppia mastigophora GOLOSOVA, 1970 — Far East (Siberia, Kurili Is.)

Membranoppia (Membranoppia) HAMMER, 1968 (Figs 17.4)
Type-species: Membranoppia krivolutskyi HAMMER, 1968 — New Zealand
(= *Membranoppia karppineni* HAMMER, 1968 — New Zealand)
(?) Oppia breviclava HAMMER, 1958 — Argentina
Membranoppia sitnikovae HAMMER, 1968 — New Zealand
Oppia (?) truncata HAMMER, 1961 — Peru
Oppia tuxeni HAMMER, 1968 — New Zealand

Membranoppia (Pravoppia) LUXTON, 1985 (Figs 54—55)
Type-species: Oppia disjuncta WALLWORK, 1964 — Campbell Is.
Oppia argentinensis BALOGH et CSISZÁR, 1963 — Argentina (Patagonia)
Globoppia campbellensis WALLWORK, 1964 — Campbell Is.
Oppia loxolineata WALLWORK, 1965 — Antarctic and Subantarctic
(= *Oppia loxolineata longipilosa* COVARRUBIAS, 1968)
Oppia patagonica MAHUNKA, 1980 — Argentina (Patagonia)
Oppia pseudocorrugata MAHUNKA, 1980 — Argentina (Patagonia)
Oppia scotiae WALLWORK, 1970 — Subantarctic islands
Oppia ventrolaminata HAMMER, 1962 — Argentina (Patagonia)
Globoppia wallworki MAHUNKA, 1980 — Argentina (Patagonia)

Microppia BALOGH, 1983 (Figs 9.7)
Type-species: Dameosoma minus PAOLI, 1908 — Cosmopolite
(? = *Oppia minus simplex* JACOT, 1938)
(= *Oppia minutissima* SELLNICK, 1950)
Microppia minus longisetosa SUBIAS et RODRIGUEZ, 1988 — Spain

Mimoppia BALOGH, 1983 (Figs 15.7)
Type-species: Oppia tenuiseta WALLWORK, 1961 — W. Africa
(?) Arcoppia dendropectinata WOAS, 1986 — El Salvador

Miroppia HAMMER, 1968 (Figs 9.8)
Type-species: Miroppia zealandica Hammer, 1968 — New Zealand

Moritziella BALOGH, 1983 → = **Moritzoppia** SUBIAS et RODRIGUEZ, 1988

Moritzoppia SUBIAS et RODRIGUEZ, 1988 (Figs 9.9)
Type-species: Oppia keilbachi MORITZ, 1969 — Germany, Great Britain
Oppia clavigera HAMMER, 1952 — North Holarctic
Moritziella escotata SUBIAS et RODRIGUEZ, 1986 — Spain
Notaspis hamatus PEARCE, 1906 — Himalaya
(?) Oppia lebedevi RJABININ, 1975 — USSR (Far East)
Moritziella longilamellata SUBIAS et RODRIGUEZ, 1986 — Spain

Oppia longogisterosoma KULIJEV, 1962 — USSR (Azerbaijan)
(?) Oppia punctata MIHELČIČ, 1958 — Austria
(?) Oppia sitnikovae KULIEV, 1962 — USSR (Caucasus)
(?) Oppia tridentata FORSSLUND, 1942 — Sweden, Austria
Moritziella uherkovichi MAHUNKA, 1985 — Hungary
Dameosoma unicarinatum PAOLI, 1908 — ? Holarctis
(= *Dameosoma formosum* HULL, 1914)
(= *Oppia lignivora* JACOT, 1939)
(= *Oppia fixa* MIHELČIČ, 1956)
Moritziella unicarinata cristata SUBIAS et RODRIGUEZ, 1986 — Spain
Moritziella unicarinata unicarinatoides SUBIAS et RODRIGUEZ, 1986 — ? Holarctis

(Multilanceoppia) → Multioppia

Multioppia (Furculoppia) BALOGH, 1983 (Figs 20.4)
Type-species: Oppia ramulifera KUNST, 1959 — South Europe
(= *Oppia furcata* KUNST, 1958; n. praeocc. WILLMANN, 1918)

Multioppia (Multilanceoppia) SUBIAS subgen. n. (Figs 101—102)
Type-species: Multioppia ramulifera carpatica SCHALK, 1966 — Roumania
Multioppia brevipectinata SUZUKI, 1976 — Japan, Korea
Multioppia insularis MAHUNKA, 1985 — Antilles
Multioppia brevipectinata lenis FUJITA et FUJIKAWA, 1987 — N. Japan
Multioppia pankovi RJABININ, 1987 — USSR (Far East)

Multioppia (Multioppia) HAMMER, 1961 (Figs 22.7)
Type-species: Multioppia radiata HAMMER, 1961 — Peru, Antilles
Multioppia australis HAMMER, 1962 — Chile
Multioppia excisa MORITZ, 1961 — C. Europe
Multioppia furugelma RJABININ, 1987 — USSR (Far East)
Multioppia gapsaensis CHOI, 1986 — Korea
(?) Oppia ghiljarovi KULIEV, 1962 — USSR (Cacucasus)
Oppia glabra MIHELČIČ, 1971 — Palearctis
Multioppia gracilis HAMMER, 1972 — Tahiti
Multioppia indica HAQ, 1978 — India
Multioppia insulana PÉREZ-INIGO, 1982 — Annobon Is. (W. Africa)
Multioppia laniseta MORITZ, 1965 — Europe, Caucasus
(? = Oppia sexmaculata DALENIUS, 1950 — Sweden, Finland
(? = Dameosoma clavipectinat var. lamellatum THAMDRUP, 1932 — N. Europe
Multioppia laniseta hungarica MAHUNKA, 1983 — Hungary
Multioppia longisetosa MAHUNKA, 1986 — Kenya
Multioppia moritzi MAHUNKA et TOPERCER, 1983 — Czechoslovakia
Multioppia neglecta PÉREZ-INIGO, 1969 — Spain, Great Britain
Multioppia pakistanensis HAMMER, 1977 — NW Pakistan
Multioppia pauciramosa J. BALOGH et P. BALOGH, 1986 — New Guinea
Multioppia perfecta MAHUNKA et TOPERCER, 1983 — Czechoslovakia
Multioppia pulchra LITTLEWOOD et WALLWORK, 1972 — Great Britain
Multioppia similis MAHUNKA, 1982 — Fiji
Multioppia spinifera MAHUNKA, 1982 — Tahiti
Multioppia stellifera HAMMER, 1961 — Peru, India
Multioppia tamdao MAHUNKA, 1988 — Vietnam
Multioppia translamellaris J. BALOGH et P. BALOGH, 1986 — New Guinea
Multioppia trembleyi MAHUNKA, 1977 — Seychelles, Mauritius, Réunion
Multioppia wilsoni AOKI, 1964 — ? Cosmopolita
(? = *Oppia carolinae* JACOT, 1938 — USA)
(? = *Oppia carolinae barbatis* JACOT, 1938 — USA)

(Multipulchroppia) → Pulchroppia

Mystroppia BALOGH, 1959 (Fig 11.3)
Type-species: Mystroppia sellnicki BALOGH, 1959 — Hungary, South USSR
Mystroppia dallasi BERNINI, 1973 — Italy
Mystroppia rethejumi KRIVOLUTSKY, 1971 — South USSR

Neoamerioppia (Amerigloboppia) SUBIAS subgen. n. (Figs 73—74)
Type-species: Amerioppia espeletiarum P. BALOGH, 1984 — Colombia
Oppia badensis WOAS, 1986 — W. Germany
(?) Globoppia centraliamericana MAHUNKA, 1983 — Mexico

Amerioppia extrema MAHUNKA, 1985 — Antilles
Oppia salvadoriensis WOAS, 1986 — El Salvador
Amerioppia senecionis P. BALOGH et J. BALOGH, 1984 — Colombia

Neoamerioppia (Neoamerioppia) SUBIAS gen. n. (Figs 21.1)
Type-species: Amerioppia decemsetosa HAMMER, 1973 — Tonga Is.
Amerioppia aeleni MAHUNKA, 1982 — Fiji Is.
Amerioppia africana KOK, 1967 — S. Africa, St. Paul Is., New Amsterdam Is.
Amerioppia asiatica HAMMER, 1977 — W. Pakistan
Amerioppia chavinensis HAMMER, 1961 — Peru
Amerioppia chilensis HAMMER, 1962 — Chile
Amerioppia cocuyana P. BALOGH, 1984 — Colombia
Oppia deficiens BALOGH, 1959 — W. Africa
Amerioppia extrusa MAHUNKA, 1983 — Tanzania
Amerioppia flagellata HAMMER, 1975 — Sahara
Amerioppia foveolata MAHUNKA, 1984 — Tanzania
Amerioppia hamidi AL-ASSIUTY et EL-DEEB, 1983 — Egypt
Amerioppia hexapilis HAMMER, 1961 — Peru
Amerioppia interrogata MAHUNKA, 1976 — Hong-Kong, Philippines
Oppia lanceolata HAMMER, 1958 — Argentina, Peru
Amerioppia longiclava HAMMER, 1962 — Patagonia, New Zealand
Amerioppia longiclava microseta J. BALOGH et P. BALOGH, 1986 — New Guinea
Oppia longicoma HAMMER, 1958 — Bolivia
Amerioppia minima HAMMER, 1961 — Peru
Oppia nagyi MAHUNKA, 1969 — Tanzania
Oppia notata HAMMER, 1958 — Bolivia
Amerioppia papuana J. BALOGH et P. BALOGH, 1986 — New Guinea
Amerioppia paripilis HAMMER, 1961 — Peru
Amerioppia pectigera HAMMER, 1961 — Peru
Amerioppia polygonata MAHUNKA, 1982 — Ethiopia
Oppia rotunda HAMMER, 1958 — Bolivia
Amerioppia similis COVARRUBIAS, 1967 — Chile
Amerioppia sturmi P. BALOGH, 1984 — Colombia
Oppia trichosa HAMMER, 1958 — Bolivia, Peru
Amerioppia trichosoides HAMMER, 1961 — Peru
Amerioppia ventrosquamosa HAMMER, 1979 — Java
Amerioppia vicina HAMMER, 1971 — Fiji, Java
Amerioppia woolley HAMMER, 1968 — New Zealand, Fiji, Samoa

Neoppia (Joboppia) RUIZ, MINGUEZ et SUBIAS, 1988 (Figs 3—4)
Type-species: Neoppia (Joboppia) dichosa RUIZ, MINGUEZ et SUBIAS, 1988

Neoppia (Neoppia) BATTACHARYA et BANERJEE, 1981 (Figs 1—2)
Type: species: Neoppia minuta BATTACHARYA et BANERJEE, 1981 — India
Multioppia bayoumii AL-ASSIUTY et EL-DEEB, 1983 — Egypt
Neoppia (Neoppia) discreta RUIZ, MINGUEZ et SUBIAS, 1988 — Spain
Antilloppia schauenbergi MAHUNKA, 1985 — Antilles

Neostrinatina MAHUNKA, 1979 (Figs 9.10)
Type-species: Neostrinatina mixoppia MAHUNKA, 1979 — Guatemala

Neotrichoppia (Ancestroppia) SUBIAS et RODRIGUEZ, 1986 (Fig 27)
Type-species: Neoppia (Ancestroppia) berninii SUBIAS et RODRIGUEZ, 1986 — Italy, Spain
(= *Oppia confinis* BERNINI, 1973 [partim] nec PAOLI, 1908)

Neotrichoppia (Confinoppia) SUBIAS et RODRIGUEZ, 1986 (Figs 28—29)
Type-species: Dameosoma confine PAOLI, 1908 — C. and S. Europe, USSR (Caucasus)
Oppia getica VASILIU et CALUGAR, 1981 — Roumania
Oppia gibber MAHUNKA, 1982 — Greece
Oppia variabilis ITURRONDOBEITIA et SUBIAS, 1981 — Spain
Oppiella zushi AOKI, 1984 — Japan

Neotrichoppia (Neotrichoppia) SUBIAS et ITURRONDOBEITIA, 1980 (Figs 9.11)
Type-species: Neotrichoppia pseudoconfinis SUBIAS et ITURRONDOBEITIA, 1980 — Spain

Nesoppia LUXTON, 1985 = **Membranoppia (Membranoppia)** HAMMER, 1968

Niloppia BALOGH, 1983 (Figs 23.4)
Type-species: Oppia sticta POPP, 1960 — Egypt

Octoppia BALOGH et MAHUNKA, 1969 (Figs 20.6)
Type-species: Octoppia Irmayi BALOGH et MAHUNKA, 1969 — Amazonia

Oligoppia BALOGH, 1983 (Figs 21.3)
Type-species: Amerioppia octocoma HAMMER, 1973 — Samoa

Operculoppia HAMMER, 1968 (Figs 25.10)
Type-species: Operculoppia kunsti HAMMER, 1968 — New Zealand

Oppia C. L. KOCH, 1836 (Figs 23.5)
Type-species: Oppia nitens C. L. KOCH, 1836 — Holarctis
Oppia arcidiaconoae BERNINI, 1973 — Mediterranean Region
Dameosoma capense PAOLI, 1908 — S. Africa
Damaeus cephalotus HALL, 1911 — USA
(?) Oppia coloradensis WOOLLEY, 1969 — USA
Oppia concolor tridentata PÉREZ-IÑIGO, 1976 — Canary Is.
Belba denticulata G. et R. CANESTRINI, 1882
(= *Oppia cyclosoma* MIHELČIČ, 1955)
(? = *Oppia grandis* MIHELČIČ, 1955 — Austria)
(= *Oppia willmanni* OUDEMANS, 1937)
Dameosoma denticulatum var. ewingi BERLESE, 1917 — USA
Dameosoma denticulatum var. subuligerum BERLESE, 1917 — Argentina
Dameosoma elongatum PAOLI, 1908 — Italia, Bulgaria
Cilioppia hesperidiana PÉREZ-IÑIGO, 1986 — Canary Is.
Oppia kuehnelti CSISZÁR, 1961 — Oriental Region
(= *Oppia yodai* AOKI, 1965 — Thailand)
(? = *Oribata perolata* BANKS, 1909)
(? = *Belba minuta* BANKS, 1895)
(? = *Dameosoma nitens var. myrmecophila* SELLNICK, 1928)
Oppia nitens brachytrichinus DALENIUS et WILSON, 1958 — Crozet Is.
Oppia speciosa GOLOSOVA, 1981 — USSR (Far East)
Oppia yodai africana KOK, 1967 — S. Africa, Mauritius, Réunion
Oppia varians WALLWORK, 1961 — W. Africa, St. Helena, Saudi-Arabia

Oppiella (Oppiella) JACOT, 1937 (Figs 9.12)
Type-species: Eremaeus novus OUDEMANS, 1902 — Cosmopolite
(= *Oppiella aegyptiaca* ELBADRY et NASR, 1974 — Egypt)
(? = *Oppiella chistyakovi* RJABININ, 1975 — USSR [Siberia, Far East])
(= *Oppiella corrugata apicalis* JACOT, 1937 — USA)
(= *Oppiella corrugata squarrosa* JACOT, 1937 — USA)
(= *Dameosoma corrugatum* BERLESE, 1904)
(= *Dameosoma corrugatum var. intralamellatum* THAMDRUP, 1932 — Denmark)
(= *Dameosoma krygeri* TRÄGARDH, 1931 — Faeroe Is.)
(= *Oppia neerlandica var. sumatrensis* WILLMANN, 1931 — Sumatra)
(= *Oppiella nova palustris* LASKOVA, 1980 — USSR [Kursk])
(= *Oppiella orientata* RJABININ, 1975 — USSR [Far East])
(? = *Oppia rossica* BULANOVA-ZACHVATKINA, 1964 — USSR)
(= *Notaspis sculptilis* WARBURTON et PEARCE, 1905 — Great Britain)
(= *Dameosoma uliginosum* WILLMANN, 1919 — Germany)
(? = *Oppia washburni* HAMMER, 1952 — Canada, Alaska)
Oppiella baburini RJABININ, 1979 — USSR (Far East)
Oppia primorica GOLOSOVA, 1969 — USSR

Oppiella (Perspicuoppia) PÉREZ-INIGO, 1971 (Figs 9.14)
Type-species Oppia perspicua MIHELČIČ, 1956 — Spain, USSR (Caucasus, Crimea)
Perspicuoppia minidentata SUBIAS, 1977 — Spain, USSR (Caucasus, Crimea)

Otoppia BALOGH, 1983 (Figs 17.5)
Type-species: Oppia midas BALOGH, 1962 — Madagascar

Oxybrachioppiella SUBIAS gen. n. (Figs 51—52)
Type-species: Brachioppiella ctenifera barbata CHOI, 1986 — Korea
Oppia ctenifera GOLOSOVA, 1970 — USSR (Far East)

Oxyoppia (Aciculoppia) SUBIAS et RODRIGUEZ, 1986 (Figs 43—44)
Type-species: Oxyoppia? genavensium MAHUNKA, 1982 — Mexico
Oxyoppia clavata AOKI, 1983 — Japan

Oxyoppia (Dzarogneta) KULIEV, 1978 (Figs 39—40)
Type-species: Oppia dubia KULIEV, 1966 — USSR (Caucasia)
Oxyoppia cristata HAMMER, 1977 — NW. Pakistan
Oxyoppia (Pectinoppia) intermedia SUBIAS et RODRIGUEZ, 1986 — Spain
Oppia latisternalis BALOGH et MAHUNKA, 1974 — Cuba
Oppia pluripectinata BALOGH, 1958 — W. Africa
(?) Oppia sadbinia SHTANCHAEVA, 1984 — USSR (Nukus Region)
Oxyoppia yepesensis MUÑOZ-MINGARRO, 1987 — Spain

Oxyoppia (Oxyoppia) BALOGH et MAHUNKA, 1969 (Figs 9.13)
Type-species: Oppia spinosa HAMMER, 1958 — Bolivia
(?) Oxyoppia complicata MAHUNKA, 1986 — Kenya
(= *Oxyoppia clavata* "lapsus" MAHUNKA, 1986)
(?) Oxyoppia polita P. BALOGH, 1984 — Colombia

Oxyoppia (Oxyoppiella) SUBIAS et RODRIGUEZ, 1986 (Figs 45—46)
Type-species: Oppiella polynesia HAMMER, 1972 — Tahiti, India
Oppia baliensis HAMMER, 1982 — Bali
Oppia bituberculata BALOGH, 1958 — W. Africa, St. Paul Is., New Amsterdam Is.
Oppia bituberculata cognata WALLWORK, 1961 — Ghana
Oxyoppia cubana BALOGH et MAHUNKA, 1980 — Cuba
(?) Oxyoppia europaea MAHUNKA, 1982 — Hungary
Oxyoppia incurva AOKI, 1983 — Japan
Oxyoppia pilosa BALOGH et MAHUNKA, 1981 — Paraguay
(?) Oppia saskai BALOGH, 1961 — E. Africa
Oppia scalifera HAMMER, 1958 — Argentina, Peru, Philippines
(?) Oxyoppia spiculifera MAHUNKA, 1985 — S. Africa
Oxyoppia struthio MAHUNKA, 1983 — Tanzania
Oppia suramericana HAMMER, 1958 — S. America, New Zealand, India

(Oxyoppiella) → **Oxyoppia**

Oxyoppioides SUBIAS et MINGUEZ, 1985 (Fig 53)
Type-species: Dameosoma decipiens PAOLI, 1908 — South Palearctis
Oppia paradecipiens KULIEV, 1967 — USSR (Carpathian Ukraine)

(Paragloboppia) → **Vietoppia**

Pararectoppia MAHUNKA, 1987 = **Subiasella (Lalmoppia)** Subias et Rodriguez, 1986

Parasynoppia AOKI, 1983 = **Elaphoppia** BALOGH, 1983

Paroppia HAMMER, 1968 (Figs 25.11)
Type-species: Paroppia lebruni HAMMER, 1968 — New Zealand
(?) Oppia breviseta BALOGH, 1962 — E. Africa
Paroppia flagellata J. BALOGH et P. BALOGH, 1983 — Hawaii
Paroppia hawaiiensis J. BALOGH et P. BALOGH, 1983 — Hawaii

Pectinoppia SUBIAS et RODRIGUEZ, 1986 = **Oxyoppia (Dzarogneta)** KULIEV, 1978

(Perspicuoppia) → **Oppiella**

(Plaesioppia) → **Brassoppia**

Pletzenoppia BALOGH, 1983 (Figs 15.8)
Type-species: Oppia pletzenae KOK, 1967 — S. Africa
(?) Pletzenippia (?) aseta MAHUNKA, 1986 — S. Africa
(?) Oppia inclinata HAMMER, 1962 — Patagonia

Pluritrichoppia SUBIAS et ARILLO (in litt.) (Figs 75—76)
Type-species: Pluritrichoppia insolita SUBIAS et ARILLO, 1988 — Spain

Polyoppia HAMMER, 1968 (Figs 24.6)
Type-species: Polyoppia baloghi HAMMER, 1968 — New Zealand
(?) Dameosoma magnum SELLNICK, 1924 — Brazil

Porrhoppia BALOGH, 1970 (Figs 15.9)
Type-species: Porrhoppia crux BALOGH, 1970 — Ceylon

(Pravoppia) → **Membranoppia**

Processoppia BALOGH, 1983 (Figs 25.13)
Type-species: Oppia oudemansi HAMMER, 1968 — New Zealand
Oppia mihelcici HAMMER, 1968 — New Zealand
Rhaphoppia sphagnicola J. BALOGH et P. BALOGH, 1986 — New Guinea

Pseudoamerioppia SUBIAS gen. n. (Figs 90–91)
Type-species: Oppia barrancensis paraguayensis BALOGH et MAHUNKA, 1981 — Paraguay
Amerioppia ankae MAHUNKA, 1974 — Zimbabwe
Oppia (?) barrancensis HAMMER, 1961 — Peru, Mexico, Philippines
Oppia deficiens var. circumciliata BALOGH, 1959 — W. Africa
Oppia deficiens lamellata WALLWORK, 1961 — W. Africa (Ghana)
Amerioppia javensis HAMMER, 1979 — Java
(?) Damaeus minutus EWING, 1917 — USA
Amerioppia vietnamica MAHUNKA, 1988 — Vietnam

Ptiloppia BALOGH, 1983 (Figs 9.15)
Type-species: Oppiella bulanovae HAMMER, 1968 — New Zealand

Pulchroppia (Multipulchroppia) SUBIAS gen. n. (Figs 5–6)
Type-species: Multioppia berndhauseri MAHUNKA, 1978 — Mauritius
Multioppia amazonica BALOGH et MAHUNKA, 1969 — Brazil
(?) Multioppia graeca MAHUNKA, 1977 — Greece
Multioppia gyoergyi BALOGH et MAHUNKA, 1969 — Bolivia
Multioppia pectinata AOKI, 1967 — Thailand
Multioppia schauenbergi MAHUNKA, 1978 — Réunion
Pulchroppia similis HAMMER, 1979 — Java
Multioppia vietnamica BALOGH, 1983 — Vietnam
(= *Multioppia pectinata* BALOGH et MAHUNKA, 1967 nom. praeocc.)

Pulchroppia (Pulchroppia) HAMMER, 1979 (Figs 20.7)
Type-species: Pulchroppia elegans HAMMER, 1980 — Java
Pulchroppia bruckhardti MAHUNKA, 1987 — Borneo
Pulchroppia granulata MAHUNKA, 1988 — Vietnam
Brachioppiella malapectinata CORPUZ-RAROS, 1979 — Philippines
Brachioppia pendula BALOGH, 1970 — Ceylon

Pulchroppiella BALOGH, 1983 (Figs 22.8)
Type-species: Oppia plurisetosa MIHELČIČ, 1956 — Spain
Pulchroppiella littlewoodi SUBIAS nom. n.
(pro Multioppia sp. LITTLEWOOD, 1972 — Great Britain)
Oppia palustrisetisa MIHELČIČ, 1956 — Spain

Ramuloppia BALOGH, 1961 (Figs 15.10)
Type-species: Oppia ramiseta BALOGH, 1959 — W. Africa
Oppia ramiseta atypica WALLWORK, 1961 — Ghana

Ramusella (Insculptoppia) SUBIAS, 1980 (Figs 22.6)
Type-species: Dameosoma insculptum PAOLI, 1908 — S. Palearctic
(? = *Oppia shaldybinae* KULIEV, 1962)
Ramusella (Insculptoppia) anuncata SUBIAS et RODRIGUEZ, 1986 — Spain
Amolops begnalii HULL, 1916 — Great Britain
Oppia berninii PÉREZ-INIGO, 1975 — Spain
Lohmannia elliptica BERLESE, 1908 — ? S. Palearctis
Ramusella (Insculptoppia) elmela SUBIAS et RODRIGUEZ, 1986 — NW. Pakistan
Dameosoma furcatum WILLMANN, 1928 — Germany
Oppia golosovae RJABININ, 1987 — USSR (Far East)
Ramusella insularis RJABININ, 1987 — USSR (Far East)
Brachioppia japonica AOKI, 1983 — Japan
(?) Oppia krivolutskyi KULIEV, 1966 — USSR
Oppia merimna BALOGH et MAHUNKA, 1977 — Brazil
Brachioppiella sheshanensis ZAI-GEN, AOKI et XIAO-ZU, 1984 — China
(?) Oppia soror BALOGH, 1958 — W. Africa, Tanzania, USSR (Caucasus, Crimea)
Oppia soror fusiformis WALLWORK, 1961 — Ghana, Tchad
Brachioppia (?) suciui HAMMEN, 1968 — New Zealand, ? Spain
Ramusella (Insculptoppia) terricola SUBIAS et RODRIGUEZ, 1986 — Spain

Ramusella (Insculptoppiella) SUBIAS et RODRIGUEZ, 1986 (Fig 87)
Type-species: Oppia alfonsii BERNINI, 1980 — Italy

Ramusella (Ramusella) HAMMER, 1962 (Figs 22.9)
Type-species: Ramusella puertomonttensis HAMMER, 1962 — ? Cosmopolite
Oppia alejnicovae GATILOVA et KRIVOLUTSKY, 1974 — USSR
Oppia assimilis MIHELČIČ, 1950 — ? Holarctis
(? = *Dameosoma alces* JACOT, 1934 — Hawaii)

(? = *Notaspis clavipectinata* MICHAEL, 1885)
(= *Oppia taminae* RJABININ, 1975)
Ramusella (Ramusella) assimiloides SUBIAS et RODRIGUEZ, 1987 — Spain
Oppia chulumaniensis HAMMER, 1958 — Bolivia, Peru, Java
Ramusella chulumaniensis var. curtipilus HAMMER, 1971 — Pacific Area
(?) Oppia cordobensis BALOGH et MAHUNKA, 1968 — S. America
Ramusella (Ramusella) defectuosa SUBIAS et RODRIGUEZ, 1987 — Spain
(?) Brachioppia filamentosa MAHUNKA, 1985 — S. Africa
Brachioppia filigera MAHUNKA, 1985 — S. Africa
Oppia fusiformis var. lyroseta WALLWORK, 1964 — Tchad
Bioppia gyrata MAHUNKA et PAOLETTI, 1984 — Italy
Oppia hippy MAHUNKA, 1983 — Mexico
Ramusella junonis PÉREZ-IÑIGO, 1986 — Canary Is.
Oppia nana WOAS, 1986 — El Salvador
(?) Oppia paillei MAHUNKA, 1980 — Morocco
Oppia philippinensis MAHUNKA, 1982 — Philippines
Ramusella pinifera MAHUNKA, 1988 — Borneo
(?) Oppia pocsi BALOGH et MAHUNKA, 1967 — Vietnam
(?) Oppia remyi KARPPINEN, 1966 — Guinea
Ramusella sengbuschi HAMMER, 1968 — ? Cosmopolite
(= *Oppia insolita* MIHELČIČ, 1956 — Spain)
(= *Oppia tokyoensis* AOKI, 1974 — Japan)
Ramusella (Ramusella) tasetata SUBIAS, 1980 — NW. Pakistan
Ramusella (Ramusella) translamellata SUBIAS, 1980 — Spain, Canary Is.
(?) Oppia triacantha MAHUNKA, 1983 — Mexico
Ramusella tuberculata MAHUNKA et TOPERCER, 1983 — Czechoslovakia

Ramusella (Rectoppia) SUBIAS, 1980 (Figs 22.10)
Type-species: Oppia mihelcici PÉREZ-IÑIGO, 1965 — S. Palearctic Area
(? = Oppia guelticola HAMMER, 1975 — Sahara)
Oppia debililamellata KULIEV, 1962 — USSR (Caucasus)
Dameisoma fasciatum PAOLI, 1908 — Holarctis
(?) Oppia incisiva BALOGH et MAHUNKA, 1980 — Cuba
Oppia radiata BALOGH, 1961 — E. Africa
Ramusella (Rectoppia) rhinina SUBIAS et MINGUEZ, 1981 — Spain
Oppia sahariensis HAMMER, 1975 — Mediterranean Region
Oppia strinatii MAHUNKA, 1980 — Morocco
Ramusella (Rectoppia) strinatii curtiramosa SUBIAS et RODRIGUEZ, 1987 — Spain

Ramuselloppia SUBIAS et RODRIGUEZ, 1986 (Figs 88—89)
Type-species: Ramuselloppia anomala SUBIAS et RODRIGUEZ, 1986

(Rectoppia) → Ramusella

(Reductoppia) → Similoppia

Rhaphoppia BALOGH, 1983 = **Processoppia** BALOGH, 1983

Rhinoppia BALOGH, 1983 (Figs 9.16)
Type-species: Oppia nasuta MORITZ, 1965 — Germany

Rugoppia MAHUNKA, 1986 (Figs 30—31)
Type-species: Rugoppia louisiae MAHUNKA, 1986 — Tanzania

(Sabahoppia) → Ramusella

Ramusella (Sabahoppia) MAHUNKA, 1987 (Figs 103—104)
Type-species: Sabahoppia hauseri MAHUNKA, 1987 — Borneo
(? = *Xenillus blattarum* OUDEMANS, 1911 — Java)

Sacculoppia BALOGH et MAHUNKA, 1968 (Figs 9.17)
Type-species: Sacculoppia singularis BALOGH et MAHUNKA, 1968 — Argentina

Separatoppia MAHUNKA, 1983 (Figs 41—42)
Type-species: Oppia africana EVANS, 1953 — E. Africa

Serratoppia SUBIAS et MINGUEZ, 1985 (Figs 16—17)
Type-species: Oppia serrata MIHELČIČ 1956 — Spain, France, Belgium, Roumania
Oppia duffyi Evans, 1954 — Ireland
Serratoppia intermedia SUBIAS et RODRIGUEZ, 1988 — Spain
Serratoppia minima SUBIAS et RODRIGUEZ, 1988 — Spain
Serratoppia toletana MUÑOZ-MINGARRO, 1987 — Spain

Setoppia BALOGH, 1983 (Figs 16.5)
Type-species: Oppia toeroeki BALOGH, 1982 — Queensland
Lanceoppia angustopili HAMMER, 1962 — Chile
Oppia antennata BALOGH et MAHUNKA, 1966 — S. Africa
Oppia bornemisszai BALOGH, 1982 — Australia
Tectoppiella clavimera MAHUNKA, 1985 — S. Africa
Oppia compressa BALOGH et MAHUNKA, 1975 — Queensland
Oppia fortis BALOGH et MAHUNKA, 1966 — S. Africa
Tectoppia karinae MAHUNKA, 1974 — Zimbambwe
Oppia longisetosa BALOGH et MAHUNKA, 1975 — Queensland
(?) Lanceoppia mahunkai HAMMER, 1968 — New Zealand
Oppia quattuor KOK, 1967 — S. Africa
Oppia strinovichi BALOGH, 1982 — Australia
Oppia toxotes BALOGH, 1982 — Australia
Tectoppiella tuberosa, MAHUNKA, 1984 — S. Africa
Tectoppiella verrucosa MAHUNKA, 1985 — S. Africa

Setuloppia BALOGH, 1983 (Figs 16.6)
Type-species: Oppia newelli HAMMER, 1968 — New Zealand

Sphagnoppia J. BALOGH et P. BALOGH, 1986 (Figs 64—65)
Type-species: Sphagnoppia biflagellata J. BALOGH et P. BALOGH, 1986 — New Guinea
Oppia durhamensis METZ et SHARMA, 1975 — USA

Similoppia (Reductoppia) P. BALOGH, 1984 (Figs 81—82)
Type-species: Reductoppia espeletiae P. BALOGH, 1984 — Colombia

Similoppia (Similoppia) MAHUNKA, 1983 (Figs 79—80)
Type-species: Similoppia halterata MAHUNKA, 1983 — Tanzania

Solenoppia (Campbelloppia) LUXTON, 1985 (Figs 9—10)
Type-species: Oppia diaphora WALLWORK, 1964 — Campbell Is.

Solenoppia (Solenoppia) HAMMER, 1968 (Figs 25.15)
Type-species: Solenoppia grandjeani HAMMER, 1968 — New Zealand
Solenoppia taberlyi HAMMER, 1968 — New Zealand
Solenoppia travei HAMMER, 1968 — New Zealand

Stachyoppia BALOGH, 1961 (Figs 11.4)
Type-species: Stachyoppia muscicola BALOGH, 1961 — E. Africa

(Stakarenoppia) → Karanella

(Stenoppia) → Graptoppia

Striatoppia BALOGH, 1958 (Figs 11.5)
Type-species: Striatoppia machadoi BALOGH, 1958 — W. Africa, India
Striatoppia baloghi MAHUNKA, 1974 — Cameroon
Striatoppia breviclava MAHUNKA, 1982 — Ethiopia
Oppiella foliosa JACOT, 1937 — USA
Striatoppia hammeni MAHUNKA, 1977 — Oriental Region
Striatoppia lanceolata HAMMER, 1972 — Tahiti, India
Striatoppia madagascarensis BALOGH, 1960 — Madagascar
Striatoppia margaritata MAHUNKA, 1969 — Tanzania
Striatoppia margaritifera BALOGH et MAHUNKA, 1966 — W. Africa
Striatoppia modesta MAHUNKA, 1988 — Borneo
Striatoppia multilineata CORPUZ-RAROS, 1979 — Philippines
Oppiella niliaca POPP, 1960 — Egypt, India, Saudi Arabia
Striatoppia opuntiseta BALOGH et MAHUNKA, 1968 — ? Circumtropical
Striatoppia papillata BALOGH et MAHUNKA, 1966 — W. Africa, Egypt
Striatoppia quadrilineata HAMMER, 1982 — Indonesia
Striatoppia similis SUBIAS et SARKAR, 1983 — India
Oppiella stipularis JACOT, 1937 — USA
Striatoppia tribuliformi BALOGH et MAHUNKA, 1981 — Paraguay
Striatoppia tripurensis SUBIAS et SARKAR, 1983 — India

Subiasella (Dividoppia) MAHUNKA, 1987 (Figs 97—98)
Type-species: Dividoppia aperta MAHUNKA, 1987 — Hungary

Subiasella (Lalmoppia) SUBIAS et RODRIGUEZ, 1986 (Figs 49—50)
Type-species: ? Oppia ventronodosa HAMMER, 1962 — Chile

Oppia arcuata HAMMER, 1958 — Argentina
(?) Dameosoma gracile PAOLI, 1908 — USA
Oppia maculata HAMMER, 1952 — Alaska, Canada, USSR
(?) Oppia minus simplissimus JACOT, 1938 — USA, Canada
Oppia quadrimaculata, EVANS, 1952 — Palearctis
Pararectoppia subiasi MAHUNKA, 1987 — Hungaria
(?) Oppia zeyensis RJABININ, 1975 — USSR (Far East)

Subiasella (Lucioppia) MAHUNKA, 1985 (Figs 47—48)
Type-species: Lucioppia hauseri MAHUNKA, 1985 — Antilles

Subiasella (Subiasella) BALOGH, 1983 (Figs 25.9)
Type-species: Oppia exiguus HAMMER, 1971 — Fiji, Tonga, New Zealand
Oppia segmella GOLOSOVA, 1970 — USSR (Far East)

Tectoppia WALLWORK, 1961 (Figs 13.1)
Type-species: Tectoppia nigricans WALLWORK, 1961 — W. Africa
Tectoppia longisetosa MAHUNKA, 1974 — W. Africa
Tectoppia nigricans WALLWORK, 1961 — W. Africa

Tectoppiella MAHUNKA, 1984 = **Setoppia** BALOGH, 1983

Trapezoppia BALOGH et MAHUNKA, 1969 (Figs 23.6)
Type-species: Trapezoppia longipectinata BALOGH et MAHUNKA, 1969 — Brazil

Trematoppia BALOGH, 1962 (Figs 16.7)
Type-species: Trematoppia cristipes BALOGH, 1962 — Madagascar

Tripiloppia HAMMER, 1968 (Figs 9.18)
Type-species: Tripiloppia aokii HAMMER, 1968 — New Zealand
Tripiloppia dalenii HAMMER, 1968 — New Zealand
Tripiloppia forsslundi HAMMER, 1968 — New Zealand
Tripiloppia subiasi BALOGH, 1982 — Queensland
(= *Tripiloppia hammeri* "lapsus" BALOGH, 1983)
Tripiloppia traegardhi HAMMER, 1968 — New Zealand
Tripiloppia tarraswahlbergi HAMMER, 1968 — New Zealand

Tuberoppia GOLOSOVA, 1974 (Fig 20)
Type-species: Oppia rotundata GOLOSOVA, 1970 — USSR (Far East)
Tuberoppia paradoxa GOLOSOVA, 1980 — USSR (Far East)

Uroppia BALOGH, 1983 (Figs 22.11)
Type-species: Oppia akusiensis WALLWORK, 1961 — W. Africa
Uroppia kenyaensis MAHUNKA, 1985 — Antilles

Varioppia MAHUNKA, 1985 (Figs 7—8)
Type-species: Varioppia radiata MAHUNKA, 1985 — Antilles

Vietoppia (Paraglobоppia) SUBIAS subgen. n. (Figs 70—71)
Type-species: Oppia diversiseta MAHUNKA, 1985 — S. Africa
(?) Oppia trichotos BALOGH et MAHUNKA, 1977 — Brazil

Vietoppia (Vietoppia) MAHUNKA, 1988 (Figs 93—94)
Type-species: Vietoppia hungarorum MAHUNKA, 1988 — Vietnam

Wallworkella BALOGH, 1983 (nom. praeocc HAMMER, 1979)

Wallworkoppia SUBIAS nom. n. (Figs 15.11)
Type-species: Oppia trimucronata WALLWORK, 1961 — W. Africa
Oppia cervifer MAHUNKA, 1983 — Mexico
(= *Arcoppia longiramosa* WOAS, 1986 — El Salvador)
Arcoppia granulata MAHUNKA, 1986 — Kenya
Oppia machadoi BALOGH, 1958 — W. Africa, Tanzania
Wallworkella vibrissa MAHUNKA, 1983 — Tanzania

Xenoppia MAHUNKA, 1982 (Figs 22.17)
Type-species: Xenoppia brevipila MAHUNKA, 1982 — Ethiopia

REFERENCES

AOKI, J. (1959): Die Moosmilben (Oribatei) aus Südjapan. — Bull. Biogeogr. Soc. Japan **21:** 1—22.

AOKI, J. (1964): Some Oribatid mites (Acarina) from Laysan Island. — Pacific Insects **6:** 649—664.

AOKI, J. (1983): Some new species of Oppiid mites from South Japan (Oribatida: Oppiidae). — Int. J. Acarology, **9:** 165—172.

BALOGH, J. (1959): Oribates (Acari) nouveaux d'Angola et du Congo Belge, 1re serie. Publ. cult. Co. Diam. Ang. Lisboa, **48:** 91—108.

BALOGH, J. (1960): Oribates (Acari) nouveaux de Madagascar (1re serie). — Mem. Inst. Sci. Madagascar ser. A **14:** 7—37.

BALOGH, J. (1961): Identification keys of world Oribatid (Acari) families and genera. — Acta Zool. Hung. **7** (3—4): 243—344.

BALOGH, J. (1961): Descriptions complémentaires d'Oribates (Acari) d'Angola et du Congo Belge (2eme serie). — Publ. cult. Co. Diam. Ang. Lisboa, **52:** 67—73.

BALOGH, J. (1961): Some new Oribatidae from Central Africa (Acari). — Ann. Univ. Sci., Budapest, **4:** 3—7.

BALOGH, J. (1962): Mission zoologique de l'I.R.S.A.C. en Afrique Orientale (P. BASILEWSKY et N. LELEUP, 1957). LXXV. — Acari, Oribates. — Ann. Mus. Roy. Afr. Centr., in-8, Zool. **110:** 90—131. 80 fig.

BALOGH, J. (1962): Recherches sur la faune endogée de Madagascar. VII Oribates (Acariens) nouveaux II. — Naturaliste malgache **13:** 121—151.

BALOGH, J. (1963): Identification keys of holarctic mites (Acari) families and genera. — Acta Zool. Hung. **9:** 1—60. 16 pl.

BALOGH, J. (1966): On some Oribatid mites from Tchad and East Africa collected by Prof. H. Franz, Vienna. — Opusc. Zool. Budapest **6** (1): 69—77.

BALOGH, J. (1970): New Oribatids (Acari) from Ceylon. The scientific results of the Hungarian Soil Zoological expeditions. — Opusc. Zool. Budapest **10** (1): 33—67.

BALOGH, J. (1970): New Oribatids (Acari) from New Guinea II. — Acta Zool. Hung. **16** (3—4): 291—344.

BALOGH, J. (1972): The Oribatid genera of the world. — Akadémiai Kiadó, Budapest: 1—188, 71 pls.

BALOGH, J. & MAHUNKA, S. (1966): New Oribatids (Acari) from South Africa. — Acta Zool. Hung. **12** (1—2): 1—23.

BALOGH, J. & MAHUNKA, S. (1966): The scientific results of the Hungarian Soil Zoological Expedition to the Brazzaville-Congo. 3. The Oribatid Mites (Acari) of Brazzaville--Congo I. — Acta Zool. Hung. **12** (1—2): 25—40.

BALOGH, J. & MAHUNKA, S. (1967): New Oribatids (Acari) from Vietnam. — Acta Zool. Hung. **13** (1—2): 39—74.

BALOGH, J. & MAHUNKA, S. (1968): Some new Oribatids (Acari) from Indonesian Soils. — Opusc. Zool. Budapest **8** (2): 341—346.

BALOGH, J. & MAHUNKA, S. (1968): The scientific results of the Hungarian Soil Zoological expedition to South America. 5. Acari: Data to the Oribatid fauna of the environment of Cordoba, Argentina. — Opusc. Zool. Budapest **8** (2): 317—340.

BALOGH, J. & MAHUNKA, S. (1969): The scientific results of the Hungarian Soil Zoological expedition to South America. 10. Acari: Oribatids, collected by the second expedition. I. Acta Zool. Acad. Sci. Hung. **15** (1—2): 1—21.

BALOGH, J. & MAHUNKA, S. (1969): The scientific results of the Hungarian Soil Zoological expedition to South America. 11. Acari: Oribatids from the material of the second expedition. II. — Opusc. Zool. Budapest **9** (1): 31—69.

BALOGH, J. & MAHUNKA, S. (1969): The scientific results of the Hungarian Soil Zoological expedition to South America. 12. Acari: Oribatids from the materials of the second expedition. III. — Acta Zool. Hung. **15** (3—4): 255—275.

BALOGH, J. & MAHUNKA, S., (1974): A foundation of the Oribatid (Acari) fauna of Cuba. — Acta Zool. Hung. **20** (1—2): 1—25.

BALOGH, J. & MAHUNKA, S. (1974): Oribatid species (Acari) from Malaysian soils. — Acta Zool. Hung. **20** (3—4): 243—264.

BALOGH, J. & MAHUNKA, S. (1975): New Oppioid mites (Acari: Oribatei) from Queensland. — Acta Zool. Hung. **21** (3—4): 241—256.

BALOGH, J. & MAHUNKA, S. (1977): New Data to the knowledge of the Oribatid fauna of Neogea (Acari). I. — Acta Zool. Hung. **23** (1—2): 1—28.

BALOGH, J. & MAHUNKA, S. (1977): New Data to the knowledge of the Oribatid fauna of Neogea (Acari). II. — Acta Zool. Hung. **23** (3—4): 247—265.

BALOGH, J. & MAHUNKA, S. (1978): New Data to the knowledge of the Oribatid fauna of Neogea (Acari). III. Acta Zool. Hung. **24** (3—4): 269—299.
BALOGH, J. & MAHUNKA, S. (1979): New Data to the knowledge of the Oribatid fauna of Neogea (Acari). IV. — Acta Zool. Hung. **25** (1—2): 35—60.
BALOGH, J. & MAHUNKA, S. (1980): New Data to the knowledge of the Oribatid fauna of Neogea (Acari). V. — Acta Zool. Hung. **26** (1—3): 21—59.
BALOGH, J. & MAHUNKA, S. (1981): New Data to the knowledge of the Oribatid fauna of Neogea (Acari). VI. — Acta Zool. Hung. **27** (1—2): 49—102.
BALOGH, J. (1982): New Oppioid mites from Australia (Acari: Oribatei). — Acta Zool. Hung. **28** (1—2): 3—14.
BALOGH, J. (1983): A partial revision of the Oppiidae Grandjean, 1954 (Acari: Oribatei). — Acta Zool. Hung. **29** (1—3): 1—79.
BALOGH, J. & BALOGH, P. (1983): New Oribatid mites from Australia (Acari: Oribatei). — Acta Zool. Hung. **29** (1—3): 81—105.
BALOGH, J. & BALOGH, P. (1983): New Oribatids (Acari) from the Pacific region. — Acta Zool. Hung. **29** (4): 303—325.
BALOGH, J. & BALOGH, P. (1986): New Oribatids from New Guinea III. — Acta Zool. Hung. **32** (1—2): 35—60.
BALOGH, J. & BALOGH, P. (1986): Some Oribatid mites collected in the Western Pacific area. — Acta Zool. Hung. **32** (3—4): 263—280.
BALOGH, P. (1984): Oribatid mites from Colombia (Acari). — Acta Zool. Hung. **30** (1—2): 29—51.
BALOGH, P. (1985): Data to the Oribatid fauna of Australia (Acari) III. — Acta Zool. Hung. **31:** 81—96.
GOLOSOVA, L. D. & KARPPINEN, E. (1983): Two new Oribatid mites (Acarina, Oribatei) from the Far East — Ann. Entom Fenn. **49:** 87—88.
GOLOSOVA, L. D. & TARBA, Z. M. (1974): Neue Arten und Gattungen der Überfamilie Oppioidea (Acariformes, Oribatei) aus Abchasi und Primorskogo kraja — Zool. Zh. **53:** 1885—1887. (in Russian.)
HAMMER, M. (1958): Investigations on the Oribatid fauna of the Andes Mountains. 1. The Argentine and Bolivia. — Biol. Skr. Dan. Vid. Selsk. **10:** 1—129.
HAMMER, M. (1962): Investigations on the Oribatid fauna of the Andes Mountains. II. Peru. — Biol. Skr. Dan. Vid. Selsk. **13:** 1—157.
HAMMER, M. (1962): Investigations on the Oribatid fauna of the Andes Mountains. 111. Chile. — Biol. Skr. Dan. Vid. Selsk. **12** (3): 1—96.
HAMMER, M. (1962): Investigations on the Oribatid fauna of the Andes Mountains. IV. Patagonia. — Biol. Skr. Dan. Vid. Selsk. **13** (3): 1—37.
HAMMER, M. (1966): Investigations on the Oribatid fauna of New Zealand. Part I. — Biol. Skr. Dan. Vid. Selsk. **15** (2): 1—108. 45 taf.
HAMMER, M. (1967): Investigations on the Oribatid fauna of New Zealand. Part II. — Biol. Skr. Dan. Vid. Selsk. **15** (4): 1—60.
HAMMER, M. (1968): Investigations on the Oribatid fauna of New Zealand. Part III. — Biol. Skr. Dan. Vid. Selsk. **16** (2): 1—96.
HAMMER, M. (1971): On some Oribatids from Viti Levu, Fiji Islands. — Biol. Skr. Dan. Vid. Selsk. **16** (6): 1—60.
HAMMER, M. (1972): Investigation on the Oribatid fauna of Tahiti, and on some Oribatids found on the Atoll Rangiora. — Biol. Skr. Dan. Vid. Selsk. **19** (3): 1—65.
HAMMER, M. (1973): Oribatids from Tongatapu and Eua, the Tonga Islands, and from Upolu, Western Samoa. — Biol. Skr. Dan. Vid. Selsk. **20** (3): 1—70.
HAMMER, M. (1975): On some Oribatids from Central Sahara (Acari, Oribatidae). — Steenstrupia **3** (18): 187—196.
HAMMER, M. (1977): Investigations on the Oribatid fauna of North—West Pakistan. — Biol. Skr. Dan. Vid. Selsk. **21** (4): 1—108.
HAMMER, M. (1979): Investigations on the Oribatid fauna of Java. — Biol. Skr. Dan. Vid. Selsk. **22** (9): 1—79.
KULIEV, K. A. (1967): Zwei neue Hornmilbengattungen aus Aserbaidschan. — Ber. Akad. Wiss. Aserbaidisch. SSR **23:** 63—70. (in Russian).
LUXTON, M. (1985): Cryptostigmata — a concise review. — Fauna of New Zealand **7:** 1—106.
MAHUNKA, S. (1978): Neue und interessante Milben aus dem Genfer Museum. XXVII. A first survey of the Oribatid (Acari) fauna of Mauritius, Reunion and the Seychelles. I. — Rev. Suisse Zool. **35** (1): 177—236.
MAHUNKA, S. (1979): Complementary data to the knowledge of some Oribatid species (Acari). — Folia Entomol. Hung. S. N. **32** (2): 139—152.

MAHUNKA, S. (1980): Neue und interessante Milben aus dem Genfer Museum. XXV. On some Oribatids collected by Dr. P. Strinati in Guatemala (Acari, Oribatida). — Acarologia **21** (1): 133—142.
MAHUNKA, S. (1980): Oribatids from Tunesian soils (Acari: Oribatida). I. — Folia Entomol. Hung. **41** (33) (1): 123—124.
MAHUNKA, S. (1982): Neue und interessante Milben aus dem Genfer Museum. XLVI. Oribatiden der Pazifischen Region (Acari: Oribatida). — Rev. Suisse Zool. **89** (2): 379—394.
MAHUNKA, S. (1982): Neue und interessante Milben aus dem Genfer Museum. XLIII. Oribatida Americana 4: Mexico I (Acari). — Arch. Sci. Geneve **35** (2): 173—178.
MAHUNKA, S. (1983): Oribatids from eastern part of the Ethiopian region (Acari). II. — Acta Zool. Hung. **29** (1—3): 151—180.
MAHUNKA, S. (1983): Oribatids from eastern part of the Ethiopian region (Acari). III. — Acta Zool. Hung. **29** (4): 397—440.
MAHUNKA, S. (1983): Oribatids from eastern part of the Ethiopian region (Acari). IV. — Ann. Hist. Nat. Mus. Nat. Hung. **75:** 327—338.
MAHUNKA, S. (1983): Data to the knowledge of the Oribatid fauna of Surinam and Brasil (Acari). — Folia Entomol. Hung. **44** (2): 205—227.
MAHUNKA, S. (1983): Neue und interessante Milben aus dem Genfer Museum. 45. Oribatida Americana 6: Mexico II (Acari). — Rev. Suisse Zool. **90** (2): 269—298.
MAHUNKA, S. (1985): Oribatids from Africa (Acari: Oribatida) II. — Folia Entomol. Hung. **46** (1): 73—113.
MAHUNKA, S. (1987): A survey of the Oribatids of the Kiskunság National Park (Acari, Oribatida) — In: The Fauna of the Kiskunság National Park 1987: 346—397.
MAHUNKA, S. (1987): Oribatids from Africa (Acari: Oribatida), V. — Fol. Entom. Hung. **48:** 105—128.
MAHUNKA, S. (1988): A survey of the Oribatid fauna (Acari) of Vietnam II. — Acta Zool. Hung. **34**: 215—246.
MAHUNKA, S. (1988): New and interesting mites from the Geneva Museum LXI. Oribatids from Sabah (East Malaysia) III (Acari: Oribatida). — Revue suisse Zool. **95**: 817—888.
MINGUEZ, M. E. (1981): Estudio taxocenótico de los Oribátidos (Acarida, Oribatida) de el Pardo. — Edit. Univ. Complutense, Madrid: 281 pp.
PÉREZ-INIGO, C. (1965): Especies españolas del género Oppia C. L. Koch (Acari, Oribatei). — Bol. R. Soc. Esp. Hist. Nat. (Biol.), **62** (1964): 385—416.
PÉREZ-INIGO, C. (1982): Resultados de la expedición Peris-Alvarez a la isla de Annobón (13). Oribatid mites (3rd part). — Eos, Madrid, **58:** 223—236.
SUBIAS, L. S. (1978): Anomaloppia canariensis n. gen., n. sp. (Acarida, Oribatida, Oppiidae) de las islas Canarias. Consideraciones filogeneticas sobre la familia. — Redia **61:** 565—574.
SUBIAS, L. S. (1980): Oppidae del complejo 'clavipectinata insculpta' (Acari, Oribatida). — Eos, Rev. Esp. Entom. **54:** 281—313.
SUBIAS, L. S. & ITURRONDOBEITIA, J. C. (1980): Contribucion al conocimiento de los Oribatidos (Acarida, Oribatida) del Pais Vasco. III. — Graellsia **34:** 205—209.
SUBIAS, L. S. & MINGUEZ, M. E. (1980): Ramusella (Rectoppia) rhinina n. sp. de Espana (Acarida, Oribatida, Oppiidae). — Bol. Asoc. Esp. Entomol. **4:** 103—106.
SUBIAS, L. S. (1981): Hypogeoppia nov. gen. de la familia Oppiidae Grandjean, 1954 (Acarida, Oribatida) y descripcion de la especie H. terricola n. sp. — Redia **64:** 57—63.
SUBIAS, L. S. & SARKAR, S. (1983): Some new Oppiidae from India (Acarida, Oribatida). — Redia **66:** 435—447.
SUBIAS, L. S. & SARKAR, S. (1984): Three new species of Ptyctimines Oribates (Acari) from India (Mesoplophoridae and Phthiracaridae). — Folia Entomol. Hung. **45** (1): 215—220.
SUBIAS, L. S. (1985): Estudio actual del conocimiento de la familia Oribatidos Oppiidae Grandjean, 1954 (Acari). (Es., es., en.). — Actas II. Congr. Iberico Entomol. (= Suppl. **1:** Boletim Soc. Portug. Entomol.): 155—164.
SUBIAS, L. S. & MINGUEZ, M. E. (1985): Los Oppidos (Acari, Oribatida) de El Pardo (Espana central). Seratoppia n. gen. y Oxyoppioides n. gen. (Es., es., en.). — Actas II. Congr. Iberico Entomol. (= Suppl. **1:** Boletim Soc. Portug. Entomol.); 165—174.
SUBIAS, L. S. & MINGUEZ, M. E. (1985): Medioppiinae n. subfam. de Oppidos (Acari, Oribatida, Oppiidae) y descripcion de Medioppia tridentata n. gen. y n. sp. — Redia **68:** 61—67.
SUBIAS, L. S., & RODRIGUEZ, P. (1985): Oppiidae (Acari, Oribatida) de los sabinares (Juniperus thurifera) de Espana III. Graptoppia s. str. Balogh (Es., es., en.). — Cuadernos Invest. Biol. **8:** 69—76.

SUBIAS, L. S. & MINGUEZ, M. E. (1986): Lauroppia similifallax n. gen. y n. sp. (Acari, Oribatida, Oppiidae) de España Central. — Bol. Asoc. Esp. Entom. **10:** 51—58.

SUBIAS, L. S. & RODRIGUEZ, P. (1986): Oppiidae (Acari, Oribatida) de los sabinares (Juniperus thurifera) de España, II. Ramusella (Insculptoppia) Subias y Ramuselloppia n. gen. — Bol. Asoc. esp. Entom. **10:** 83—94.

SUBIAS, L. S. & RODRIGUEZ, P. (1986): Oppiidae (Acari, Oribatida) de los Sabinares (Juniperus thurifera) de España VI. Neotrichoppia (Confinoppia) n. subgen. y Moritziella Balogh, 1983. — Redia **69:** 115—130.

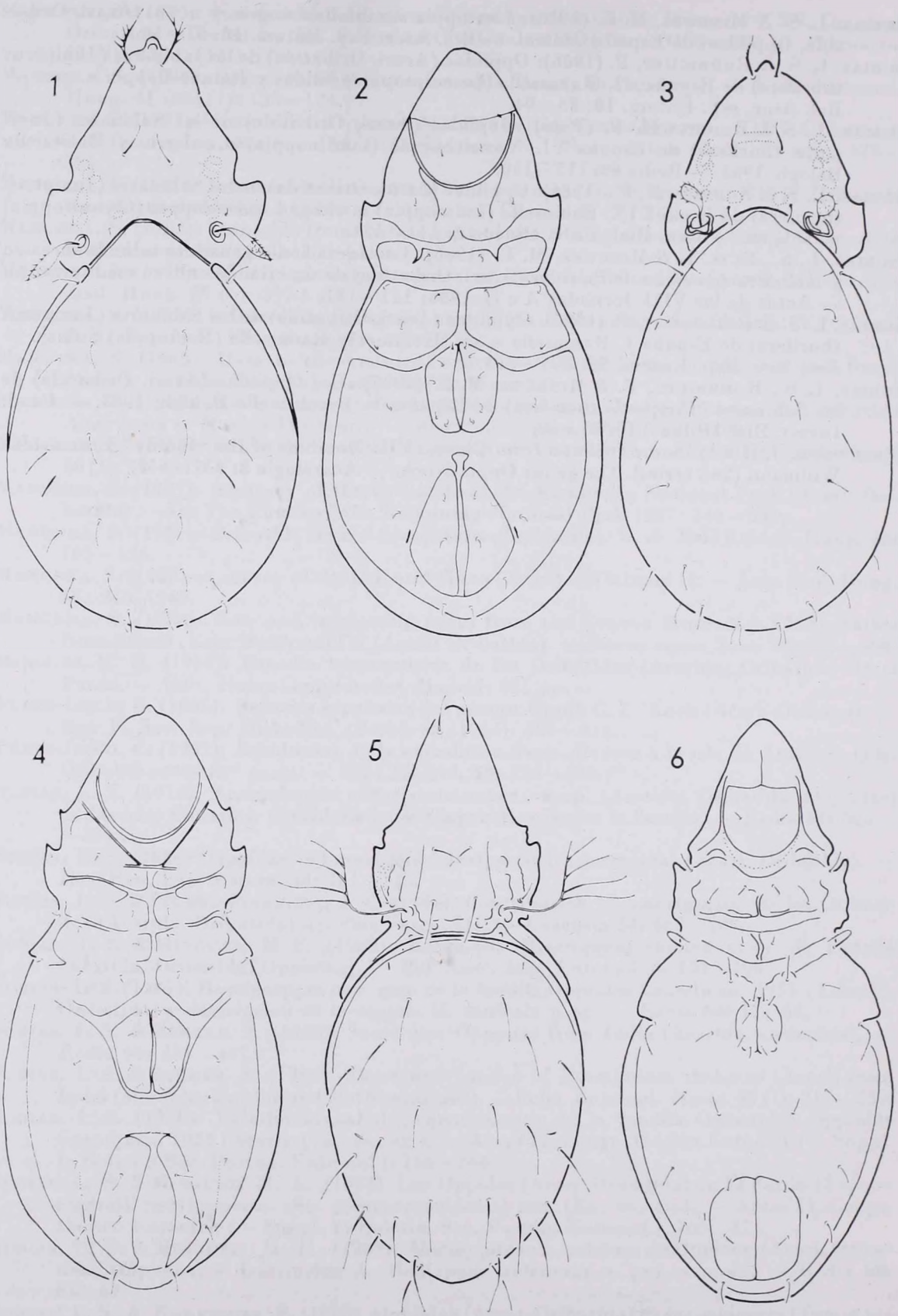
SUBIAS, L. S. & RODRIGUEZ, P., (1986): Oppiidae (Acari, Oribatida) de los Sabinares (Juniperus thurifera) de España IX. Subiasella (Lalmoppia) n. subgen. y Discoppia (Clyindroppia) n. subgen. - Rev. Biol. Univ. Oviedo **4:** 111—121.

SUBIAS, L. S., RUIZ, E. & MINGUEZ, M. E. (1986): Consideraciones generales sobre la sucesion y bioindicacion en los Oribatidos (Acari, Oribatida) de un erial de cultivo mediterraneo. — Actas de las VIII Jornadas A e E, 1986: 121—131.

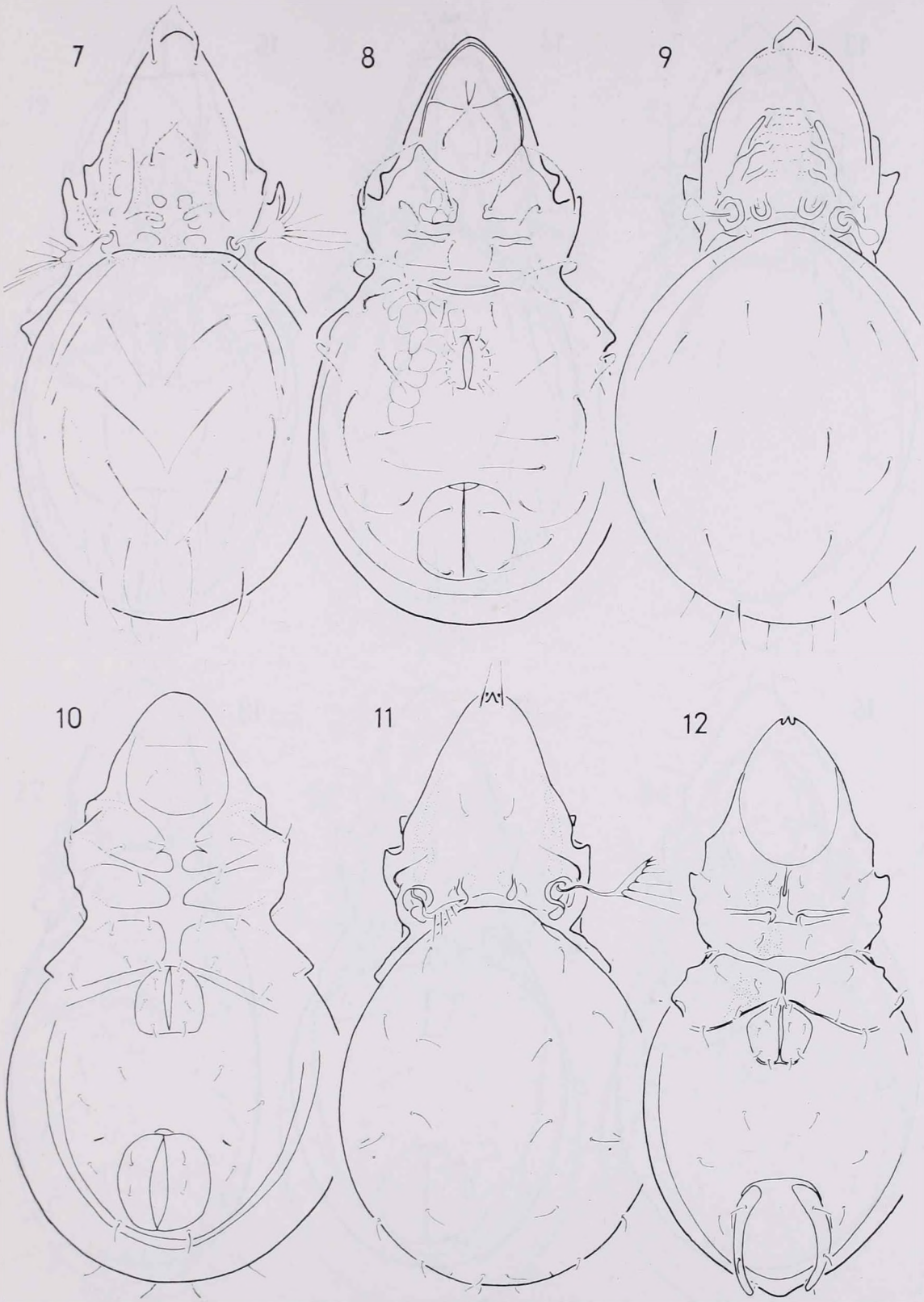
SUBIAS, L. S. & RODRIGUEZ, P. (1987): Oppiidae (Acari, Oribatida) de los Sabinares (Juniperus thurifera) de España I. Ramusella s. str. Hammer y Ramusella (Rectoppia) Subias. — Eos, Rev. Esp. Entom. **53:** 301—314.

SUBIAS, L. S., RODRIGUEZ, P. & MINGUEZ, M. E. (1987): Los Oppiidae (Acari, Oribatida) de los Sabinares (Juniperus thurifera) de España, V. Bernininella Balogh, 1983. — Cuad. Invest. Biol. (Bilbao) **10:** 35—50.

WALLWORK, J. (1961): Some Oribatei from Ghana. VII. Members of the "family" Eremaeidae Willmann (2nd series). The genus Oppia Koch. — Acarologia **3:** 637—658.



Figs 1—2. *Neoppia (Neoppia) minuta* (BHATTACHARYA et BANERJEE, 1981). — Figs 3—4. *Neoppia (Joboppia) dichosa* RUIZ, MINGUEZ et SUBIAS, 1988 — Figs 5—6. *Pulchroppia (Multipulchroppia) berndhauseri* (MAHUNKA, 1978)



Figs 7—8. *Varioppia radiata* MAHUNKA, 1985: — Figs 9—10. *Solenoppia (Campbelloppia) diaphora* (WALLWORK, 1964) — Figs 11—12. *Medioppia tridentata* SUBIAS et MINGUEZ, 1985

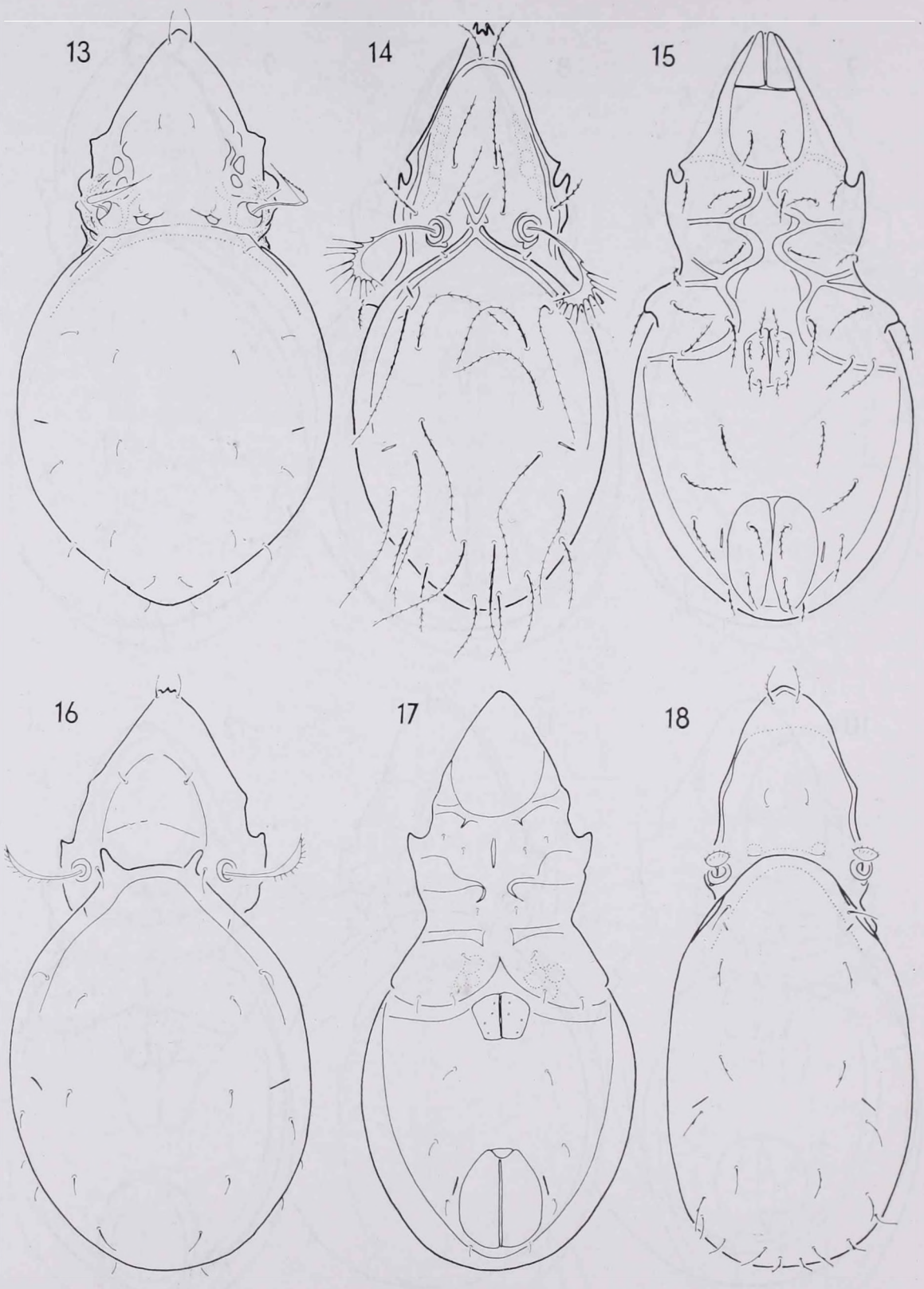


Fig. 13. *Medioxyoppia yuwana* (AOKI, 1983). — Figs 14—15. *Epimerella smirnovi* var. *longisetosa* KULIEV, 1967. — Figs 16—17. *Serratoppia serrata* (MIHELČIČ, 1956). — Fig. 18. *Discoppia (Cylinroppia) cylindrica* (PÉREZ-IÑIGO, 1965)

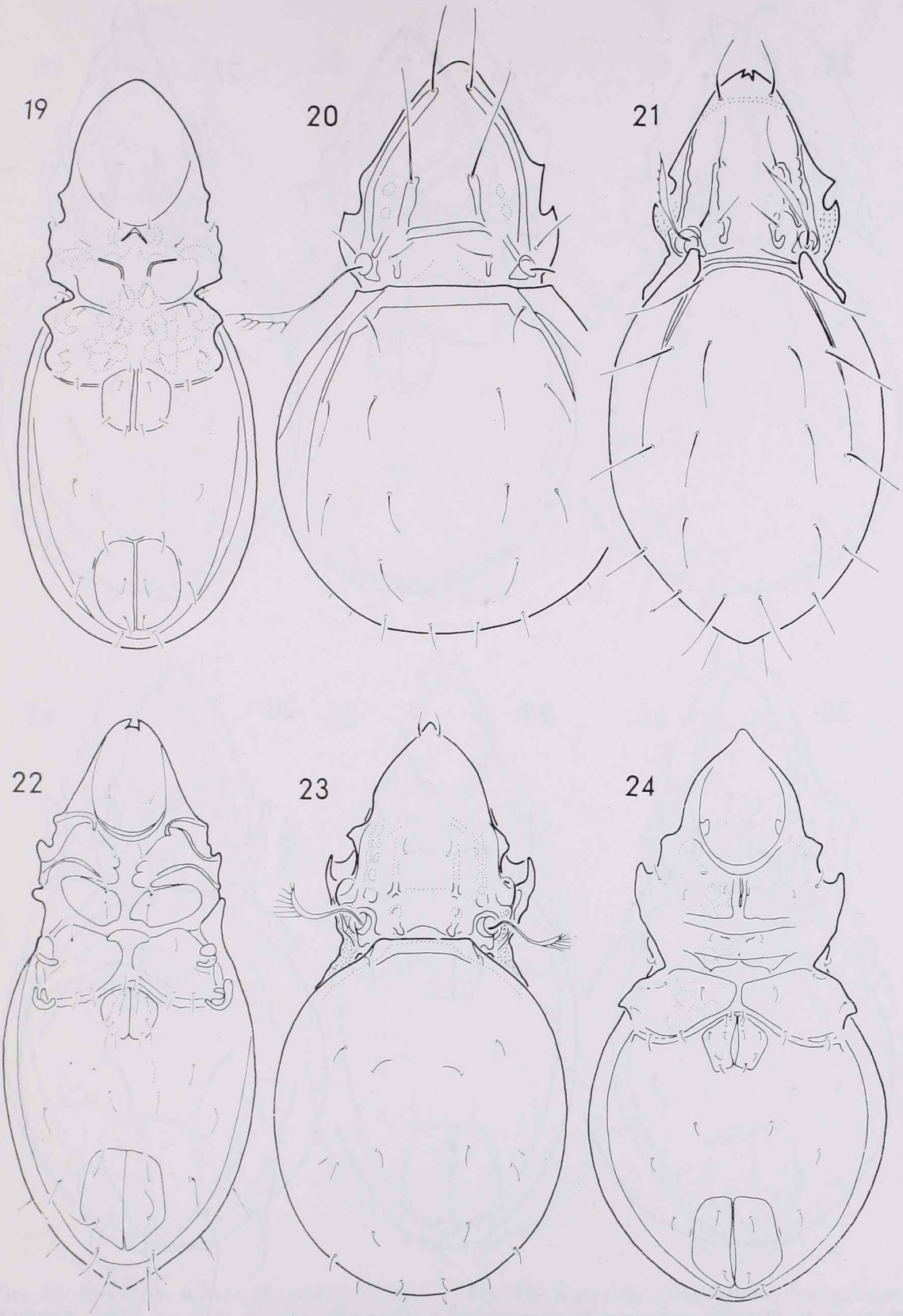
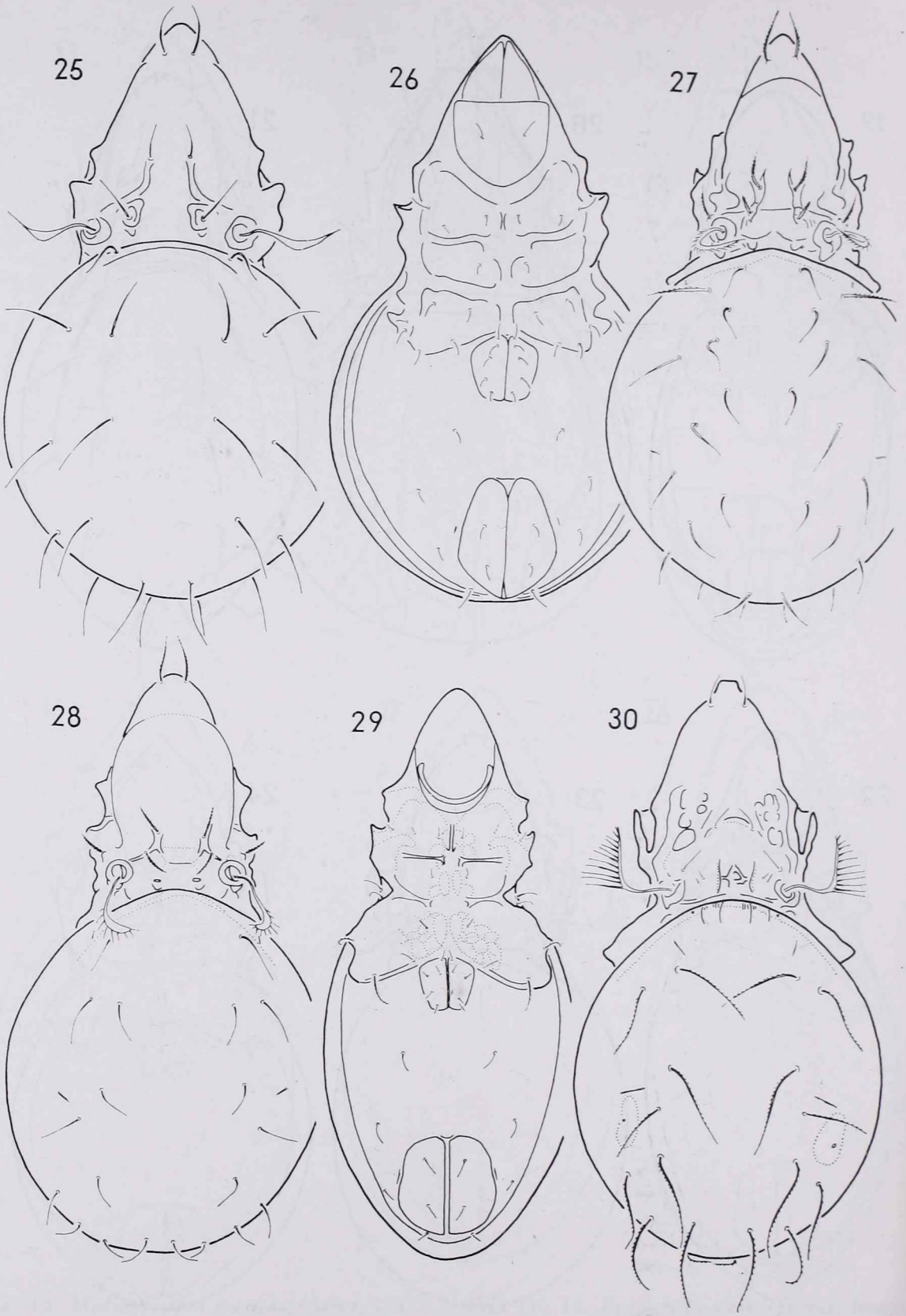


Fig 19. *Discoppia (Cylindroppia) cylindrica* (Pérez—Iñigo, 1965. — Fig. 20. *Tuberoppia rotundata* (Golosova, 1970.) — Figs 21—22. *Autoppia algicola* Golosova et Karppinen, 1983. — Figs 23—24. *Lauroppia similifallax* Subias et Minguez, 1986



Figs 25—26. *Liacaroppia doryphoros* (J. BALOGH et P. BALOGH, 1983). — Figs 27. *Neotrichoppia (Neotrichoppia) pseudoconfinis* (SUBIAS et ITURRONDOBEITIA, 1980) — Figs 28—29. *Neotrichoppia (Confinoppia) tenuiseta* SUBIAS et ITURRONDOBEITIA, 1980. — Fig. 30. *Rugoppia luisiae* MAHUNKA, 1986

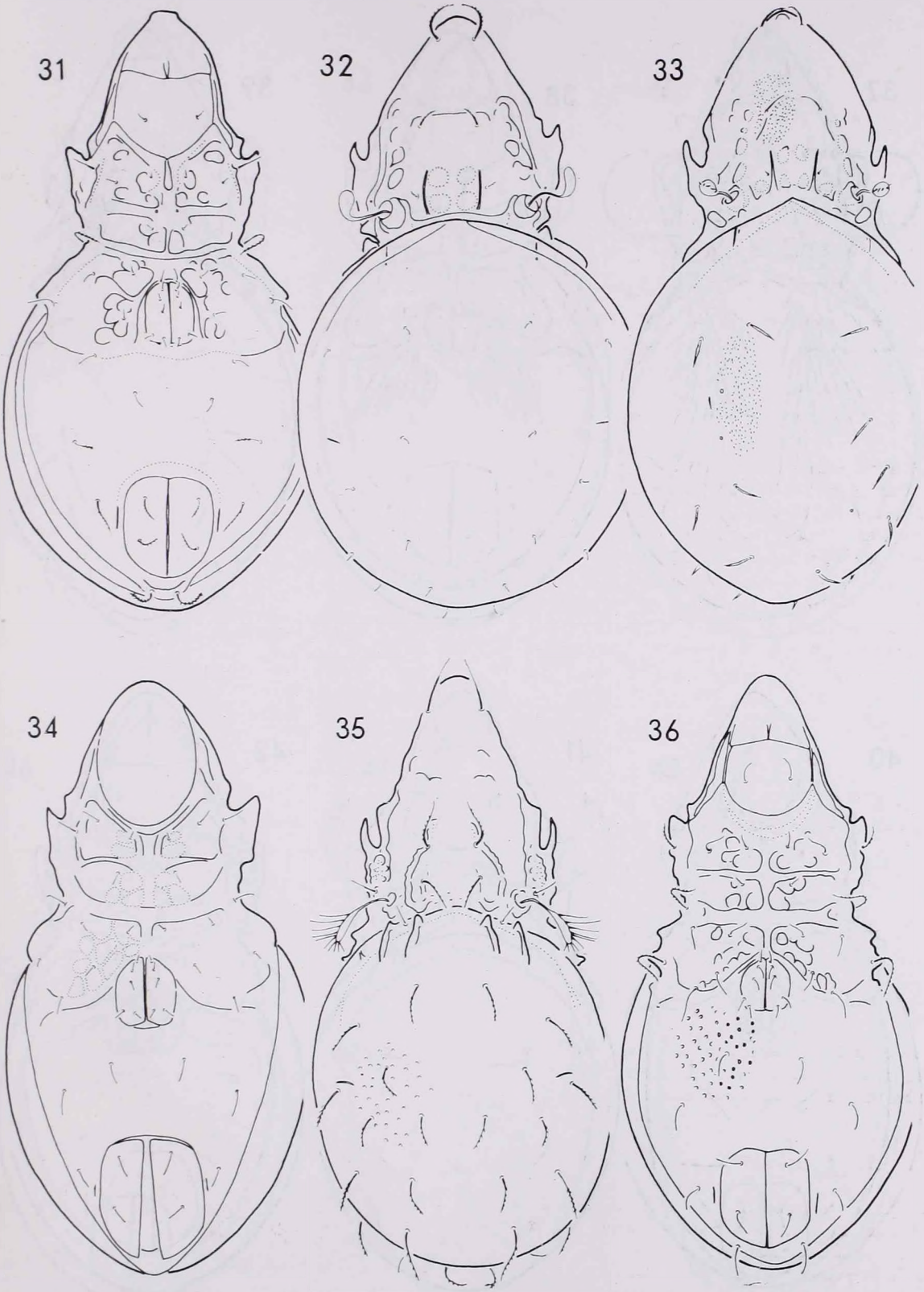
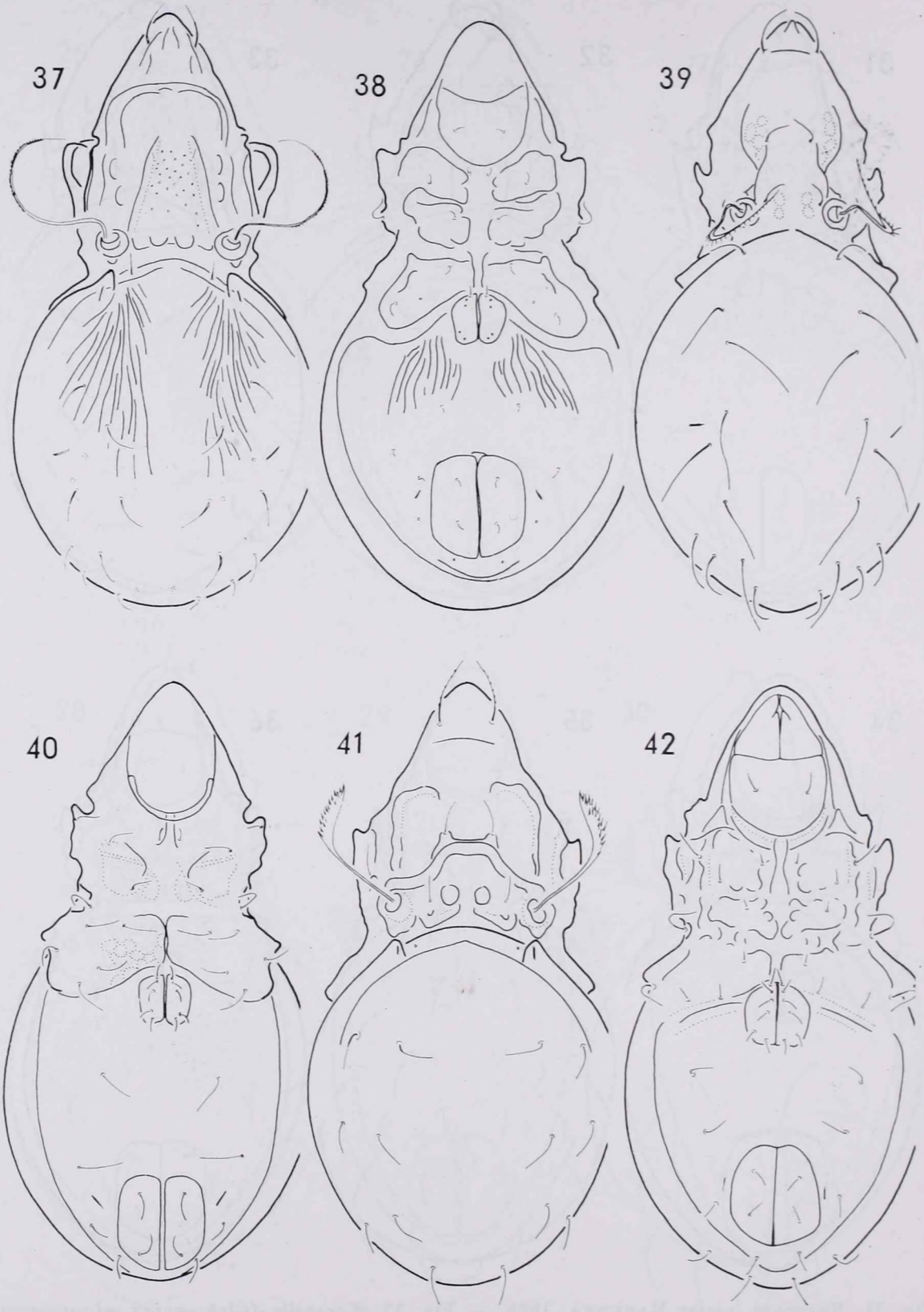
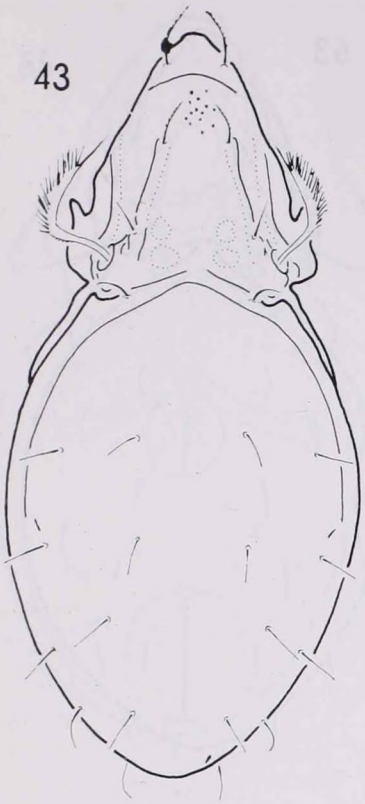
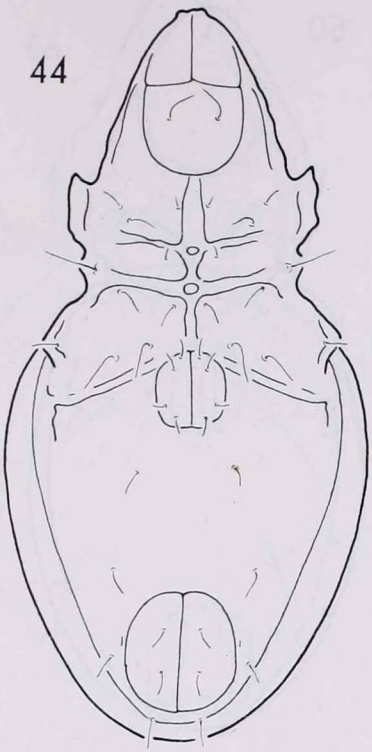


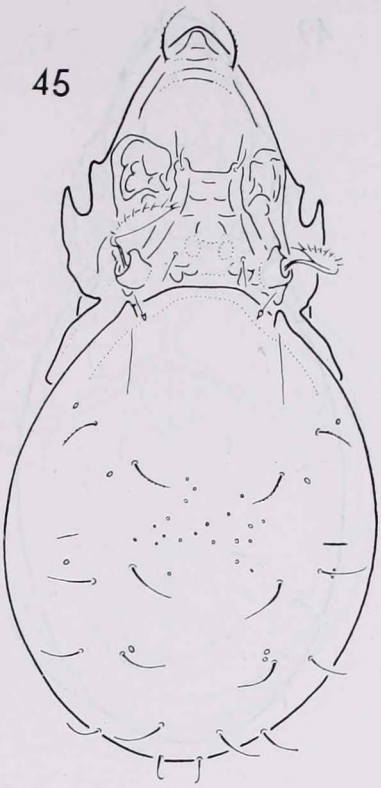
Fig. 31. *Rugoppia luisiae* MAHUNKA, 1986. — Fig. 32. *Karenella (Glabroppia) minutisetosa* HAMMER, 1982. — Figs 33—34. *Karenella (Stakarenoppia) granulosa* (SUBIAS et SARKAR, 1983). — Figs 35—36. *Baloghoppia dentata* MAHUNKA, 1983

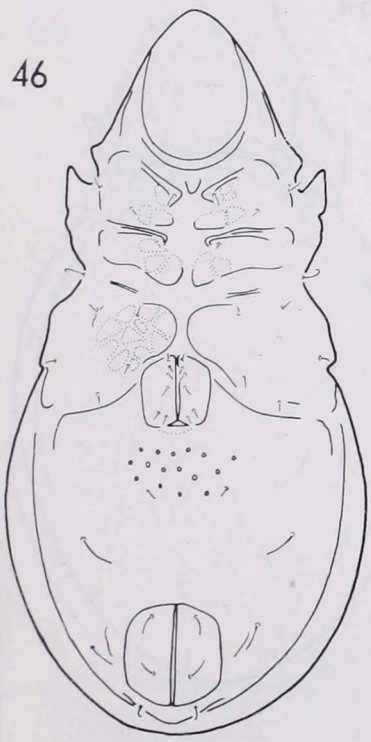


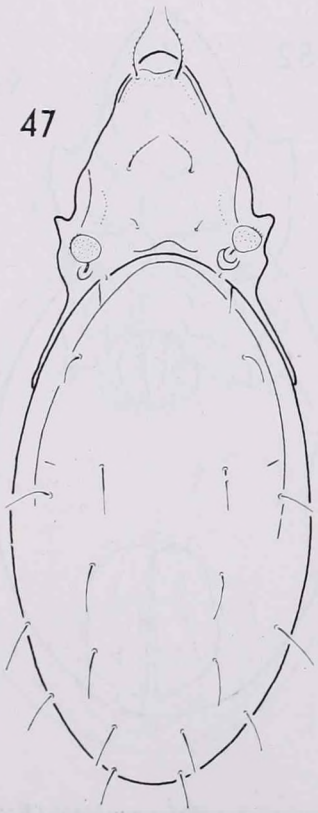
Figs 37—38. *Lineoppia frouini* J. BALOGH et P. BALOGH, 1983. — Figs 39—40. *Oxyoppia (Dzarogneta) intermedia* SUBIAS et RODRIGUEZ, 1986. — Figs 41—42. *Separatoppia africana* (EVANS, 1953)

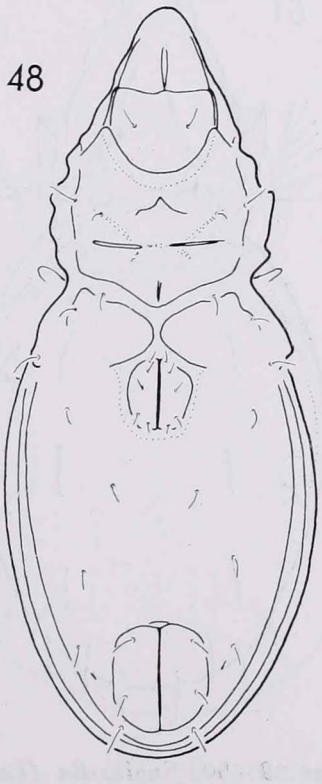




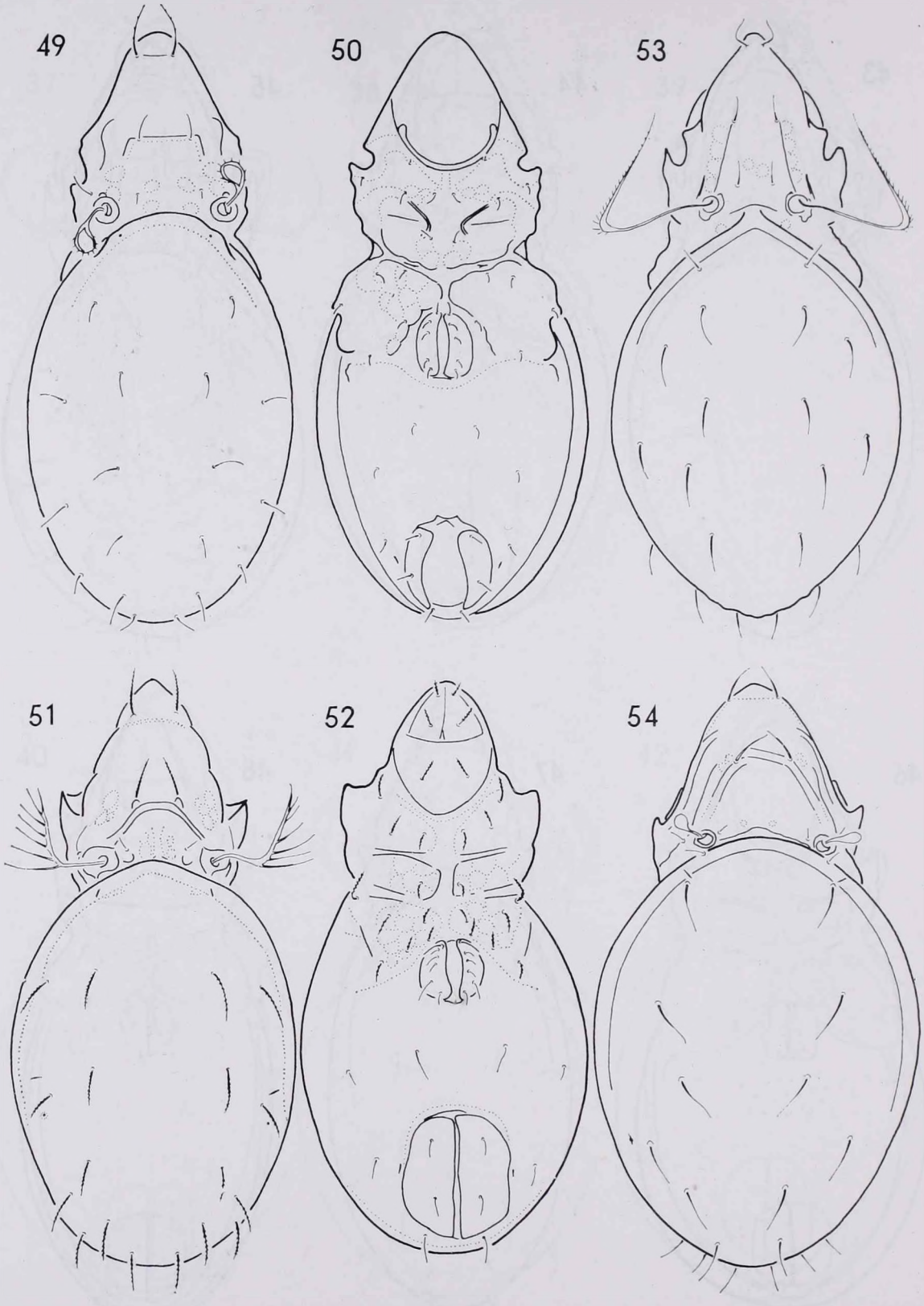








Figs 43—44. *Oxyoppia (Aciculoppia) genavensium* (MAHUNKA, 1982). — Figs 45—46. *Oxyoppia (Oxyoppiella) polynesia* (HAMMER, 1972). — Figs 47—48. *Subiasella (Lucioppia) hauseri* MAHUNKA, 1985)



Figs 49—50. *Subiasella (Lalmoppia) quadrimaculata* (EVANS, 1952). — Figs 51—52. *Oxybrachioppia ctenifera barbata* (CHOI, 1986). — Fig. 53. *Oxyoppioides decipiens* (PAOLI, 1908). — Fig. 54. *Membranoppia (Pravoppia) disjuncta* (WALLWORK, 1964)

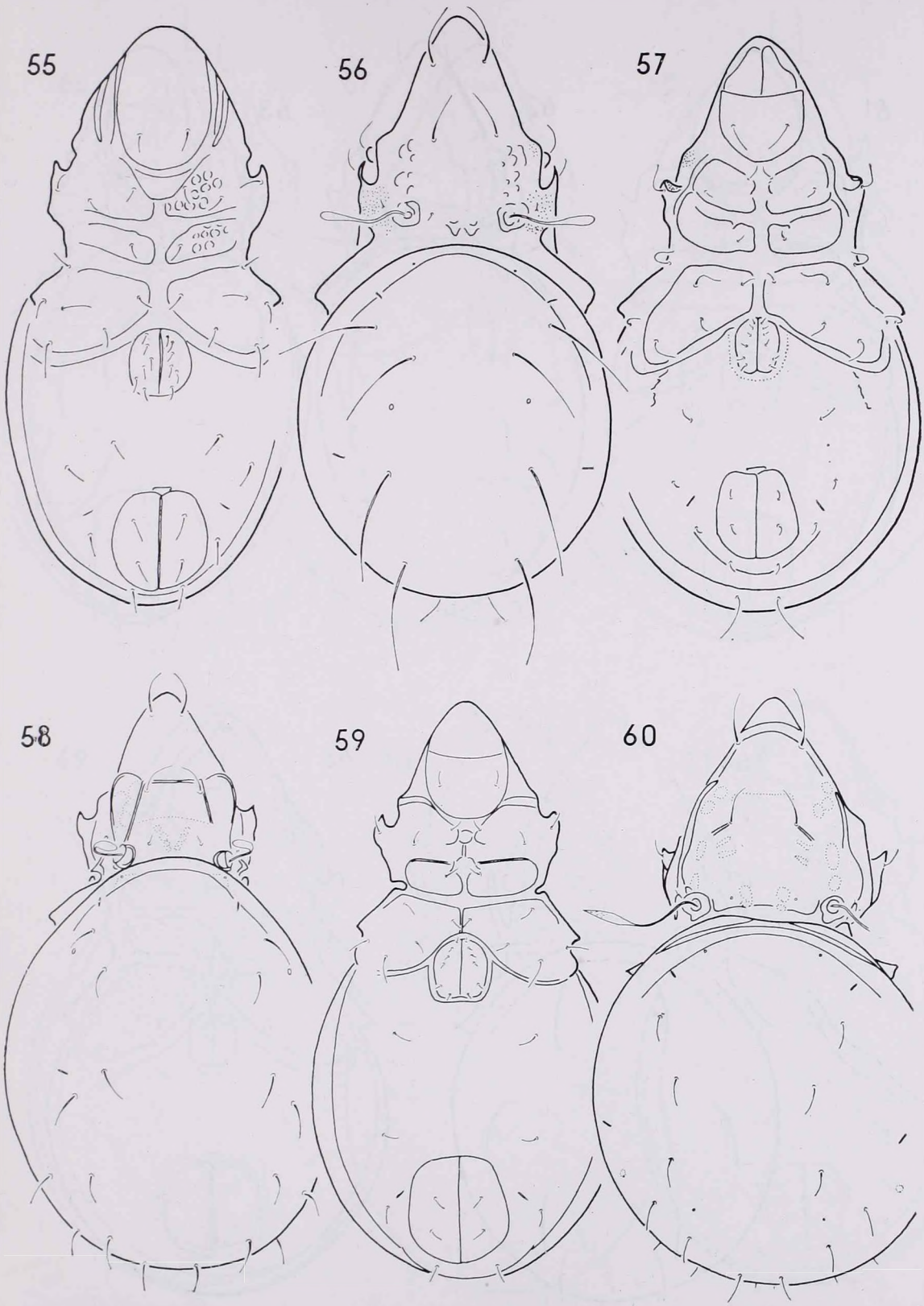


Fig. 55. *Membranoppia (Pravoppia) disjuncta* (WALLWORK, 1964). — Figs 56—57. *Geminoppia papineaui* J. BALOGH et P. BALOGH, 1983. — Figs 58—59. *Lanceoppia (Baioppia) moritzi* (HAMMER, 1968). — Fig. 60. *Lanceoppia (Lancelalmoppia) perezinigoi* (HAMMER, 1968)

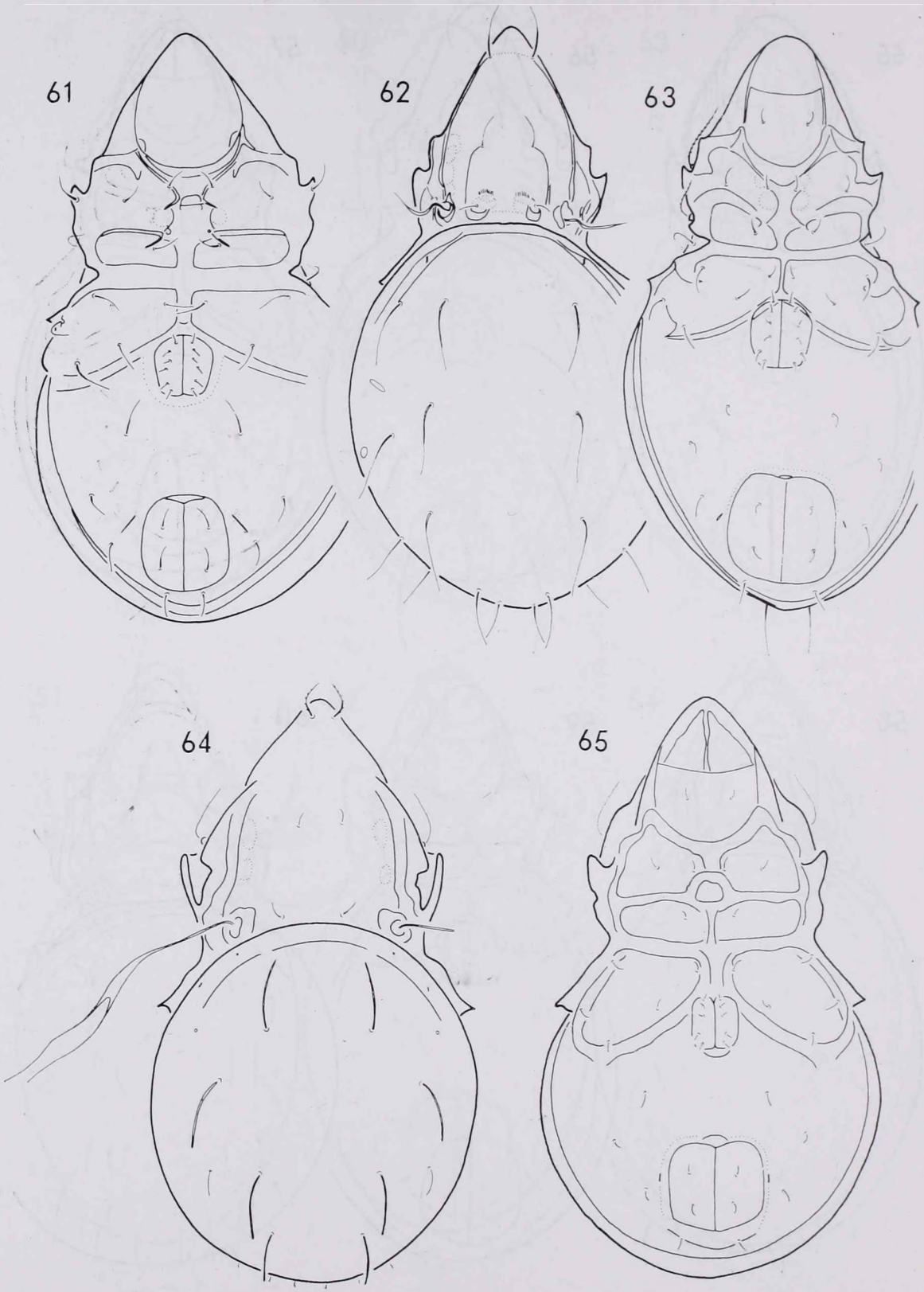
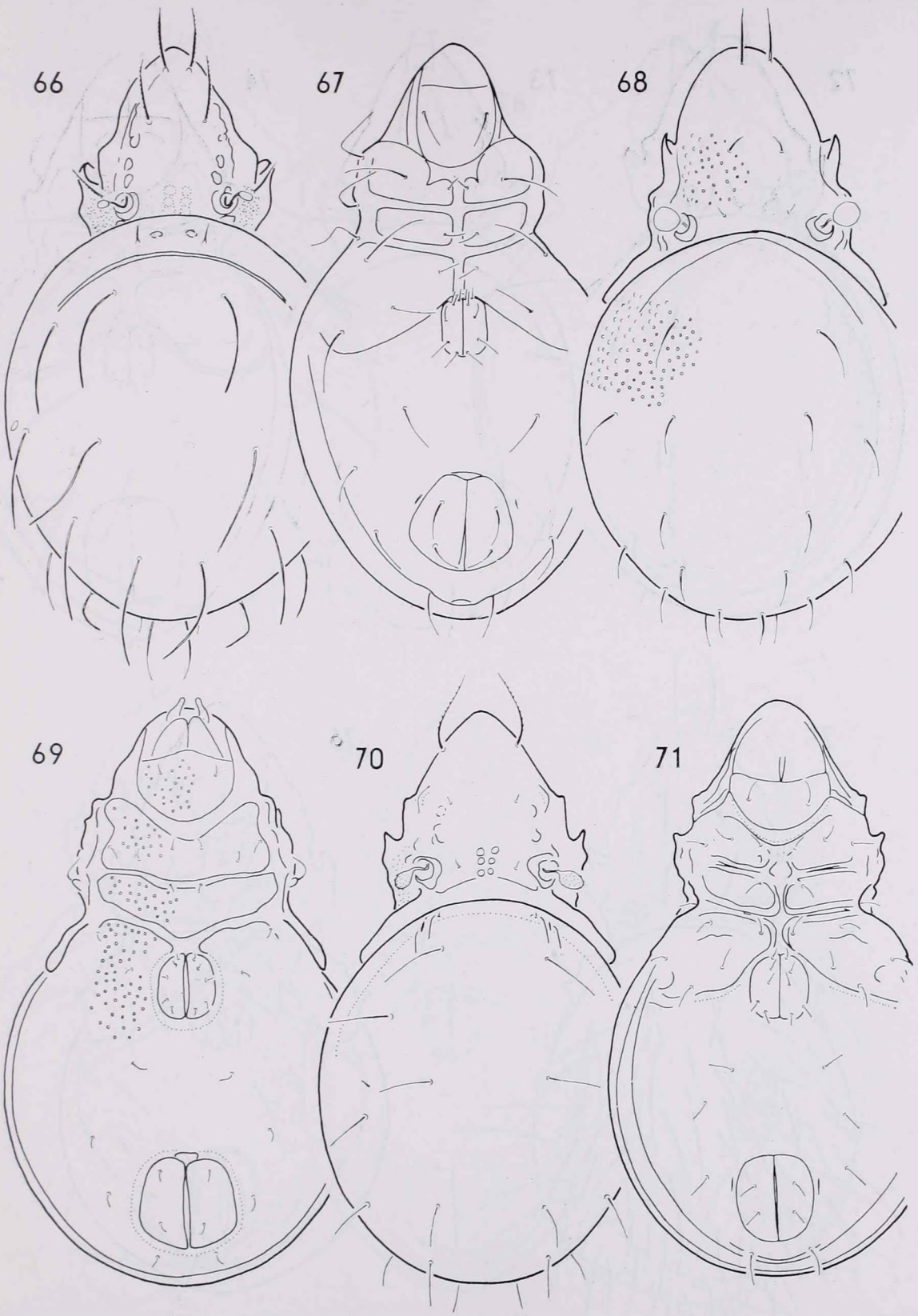


Fig. 61. *Lanceoppia (Lancelalmoppia) perezinigoi* (HAMMER, 1968). — Figs 62—63. *Lanceoppia (Bicristoppia) bicristata* (HAMMER, 1962). — Figs 64—65. *Sphagnoppia biflagellata* J. BALOGH et P. BALOGH, 1986



Figs 66—67. *Amerioppia rudentigera* HAMMER, 1961. — Figs 68—69. *Exanthoppia ornatissima* J. BALOGH et P. BALOGH, 1983. — Figs 70—71. *Vietoppia (Paragloboppia) diversiseta* (MAHUNKA, 1985)

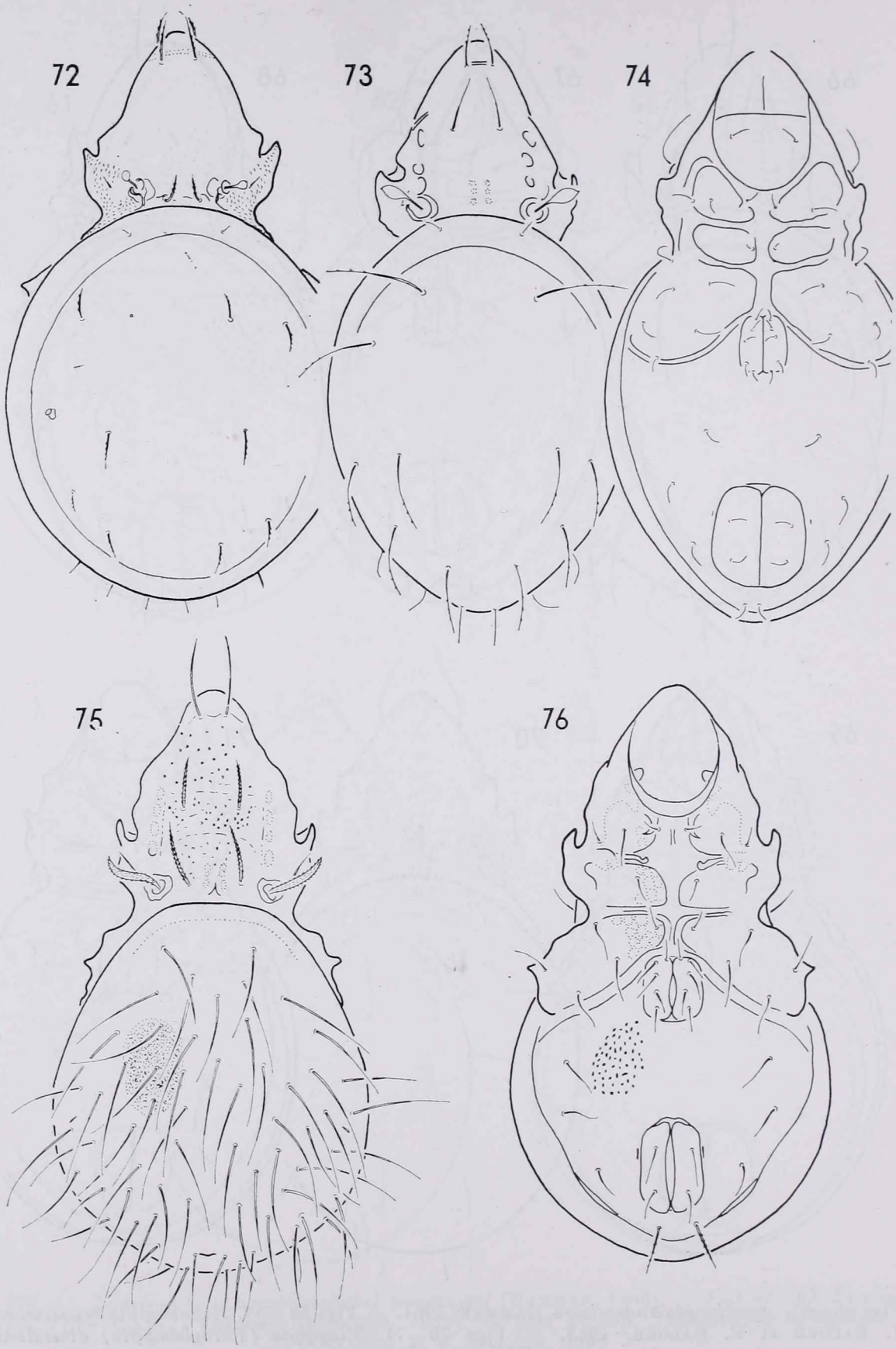
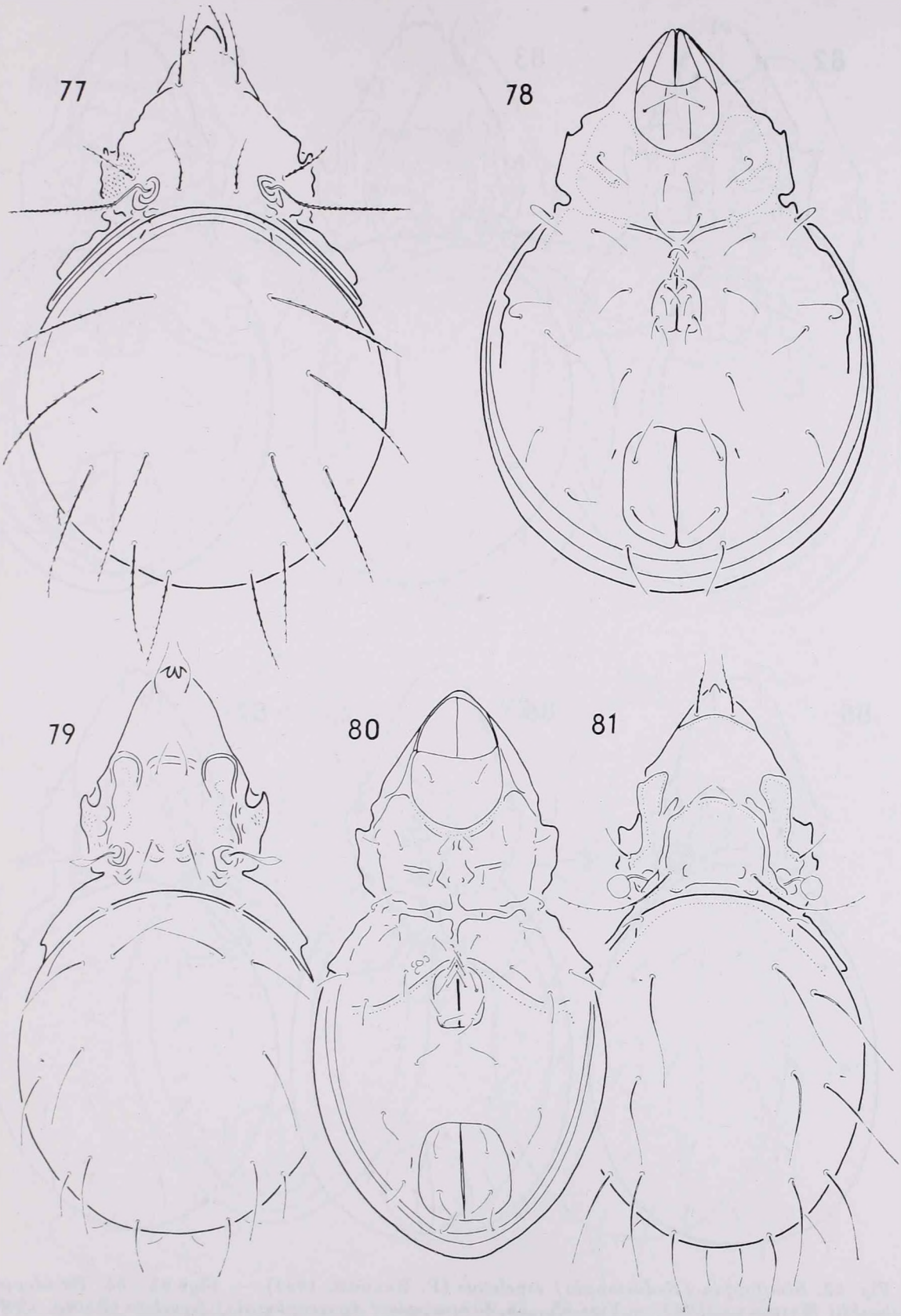


Fig. 72. *Laroppia petiolata* (WALLWORK, 1977). — Figs 73—74. *Neoamerioppia (Neoamerioppia) decemsetosa* (HAMMER, 1973). — Figs 75—76. *Pluritrichoppia insolita* SUBIAS et ARILLO, 1988



Figs 77—78. *Lasiobelba insignis* BALOGH, 1970. — Figs 79—80. *Similoppia (Similoppia) halterata* (MAHUNKA, 1983). — Fig. 81. *Similoppia (Reductoppia) espeletiae* (P. BALOGH, 1984)

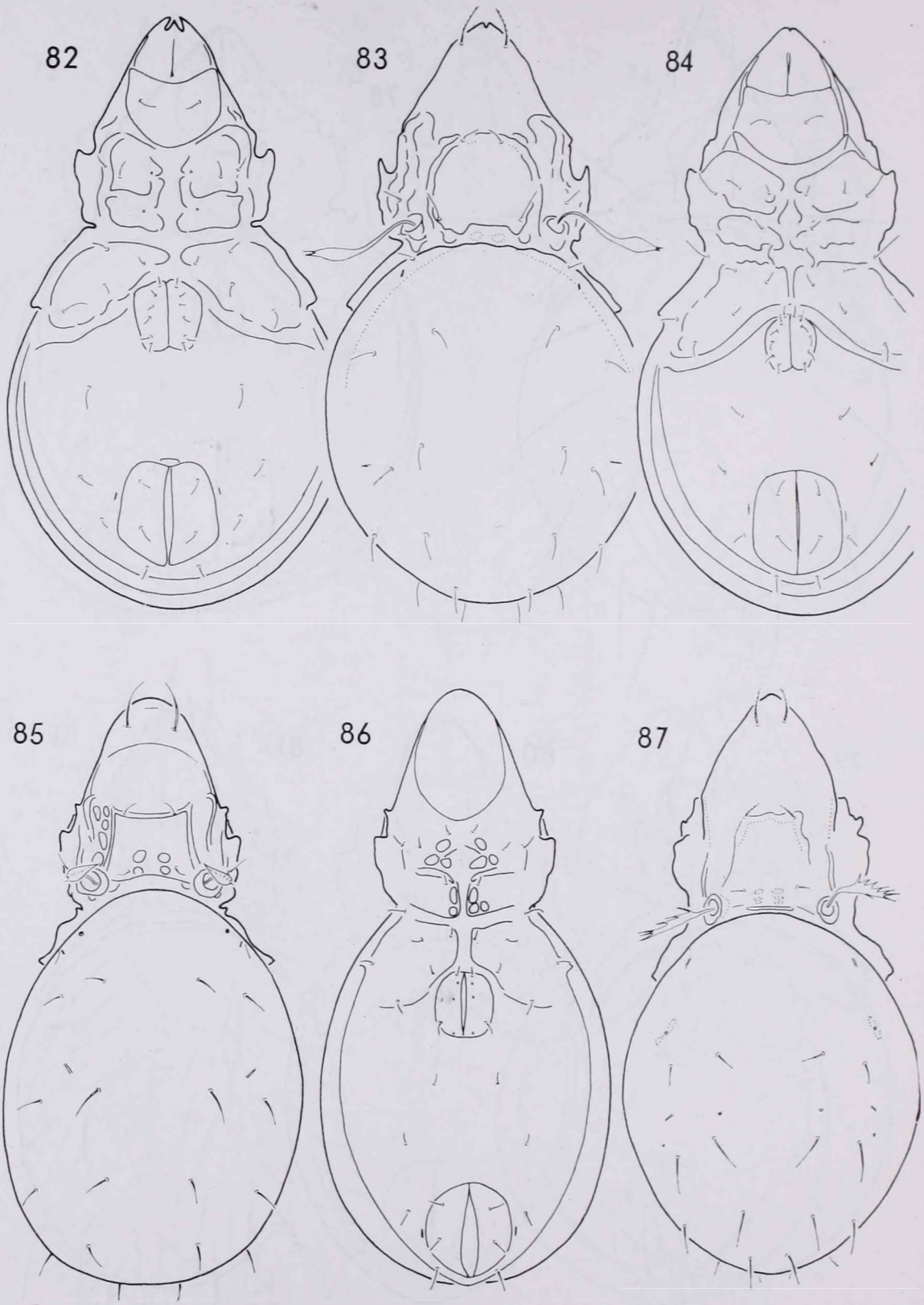
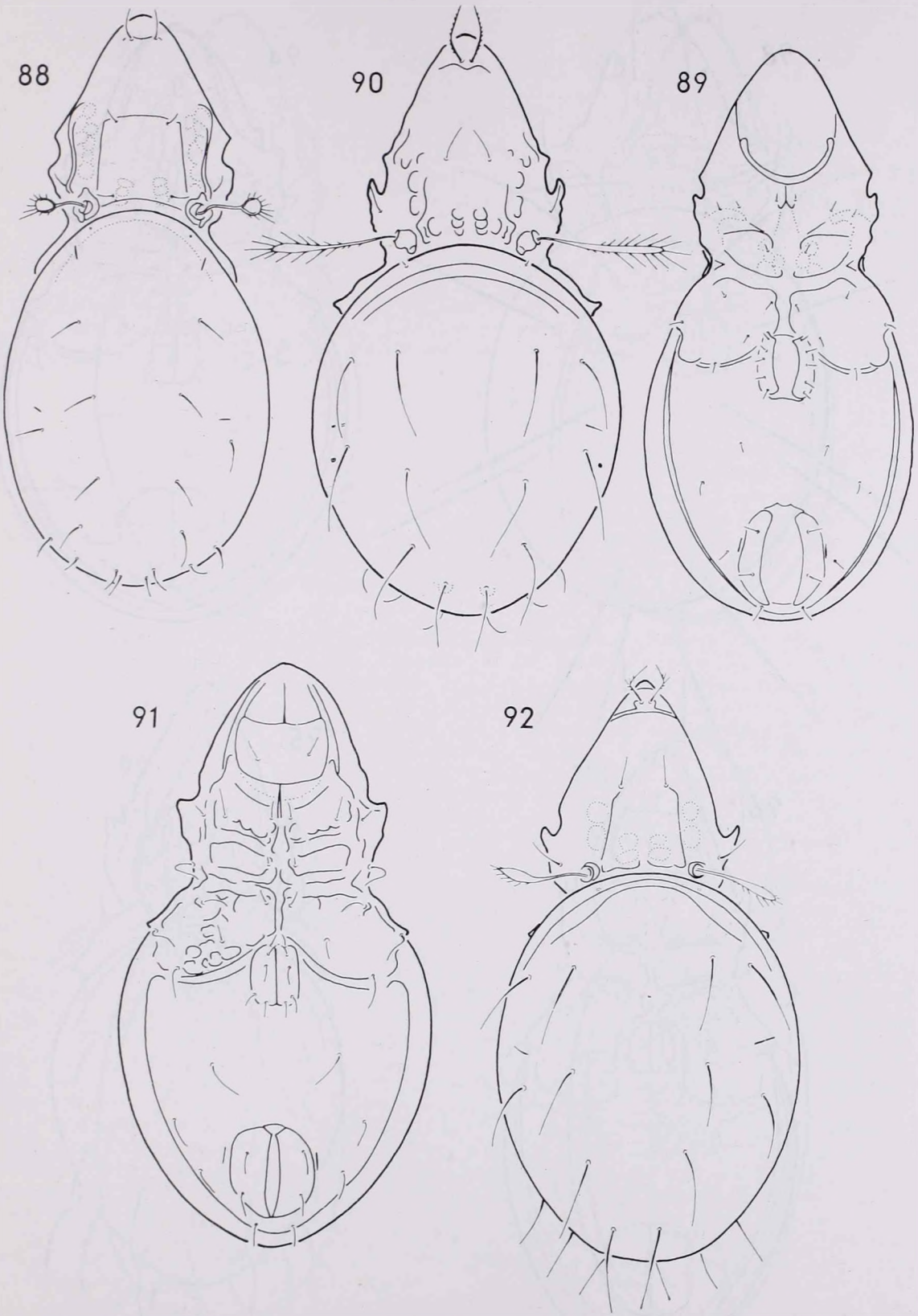
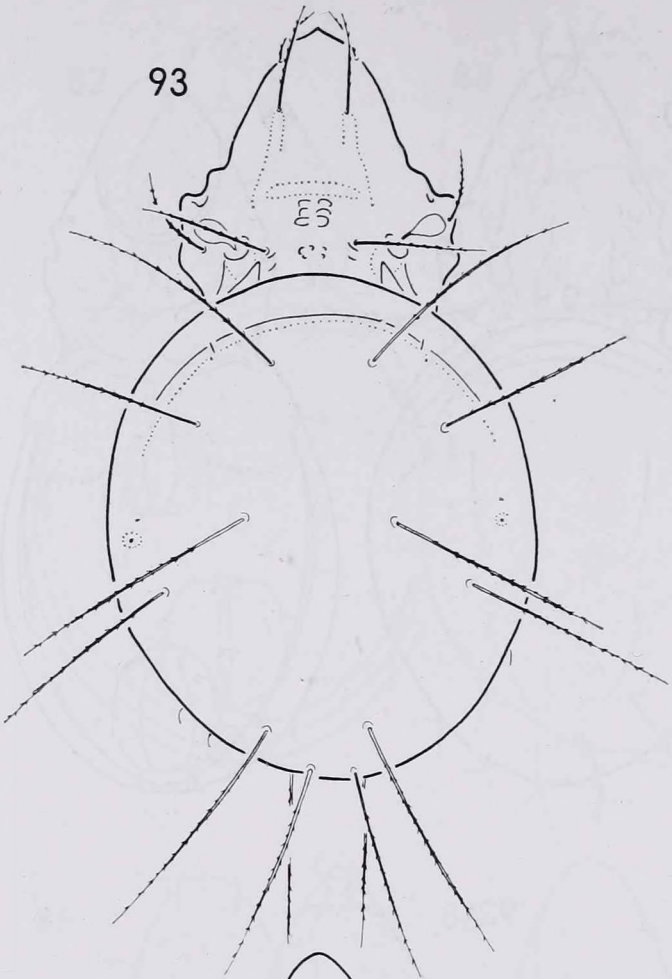
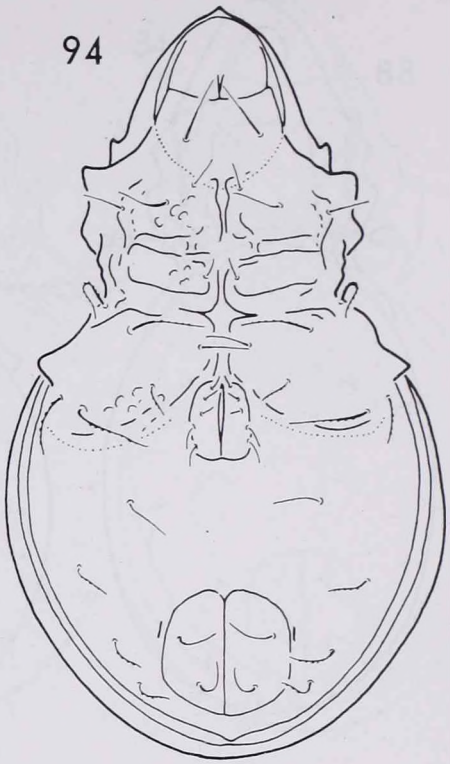


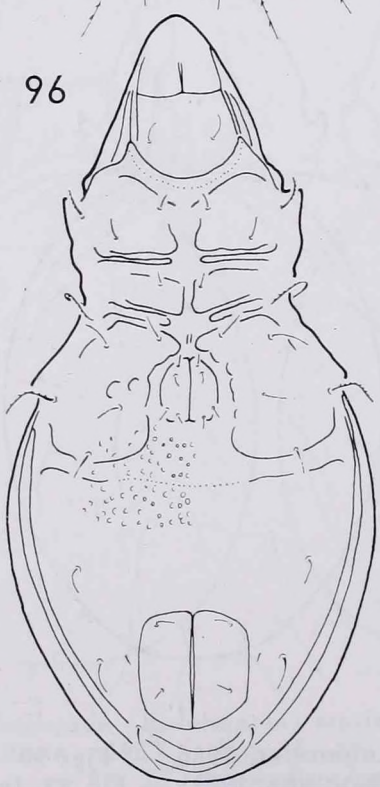
Fig. 82. *Similoppia (Reductoppia) espeletiae* (P. BALOGH, 1984). — Figs 83—84. *Basidoppia basidii* MAHUNKA, 1983. — Figs 85—86. *Graptoppia (Apograptoppia) foveolata* (PAOLI, 1908). — Fig. 87. *Ramusella (Insculptoppiella) alfonsii* (BERNINI, 1980)

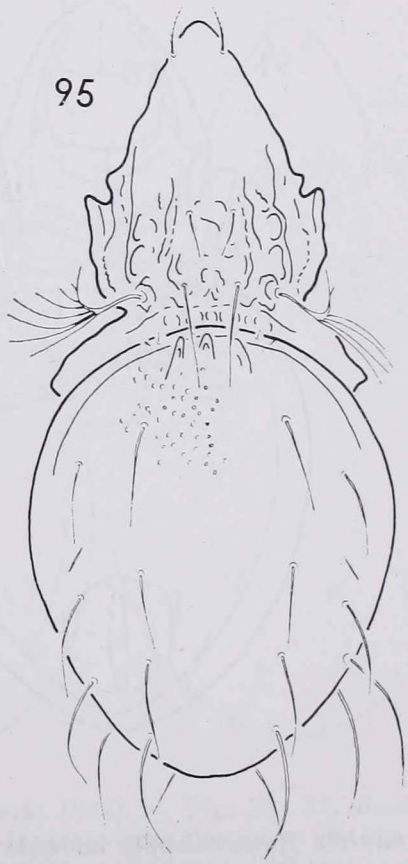


Figs 88—89. *Ramuselloppia anomala* SUBIAS et RODRIGUEZ, 1986. — Figs 90—91. *Pseudoamerioppia barrancensis paraguayensis* (BALOGH et MAHUNKA, 1981). — Fig. 92. *Intermedioppia alvarezi* (PÉREZ-IÑIGO, 1982)

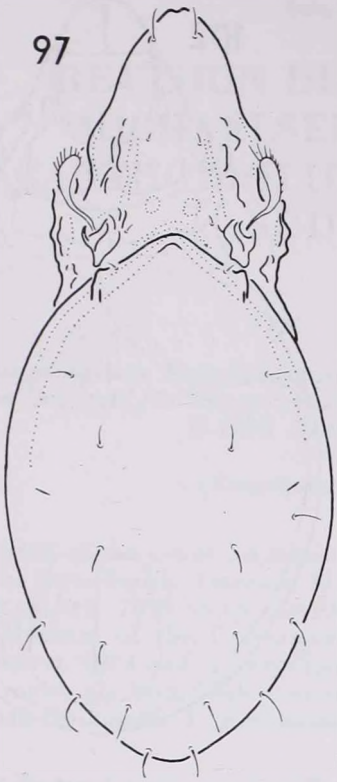


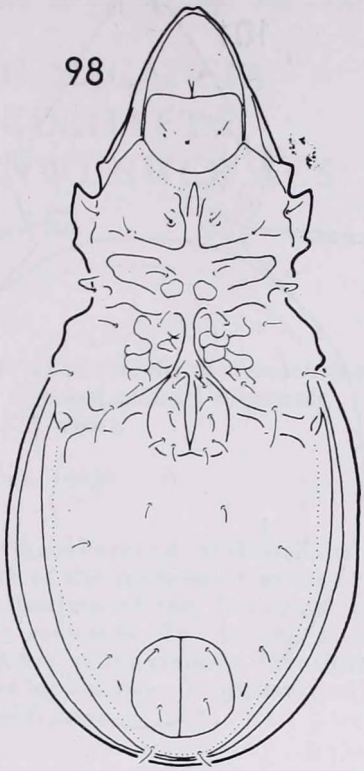


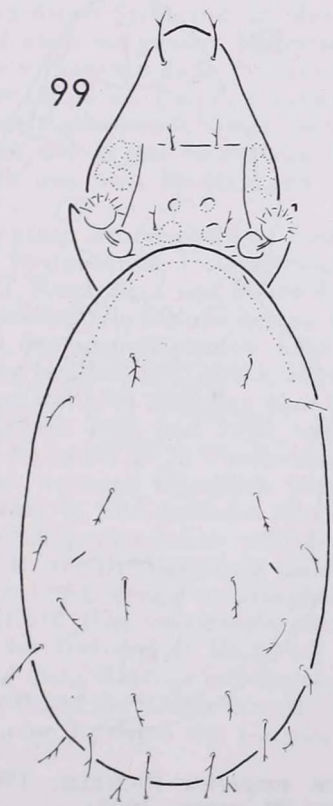


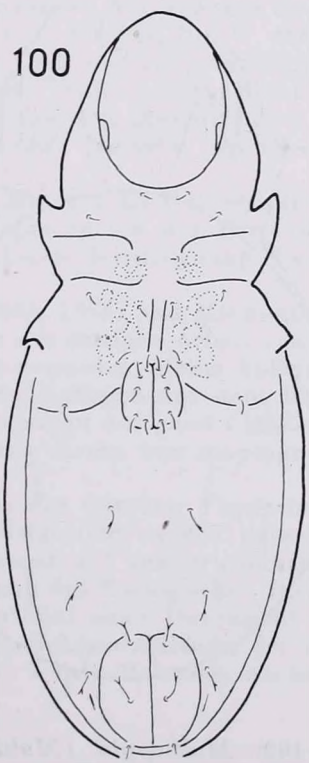


Figs 93—94. *Vietoppia (Vietoppia) hungarorum* MAHUNKA, 1988. — Figs 95—96. *Foveolatoppia foveolata* MAHUNKA, 1988

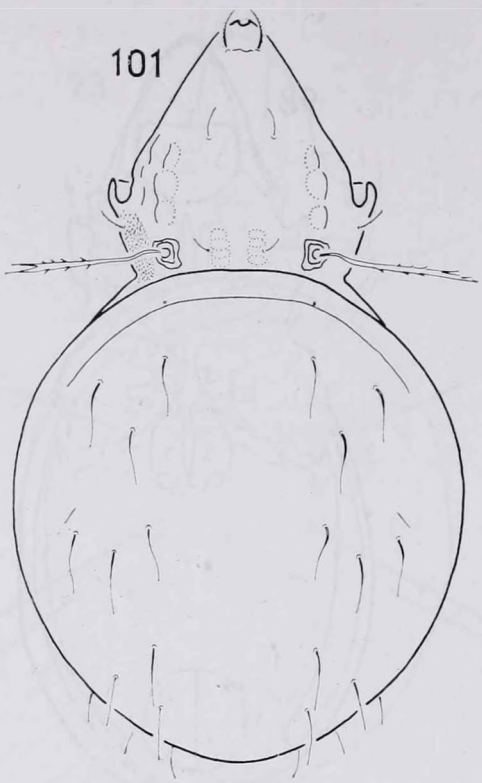


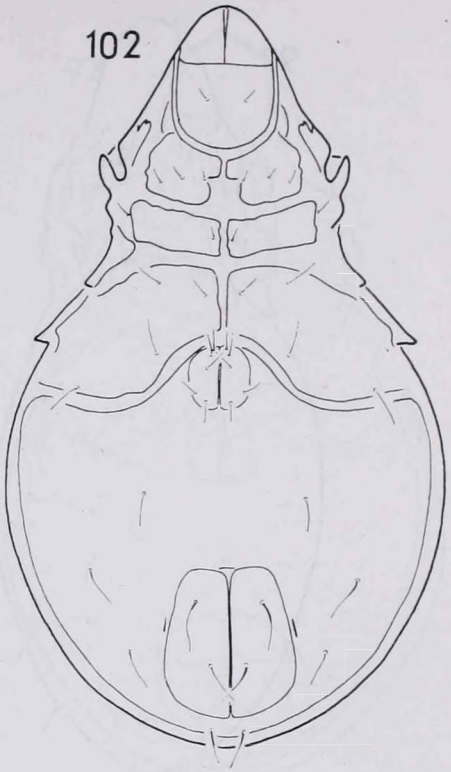


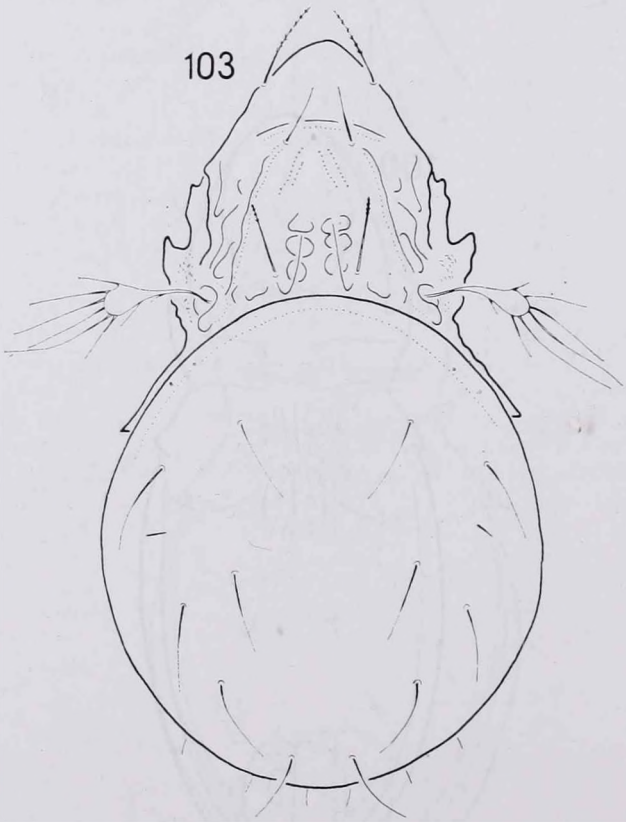


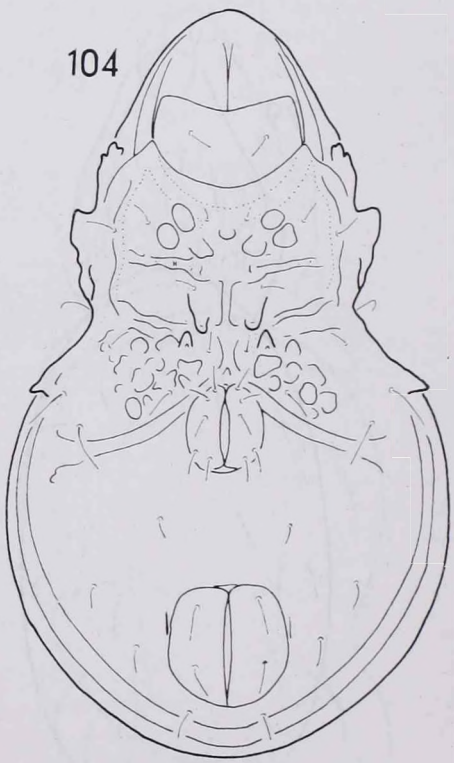


Figs 97—98. *Subiasella (Dividoppia) aperta* (MAHUNKA, 1987). — Figs 99—100. *Javieroppia cervus* MINGUEZ et SUBIAS, 1986









Figs 101—102. *Multioppia (Multilanceoppia) ramulifera carpatica* (SCHALK, 1966) Figs 103—104. *Ramusella (Sabahoppia) hauseri* (MAHUNKA 1987)

Acta Zoologica Hungarica 35 (3—4), pp. 413—430 (1989)

REVISION DER GATTUNG YAGANSIA MICHAELSEN, 1899 (OLIGOCHAETA, ACANTHODRILIDAE) REGENWÜRMER AUS SÜD-AMERIKA, 11.

A. ZICSI

Bodenzoologische Forschungsgruppe der Ungarischen Akademie der Wissenschaften, am Lehrstuhl für Tiersystematik und Ökologie der Eötvös-Loránd-Universität, H-1088 Budapest, Puskin utca 3, Ungarn

(Eingegangen am: 15 November, 1988)

(Revision of the genus Yagansia Michaelsen, 1899, Oligochaeta: Acanthodrilidae. Earthworms from South America, 11.) In the framework of the revision of genus *Yagansia* MICHAELSEN, 1899 all species represented in the Collection of the Zoological Institute and Museum of the University of Hamburg were reviewed. The names *Y. chilensis* COGNETTI, 1904 and *Y. papillosa* (BEDDARD, 1895) are synonymized. Identification of new materials from Chile resulted four species new for science: *Y. dicastrii*, *Y. covarrubiasi*, *Y. hajeki*, *Y. parinacotana*. With 15 original figures.

Im Rahmen der Ungarischen Bodenzoologischen Expedition aus den Jahren 1965—1966 (Teilnehmer: Prof. DR. J. BALOGH, DR. I. ANDRÁSSY, DR. I. LOKSA, DR. S. MAHUNKA und DR. A. ZICSI) wurden unter anderem auch in Chile eingehende Regenwurm-Aufsammlungen durchgeführt. An dieser Stelle soll mit der Bearbeitung dieses Materiales begonnen werden. Gleichzeitig wird auch ein grosses Material, welches von den damaligen Mitarbeitern des Instituto de Higiene y Fomento de la Produccion Animal (Prof. DR. F. DI CASTRI, DR. W. HERMOSILLA, DR. R. COVARRUBIAS, DR. E. HAJEK), Santiago de Chile, in Chile und auf verschiedenen chilenischen Inseln gesammelt wurde, berücksichtigt. Ausser diesen beiden reichen Aufsammlungen wurde auch das in der Sammlung des Zoologischen Instituts und Museums von Hamburg vorliegende und von MICHAELSEN seinerzeit nicht bestimmte Material durchgesehen und bestimmt.

Für einen Arbeitsplatz im Zoologischen Institut und Museum der Universität Hamburg, sowie für weitgehende Unterstützung meiner Arbeiten, spreche ich der Direktion, Herrn Prof. DR. J. PARZEFALL und Herrn Prof. DR. M. DZWILLO, Leiter der Abteilung Niedere Tiere, auch an dieser Stelle meinen besten Dank aus.

Seit den grundlegenden Arbeiten von BEDDARD (1895, 1896) und MICHAELSEN (1889, 1898, 1899a, b, 1910, 1921, 1923, 1936) sind aus Chile ausser der einzigen Arbeit von COGNETTI (1904) keine weiteren Angaben über Regenwürmer bekannt geworden. Meine Aufsammlungen aus den Jahren 1965 und 1966, sowie die der angeführten Kollegen aus dem Instituto de Higiene y Fomento de la Produccion Animal, die sich sozusagen auf ganz Chile erstrecken, geben einen weiteren Überblick über die Regenwurm-Fauna dieses, aus zoogeographischem Gesichtspunkt in Süd-Amerika alleinstehenden Landes.

In vorliegender Arbeit will ich mich mit den Vertretern der Gattung *Yagansia* befassen. Schon bei der ersten Durchsicht meines Materiales musste festgestellt werden, dass ein Identifizieren der Arten wegen unzulänglicher Originalbeschreibungen auf unüberwindliche Schwierigkeiten stösst. Dies veranlasste mich, dass in der Sammlung des Zoologischen Instituts und Museums der Universität Hamburg befindliche Typen-Material einer Durchsicht zu unterwerfen, und mein Material mit diesem zu vergleichen. Bei der Bekanntmachung der Ergebnisse gehe ich auch auf die Beobachtungen ein, die ich an Hand des Typen-Materials machen konnte, und führe eine Revision der Gattung durch.

GATTUNG *YAGANSIA* MICHAELSEN, 1899 emend. ZICSI

Typus-Art: *Yagansia spatulifera* (MICHAELSEN, 1889)

Gattungsdiagnose — Borsten zu 8 auf einem Segment. Kopf epi- oder tanylobisch. Nephridialporen jederseits in einer Längslinie. Männliche Poren am 17. oder 18. Segment, den Prostataporen mehr oder weniger genähert. Prostataporen ein Paar am 17. Segment. Samentaschenporen ein Paar auf Intersegmentalfurche 8/9 oder auf dem 8. Segment. Oesophagus einfach, ohne Klakdrüsen und Oesophagealtaschen. Ein Paar Hoden und Samentrichter im 10. Segment, frei oder in Testikelblasen eingeschlossen. Samensäcke im 9. und 11. Segment, oder in einer der beiden Segmente. Prostata schlauchförmig, mit Penialborsten versehen. Samenleiter gesondert oder gemeinsam mit den Prostata ausmündend.

Mit Ausnahme von drei Arten: *Y. kinbergi* MICHAELSEN, 1899, *Y. peruana* ČERNOSVITOV, 1939 und *Y. epiphanica* CORDERO, 1942 sind alle überigen von BEDDARD 1895 (*corralensis*, *diversicolor*, *gracilis*, *grisea*, *longiseta*, *papillosa*, *robusta*), von MICHAELSEN (*spatulifera* 1889, *pallida* 1898, *delfini* 1899, *chiloensis* 1921, *rahmi* 1936) und von COGNETTI (*chilensis* 1904) aus Chile beschrieben worden. Die übrigen, *Y. kinbergi* aus Süd-Afrika, *Y. epiphanica* aus Uruguay, und *Y. peruana* aus Peru vom Titicaca-See.

Ohne den beiden ersten Arten gegenüber Stellung einnehmen zu können, da kein Typenmaterial eingesehen werden konnte, sei bloss bemerkt, dass *kinbergi* an Hand eines gürtellosen Tieres beschrieben wurde, *epiphanica*, die zwar auf Grund von 6 adulten Tieren beschrieben wurde, solche Merkmale führt: Gürtel bis 1/2 21. Segment, Samentasche ohne Divertikel, die für die übrigen Arten der Gattung *Yagansia* nicht kennzeichnend sind. Von *Y. peruana* ist es mit Sicherheit anzunehmen, dass wir einer *Yagansia*-Art gegenüber stehen, da mir aus Nord-Chile eine dieser Art sehr nahestehende, neue Art in zahlreichen Individuen zur Verfügung steht.

An dieser Stelle sei noch bemerkt, dass zwei Arten, die von MICHAELSEN (1900) zu *Yagansia* gestellt wurden: *beddardi* ROSA, 1895 und *michaelseni* BEDDARD, 1895 im späteren (1910, 1921) wieder in die Gattung *Microscolex* zurückversetzt wurden. Ob dies für *Y. michaelseni* zutrifft, mag vorläufig hingestellt bleiben.

Bearbeitung des Materiales

Fundortliste

1. Antofagasta (Prov. Antofagasta); in der Spritzzone des Meeresufers. 21. IX. 1965.
2. Maipu, Quebrada, La Plata (Prov. Santiago). Fundo: La Rinconada, 25 km SW von Santiago de Chile; schwarzer, feuchter Wiesenboden. 28. IX. 1965.
3. Cerro El Roble, Cordillera de la Coste (Prov. Santiago), 84 km NW von Santiago de Chile, 1800 m. 29. IX. 1965.
4. Curacavi (Prov. Santiago), Los Cerillos, 72 km W von Santiago de Chile; sehr trockener Boden. 3. X. 1965.
5. El Arrayan (Prov. Santiago), 10 km O von Santiago de Chile, 1300 m. 9. X. 1965.
6. Umgebung von Valdivia (Prov. Valdivia), 20 km von der Stadt entfernt, auf dem Weg nach La Unión; unter der Brücke. 24. X. 1965.
7. Fundort wie zuvor; unter Kuhfladen, Holzrinde und Steinen. 24. X. 1965.
8. Pelchuquin (Prov. Valdivia); sehr feuchter, harter Boden. 25. X. 1965.
9. Zwischen Loncoche und Villarrica (Prov. Valdivia); unter Baumstämmen und Kuhfladen. 25. X. 1965.
10. Umgebung von La Unión (Prov. Valdivia); neben der alten Verkehrstrasse. 26. X. 1965.
11. Tiltil, Cuesta La Dormida (Prov. Santiago); sandiger, lehmiger Boden und in der Laubstreu. 5. XI. 1965.

12. Bofedal de Bacuyo (Prov. Tarapaca), 4500 m; nasser, mooriger Boden. 26. XI. 1965. Am Fusse des Parinacota Vulkanes.
13. Laguna La Cotacotani (Prov. Tarapaca), 4780 m; unter Steinen am Seeufer. 26. XI. 1965.
14. Lago de Chungará (Prov. Tarapaca), 4500 m; sehr feuchter Boden. 27. XI. 1965.
15. Caquena (Prov. Tarapaca); unter Steinen. 28. XI. 1965.
16. Am Fusse des Guallatiri Vulkans (Prov. Tarapaca); unter Steinen. 29. XI. 1965.
17. Ahui, Chiloé Island; künstliche Prärie. 13. II. 1964.
18. El Arrayán; Santiago; buschige Steppe. 4. VIII. 1963.
19. Isla Negra, el Tabo (Prov. Valparaiso); sandiger Boden. 18. IX. 1964.
20. Catamutun (Prov. Valdivia); temperierter Regenwald. 11. X. 1963.
21. Los Ulmos, Valdivia; temperierter Regenwald. 11. X. 1963.
22. 20 km N von Valdivia entfernt; temperierter Regenwald. 13. X. 1963.
23. Parque Saval, Valdivia; im Garten. 12. X. 1963.
24. Cuesta Soto-Valdivia (Prov. Valdivia); temperierter Regenwald. 20. VIII. 1964.
25. Am Wege zwischen Puyehue und Antillanca (Prov. Osorno); temperierter Regenwald. 17. X. 1964.
26. Calafquén See, (Prov. Valdivia); temperierter Regenwald. 16. X. 1964.
27. Mehuin (Prov. Valdivia); temperierter Regenwald. 17. IX. 1964.
28. Antillanca (Prov. Osorno); temperierter Regenwald. 17. X. 1964.
29. Villarrica Vulkan (Prov. Cautin); Gebirgsteppe. 28. XI. 1964.
30. Futrono (Prov. Valdivia); temperierter Regenwald. 9. X. 1964.
31. Insel Mulchey, Hafen Ballenas; temperierter Regenwald. 19. IX. 1969.
32. Puerto Edén; degradierter patagonischer Wald. 23. IX. 1969.
33. Hafen Charrua; Torfmoor. 24. IX. 1969.
34. Insel Grant; hydrophiles Gebüsch. 25. IX. 1969.
35. Insel Mornington, Hafen Alert; unter Steinen. 26. IX. 1969.
36. Insel Juan, Bucht Wide; patagonischer Wald, im gefallenen Baumstamm. 30. IX. 1969.
37. Insel Desolation, Bucht Tuesday; Steine ohne Vegetation. 4. X. 1969.
38. Puerto Bueno; Torfmoor. 2. X. 1969.
39. Fiordo Peel, Caleta Amalia; Wald mit Nothofagus pumilio. 1. X. 1969.
40. Insel Desolation, Hafen Charrua; unter Steinen am Waldweg. 5. X. 1969.
41. Puerto Fontescue; patagonicher Wald. 6. X. 1969.
42. Bahia Pond; patagonischer Wald, gefallene Baumstämme. 8. X. 1969.

Von den Fundorten 1. bis 16. ist das Material von den Teilnehmern der Ungarischen Bodenzoologischen Expedition, insbesondere aber vom Verfasser selbst gesammelt worden (vgl. auch Andrássy et al. 1967). Von den Fundorten 17. bis 42. wurde das Material von den chilenischen Kollegen des damaligen Instituto de Higiene y Fomento de la Produccion Animal, Santiago de Chile, gesammelt und mir zur Bestimmung überlassen. Für ihre Bemühungen spreche ich ihnen auch an dieser Stelle meinen besten Dank aus.

In der Sammlung des Zoologischen Instituts und Museums der Universität Hamburg konnte das Typen-Material folgender Arten eingesehen werden: *Yagansia spatulifera*, *grisea*, *robusta*, *diversicolor*, *papillosa*, *longiseta*, *rahmi*, *corralensis*, *gracilis*, *delfini*, *chiloensis*. Mit Ausnahme von *pallida* und *chilensis* waren alle aus Chile beschriebenen Arten vorhanden und gehörten der Typen-Serie an. Da MICHAELSEN im späteren (Nachtrag, 1899b) auch Nachbestimmungen durchführte, und mir nicht bekannt ist, welche Exemplare von BEDDARD zurückgehalten wurden, sehe ich jetzt bei den von BEDDARD beschriebenen Arten von einem Designieren eines Lecto-, bzw. Paralectotypus ab. Bei meiner Überprüfungen jedoch führe ich sämtliche Merkmale, die in der Beschreibung fehlen, an.

Yagansia spatulifera (MICHAELSEN, 1889)
(Abb. 1.)

Yagansia chilensis COGNETTI, 1904 (JAMIESON 1974).

Der unter Inventarnummer V. 387 in der Sammlung des Museums aufbewahrte Regenwurm ist einwandfrei das Originalstück dieser Art. Leider ist das Tier vollkommen ausgetrocknet, und so nicht nachbestimmbar. In der Sammlung von MICHAELSEN, aber auch in meinem Material ist es einer, der in Chile am häufigsten angetroffenen Regenwürmer. Eine

Nachuntersuchung der von MICHAELSEN bestimmten Tiere und ein Vergleich mit gut erhaltenen Tieren meines Materiales erbrachten den Nachweis von einigen interessanten Merkmalen die entweder in der Originalbeschreibung, noch in der ausführlichen Ergänzung von MICHAELSEN (1936) angeführt sind. Deswegen sehe ich mich gezwungen eine ausführliche Neubeschreibung dieser Art zu liefern.

Die Grösse der Tiere ist sehr verschieden, 5 bis 16 cm. Farbe des Tieres kann von dunkelgrau bis rot, dunkelrot sein. Die ausgelöschten Intersegmentalfurchen sowie die pigmentlosen freien Borstenpaaransätze sind nicht bei

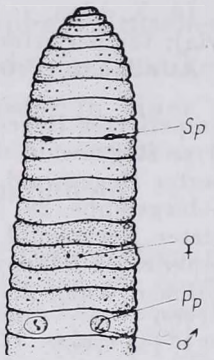


Abb. 1. *Yagansia spatulifera* (MICHAELSEN, 1889): Ventralansicht, Sp = Samentaschenporen, Pp = Prostataporen

allen konservierten Tieren zu erkennen. Rückenporen können auch schon mehrere Segmente vor dem Gürtel beobachtet werden, ganz deutlich im 12/13 Segment. Nephridialporen in der Borstenlinie *c*, nur die im 3. und 4. Segment verschieben sich konstant in die Borstenlinie *d*, oder etwas oberhalb *d*. (Dies wird von COGNETTI auch bei *Y. chilensis* erwähnt.) Samentaschenporen auf Intersegmentalfurche 8/9 zwischen der Borstenlinie *ab*. Die Poren können manchmal auch auf den unteren Rand des 8. Segmentes verschoben sein.

Ringförmiger Gürtel eindeutig vom 13. bis 17. Segment. (Im Schlüssel von MICHAELSEN 1900, p. 157, fälschlicherweise vom 13. bis 16. Segment angegeben.) Die Segmente der Gürtelregion können gänzlich verschwommen sein, doch kann bei einigen Exemplaren die Segmentierung noch erkannt werden. Weibliche Poren auf dem 14. Segment, innerhalb der Borstenlinie *a*, und etwas vor ihnen. Prostataporen auf dem 17. Segment, zwischen der Borstenlinie *ab*, auf kleinen Erhebungen, die mit einem kleinen Schlitz versehen sind, und bis zum unteren Rand des 17. Segmentes reichen. Hier münden auch die männlichen Poren aus. Hinterer ventraler Teil des 16. Segmentes halbkreisförmig ausgelöscht, weiss (Abb. 1).

Innere Organisation — Dissepimente 6/7—9/10 zart angedeutet, 10/11—12/13 mässig verdickt. Im 10. Segment kann eine perioesophageale Testikelblase erkannt werden, die Hoden und Samentrichter und den Oesophagus umhüllen. Samensäcke, wie dies von MICHAELSEN (1936) richtig

gestellt, im 9. Segment, seitlich nach vorne gerichtet, büschelige Gebilde, im 11. Segment traubenförmig grosse Säcke. Letzte Paar Herzen im 12. Segment Nephridien im mittleren und hinteren Teil des Körpers fadenförmig gestreckt, am Ende mit einem runden, später hinten mit einem gestreckten Säckchen versehen. Ovarien im 13. Segment, mässig gross. Prostata mit geschlängeltem Drüsenteil im 14. bis 23. Segment. Ausführungsgang der Prostata ebenfalls gebogen, bedeutend dünner, glänzend, muskulös.

Penialborsten zu zwei auf einer Seite, eine Borste länger als die andere, beide am Ende spatelförmig ausgebildet, und mit feinen Zähnchen besetzt. Bei der kleineren beginnen die Zähnchen in Reihen ganz vorne, bei der grösseren Borste ist der vordere Teil glatt, die Zähnchen fangen erst später an zu erscheinen.

Übereinstimmend mit MICHAELSEN bin ich ebenfalls der Meinung, dass *spatulifera* der *grisea* BEDDARD sehr nahe steht, die Form der Samentaschen sind tatsächlich verschieden, doch ist die Vielfältigkeit mit der *spatulifera* in Erscheinung tritt, so gross, dass ein sicheres Auseinanderhalten der beiden Arten auf Schwierigkeiten stösst.

Fundorte — Nr. 9. AF 644—647.* 52 + 13 Ex. — Nr. 6 = AF 648. 200 Ex. — Nr. 10. AF. 649. 25 Ex. — Nr. 23. AF. 678. 3 Ex. — Nr. 1. AF. 685. 18 Ex. — Nr. 17. AF. 723. 1 Ex. — Nr. 31. AF. 727. 1 + 1 Ex. — Nr. 9. AF. 1033. 1 Ex. — Nr 10. AF. 1034. 12 juv. Ex. — Nr. 25. AF. 1055. 1 Ex. — Nr. 29. AF. 1072. 2 Ex. — Nr. 30. AF. 1073. 1 Ex. — Nr. 22. AF. 1085. 5 Ex., AF. 1114. 5 Ex. — Nr. 35. AF. 1092. 1 Ex. — Nr. 18, AF. 1093. 1 Ex. — Nr. 36. AF. 1102. 1. Ex. — Nr. 20. AF. 1104. 1 Ex.

Die folgenden Tiere wurden in der Sammlung des Zoologischen Instituts und Museums der Universität Hamburg bestimmt:

Chile, Coronel V 8945.** 7 + 9 juv. Ex. (ohne Datum), V. 8025. 2 Ex. 15. 10. 1912., V. 8026. 1 Ex. 17. 6. 1912., V. 7415. 1 Ex. 7. 12. 1910. leg. PAESSLER; Concepcion V. 7716. 1 + 2 juv. Ex. 13. 6. 1912. leg. PAESSLER; Ensenada V. 8173. 1 Ex. leg. FRANK.

Bemerkung — Vom Fundort Nr. 9 ist unter Inv. Nr. AF. 647 ein Exemplar aufbewahrt, wo ein Paar Samentaschen im 9. Segment und zwei Paar Prostata im 17. und 19. Segment nachgewiesen werden konnte. Da im angeführten reichen Material dies das einzige Exemplar in diesem Übergangsstadium ist, dürfen keine weitgehenden Schlüsse aus diesem Fund gezogen werden, der Fall muss einfach als eine Anomalie betrachtet werden.

Yagansia grisea (BEDDARD, 1895)

Das von BEDDARD 1895 auf p. 229 angeführte Typenmaterial konnte grösstenteils identifiziert und nachbestimmt werden. Leider waren die meisten Exemplare nicht vollkommen adult. (Inv. Nr. V. 4244 und V. 4243 je 2 Ex).

Die ergänzende Beschreibung von MICHAELSEN (1936) und JAMIESON (1974) dernach Unterschiede in den verdickten Dissepimenten, in der Ausbildung der Samentaschen und in der Form der Prostata bestehen, konnte

* Die Buchstaben AF und Numerierung beziehen sich auf die Inventarnummer der Sammlung des Lehrstuhles der Universität Budapest.

** Der Buchstabe V bezieht sich auf die Sammlung des Zoologischen Instituts und Museums der Universität Hamburg.

ebenfalls erkannt werden. Weitere Unterschiede finde ich in der Lage der männlichen Poren. Die Prostataporen stehen auf Erhebungen, die für spatulifera kennzeichnenden Schlitze im unteren Teil des 17. Segmentes fehlen, die männlichen Poren öffnen sich in der Nähe der Prostataporen. Die Penialborsten sind fast gleichlang, am Ende etwas spatelförmig, die Zähnchen sind jedoch nicht in Reihen angeordnet. Auch die Nephridien sind von anderer Form, am Ende konnte der runde Sack nicht erkannt werden. Trotzdem ist ein Auseinanderhalten der beiden Arten, wie dies bei spatulifera bereits erwähnt wurde, sehr schwer.

Im eigenen Material konnte kein Tier einwandfrei mit dieser Art identifiziert werden.

Fundort — Chile, Corral V. 8148. 1 Ex. 3. 10. 1913 leg. PAESSLER.

Yagansia dicastrii sp. n.
(Abb. 2—4)

Von dieser neuen Art liegen mehrere Exemplare von verschiedenen Fundorten aus Mittelchile vor, die in allen wesentlichen Merkmalen übereinstimmen, bloss in den Papillen tragenden Segmenten sowie in der Zahl der Papillen auf einem Segment, stark variieren.

Länge des Holotypus 60 mm, Durchmesser 4 mm, Segmentzahl 152. Bei den übrigen Tieren Länge 48—68 mm, Durchmesser 3,5—4,2 mm, Segmentzahl 128—168. — Farbe grau.

Kopf tanylobisch. Borsten eng gepaart. Borsten am Vorderkörper *ab* etwas grösser als *cd*; *aa* ebenfalls grösser als *bc*. Am Hinterkörper, besonders dem Körperende zu, gehen die Borsten *ab* und *cd* etwas auseinander. Borstendistanz hinter dem Gürtel $aa : ab : bc : cd : dd = 10 : 1{,}6 : 10 : 1 : 24$.

Samentaschenporen auf Intersegmentalfurche 8/9 in der Borstenlinie *ab*, oder etwas in Richtung *b* verschoben. Rückenporen deutlich hinter dem Gürtel erkannt. Nephridialporen in der Borstenlinie *cd*, nur im 3. Segment oberhalb der Borstenlinie *d*. Weibliche Poren auf dem 14. Segment, etwas innerhalb der Borstenlinie *a* und etwas vor diesen, kleine Schlitze deren Umgebung aufgehellt ist. Gürtel ringförmig vom 13.—17. Segment, stark drüsig, Segmentierung nicht zu erkennen. Bei einigen Exemplaren am 13. und 17. Segment manchmal nicht so drüsig ausgebildet. Prostataporen auf dem 17. Segment, manchmal auf kleinen Erhebungen, daneben oder darunter sind die männlichen Poren zu erkennen. Papillen tragende Segmente sehr verschieden, manchmal gänzlich fehlen. Am häufigsten ein Paar Paillen am 11., 15., 18. Segment von einem grossen runden Hof umgeben. Bei vielen Tieren konnten auch am 8., 16., 19., 20. Segment Papillen erkannt werden, oder es sind nur drüsige Verdickungen (Abb. 2).

Innere Organisation — Verdickte Dissepimente 6/7—12/13, die Dissepimente 6/7, 7/8 und 12/13 weniger verdickt, 8/9—11/12 kräftiger.

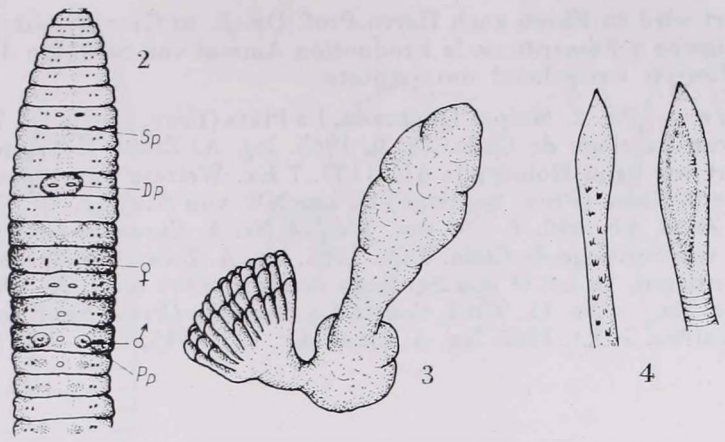


Abb. 2—4. *Yagansia digastrii* sp. n.: 2 = Ventralansicht, Sp = Samentaschenporen, Dp = = Drüsenpapillen, 3 = Samentasche mit Divertikel, 4 = Form der Penialborsten

Muskelmagen im 6 Segment, gross, vorne mit einem kräftigen Kragen. Samentaschen im 9. Segment, Ampulle gross, turmförmig mit rundem Ausführungsgang aus dem ein Divertikel entspringt welches mit zahlreichen länglichen Samenkämmerchen versehen ist (Abb. 3). Divertikel kleiner als Ampulle. 2 Paar Samensäcke im 9. und 11. Segment. Die des 9. Segmentes klein, büschelförmig nach vorne gerichtet, die des 11. traubenförmig, gross. Hoden und Samentrichter im 10. Segment, manchmal von aufgefranzten Testikelblasen umgeben. Letzte Herzen im 12. Segment. Ovarien im 13. Segment, flache Gebilde an deren Ende viele kleine Eier traubenförmig angeordnet sind. Ovarientrichter im 13/14. Segment.

Prostata gross, mehrfach gewunden im 15.—21. Segment, Ausführungsgang muskulös, dünner als die Prostata. 2 grosse und 2 kleine Borsten in Borstensäcken. Auch die 2 grossen Borsten sind nicht gleich. Grössere Borste löffelförmig ausgehöhlt ohne Ornamentierung, jedoch geringelt, etwas kleinere andere Borste ebenfalls spitz zulaufend, nicht so deutlich löffelförmig, mit Zähnchen ornamentiert (Abb. 4). Die kleinen Borsten entsprechen in Form den grossen Borsten.

Die neue Art steht *Y. pallida* (MICHAELSEN, 1898) am nächsten. Unterscheidet sich jedoch von dieser durch die Lage des Gürtels, durch die Lage der Samentaschenporen und dadurch, dass sie auch im 9. Segment über Samentaschen verfügt. Von *Y. corralensis* (BEDDARD, 1895) unterscheidet sie sich ebenfalls dadurch, dass sie über Samensäcke im 9. Segment verfügt und andere Borstenform besitzt.

B e m e r k u n g — Es ist zu bedauern, dass der Typus von *Y. pallida* nicht nachuntersucht werden konnte, da er in der Sammlung des Museums von Hamburg nicht vorlag. Ich kann den Verdacht nicht unterdrücken, dass corralensis, die vom selben Ort gesammelt wurde wie *pallida*, mit dieser synonym ist. Eine Nachuntersuchung des Typenmateriales (s. unten) von *Y. corralensis* liess mich viele Merkmale erkennen, die auch bei *pallida* beschrieben wurden (z. B. Lage der Samentaschenporen oberhalb der Borstenlinie *cd*). Dies konnte bei keiner anderen *Yagansia*-Art bisher nachgewiesen werden.

Die neue Art wird zu Ehren nach Herrn Prof. Dr. F. di Castri, dem damaligen Leiter des Instituto de Higiene y Fomento de la Produccion Animal von Santiago de Chile, benannt, der unsere Sammlungen weitgehend unterstützte.

Fundorte — Nr. 2. Maipu, Quebrada, La Plata (Prov. Santiago). Fundo: La Rinconada 25 km SW von Santiago de Chile. 28. 9. 1965. leg. A. Zicsi. Holotypus AF. 1138. — Paratypen. Fundort wie beim Holotypus AF. 1139. 7 Ex. Weitere Paratypen: Nr. 3. Cerro el Roble Cordillera de la Costa (Prov. Santiago) 84 km NW von Santiago de Chile, 1800 m; 29. IX. 1965. leg. A. Zicsi AF. 690. 8 + 4 juv. Ex. — Nr. 4. Curacavi (Prov. Santiago), Los Cerillos, 72 km W. von Santiago de Chile. 3. X. 1965. leg. A. Zicsi. AF. 691. 9 Ex. — Nr. 5 El Arrayan (Prov. Santiago), 10 km O von Santiago de Chile, 1300 m. 9. X. 1965. leg. A. Zicsi. AF. 688. 3 + 3 juv. Ex. — Nr. 11. Tiltil, Cuesta La Dormida (Prov. Santiago). Sandigerlehm Boden, in der Laubstreu. 5. XI. 1965. leg. A. Zicsi. AF. 712—715, 717—718. 98 + 43 juv. Ex.

Yagansia corralensis (Beddard, 1895)

Laut Originalbeschreibung soll nur ein einziges Exemplar dieser Art zur Beschreibung vorgelegen sein. Dies wurde auch unter Inv. Nr. V. 4254 mit den Fundortangaben: Corral unter Steinen am Rande des Gebirgsbaches 5. VII. 1893 vorgefunden. Bei der Nachbestimmung konnten die Samentaschenporen oberhalb der Borstenlinie *cd* erkannt werden, Samensäcke liessen sich nur im 11. Segment nachweisen. Im späteren wurde von Michaelsen mit dem Fundort Corral 17. 5. 1893 (Inv. Nr. V. 4208) ein weiteres nicht ganz adultes Exemplar ebenfalls als *Y. corralensis* bestimmt. Bei diesem Tier erstreckte sich der Gürtel vom 1/2 13.—16. Segment. Papillen konnten am 11., 15., 16., 18., 19. und 20. Segment erkannt werden. Wie auch aus dieser Beschreibung zu ersehen ist, lässt sich eine nahe Verwandtschaft mit *Y. pallida* einwandfrei erkennen, doch war das einzige Exemplar nicht vollkommen adult.

Fundort — V. 8147 Chile, Corral, 3. 10. 1913. leg. Paessler. 1 praeadultes Ex.

Yagansia covarrubiasi sp. n.
(Abb. 5—7)

Länge des Holotypus 62 mm, Durchmesser 4 mm, Segmentzahl 96. Bei den übrigen Tieren: Länge 40—65 mm, Durchmesser 3—4 mm, Segmentzahl 58—98. — Farbe hellgrau, unpigmentiert.

Kopf tanylobisch. Borsten weitläufig gepaart, *ab* kleiner als *cd*; *aa* etwas grösser als *bc*; Borstendistanz hinter dem Gürtel $aa : ab : bc : cd : dd = 4 : 1 : 4{,}66 : 1{,}5 : 11{,}6$.

Samentaschenporen am unteren Teil des 8. Segmentes, unterhalb der Borsten *b*, deutlich auf dem Segment angeordnete kleine Schlitze. Rückenporen auf Intersegmentalfurche 6/7 beginnend, bei den meisten Tieren sind die Rückenporen vor dem Gürtel zu. Nephridialporen in der Borstenlinie *c*, nur vorne im 4. Segment zwischen der Borstenlinie *cd*, im 3. Segment manch-

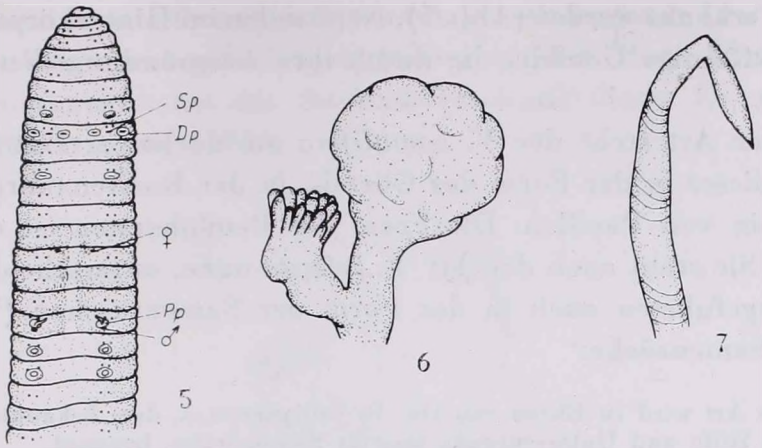


Abb. 5—7. *Yagansia covarrubiasi* sp. n.: 5 = Ventralansicht, Sp = Samentaschenporen, Dp = Drüsenpapillen, Pp = Prostataporen, 6 = Samentasche mit Divertikel, 7 = Form der Penialborste

mal oberhalb der Borstenlinie *d*. Weibliche Poren auf dem 14. Segment innerhalb der Borsten *a*, ganz am vorderen Rand des Segmentes. Prostataporen auf dem 17. Segment zwischen der Borstenlinie *ab*, kleine Schlitze aus denen die Penialborsten bei einigen Tieren hervorstehen. Männliche Poren dicht hinter den Prostataporen auf dem 17. Segment.

Gürtel vom 13.—17. Segment nicht vollkommen ringförmig, auf der Ventralseite zwischen den hier etwas verengten Borsten *ab* Drüsenausbildung verlöscht. Gürtel von Intersegmentalfurchen deutlich unterbrochen (Abb. 5).

Borstenpapillen tragende Segmente stark variierend. Beim Holotypus ein Paar Papillen auf dem 7., 10., 17.—19. Segment. 2 Papillen auf dem 8. Segment neben den Samentaschenporen. Bei den übrigen Exemplaren auch auf dem 11. und bis hinten auf dem 20. Segment sind Papillen auf den Segmenten.

Innere Organisation — Verdickte Dissepimente vom 7/8—11/12, 12/13 nur schwach verdickt. Muskelmagen gross mit Kragen im 6. Segment. Samentaschen im 9. Segment, mächtige runde Ampulle mit dünnerem Stiel aus dem ein Divertikel hervorgeht, handfingerförmige Samenkämmerchen (Abb. 6). Zwei Paar Samensäcke im 9. und 11. Segment. Die des 9. Segmentes nicht büschelförmig wie bei den meisten anderen Arten dieser Gattung, sondern normal wie die des 11. Segmentes. Hoden und Samentrichter im 10. Segment von einer mächtigen perioesophagealen Testikelblase umgeben. Letzte Paar Herzen im 12. Segment. Ovarien gross im 13. Segment, Ovarientrichter im 13/14. Segment. Prostata im 14—18. Segment, dicke gewundene Gebilde mit kurzem Ausführungsgang, der nicht muskulös ist. Dicht neben den Prostata stehen die Penilaborsten in Säcken, mit 2 kleinen und 2 grossen Borsten. Die grossen Borsten sind hakenförmig gebogen, ohne Ornamentierung, spitz zulaufend. Hinter der Spitze konnte in gewissen Abständen eine Ringelung von

3—4 Ringen erkannt werden (Abb. 7). Nephridien im Hinterkörper sind langgestreckte sackförmige Gebilde, die durch ihre Ausmündung den Sack in zwei Teile teilen.

Die neue Art steht der *Y. spatulifera* am nächsten. Unterscheidet sich jedoch von dieser in der Form des Gürtels, in der Borstenanordnung und im Vorhandensein von Papillen. Die Form der Penilaborsten ist ebenfalls ganz verschieden. Sie steht auch der Art *Y. robusta* nahe, unterscheidet sich ausser den oben angeführten auch in der Form der Samentaschen (Vergl. Abb. 6 und 8) und Samensäcke.

Die neue Art wird zu Ehren von Dr. R. Covarrubias, dem bekannten Milbenspezialisten für seine Hilfe und Unterstützung unserer Sammelreise, benannt.

Fundorte — Nr. 11. Tiltil, Cuesta La Dormida (Prov. Santiago), in der Laubstreu von sandigem-lehmigem Boden. 5. XI. 1965. leg. A Zicsi. Holotypus AF. 1140. — Paratypen. AF. 651. 9 + 4 juv. Ex. AF. 1716. 1 Ex. Fundort wie beim Holotypus. Weitere Paratypen: Nr. 3. Cerro el Roble, Cordillera de la Costa (Prov. Santiago) 84 km NW von Santiago de Chile, 1800 m 29. IX. 1965. leg. A. Zicsi AF. 689. 9 + 2 juv. Ex.

Yagansia robusta (Beddard, 1895)
(Abb. 8)

In der Sammlung von Hamburg konnten unter Inv. Nr. V. 4192 u. V. 4193 2 Exemplare von der Insel Teja bei Valdivia (11. IV. 93) und 2 Ex. von Putabla bei Valdivia (20. IV. 93) vorgefunden werden, die Beddard bei der Beschreibung der neuen Art vorlagen. Die von der Insel Teja stammenden Exemplare waren ausgetrocknet und konnten nicht nachbestimmt werden, die anderen beiden Exemplare waren juvenil. Die Beddard ebenfalls zur Beschreibung von Estancilla bei Valdivia (Inv. Nr. V. 4190. 9. IV. 93, Coll. Mich.) vorliegenden Exemplare und deren Beschreibung am Ende der Originalbeschreibung angeführt wird, konnten überprüft werden. Ausser dem Typenmaterial wurde von Michaelsen (Inv. Nt. V. 4207) aus Chile, Corral, 5. VII. 93. noch ein Exemplar dieser Art eingereiht.

Die Nachbestimmungen dieser Exemplare zeigen einige Unterschiede von der Originalbeschreibung, die an dieser Stelle richtig gestellt werden sollen. Vor allem erstreckt sich der Gürtel eindeutig vom 13.—17. Segment, der Gürtel ist von Intersegmentalfurchen unterbrochen, ringförmig, wenn auch auf der Ventralseite nicht zusammenhängend verdickt. Die Samentaschenporen liegen auch bei dieser Art auf dem hinteren Rand des 8. Segmentes, mehr der Intersegmentalfurche genähert, in Höhe der Borsten *a*. Rückenporen sind vor dem Gürtel nicht vorhanden. Nephridialporen liegen in der Borstenlinie *c* und springen im 3. und 4. Segment nicht, in die Borstenlinie *d* oder oberhalb dieser, hinauf.

Innere Organisation — Beim geöffneten Tier konnte nur auf der linken Seite im 9. Segment ein büschliger Samensack erkannt werden, bei dem von mir geöffneten Tier auf beiden Seiten. Samentaschen Ampulle herzförmig gross, mit einem Divertikel an dessem Stiel Samenkämmerchen zu erkennen waren und auch der fächerförmige Teil voller Samenkämmerchen ist (Abb. 8). Zwei gleichgrosse Penialborsten am Ende löffelförmig ausgehöhlt

und gebogen, oder spattelförmig abgerundet, gerade endend. Die Borsten sind mit 2—3 Zähnchen in unregelmässigen Reihen besetzt. Diese Ornamentierung wurde von MICHAELSEN bei der Nachuntersuchung dieser Exemplare ebenfalls erkannt (MICHAELSEN 1899).

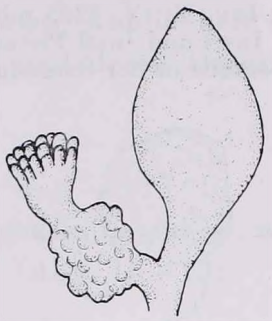


Abb. 8. *Yagansia robusta* (BEDDARD, 1895): Samentasche mit Divertikel

Fundorte — V. 10 457 Valdivia leg. CH. BUSCH, V. 8146. 1 Ex. Corral. 3. 10. 1913. leg. PAESSLER.

Yagansia diversicolor (BEDDARD, 1895)

Von dieser in meinem Material ebenfalls angetroffenen Art, konnten alle von BEDDARD 1895 und 1896 p. 60 angeführten Originalstücke überprüft werden. Wie dies auch aus der Originalbeschreibung hervorgeht, sind in der Beschreibung zwei stark verschieden grosse Formen vertreten, die von BEDDARD zu einer Art zusammengefasst wurden. Eine Überprüfung des Materiales erbrachte den Nachweis, dass die kleinere Form aufgrund der Samentaschenform zu *Yagansia gracilis* gestellt werden muss.

Die Originalbeschreibung der Grossform, also die von *Y. diversicolor* soll mit folgenden Merkmalen ergänzt werden:

Die Nephridialporen liegen in der Borstenlinie *c* und bleiben auch im 3. und 4. Segment in dieser Borstenlinie. Weibliche Poren auf dem 14. Segment innerhalb der Borstenlinie *aa*, aber etwas vor den Borsten. Rückenporen auch einige Segmente vor dem Gürtel erkannt. Samentaschenporen in der Borstenlinie *c*. Hoden und Samentrichter im 10. Segment von oesophagealen Testikelblasen eingehüllt. Samentaschenampulle wie auf der Abbildung richtig angeführt, bedeutend grösser als Divertikel und nicht wie im Text »Das Divertikel ist fast so lang wie die Tasche . . .« Im übrigen wie die Originalbeschreibung.

Fundorte — Nr. 6. AF. 680 1 Ex., Nr. 8. AF. 650. 10 + 2 juv. Ex.; Nr. 10. AF. 681. 5 + 1 juv. Ex.; Nr. 27. AF. 725. 1 Ex.

Yagansia gracilis (BEDDARD, 1895)
(Abb. 9)

In der Originalbeschreibung von BEDDARD (1895) ist nur ein Fundort aus Feuerland, Uschuaia 30. X. 1892 Wald, unter vermodernden Baumstämmen angeführt. In der Sammlung war dieser Fundort unter Inv. Nr. V. 4210 registriert und enthielt 2 Exemplare. Ein drittes Exemplar aus Uschuaia war unter Inv. Nr. V. 4203 mit dem selben Datum untergebracht. Dies und die Tiere von der Lennox Insel und Insel Pieton, die im Nachtrag von MICHAELSEN (1899) bearbeitet wurden, lagen ebenfalls in der Sammlung vor (Inv. Nr. V. 4205, V. 4219).



Abb. 9. *Yagansia gracilis* (BEDDARD, 1895): Samentasche mit Divertikel

Aufgrund des Typenmateriales sowie anhand meiner Exemplare soll nachstehend eine Ergänzung der Originalbeschreibung erfolgen.

Kopf epilobisch offen, reicht bei einigen Exemplaren weit nach hinten und lässt den Kopf auch tanylobisch erscheinen. Samentaschenporen auf Intersegmentalfurche 8/9 unterhalb der Borstenlinie *c*. Borsten ungepaart, in Höhe des Gürtels nicht verengt. Eine paarige Papille auf dem 9. Segment zwischen der Borstenlinie *ab*. Rückenporen von 8/9 Segment beginnend erkannt.

Innere Organisation — Es konnte einwandfrei festgestellt werden, dass die Samensäcke im 9. und 11. Segment liegen und nicht im 11. und 12. Segment, wie dies von BEDDARD angeführt wird. Die Samensäcke des 9. Segmentes büschelförmig, die des 11. Segmentes traubenförmig. Samentasche gross mit einem beinahe gleichgrossen Divertikel, dass nach aussen gebogen und am Ende maulbeerförmigen Umriss besitzt (Abb. 9). Ovarien wie in der Originalbeschreibung angegeben sehr gross, prall mit Eiern gefüllt. Prostata dick gewunden, mehrere Segmente einnehmend, Ausführungsgang muskulös und gewunden.

Fundorte: — Nr. 8. AF. 676. 2 Ex., AF. 683. 2 Ex. — Nr. 10. AF. 1026. 11. Ex. — Nr. 21. AF. 1110. 1 + 1 juv. Ex. — Nr. 22. AF. 1054. 7 Ex., AF. 1101. 1 + 2 juv. Ex. — Nr. 24. AF. 724. 1 Ex. — Nr. 26. AF. 1103. 2 Ex. — Nr. 32. AF. 656. 1 juv. Ex. — Nr. 33. AF. 665. 1 + 1 juv. Ex. — Nr. 35. AF. 674. 1 + 1 juv. Ex. — Nr. 37. AF. 662. 5 Ex. — Nr. 39. AF. 671. 2 Ex. — Nr. 40. AF. 655. 1 Ex. — Nr. 41. AF. 673. 1 Ex.

Yagansia rahmi MICHAELSEN, 1936

V. 12323. Villarica — See bei Pucén, leg. PAESSLER.

Von den zwei vorliegenden Exemplaren war nur eins geöffnet, mit Sicherheit lässt sich dies als Lectotypus dessignieren. Das von mir untersuchte zweite Exemplar zeigt eine gewisse Ähnlichkeit mit *Y. diversicolor*, allein die Ausbildung der Samentaschen und deren Diverti weicht von dieser wesentlich ab.

Yagansia hajeki sp. n.
(Abb. 10—12)

Länge des Holotypus 44 mm, Durchmesser 3,2 mm, Segmentzahl 83. Bei den übrigen Tieren: Länge 22—45 mm, Durchmesser 2,8—3,5 mm, Segmentzahl 53—91. — Farbe rot, purpur rot irrisierend, unterhalb der Borstenlinie *cd* hell.

Kopf undeutlich tanylobisch, bei einigen Exemplaren von einer Querfurche getrennt, Übergänge von epilobisch bis tanylobisch. Borsten mässig eng gepaart, am ganzen Körper gleichmässig. Borsten $ab = bc$; *aa* etwas kleiner als *bc*. Borstendistanz hinter dem Gürtel $aa : ab : bc : cd : dd := 5{,}6 : 1 : 6{,}3 : 1 : 16{,}6$. Samentaschenporen gross, schlitzförmig auf Intersegmentalfurche 8/9 in der Borstelinie *ab*, etwas in Richtung Borsten *b* verschoben. Weibliche Poren auf dem 14. Segment in der Borstenlinie *aa* etwas oberhalb dieser. Prostataporen auf dem 17. Segment, durch eine Furche die bis zu den Borsten des 18. Segmentes führt mit den männlichen Poren verbunden. Männliche Poren am vorderen Teil des 18. Segmentes (Abb. 10.).

Papillen variieren, am häufigsten unpaarige Papille vom 9—13. und 15—19. Segment. Manchmal auch paarige Papillen auf dem 8., 9., 10. Segment. — Gürtel ringförmig vom 13. — 17. Segment, auf dem Gürtel sind die Intersegmentalfurchen nicht zu erkennen. — Nephridialporen in der Borstenlinie *c*. Rückenporen nicht erkannt.

Innere Organisation — Dissepimente 6/7—12/13 zart nicht verdickt. Muskelmagen vorhanden im 6. Segment beginnend länglich. Samentaschen im 9. Segment, Ampulle auf langem Stiel mit rundem Kopf, Divertikel so lang wie die Ampulle, oder auch länger, am Ende fächerförmig verbreitet mit Samenkämmerchen besetzt (Abb. 11.). Ein Paar Hoden und Samentrichter im 10. Segment, sie sind von einer aufgefranzten Testikelblase perioesophageal umgeben. Traubige Samensäcke im 11. Segment. Beim Holotypus konnte auf der linken Seite ein büschliger Samensack auch im 9. Segment beobachtet werden. Bei anderen Exemplaren fehlten sie gänzlich oder waren beiderseits vorhanden. Letzte Paar Herzen im 12. Segment. Ovarien im 13.

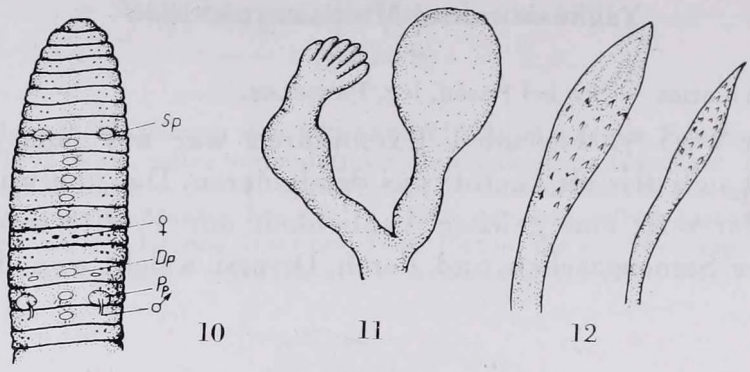


Abb 10—12. *Yagansia hajeki* sp. n.: 10 = Ventralansicht, Sp = Samentaschenporen, Dp = = Drüsenpapillen, Pp = Prostataporen, 11 = Samentasche mit Divertikel, 12 = Form der Penialborsten

Segment, längliche Gebilde mit prall gefüllten Eikapseln. Ovarientrichter am Dissepiment 13/14. Prostata dünnere stark gewundene, nach vorne gerichtete Drüsen, Ausführungsgang ebenfalls geschlängelt, muskulös glänzend. Samenrinne verläuft etwas geschlängelt an der Körperwand entlang und mündet hinter der Prostata aus. Penialborsten zu zweit in einem Sack, grössere Borste löffelförmig ausgebreitet, 2,3 mm, kleinere Borste spitz, 1,6 mm beide mit Dornen besetzt (Abb. 12.).

Die neue Art unterscheidet sich von allen bisher beschriebenen *Yagansia* Arten mit einem Divertikel dadurch, dass die männlichen Poren auf dem 18. Segment ausmünden.

Die neue Art wird zu Ehren von Herrn Dr. E. Hajek benannt, der uns auf unserer Sammelreise in Chile weitgehend behilflich war.

Fundorte — Nr. 37. Insel Desolation, Bucht Tuesday, unter Steienen ohne Vegetation. 4. X. 1969 leg. Covarrubias et al. Holotypus AF. 1141. — Paratypen: AF. 660. 25 Ex., AF. 667. 21 + 4 juv. Ex. AF. 660. 25 Ex., AF. 659. 30 + 3 juv. Ex. Fundort wie beim Holotypus. — Nr. 33. Hafen Charrua. Torfmoor. 24. IX. 1969. leg. Covarrubias et al. AF. 666. 13 + 1 juv. Ex. — Nr. 34. Insel Grant, unter hydrophilem Gebüsch. 25. IX. 1969. leg. Covarrubias et al. AF. 670. 2 Ex., AF. 663. 7 + 6 juv. Ex. — Nr. 35. Insel Mornington, Hafen Alert, unter Steinen. 26. IX. 1969 leg. Covarrubias et. al. AF. 675. 1 Ex.

Yagansia delfini Michaelsen, 1899

Von den 4 Exemplaren des Typenmateriales (Inv. Nr. 4277) waren nur Schwanzteile in der Sammlung vorhanden.

Laut Originalbeschreibung soll diese Art dem Formenkreis von *Y. longiseta* und *Y. papillosa* (Beddard, 1895) angehören, die Penialborsten von 6—8 mm Länge besitzen. Die in der Beschreibung angeführte Länge von 1,6 mm bei delfini muss entweder ein Druckfehler sein, oder die Art gehört nicht dem erwähnten Formenkreis an. Ein ähnlicher Fehler ist auch im Bestimmungsschlüssel der Gattung *Yagansia* bei Michaelsen (1900 p. 156) unterlaufen, da

man unter Punkt 9 im Schlüssel »Penialborsten kürzer als das Tier dick« auf *Y. papillosa* stösst. Es ist zu bedauern, dass die Tiere nicht nachbestimmt werden konnten.

Yagansia longiseta (BEDDARD, 1895)

Yagansia papillosa (BEDDARD, 1895), **syn. n.**

Die Überprüfung des Typenmateriales beider Arten sowie ein Vergleich mit dem neuen Material haben mich davon überzeugt, dass *papillosa* ein Synonym von *longiseta* ist. Selbst im Typenmaterial von *longiseta* (Inv. Nr. V. 4236 Coll. Mich. 178, V. 4237. Coll. Mich. 140) und von *papillosa* (V. 4204 Coll. Mich. 139) konnten Übergänge von epilobisch zu tanylobischer Kopfausbildung erkannt werden. Bei einigen Exemplaren von *longiseta* konnten ebenfalls Tiere mit Papillen erkannt werden. Da die Beschreibung der Arten, aber insbesondere die von *papillosa* und deren Abbildung so vorzüglich ist, verzichte ich auf weitere Ergänzungen.

Fundorte.— Nr. 31. AF. 664. 3 Ex. — Nr. 32. AF. 657. 1 Ex. — Nr. 33. AF. 654. 5 Ex., AF. 1142. 1 + 1 juv. Ex. — Nr. 36. AF. 652. 7 + 2 juv. Ex. — Nr. 37. AF. 661. 1 Ex., AF. 668. 7 + 1 juv. Ex. — Nr. 39. AF. 672. 1 + 1 juv. Ex — Nr. 42. AF. 653. 14 + 2 Ex.

Yagansia chiloensis MICHAELSEN, 1921

Vom einzigen Exemplar dieses Tieres sind nur Teile angetroffen worden die nicht nachbestimmt werden konnten (Inv. Nr. V. 8932).

Yagansia parinacotana sp. n.
(Abb. 13—15)

Länge des Holotypus 40 mm, Durchmesser 2 mm, Segmentzahl 73. Bei den übrigen Tieren: Länge 26—50 mm, Durchmesser 1,5—2,3 mm, Segmentzahl 52—88. — Farbe pigmentlos, weiss.

Kopf epilobisch 1/2 offen. Borsten ungepaart. Borsten *ab* kleiner als *cd*, *aa* kleiner als *bc*. Borstendistanz $aa : ab : bc : bd : dd = 3{,}7 : 2 : 3{,}7 : 1 : 12{,}5$. — Borsten am Gürtel verengen sich in der Borstenlinie *ab*. Ein Paar Papillen auf dem 15. und 16. Segment, innerhalb der Borsten *aa*. Diese Papillen sind nicht bei allen Exemplaren deutlich zu erkennen (Abb. 13.). Samentaschenporen, kleine Schlitze auf Intersegmentalfurche 8/9 in der Borstenlinie *a*. Weibliche Poren auf dem 14. Segment, etwas vor den Borsten *a*. Prostataporen auf dem 17. Segment auf kleinen punktförmigen Erhebungen.

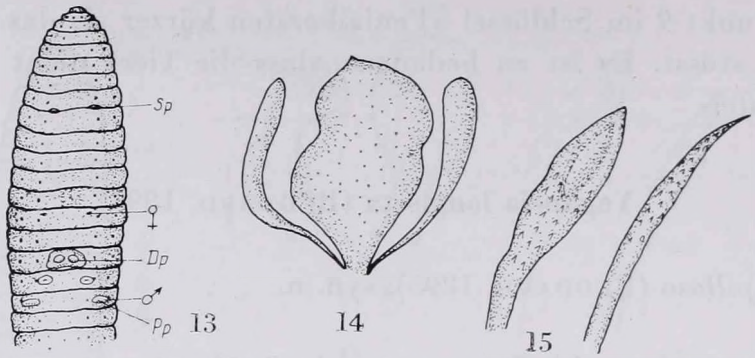


Abb. 13—15. *Yagansia parinacotana* sp. n.: 13 = Ventralansicht, Sp = Samentaschenporen, Dp = Drüsenpapillen, Pp = Prostataporen, 14 = Samentasche mit Divertikeln, 15 = Form der Penialborsten

Männliche Poren münden gemeinsam mit den Prostataporen auf dem 17. Segment aus. — Gürtel vom 13.—16. Segment, ringförmig, Intersegmentalfurchen auf dem Gürtel nicht zu erkennen.

Nephridialporen vom 3. Segment beginnend unterhalb der Borstenlinie *c*. Rückenporen hinter dem Gürtel erkannt, jedoch nicht offen.

Innere Organisation — Dissepimente 6/7—12/13 zart, nicht verdickt. Samentaschen im 9. Segment. Grosse Ampulle mit rundem Kopf und seitlich mit zwei langen Divertikeln die beinahe so lang sind wie die Ampulle (Abb. 14.). Hoden und Samentrichter im 10. Segment, frei. Samensäcke ein Paar im 11. Segment. Herzen im 10—12. Segment sehr gross. Ovarien im 13. Segment, grosse fächerförmige Gebilde die voll mit Eiern sind. Ovarientrichter im 13/14. Segment. Mitteldarm im 16. Segment beginnend, ohne Tiphlosolis. Prostata lang, drüsiger Teil auch bis ins 25. Segment reichend, verläuft an den Darm angeschmiegt. Ausführungsgang muskulös und geschlängelt. Samenrinne mündet in diesen Ausführungsgang, ohne jeglichen muskulösen Raum zu bilden. Penialborsten zu zwei in jedem Sack, nahezu gleich gross. Die eine Borste ist löffelförmig ausgebreitet am Ende zugespitzt, die andere Borste einfach gespitzt gebogen. Letztere dicht mit Zähnchen besetzt, bei der löffelförmig verbreiteten Borsten sind die Zähnchen nicht so dicht (Abb. 15.)

Die neue Art steht *Y. peruana* Černosvitov, 1939 am nächsten, unterscheidet sich jedoch von dieser in der Lage des Gürtels, in der Ausführung der männlichen Poren, die nicht durch eine muskulöse Kammer ausmünden.

Fundorte — Nr. 12. Bofedal de Bacuyo (Prov. Tarapaca), 4500 m, am Fusse des Vulkans Parinacota, nasser, mooriger Boden, 26. XI. 1965, leg. A. Zicsi. Holotypus AF. 1144. — Paratypen AF. 679. 136 Ex. Fundort wie beim Holotypus. — Nr. 13. Laguna La Cotacotani (Prov. Tarapaca) 4780 m. Parinacota Vulkan, am Seeufer, 26. XI. 1965, leg. A. Zicsi. AF. 694. 14 + 5 juv. Ex. Nr. 14. Lago de Chungara (Prov. Tarapaca) 4500 m, feuchter Boden, 27. XI. 1965, leg. A. Zicsi. AF. 703. 44 + 11. juv. Ex. Nr. 15. Caquena (Prov. Tarapaca) unter Steinen, 28. XI. 1965, leg. A. Zicsi. AF. 705. 31 + 12 juv. Ex. — Nr. 16. Am Fusse des Guallatiri Vulkans (Prov. Tarapaca) unter Steinen, 29. XI. 1965, leg. A. Zicsi. AF. 1143. 21 + 4 juv. Ex.

MTA Könyvtára

Bemerkung — In der sehr reichen Ausbeute konnten von verschiedenen Fundorten Exemplare bestimmt werden, die in den inneren Merkmalen, meiner Ansicht als Anomalien zu betrachtende, Abweichungen aufwiesen. Insbesondere zeigte die Ausbildung der Prostatadrüsen grosse Verschiedenheiten. Es kamen zahlreiche Exemplare vor, wo die Drüsen und Penialborsten nur auf einer Seite entwickelt waren, oder beiderseits fehlten. Die Samensäcke des 11. Segmentes waren ebenfalls bei vielen Tieren nicht vorhanden, es lagen freie Samenmassen in riesigen Mengen in der Körperhöhle vor. Einen richtigen Muskelmagen vermissten ebenfalls mehrere Tiere.

Yagansia michaelseni (BEDDARD, 1895)

Von dieser in Feuerland und auf verschiedenen chilenischen Inseln so häufig angetroffenen Art war kein einziges Exemplar in meiner Sammlung anzutreffen. Ohne näher auf das von MICHAELSEN angeschnittene Problem (MICHAELSEN 1911, 1921) an dieser Stelle einzugehen, bin ich aufgrund des in der Sammlung von Hamburg überprüften Materiales der Meinung, dass *Y. michaelseni* zusammen mit den vorerst bekanntgebenen Arten *Y. chiloensis*, *peruana*, *parinacotai* sp. n. den Artenkreis mit 2 Divertikeln bildet und zur Gattung *Yagansia* gestellt werden muss.

BESTIMMUNGSSCHLÜSSEL FÜR DIE ARTEN DER GATTUNG *YAGANSIA* MICHAELSEN, 1899

1 Samentaschen mit zwei Divertikeln 2
— Samentaschen mit einem Divertikel 4
— Samentaschen ohne Divertikel ..... **epiphanica** CORDERO, 1942
2 Gürtel vom 13—16. Segment 3
— Gürtel vom 14—16. Segment ..... **chiloensis** MICHAELSEN, 1921
— Gürtel vom 13—17. Segment ..... **peruana** ČERNOSVITOV, 1939
3 Männliche Poren auf dem 17. Segment ..... **parinacotana** sp. n.
— Männliche Poren auf dem 18. Segment ..... **michaelseni** (BEDDARD, 1895)
4. Borsten eng gepaart 5
— Borsten nicht eng gepaart 11
5 Penialborsten bedeutend länger als der Durchmesser des Körpers **longiseta** (BEDDARD, 1895)
— Penialborsten nicht länger als der Durchmesser des Körpers 6
6 Männliche Poren auf dem 17. Segment 7
— Männliche Poren auf dem 18. Segment ..... **hajeki** sp. n.
7 Samentaschenporen in der Borstenlinie *ab* 8
— Samentaschenporen unterhalb der Borstenlinie *c* 10
8 Prostataporen mit männlichen Poren durch Schlitze verbunden ..... **spatulifera** (MICHAELSEN, 1889)
— Prostataporen mit männlichen Poren nicht durch Schlitze verbunden 9
9 Papillen auf verschiedenen Segmenten vorhanden ..... **dicastrii** sp. n.
— Papillen auf verschiedenen Segmenten fehlen ..... **grisea** (BEDDARD, 1895)
10 Gürtel vom 13—16. Segment ..... **pallida** (MICHAELSEN, 1898)
— Gürtel vom 13—17. Segment ..... **corralensis** (BEDDARD, 1895)
11 Gürtel vom 13—17. Segment 12
— Gürtel vom 13—16. Segment 13
12 Gürtel vollkommen ringförmig ..... **robusta** (BEDDARD, 1895)
— Gürtel nicht vollkommen ringförmig ..... **covarrubiasi** sp. n.
13 Kopf epilobisch 14
— Kopf tanylobisch 15
14 Penialborsten mit hakig gebogenem, schwach verbreitetem distalem Ende ..... **gracilis** (BEDDARD, 1895)

— Penialborsten am distalen Ende nicht verbreitet ..... **delfini** MICHAELSEN, 1899
15 Samentaschenporen in Borstenlinie *b* ..... **rhami** MICHAELSEN, 1936
— Samentaschenporen in der Borstenlinie *c* ..... **diversicolor** (BEDDARD, 1895)

Bemerkung: Die Arten *Y. kingbergi* MICHAELSEN, 1899 und *Y. beddardi* ROSA, 1895 sind in den Schlüssel nicht aufgenommen worden. *Y. kinbergi* betrachte ich als species inquirenda, *Y. beddardi* wird in der Gattung *Microscolex* geführt.

SCHRIFTTUM

ANDRÁSSY, I., BALOGH, J., LOKSA, I., MAHUNKA, S. und ZICSI, A. (1967): The scientific results of the Hungarian Soil Zoological Expedition to Chile, Argentina and Brasil. I. Report on the Collectings. — Folia Ent. Hung. **20:** 247—296.

BEDDARD, F. E. (1895): Preliminary account of new species of earthworms belonging to the Hamburg Museum. — Proc. Zool. Soc. London **15:** 210—239.

BEDDARD, F. E. (1896): Naiden, Tubificiden und Terricolen. — In: Erg. Hamb. Magelh. Sammelreise p. 1—62.

ČERNOSVITOV, L. (1939): The Percy Sladen Trust expedition to Lake Titicaca, VI. Oligochaeta. — Trans. Linn. Soc. Lond. **1:** 81—116.

COGNETTI DE MARTIIS, L. (1904): Diagnosi di un nuovo lombrico del Chile. — Boll. Mus. Zool. Anat. Comp., Torino, **19:** 1—2.

CORDERO, H. (1942): Oligoquetos terricolas del Museo Argentino de Ciencias Naturales. — Ann. Mus. Argent. **40:** 269—293.

JAMIESON, B. G. M. (1974): Generic type-species and other Megascolecidae (Annelida, Oligochaeta) in the Museum of Systematic Zoology, University of Turin. — Boll. Mus. Zool. Univ. Torino **8:** 57—88.

MICHAELSEN, W. (1889): Olligochaeten des Naturhistorischen Museums in Hamburg. — Jahrb. Hamb. wiss. Anst. **6:** 1—16.

MICHAELSEN, W. (1898): Die Oligochaeten der Sammlung Plate. — Zool. Jahrb. — Suppl. **4:** 471—480.

MICHAELSEN, W. (1899a): Revision der Kinberg'schen Oligochaeten-Typen. — Öfv. Akad. Förh. **56:** 413—447.

MICHAELSEN, W. (1899b): Terricolen (Nachtrag.) In: Erg. Hamb. Magelh. Sammelr. **3:** 1—28.

MICHAELSEN, W. (1900): Oligochaeta. — In: Das Tierreich, 10. Lief. Berlin, pp. 575.

MICHAELSEN, W. (1910): Oligochaeten von verschiedenen Gebieten. — Mitt. nat. Mus. Hamb. **27:** 47—170.

MICHAELSEN, W. (1921): Neue und wenig bekannte Oligochaeten aus skandinavischen Sammlungen. — Ark. Zool. **13:** 1—25.

MICHAELSEN, W. (1923): Oligochaeten von Peru und West-Patagonien. — Med. Göt. Mus. Zool. **32:** 2—12.

MICHAELSEN, W. (1936): Oligochaeten aus Chile und von der Osterinsel. — Zool. Anz. **113:** 193—200.

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

NOTES TO CONTRIBUTORS

I. PAPERS will be considered for publication in *Acta Zoologica* only if they have not previously been published or submitted for publication elsewhere. They may be written in English, French, German or Russian.

Papers should be submitted to

Prof. Dr. J. BALOGH
Zoosystematical and Ecological Institute
Eötvös Loránd University
H-1088 Budapest, Puskin utca 3, Hungary

Papers may be either articles with abstracts or short communications. Both should be as concise as possible, articles in general not exceeding 25 typed pages, short communications 8 typed pages.

II. MANUSCRIPTS

1. Papers should be submitted in *two copies.*

2. The text of papers must be of high stylistic standard, requiring minor corrections only.

3. Manuscripts should be typed double spaced on good quality paper, with generous margins.

4. The name of the author(s) and of the institutes where the work was carried out should appear on the first page of the manuscript.

5. *References* should be listed at the end of the paper in the following form:

BELLO, A. & GERAERT, E. (1972): Redescription of eight species belonging to the superfamily Tylenchoidea (Nematoda). — Nematologica, **18**: 190–200.

For books, please give the initials and family name of the author(s), title of the book, name of publisher, place and year of publication.

References to the literature in the text should be made using the name and date system.

6. *Captions* to illustrations should be listed on a separate sheet, not inserted in the text.

III. ILLUSTRATIONS AND TABLES

1. Each paper should be accompanied by two sets of illustrations, one of which must be ready for the blockmaker. The other set attached to the second copy of the manuscript may be rough drawings in pencil or photocopies.

2. Illustrations must not be inserted in the text.

3. All illustrations should be identified in blue pencil by the author's name, abbreviated title of the paper and figure number.

4. Tables should be typed on separate pages and have captions describing their content. Clear wording of column heads is advisable. Tables should be numbered in Roman numerals (I, II, etc.).

IV. RETURN OF MATERIAL

Owing to high postage costs, the Editorial Office cannot undertake to return *all* material not accepted for any reason for publication. Of papers to be revised (for not being in conformity with the above Notes or for other reasons) only *one* copy will be returned. Material rejected for lack of space or on account of the referees' opinion will not be returned to authors outside Europe.

PRINTED IN HUNGARY

Akadémiai Nyomda és Kiadó Vállalat, Budapest

CONTENTS

Neue Enchytraeiden-Arten (Oligochaeta) aus Ekuador, K. Dózsa—Farkas 191
Data to the Thysanoptera fauna of Ethiopia, G. Jenser 205
Addenda to the millipede fauna of Vietnam (Diplopoda), Z. Korsós and S. I. Golovath 211
Some Steganacarus Ewig, 1917 species (Acari: Oribatida) from Turkey, S. Mahunka and L. Miko 221
Melanesian representatives of Toxicum and Cryphaeus (Coleoptera, Tenebrionidae: Toxicini), O. Merkl 235
Thirty-five new hydroptilid species from Vietnam (Trichoptera, Hydroptilidae), J. Oláh 255
Braconidae (Hymenoptera) from Korea, XI., J. Papp 195
Revision of the species of Pterogrammoides L. Papp (Diptera, Sphaeroceridae), L. Papp 327
Studies on the Palaearctic Noctuidae. Sect. Amphipyrinae. I. The genus Pseudohadena Alpheraky, 1889. The laciniosa group, L. Ronkay and Z. Varga..... 339
Identification keys to the genera of Oppiidae Grandjean, 1951 (Acari: Oribatei), L. S. Subias and P. Balogh 355
Revision der Gattung Yagansia Michaelsen, 1889 (Oligochaeta, Acanthodrilidae), Regenwürmer aus Süd-Amerika, 11., A. Zicsi 413

Index: 26 027