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FIFTEEN NEW NEMATODE SPECIES FROM THE SOUTHERN HEMISPHERE

I. ANDRÁSSY

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

(Received 15 March, 1985)

Fifteen new nematode species collected in various terrestrial habitats of the Southern Hemisphere are described: *Anaplectus tortus*, *Wilsonema cheliferum*, *Bicirronema peruense*, *Panagroteratus hamatus*, *Panagroteratus baloghi*, *Panagrobilium minimum*, *Rhabditella muscicola*, *Bunonema pustulatum*, *Acrostichus pulcher*, *Notholetus eucalypti*, *Seriespinula australis*, *Etamphidelus neotropicus*, *Mylonchulus oceanicus*, *Practinocephalus secundus* and *Stomachoglossa pilata* spp. n. A new genus, *Panagroteratus* gen. n. is proposed for two species resembling the members of *Panagrocephalus* ANDRÁSSY, 1967 but differing from them in the shape of head and tail. Keys to species of the genera *Wilsonema* COBB, 1913 and *Stomachoglossa* ANDRÁSSY, 1968 are added.

In this paper I present fifteen new nematode species from my collection. They all originated from geographical regions south of the Equator: ten from the Neogaea (Ecuador, Peru and Bolivia) and five from the Notogaea (Hawaii, New Guinea and Australia). For most of these species I have to thank Prof. J. BALOGH who never forgot bringing me nematode samples from his collecting trips over the Southern Hemisphere.

Concerning the taxonomic position, two of the new species belong to the subclass Torquentia (*Anaplectus tortus*, *Wilsonema cheliferum*), nine to the subclass Secernentia (*Bicirronema peruense*, *Panagroteratus baloghi*, *Panagroteratus hamatus*, *Panagrobilium minimum*, *Rhabditella muscicola*, *Bunonema pustulatum*, *Acrostichus pulcher*, *Notholetus eucalypti*, *Seriespinula australis*) and four to the subclass Penetrantia (*Etamphidelus neotropicus*, *Mylonchulus oceanicus*, *Practinocephalus secundus*, *Stomachoglossa pilata*).

Anaplectus tortus sp. n. (Fig. 1A-G)

♀: $L = 0.85-1.02$ mm; $a = 23-25$; $b = 4.9-5.1$; $c = 12-15$; $V = 48-50\%$; $c' = 2.9-3.3$.

♂: $L = 0.96-1.08$ mm; $a = 26-28$; $b = 4.9-5.2$; $c = 14-15$; $c' = 2.4-2.5$.

Body bent ventrally, 35-40 μ m wide. Cuticle 1-1.5 μ m thick, finely annulated. Lateral field 4 μ m wide, simple, about 1/10 of body diameter. On each side of body two rows of conspicuous hypodermal glands are present which open to the surface of the cuticle in two rows of small pores. The lateral glands on one side number 96-102 (20-25 level with the oesophagus).

Head 8—9 μm wide, slightly set off; body at posterior end of oesophagus 3.8—4 times wider than head. Lips hardly separate, papillae very small. Subcephalic setae originating on the 3rd annule, thin, obliquely directed forward. Amphid a transverse slit nearly as wide as mouth cavity, located somewhat anterior to middle of stoma. Stoma 18—19 μm long, 2.1—2.2 times as long as cephalic diameter; it consists of a more or less globular cheilostom and a cylindrical tube, of them the latter is surrounded by a thin oesophageal tissue. It is very characteristic for this species that the proximal (posterior) end of stoma always shows an S-shaped curvature: it is bent first ventrally than dorsally.

Oesophagus 170—200 μm long, shorter than distance between posterior end of oesophagus and vulva. Corpus cylindrical, hardly longer than isthmus. Bulb moderately developed, oesophago-intestinal valve elongate, penetrating into intestine. Excretory pore level with isthmus. Deirid unusually large, circular with central point, located some annules behind excretory opening. Rectum as long as anal diameter.

Vulva seemingly longitudinal, sunk in body contour, vagina tubular, $2/5$ of corresponding body width. Each gonad 3.3—4.8 times as long as mid-body diameter. Spermathecae large, oval, filled with 7—8 μm large spermatozoa of irregular (more or less globular) shape.

Distance between vulva and tail 5.3—6.3 times as long as tail. Tail 67—70 μm , 2.9—3.3 times as long as anal body diameter, fairly plump, ventrally curved. It is very typical that the tip of tail is always twisted to the left side.

Tail of male less bent than that of female and not twisted on the tip. Spicula arcuate, semilunar, 50—52 μm long. Gubernaculum 10—11 μm long, with a dorsal projection and a ventral cuneus projecting between spicula. Three cuticularized preanal tubuli present; the first (most posterior) 21—23 μm , the second 19—20 μm and the third 17—18 μm long. First tubulus uni-tipped, other two tubuli finely bifurcate. 9 or 10 pairs of small caudal papillae arranged as shown on Fig. 1G.

Brief characteristics: Medium-sized body, finely annulated cuticle, numerous large hypodermal glands, slightly offset head, specially curved stoma, large deirids, twisted female tail and three preanal tubuli.

Holotype: Female with No. 11323 in the collection of the author.

Type locality: La Paz, Belivía, humus and fallen leaves from a small forest, December 1966, leg. A. Zicsi.

Anaplectus tortus sp. n. may be especially characterized by the shape of the mouth cavity and the female tail, and in these respects it can be easily separated from every other representative of the genus.

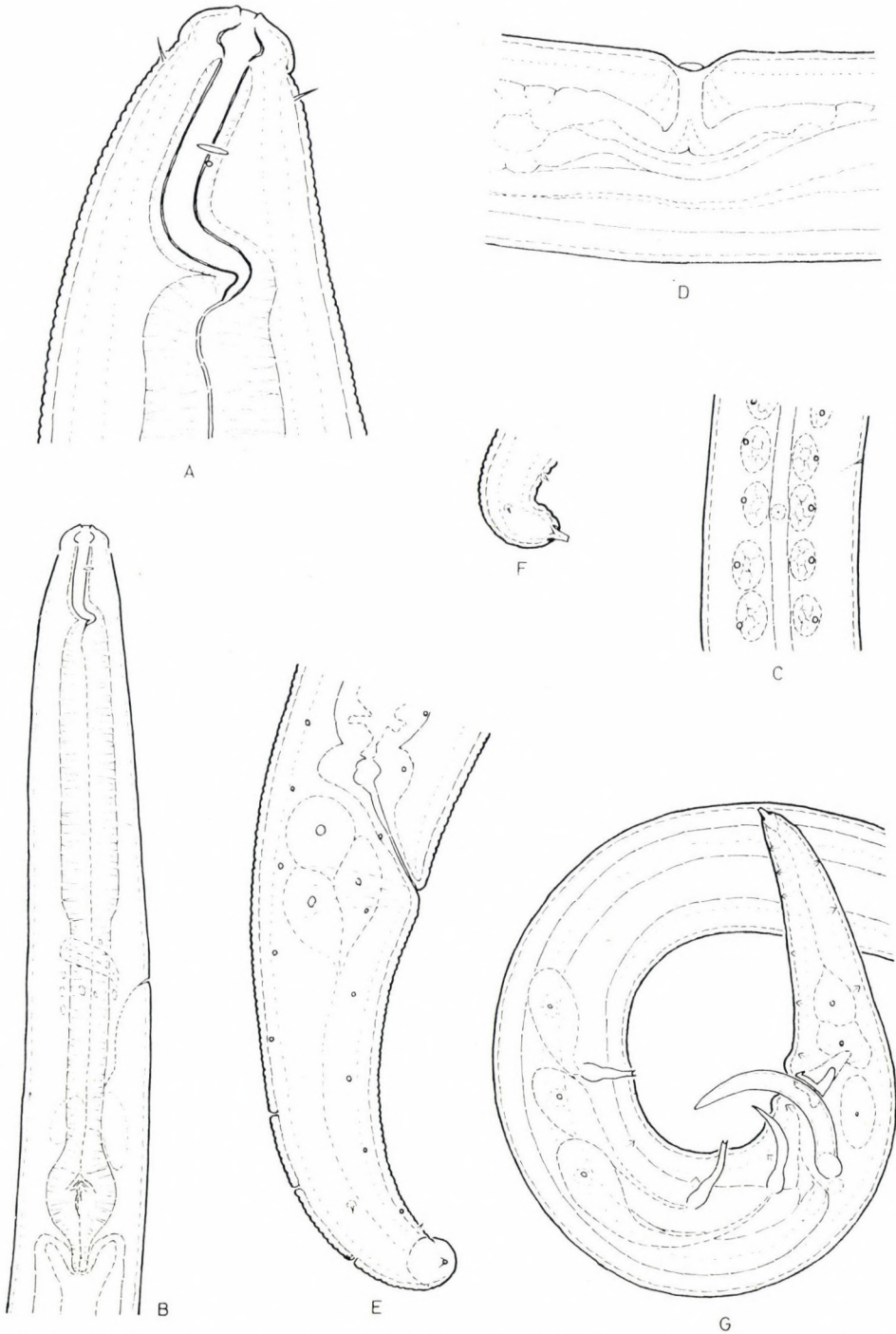


Fig. 1. *Anaplectus tortus* sp. n. A = anterior end ($\times 1800$); B = oesophageal region ($\times 500$); C = lateral field and hypodermal glands; D = vulval region ($\times 680$); E = female tail ($\times 1000$); F = flexure of tail tip; G = posterior end of male ($\times 500$)

Wilsonema cheliferum sp. n. (Fig. 2A—D)

♀: $L = 0.31-0.34$ mm; $a = 18-20$; $b = 3.7-4.0$; $c = 7.5-7.6$; $V = 49-50\%$;
 $c' = 5.2-5.5$.

Body small but fairly robust, $16-17$ μm wide in the middle. Cuticle very thin, annules $0.8-0.9$ μm wide. Lateral field $1/5-1/6$ as wide as body, simple, originating at the first fourth of oesophageal corpus and ending in first third of tail. Cuticle scattered with fine submedial setae.

Cervical expansion strong, $15-16$ μm wide and $11-12$ μm high, with 4 or 5 weak striae, projected on both sides into a long and sharply pointed process. Both processes and anterior margin of cervical expansion beset with very fine setae. Head distinctly broader than neck, armed with unusually large but hardly cuticularized and transparent, claw-like appendages.

Amphid oval, its posterior margin not quite closed, at level of midstoma or somewhat behind that. Stoma tubular, plectoid, $12-13$ μm long, weakly cuticularized. Oesophagus $84-86$ μm long, corpus about twice as long as isthmus. Bulb strong, ovoid, with cardial process penetrating into intestine. Excretory pore at base of corpus, deirid 4—6 annules further back. Rectum 1.3 to 1.5 times anal body diameter.

Vulval lips not protruding, vagina short, only $1/4$ of corresponding body width. Each gonad $10-12$ times as long as mid-body diameter. Distance between vulva and anus 2.8—2.9 times longer than tail.

Tail $41-44$ μm long, 5.2—5.5 times anal diameter, 15% of body length, straight, ventral with 30—32 annules. Tail tip ending in a short spinneret. A pair of subventral and a pair of subdorsal caudal setae present.

Male unknown.

Brief characteristics: Small body, broad and slightly annulated cervical extension, fine and comparatively short setae, large, claw-like labial processes, elongate and straight tail.

Holotype: Female, No. 10637 in the collection of the author.

Type locality: La Paz, Bolivia, 3800 m above sea level, mosses from a rock, December 1966, leg. J. BALOGH.

The genus *Wilsonema* COBB, 1913 includes four species: *W. otophorum* (DE MAN, 1880) COBB, 1913, *W. inflatum* (YEATES, 1967) comb. n.,* *W. agrarum* NESTEROV, 1973 and *W. cheliferum* sp. n. As for the shape and length of tail they may be grouped as follows: *otophorum* and *agrarum* where the tail is shorter (2.5—4 anal diameters) and bent ventrally, while *inflatum* and *cheliferum* where the tail is longer (4—4.5 anal diameters) and straight. The new

* Syn. *Ereptonema inflatum* YEATES, 1967.

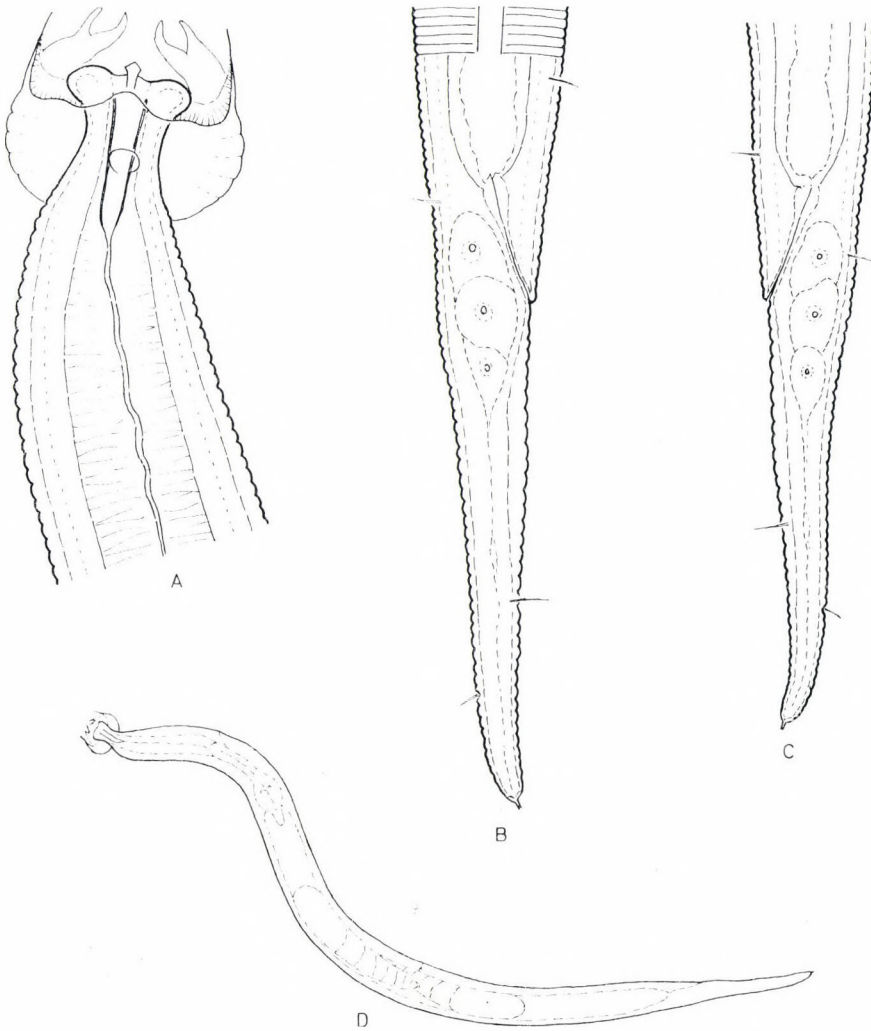


Fig. 2. *Wilsonema cheliferum* sp. n. A = anterior end ($\times 1800$); B - C = female tails ($\times 1500$); D = entire female ($\times 330$)

species can be distinguished from *inflatum* by the semicircular and finely annulated cervical extension, the shape of the labial processes, the larger amphid and the tail which is a little longer.

Key to the species of *Wilsonema*

- 1 Tail shorter, 2.5-4 anal body diameters, ventrally bent 2
- Tail longer, 4-5.5 anal body diameters, straight 3

- 2 Cervical expansion with 5 or 6 annules. — ♀: $L = 0.27-0.32$ mm; $a = 15-17$; $b = 3.1-3.8$; $c = 7.3-8.7$; $V = 49-54\%$. ♂ unknown (Soviet Union [Moldavia] and Hungary) **agrarum** NESTEROV
- Cervical expansion smooth, without annules. — ♀: $L = 0.25-0.36$ mm; $a = 15-20$; $b = 3.2-4.0$; $c = 6-11$; $V = 48-57\%$. ♂: $L = 0.26-0.27$ mm; $a = 17-18$; $b = 3.5$; $c = 7.6-7.8$ (Cosmopolitan, known from Europe, Eastern Asia, Central Africa, North and South America, Australia and Oceania) **otophorum** (DE MAN)
- 3 Cervical expansion regularly arched, labial processes large, claw-like. — ♀: $L = 0.31-0.34$ mm; $a = 18-20$; $b = 3.7-4.0$; $c = 7.5-7.6$; $V = 49-50\%$. ♂ unknown (Bolivia) **cheliferum** sp. n.
- Cervical expansion bulbiform, labial processes small, not claw-like. — ♀: $L = 0.26-0.31$ mm; $a = 15-18$; $b = 3.6-4.1$; $c = 3.3-4.4$; $V = 47-48\%$. ♂ unknown (New Zealand) **inflatum** (YEATES)

Bicirronema peruense sp. n. (Fig. 3A—D)

♀: $L = 0.47-0.49$ mm; $a = 27-28$; $b = 2.5-2.7$; $c = 24-26$; $V = 74\%$; $c' = 2.3-2.4$.

Body short, ventrally bent after fixation. Cuticle thin, finely striated, annules $1.4-1.5$ μ m wide on the mid-body region. Lateral field simple, consisting of two incisures, reaching to middle of tail, $1/8-1/9$ as wide as body.

Head $6-6.5$ μ m wide, not set off, with six rounded lips and very small papillae. Lips separated by cuticularized furrows each from the other. On both sides of head, between the submedial lips, a $4.5-5$ μ m long cirrus arises; these cirri are armed with fine branches or fringes. Amphid inconspicuous.

Stoma 9 μ m long, consisting of an anterior broad chamber with cuticularized walls and of a posterior, weakly cuticularized funnel. Cheilostom insignificant, metastom with a dorsal swelling. Oesophagus comparatively very long, $190-195$ μ m, $39-40\%$ of entire length of body. Corpus 75% of oesophagus, cylindrical. Bulbus oblong, $20-21$ μ m. Excretory pore located in $60-61\%$ of the oesophagus length. Nerve ring before the excretory opening, encircling the corpus. Cardia small. Rectum very long, 30 μ m, $3.5-3.7$ times anal diameter. Prerectum present, nearly equal in length with rectum. Distance between posterior end of oesophagus and vulva a little shorter than oesophagus.

Vulval lips small, vagina about $1/3$ of corresponding body width. Gonad unpaired, prodelphic, recurved almost to prerectum. Postvulval uterine sack short, about $1/3$ of body diameter; distance between vulva and anus 5.8 times as long as tail.

Tail ventrally curved, $18-19$ μ m long, $2.3-2.4$ times anal body diameter, terminated in a harpoon-shaped, doubly pointed tip. Phasmids conspicuous, a little behind the anal opening.

Male unknown.

Brief characteristics: Small body, thin cirri, spacious stoma, long oesophagus, short uterine sac, very long rectum, ventrally arcuate tail and peculiarly shaped tail terminus.

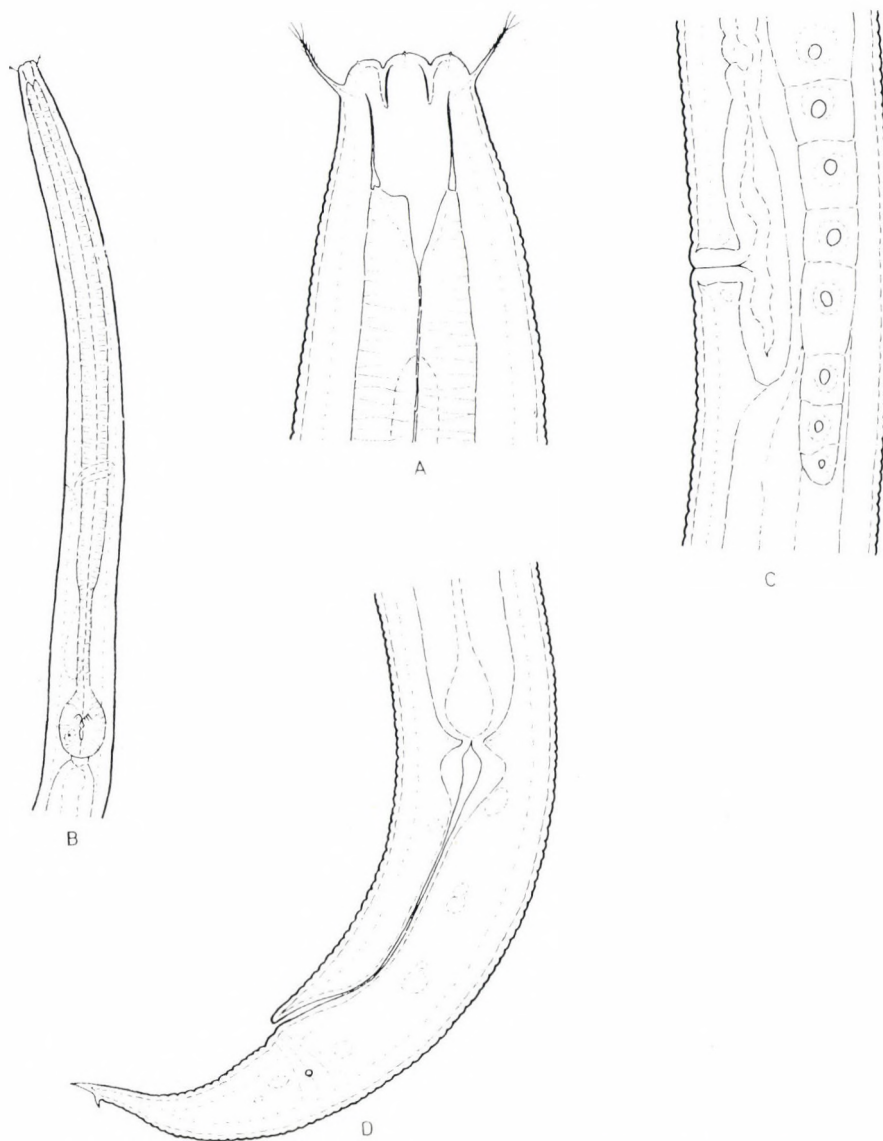


Fig. 3. *Bicirronema peruense* sp. n. A = anterior end ($\times 2800$); B = oesophageal region ($\times 500$); C = vulval region ($\times 1500$); D = posterior end of female ($\times 1500$)

Holotype: Female, No. 9517 in the collection of the author.

Type locality: Pucallpa, Peru, roots and humus from a primary rain forest, November 1971, leg. J. BALOGH.

The genus *Bicirronema* was established by me when I described the type-species, *B. caledoniense* ANDRÁSSY, 1978 from New Caledonia. The new species

shows well the general characters of the genus and resembles the species mentioned above, it can be, however, easily distinguished from that by the much shorter body (*caledoniense* 0.76—0.88 mm), the ventrally curved tail, the differently shaped tail tip, and the shorter uterine sac.

Panagroteratus gen. n.

Cephalobidae, Panagrocephalinae. Body shorter than 1/2 mm. Cuticle annulated, lateral field with weak inner incisure. Head set off, lips *Teratocephalus*-like, lobed with cuticularized margins. Cheilo- and promesostom wider than meta- and telostom and more strongly cuticularized than both latter. Oesophageal corpus cylindrical. Female gonad prodelfhic, with long and doubly curved postvulval portion. Posterior uterine sac present. Tail conoid or elongate, straight; terminus bifurcate. Male unknown.

Type-species: *Panagroteratus hamatus* sp. n.

Other species: *Panagroteratus baloghi* sp. n.

The new genus is closely related to *Panagrocephalus* ANDRÁSSY, 1967 and they both serve as collecting link between the families Cephalobidae and Panagrolaimidae. The shape of stoma — having an anterior spacious chamber — shows a panagrolaimid character whilst the double flexure of the postvulval part of the female gonad is still a typical cephalobid feature. *Panagroteratus* differs from *Panagrocephalus* by the lobed labial region and the doubly pointed tail.

Panagroteratus hamatus sp. n. (Fig. 4A—F)

♀: $L = 0.44-0.52$ mm; $a = 21-24$; $b = 3.0-3.4$; $c = 10-11$; $V = 63-64\%$; $c' = 3.7-3.8$.

Body 18—19 μm — at gravid female 24 μm — wide. Cuticle distinctly annulated, annules 2—2.4 μm wide. Lateral field with two conspicuous outer incisures and a weaker inner incisure, 1/6—1/7 as wide as body, originating at first third of oesophagus and terminating in first fourth of tail length.

Head well set off, 7.5—8 μm wide; body at posterior end of oesophagus 3—3.3 times wider than head. Labial region *Teratocephalus*-like, consisting of six lobes separated by deep furrows each from the other; margin of these lobes cuticularized. Amphid very small.

Stoma 12—13 μm long, composed of two parts: cheilostom and promesostom wide and cuticularized, metastom and telostom narrow, tubular and thin-walled. Oesophagus 150—154 μm long, almost 1/3 of total body length. Corpus cylindrical, three times as long as isthmus, bulbous oval. Excretory pore located in 55—63% of oesophagus length, 45—50 annules behind anterior

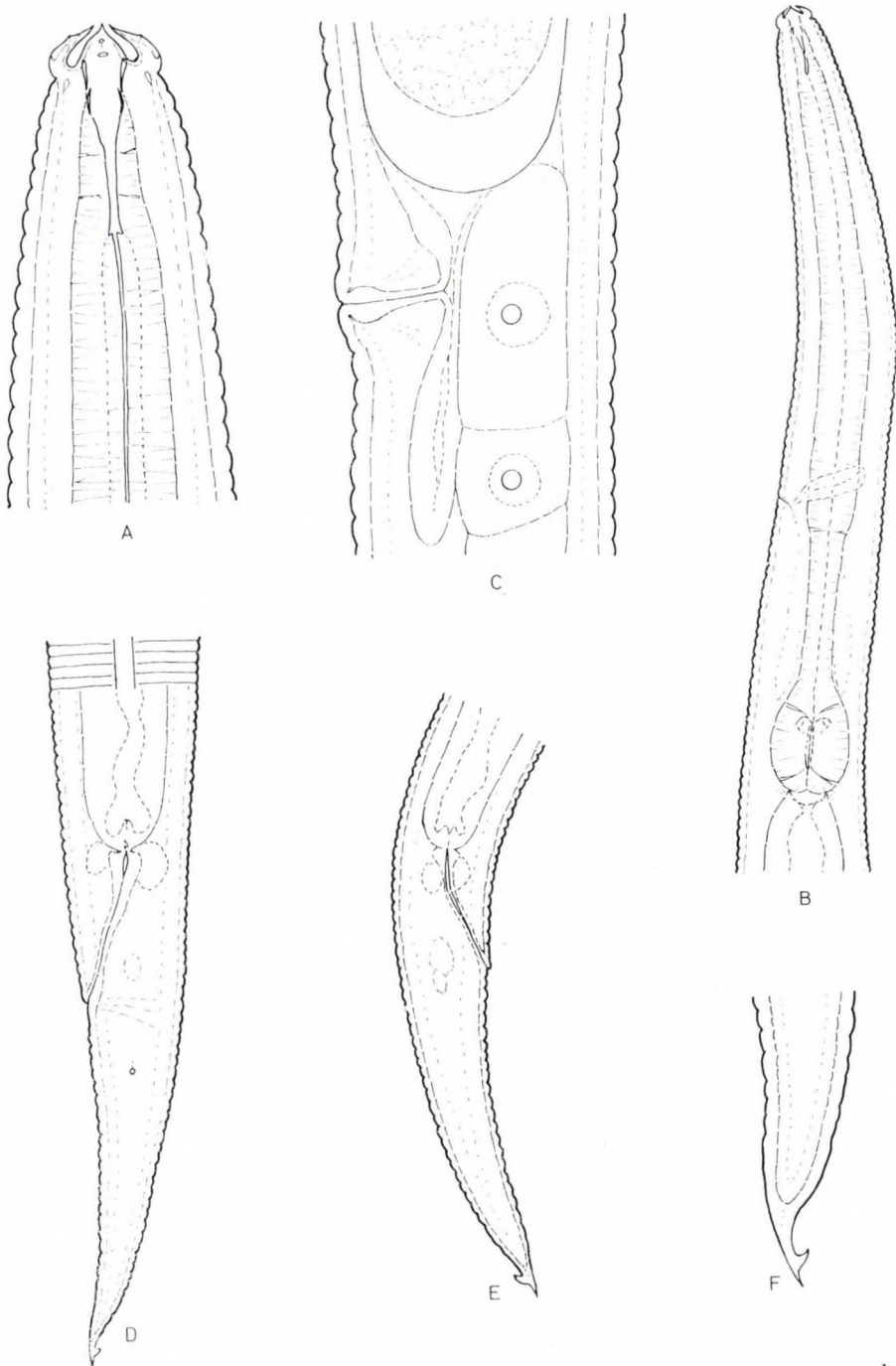


Fig. 4. *Panagroteratus hamatus* gen. n., sp. n. A = anterior end ($\times 1800$); B = oesophageal region ($\times 680$); C = vulval region ($\times 1500$); D-E = female tails (D: $\times 1000$, E: $\times 680$); F = tip of tail ($\times 1800$)

end. Deirid small, 6—8 annules posterior to excretory opening. Rectum 1.4—1.8 times anal body width.

Vulval lips small, vagina nearly 1/2 of corresponding body diameter, swollen on its distal part. Female gonad prodelphic, reflexed past the vulva; posterior branch showing a double flexure. Postvulval uterine sac present, as long as one body diameter.

Distance between vulva and anus 2.8—3 times as long as tail. The latter 40—48 μm long, 3.7—3.8 times anal body diameter, almost straight, conoid with harpoon-like tip. Ventral side of tail with 20—23 annules. Phasmids in first fourth or fifth of tail length.

Male unknown.

Brief characteristics: Body small, head separate, cephalic lobes large, posterior uterine branch short, tail comparatively short with terminal harpoon.

Holotype: Female, No. 8860 in the collection of the author.

Type locality: Keravat, New Britain, fallen leaves from a six years old secondary rain forest, September, 1969, leg. J. BALOGH. — Other locality: Gogol River, New Guinea, mosses from soil in a primary rain forest, September, 1969, leg. J. BALOGH.

Panagroteratus hamatus sp. n. can be distinguished from *P. baloghi* sp. n. by the lower and wider head, the shorter posterior uterine sac, the shorter tail and the shape of the tail tip.

***Panagroteratus baloghi* sp. n. (Fig. 5A—D)**

♀: $L = 0.47\text{--}0.48$ mm; $a = 26\text{--}29$; $b = 3.1\text{--}3.5$; $c = 7.0\text{--}7.5$; $V = 60\text{--}61\%$; $c' = 6.5\text{--}7.0$.

Body slender, 16—18 μm wide. Cuticle thin, finely striated; annules 1.3—1.5 μm wide. Lateral field 1/7 of body width, consisting of two distinct outer incisures and a weaker inner incisure. Lateral field beginning in anterior third of oesophagus and ending near anal opening. Amphid inconspicuous.

Head set off, 5.5—6 μm wide, narrower than adjacent body region, *Teratocephalus*-like, composed of six labial lobes separated by deep furrows each from the other. Stoma 12—13 μm long; anterior chamber (cheilostom + promesostom) spacious, posterior tube (metastom + telostom) narrow. Cheilo- and promesostom cuticularized. Oesophagus 134—138 μm long, corpus almost thrice as long as isthmus. Bulbus ovoid. Excretory pore 84 μm posterior to anterior body end, in 60—62% of oesophagus. Deirid extremely small. Rectum nearly twice anal body width.

Vulval lips not protruding, vagina oblique, 1/3 of corresponding body diameter. Female gonad prodelphic; posterior branch showing a double flexure. Postvulval uterine sac 35—38 μm , twice as long as body diameter.

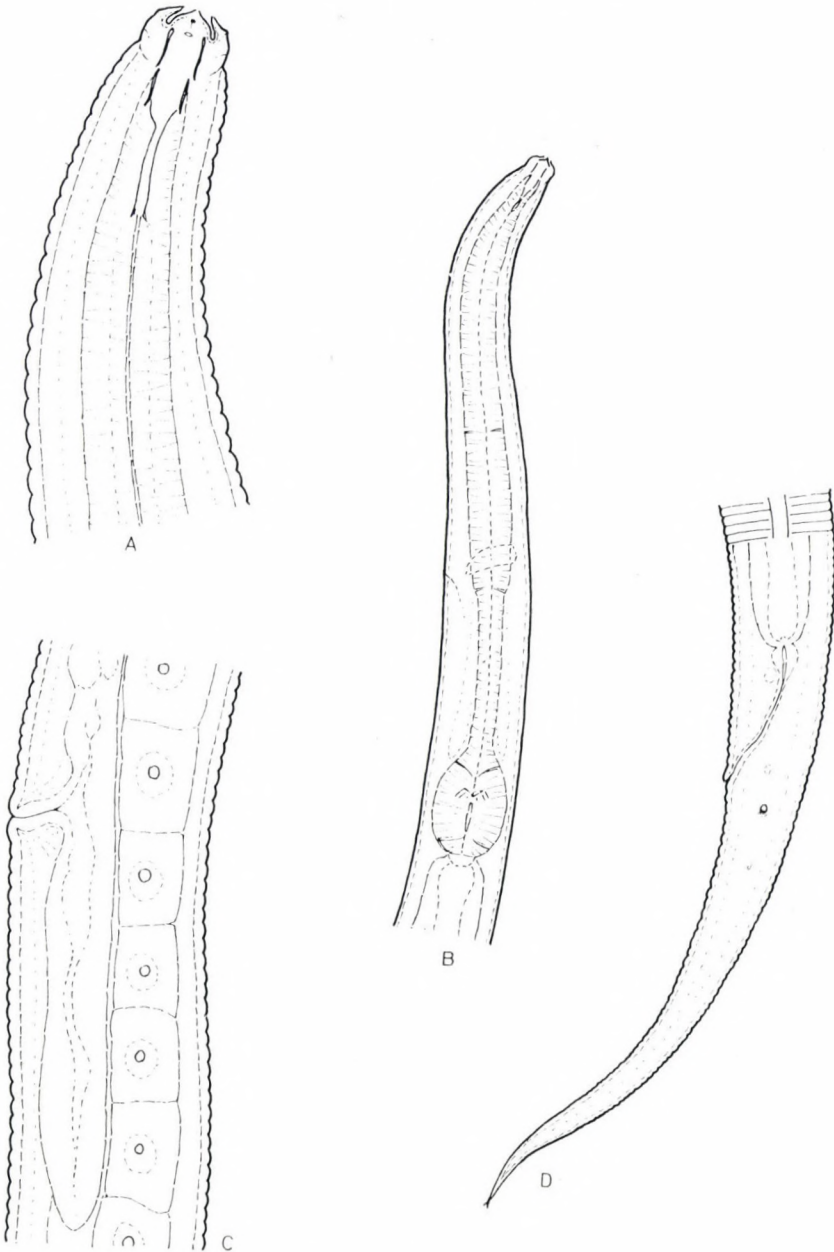


Fig. 5. *Panagroteratus baloghi* gen. n., sp. n. A = anterior end ($\times 1800$); B = oesophagus ($\times 680$); C = vulval region ($\times 1500$); D = female tail ($\times 680$)

Distance between vulva and anus 1.8—1.9 times as long as tail. Tail 62—65 μm , 6.5—7 times anal body diameter, gradually narrowing, straight. Tip of tail very finely forked. Phasmid not far from anal opening.

Male unknown.

Brief characteristics: Body small, head set off and comparatively high, labial lobes distinct, posterior uterine sac long, tail elongate, doubly pointed.

H o l o t y p e: Female, No. 9518 in the collection of the author.

T y p e l o c a l i t y: Lima, Peru, humus with roots from an old forest, November, 1971, leg. J. BALOGH.

This *Panagroteratus* species is closely related to *P. hamatus* sp. n., shows however a number of distinguishing characters: head higher and narrower, postvulval uterine branch about twice as long, tail much longer and slenderer, tail tip not harpoon-like. It is worthy of mention that the new genus *Panagroteratus* is represented by a species each in the Old and New World.

Panagrobelum minimum sp. n. (Fig. 6A—D)

♀: $L = 0.40\text{--}0.41$ mm; $a = 37\text{--}39$; $b = 3.0\text{--}3.1$; $c = 12$; $V = 64\text{--}65\%$; $c' = 4.9\text{--}5$.

Body small and slender. Cuticle very thin, finely annulated; annules indistinct, about 1 μm wide on mid-body. Lateral field simple, with two incisures, 1/10 of body diameter.

Head not set off, 6.5 μm wide; body at posterior end of oesophagus only 1.6—1.8 times as wide as head. Labial region *Teratocephalus*-like, lobed. Stoma 7—8 μm long, consisting of two parts: cheilo- and promesostom wide and cuticularized, meta- and telostom narrow and thin-walled. Oesophagus 130—133 μm long, corpus occupying 3/4 of oesophagus length. Bulbus 12 μm long, ovoid, isthmus 1.5 times as long as bulb. Excretory pore level with the middle of oesophagus, deirid inconspicuous. Rectum 2—2.5 times anal body diameter.

Vulval lips somewhat protruding, vagina oblique, half as long as corresponding body width. Gonad prodelphic, 110 μm long, 31% of body length. Receptaculum seminis oval. Postvulval uterine sac absent.

Distance between vulva and anus 3.3 times as long as tail. This latter 33—34 μm , 4.9—5 times anal diameter, uniformly conoid with pointed tip. Phasmid far back, in 2/3 of tail length.

Male unknown.

Brief characteristics: Body small and slender, annulation of cuticle fine, head not set off, lateral field narrow, vagina oblique, tail comparatively short, phasmids far back on tail.

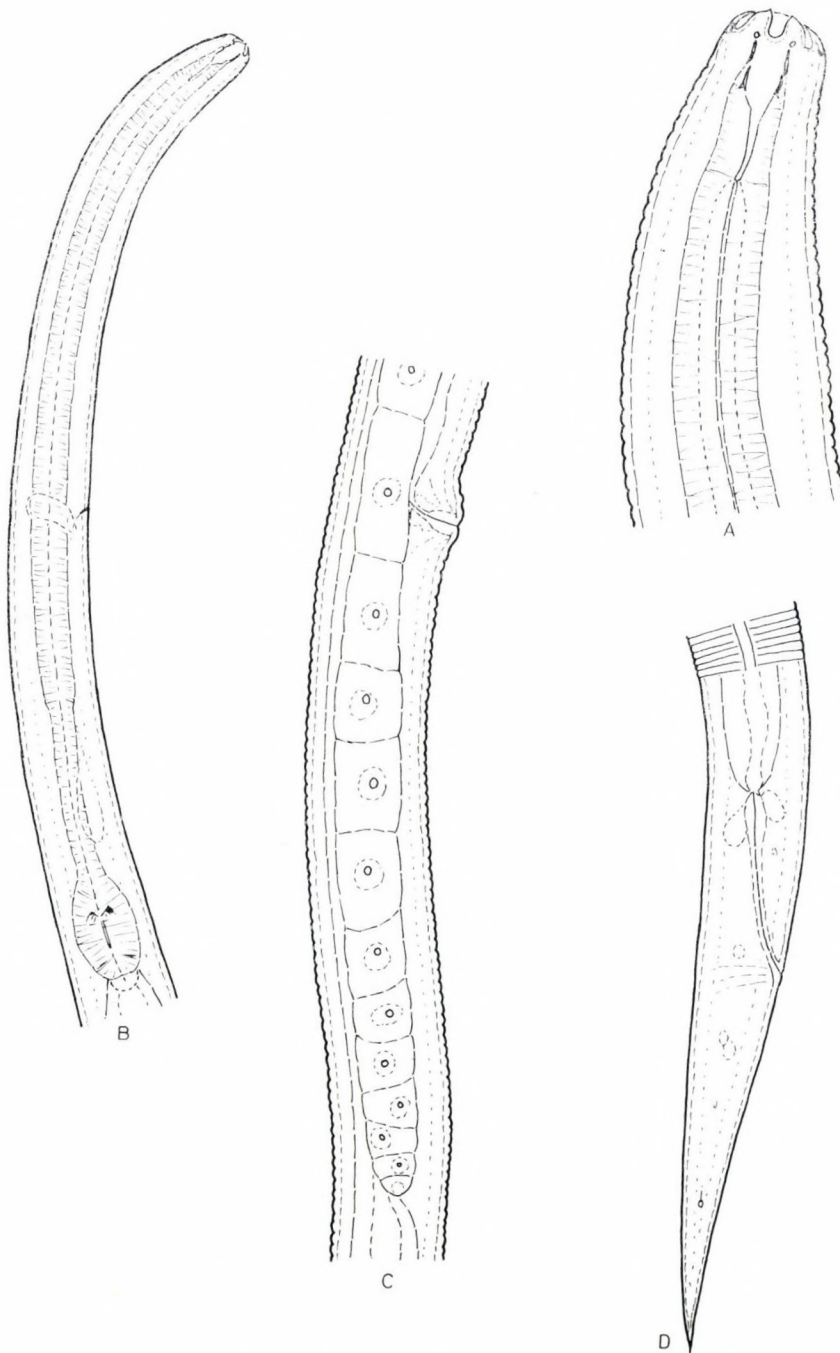


Fig. 6. *Panagrobelum minimum* sp. n. A = anterior end ($\times 2800$); B = oesophagus ($\times 1000$); C = vulval region ($\times 1500$); D = female tail ($\times 1500$)

H o l o t y p e: Female, No. 9362 in the collection of the author.

T y p e l o c a l i t y: Pucallpa, Peru, wet humus from a mountainous rain forest, November, 1971, leg. J. BALOGH.

Last year I proposed a new genus, *Panagrobelum* ANDRÁSSY, 1984, for one species of the old genus *Panagrobelus* THORNE, 1939. The type-species, *Panagrobelum topayi* (ANDRÁSSY, 1960) ANDRÁSSY, 1984 is similar to the representatives of the old genus, can be, however, distinguished from them in three points: the metastom is more elongate, the posterior uterine sac lacking and the tail elongate-conoid. The recent new species, *P. minimum* sp. n. differs from *P. topayi* in having a shorter body (*topayi* 0.6 mm), a finer annulation on the cuticle, a narrower lateral field and a shorter tail (7–8 times anal body diameter in *topayi*).

Rhabditella muscicola sp. n. (Figs. 7A–E and 8A–C)

♀: $L = 0.98\text{--}1.22$ mm; $a = 30\text{--}32$; $b = 5.2\text{--}5.8$; $c = 5.2\text{--}5.8$; $V = 46\text{--}48\%$; $c' = 12\text{--}15$.

♂: $L = 0.77\text{--}1.04$ mm; $a = 30\text{--}33$; $b = 4.6\text{--}5.2$; $c = 7.5\text{--}7.8$; $c' = 6\text{--}8$.

Body straight after fixation, 34–38 (♀) or 24–32 (♂) μm wide. Cuticle very thin, very finely annulated on both ends of body. Lateral field simple, $1/5\text{--}1/6$ of body width. Head not set off, rounded, 10–12 μm wide; body at posterior end of oesophagus thrice as wide as head. Lips six, asymmetrical, separated by fairly deep furrows each from the other. Amphid pore-like.

Stoma tubular, 18–19 μm long. Cheilostom not cuticularized. Prostom shorter but a little more heavily cuticularized than mesostom. Metastom anisomorph, ventral wall of mesostom somewhat longer than dorsal one; metastomatal swellings armed with setose denticles. Telostom short, insignificant. Oesophageal collar present, surrounding $2/3$ of buccal prisma. Oesophagus 190–210 μm long, anterior portion (from head to posterior end of medial swelling) 56–58% of oesophagus length. Both medial and basal bulb moderately developed. Excretory pore level with isthmus. Rectum twice as long as anal body diameter.

Vulva a broad transverse slit, vagina $2/5$ of corresponding body width. Female gonads paired, long. Spermathecae present, filled with fairly large globular spermatozoa. Ovoviviparous; uterus with 2 to 4 eggs at a time. Egg $39\text{--}42 \times 23\text{--}26$ μm , ovoid, 1.1–1.2 times as long as body diameter.

Distance between vulva and anus 1.8–2 times as long as tail. The latter 180–210 μm , 12–15 times anal body diameter, filiform, straight, 17–19% of total length of body. Phasmids 33–40 μm behind anus, in 16–18% of tail length.

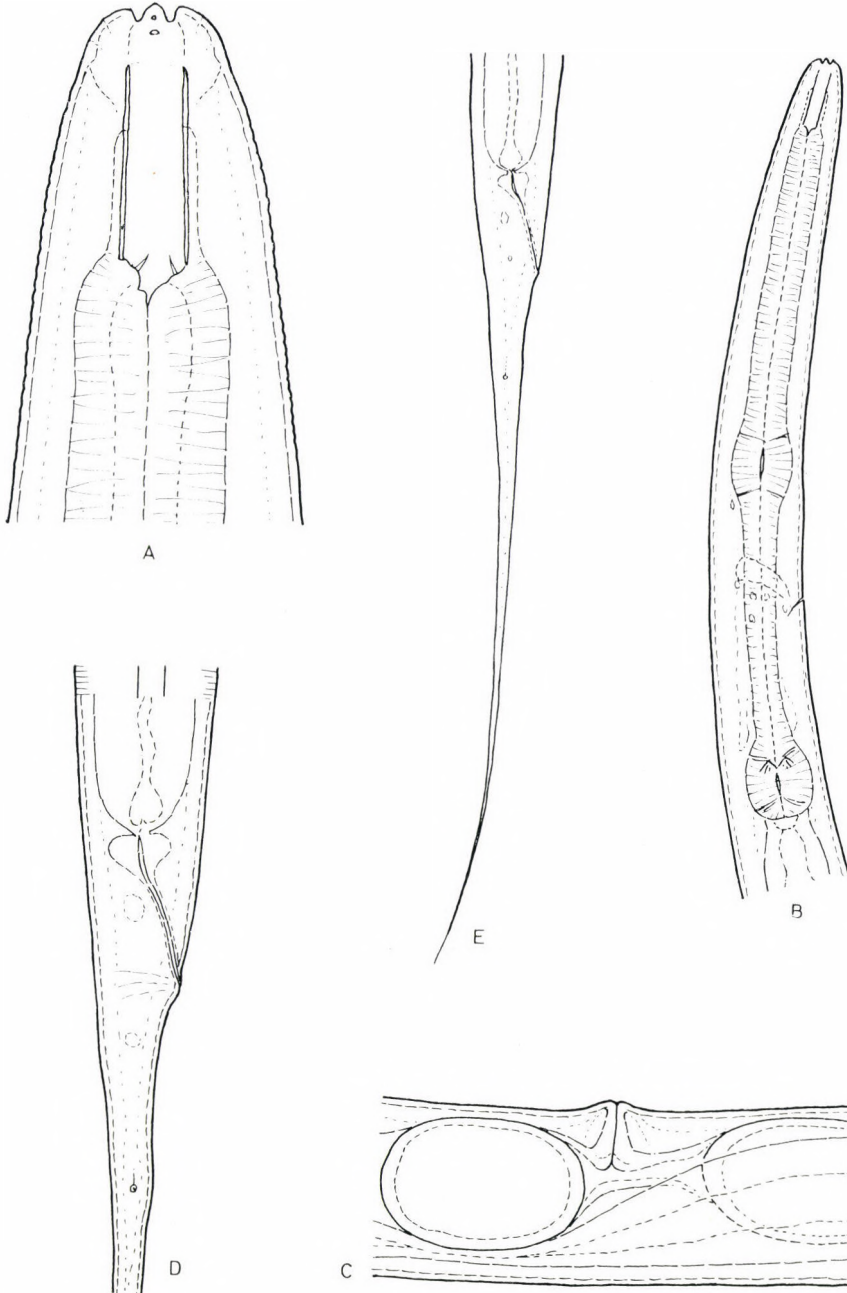


Fig. 7. *Rhabditella muscicola* sp. n. A = anterior end ($\times 1800$); B = oesophageal region ($\times 500$); C = vulval region ($\times 680$); D = anal region of female ($\times 680$); E = female tail ($\times 400$)

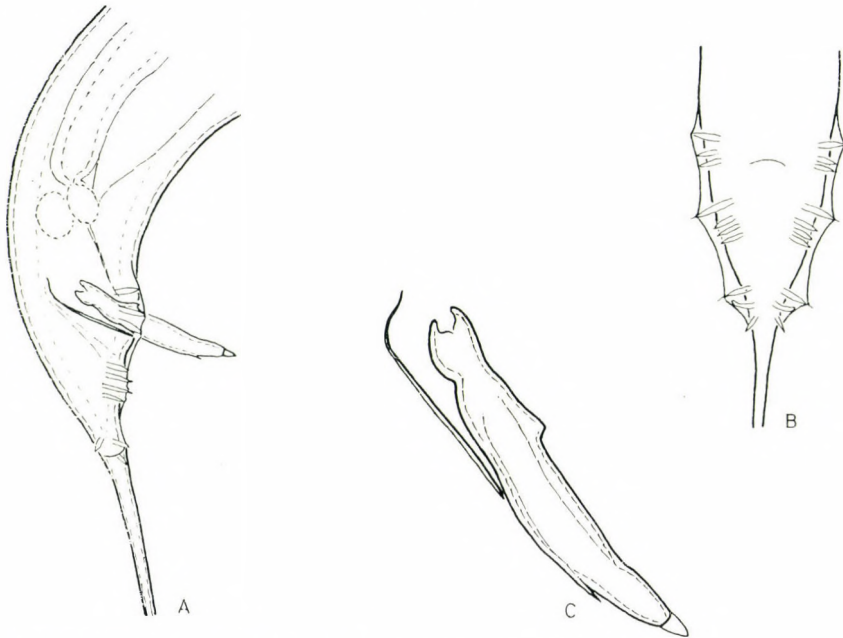


Fig. 8. *Rhabditella muscicola* sp. n. A = cloacal region from lateral view ($\times 680$); B = cloaca region in medial view ($\times 680$); C = spiculum and gubernaculum ($\times 1500$)

Male nearly as common as female. Tail 100–133 μm , 6–7 times anal body diameter, or 12–13% of body length, respectively. Spicula 32–40 μm long, equally long in the same animal, free, not fused distally. Gubernaculum very thin, more than half as long as spicula. Bursa rudimentary, hardly visible in lateral view. Papillae ten pairs: 3 + 4 + 3 or 1 + 2 + 4 + 3. 1st pair preanal, 2nd and 3rd pairs adanal, the other pairs postanal in position. In medial view the 4th and 8th pairs of papillae are the longest, in lateral view the 9th pair is directed sublaterally-subdorsally. The 10th pair is equal with the phasmids. Spermatozoa globular, 6–7 μm large.

In some cases I could observe bacilliform structures (bacteria?) in the intestine.

Brief characteristics: Body of medium size, cuticle hardly annulated, metastom with setose denticles, female rectum long, spicula straight, gubernaculum thin, first pair of bursal papillae close to the second pair, tail filiform.

Holotype: Male, No. 9556 in the collection of the author.

Type locality: Pucallpa, Peru, mosses from a fern-tree in a mountain rain forest, November, 1971, leg. J. BALOGH.

The genus *Rhabditella* (COBB, 1929) CHITWOOD, 1933 contained three species hitherto: *Rh. pseudoelongata* (MICOLETZKY, 1913) ANDRÁSSY, 1983;

Rh. leptura (COBB, 1929) CHITWOOD, 1933; *Rh. octopleura* (STEINER, 1929) CHITWOOD, 1933. The new species can be distinguished from them in four characters: 1. the metastomatal swellings bear setiform denticles (not minute warts); 2. the rectum of female is strikingly long; 3. the dorsal process of spiculum is small, reduced; 4. the first pair of bursal papillae are located quite close to the second pair or the cloaca, respectively (in the other species these first papillae are far from the cloaca: at level with the anterior end of spicula).

***Bunonema pustulatum* sp. n. (Fig. 9A—D)**

♀: $L = 0.27-0.28$ mm; $a = 13-15$; $b = 3.0-3.2$; $c = 17-19$; $V = 56\%$.

Body very small and slightly bent dorsally, 20 μm wide in the middle. Ornamentation on right side consisting of 14—16 pairs of fairly large tubercles and between them of a fine network composed of small dots. Tubercles "empty", without rods, 3.5—4 μm high; they are at a distance of 15—16 μm each from the other. Of the tubercles, 9 or 10 pairs lying in prevulvar and 5 or 6 pairs in postvulvar position; at level with the oesophagus 4 or 5 pairs are to be found. The first pair is located at level of the oesophageal corpus, the last pair a little before the beginning of the rectum. Left side of body bearing five ridges.

Head 5—6 μm wide; body at posterior end of oesophagus thrice as wide as head. Lips with the usual projections as figured. Buccal tube 11 μm long, with parallel walls. Oesophagus 86 μm long, both portions about equal in length. Medial bulb moderately developed, basal bulb strong, 18—20% of total length of oesophagus. Excretory pore level with isthmus. Deirids inconspicuous. Rectum extremely long, about 8 times anal body diameter.

Vulva a transverse slit, vagina short. Gonads paired and short, each twice as long as body diameter. Distance between vulva and anus 10 times as long as tail. Tail short, conical, 16 μm , thrice anal body diameter.

Brief characteristics: Small nematode, tubercles few and empty, network very fine.

Holotype: Female, No. 11366 in the author's collection.

Type locality: Quito, Ecuador, Pichinoha volcan, wet leaves from a creek, November, 1984, leg. J. BALOGH.

Including the recent new species the genus *Bunonema* JÄGERSKIÖLD, 1905 contains ten species. Of them, seven species bear well-developed tubercles on the right side of body, whilst these organs are reduced in three species. The number of tubercles is fairly constant and characteristic for the species, it fluctuates between 6 and 50. In the number of tubercles *Bunonema pustulatum* sp. n. resembles *B. richtersi* JÄGERSKIÖLD, 1905, *B. ditlevseni* MICOLETZKY,

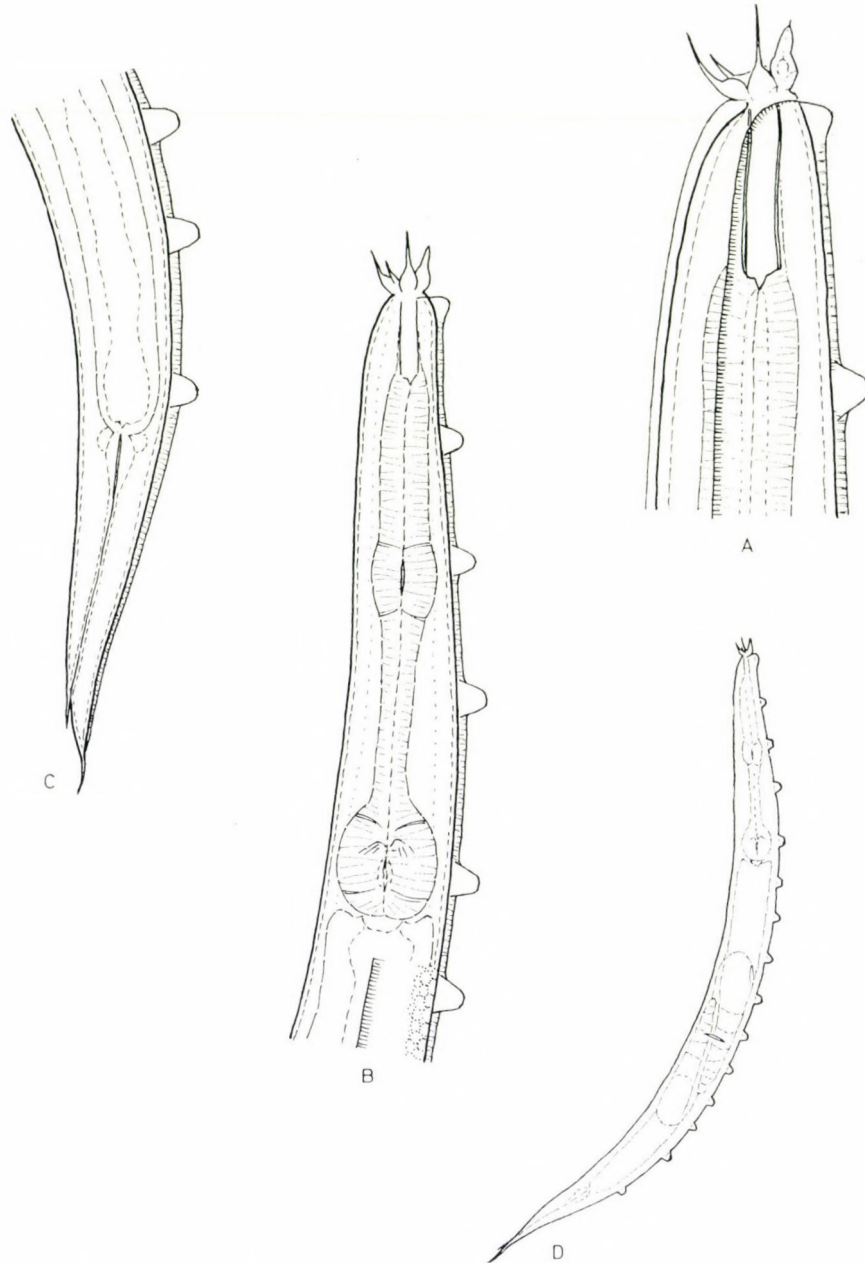


Fig. 9. *Bunonema pustulatum* sp. n. A = anterior end ($\times 1800$); B = oesophageal region ($\times 1000$); C = posterior end ($\times 1000$); D = entire female ($\times 330$)

1925 and *B. franzi* ANDRÁSSY, 1971. It can be separated from *I. richtersi* by the less number of tubercles (18—24 pairs in *richtersi*) and that they do not possess rods (four rods in each tubercle in *richtersi*); 2. from *ditlevseni* by the greater number and the arrangement of tubercles (6—10 pairs in *ditlevseni* and arranged only at level of the oesophagus) and that they are empty (three rods in each tubercle in *ditlevseni*); 3. from *franzi* by the stronger development and “emptiness” of tubercles (two rods in each tubercle in *franzi*).

***Acrostichus pulcher* sp. n. (Fig. 10A—F)**

♀: $L = 0.80\text{--}0.83$ mm; $a = 30\text{--}34$; $b = 5.8\text{--}6.1$; $c = 2.2\text{--}2.4$; $V = 44\text{--}46\%$;
 $c' = 22\text{--}26$.
 ♂: $L = 0.66\text{--}0.68$ mm; $a = 31\text{--}36$; $b = 5.4\text{--}5.5$; $c = 2.5\text{--}2.6$; $c' = 20\text{--}22$.

Small, long-tailed nematode, male shorter than female. Cuticle very thin, about $0.8\ \mu\text{m}$, smooth; subcuticle very finely striated. Lateral field obscure. Head not set off, $9\text{--}9.5\ \mu\text{m}$ wide; body at posterior end of oesophagus 2—2.2 times wider than head. Lips six, low, papillae setose. Amphid well observable, oval, level with cheilostom.

Stoma 11—12 μm long, consisting of two chambers: an anterior large chamber (cheilo- and promesostom) and a posterior small one (meta- and telostom). Cheilostom cuticularized, about as long as dorsal wall of promesostom. This latter also well cuticularized, tubuliform, asymmetrical: its ventral wall longer than the dorsal wall. Metastom similarly asymmetrical: dorsal tooth large and strong, $4\ \mu\text{m}$ long, penetrating to the middle of stoma and bearing two rod-like cuticularized pieces on its base; subventral teeth smaller and thinner and lying farther back in mouth cavity. Telostom short. Oesophagus 133—140 μm long; anterior portion (from head to base of medial bulb) occupying 63—65% of oesophagus length, i.e. 1.7—1.8 times as long as posterior portion. Medial bulb oval, basal bulb ovoid. Excretory pore level with isthmus; hemizonid present, small. Rectum 1.3—1.5 times as long as anal body diameter.

Vulval lips a little protruding, vagina $1/3$ as long as corresponding body diameter or somewhat longer. Female gonad prodelphic, ovary reflexed. Postvulval uterine sac 28—30 μm long, nearly 1.5 times longer than body width. Uterus with one egg: $45 \times 17\ \mu\text{m}$, twice body width.

Tail filiform, very thin in its posterior half, 330—355 μm long, 22—26 times anal body diameter, 3.2—3.8 times as long as vulva-anus distance. Phasmids unusually large, oval, located 1.5—2 body widths behind anal opening.

Males common. Tail 260—270 μm long, 20—22 times anal diameter. Spicula arched, 18—20 μm long, probably distally fused. Gubernaculum 10 μm

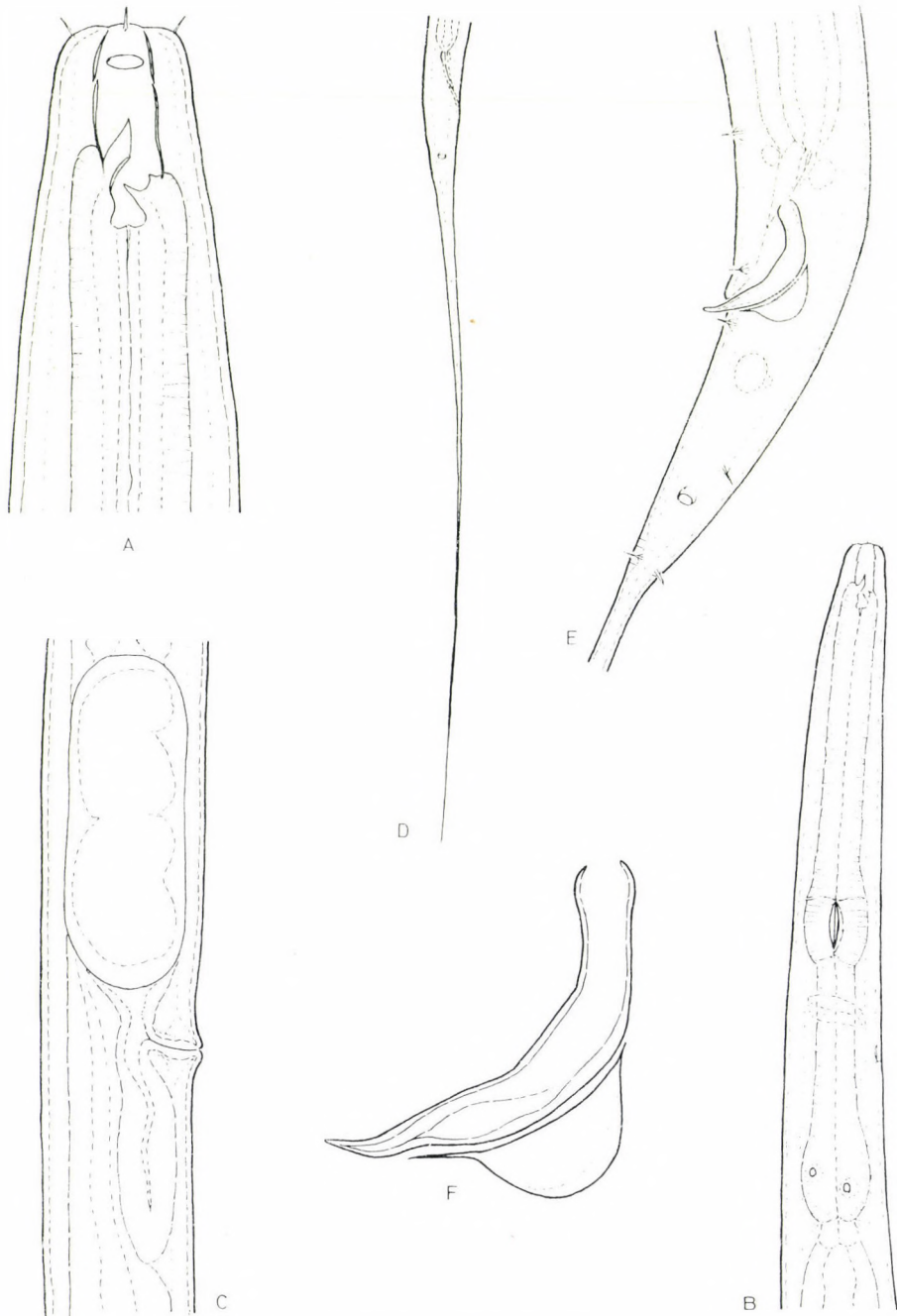


Fig. 10. *Acrostichus pulcher* sp. n. A = anterior end ($\times 1800$); B = oesophagus ($\times 680$); C = vulval region ($\times 1000$); D = female tail ($\times 400$); E = cloacal region ($\times 1000$); F = spiculum and gubernaculum ($\times 2800$)

long, very thick, semilunar, with thin projections on both ends. Six pairs of large, setose papillae and three pairs of small, reduced papillae. Two pairs lying preanal, the other postanal. Two of the postanal pairs located sublaterally or subdorsally. Phasmids large, oval.

Brief characteristics: Body small, dorsal tooth highly developed, postvulval uterine sac long, spicula short, gubernaculum extremely thick, 6 + 3 pairs of papillae, tail very long.

Holotype: Female, No. 9090 in the collection of the author.

Type locality: Lae, New Guinea, decayed leaves from the botanic garden, September, 1969, leg. J. BALOGH.

In one of my last works (ANDRÁSSY, 1984) I ordered seven species in the genus *Acrostichus* RAHM, 1928. The present species may be especially characterized by its strongly developed dorsal tooth and differs in this respect from every other representative of the genus. Regarding the shape of buccal cavity and the tail it resembles *A. indicus* (SURYAWANSHI, 1978) ANDRÁSSY, 1984 but can be distinguished from that in the following characters: body longer (*indicus* 0.60–0.62 mm), tail longer ($c = 2.5\text{--}3.0$ in *indicus*), dorsal tooth stronger, posterior uterine sac longer, gubernaculum more robust.

***Notholetus eucalypti* sp. n. (Fig. 11A–C)**

♀: $L = 0.53$ mm; $a = 13$; $b = 4.3$; $c = ?$; $V = 93\%$; $R = 80$; $RV = 8$.

Body stout, bent ventrally, 42 μm wide. Body consisting of 80 annules; annules 7–7.5 μm wide, smooth on greatest part of body but bearing short scale-like appendages on the posterior 9 or 10 annules. These appendages rounded, gradually increasing posteriad and arranged in 11–12 longitudinal rows.

Head (first annule) 19 μm wide with smooth and outward directed margins. Second annule 20 μm , third annule 23 μm wide. Sublateral lobes small, insignificant. Spear 67 μm (12 annules) long, 13% of total length of body. Metenchium 75% of spear length. Basal knobs strong, 10 μm wide, forward directed. Medial bulb large, 29 \times 24 μm , longer than isthmus and basal bulb together. Posterior end of oesophagus in the 21st annule. Excretory pore on the 25th annule, 148 μm behind head or in 28% of body length, respectively. Anal opening indistinct.

Distance between oesophagus and vulva thrice as long as oesophagus. Vulva conical, closed, on the 73rd annule counted from head and on the 8th annule counted from terminus, respectively. Postvulval body region 37 μm long. Gonad long, 38% of body length. Spermatheca oval, 22 μm long.

Male and larval forms unknown.

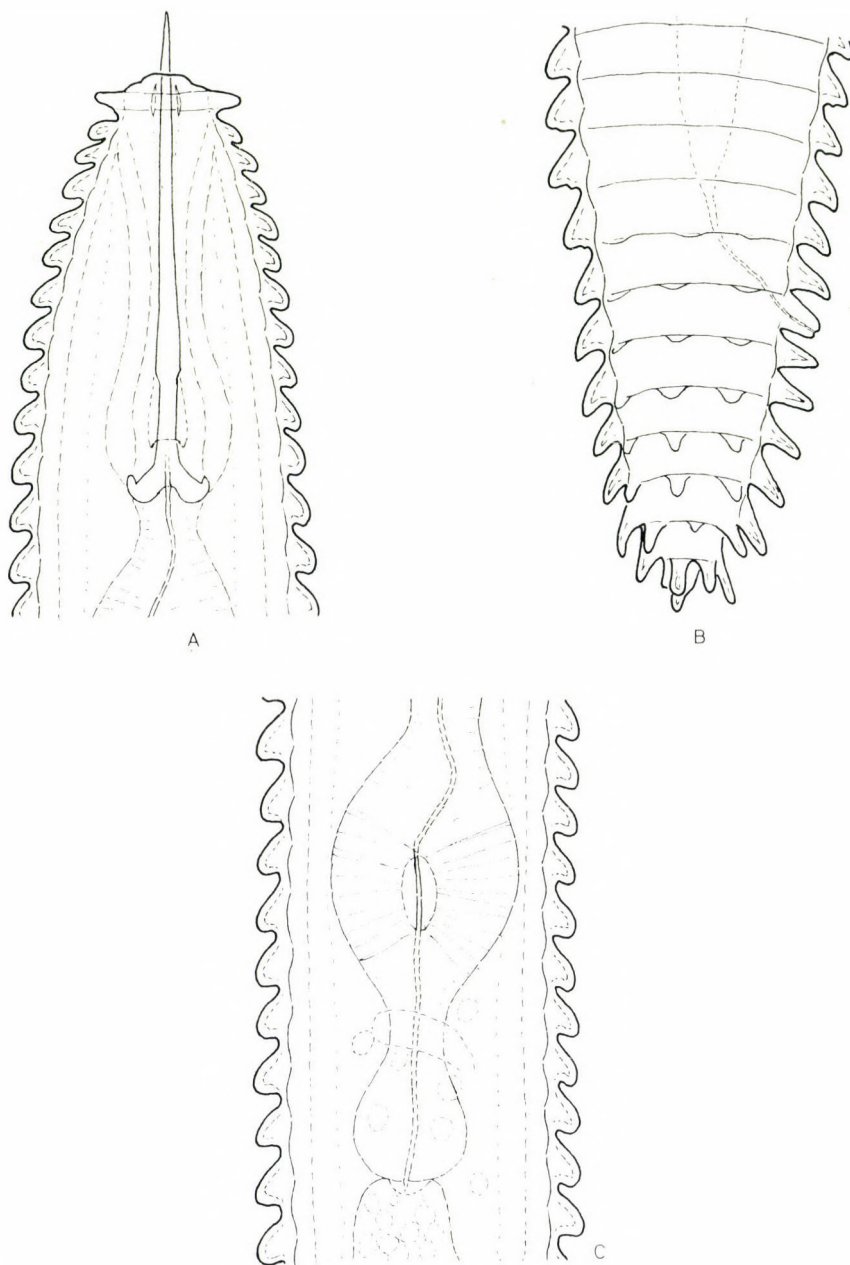


Fig. 11. *Notholetus eucalypti* sp. n. A = anterior end ($\times 1000$); B = posterior end ($\times 1000$); C = oesophageal bulbi ($\times 1000$)

Brief characteristics: Body small, comparatively with a high number of annules, head with one annule, spear of medium length, scales on posterior body numerous, postvulval body region conoid-rounded.

Holotype: Female, No. 9646 in the collection of the author.

Type locality: Canberra, Australia, Black Mountains, grassy soil from an *Eucalyptus* forest, July, 1968, leg. J. BALOGH.

Notholetus eucalypti sp. n. differs in its combination of features from every other species described hitherto.

***Seriespinula australis* sp. n. (Fig. 12A—C)**

♀: $L = 0.42-0.44$ mm; $a = 7.8-8.0$; $b = 3.3-3.8$; $c = ?$; $V = 91-92\%$; $R = 56$; $RV = 8$.

Body very plump, $53 \mu\text{m}$ wide. It consists of 56 annules. Annules 8—8.5 μm wide, ornamented with 2—5-tipped (mostly 3-tipped) scales arranged in 14 longitudinal rows. Scales very short on first annules but gradually increasing in length toward tail.

Head $24 \mu\text{m}$ wide, with fringed and outward directed margin. Second annule $21 \mu\text{m}$, third annule $30 \mu\text{m}$ wide. Sublateral lobes indistinct. Spear $94 \mu\text{m}$ long, four times head diameter, 22% of body length, occupying 13 or 14 annules. Basal knobs $8 \mu\text{m}$ wide, located in the 13rd or 14th annule. Medial bulb not too strong. Excretory pore inconspicuous, so is anus.

Vulva conoid, closed, on the 49th annule from head and on the 8th annule from tail tip, respectively. Postvulval body region $35 \mu\text{m}$ long, conoid.

Male and larval forms unknown.

Brief characteristics: Annules few in number with scales arranged in 14 rows, scales 2—5-tipped, spear long, terminus obtuse.

Holotype: Female, No. 9650 in the collection of the author.

Type locality: Canberra, Australia, Uriaria forest, Sphagnum moor, July, 1968, leg. J. BALOGH and I. LOKSA.

In having less than 60 annules and 14 rows of cuticular appendages *Seriespinula australis* sp. n. resembles *S. cobbi* (MICOLETZKY, 1925) KHAN, CHAWLA & SAHA, 1976, *S. tenuicaudata* (SIDDIQI, 1961) KHAN, CHAWLA & SAHA, 1976 and *S. impar* KHAN, CHAWLA & SAHA, 1976. It differs however from all of them by the obtuse body end and by the presence of some small spines between scales.

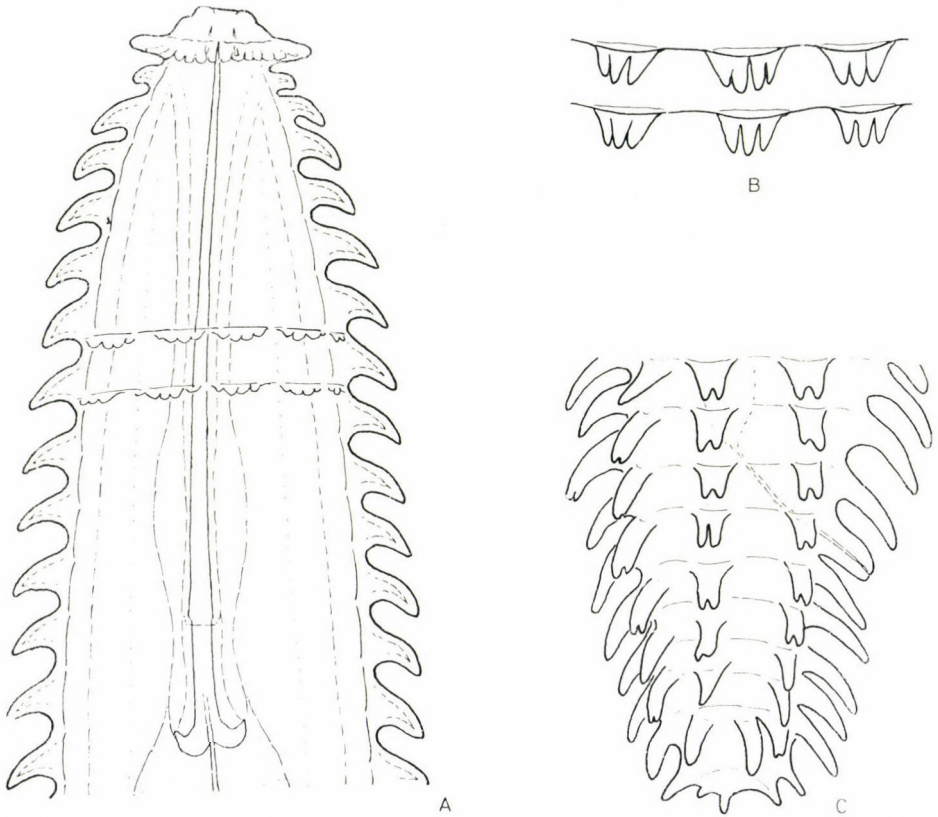


Fig. 12. *Seriespinula australis* sp. n. A = anterior end ($\times 1000$); B = scales on mid-body; C = posterior end ($\times 1000$)

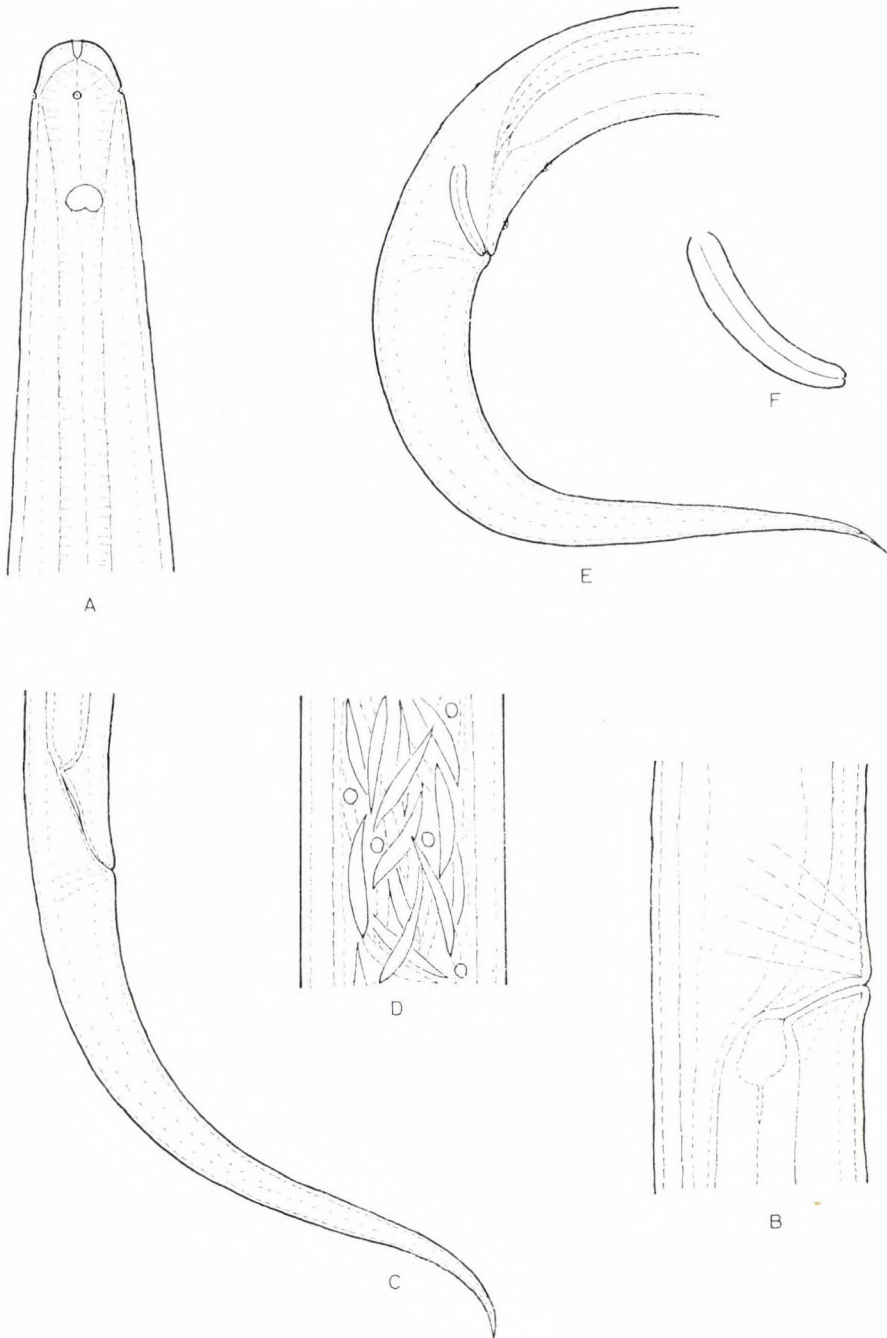
***Etamphidelus neotropicus* sp. n. (Fig. 13A—F)**

♀: $L = 1.10$ mm; $a = 62$; $b = 4.4$; $c = 13$; $V = 42\%$; $c' = 8$.
 ♂: $L = 1.11$ mm; $a = 57$; $b = 4.4$; $c = 12$; $c' = 6$.

Body very slender and arcuate after fixation: $18\text{--}19\ \mu\text{m}$ wide. Cuticle thin, $0.8\text{--}1\ \mu\text{m}$, smooth. Head rounded, not set off practically, $6\text{--}6.5\ \mu\text{m}$ wide in level of papillae. Body at posterior end of oesophagus 2.7—3 times as wide as head. Papillae pitted, small. Amphid rounded-oval with cuticularized margin and on the basis with a minute, tongue-shaped fold. Amphid $2\text{--}2.5\ \mu\text{m}$ wide, $27\text{--}32\%$ of corresponding body width, located $8\text{--}10\ \mu\text{m}$ or $1.4\text{--}1.6$ head diameters behind anterior body end.

Mouth cavity small. Oesophagus $250\text{--}252\ \mu\text{m}$ long, gradually expanding at about 60% of its length. Cardia small. Rectum 1.5 times as long as anal body diameter. Distance between oesophagus and vulva shorter than oesophagus.

Fig. 13. *Etamphidelus neotropicus* sp. n. A = anterior end ($\times 1800$); B = vulval region ($\times 1500$); C = female tail ($\times 1000$); D = spermatozoa ($\times 1500$); E = posterior end of male ($\times 1000$); F = spiculum ($\times 1800$)



Vulval lips not protruding, vagina oblique, directed posteriad. Female gonad opisthodelphic, 13 times as long as body width. Pre-vulval uterine sac not present. Spermatheca oval, between uterus and oviduct.

Distance between vulva and anus 6.5 times as long as tail. This latter 86 μm , 8 times anal diameter, uniformly conoid, first ventrally then — on its tip — dorsally bent, sharply pointed.

Male as long as female. Tail 88 μm , 6 times anal body diameter, similar to that of female. Spicula slightly arched, 13 μm long, simple, with central line, a little shorter than anal body diameter. No gubernaculum. Two ventral papillae: one just before the cloaca, the other a little before the spicula. Spermatozoa fusiform, large, 10–12 μm , almost 2/3 as long as corresponding width of body.

Brief characteristics: Body slender, amphids large, oval, with a minute tongue, female gonad postvulval, spicula simple, genital papillae few in number, tail S-shaped and pointed.

Holotype: Female, No. 10846 in the collection of the author.

Type locality: Pucallpa, Peru, humus from a bamboo forest in a valley, November, 1971, leg. J. BALOGH.

I established the genus *Etamphidelus* in 1977 when I described its type-species, *E. japonicus* ANDRÁSSY, 1977. Twelve years later Indian authors described a second species, *E. manipuriensis* CHOUDHARY & JAIRAJPURI, 1983. The third species, *E. neotropicus* sp. n., shows well the general characters of the genus (pitted cephalic papillae, large oval amphids, single gonad, uniformly tapering tail and spicula with central lines) and is closely related with both other species. It can be easily distinguished from them by the postvulval gonad (gonad prevulval in *japonicus* and *manipuriensis*), the fine structure of amphids and the shape of tail. The genus is distributed in Asia (Japan, India) and South America (Peru).

Mylonchulus oceanicus sp. n. (Fig. 14A–D)

♀: $L = 1.06\text{--}1.23$ mm; $a = 24\text{--}26$; $b = 3.0\text{--}3.2$; $c = 34\text{--}35$; $V = 63\text{--}64\%$; $c' = 1.0\text{--}1.2$.

Body bent ventrally after fixation and rather stout, 43–49 μm wide. Cuticle smooth, 1.5–2 μm thick. Head 25–26 μm wide, lips separate, angular, posterior ones somewhat auriculate. Body at proximal end of oesophagus 1.5–1.9 times as wide as head. Amphid an oval slit located a little behind lips.

Buccal cavity (the cuticularized part) 26–29 \times 16–17 μm , its walls strong, heavily cuticularized. Dorsal tooth very large, 9–10 μm from basis to tip, claw-like, obliquely directed forward; apex of tooth in 18–20% of buccal

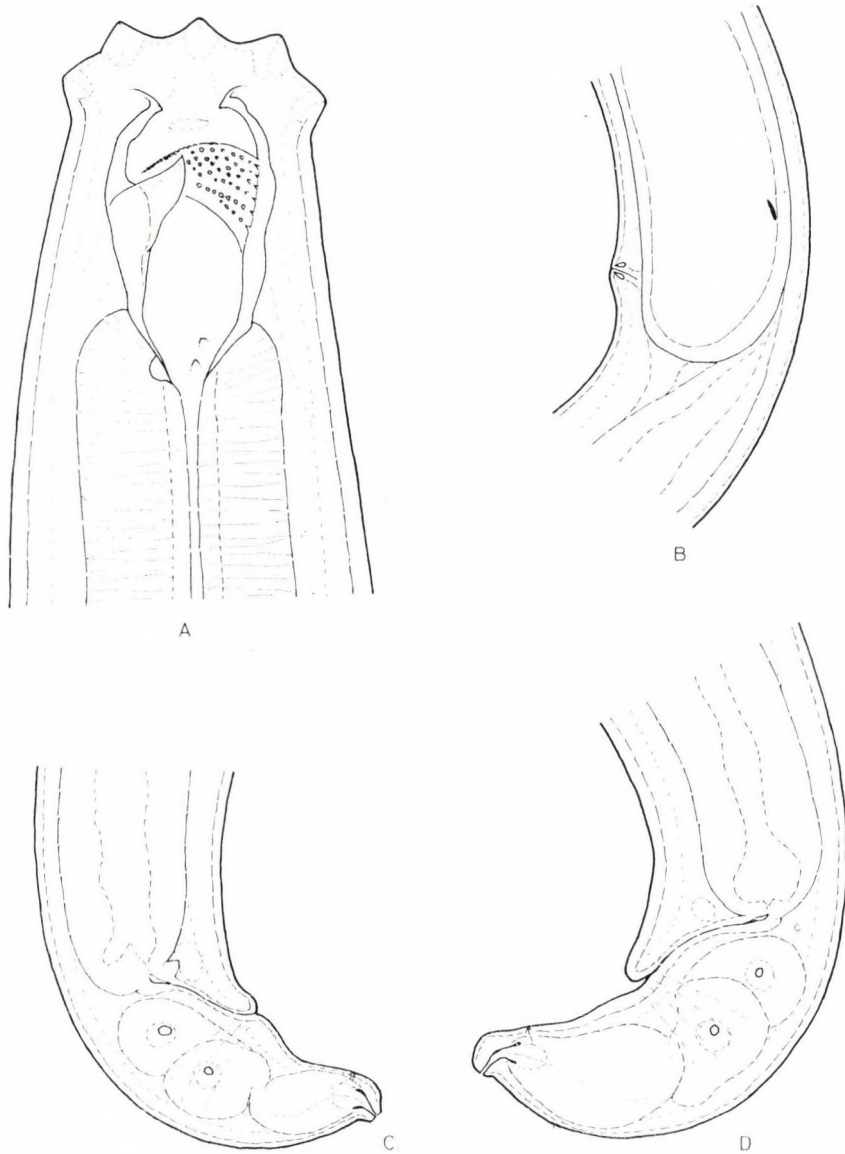


Fig. 14. *Mylonchulus oceanicus* sp. n. A = anterior end ($\times 1500$); B = vulval region ($\times 500$); C—D = female tails ($\times 680$)

cavity. Subventral denticles rasp-like, small, arranged in 6—7 transversal rows. Major subventral teeth not present. Oesophagus 350—410 μm long, strongly muscular; oesophago-intestinal junction not tubercled. Rectum shorter than anal body diameter.

Vulval lips cuticularized, vagina short, tubular. Female gonads paired, each 1.5—2.6 times as long as body width. Anterior gonad on the left side, posterior on the right side of intestine. Egg $105 \times 35 \mu\text{m}$, thrice as long as corresponding width of body. Distance between vulva and anus 11—12 times longer than tail.

Tail 31—35 μm , 1—1.2 times anal body diameter, or 2.8—3% of total length of body, plump, ventrally bent, nearly semicircular in its dorsal contour. Tail tip slightly but distinctly dorsally curved, rounded or obtuse. Three large caudal glands, two of them lying side by side; orifice of the glands subterminal, dorsally shifted with cuticularized valvular apparatus. A single subventral pair of caudal papillae present before tail tip.

Male unknown.

Brief characteristics: Body medium-sized, lips angular, conspicuous, dorsal tooth large, subventral teeth absent, tail of characteristic shape, orifice of caudal glands subterminal.

Holotype: Female, No. 8736 in the collection of the author.

Type locality: Kileanea, Hawaii, wet humus under *Metrosideros* trees. — Other localities: Olinda, Hawaii, fallen leaves from a *Metrosideros* forest; Kokee, Hawaii, dry mosses from a trunk. All exemplars collected in October 1969 by J. BALOGH.

Mylonchulus oceanicus sp. n. belongs to that group of species within the genus which do not possess subventral teeth in the buccal cavity. In having a subterminal orifice of caudal glands, the new species is closest related to *M. ubis* CLARK, 1961; it differs from that by the more prominent labial papillae, the shorter tail ($c = 22\text{—}26$ in *ubis*) and the dorsally bent tail terminus. In its general habit *M. oceanicus* sp. n. resembles also *M. brevicaudatus* (COBB, 1917) ALTHERR, 1954, it can be separated however from that by the shorter body (*brevicaudatus* 1.4—1.7 mm), the protruding lips, the lacking subventral teeth and the longer and other shaped tail.

***Practinocephalus secundus* sp. n. (Fig. 15A—D)**

♀: $L = 2.08\text{—}2.16$ mm; $a = 35\text{—}37$; $b = 3.7\text{—}3.8$; $c = 6.9\text{—}7.0$; $V = 46\text{—}47\%$; $c' = 10\text{—}11$.

Body large, rapidly narrowing to head, 58—60 μm wide. Cuticle 3.5—4 μm thick on mid-body, marked by 32—34 longitudinal ridges which decrease in number toward the extremities. Head 16 μm wide, distinctly expanded, much wider than adjacent neck region, rounded in contour. Labial papillae small, not protruding. Amphid large, caliciform.

Vestibule corrugated, leading to a buccal cavity armed with four large onchia. Vestibular ring cuticularized. Sclerotization of buccal cavity extending to guiding ring. Spear 34—35 μm long and about 2 μm thick, 2—2.2 times

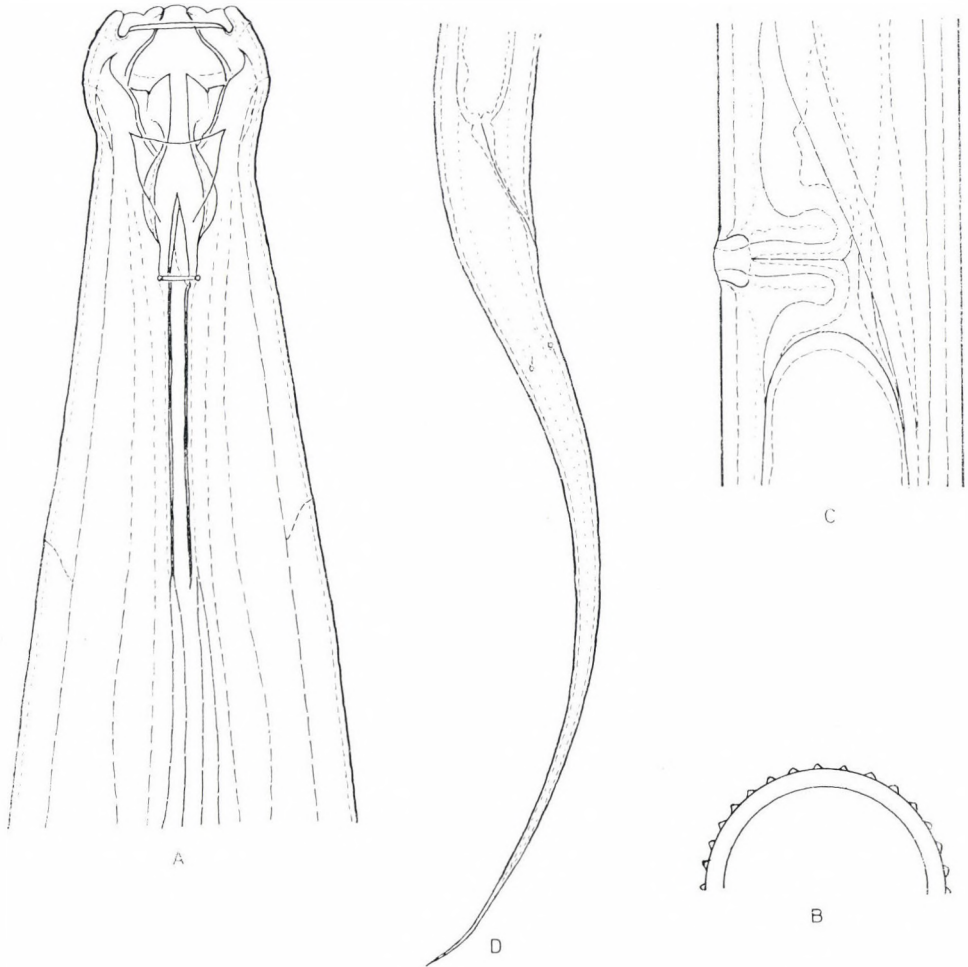


Fig. 15. *Practinocephalus secundus* sp. n. A = anterior end ($\times 1500$); B = cross section with cuticular ridges ($\times 680$); C = vulval region ($\times 680$); D = female tail ($\times 330$)

head diameter; its aperture occupying 26—28% of its length. Spear distinctly thinner than cuticle in the same level. Guiding ring simple, thin, in 1/4 of spear length.

Oesophagus 558—563 μm long, gradually increasing in width in 49—50% of its length. Dorsal gland nucleus far in the anterior part of the expanded oesophageal region. Cardia elongate, tongue-shaped. Rectum 1.5—2, pre-rectum 4—5 anal body diameters long. Distance between posterior end of oesophagus and vulva shorter than oesophagus.

Vulva longitudinal, with slightly cuticularized lips. Vagina 34—36 μm long, about half as long as corresponding body width or a little longer. Gonads

paired, each 3.8—4.5 times as long as body diameter. Uterus with two eggs: $110-117 \times 38-41 \mu\text{m}$. Distance between vulva and anus 2.8 times as long as tail.

Tail 295—305 μm , 10—11 times anal body diameter, filiform, slightly bent dorsally. Tail terminus finely pointed.

Male unknown.

Brief characteristics: Body large and slender, cuticle with longitudinal ridges comparatively few in number, spear not too long, buccal armature strong, vulva longitudinal, tail long, filiform.

H o l o t y p e: Female, No. 9370 in the collection of the author.

T y p e l o c a l i t y: Peru, at a distance of 350 km from Lima in direction of Pucallpa, mountain rain forest, liver mosses under trees, November, 1971, leg. J. BALOGH.

THORNE described from Puerto Rico a new species under the name *Actinocephalus bizarrus* THORNE, 1967. Since THORNE's genus proved to be a homonym of *Actinocephalus* STEIN, 1848 (Sporozoa), I proposed the new name *Practinocephalus* ANDRÁSSY, 1974 for it. The genus belongs to the family Brittonematiidae THORNE, 1967 and is especially characterized by the greatly expanded head, the structure of buccal cavity and the position of spear that lies far from the labial region.

Practinocephalus secundus sp. n. is closely related to the type-species but the body is shorter (*bizarrus* 2.8 mm), the cuticle thinner and provided with longitudinal ridges much less in number (about 100 ridges in *bizarrus*) and the spear shorter (47 μm in *bizarrus*).

Stomachoglossa pilata sp. n. (Fig. 16A—E)

♀: $L = 1.48-1.58 \text{ mm}$; $a = 23-26$; $b = 3.4-3.7$; $c = 58-62$; $V = 41-43\%$; $c' = 9$.

Body fairly robust, 60 μm wide. Cuticle extremely thick, 5—5.5 μm in mid-body, at level of spear about twice as thick as spear. Cuticular ridges 38—38 in mid-body region but decreasing in number toward the extremities. Head 12 μm wide; body at posterior end of oesophagus 5 times as wide as head. Head not set off practically, lips rounded, papillae small. Amphid large, caliciform.

Vestibular ring cuticularized, thin. Buccal cavity armed with four large onchia and sclerotized walls. Spear 29—30 μm long, 2.2—2.5 times head diameter, occupying 1/14 of oesophagus length. Aperture about 1/4 of spear length. Guiding ring double, in anterior third of spear. Oesophagus 410—430 μm long, gradually expanded in 49—50% of its length. Cardia tongue-shaped. Rectum 1.5, prerectum 3.5 times as long as anal body width.

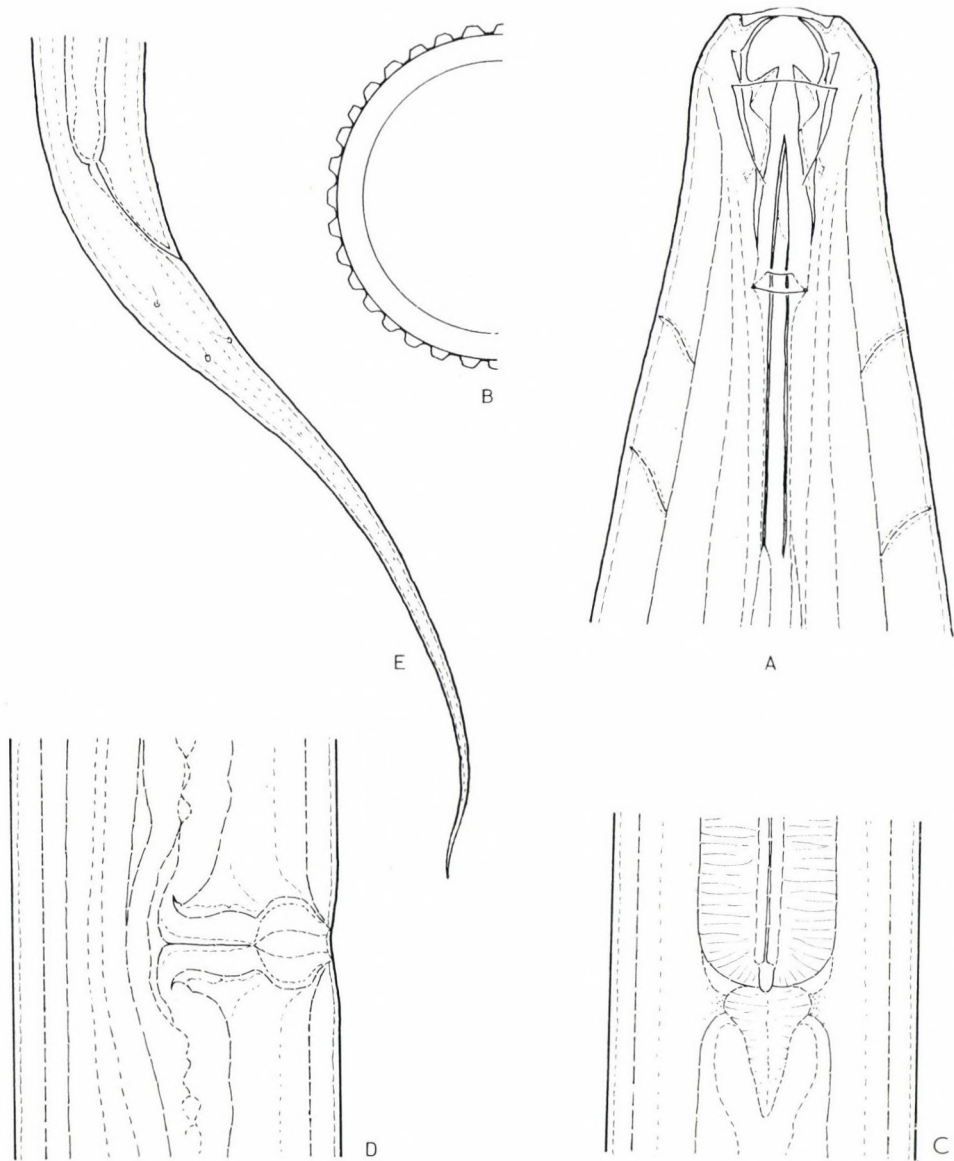


Fig. 16. *Stomachoglossa pilata* sp. n. A = anterior end ($\times 1800$); B = cross section with cuticular ridges ($\times 680$); C = oesophageal region ($\times 680$); D = vulval region ($\times 680$)

Vulva longitudinal. Vagina very strong, composed of two sections, a distal, greatly expanded and a proximal, tubular one. Female gonads paired, each branch 2.8—3.3 times as long as body diameter. Distance between vulva and anus 2.4—2.5 times as long as tail.

Tail 260—275 μm , 9 times anal body diameter, gradually narrowing to its pointed tip. Caudal papillae three pairs.

Male unknown.

Brief characteristics: Body comparatively short, cuticular ridges numerous, anterior body region rapidly narrowing, spear very long, tail filiform.

Holotype: Female, No. 11322 in the collection of the author.

Type locality: La Paz, Bolivia, decayed leaves from a small forest, November, 1966, leg. A. ZICSI.

The genus *Stomachoglossa* ANDRÁSSY, 1968 contained five species hitherto. The recent species can be simply distinguished from all of them in having a long spear. Other distinguishing characters see in the key.

Key to the species of *Stomachoglossa*

- 1 Body about 4 mm long, slender ($a = 50$ or more). — ♀: $L = 3.7-4.1$ mm; $a = 50-57$; $c = 17-18$; $V = 38-40\%$. ♂: $L = 3.1-3.8$ mm; $a = 55-58$; $b = 3.5-4.5$; $c = 70-101$ (Ivory Coast) **costata** (SCHNEIDER, 1935) ANDRÁSSY, 1968
— Body smaller than 3 mm, more robust (a under 50) 2
- 2 Spear long, 2.5 times head diameter. — ♀: $L = 1.48-1.58$ mm; $a = 23-26$; $b = 3.4-3.7$; $c = 5.8-6.2$; $V = 41-43\%$. ♂ unknown (Bolivia) **pilata** sp. n.
— Spear shorter than 2 head diameters 3
- 3 Body more than 2.5 mm, slender ($a = 40-44$). — ♀: $L = 2.7-2.9$ mm; $a = 40-44$; $b = 4.5-5.0$; $c = 9-10$; $V = 41\%$. ♂: $L = 2.5-2.8$ mm; $a = 38-45$; $b = 4.1-4.7$; $c = 62-74$ (St. Lucia) **bryophila** HUNT, 1978
— Body smaller, to 1.8 mm, less slender ($a = 26-33$) 4
- 4 Cuticle extremely thick, at level of spear almost 4 times as thick as spear. — ♀: $L = 1.5-1.9$ mm; $a = 28-30$; $b = 3.9-4.0$; $c = 7.8-9.4$; $V = 43-45\%$. ♂: $L = 1.7$ mm; $a = 29$; $b = 3.5$; $c = 45$ (Mexico) **macroderma** ZULLINI, 1973
— Cuticle not so thick, at level of spear about twice as thick as spear 5
- 5 Cuticle with 30 longitudinal ridges; spear 15 μm long. — ♀: $L = 1.8$ mm; $a = 26$; $b = 4.6$; $c = 8.5$; $V = 42\%$. ♂ unknown (Puerto Rico) . . . **spicata** (THORNE, 1967) ANDRÁSSY, 1970
— Cuticle with 38 longitudinal ridges; spear 22—23 μm long. — ♀: $L = 1.6-1.9$ mm; $a = 26-28$; $b = 3.7-4.6$; $c = 12-13$; $V = 40-45\%$. ♂ unknown (Paraguay) **pachyderma** ANDRÁSSY, 1968

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NEW ORIBATIDS (ACARI) FROM NEW GUINEA. III

J. BALOGH and P. BALOGH

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

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Two new genera, 16 new species, and 4 new subspecies from Papua New Guinea, along with discussion from four species occurring in South America and New Zealand too. With 61 figures.

In two previous contributions the senior author have begun to publish the Oribatid fauna of New Guinea (J. BALOGH 1968, 1970). This research was based on the very rich material collected between 1965 and 1969 by the Hungarian Soil Zoological Expeditions in New Guinea. The present paper is also based on this material comprising several hundred of Berlese samples. Since this huge material include tens of thousands of Oribatid mites, obviously, the results can be published only in a series of papers. These contributions basically elaborate preferably those samples which come from various vegetation types, from various ecosystems. The present paper proposes to discuss mainly new species described from samples originating from some mossy forests and tropical montane forests. A part of the species displays significant relation with the Oribatid fauna of the South American Andes.

BRACHYCHTHONIIDAE

Liochthonius fimbriatissimus (HAMMER, 1962) (Figs 1—3)

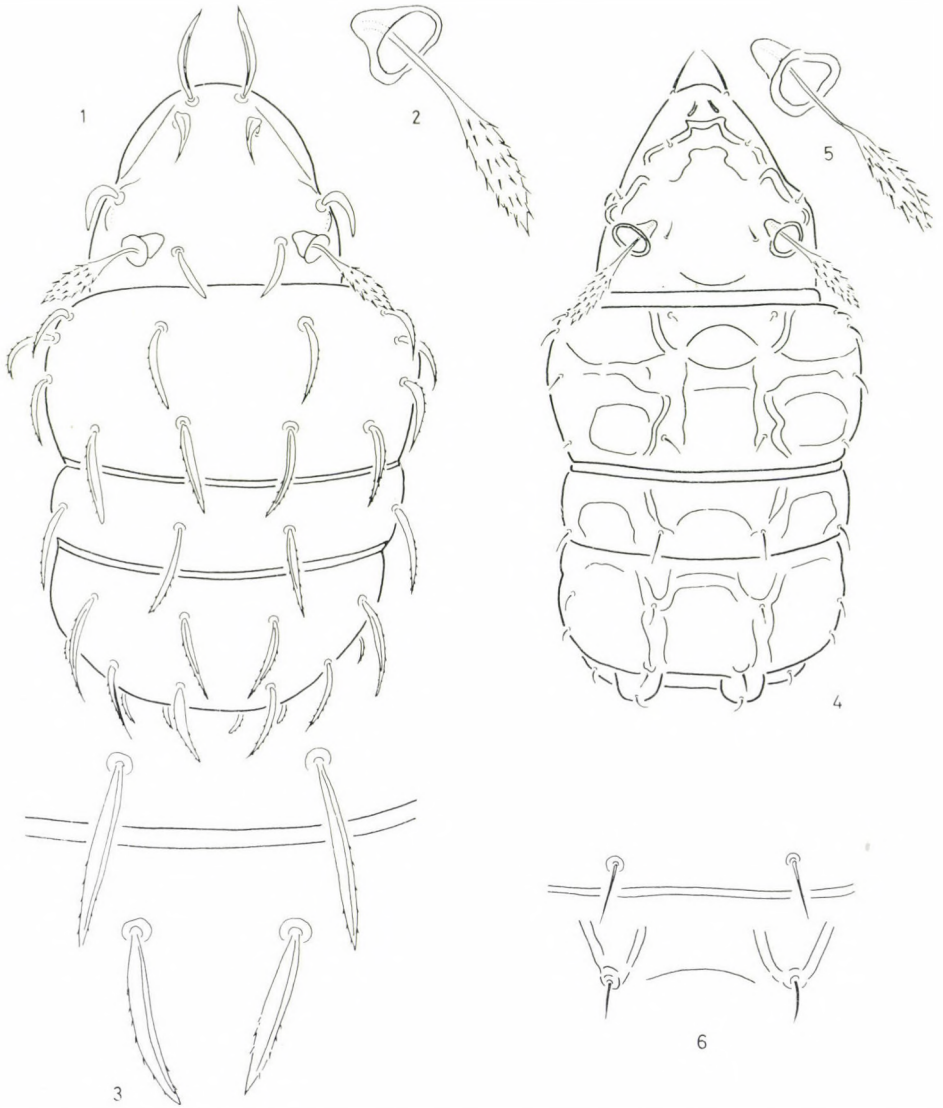
Length: 201—213 μm ; width: 123—127 μm . The collected exemplars transparent enough; the light areolae on the prodorsum and notogaster not visible. Distribution: South America, New Zealand. Habitat: Nothofagus forest, litter.

Material examined: Papua New Guinea: Mt. Wilhelm, near to summit, cca 4400 m, wet, luxuriant moss on the soil.

Brachyochthonius similis (HAMMER, 1961) (Figs 4—6)

Length: 176—197 μm ; width: 94—98 μm .

Material examined: Papua New Guinea: Mt. Wilhelm, near to summit cca 4400 m, 6. VIII. 1969, leg. J. BALOGH. Habitat: luxuriant moss on the soil.



Figs 1–6. 1–3. *Liochthonius fimbriatissimus* (Hammer, 1962) — 1 = dorsal side, 2 = sensillus, 3 = median part of shield Nm and Py with the setae e_1 and f_1 , 4–6. *Brachyochthonius similis* (Hammer, 1961) — 4 = dorsal side, 5 = sensillus, 6 = median part of shield Nm and Py with the setae e_1 and f_1

Our specimens are identical with the material collected in Peru, at Cusco. The differences given in our figures are only of quantitative value.

CAMISIIDAE

Platynothrus reductus sp. n. (Figs 7—9)

Length: 627—664 μm ; width: 320—328 μm .

Dorsal side: Bothridium small, directed laterally, with very small, setiform sensillus. Exobothridial setae in unusual position: upon the bothridium. Interlamellar setae long, setiform, as long as distance *in-le*. Lamellar setae on a transversal chitinous ridge, near to rostrum. Rostral setae short, setiform. Prodorsum with elevated median field and with scattered foveolae. Lamellar setae densely ciliate. Notogastral setae long setiform. Notogaster of *Platynothrus*-type, with two longitudinal median crests.

Ventral side: Type of *Platynothrus*. 16 pairs of genital setae.

Material examined: Papua New Guinea: Mt. Wilhelm, near to summit cca 4400 m, 6. VIII. 1969, leg. J. BALOGH. Habitat: luxuriant moss on the soil, holotype and 14 paratypes.

Remarks: The reduced bothridium and the small, setiform sensillus combined with 16 pairs of genital setae quite unique in the genus *Platynothrus*.

MALACONOTHRIDAE

Trimalaconothrus lineolatus sp. n. (Figs 10—11)

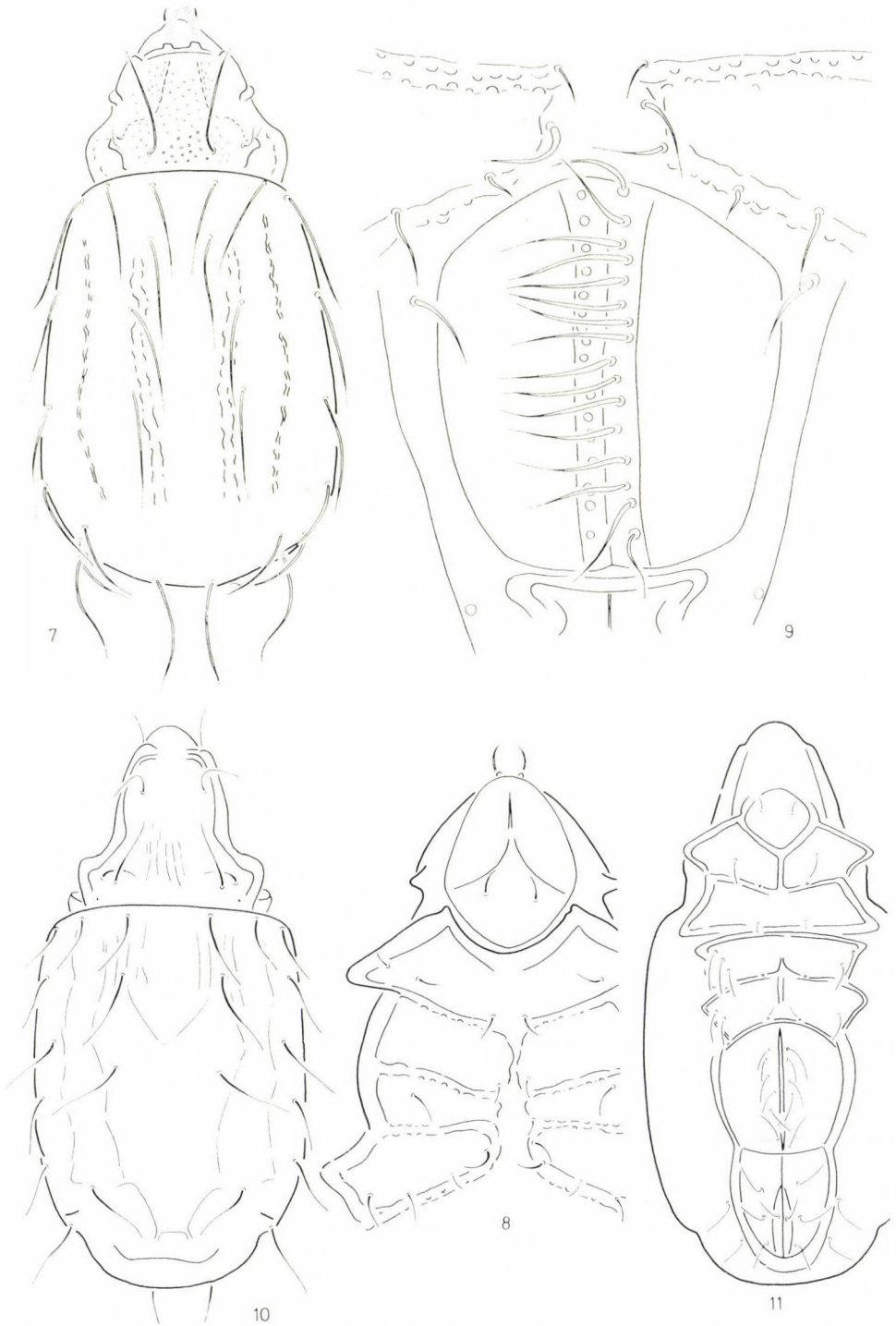
Length: 410—476 μm ; width: 213—226 μm .

Dorsal side: The lateral projection of propodosoma between legs I and II well marked. Anterior part of lamellar ridge bending inward to form a short transverse ridge. Interlamellar setae the longest, the exobothridial setae the shortest. Interlamellar area with evanescent longitudinal lineolae.

Notogaster without reticulation; anterior part with evanescent longitudinal lineolae. All notogastral setae fine, smooth, comparatively long. Four longitudinal ridges on notogaster.

Ventral side: Inclination to asymmetry in ventral setation. Epimeral setal formula on the left side: 2—1—4—3; the same on the right side: 2—1—3—2. (Holotype!) The species belongs to the opisthoseta group within *Trimalaconothrus* in which the posterior genital seta is displaced posteriorly and directed forwards. The left genital plate has 6, the right 5 genital setae. Anal plates with 1, adanal plates with 3 setae.

Material examined: Papua New Guinea: Mt. Wilhelm, near to summit cca 4400 m, 6. VIII. 1969, leg. J. BALOGH. Habitat: luxuriant moss on the soil, holotype and 8 paratypes.



Figs 7—11. 7—9. *Platynothrus reductus* sp. n. — 7 = dorsal side, 8 = epimeral region, 9 = genital plates, 10—11. *Trimalaconothrus lineolatus* sp. n. — 10 = dorsal side, 11 = ventral side

R e m a r k s : The opisthoseta group includes 5 species: *T. oxyrhinus* HAMMER, 1962 (Chile), *T. platyrhinus* HAMMER, 1962 (Chile, New Zealand), *T. opisthoseta* HAMMER, 1966 (New Zealand), *T. reticulatus* YAMAMOTO, 1977 (Japan), *T. prahuensis* HAMMER, 1980 (Java), but these species have reticulate notogaster.

OTOCEPHEIDAE

Dolicheremaeus alticola sp. n. (Figs 12—14)

Length: 406 μm ; width: 168 μm .

D o r s a l s i d e : Sensillus long; their apical part slightly dilated. Interlamellar setae long, setiform, lamellar and rostral setae near to each other, setiform. Lamellar costulae long, parallel. Median prodorsal condyles semi-circular, lateral prodorsal quadrangular with rotundate angles.

10 pairs of short, setiform notogastral setae. Setae *te* nearer to setae *ti* than to setae *ta*. Lateral notogastral condyles triangular, medial notogastral condyles somewhat quadrangular.

V e n t r a l s i d e : 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Setae ad_1 in paraanal, setae ad_3 in preanal position. Distance ad_3-ad_3 as long as distance ad_2-ad_2 or shorter. All legs with ultimate setae of flagelliform type, i.e. ultimate setal formula L—L—L—L.

M a t e r i a l e x a m i n e d : Papua New Guinea: Wau. Mt. Kaindi cca 2350 m, 25. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: mossy forest, humified material of a lying log, under moss, holotype.

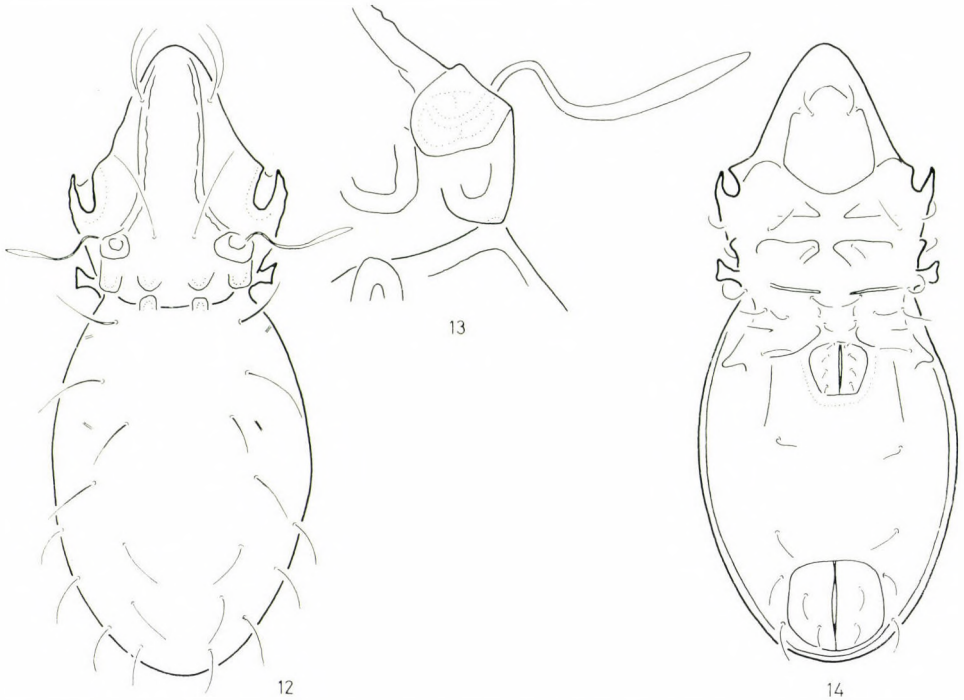
R e m a r k s : There are two *Dolicheremaeus* species having the following combination of characters: 1. setae ad_3 in preanal position, 2. distance ad_3-ad_3 as long as distance ad_2-ad_2 or shorter, 3. ultimate setal formula L—L—L—L: *Dolicheremaeus philippensis* AOKI, 1967 (Philippines) and *D. elongatus* J. BALOGH, 1968 (Papua New Guinea), but the first species has lineolate genital plates, the second bacilliform, ciliate interlamellar setae.

Trichocondyla gen. n.

Fam. Otocephidae. 13 pairs of notogastral setae. 4 pairs of genital setae. Strong ventral neotrichy: 2—3 pairs of aggenital, 5—6 pairs of anal, 7—11 pairs of adanal setae. Pori *iad* in apoanal position.

Typus generis: *Trichocondyla multisetosa* sp. n.

R e m a r k s : Anal and adanal neotrichy combined with 13 pairs of notogastral setae quite unique in this family.



Figs 12–14. *Dolicheremaeus alticola* sp. n. — 12 = dorsal side, 13 = prodorsal and notogastral condyles, bothridium and sensillus, 14 = ventral side

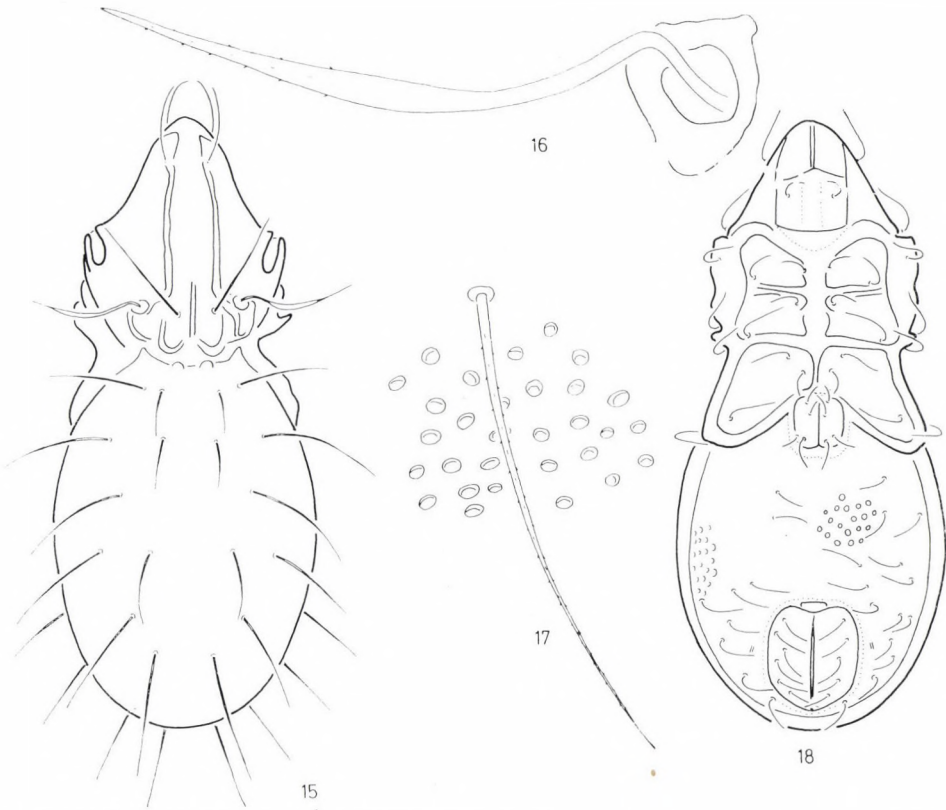
***Trichocondyla multisetosa* sp. n. (Figs 15–18)**

Length: 558 μm ; width: 185 μm .

Dorsal side: Sensillus lanceolate with a long, sharp tip; under higher magnification their apical half finely and sparsely aciculate. Interlamellar setae long, straight, lamellar and rostral setae shorter, near to each other. Lamellar costulae long, parallel. Median prodorsal condyles semicircular, lateral prodorsal condyles flat. There is a median crest in the interlamellar area.

13 pairs of notogastral setae: 3 pairs in the median rows (probably the setae *da*, *dm* and *dp*) shorter; the remaining 10 pairs long, apparently smooth, but under higher magnification very finely and sparsely ciliate. Notogaster with scattered foveolae.

Ventral side: Epimeral setae long and fine. 4 pairs of medium long genital setae. Aggenital, anal and adanal neotrichy asymmetrical: the left side with 2, the right side with 3 aggenital setae; the left side with 6, the



Figs 15—18. *Trichocondyla multisetosa* g. n. sp. n. — 15 = dorsal side, 16 = sensillus, 17 = seta r_1 , 18 = ventral side

right side with 5 anal setae; the left side with 7, the right side with 11 adanal setae. Notogaster sparsely foveolated.

Material examined: Papua New Guinea: Wau, Mt. Kumbak, 28. IX. 1968, leg. J. BALOGH et I. LOKSA. Habitat: Nothofagus forest, litter, holotype.

Remarks: see after the generic diagnosis.

DAMPFIELLIDAE

Dampfiella papuana sp. n. (Figs 19—23)

Length: 410—640 μm ; width: 131—209 μm .

Dorsal side: Sensillus short, with short stalk and globular head. Interlamellar setae in the level of bothridium, setiform, small, curved. Lamellar and rostral setae originated in the rostral region, near to rostral setae,

thick, exterior margin denticulate. There is a Λ -shaped fissure on the rostrum. Prodorsum elongated, almost twice longer than wide; interlamellar area with 4—5 pairs of light areolae. Anterior half of prodorsum abruptly narrowing, first with parallel, at the apical half with converging sides.

Dorsosejugal suture concave. Notogaster almost twice longer than wide. 10 pairs of slightly widening, phylliform, short notogastral setae; 6 pairs: *te*, *te*, *ti*, *ms*, r_2 and r_1 in two longitudinal rows; 4 pairs in posteromarginal position.

Ventral side: 3 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Setae ad_1 in postanal, ad_2 in paraanal, ad_3 in preanal position. The distance between the anterior margin of anal plates and the setae ad_3 as long as the length of anal plates.

Material examined: Papua New Guinea: Wau, Mt. Kaindi, 2350 m, 25. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical mossy forest, moss on a standing trunk, holotype and 10 paratypes.

Remarks: Only one *Dampfiella* known with phylliformly dilated notogastral setae: *D. foliata* BALOGH et MAHUNKA, 1973 from Malaysia, but this species is less elongate, has a hollow on the anterior part of notogaster and the position of notogastral setae is different (only 3 pairs of setae in posteromarginal position!).

OPPIIDAE

Oppiella nova (OUDEMANS, 1902) (Figs 24—25)

There are unessential differences in the length of notogastral setae, the form of costulae etc., generally as in the figure of MARIE HAMMER from New Zealand.

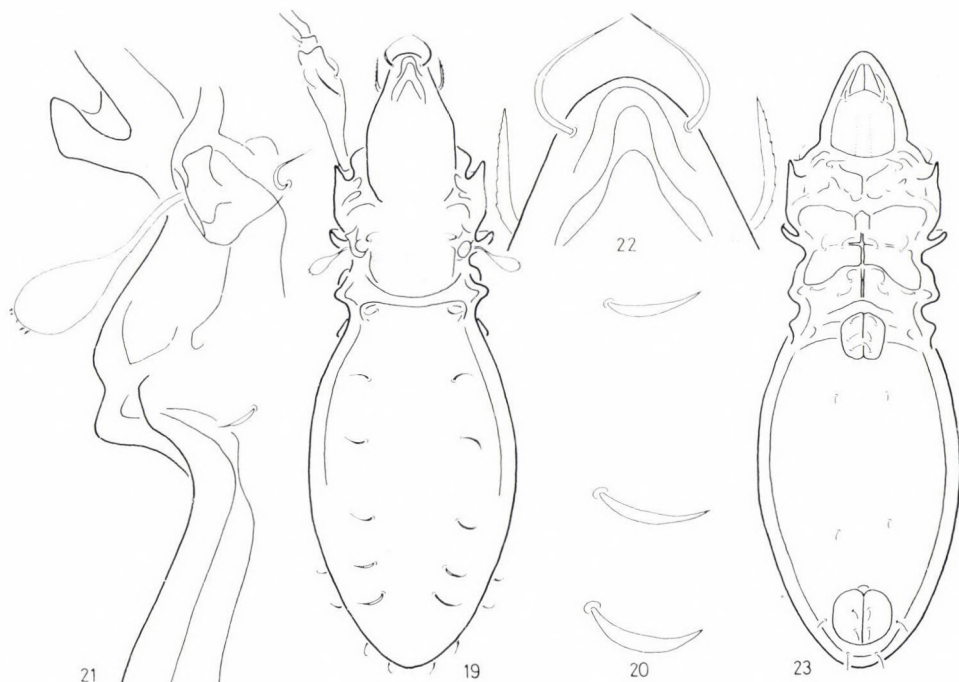
Material examined: Papua New Guinea: McAdam Park, 29. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: secondary rain forest, litter and humus with roots.

Amerioppia longiclava microseta ssp. n. (Figs 26—27)

Length: 414 μm ; width: 238 μm .

Dorsal side: Sensillus long, lanceolate with pointed tip, and with some very short, hardly visible cilia. Interlamellar setae absent. Lamellar setae very fine and short; about at the half length of prodorsum. Rostral setae geniculate, twice longer than lamellar setae, unilaterally ciliate. Interlamellar area with 3 pairs of light, evanescent areolae.

9 pairs of extremely short and fine notogastral setae; setae *ta* absent. The alveoli of setae *ta* invisible.



Figs 19—23. *Dampfiella papuana* sp. n. — 19 = dorsal side, 20 = setae *ms*, *r*₂ and *r*₁, 21 = bothridium and sensillus, 22 = rostral region, 23 = ventral side

Ventral side: The type of *Amerioppia*, i.e. 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Pori *iad* in adanal position.

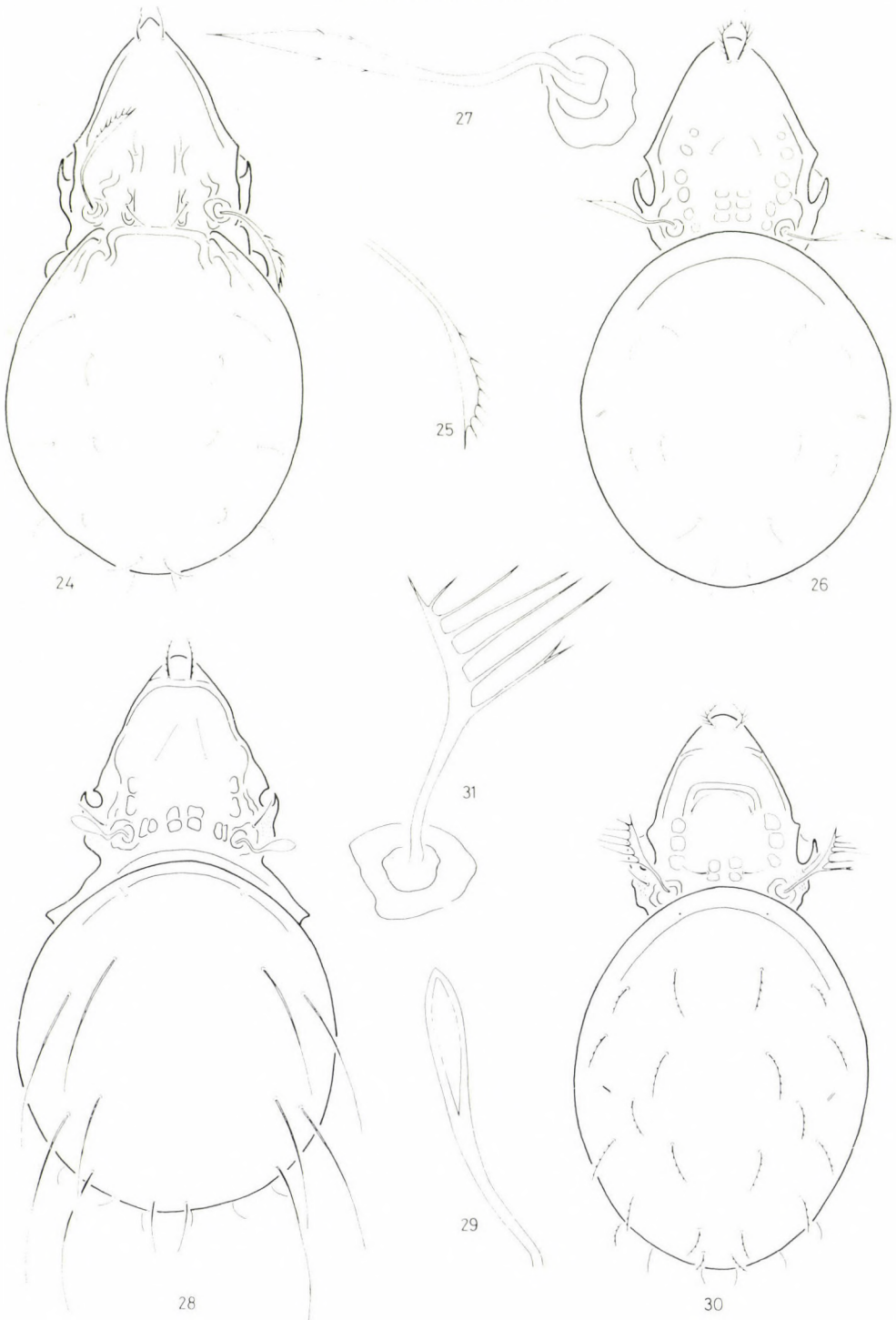
Material examined: Papua New Guinea: Mt. Wilhelm, Komamamanbuno area cca 3200 m, 24. IX. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical mossy forest, litter, holotype.

Remarks: The single specimen is very similar to *Amerioppia longiclava* HAMMER, 1942, occurring in Patagonia and New Zealand, but the extremely short notogastral setae and the form of sensillus justify its separation as new subspecies.

Amerioppia papuana sp. n. (Figs 28—29)

Length: 291 μm ; width: 172 μm .

Dorsal side: Sensillus medium long with gradually dilated, fusi-form head. Lamellar setae medium long, very thin. Rostral setae finely ciliate. Exobothridial setae long, only a little shorter than lamellar setae. Exoboth-



Figs 24—31. 24—25. *Oppiella nova* (Oudemans, 1902). — 24 = dorsal side, 25 = sensillus, 26—27. *Amerioppia longiclava microseta* ssp. n. — 26 = dorsal side, 27 = sensillus, 28—29. *A. papuana* sp. n. — 28 = dorsal side, 29 = sensillus, 30—31. *Multioppia translamellaris* sp. n. — 30 = dorsal side, 31 = sensillus

ridial region granulate. 2 pairs of irregular quadrangular light areolae near to each other in the interlamellar region; two more lateral, near to bothridia.

10 pairs of notogastral setae. Setae *ta* short, hardly visible. Setae *te*, *ti*, *ms*, *r*₂ and *r*₃ very long; setae *ti* longer than distance *ti—ms*. Setae *p* short, setae *r*₁ twice longer than setae *p*₁.

Ventral side: Type of *Amerioppia*, i.e. 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae; all very short and fine. Setae *ad*₁ in postanal, *ad*₂ in paraanal, *ad*₃ in preanal position, but at the same level as the anterior margin of anal plates. Pori *iad* in adanal position.

Material examined: Papua New Guinea: Wau, Mt. Kaindi 2350 m, 25. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical mossy forest, litter, holotype.

Remarks: Only one *Amerioppia* species has 5 pairs of very long notogastral setae (setae *ti* longer than distance *ti—ms*!) combined with the presence of setae *ta*: *A. decemsetosa* HAMMER, 1973 from Samoa, but the sensillus of this species much longer and only slightly fusiform and setae *p* longer; almost as long as setae *r*₁.

***Multioppia translamellaris* sp. n. (Figs 30—31)**

Length: 320 μ m; width: 172 μ m.

Dorsal side: Sensillus pectinate with 6 branches. The first branch much shorter than the second one; the 2nd to 6th gradually becoming shorter. The apical half of the sensillus (bearing the branches) slightly dilated. Interlamellar and lamellar setae short and smooth; rostral setae geniculated and ciliate. Before lamellar setae a translamellar crest with backward directed lateral ends present. Exobothridial area granulated, with well-visible exobothridial setae. There are 4 light, round areolae between the interlamellar setae.

13 pairs of short, unilaterally ciliated notogastral setae. The first pair on the anterior margin of notogaster (that is the 14th pair of notogastral setae!) represented only by their alveoli.

Ventral side: 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Setae *ad*₁ in postanal, *ad*₂ in adanal, *ad*₃ in preanal position. Pori *iad* somewhat in apoanal position.

Material examined: Papua New Guinea: McAdam Park, 29. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: secondary rain forest, litter and humus with roots, holotype.

Remarks: See after *Multioppia pauciramosa* sp. n.

Multioppia pauciramosa sp. n. (Figs 32—33)

Length: 488 μm ; width: 267 μm .

Dorsal side: Sensillus pectinate with 2 branches. The first branch the longest; the second one shorter. The apical part of sensillus curved, almost parallel with the first and second branches, apparently forming the third branch of sensillus. Interlamellar and lamellar setae medium long, thin, rostral setae geniculated. There are three pairs of round, light areolae between interlamellar setae. Exobothridial area granulated; exobothridial setae well visible.

13 pairs of short, sparsely and finely ciliata notogastral setae.

Ventral side: Apodemata I, II, sejugal and III + IV coalescent in the middle line, forming a partly broad "sternal plate", first dilating between the first and second epimeres, then abruptly narrowing and dilating again between epimeres III + IV. Epimeral setae $1a-1a$, $2a-2a$ and $3a-3a$ far from each other. 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae, all very short. Setae ad_1 in postanal, ad_2 in paraanal, ad_3 in preanal position.

Material examined: Papua New Guinea: Wau, Mt. Kaindi, cca 2350 m, leg. J. BALOGH et I. LOKSA. Habitat: tropical mossy forest, litter, holotype.

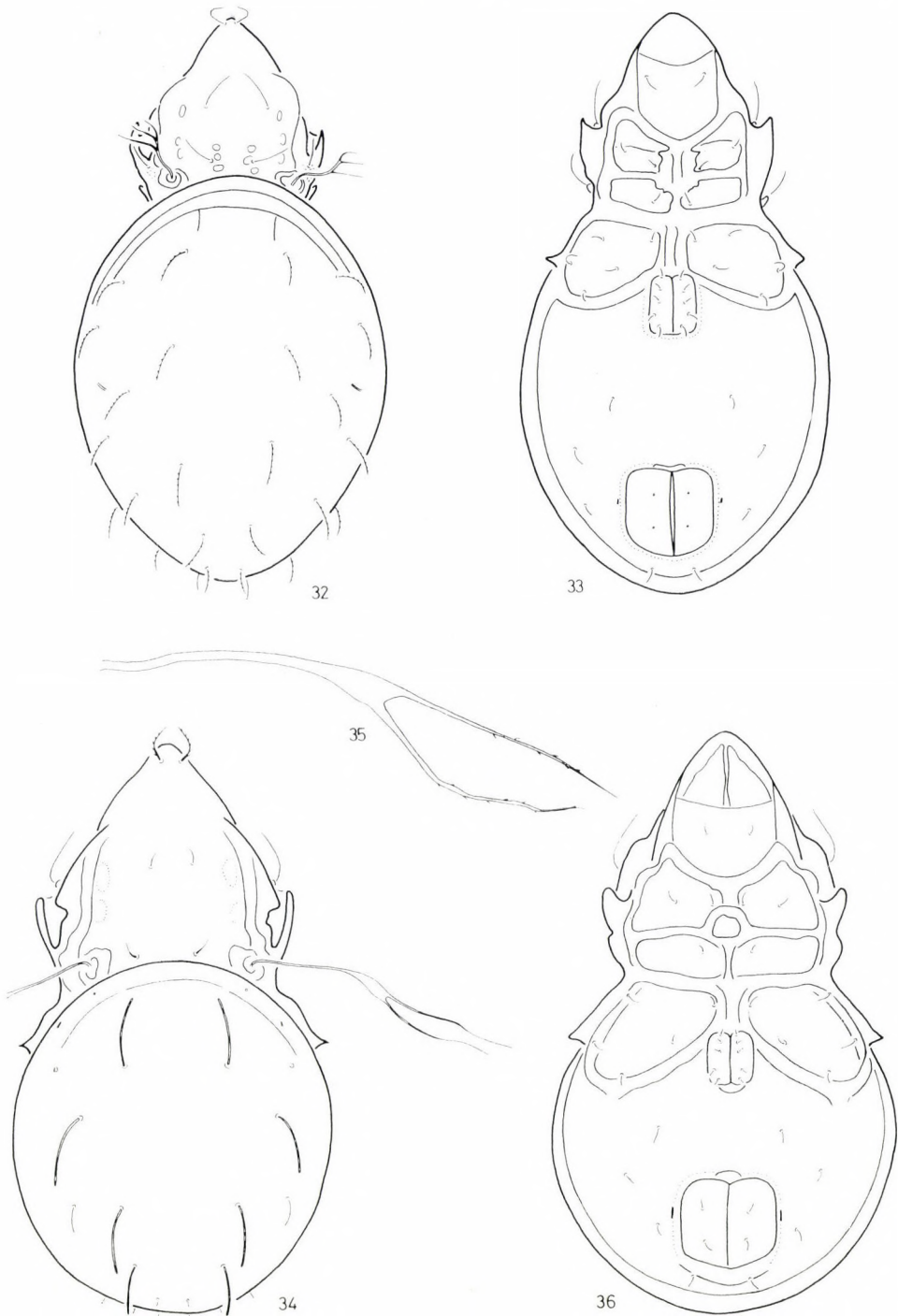
Remarks: There are only 4 species of *Multioppia* with pectinate, apically not or only slightly dilated sensillus.

Key to species

- 1 (4) The first branch of sensillus is the longest; the second and third gradually becoming shorter.
- 2 (3) Sensillus only with two branches, but the apical part of sensillus parallel with the second one forming the third branch of sensillus. Prodorsum without costulae. Notogastral setae sparsely ciliate. 488 \times 267 μm . — Papua New Guinea ***pauciramosa*** sp. n.
- 3 (2) Sensillus with 4 or 5 branches. Prodorsum with two short costulae bearing the lamellar setae. Notogastral setae smooth. 335 μm . — Tahiti ***gracilis*** HAMMER, 1972
- 4 (1) The first branch of sensillus never the longest: either the 2nd or the 3rd branch the longest and the following 3 to 5 gradually becoming shorter.
- 5 (6) Before the lamellar setae there is a translamellar costula. The second branch of sensillus the longest. 320 \times 172 μm . — Papua New Guinea ***translamellaris*** sp. n.
- 6 (5) Prodorsum without costula. The third branch of sensillus the longest. 394—422 \times 204—218 μm . — Europe ***glabra*** (MIHELICIC, 1955)

Sphagnoppia gen. n.

Subfam. Multioppiinae J. BALOGH, 1983. Notogastral setae setiform. 5 pairs of genital setae. Epimeral setae normal, setiform. Costula and crista



Figs 32—36. 32—33. *Multioppia pauciramosa* sp. n. — 32 = dorsal side, 33 = ventral side, 34—36. *Sphagnoppia biflagellata* g. n., sp. n. — 34 = dorsal side, 35 = sensillus, 36 = ventral side

absent. Setae *ta* absent, represented only by alveoli. Setae *in* present. Setae *ro* originated near to each other, geniculate. Sensillus very long, longer than prodorsum, dilated at its half length; dilated part with two long, flagellate branches. Notogastral heterotrichy: setae *ti*, *te*, *ms* and r_2 much longer than the remaining notogastral setae.

Typus generis: *Sphagnoppia biflagellata* sp. n.

Remarks: The combination of the above characteristics is very peculiar. The new genus belongs to the alliance of *Ramusella* or its relatives.

***Sphagnoppia biflagellata* sp. n. (Figs 34—36)**

Length: 258—262 μm ; width: 144 μm .

Dorsal side: Sensillus very long, longer than prodorsum; dilated at its half length; dilated part with two long flagellate branches. The branches with some short cilia. Interlamellar and lamellar setae very short and fine. Rostral setae geniculate and finely ciliate. Exobothridial setae not observable. Interlamellar area without any sculpture.

9 pairs of heterotrichous notogastral setae. Setae *ta* represented only by their alveoli. Setae *ti*, *te*, *ms* bacilliform with obtuse end; setae r_2 somewhat shorter and thinner. Setae r_3 much shorter than the above-mentioned setae; setae r_1 , p_1 , p_2 and p_3 very short and fine, hardly visible, the *p*-setae near to each other in posteromarginal position.

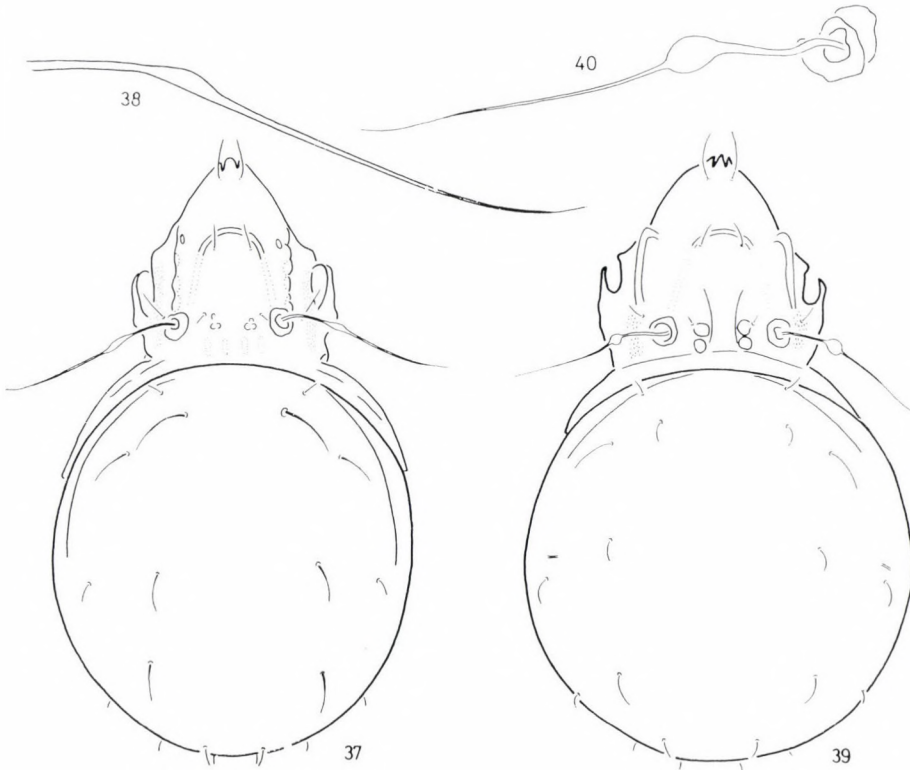
Ventral side: Apodemata II bifurcate medially, the bifurcate ends surrounding a small round part of epimeral region. Epimeral setae short. 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae; all very short and fine. Anal plates much larger than genital plates.

Material examined: Papua New Guinea: Wau, Mt. Kaindi 2350 m, 25. VIII. 1968, leg. J. BALOGH et I. LOKSA. Habitat: tropical mossy forest, sphagnum, holotype and 2 paratypes.

***Arcoppia kaindicola* sp. n. (Figs 37—38)**

Length: 750—787 μm ; width: 455—476 μm .

Dorsal side: Sensillus with one long, setiform branch. Dilated part of sensillus gradually widening, then again gradually narrowing. Interlamellar setae very short and fine; lamellar setae somewhat longer; rostral setae thin and longer, as long as exobothridial setae. Basal part of prodorsum with four obscure, dark, longitudinal spots. Interlamellar area between interlamellar setae with three small, evanescent areolae. Exobothridial region



Figs 37—40. 37—38. *Arcoppia kaindicola* sp. n. — 37 = dorsal side, 38 = sensillus, 39—40. *A. mcadami* sp. n. — 39 = dorsal side, 40 = sensillus

finely granulate. Translamellar part of prodorsal arch sharp, almost semi-circular, lamellar part evanescent.

10 pairs of fine, smooth notogastral setae. Setae *ta* short; the remaining notogastral setae short but somewhat heterotrichous: setae *ti* the longest; *te*, *ms* and *r*₂ shorter; *r*₁, *r*₃, *p*₁, *p*₂ and *p*₃ the shortest.

Ventral side: The type of *Arcoppia*, i.e. 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Pori *iad* in adanal position.

Material examined: Papua New Guinea: Wau, Mt. Kaindi, 2350 m, 25. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical mossy forest, litter, holotype and 2 paratypes.

Remarks: See the remarks after the *Arcoppia praeearcuata* sp. n.

***Arcoppia mcadami* sp. n.** (Figs 39—40)

Length: 508 μm ; width: 332 μm .

Dorsal side: Sensillus with one long, setiform branch. Dilated part of sensillus abruptly widening; the widened part almost spherical, then again abruptly narrowing. Interlamellar and lamellar setae short and fine, rostral setae longer and fine; exobothridial setae as long as lamellar ones. Interlamellar area with two pairs of rounded, pale areolae. Exobothridial region granulate. Translamellar part of prodorsal arch sharp; almost semi-circular, lamellar part evanescent.

10 pairs of fine, smooth, extremely short notogastral setae; setae *te* a little longer than the remaining notogastral setae. Surface of notogaster circular.

Ventral side: Type of *Arcoppia*. 6 pairs of genital setae; pori *iad* in adanal position.

Material examined: Papua New Guinea; Wau, Mt. Missim Range cca 1200 m, 28. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical montane forest with *Araucaria*, litter and humus with roots, holotype.

Remarks: See the remarks after the *Arcoppia praearcuata* sp. n.

***Arcoppia praearcuata* sp. n.** (Figs 41—42)

Length: 607—623 μm ; width: 349—357 μm .

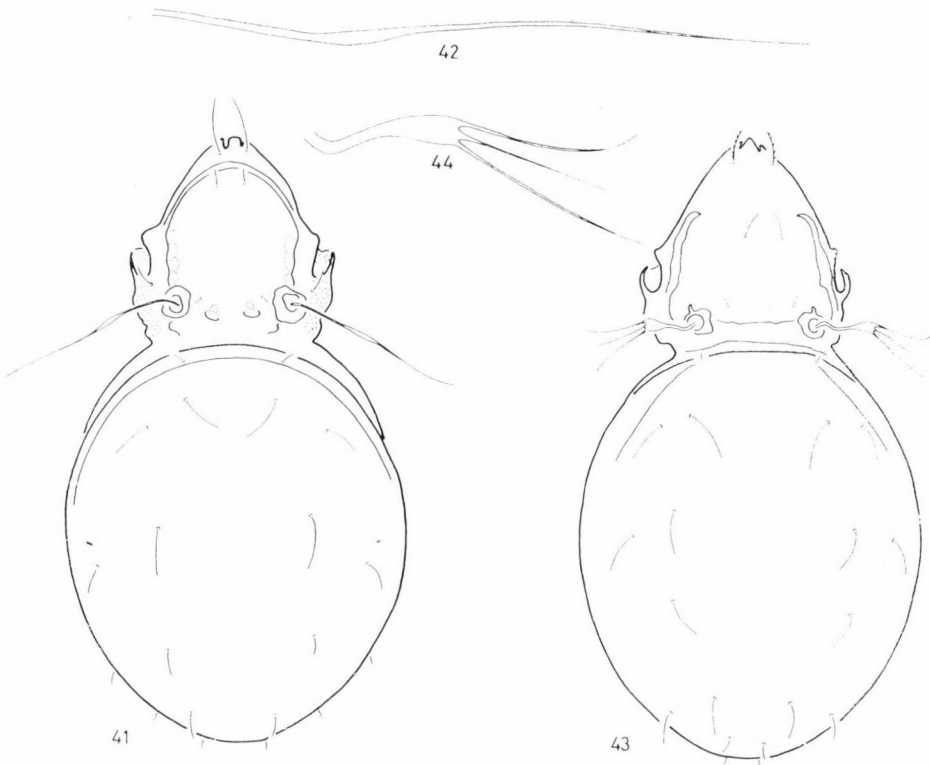
Dorsal side: Sensillus with one long, setiform branch. Dilated part of sensillus hardly visible, very gradually widening and narrowing. Interlamellar setae extremely short, hardly visible. Prodorsal arch far ahead, near to rostrum and therefore the lamellar setae (originating near to translamellar part of prodorsal arch) much nearer to rostral than to the interlamellar setae. Rostral setae about thrice longer than lamellar setae. Interlamellar region each with two evanescent areolae. Exobothridial region finely granulate.

10 pairs of fine notogastral setae; setae *ta* extremely short but well visible; setae *te*, *ti* and *ms* about twice longer than the remaining notogastral setae.

Ventral side: The type of *Arcoppia*. 6 pairs of genital setae; pori *iad* in adanal position.

Material examined: Papua New Guinea; Wau, Mt. Kaindi, 2350 m, 25. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical mossy forest, litter, holotype and 1 paratype.

Remarks: There is an artificial, but easily distinguishable species-group of *Arcoppia* including forms with one setiform branch of sensillus.



Figs 41—44. 41—42. *Arcoppia praearcuata* sp. n. — 41 = dorsal side, 42 = sensillus, 43—44. *A. curtipila* sp. n. — 43 = dorsal side, 44 = sensillus

Key to this species-group

- 1 (4) Prodorsal arch evanescent or absent.
- 2 (3) Notogaster circular; as long as wide. Surface of notogaster smooth. Dilated part of sensillus beside the setiform branch with a small corniculus. $650 \times 420 \mu\text{m}$. — Java
dis simile (BERLESE, 1905)
- 3 (2) Notogaster oval; considerably longer than wide. Surface of notogaster with short, longitudinally arranged lines. Dilated part of sensillus beside the setiform branch without small corniculus. $428 \times 200 \mu\text{m}$. — Réunion **groucheti** (MAHUNKA, 1978)
- 4 (1) Prodorsal arch present.
- 5 (6) Prodorsal arch far ahead, near to rostrum. Lamellar setae much nearer to rostral than to lamellar setae. $607-623 \times 349-357 \mu\text{m}$. — Papua New Guinea
prae arcuata sp. n.
- 6 (5) Prodorsal arch normal, about half way between the rostral and interlamellar setae.
- 7 (16) Dilated part of sensillus smooth; without small bristle or corniculus.
- 8 (13) Dilated part of sensillus gradually widening, then again gradually narrowing; much longer than wide.
- 9 (10) Notogaster with heterotrichy: setae *ti*, *te* and *ms* about thrice longer than r_1 . Rostrum pointed, not tripartite (?). $660 \mu\text{m}$. — Java
rotunda HAMMER, 1970
- 10 (9) Notogaster without heterotrichy: setae *ms* as long as setae r_1 . Rostrum tripartite.
- 11 (12) Interlamellar setae long; as long as rostral setae. Interlamellar area between the interlamellar setae with two pairs of round areolae. $457-469 \times 245-273 \mu\text{m}$. — Australia: New South Wales
incerta J. BALOGH et P. BALOGH, 1983

- 12 (11) Interlamellar setae short; much shorter than the rostral setae. Interlamellar area between the interlamellar setae each with three evanescent areolae. $750-787 \times 455-476 \mu\text{m}$. — Papua New Guinea **kaindicola** sp. n.
- 13 (8) Dilated part of sensillus abruptly widening, then again abruptly narrowing; only a little longer than wide.
- 14 (15) Notogaster circular: almost as long as wide. Notogastral setae short; setae r_3 about thrice shorter than distance $ms-r_3$. Larger species: $508 \times 332 \mu\text{m}$. — Papua New Guinea **mcadami** sp. n.
- 15 (14) Notogaster oval: considerable longer than wide. Notogastral setae longer; setae r_3 viewed from above as long as distance $ms-r_3$. Smaller species: $370-390 \times 200-230 \mu\text{m}$. — Japan **viperea** (AOKI, 1959)
- 16 (7) Dilated part of sensillus beside the setiform branch with a small bristle or with two corniculi.
- 17 (18) Dilated part of sensillus beside the setiform branch with a small bristle. $460 \mu\text{m}$. — Java, Vietnam **arcualis** var. **robustior** (BERLESE, 1913)
- 18 (17) Dilated part of sensillus beside the setiform branch with two corniculi.
- 19 (20) Setiform branch of sensillus straight. Transversal line before the interlamellar setae absent. Setae r_2 and r_3 as long as setae ti , te and ms . $543-560 \times 293-316 \mu\text{m}$. — Mauritius **corniculifera** (MAHUNKA, 1978)
- 20 (19) Setiform branch of sensillus curved. There are two parallel lines before the interlamellar setae. Setae r_2 and r_3 about twice shorter than setae ti , te and ms . $430-450 \mu\text{m}$ length. — Java **bidentata** HAMMER, 1980

***Arcoppia curtipila* sp. n. (Figs 43—44)**

Length: $320 \mu\text{m}$; width: $239 \mu\text{m}$.

Dorsal side: Sensillus short with gradually dilated head and with the medium long apical setae. Apical setae about as long as sensillus; median seta somewhat shorter. Interlamellar setae short and fine, lamellar setae longer. Rostral setae as long as lamellar setae, unilaterally ciliate. Prodorsal arch absent. Interlamellar area without areolae.

10 pairs of fine, smooth notogastral setae. Setae ta very short; the remaining notogastral setae about the same length.

Ventral side: Type of *Arcoppia*, i.e. 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Pori *iad* in adanal position.

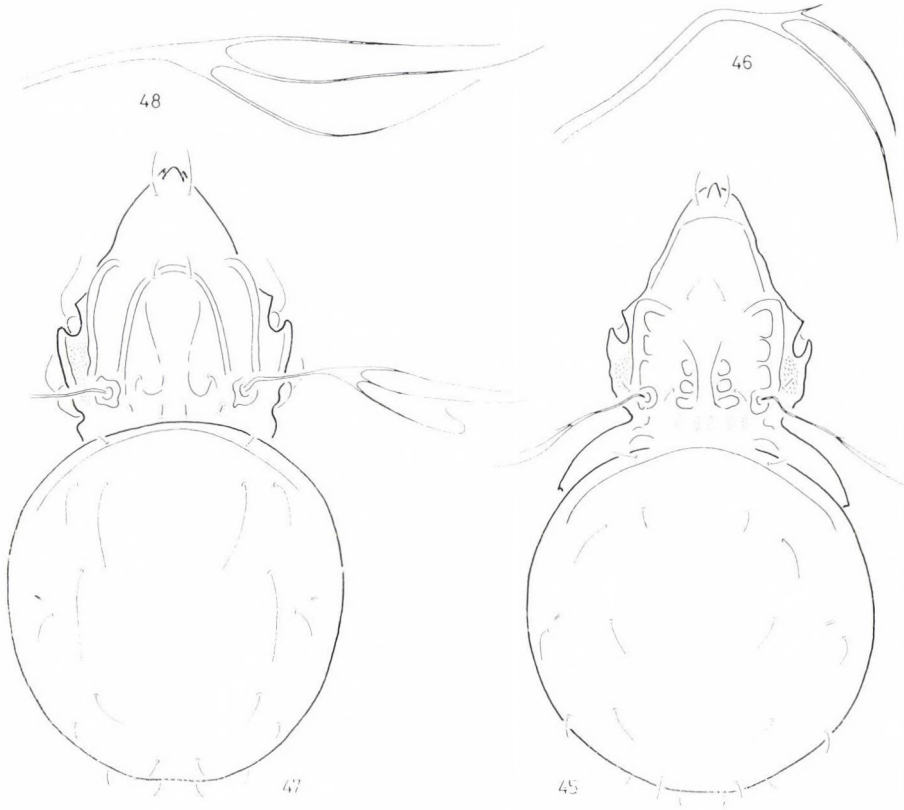
Material examined: Papua New Guinea: Wau, Mt. Missim Range, cca 1200 m, 28. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical montane forest with Araucaria, litter and humus with roots, holotype.

Remarks: See the remarks after the *Arcoppia cronus papua* ssp. n.

***Arcoppia cronus papua* ssp. n. (Figs 45—46)**

Length: $410-426 \mu\text{m}$; width: $246 \mu\text{m}$.

Dorsal side: Sensillus with 3 unequally long, setiform branches; the posterior one the longest; the second about the half length and the anterior



Figs 45–48. 45–46. *Arcoppia cronus papua* ssp. n. — 45 = dorsal side, 46 = sensillus, 47–48. *A. rangifer* sp. n. — 47 = dorsal side, 48 = sensillus

one extremely short. The posterior and the second branches curved. Interlamellar setae short, ciliate. Lamellar setae about half way between interlamellar and rostra setae, short and fine; rostral setae somewhat longer. Basal part of prodorsum with 6 obscure, elongate spots. Interlamellar area with 3 pairs of light areolae. Exobothridial region finely granulate. Prodorsal arch absent.

10 pairs of fine, extremely short notogastral setae; setae *ta* only somewhat shorter than setae *te* and *ms*. Notogaster circular.

Ventral side: Type of *Arcoppia*, i.e. 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Pori *iad* in adanal position.

Material examined: Papua New Guinea: Wau, Mt. Missim Range, cca 1200 m, 28. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical montane forest with *Araucaria*, litter and humus with roots, holotype and 1 paratype.

R e m a r k s : There is an artificial group of *Arcoppia* containing species and subspecies with two or three equal or unequal branches of sensillus and without prodorsal arch.

Key to this species-group

- 1 (2) Sensillus short, with 3 medium long branches. Branches about as long as sensillus; the median branch somewhat shorter. $320 \times 239 \mu\text{m}$. — Papua New Guinea
***curtipila* sp. n.**
- 2 (1) Sensillus with 3 abruptly shortening branches.
- 3 (4) The first branch of sensillus considerably long, thin, setiform; the third long, curved. $490 \times 265 \mu\text{m}$. — Hawaii Islands
***cronus cronus* (JACOT, 1934)**
- 4 (3) The first branch of sensillus very short, hardly visible.
- 5 (6) The first branch of sensillus about twice longer than the third one. $410-426 \times 246 \mu\text{m}$. — Papua New Guinea
***cronus papua* ssp. n.**
- 6 (5) The first branch of sensillus about thrice longer than the third one. — New Zealand
***cronus winkleri* (HAMMER, 1968)**

Arcoppia rangifer sp. n. (Figs 47—48)

Length: $287 \mu\text{m}$; width: $115 \mu\text{m}$.

D o r s a l s i d e : Sensillus extremely long, as long as prodorsum. Widened part of sensillus triangularly dilated with 3 long, flagellate branches. Interlamellar and lamellar setae short, rostral setae twice longer, fine. Prodorsal arch sharp, posteriorly extending to the bothridia. Basal part of prodorsum with 4 sharp, longitudinal lines surrounding with obscure, dark, longitudinal spots. Exobothridial region granulate.

10 pairs of heterotrichous notogastral setae. Setae *ta* very short. Setae *ti* and *ms* long, twice longer than setae *te*; setae r_2 and r_3 little longer than setae r_1 , p_1 , p_2 and p_3 .

V e n t r a l p l a t e : Type of *Arcoppia*. 6 pairs of genital setae.

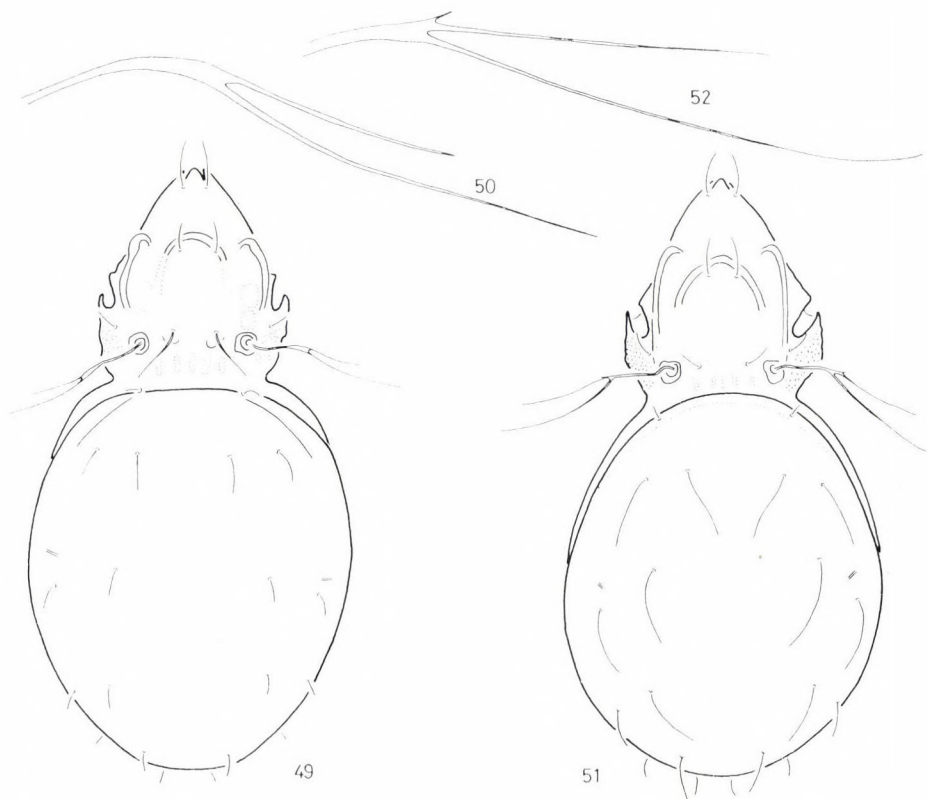
M a t e r i a l e x a m i n e d : Papua New Guinea: Wau, Mt. Missim Range, cca 1200 m, 28. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical montane forest with Araucaria, litter and humus with roots, holotype and 1 paratype.

R e m a r k s : There is only one *Arcoppia* species with triramose sensillus and with prodorsal arch: *A. brachyramosa* HAMMER, 1971 from Pakistan; but the sensillus of this species much shorter and the branches short, straight.

Arcoppia arcualis novaeguineae ssp. n. (Figs 49—50)

Length: $476 \mu\text{m}$; width: $279 \mu\text{m}$.

D o r s a l s i d e : Sensillus with two long, setiform branches; the posterior one almost twice longer than the anterior branch. Interlamellar



Figs 49—52. 49—50. *Arcoppia arcualis novaeguineae* ssp. n. — 49 = dorsal side, 50 = sensillus, 51—52. *A. fenestralis orientalis* ssp. n. — 51 = dorsal side, 52 = sensillus

setae long; lamellar setae much shorter than interlamellar ones; rostral setae longer than lamellar setae. Basal part of prodorsum before the dorsosejugal suture with 5 longitudinal, dark spots.

10 pairs of very short and fine notogastral setae; distance *ti*—*ms* thrice longer than setae *ti*.

Ventral side: Type of *Arcoppia*, i.e. with 6 pairs of genital setae.

Material examined: Papua New Guinea: Mt. Kaindi, cca 2350 m, 25. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: mossy forest, humified material of a lying log, under moss, holotype.

Remarks: *Arcoppia arcualis* (BERLESE, 1913) is represented in different regions by different forms, these are apparently different subspecies.

Key to subspecies

- 1 (2) Notogastral setae long: distance $ms-r_2$ as long as setae ms . The branches of sensillus are of equal length (?). $420 \times 210 \mu\text{m}$. — Java **arcualis arcualis** (BERLESE, 1913)
- 2 (1) Notogastral setae shorter: distance $ms-r_2$ twice or more longer than r_2 .
- 3 (4) Notogastral setae medium long: distance $ms-r_2$ twice longer than r_2 . $420 \mu\text{m}$. — New Zealand [new name for *arcualis* HAMMER, 1968 (nec BERLESE, 1913)]
arcualis novaezealandiae ssp. n.
- 4 (3) Notogastral setae very short: distance $ms-r_2$ three or four times longer than r_2 . $476 \times 279 \mu\text{m}$. — Papua New Guinea
arcualis novaeguineae ssp. n.

Arcoppia fenestralis orientalis ssp. n. (Figs 51—52)

Length: $513 \mu\text{m}$; width: $271 \mu\text{m}$.

Dorsal side: Sensillus with three setiform branches; the posterior one longer than the middle one, the anterior branch very or extremely short. Interlamellar setae short and fine, lamellar and rostral setae longer. Basal part of prodorsum with 4 or 5 longitudinal dark spots.

10 pairs of notogastral setae medium long: distance $ti-ms$ considerably longer than ti .

Ventral side: Type of *Arcoppia*, i.e. with 6 pairs of genital setae.

Material examined: Papua New Guinea: Mt. Kaindi, cca 2350 m, 25. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: mossy forest, humified material from a lying log, under moss, holotype.

Remarks: *Arcoppia fenestralis* (WALLWORK, 1961) has a wide distribution and is represented by three subspecies.

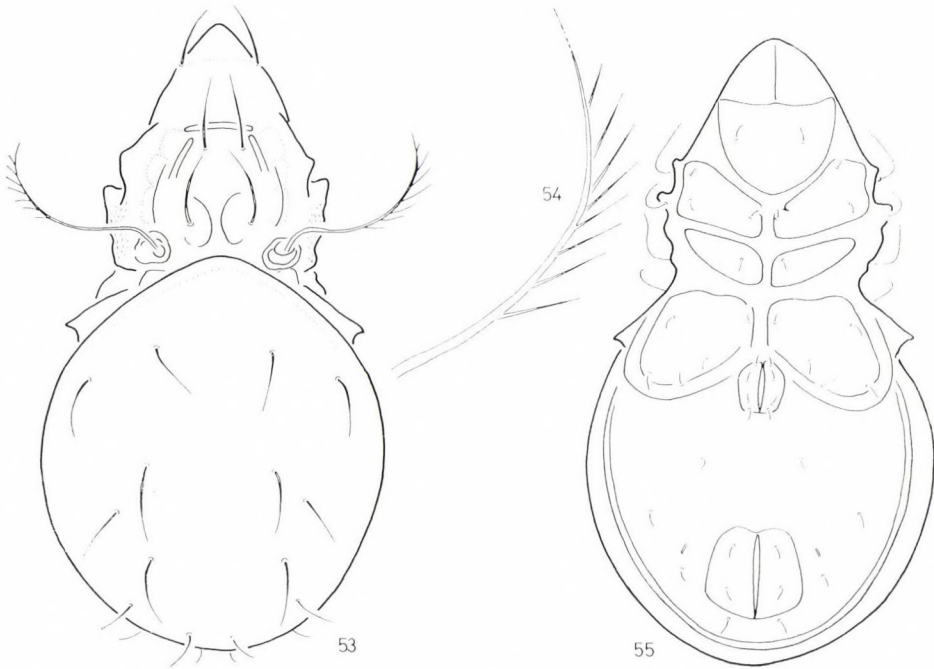
Key to subspecies

- 1 (2) Notogastral setae medium long: distance $ti-ms$ considerably longer than ti . $513 \times 271 \mu\text{m}$. — Java, Vietnam, Papua New Guinea **fenestralis orientalis** ssp. n.
- 2 (1) Notogastral setae long: distance $ti-ms$ as long as ti .
- 3 (4) Notogastral setae ciliate. Anterior branch of sensillus reduced, represented only with small corniculi. Interlamellar area with 2–3 transversal lines. $440-475 \times 220-275 \mu\text{m}$. — Hong-Kong **fenestralis sinensis** (MAHUNKA, 1976)
- 4 (3) Notogastral setae smooth. Anterior branch of sensillus well developed, setiform. Interlamellar area without transversal lines. $425 \times 213 \mu\text{m}$. — Ghana
fenestralis fenestralis (WALLWORK, 1961)

Brassoppia lamellata sp. n. (Figs 53—55)

Length: $271-308 \mu\text{m}$; width: $156-164 \mu\text{m}$.

Dorsal side: Sensillus long, setiform, curved, pectinate with 7–8 long branches. Interlamellar setae long, almost as long as distance $in-le$.



Figs 53–55. *Brassoppia lamellata* sp. n. — 53 = dorsal side, 54 = sensillus, 55 = ventral side

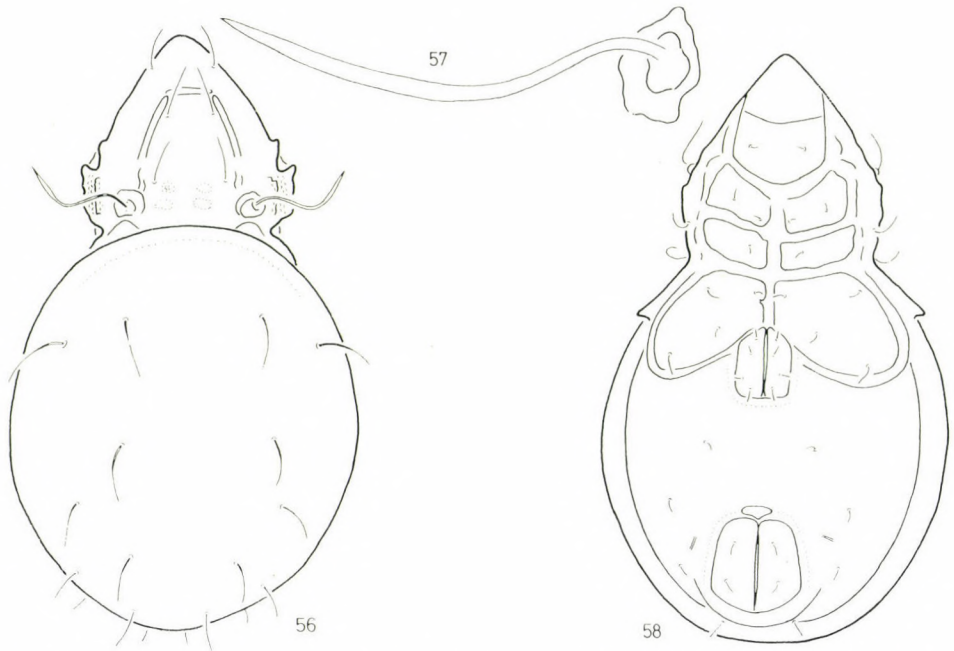
Lamellar setae only a little shorter than interlamellar setae. Rostral setae originated far from each other, marginally. Prodorsum with two short lamellar costulae; the basal half of costulae evanescent. Translamellar costula well developed, separated from the cuspides of costulae. Extrabothridial region granulate; exobothridial setae not visible.

9 pairs of notogastral setae, setae *ta* absent. The first 5 pairs of setae medium long; the first pair of *r* setae (r_1) shorter; setae p_1 and p_2 the shortest; p_3 as long as r_1 .

Ventral side: 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Setae p_1 in postanal, setae p_2 in paraanal, p_3 in preanal position. Setae *ag* much nearer to each other than setae ad_3 . Pori *iad* in apoanal position.

Material examined: Papua New Guinea: Wau, Mt. Kaindi, 2350 m, 25. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical mossy forest, Sphagnum, holotype and 2 paratypes.

Remarks: The genus *Brassoppia* has only one species: *Br. brassi* (J. BALOGH, 1981). This species has setae *ta*, sensillus with 9 branches, setae *in* much shorter.



Figs 56—58. *Rhaphoppia sphagnicola* sp. n. — 56 = dorsal side, 57 = sensillus, 58 = ventral side

***Rhaphoppia sphagnicola* sp. n. (Figs 56—58)**

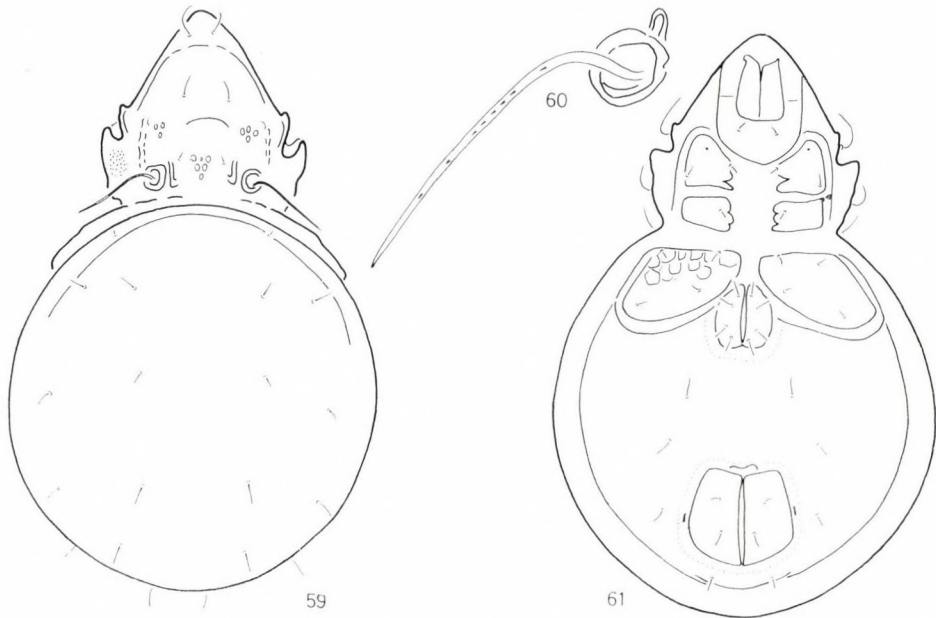
Length: 340—369 μm ; width: 205—213 μm .

Dorsal side: Sensillus setiform, slightly lanceolate, smooth. Lamellar and interlamellar setae medium long, fine, smooth; rostral setae a little shorter, far from each other. Lamellar and translamellar costulae present, similar to those of *Brassoppia lamellata* sp. n. Interlamellar area with two pairs of round areolae. There is a flattened tubercle each opposite to posterior margin of bothridium.

9 pairs of notogastral setae; setae *ta* absent. Notogastral setae medium long, smooth, setae p_1 and p_2 shorter than the remaining setae.

Ventral side: 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Setae ad_1 in postanal, ad_2 in paraanal, ad_3 in preanal position. Pori *iad* in apoanal position.

Material examined: Papua New Guinea: Wau, Mt. Kaindi, 2350 m, 25. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical mossy forest, Sphagnum, holotype and 2 paratypes.



Figs 59—61. *Cycloppia latisternum* sp. n. — 59 = dorsal side, 60 = sensillus, 61 = ventral side

Remarks: *Raphoppia* had only one species: *R. mihelcici* (HAMMER, 1968) from New Zealand. The sensillus of *R. mihelcici* much longer and thinner; the interlamellar setae extremely small, hardly visible.

***Cycloppia latisternum* sp. n. (Figs 59—61)**

Length: 353—414 μm ; width: 221—258 μm .

Dorsal side: Sensillus setiform, apparently smooth but under greater magnification dorsally with some scattered, very short cilia. Interlamellar setae extremely short and fine, hardly visible. Lamellar setae short, longer than interlamellar setae. Rostral setae curved inward. Interlamellar area near to bothridium each with a short longitudinal chitinous lath. In the middle of interlamellar area a number of small, irregular areolae present forming a small, triangular group.

10 pairs of very short and fine notogastral setae; setae *ta* extremely short, hardly visible.

Ventral side: Sternal ridge very wide, therefore epimeral setae *1a—1a* and *2a—2a* far from each other. 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Setae *ad*₁ in postanal, *ad*₂ in paraanal, *ad*₃ in preanal position. Pori *iad* in adanal position.

M a t e r i a l e x a m i n e d : Papua New Guinea: Mt. Wilhelm, Kamamambuno cca 3200 m, 24. IX. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical mossy forest, litter, holotype.

R e m a r k s : There are only two *Cycloppia* species: *C. simplex* (SUZUKI, 1970) from Japan and *C. szentirmayi* (J. BALOGH, 1970) from Papua New Guinea, both without setae *ta* and without chitinous laths on prodorsum.

Cycloppia szentirmayi (J. BALOGH, 1970)

Described from Mt. Kaindi, tropical mossy forest, litter. New material: Mt. Kaindi 2350 m, 25. VIII. 1968, leg. J. BALOGH and I. LOKSA. Habitat: tropical mossy forest, Sphagnum.

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ONE NEW SPECIES
OF FAMILY NIPHARGIDAE (GAMMARIDEA),
NIPHARGUS FORROI SP. N. FROM HUNGARY*

GORDAN S. KARAMAN

Biological Institute, P.O. Box 40, Titograd, Yugoslavia

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One new subterranean species of the family Niphargidae (Amphipoda, Gammaridea), *Niphargus forroi* sp. n. from the Diabáz Cave in the Bükk National Park (Hungary) is described and figured; its taxonomic relationships to other *Niphargus* species from Hungary are discussed.

Although the fauna of the subterranean Amphipoda in Hungary has been studied by several scientists (DUDICH, HANKÓ, MÉHELY, SCHELLENBERG, etc.), it is still poorly known and needs further studies.

Thanks to Dr. B. SKET, University of Ljubljana (Yugoslavia) and Dr. L. FORRÓ, Zoological Department, Hungarian Natural History Museum, Budapest (Hungary), I had the opportunity to study one sample of the subterranean amphipods collected in the Diabáz Cave in the Bükk National Park (Hungary), belonging to the family Niphargidae. The specimens in hands belong to the genus *Niphargus* SCHIÖDTE, one genus widely distributed over the whole Central and South Europe to the Caspian Sea region (absent in Scandinavia and the middle and northern parts of Great Britain), consisting of over one hundred species, many of them still poorly known.

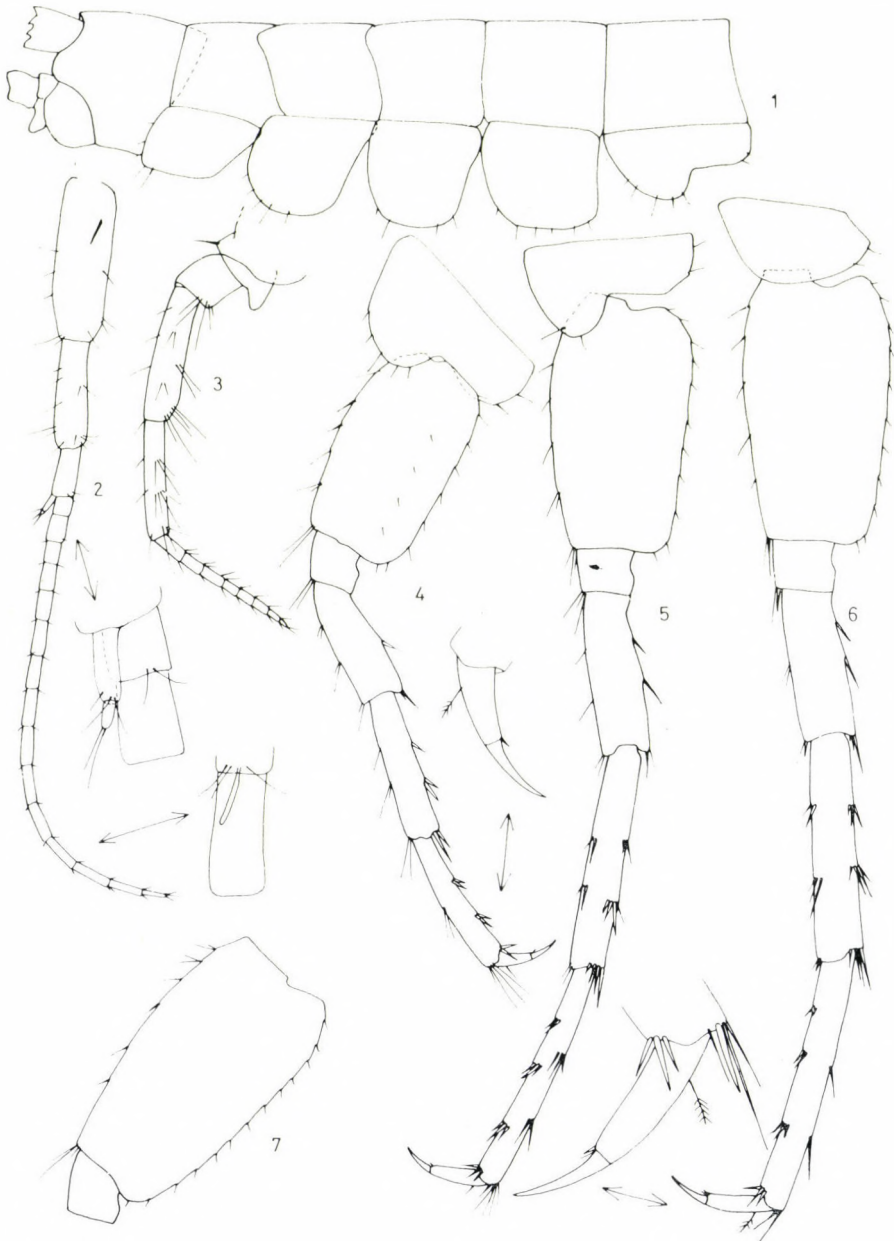
After one detailed study of all taxonomic characters of the specimens in hands, it was established that these specimens represent a new species, *Niphargus forroi* sp. n. This species is nominated in honour to DR. LÁSZLÓ FORRÓ of the Hungarian Natural History Museum in Budapest.

Acknowledgements: I am indebted to Prof. DR. BORIS SKET of the University of Ljubljana (Yugoslavia) and to DR. LÁSZLÓ FORRÓ of the Hungarian Natural History Museum, Budapest, for the loan of materials used in this study.

***Niphargus forroi* sp. n. (Figs 1—42)**

Description: Male: Body length 9.2—9.3 mm; body elongated, slender, metasomsegments each at dorsoposterior margin with 4 short setae

* Contribution to the Knowledge of the Amphipoda 143.



Figs 1—7. *Niphargus forroi* sp. n., Diabáz Cave, male 9.2 mm: 1 = anterior body part; 2 = antenna 1; 3 = antenna 2; 4—6 = pereopods 5—7; 7 = segment 2 of pereopod 7, male 9.3 mm

(Figs 1, 29); urosomite 1 on each side with 1 seta, urosomite 2 on each side with 2 setae (Figs 27, 28).

Head with short rostrum, lateral cephalic lobes short, subrounded (Fig. 1), eyes absent, ventroanterior sinus of head distinct (Fig. 1).

Antenna 1 short, slightly shorter than half of body (ratio is 3.5 : 9.2), peduncular segments 1—3 relatively short, poorly setose, peduncular segment 3 only twice longer than broad (Fig. 2), main flagellum consisting of 15—20 segments bearing one short aesthetasc each (Fig. 2); accessory flagellum short, 2-segmented, second segment short (Fig. 2).

Antenna 2 short, peduncular segment 3 short, peduncular segment 5 slightly shorter than 4, both with bunches of setae (Fig. 3), flagellum consisting of 8—9 segments and longer than last peduncular segment; antennal gland cone short (Fig. 3).

Coxae short (Fig. 1), coxae 1—4 broader than long, its ratio of length : width is 26 : 36, 35 : 40, 38 : 41, 36 : 43, respectively (Figs 1, 8, 11, 18, 19); coxa 4 unlobed, coxa 5 slightly shorter than 4 (Figs 1, 4).

Labrum entire, broader than long, convex distally (Fig. 21); labium with well developed inner lobes, mandibular fingers prominent (Fig. 22).

Mandibular molar triturative, incisor toothed; between them a row of 7—8 plumose setae (Fig. 25); palp 3-segmented: first segment smooth (Fig. 25), second segment with about 10 setae; third segment with one group of *A*-setae on outer face, 2—3 groups of *B*-setae on inner face, up to 14 *D*-setae and 5—6 long distal *E*-setae; *C*-setae are absent.

Maxilla 1: inner plate with 2 distal simple setae (Fig. 15), outer plate with 7 spines (inner spine with 3 lateral teeth, 0—1 spine with 2 teeth, 5—6 spines with one lateral tooth), palp 2-segmented, second segment with about 7 setae (Fig. 15).

Maxilla 2: both plates with distal setae, inner plate with several distolateral setae also (Fig. 20). Maxilliped: inner plate short, not exceeding outer tip of first palp segment (Fig. 14), bearing 3 distal spines accompanied by several plumose setae; outer plate reaching half of second palp segment, bearing a row of lateral strong spines, without setae (Fig. 14) and with a row of strong plumose setae at distal margin (Fig. 14); palp 4-segmented, segment 4 with long nail, shorter than the remaining part of segment 4, and with one bunch of 2 setae at inner margin and with one median seta at outer margin.

Gnathopods 1—2 alike, relatively small, their segment 6 somewhat larger than corresponding coxae (Figs 8, 11). Gnathopod 1: segment 2 stout, with several bunches of setae along posterior margin and with a row of several single setae along anterior margin (Fig. 8); segments 3—4 short, each with one bunch of setae at posterior margin; segment 5 slightly shorter than segment 6, with a bunch of posterior setae (Fig. 8); segment 6 trapezoid, slightly longer than broad, its palm slightly inclinate, convex (Figs 9, 10), defined by



Figs 8—16. *Niphargus forroi* sp. n., Diabáz Cave, male 9.2 mm: 8—10 = gnathopod 1; 11—13 = gnathopod 2; 14 = maxilliped; 15 = maxilla 1; 16 = gnathopod 2, male 9.3 mm

one strong corner spine accompanied on outer face by 3 slender toothed spines (Fig. 10) and with one strong shorter spine on inner face (= subcorner spine); dactyl not exceeding posterior margin of segment 6, bearing one median seta at outer margin (Fig. 9); on segment 6, near corner spine, on the outer face one row of 5 facial setae appears (Fig. 9).

Gnathopod 2 slightly larger than gnathopod 1, its segment 2 slightly more slender than that of gnathopod 1 (Fig. 11), segments 3—4 short, with one bunch of setae at posterior margin each; segment 5 narrow, almost as long as segment 6 (Fig. 11); segment 6 trapezoid, slightly broader than long (Figs 11, 12); palm slightly inclinate, convex, defined by one strong corner spine accompanied on outer face by 2—3 slender toothed spines and with one strong subcornerspine on inner face (Figs 13, 16); near corner spine on outer face a row of 5—6 facial setae appears (Fig. 12); dactyl not exceeding posterior margin of segment 6, bearing one median seta at outer margin (Fig. 12).

Pereopods 3—4 similar to each other, but pereopod 4 somewhat shorter than pereopod 3 (Figs 18, 19); both pereopods slender, dactyl nearly reaching half of segment 6, with slender nail nearly as long as the remaining part of dactyl (Figs 18, 19), bearing one slender spine at inner margin and one plumose seta at outer margin.

Pereopods 5—7 relatively slender, progressively longer towards pereopod 7 (Figs 4—6), their segment 2 almost twice longer than broad, with ventro-posterior corner but without lobe (Figs 4—7); dactyl of pereopods 5—7 not reaching half of segment 6, with short spine at inner margin, nail exceeding half of the remaining part of dactyl (Figs 4—6).

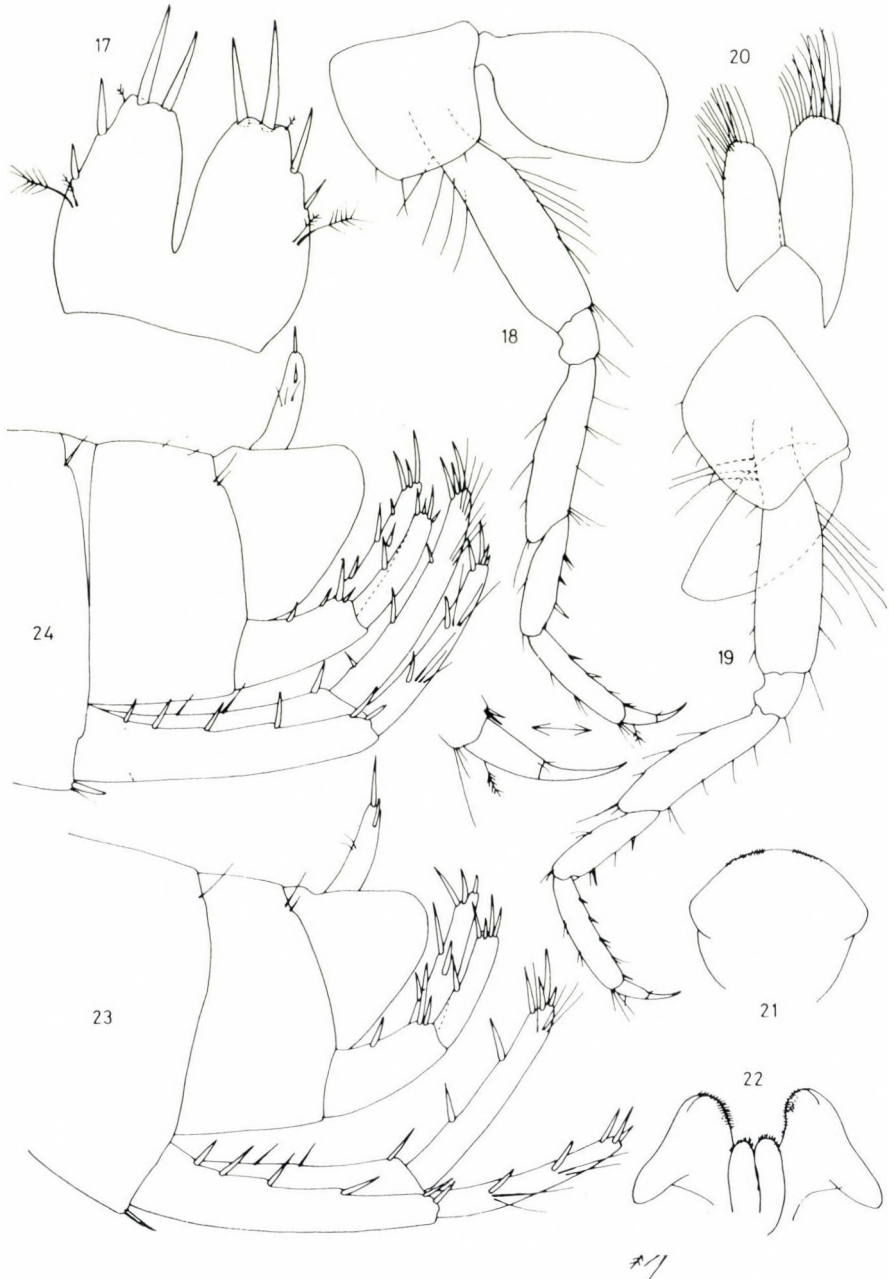
Pleopods 1—3 slender, subequal long, their peduncle with 2 retinacula each, retinacula without accompanying setae (Figs 26—28); anterior margin of peduncle of pleopod 1 with one seta (Fig. 26), posterior margin of peduncle of pleopod 3 with one short seta (Fig. 28).

Epimeral plates 1—3 subrounded, epimeral plates 2—3 each with several subdistal spines (Fig. 29), epimeral plate 1 smooth.

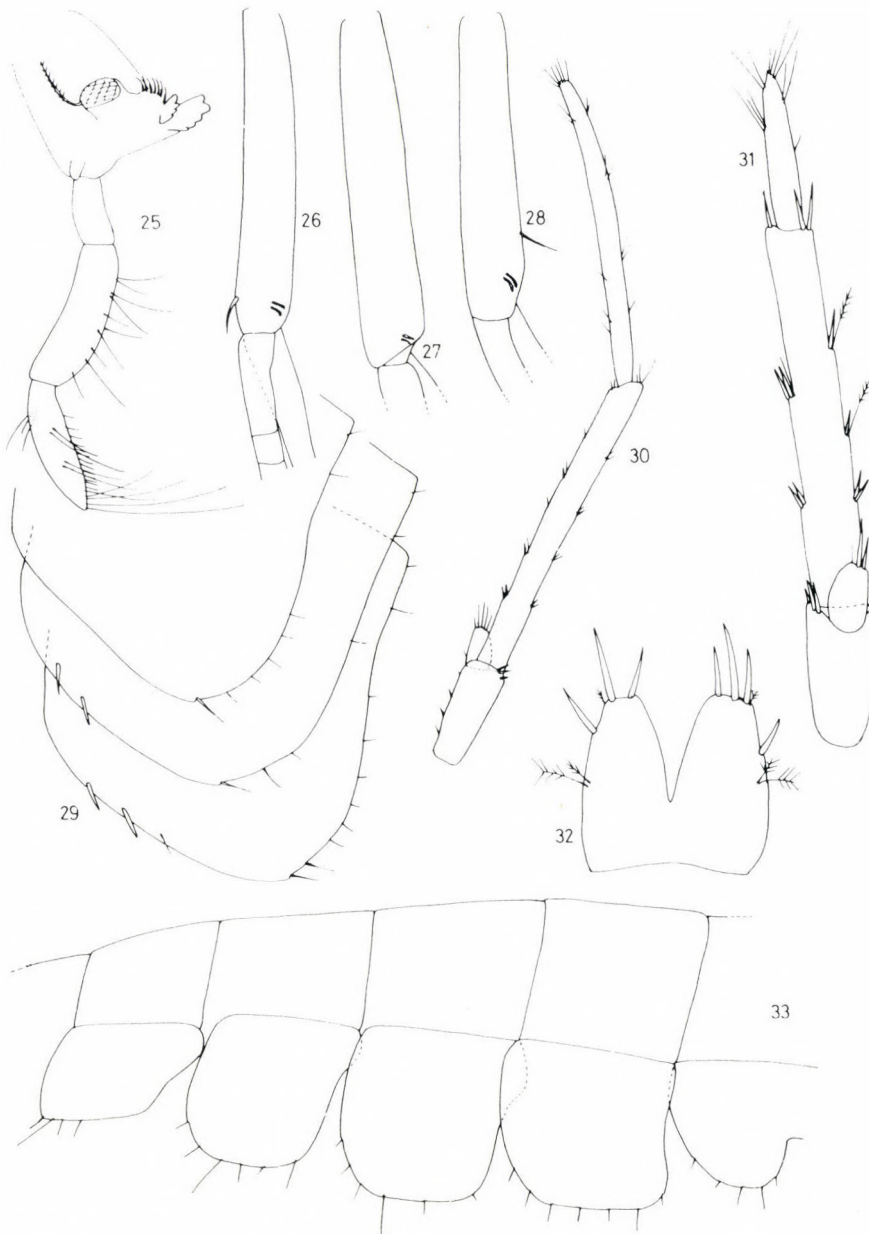
Urosomite 1 near peduncle of uropod 1 with 1 spine (Fig. 23). Peduncle of uropod 1 without ventrofacial spine and without distal tubercle (Figs 23, 24), but provided with a row of spines at dorsoexterior-margin and with a row of setae at dorsoinferior margin (except distal spine) (Figs 23, 24); rami unequal, outer ramus reaching up to 68% of inner ramus, both rami with lateral and distal short spines and lateral setae (Figs 23, 24).

Uropod 2: inner ramus longer than outer one, both rami with lateral and distal short spines (Figs 23, 24). Uropod 3 long, second segment of outer ramus nearly as long as first segment (Fig. 30), both segments with short setae at margins, inner ramus short, scale-like (Fig. 30).

Telson short, incised $2/3$ of its length (Fig. 17), each lobe with 2 distal



Figs 17–24. *Niphargus forroi* sp. n., Diabáz Cave, male 9.2 mm: 17 = telson; 18 = pereopod 3; 19 = pereopod 4; 20 = maxilla 2; 21 = labrum; 22 = labium; 23 = urosome with uropods 1–2; 24 = urosome with uropods 1–2, male 9.3 mm



Figs 25—30, *Niphargus forroi* sp. n., Diabáz Cave, male 9.2 mm: 25 = mandible; 26—28 = pleopods 1—3; 29 = epimeral plates 1—3; 30 = uropod. — Figs 31—33. *N. forroi* sp. n., Diabáz Cave, female 8.5 mm: 31 = uropod 3; 32 = telson; 33 = anterior part of body

and 2 outer marginal spines; a pair of short plumose setae appearing in the middle of each lobe (Fig. 17).

Female: body length 8.5 mm, oostegys broad, setose. Body like that of males but coxae 1—4 slightly longer (= higher) (Fig. 33), coxa 5 slightly shorter than 4 (Fig. 33).

Antenna 1 like that in males, its main flagellum consisting of 17—18 segments bearing one aesthetasc each. Flagellum of antenna 2 consisting of 7 segments.

Urosomite 1 on each side with 1 seta, urosomite 2 on each side with 1 spine and one seta (Fig. 34). Urosomite 1 near peduncle of uropod 1 with 2 spines or one spine and one seta (Fig. 34).

Gnathopods 1—2 like those in males but slightly smaller. Segment 6 of gnathopod 1 slightly longer than broad, palm oblique, convex (Fig. 35), defined by one strong corner spine accompanied on outer face by 3 slender toothed spines and with one stout subcorner spine on inner face; dactyl with one seta on outer margin (Fig. 35).

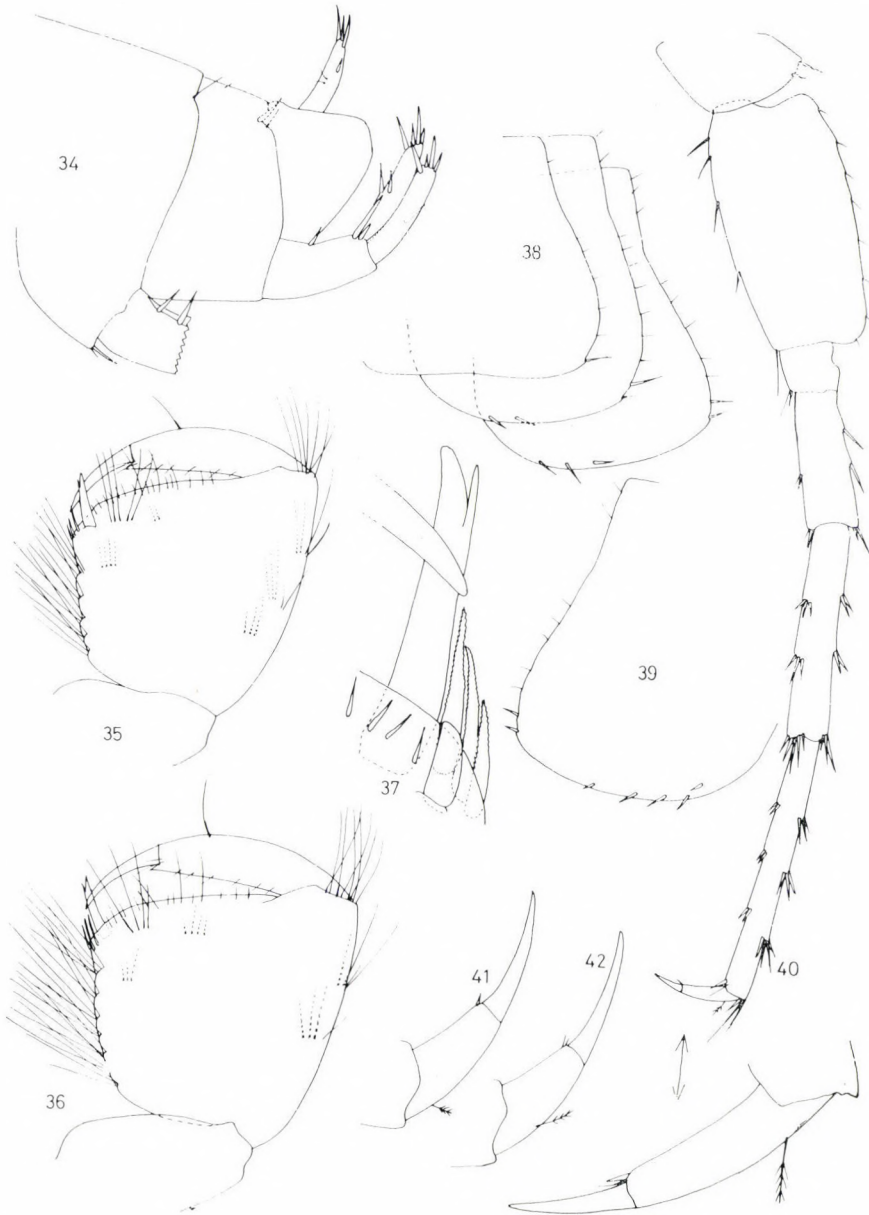
Gnathopod 2: segment 6 hardly longer than broad, palm like that in males, defined by one strong spine accompanied on outer face by 2—3 slender toothed spines and with one stout subcorner spine on inner face, dactyl with one seta on outer margin (Figs 36, 37).

Pereopods 3—4 like those in males, with nails as long as or hardly longer than the remaining part of dactyl (Figs 41, 42), with one plumose seta at outer margin. Pereopods 5—7 like those in males, with relatively narrow segment 2 slightly less than twice longer than broad (Fig. 40); dactyl of pereopods 5—7 like those in males.

Pleopods and epimeral plates like those in males (Figs 38, 39). Uropod 1 with no rami (Fig. 34). Uropod 2 with outer ramus slightly shorter than inner one (Fig. 34). Uropod 3 shorter than that in males (Fig. 31), second segment of outer ramus not reaching half of first segment; first segment with spines along both margins, accompanied by single plumose setae at inner margin of segment 1 (Fig. 31).

Telson short, slightly broader than long (Fig. 32), incised about $\frac{2}{3}$ of its length, each lobe provided with 2—3 distal and one outer marginal spine; one pair of short plumose setae appears in the middle of each lobe (Fig. 32).

Variability: on urosomite 1 near basis of uropod 1 peduncle normally one spine appears, but sometimes one spine and one seta or 2 spines. On one damaged segment 6 of gnathopod 2 (male) appear on inner face 3 short strong subcorner spines and outer face 2 slender toothed spines and one strong corner spine. This is an aberration, because normally on the inner face one short strong subcorner spine and on outer face 2—3 slender toothed spines and one strong corner spine appear.



Figs 34—42. *Niphargus forroi* sp. n., Diabáz Cave, female 8.5 mm: 34 = urosome with uropod 2; 35 = gnathopod 1; 36—37 = gnathopod 2; 38 = right epimeral plates 1—3; 39 = left epimeral plate 3; 40 = pereopod 7; 41—42 = dactyl of pereopods 3—4

Material examined: HUNGARY: Bükk National Park, Nagyvisnyó, Diabáz Cave, August 26, 1981, 3 specimens (leg. ÁDÁM & HÁMORI).

Holotype: male 9.2 mm. Holotype is deposited in the Hungarian Natural History Museum, Budapest (Hungary). Two paratypes are deposited in KARAMAN's Collection in Titograd.

Remarks and affinities: *Niphargus forroi* sp. n. is characterized by subrounded epimeral plates, presence of only one seta on outer margin of dactyl in gnathopods 1—2 and by unequal rami of uropods 1—2 and only 2 retinacula on pleopods 1—3.

Niphargus adbiptus G. KARAMAN, 1973, known from Ravanica Cave in Serbia (Yugoslavia) is very similar to *N. forroi* (subrounded epimeral plates 1—3, shape and pilosity of gnathopods 1—2, uropod 3, etc.) but it differs from *N. forroi* by the higher number of retinacula on pleopods 1—3, nearly subequal rami of uropods 1—2, etc.

HANKÓ (1924) described a new species, *N. dudichi* from well in Nagysalló, Com. Bars (= Tekovski Lužany, Czechoslovakia); this species differs from *N. forroi* by the higher number of spines on inner margin of dactyl of pereopods, presence of many setae on outer margin of dactyl in gnathopods 1—2, etc.

MÉHELY (1927) described a new species, *N. molnari* from Kőlyuk Cave near Mánfa (Baranya, Mecsek Mts.); it differs from *N. forroi* by pluritoothed all spines of outer plate in maxilla 1, by very large and inclinate segment 6 of gnathopod 2, etc.

DUDICH (1932) described a new species, *N. aggtelekiensis* from Aggteleker Cave "Baradla" (Hungary); his species differs by presence of many setae on outer margin of dactyl in gnathopods 1—2, etc.

SCHELLENBERG (1934) described *N. foreli gebhardti* from Abaliget Cave in Mecsek Mts.; this is a good species, *N. gebhardti*, differing from *N. forroi* by higher number of retinacula on pleopods, broader segment 2 of pereopods 5—7, etc.

MÉHELY (1937) described a new species, *N. hungaricus* from one spring in the forest, Jámbor spring (Kőszeg Mts., W. and SW. of Kőszeg). This species was never figured, it differs from *N. forroi* by presence of 3 setae on outer margin of dactyl in gnathopods 1—2, by elongated inner ramus of uropod 1 in males (outer ramus reaching half of inner ramus), subequal rami of uropod 2 in males, etc.

DUDICH (1941a) described a new species, *N. mediodanubialis* from the middle of the Danubian basin (Szeged, Aszófő at Lake Balaton, etc.); it differs by the presence of tubercle on peduncle of uropod 1 in males, sharply pointed epimeral plates, the presence of several setae on outer margin of dactyl in gnathopods 1—2, etc.

In the same year (1941b) DUDICH described a second new species, *Niphargus thermalis* from the thermal spring (25 °C) of St. Lucas baths in Buda-

pest; this species differs by sharply pointed epimeral plates 1—3, presence of distal tubercle on peduncle of uropod 1 in males, etc.

MÉHELY (1941) described *N. pater* from Kisnyíres Cave (Com. Szolnok-Doboka); this species differs by presence of many setae on outer margin of dactyl in gnathopods 1—2, etc.

Some of these mentioned species, described from Hungary, have been later synonymized by other authors with other already known *Niphargus* species, but it is necessary to re-examine all these species to establish the exact taxonomic status and relation between these species described from Hungary and other species known from Balkan Peninsula (especially these from Romania and Yugoslavia) and Czechoslovakia.

DEDJU (1963, 1967) described and mentioned several *Niphargus* species from the USSR, provided with only seta on outer margin of dactyl in gnathopods 1—2 and long uropod 3 in males; but all these species are with more or less angular or pointed epimeral plates 1—3. Unfortunately, these species are not described in detail, so no exact comparison can be provided with *N. forroi*.

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A SURVEY OF THE FAMILY
CARABODIDAE C. L. KOCH, 1836
(ACARI: ORIBATIDA)

S. MAHUNKA

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

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The examination of the supraspecific taxa of the family Carabodidae, the revision of the type species of several genera, the description of new taxa, and redescription of some taxa as well as many new drawings of types are given. A key to the genera of the family is compiled and the diagnosis to each of the genera is presented.

The importance of Oribatida, owing to their high individual number in any substrate rich in organic matter, is common knowledge. Their exact identification for any kind of investigations is indispensable. Since this large group includes taxa with a very restricted area as well as whose area is extremely large, to work with them safely all the taxa should be fully known at least at the supraspecific level, thus, good identification keys and revisions are more than desirable.

In modern acarology several authors have shouldered this difficult task the series of GRANDJEAN of Enarthronota (1946–1954) and of Palaeacaroida (1954–1958), the surveys of BALOGH concerning Lohmaniidae (1961) and later Microzetidae (1962). But WOOLLEY (1966) and AOKI (1965–1967) were the first to make revisions of the accumulated materials. More recently the following works deserve special mention: AOKI and OHKUBO 1974, WOAS 1981 and BALOGH 1983, 1984. Of course, besides the mentioned authors several smaller contributions have appeared that treated one genus, or another, or a small group of genera. Such a survey is badly needed, besides other taxa, also about the family Carabodidae, in the latter case especially for the reason that a high number of species and genera has been described newly.

The species belonging to the family Carabodidae have the most strongly chitinized body among the Oribatida with a highly varied sculpture by which they are readily distinguishable. The taxa belonging here are spread all over the continents, excepting the Antarctica, many genera are treated as cosmopolites. The great majority of the species live in litter, in decaying wood, only a small number of the species live in moss and in matted grass.

The family was long since separated from the other groups by C. L. KOCH (1836), and this fairly coherent group was rarely enriched by new genera,

while those genera which proved to belong to other taxa, or were found to be synonyms (BERLESE 1913, TRÄGARDH 1931, WILLMANN 1936) were transferred. However, owing to recent explorations, the number of new genera suddenly increased, the diagnoses of which occasionally presented some difficulty when evaluating the supraspecific categories, leaving the researcher sometimes at loss, consequently, now it is inevitable to make a survey or a partial revision of the group. Thus, besides giving some highly needed redescriptions, I attempt to summarize on the bases of the literature, and partly on the investigated material and the type material that knowledge that definitely refer to the family.

Previously to my investigations the family included 35 genera (as nomen), among them, however, *Neocephus* WILLMANN, 1936, according to our present state of knowledge, is unequivocally a synonym of *Carabodes* C. L. KOCH, 1836 (BALOGH 1961), furthermore, two such genera are treated here momentarily (*Podopterotegaeus* AOKI, 1969 and *Cerocephus* TRÄGARDH, 1931) which, without even detailed examination, have no close relationship with the other genera.

According to my opinion the genus *Podopterotegaeus* should be transferred to the superfamily Polypterozetoidea GRANDJEAN, 1959, and there provisorily in the family Polypterozetidae, although, a relationship with the families Eutegaeidae BALOGH, 1965 or Cepheidae BERLESE, 1896 might also be considered. That concerns the genus *Cerocephus* some connections are standing with *Bornebuschia* HAMMER, 1966 within the family Eutegaeidae. However, with regard to the structure of the mouthparts and that of the notogaster, further, the overall habitus of the sternocoxal region do not support even provisory solution, consequently, I suggest to separate this taxa under the name of

Cerocephidae fam. n.

whose type genus is *Cerocephus* TRÄGARDH, 1931, belonging to the superfamily Cepheoidea.

My present studies revealed that the genus *Carabocephus* BERLESE, 1913, described from South Africa, cannot be retained in the family Carabodidae; this I may safely state, since I have a long series of the only known species of the genus. I have found (see redescription later) that the genus should be transferred to the superfamily Otocephoidea,* and under that I erect a new family Carabocephidae fam. nov.

Besides the suggested transfers, my results of investigations include the erection of three new genera, thus, again, the number of valid genera in the

* According to my opinion the closest allies of the superfamily Carabodoidea should be looked for in this superfamily, based primarily on the structure of the leg, but also on other features.

family reaches 35. The state of *Diplobodes* AOKI, 1958 is not fully solved yet, but since I could not carry out type examination, I am not of the opinion (see identification key) that it is identical either with *Gibbicepheus* (see BALOGH 1961: 276), or *Machadocephus* (see AOKI 1970: 419).

I have also found that the family is by far not homogeneous, thus, some clearly delimitable groups of genera might be conceived. In order to make orientation easy and with a view to show the degree of relationship I propose to erect a number of subfamilies, though, obviously, this division might need some further comparative examinations and perhaps finer corrections.

The system of the family, thus, would show the picture on page 00—00.

So far in the separation of the taxa, either at the specific or supra-specific level, only a small number of features has been used, and in the descriptions, even in the comparatively more recent ones, such data as the number of epimeral setae, the position or the absence of the lyrifissure *iad* are lacking or incorrect. During my present investigations I endeavoured to study several new characteristics not studied before. Consequently, the most important identification features in the keys are the following:

1. The number and the position of notogastral setae. This number may vary between 8 and 15, their position is frequently, however, the function of the notogastral structure. I consider it most important how and in what number the setae originate on the humeral apophysis, or in general in the humeral region.

The shape of the setae is considered only at the specific level. True enough this feature as identification character combined with other features might appear and can be decisive in the separation of genera: *Hardybodes*, *Cavernocarabodes*, *Klapperiches*, *Berndobodes*. Similarly, the highly variable shape of the sensillus I should not consider decisive in the characterization of genera, let alone separation from other groups. For the description of setiform organs and setae I use a recently elaborated nomenclature (MAHUNKA and ZOMBORI 1985).

2. The number of epimeral and anogenital setae. In the family Carabodidae two basic types (1—1—3—3 and 3—1—3—3) can be recognized, since the 2—1—3—3, the 1—1—2—4 or 3—1—2—4 are only variations of them. Furthermore, on epimere 1 frequently appears 1—1 insertion point asymmetrically in the place of seta 1a, the only reliable feature is the absence of seta 1c.

The basic type for the number of anogenital setae is 4—1—2—3. The number of genital setae is between 4 and 10, that of aggenital ones between 0 and 2, adanal 2—3, while the number of anal setae is constantly two pairs.

It is rather questionable whether the number of the genital setae might be considered to be of generic value, since there are many generic pairs (*Gibbibodes* — *Gibbicepheus*, *Austrocarabodes* — *Xenocarabodes*, etc.) where the separation is based on this character, otherwise, these pairs are highly similar.

The most important characters will be given in the following table:

Table I

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.
<i>Aokiella</i>	0	0	1	1	14	4	1	0	0	2	2	2	1
<i>Apomotocephus</i>	1	1	1	1	15	6	1	0	2	1	1	1	0
<i>Archegocephus</i>	0	0	1	?	15	4	1	0	2	2	1	1	1
<i>Austrocarabodes</i>	0	0	0	1	14	4	1	0	1	0	0	1	0
<i>Bathocephus</i>	1	0	1	1	13	4	0	0	1	2	1	2	0
<i>Berndobodes</i>	0	0	1	1	15	4	1	1	2	1	1	3	0
<i>Carabodes</i>	0	0	1	1	10	4	1	0	0	0	0	1	0
<i>Cavernocarabodes</i>	0	0	0	1	10	4	1	2	2	0	1	3	0
<i>Congocephus</i>	1	0	0	2	14	4	1	0	1	0	2	2	1
<i>Cubabodes</i>	0	0	1	0	8	4	1	1	2	0	1	2	1
<i>Diplobodes</i>	0	1	?	?	14	4	1	0	2	1	1	?	1
<i>Flexa</i>	0	0	0	1	10	4	1	0	2	0	2	2	0
<i>Gibbibodes</i>	0	1	1	1	14	5	1	0	2	0	1	2	1
<i>Gibbicephus</i>	0	1	1	1	14	4	1	0	2	0	1	2	1
<i>Gymnobodes</i>	0	0	1	0	10	4	0	3	2	0	1	2	0
<i>Hardybodes</i>	0	0	0	1	15	4	1	1	0	1	1	2	0
<i>Kalloia</i>	0	1	1	1	15	4	1	0	2	1	1	2	1
<i>Klapperiches</i>	0	0	0	1	10	4	1	3	2	0	1	1	0
<i>Machadocephus</i>	1	1	1	1	14	4	1	0	1	1	1	2	1
<i>Meriocephus</i>	1	0	1	1	10	4	1	2	1	1	1	3	0
<i>Machadocephus</i>	1	1	1	1	15	4	1	0	1	1	1	2	1
<i>Meriocephus</i>	1	0	1	1	10	4	1	2	1	1	1	3	0
<i>Neocarabodes</i>	0	1	1	1	15	6	1	0	2	1	1	2	1
<i>Odontocephus</i>	0	0	1	2	14	4	1	1	0	0	2	1	0
<i>Opisthocephus</i>	1	0	2	1	13	4	1	1	?	1	1	2	0
<i>Pasocephus</i>	1	1	2	?	13	4	1	1	?	0	1	2	0
<i>Pentabodes</i>	0	0	2	1	10	5	1	2	2	0	0	1	1
<i>Phyllocarabodes</i>	0	0	1	2	10	6	1	2	2	0	0	2	1
<i>Spathulocephus</i>	1	1	1	1	10	10	1	1	1	0	1	4	1
<i>Tansocephus</i>	0	0	1	1	14	4	1	0	1	0	0	1	0
<i>Trichocarabodes</i>	0	0	1	1	14	6	1	0	2	0	0	2	1
<i>Tuberocephus</i>	1	1	1	1	12	4	1	0	2	0	1	2	1
<i>Uluguroides</i>	0	0	1	2	14	6	1	2	1	0	1	2	1
<i>Yoshiobodes</i>	0	0	0	1	15	4	1	0	0	1	1	2	1

I. Cavity or deep hollow in the dorsosejugal region: 0 = absent, 1 = present

II. Notogastral structure: 0 = absent, 1 = present

III. Lamellar cuspis: 0 = absent, 1 = present but short, and 2 = present and long

IV. Tutorium: 0 = absent, 1 = present but weak, and 2 = present and strong or with cuspis

V. Number of notogastral setae

VI. Number of genital setae

VII. Number of aggenital setae

VIII. Position of lamellar setae: on lateral surface of lamellae = 0, dorsal surface of lamellae = 1, in interlamellar position = 2, and in front of lamellae = 3

3. The position of the adanal setae and lyrifissure *iad*. This feature apparently well characterizes the genera, since it is constant. There may be recognized three basic types and some variations of these. a) ad_1 and ad_2 in postanal, ad_3 in preanal position; b) ad_1 in postanal, ad_2 is adanal and ad_3 in preanal position; c) ad_1 in postanal, ad_2 and ad_3 in adanal position.

It is rather difficult to recognize lyrifissure *iad*, the sculpture of the ventral plate frequently covers it. It appears, that, excepting a few cases, when it is wholly reduced, that it is situated always far from the anal plate, and only rarely may it be found close to seta ad_3 , but then very frequently in paraanal position.

4. The sculpture of prodorsum, the development of the lamellae and the position of prodorsal setae. The lamellae were rarely included in the generic diagnoses, excepting when it was strikingly obvious, but especially the shape or the lack of lamellar cuspis, and together with this the origin of the lamellar setae are surely generic characters. The apex of the lamella may be insignificant, or rounded, sharply pointed, but there are strongly enlarged or reclinate types too. The swellings or the importance of transverse laths resembling translamellae in the interlamellar region are not fully explained, furthermore, there are many transitional forms. These all need further investigations.

The lamellar seta most frequently originates on the outer side of the lamella, but of course, it may appear on the surface of lamella dorsalis, or even on the prodorsal surface. The position of the interlamellar seta also appears to be significant, since it may be inserted on the lamellar surface, in the interlamellar region or on the margin of the lamella. Within a genus its position is reliably constant.

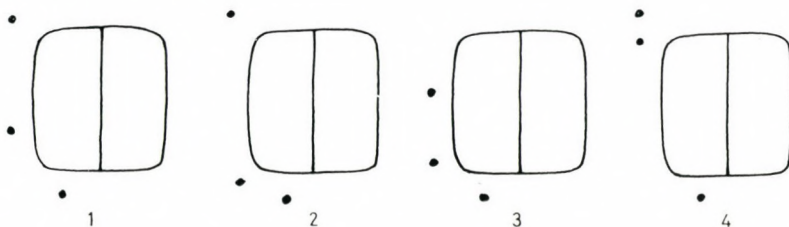
5. The structure of notogaster including the development of the dorso-sejugal region. I do not consider the sculpture important at the supraspecific

IX. Position of interlamellar setae: on dorsal surface of lamellae = 0, on the median margin of lamellae = 1, and in interlamellar position = 2

X. Setae in humeral position: absent = 0, one pair present = 1, and two pairs present = 2

XI. Direction of notogastral setae: all backwards = 0, without constant direction = 1, and one or more pairs directed forwards = 2

XII. Position of adanal setae:



XIII. End of anal plate: without long spine = 0, and with long spine = 1

level, on the other hand, apparently the projections, elevations and costulae forming a structure may be decisive in making a choice, which is usually accompanied in the dorsosejugal region by a strong hollow or cavity. Their variation and joint appearance are shown in computer evaluation.

This time I had no opportunity to study the shape of the legs and their chaetotaxic variation. It appears, however, that the shape of seta *l''* of the genu, or that of setae *u*, further, the sculpture of the femur could well be used in future identification.

This contribution discusses primarily the known genera, or newly described ones, along with other taxa discovered through recent examination. In the second part of my paper, to be published later, I should like to deal with the specific composition of the known genera, which already indicates the necessity of the erection of some further new genera.

DIAGNOSES OF SUPRASPECIFIC CATEGORIES

Family Carabodidae C. L. KOCH, 1836

C. L. KOCH, 1836: 3, 15 (?)

D i a g n o s i s : Prodorsum with lamellae, running marginally. Bothridium opened laterally, funnel-shaped. Tutorium observable but without free cusps. Dorsosejugal suture present. Notogastral cerotegument always ornamented by foveolae or pustules, also stronger chitinous structure often present. Chelicerae normal, diarthric labiogenal articulation present. Coxisternal region large, mostly well divided by apodemes and epimeral borders. Circumpedal carina absent. Anal and genital apertures situated near to each other. Lyri-fissure *iad* originating far from anal opening, in paraanal position. All legs monodactylous. Femur of legs 2—4 with sharp ventral blades. Tarsus and tibia gradually thickened to their contact, genu minute.

Typus generis: *Carabodes* C. L. KOCH, 1836.

CARABODINAE, C. L. KOCH, 1836

D i a g n o s i s : Prodorsum without high elevations or protuberances, notogaster without any structure. Lamellae normal, running marginally. Dorsosejugal region normal, both parts of body flat or gradually becoming convex, without structure.

Typus generis: *Carabodes* C. L. KOCH, 1836

Other genera: *Aokiella* BALOGH et MAHUNKA, 1967
Austrocarabodes HAMMER, 1966
Cavernocarabodes MAHUNKA, 1974
Flexa KULIEV, 1977

Gymnobodes BALOGH, 1965
Klapperiches MAHUNKA, 1974
Odontocephus BERLESE, 1913
Pentabodes P. BALOGH, 1984
Phyllocarabodes BALOGH et MAHUNKA, 1969
Tansocephus MAHUNKA, 1983
Trichocarabodes BALOGH, 1961
Uluguroides MAHUNKA, 1983

MACHADOCEPHEINAE subfam. n.

D i a g n o s i s : Prodorsum and notogaster with high elevations, dorso-sejugal region deeply excavated. Lamellae modified, translamellar apophysis or other protuberances present.

Typus generis: *Machadocephus* BALOGH, 1958

Other genera: *Apomotocephus* AOKI, 1965
Congocephus BALOGH, 1958
Cubabodes BALOGH et MAHUNKA, 1974
Meriocephus AOKI, 1973
Spathulocephus BALOGH et MAHUNKA, 1969
Tuberocephus BALOGH et MAHUNKA, 1969

GIBBICEPHEINAE subfam. n.

D i a g n o s i s : Prodorsum normal, without high elevation, lamellae running marginally. Dorsosejugal region normal. Notogaster surface with strong costules or smaller protuberances.

Typus generis: *Gibbicephus* BALOGH, 1958

Other genera: *Diplobodes* AOKI, 1958
Gibbibodes gen. n.
Kalloia MAHUNKA, 1985
Neocarabodes BALOGH et MAHUNKA, 1969

HARDYBODINAE subfam. n.

D i a g n o s i s : Prodorsum modified anteriorly, rostral part very high. Lamellae thin, running marginally. Prodorsum and notogaster without structure, dorsosejugal region normal.

Typus generis: *Hardybodes* BALOGH, 1970

No other genera.

BERNDOBODINAE subfam. n.

D i a g n o s i s : Body rounded. Prodorsum and notogaster without structure. Lamellae thin, simple. A strong humeral apophysis present.

Typus genus: *Berndobodes* gen. n.

No other genera.

PASOCEPHEINAE subfam. n.

D i a g n o s i s : Lamellae fused medially, covering the greatest part of prodorsum. Dorsosejugal region with a deep hollow. Prodorsal and notogastral protuberances and elevations present.

Typus generis: *Pasocephus* AOKI, 1977

Other genus: *Opisthocephus* AOKI, 1977

YOSHIOBODINAE subfam. n.

D i a g n o s i s : Prodorsum strongly narrowed anteriorly, concave basally. Dorsosejugal region normal. Prodorsal and notogastral protuberances or elevations absent.

Typus generis: *Yoshiobodes* gen. n.

Other genera: *Archegocephus* AOKI, 1965
Bathocephus AOKI, 1978

Key for the genera of the family Carabodidae

- 1 (20) Ten or less pairs of notogastral setae present.
- 2 (3) Eight pairs of notogastral setae present, no setae on the anterior third of notogaster
Cubabodes BALOGH et MAHUNKA, 1974
- 3 (2) Ten pairs of notogastral setae present.
- 4 (15) Four pairs of genital setae.
- 5 (10) Epimeral setal formula: $I-I-3-3$ or $I-I-2-4$. Interlamellar setae originating in interlamellar position.
- 6 (7) A deep cavity present in front of the genital aperture. Aggenital setae present. The distance between the anal and genital opening very small
Cavernocarabodes MAHUNKA, 1974
- 7 (6) Coxisternal and ventral region normal, without deep cavity or hollow. Aggenital setae absent. Anal and genital opening far from each other.
- 8 (9) Apodemes short, all ending free. Epimeral setal formula: $I-I-2-4$. Lamellae with well-developed lateral cuspis
Gymnobodes BALOGH, 1965
- 9 (8) Apodemes long, touching medially and composing a well-observable network. Epimeral setal formula: $I-I-3-3$. Lamellae without sharp lateral cuspis
Klapperiches MAHUNKA, 1978
- 10 (5) Epimeral setal formula: $3-I-3-3$ or $2-I-3-3$. Interlamellar setae originating on the surface of lamellae.
- 11 (12) Prodorsum and notogaster with very high elevation, dorsosejugal region well excavated
Meriocephus AOKI, 1973
- 12 (11) Prodorsum and notogaster gradually convex, without hollow or elevation.
- 13 (14) Setae c_2 long, directed forwards, all other notogastral setae short, phylliform. Lyrifissure *iad* situated in adanal position
Flexa KULLJEW, 1977
- 14 (13) Setae c_2 directed outwards or backwards, never forwards. No difference in the shape of c_2 and c_1 or d_2 . Lyrifissure *iad* absent or originating far from anal aperture
Carabodes C. L. KOCH, 1836

- 15 (4) Five-ten pairs genital setae present.
- 16 (17) Five pairs of genital setae present. Lamellae with long, very sharp and curved cusps. Epimeral setal formula: $2-1-3-3$ or $3-1-3-3$
Pentabodes P. BALOGH, 1984
- 17 (16) Six or more pairs of genital setae present. Epimeral setal formula: $1-1-3-3$.
- 18 (19) Six pairs of genital setae present. Setae ad_2 and ad_1 in postanal position. Notogastral setae arising also in the anterior part of notogaster
Phyllocarabodes BALOGH et MAHUNKA, 1969
- 19 (18) Ten pairs of genital setae present. Setae ad_2 in adanal, setae ad_1 in preanal position. Notogastral setae originating near to each other, along a transversal band in the middle part of notogaster
Spathulocephus BALOGH et MAHUNKA, 1969
- 20 (1) Twelve or more pairs of notogastral setae present.
- 21 (28) Six or more pairs of genital setae present.
- 22 (25) Fourteen pairs of notogastral setae present, no setae in humeral position. Notogaster without structure.
- 23 (24) A strong transversal prodorsal protuberance present. A median, nearly elliptical notogastral region distinct, all notogastral setae — excepting the posteromarginal four pairs (p_1-p_3, r_3) — arising in this region
Uluguroides MAHUNKA, 1983
- 24 (23) Prodorsum without protuberances. Median part of notogaster not separated, notogastral setae arising all over the notogastral surface
Trichocarabodes BALOGH, 1961
- 25 (22) Fifteen pairs of notogastral setae present, one pair in humeral position.
- 26 (27) Notogaster with high protuberances and costulae, a deep hollows present in the dorsosejugal region. Prodorsum with transversal protuberances
Apotomocephus AOKI, 1965
- 27 (26) Notogaster with strong longitudinal costulae, prodorsum without transversal protuberances. No dorsosejugal hollow or cavity present
Neocarabodes BALOGH et MAHUNKA, 1969
- 28 (21) Four pairs of genital setae present.
- 29 (36) Less than fourteen pairs of notogastral setae present.
- 30 (33) Lamellae fused medially and covering the greatest part of prodorsum.
- 31 (32) Notogaster with three protuberances posteriorly. Two pairs of notogastral setae present near to dorsosejugal suture
Pasocephus AOKI, 1977
- 32 (31) Notogaster only with one, but large elevation in its posterior part. No notogastral setae present in the dorsosejugal region
Opisthocephus AOKI, 1977
- 33 (30) Lamellae originating far from each other, not fused medially. Interlamellar region free.
- 34 (35) Twelve pairs of notogastral setae present. No setae in humeral position
Tuberocephus BALOGH et MAHUNKA, 1969
- 35 (34) Thirteen pairs of notogastral setae present. Two pairs originating on the shoulder
Bathocephus AOKI, 1978
- 36 (29) Fourteen or more pairs of notogastral setae present.
- 37 (48) Strong notogastral structure present consisting of costulae, elevations or protuberances.
- 38 (41) Fifteen pairs of notogastral setae present.
- 39 (40) Prodorsum with high transversal protuberances, interlamellar setae arising on its anterior margin
Machadocephus BALOGH, 1958
- 40 (39) Prodorsum without transversal protuberances or elevations. Interlamellar setae arising in the interlamellar position
Kalloia MAHUNKA, 1985
- 41 (38) Fourteen pairs of notogastral setae present.
- 42 (43) Prodorsum with a high transversal protuberance, interlamellaretae arising on its anterior margin
Congocephus BALOGH, 1958
- 43 (42) Prodorsum without transversal protuberance or elevation. Interlamellar setae arising in the interlamellar region.
- 44 (45) Lamellae with a lateral projection. Five pairs setae in posteromarginal position
Diplobodes AOKI, 1958
- 45 (44) Lamellae simple. Four pairs of setae in posteromarginal position.
- 46 (47) Four pairs of genital setae present
Gibbicephus BALOGH, 1958
- 47 (46) Five pairs of genital setae present
Gibbibodes gen. n.
- 48 (37) Notogaster without strong costulae, protuberances or elevations.
- 49 (58) Fifteen pairs of notogastral setae present.
- 50 (51) Two pairs of notogastral setae arising in the dorsosejugal region directed forwards. Six pairs of median notogastral setae composing a group and the corresponding pairs directed towards each other
Aokiella BALOGH et MAHUNKA, 1967

- 51 (52) No setae composing a group either in dorsosejugal region directed forwards, or in the median part.
- 52 (53) Rostral part of prodorsum very high and modified. Rostral and lamellar setae T-shaped (?) **Hardybodes** BALOGH, 1970
- 53 (52) Rostral part of prodorsum and its setae normally developed.
- 54 (55) One pair of setae in humeral position. Eight pairs notogastral setae arising in the anterior half of notogaster **Berndobodes** gen. n.
- 55 (54) Two pairs of setae in humeral position. Not more than six pairs of setae arising in the anterior half of notogaster.
- 56 (57) Two pairs of adanal setae present. Aggenital setae arising in aggenital position. The space between the anal and genital apertures smaller than the length of genital plate **Archegocephus** AOKI, 1965
- 57 (56) Three pairs of adanal setae present. Aggenital setae in postgenital position. The space between the genital and anal apertures much longer than the length of genital plate **Yoshiobodes** gen. n.
- 58 (49) Fourteen pairs of notogastral setae present.
- 59 (60) Two pairs of long setae directed forwards in the dorsosejugal region. Tutorium with long spines **Odontocephus** BERLESE, 1913
- 60 (59) No long setae directed forwards in the dorsosejugal region. Tutorium simple.
- 61 (62) Lamellae with an interlamellar protuberance, interlamellar setae arising on its anterior margin. Setae c_1 arising much nearer to dorsosejugal suture than to setae c_2 **Tansocephus** MAHUNKA, 1983
- 62 (61) Lamellae simple, prodorsal surface without larger protuberances or elevations. Setae c_1 and c_2 arising in a transversal line **Austrocarabodes** HAMMER, 1966

DIAGNOSIS OF THE CARABODOID GENERA

Aokiella BALOGH et MAHUNKA, 1967 (Figs 1—2, 77—78)

BALOGH et MAHUNKA, 1967: 44.

Prodorsum: Its surface flat, lamellae normally developed. Lamellar setae arising on the lateral surface of lamellae. Interlamellar setae arising on the lamellar surface. Sensillus clavate, directed outwards. Tutorium weakly developed.

Notogaster: Without structure. Fourteen pairs of notogastral setae present, two pairs directed forwards and two pairs are in humeral position.

Coxisternal region: Epimeral borders hardly observable. Epimeral setal formula: 3—1—3—3.

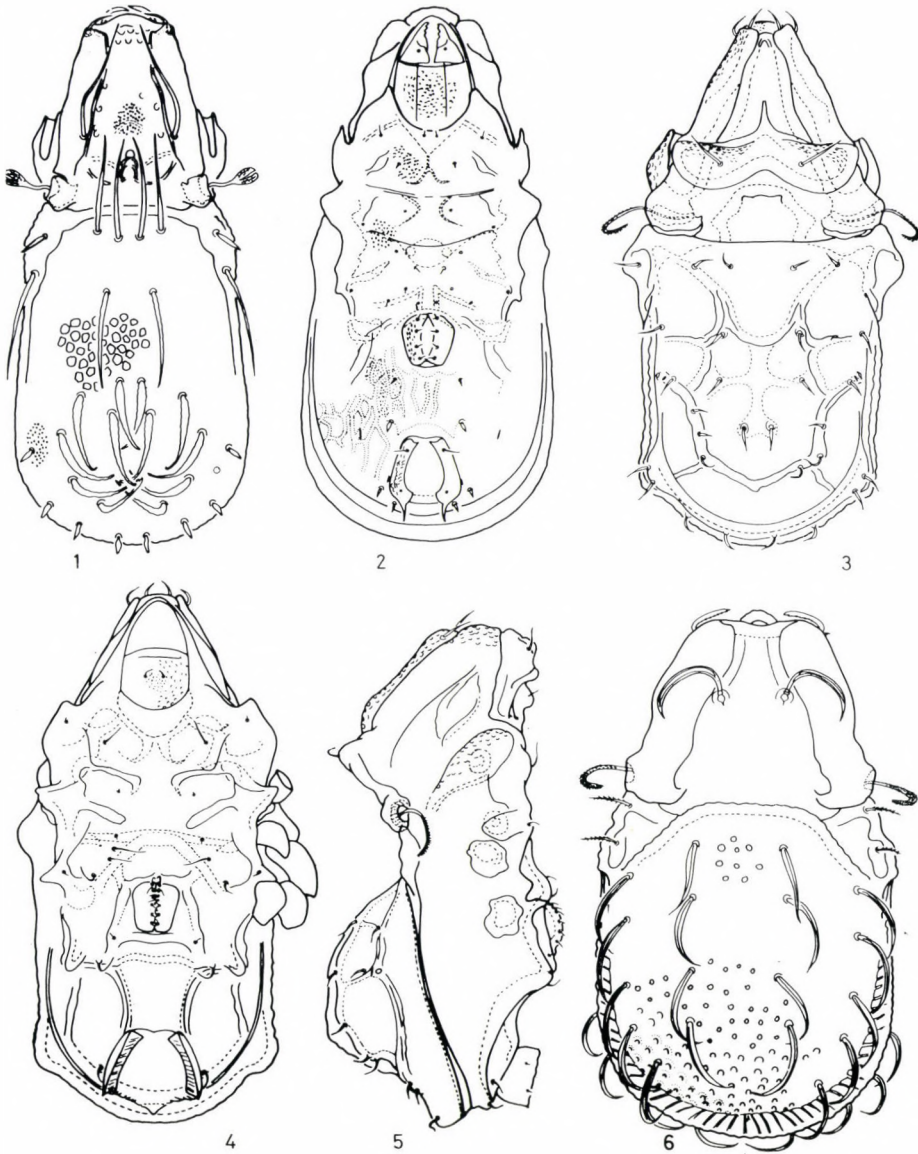
Anogenital region: Its surface ornamented by fine ribs. Anogenital setal formula: 4—1—2—3. Lyrifissure *iad* existing far from anal aperture.

Type species: *Aokiella florens* BALOGH et MAHUNKA, 1967. Cuc-phuong, Vietnam.

Apotomocephus AOKI, 1965 (Figs 3—5)

AOKI, 1965: 296.

Prodorsum: A pair of very high transversal apophysis present, interlamellar setae arising on them. Lamellae blunt at tip, lamellar setae



Figs 1—6. 1—2: *Aokiella florens* BALOGH et MAHUNKA, 1967, 3—5: *Apotomocephus gressitti* AOKI, 1965, 6: *Arhegocephus imadatei* AOKI, 1965 (1—2: original; 3—6: after AOKI)

arising on their outer surface. Rostral, lamellar and interlamellar setae of similar shape, all slightly dilate basally, resembling notogastral ones. Sensillus unicate. Tutorium weakly developed.

Notogaster: Dorsosejugal region with a deep, wide depression, median part of notogaster highly projecting, its surface divided or ornamented

by strong ridges connected with each other. Fifteen pairs of notogastral setae present, among them one pair arising on the shoulder.

Coxisternal region: Epimeral setal formula: 2—1—1—3(4), setae *Ia* absent. Median longitudinal apodeme or epimeral border absent, all epimere opened medially.

Anogenital region: Anogenital setal formula: 6(7)—1(2)*—2—3(2). Its surface with ridges and protuberances (pdh: see AOKI: 299). Lysifissure *iad* was not mentioned by AOKI.

Type species: *Apotomocephus gressitti* AOKI, 1965. Biak I. (New Guinea).

Remarks: The original description was based on the holotype (!) only.

No newly collected material available.

Archegocephus AOKI, 1965 (Figs 6—8)

AOKI, 1965: 158.

Prodorsum: Normally developed, without any conspicuous chitinous structure. Lamellae rounded anteriorly, lamellar setae phylliform, with serrate margin, arising on the outer surface of lamellae. Rostral setae narrowed, with roughened margin. Interlamellar setae originating on a pair of tubercles in the interlamellar region. Sensillus uncate.

Notogaster: Median part of notogaster gradually convex, nearly semicircular in lateral view, but chitinous structure and dorsosejugal hollow or depression absent. Fifteen pairs of phylliform notogastral setae, among them two pairs arising on the shoulder.

Coxisternal region: Epimeral setal formula: 2—1—1—1 (?). Apodemes and epimeral borders well developed composing a network.

Anogenital region: Its surface ornamented by of ribs forming the letter H. Anogenital setal formula: 4—1—2—2. Lyrifissure *iad* was not mentioned. Inner margin of anal plates ending in a medium long spine.

Type species: *Archegocephus imadatei* AOKI, 1965. Doi Suthep, Thailand.

Remarks: The description was based only on the holotype. Since then no further reference is known.

Austrocarabodes HAMMER, 1966 (Figs 9—10, 79—83)

HAMMER, 1966: 59.

Prodorsum: Without structure. Lamellae without cuspis, but they thinned — like prelamellae — before the insertion of the lamellar setae.

* I am sure that setae *ag*₂ (sensu AOKI) are in fact setae *ad*₃, with very often removed far anteriorly from the anal aperture.



Figs 7—12. 7—8: *Archegocepheus imadatei* AOKI, 1965, 9—10: *Austrocarabodes ensifer* (SELLNICK, 1931), 11—12: *Bathocepheus concavus* AOKI, 1978 (after AOKI: 7—8, 11—12; 9—10: original)

Lamellar setae originating on the lateral surface of lamellae. All prodorsal setae phylliform, interlamellar setae arising on the inner margin of lamellae. Tutorium present.

Notogaster: Dorsosejugal suture well observable, notogaster without any structure, hollow or elevations. Fourteen pairs of notogastral setae present. No setae in humeral position.

Coxisternal region: Epimeral borders only partly developed. Epimeral setal formula: 3—1—3—3.

Anogenital region: Without stronger structure, ribs or projections. Anogenital setal formula: 4—1—2—3. Lyrifissure *iad* not visible.

Type species: *Carabodes ensifer** SELLNICK, 1931. Levkas, Greece.

Bathocephus AOKI, 1978 (Figs 11—12, 83)

AOKI, 1978: 86.

Prodorsum: Median surface convex but without transversal apophysis. Lamellae separated, their cuspis rounded, lamellar setae originating on the outer margin of lamellae, the narrow phylliform rostral setae resembling these. Sensillus with dilated end, recurved. Tutorium well observable.

Notogaster: Dorsosejugal suture indistinct, a large, ω -shaped concavity existing in the anterior part of notogaster, covered by a thick cerotegument layer. Posteromedian part of notogaster highly convex, without chitinous structure. Thirteen pairs of phylliform notogastral setae of different sizes, two pairs of them originating on the shoulders.

Coxisternal region: No reference in AOKI's original description.

Anogenital region: A deep concavity existing between the genital and anal apertures. Anogenital setal formula: 4—0—2—3. Lyrifissure *iad* was neither mentioned nor figured.

Type species: *Bathocephus concavus* AOKI, 1978. Bonin I. (Japan).

Berndobodes gen. n.

Subfamily: Bernodobodinae subfam. n.

Prodorsum: Lamellae with a sharp outer cuspis, lamellar setae arising on them. Prelamellae — like costulae — present, which continue from the inner side of lamellae. Rostral setae arising before the lamellar ones. Prodorsum with one pair of protuberances, interlamellar setae originating on them. Sensillus long, with slightly dilated head. Tutorium well developed.

Notogaster: Dorsosejugal region normal, dorsosejugal suture present. Fifteen pairs of spathulate notogastral setae, one of them arising on the large humeral apophysis.

Coxisternal region: Apodemes and borders weakly developed, epimeres partly opened. Epimeral setal formula: 3—1—3—3.

Anogenital region: Anogenital setal formula: 4—1—2—3. Lyrifissure *iad* removed very far from the anal aperture.

Type species: *Berndobodes spathulifer* sp. n.** Sabah (Malaysia).

* Redescription is given in an other part of this paper.

** The description is given later.

Carabodes C. L. KOCH, 1836 (Figs 13—15, 84)

C. L. KOCH, 1836: 3, 15.

SELLNICK und FORSSLUND, 1952: 367.

Prodorsum: Surface with or without transversal projection behind the interlamellar setae but is never high. Lamellar setae phylliform, arising on the outer margin of lamellae. Interlamellar setae arising on the surface of lamellae. Sensillus clavate. Tutorium weakly developed.

Notogaster: Dorsosejugal region without hollow, notogaster without elevation or other structure. Ten pairs of notogastral setae present.

Coxisternal region: Epimeral borders weakly developed, some epimeres not framed. Epimeral setal formula: 3—1—3—3.

Anogenital region: Stronger chitinous structure absent. Anogenital setal formula: 4—1—2—3. Lyrifissure *iad* originating near setae *ad*₃.

Type species: *Carabodes coriacus** C. L. KOCH, 1836. Germany.

Remarks: Very heterogenous taxon, further investigation of the species placed here is necessary.

Cavernocarabodes MAHUNKA, 1974 (Figs 16—18, 85)

MAHUNKA, 1974: 47.

Prodorsum: Lamellae gradually narrowing, lamellar setae originating far from the lamellae in interlamellar position. Prodorsal surface without protuberances. Interlamellar setae minute, resembling notogastral ones, originating in interlamellar position. Sensillus short, clavate. Tutorium weak.

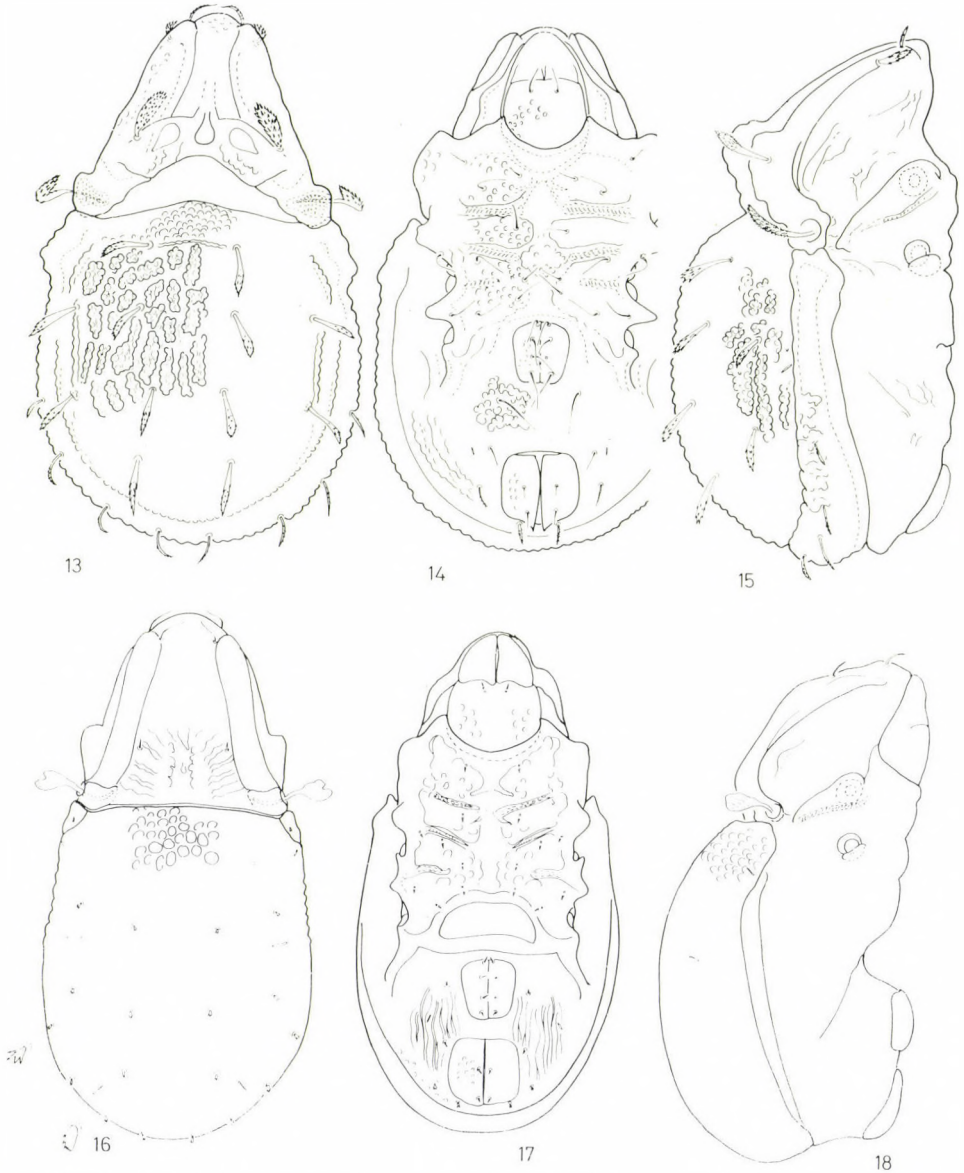
Notogaster: Dorsosejugal suture normal, notogaster without elevation or protuberances. Ten pairs of minute, penicillate notogastral setae present.

Coxisternal region: Epimeral setal formula: 1—1—3—3. A very great, well-framed median cavity before the genital aperture present. Apodemes thin, epimeres not well framed, some epimeres fused with each other.

Anogenital region: Anal and genital aperture very near to each other. Anogenital setal formula: 4—1—2—3. Lyrifissure *iad* situated far from anal opening.

Type species: *Cavernocarabodes perreti* MAHUNKA, 1974. Sahbayéme, Cameroun.

* A short redescription is given elsewhere in this article.

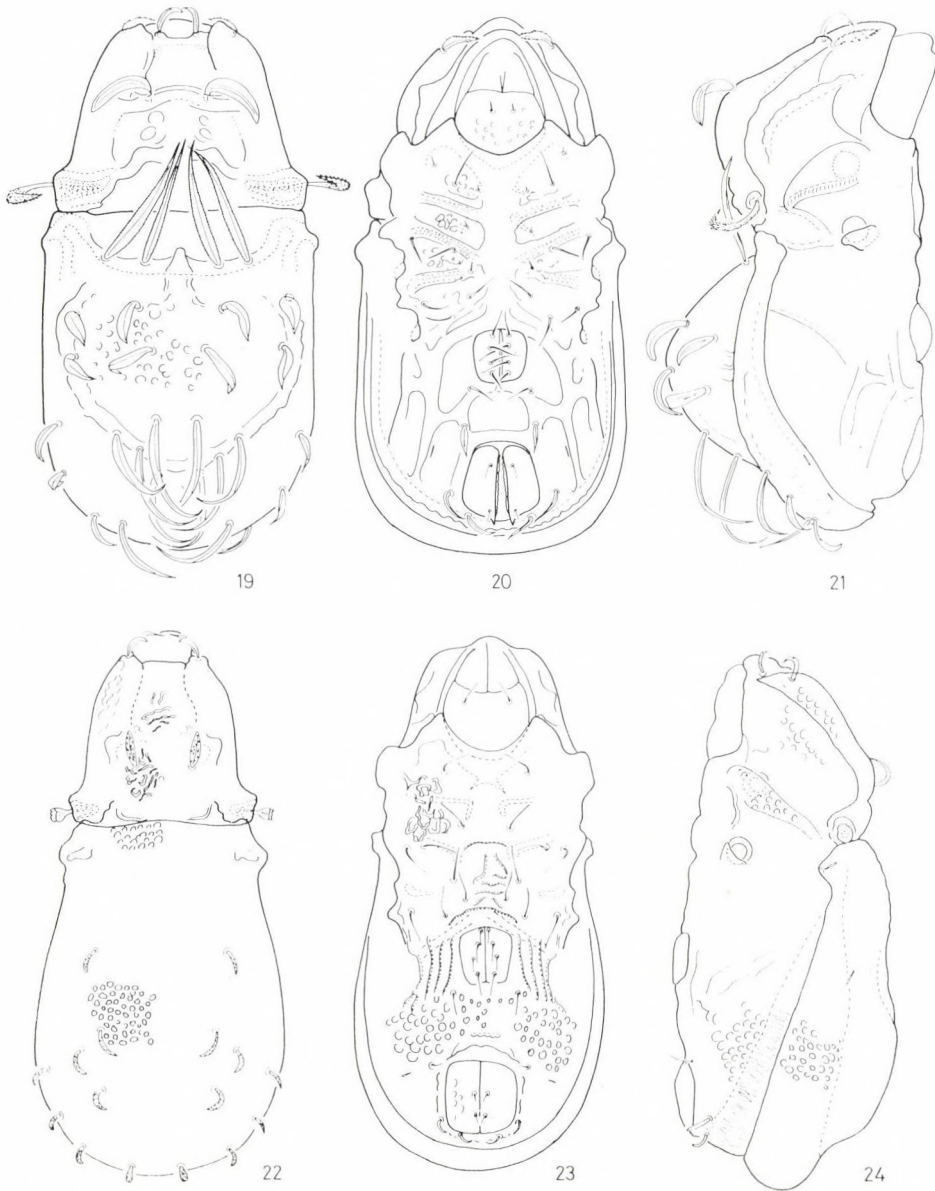


Figs 13—18. 13—15: *Carabodes coriaceus* C. L. KOCH, 1836, 16—18: *Cavernocarabodes perretti* MAHUNKA, 1974 (original)

Congocepheus BALOGH, 1958 (Figs 19—21, 86)

BALOGH, 1958: 21.

Prodorsum: Highly elevated, with an strong translamellar projection, interlamellar setae arising on it. Lamellar setae arising on the outer



Figs 19–24. 19–21: *Congocephus heterotrichus* BALOGH, 1958, 22–24: *Cubabodes hexagonalis* BALOGH et MAHUNKA, 1974 (original)

margin of lamellae; all prodorsal setae phylliform, but of different shape. Sensillus uncate. Tutorium strongly developed, with undulate margin.

Notogaster: Dorsosejugal region with a deep hollow, median part of notogaster highly convex. Fourteen pairs of phylliform notogastral setae, two pairs of them directed forwards. No seta in humeral position.

Coxisternal region: Third and fourth epimeres not completely fused. Epimeral setal formula: 3-1-3-3.

Anogenital region: Ornamented by longitudinal and transversal ribs. Anogenital setal formula: 4-1-2-3. Lyrifissure *iad* situated laterally far from adanal setae.

Type species: *Congocephus heterotrichus** BALOGH, 1958. Dem. Rep. of Congo.

Cubabodes BALOGH et MAHUNKA, 1974 (Figs 22—24, 87)

BALOGH et MAHUNKA, 1974: 10.

Prodorsum: Lamellae not separate from the prodorsal surface, only their sharp cuspis observable. Lamellar setae arising on their dorsal surface, rostral setae between lamellar cuspis. Prodorsal surface concave medially. Interlamellar setae arising on it. Sensillus short, clavate. Tutorium absent.

Notogaster: Dorsosejugal region normal, a strong humeral apophysis present. Notogaster without protuberances or other structures. Eight pair of phylliform notogastral setae present.

Coxisternal region: Apodemes short, epimeral borders not observable. Epimeral setal formula: 1-1-3-3.

Anogenital region: A well-developed genital gland (?) present. Surface without strong costulae. Epimeral setal formula: 4-1-2-3. Setae *ad*₃ in adanal position. Lyrifissure *iad* originating in a transversal line with setae *ad*₃.

Type species: *Cubabodes hexagonalis* BALOGH et MAHUNKA, 1974. Cuba.

Diplobodes AOKI, 1958 (Figs 25—26)

AOKI, 1958: 390 (28), and 1970: 419.

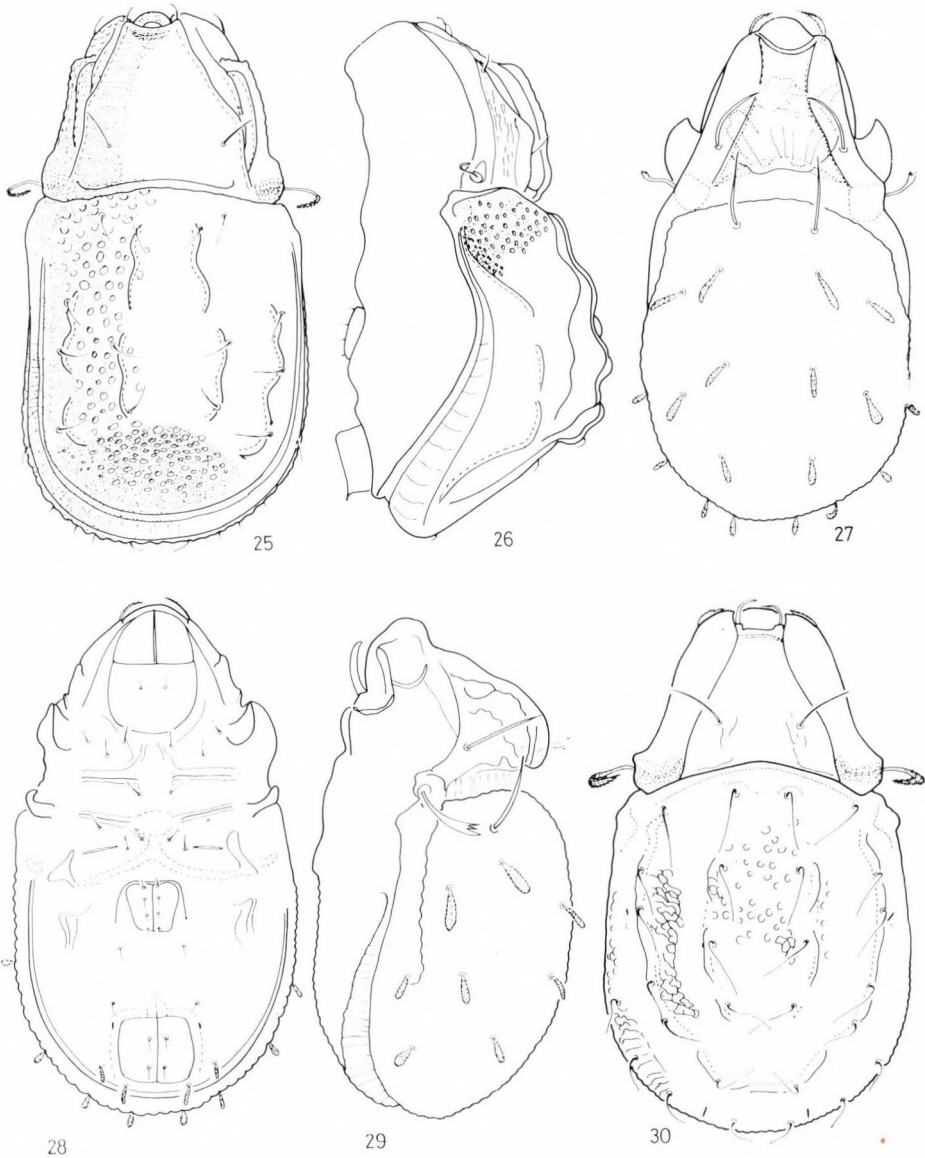
Prodorsum: Its surface without protuberances or apophysis. Lamellae of double structure, very broad, with a separate lateral keel. All prodorsal setae thin and simple. Sensillus uncate.

Notogaster: Dorsosejugal region normal, notogastral, surface ornamented by strong longitudinal costulae. Fourteen pairs of notogastral setae, one of them in humeral position.

Coxisternal region: Well-developed epimeral borders composing a network.

Anogenital region: Only few data known. Four pairs of genital and two pairs of anal setae present.

* The redescription of this species is given later.



Figs 25—30. 25—26: *Diplobodes kanekoi* AOKI, 1958, 27—29: *Flexa dubia* (KULIEV, 1968), 30: *Gibbicepheus elevatus* BALOGH, 1958 (after AOKI: 25—26, KULIEV: 27—29; 30: original)

Type species: *Diplobodes kanekoi* AOKI, 1958. Japan.

Remarks: It stands very near to *Kalloia* MAHUNKA, 1985, however, the latter has fifteen pairs of notogastral setae; AOKI (1970: 419) confirmed newly the number of the notogastral setae.

Flexa KULIJEV, 1977 (Figs 27—29)

KULIJEV, 1977: 64.

Prodorsum: Without protuberances or transversal apophysis. Lamellae broad, interlamellar setae arising on their surface. Sensillus proclinate.

Notogaster: Dorsosejugal region normal, notogaster slightly convex, without structure. Ten pairs of notogastral setae present, one of them directed forwards, being much longer than the other ones.

Coxisternal region: Epimeral setal formula: 3—1—3—3.

Anogenital region: Without any structure. Anogenital setal formula: 4—1—2—3. Setae ad_2 in adanal, ad_3 in preanal position. Lyrifissure *iad* originating near the anal aperture in adanal (?!) position.

Type species: *Carabodes dubius* KULIJEV, 1968. Azerbaijan, Soviet-Union.

Remarks: The most remarkable characteristic is the situation of the *iad* lyrifissure. In all other Carabodidae genera the lyrifissure is placed far from the anal aperture.

Gibbibodes gen. n.

Subfamily Machadocephinae.

Prodorsum: Lamellae simple, running marginally. Interlamellar area without any structure. Lamellar setae arising on the outer surface of lamellae, phylliform. Rostral setae originating between the lamellar cusps, simple, interlamellar setae thin, resembling notogastral ones, placed on the interlamellar surface. Sensillus uncate. Tutorium weak, but well observable.

Notogaster: Dorsosejugal region normal, median part of notogaster slightly elevated and framed by a round sharp crest. Fourteen pairs of simple, thin notogastral setae present, but no setae in humeral position.

Coxisternal region: Epimeres 3 and 4 only partly separated. Epimeral setal formula: 3—1—3—3.

Anogenital region: Anogenital setal formula: 5—1—2—3. Lyrifissure *iad* originating near to setae ad_3 .

Type species: *Gibbibodes similis* sp. n.*

Remarks: The new genus stands very near to *Gibbicepheus* BALOGH, 1958, however, the latter has only four pairs of genital setae.

* Its description is given in an other part of this article.

Gibbicepheus BALOGH, 1958 (Figs 30—32, 88—89)

BALOGH, 1958: 20.

Prodorsum: Prodorsal structure simple, without projection or elevation. Lamellar setae phylliform, rostral setae simple, the latter originating between the lamellar cuspis. Interlamellar setae thin, simple, resembling notogastral ones, arising in the interlamellar area. Sensillus uncate. Tutorium well observable.

Notogaster: Dorsosejugal region normal. Notogastral surface divided by longitudinal crests, arranged in two pairs of rows. Fourteen pairs of simple notogastral setae present, no setae in humeral position.

Coxisternal region: Epimeral setal formula: 3-1-3-3. The fourth epimeral apodemes not reaching in the middle.

Anogenital region: Anogenital setal formula: 4-1-2-3. Lyrifissure *iad* in preanal position.

Type species: *Gibbicepheus elevatus** BALOGH, 1958. Angola.

Gymnobodes BALOGH, 1965 (Figs 33—34, 90—91)

BALOGH, 1965: 59.

Prodorsum: Surface without any structure. Lamellar setae arising on rostral surface, beside the inner side of lamellar cuspis; rostral setae arising behind them. Interlamellar setae minute, originating on the interlamellar surface. Sensillus directed laterally, with gradually thickened, short head. Tutorium absent.

Notogaster: Dorsosejugal region normal, surface without any structure. Ten pairs of minute notogastral setae present.

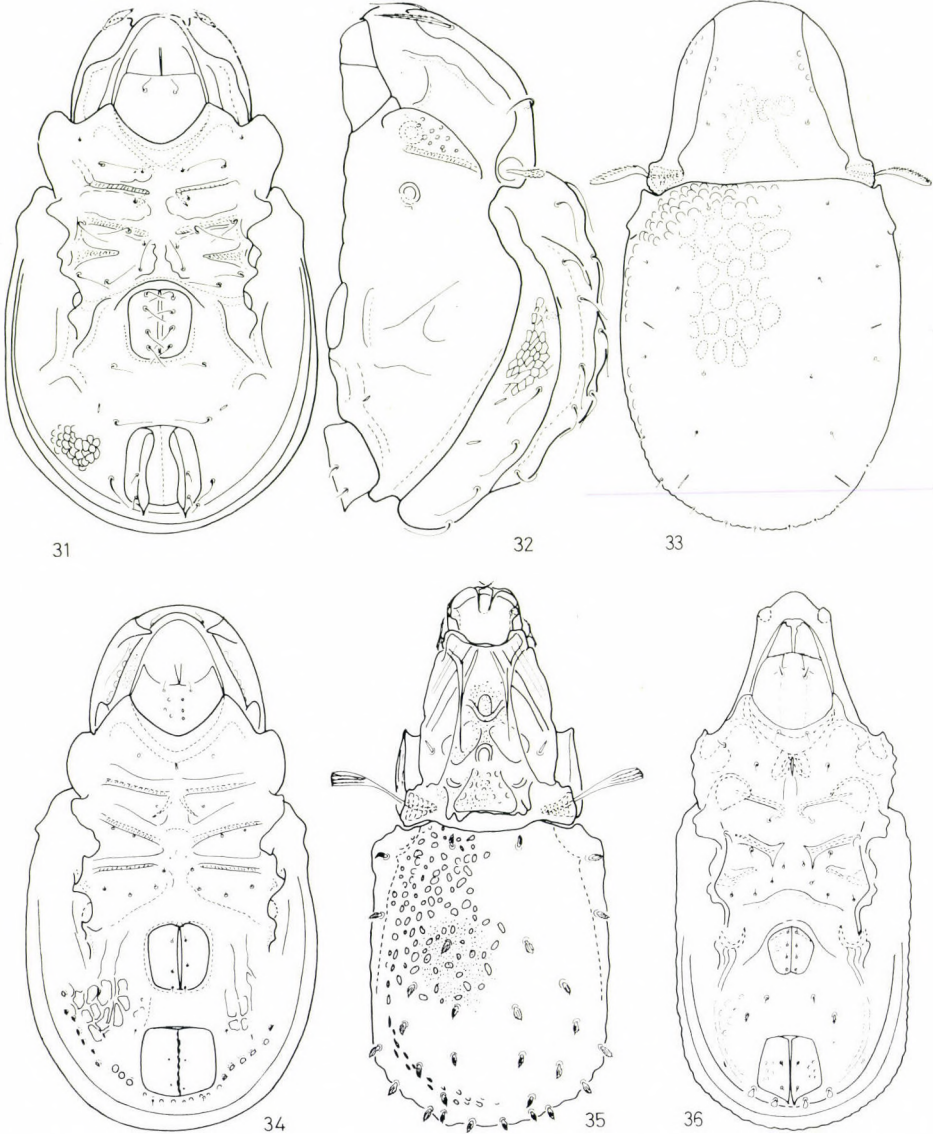
Coxisternal region: All epimeres well separated. Epimeral setal formula: 1-1-2-4.

Ventral region: Along the posterolateral margin of ventral plate some deep areolae present. Anogenital setal formula: 4-0-2-3. Lyrifissure *iad* originating very far from the anal aperture.

Type species: *Carabodes fraterculus*** BALOGH, 1963. Dem. Republic of Congo.

* Redescription of the species is given in an other part of this article.

** Redescription is given in an other part of this article.



Figs 31—36. 31—32: *Gibbicephus elevatus* BALOGH, 1958, 33—34: *Gymnobodes fraterculus* (BALOGH, 1963), 35—36: *Hardybodes mirabilis* BALOGH, 1970 (original)

Hardybodes BALOGH, 1970 (Figs 35—36, 93)

BALOGH, 1970: 298.

Prodorsum: Rostral part of prodorsum modified, very high (well-visible in lateral view). Lamellae running marginally, thin, lamellar cuspis rounded, but its end not well observable, partly merging into prodorsal surface. Rostral and lamellar setae* T-shaped (?) interlamellar setae simple originating on the lamellar surface. Interlamellar region with complicated sculpture and structure, but higher protuberances absent. Sensillus directed outwards, spatulate. Tutorium hardly observable.

Notogaster: Dorsejugal region normal, without hollow or cavity. Notogaster flat, humeral apophysis observable. Fifteen pairs of small but phylliform notogastral setae present, one of them arising on the humeral apophysis.

Coxisternal region: Apodemes short, epimeral borders fine, hardly visible. Epimeral setal formula: 3—1—3—3.

Anogenital region: Fourth pairs of legs originating comparatively at the back, genital aperture placed between them. Anogenital setal formula: 4—1—2—3. Setae ad_1 and ad_3 in postanal, setae ad_3 in preanal position, very far from anal plates. Lyrifissure *iad* visible close to the posterolateral margin of this region.

Type species: *Hardybodes mirabilis* BALOGH, 1970. New Guinea.

Kalloia MAHUNKA, 1985 (Figs 37—38, 93—94)

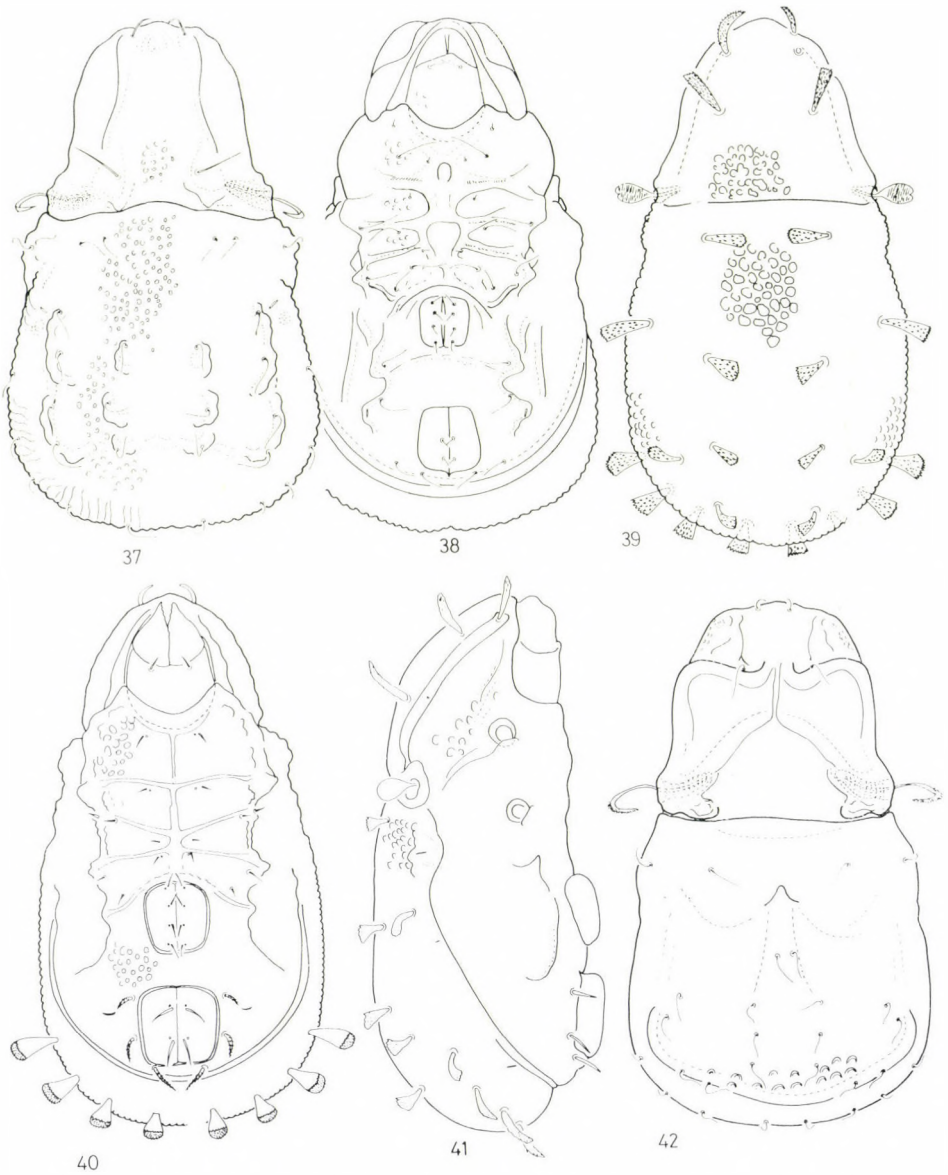
MAHUNKA, 1985: 144.

Prodorsum: Rostral part of prodorsum very broad, lamellae wide, with rounded apex. Lamellar setae arising in the lateral surface of lamellae, phylliform. Rostral and interlamellar setae thin, simple, resembling notogastral ones. Sensillus uncate.

Notogaster: Dorsejugal region without hollows or cavity, notogastral surface ornamented with protuberances of mostly longitudinal crests. Fifteen pairs of simple notogastral setae present, one of them arising on the outer margin of the shoulder.

Coxisternal region: All epimeres well framed, and placed far from each other, so a wide field present medially bearing two rounded areas. Epimeral setal formula: 3—1—3—3.

* They were broken in the examined holotype.



Figs 37—42. 37—38: *Kalloia simpliseta* MAHUNKA, 1985, 39—41: *Klapperiches nigrosetosus* MAHUNKA, 1978, 42: *Machadocephus excavatus* BALOGH, 1958 (original)

Anogenital region: Strong, mostly longitudinal costulae present. Anogenital setal formula: 4—1—2—3. Setae ad_2 in adanal position. Lyri-fissure *iad* situating far from the anal aperture.

Type species: *Kalloia simpliseta* MAHUNKA, 1985. St. Lucia (Antilles).

Klapperiches MAHUNKA, 1974 (Figs 39—41, 95)

MAHUNKA, 1974: 554.

Prodorsum: Its surface moderately convex, without any structure. Lamellae thin, originating marginally, lamellar setae arising close to their inner margin, on the prodorsal surface. Rostral setae standing behind them. Interlamellar setae originating on the interlamellar surface, in the anterior half of prodorsum. All prodorsal setae dilate, resembling notogastral ones. Sensillus short, clavate. Tutorium very weakly developed.

Notogaster: Without any structure or hollow. Ten pairs of dilate, spathulate notogastral setae present.

Coxisternal region: Apodemes and the epimeral borders well developed, composing a network. Epimeral setal formula: 1—1—3—2.

Anogenital region: Without any structure. Anogenital setal formula: 4—1—2—3. Setae ad_2 and ad_3 situated in adanal position.

Type species: *Klapperiches nigrosetosus* MAHUNKA, 1978. Dominica.

Machadocephus BALOGH, 1958 (Figs 42—44, 96—97)

BALOGH, 1958: 20.

Prodorsum: Medium part of prodorsum very highly convex, a broad interlamellar apophysis present. Interlamellar setae arising on its anterior margin. Lamellae with sharp apex, lamellar setae arising on their outer margin, phylliform. Sensillus uncate. Tutorium weak.

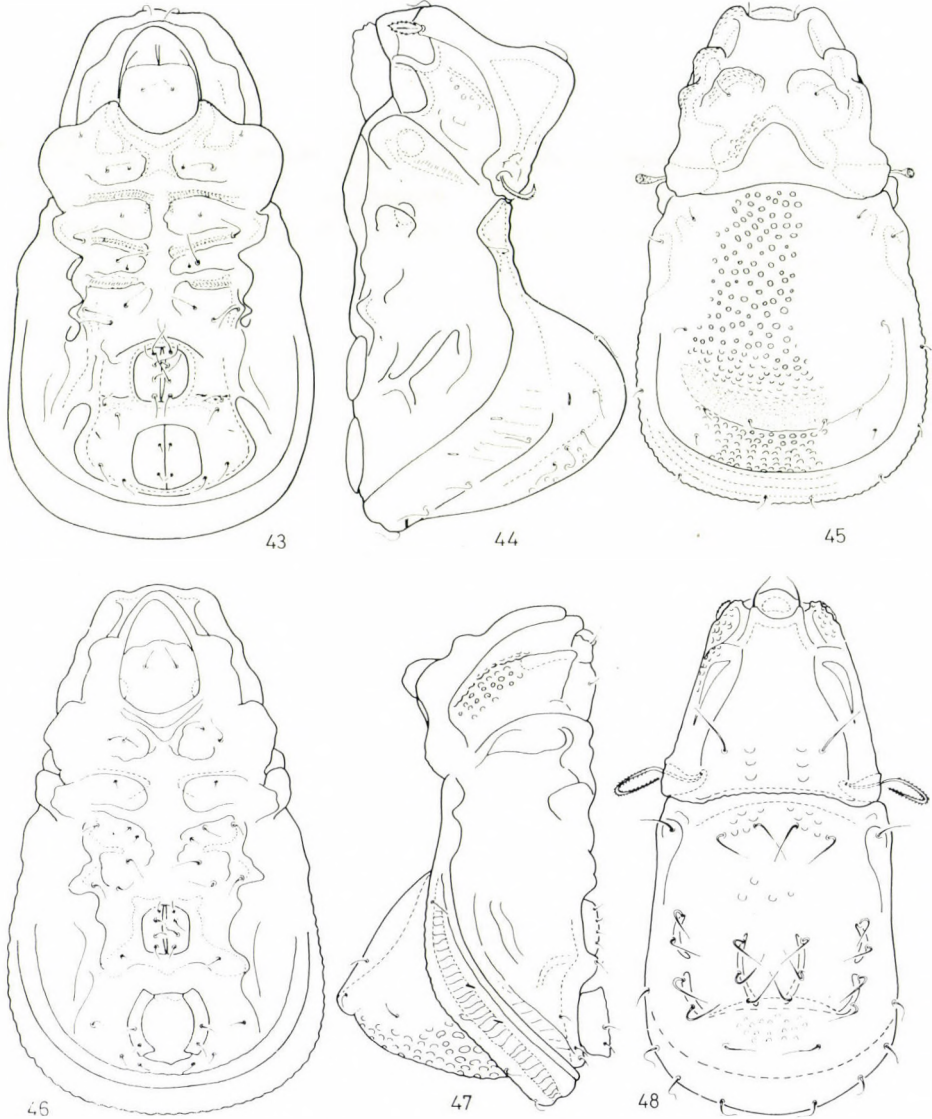
Notogaster: Dorsosejugal region with deep hollow, posterior part of notogaster with a very high elevation. Fifteen pairs of thin, simple notogastral setae present.

Coxisternal region: Apodemes and epimeral borders well developed, composing a network. Epimeral setal formula: 3—1—3—3.

Anogenital region: Strongly chitinized, with longitudinal and transversal costulae. Anogenital setal formula: 4—1—2—3. Setae ad_1 and ad_2 in adanal, ad_3 in preanal position, the latter pair very near to aggenital setae. Lyrifissure *iad* situated laterally.

Type species: *Machadocephus excavatus** BALOGH, 1958. Dem. Republic of Congo.

* Its redescription is given in an other part of this article.



Figs 43—48. 43—44: *Machadocephus excavatus* BALOGH, 1958, 45—47: *Meriocephus peregrinus* AOKI, 1973, 48: *Neocarabodes sexpilosus* BALOGH et MAHUNKA, 1969 (after AOKI: 45—47; 43—44 and 48 original)

Meriocephus AOKI, 1973 (Figs 45—47)

AOKI, 1973: 94.

Prodorsum: Three pairs of large elevations present, one of them in interlamellar position. A deep triangular concavity present basally. All prodorsal setae thin and simple. Sensillus short, clavate. Tutorium present.

Notogaster: Posteromedian part with a high elevation, anterior part excavate. Ten pairs of fine, short notogastral setae present, one pair arising on the humeral projection.

Coxisternal region: Third and fourth epimeres fused, all other well framed. Epimeral setal formula: 2—1—3—2.

Anogenital region: Strongly chitinized, some ridges also observable. Anogenital setal formula: 4—1—2—3. Setae ad_3 in adanal position (!) Lyrifissure *iad* was not observable.

Type species: *Meriocephus peregrinus* AOKI, 1973. Irimore I. (Japan).

Remarks: The description was based on the holotype only.

Neocarabodes BALOGH et MAHUNKA, 1969 (Figs 48—50, 98)

BALOGH et MAHUNKA, 1969: 8.

Prodorsum: Its surface without elevation or protuberances, but the broad lamellae having a double structure. Lamellar setae arising on the lateral surface of lamellae, lamellar cuspis sharp, rostral setae originating between them. Interlamellar setae arising on the prodorsal surface. Sensillus uncate. Tutorium well observable.

Notogaster: Dorsosejugal region normal. Notogaster with high elevation and some mostly longitudinal crests medially. Fifteen pairs of thin notogastral setae present, one of them in humeral, four in posteromarginal position.

Coxisternal region: All epimeres well framed by the epimeral border, but between them a broad median filed present with two rounded, slightly concave hollows. Epimeral setal formula: 3—1—3—2.

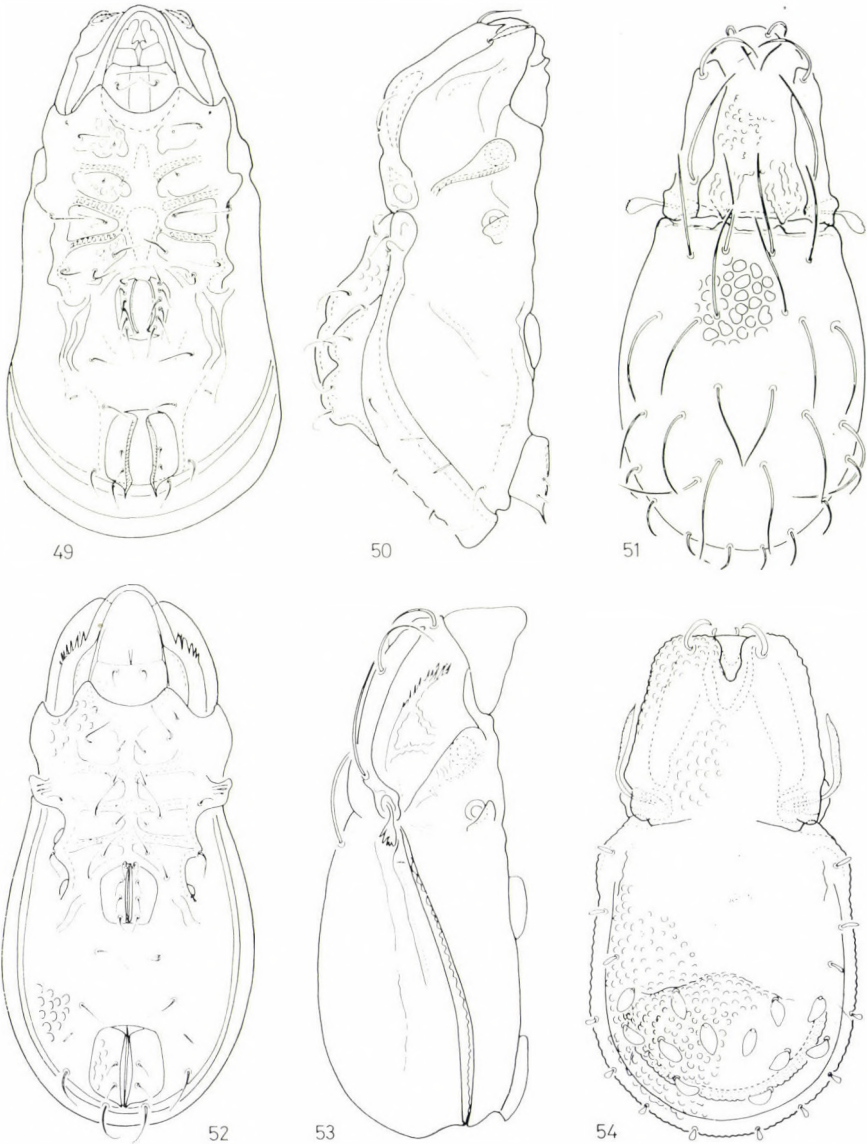
Anogenital region: Weak longitudinal crista present. Anogenital setal formula: 6—1—2—3. Setae ad_1 and ad_2 in postanal, ad_3 in preanal position. Lyrifissure *iad* situated far from the anal aperture.

Type species: *Neocarabodes sexpilosus* BALOGH et MAHUNKA, 1969. Brazil.

Odontocephus BERLESE, 1913 (Figs 51—53, 99—100)

BERLESE, 1913: 95.

Prodorsum: Lamellae rounded anteriorly, lamellar and interlamellar setae arising on their dorsal surface. All prodorsal setae long, thin, rostral ones bent backwards. Sensillus short, clavate. Interlamellar region flat, one pair of basal tubercles directed posteriorly, standing opposite to median notogastral condyles. Tutorium well developed, with long spines on the anterodorsal margin.



Figs 49—54. 49—50: *Neocarabodes sexpilosus* BALOGH et MAHUNKA, 1969, 51—53: *Odontocepheus elongatus* (MICHAEL, 1879), 54: *Opisthocephus kirai* AOKI, 1977 (after AOKI: 54; 49—53: original)

N o t o g a s t e r : Dorsosejugal region with two pairs of condyles. No other notogastral structure present. Fourteen pairs of long notogastral setae present, three anterior pairs directed forwards.

C o x i s t e r n a l r e g i o n : Apodemes and epimeral borders well developed, composing a network. Epimeral setal formula: 3—1—3—3.

Anogenital region: Without any structure. Anogenital setal formula: 4-1-2-3. Setae ad_1 in postanal, ad_2 in adanal, ad_3 in preanal position. Lyrifissure *iad* in paraanal position.

Type species: *Tegeocranus elongatus* MICHAEL, 1979. Great Britain.

Opisthocephus AOKI, 1977 (Figs 54-56)

AOKI, 1977: 45.

Prodorsum: Lamellae fused medially and covering the greatest part of prodorsum, their anterior part highly elevated, lamellar setae arising here; interlamellar setae absent.* Sensillus gradually dilated, directed forwards. Tutorium well observable.

Notogaster: Dorsosejugal area strongly excavated, dorsosejugal suture indistinct. Posteromedian part of notogaster highly projecting. Thirteen pairs of notogastral setae present, one pair in humeral position. All notogastral setae more or less phylliform.

Coxisternal region: Epimeral setal formula: 3-1-2-3. Epimeral borders well developed, so all epimeres well framed.

Anogenital region: A pair of strong longitudinal ribs ending in a tubercle present. Anogenital setal formula: 4-1-2-3. Lyrifissure *iad* was not mentioned in the original description.

Type species: *Opisthocephus kirai* AOKI, 1977. Malaysia.

Remarks: Only the holotype is known.

Pasocephus AOKI, 1977 (Figs 57-58)

AOKI, 1977: 43.

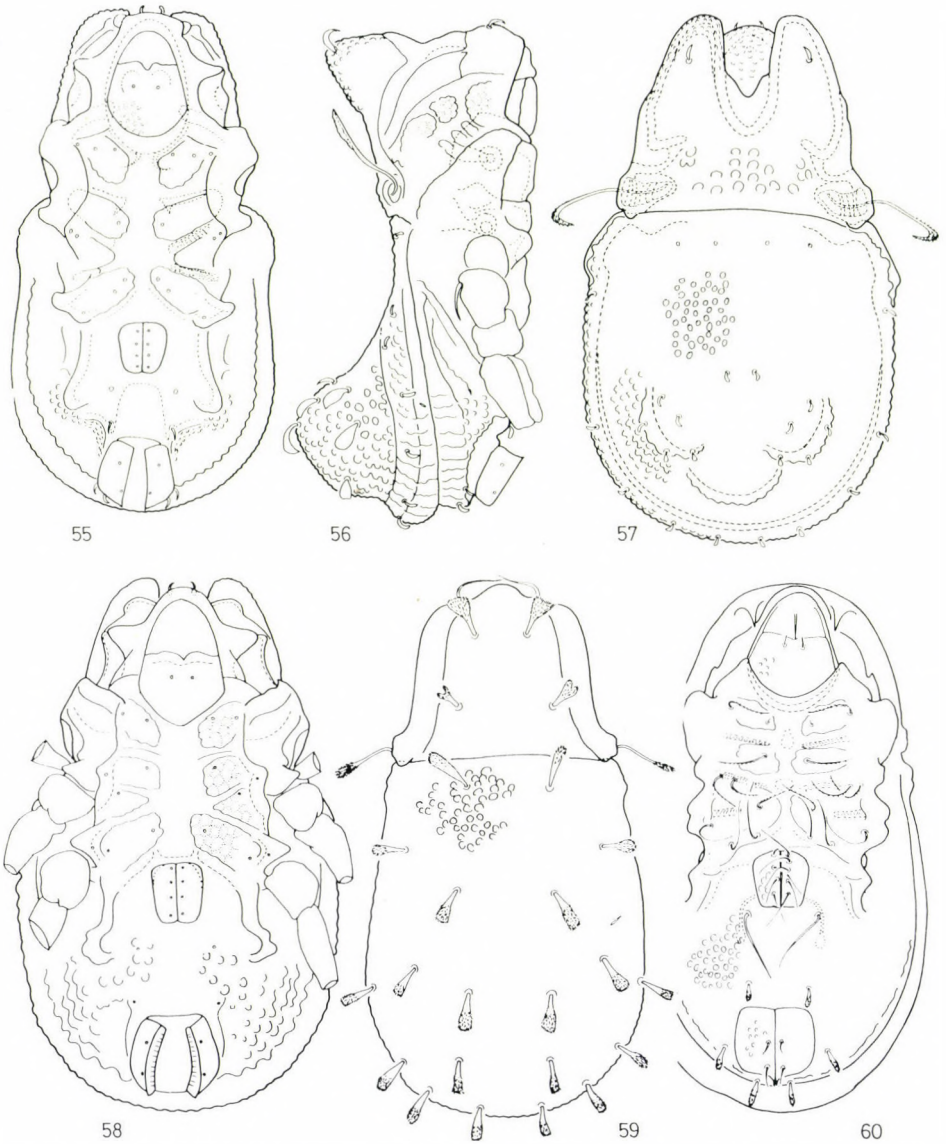
Prodorsum: Lamellae fused medially and highly elevated anteriorly covering the most part of prodorsum. Lamellar setae arising on the anterior surface of lamellae.** Sensillus thin, cordiform, bent backwards.

Notogaster: Dorsosejugal suture well observable. Posteromedian part of notogaster elevated, with 3 separated protuberances. Thirteen pairs of slightly dilate notogastral setae, but no setae in humeral position.

Coxisternal region: Epimeral setal formula: 2-1-2-3. Epimeral borders well developed, epimeres framed also medially.

* It is also possible, that in fact the "lamellar" setae are the interlamellar ones, and the true lamellar setae are reduced or hardly visible.

** See the footnote of the previous species.



Figs 55—60. 55—56: *Opisthocephus kirai* AOKI, 1977, 57—58: *Pasocephus triarcuatus* AOKI, 1977, 59—60: *Pentabodes insolitus* P. BALOGH, 1984 (after AOKI: 55—58; 59—60: original)

Anogenital region: A pair of strong longitudinal ridges ending in a tubercle, present laterally. Anogenital setal formula: 4—1—2—3. Lyrifissure *iad* was not mentioned.

Type species: *Pasocephus triarcuatus* AOKI, 1977. Malaysia.

Pentabodes P. BALOGH, 1984 (Figs 59—60, 101)

P. BALOGH, 1984: 321.

Antillobodes MAHUNKA, 1985: 124 (1984) *syn. nov.*

Prodorsum: Prodorsal surface simple, lamellae thin, their cuspis long, bent backwards, directed toward the mentum. Rostral setae thin, simple, rostral one dilated, cuneiform, but their lamina bent back. Sensillus long, with a small laminate head. Surface without any structure, but well pustulate.

Notogaster: Dorsosejugal region normal, notogastral surface evenly convex, without structure or elevation. Ten pairs of notogastral setae present.

Coxisternal region: Apodemes — excepting ap. 3 — long, epimeral borders well developed, framing all epimeres. Epimeral setal formula: 2—1—3—3.

Anogenital region: Without structure. Anogenital setal formula: 5—1—2—3. Adanal setae dilated, aggenital setae thin but very long. Anal plates with long spines posteromedially.

Legs: Surface of all joints of leg smooth. Setae *u* bifurcate.

Type species: *Pentabodes insolitus* P. BALOGH, 1984. Columbia.

Phyllocarabodes BALOGH et MAHUNKA, 1969 (Figs 61—63, 102—103)

BALOGH et MAHUNKA, 1969: 48.

Prodorsum: Lamellae with sharp cuspis, rostral setae thin, arising near to them. Lamellar setae phylliform, originating in the interlamellar area. Prodorsal surface without any structure. Sensillus long, with dilated, laminate head. Tutorium denticulate.

Notogaster: Dorsosejugal region normal. Its surface evenly convex without any structure. Ten pairs of notogastral setae present.

Coxisternal region: Apodemes and epimeral borders well observable, but bo. 3 short. Median area cordiform. Epimeral setal formula: 2—1—3—3.

Anogenital region: Along the genital aperture a pair of longitudinal costulae present. Anogenital setal formula: 6—1—2—3. All adanal setae phylliform. Lyrifissure *iad* originating far from the anal aperture.

Type species: *Phyllocarabodes octogonalis* BALOGH et MAHUNKA, 1969. Bolivia.

Spathulocephus BALOGH et MAHUNKA, 1969 (Figs 64—66, 104)

BALOGH et MAHUNKA, 1969: 9.

Prodorsum: With strong transversal interlamellar apophysis, interlamellar setae arising on its surface. Lamellae blunt, lamellar setae arising on



Figs 61—66. 61—63: *Phyllocarabodes octogonalis* BALOGH et MAHUNKA, 1969, 64—66: *Spathulocephalus amazonicus* BALOGH et MAHUNKA, 1969 (original)

the truncate lamellar apex. Rostral setae arising behind them in interlamellar position. Sensillus long, with a small, dilated and laminate head.

Notogaster: Dorsejugal suture indistinct medially, a deep hollow present in the dorsejugal region. Notogaster with a high transversal

elevation medially, six pairs of the ten notogastral setae arising on it. Other four pairs standing in posteromarginal position.

Coxisternal region: Apodemes and epimeral borders weakly developed, all epimeral fields open medially. A strong annulate apodeme visible behind the mentum. Epimeral setal formula: 2—1—3—3, setae *1a* represented only by minute alveoli. In front of the genital aperture a hollow present.

Anogenital region: Genital and anal apertures framed by strong laths, a weaker and shorter longitudinal ones present laterally. Anogenital setal formula: 10—1—2—3. Genital and aggenital setae pilose, adanal setae phylliform. Anal setae spiniform. Lyrifissure *iad* (?) situated posteriorly, hardly observable. Anal plates with short but sharp spines posteromedially.

Type species: *Spathulocephus amazonicus* BALOGH et MAHUNKA, 1969. Brazil.

Tansocephus MAHUNKA, 1983 (Figs 67—69, 105)

MAHUNKA, 1983: 168.

Prodorsum: With a strong transversal apophysis, interlamellar setae arising near their anterior margin, on the inner margins of lamellae. Basal part of prodorsum slightly excavated. Lamellae rounded anteriorly, lamellar setae arising on their outer margin. Rostral setae arising in interlamellar position. Sensillus very short, its head dilated and verrucate.

Notogaster: Dorsosejugal region normal, notogastral surface without hollows or crista. Fourteen pairs of notogastral setae present, no seta in humeral position.

Coxisternal region: Apodemes and borders well developed, all epimeres well separated from each other. Epimeral setal formula: 3—1—3—3.

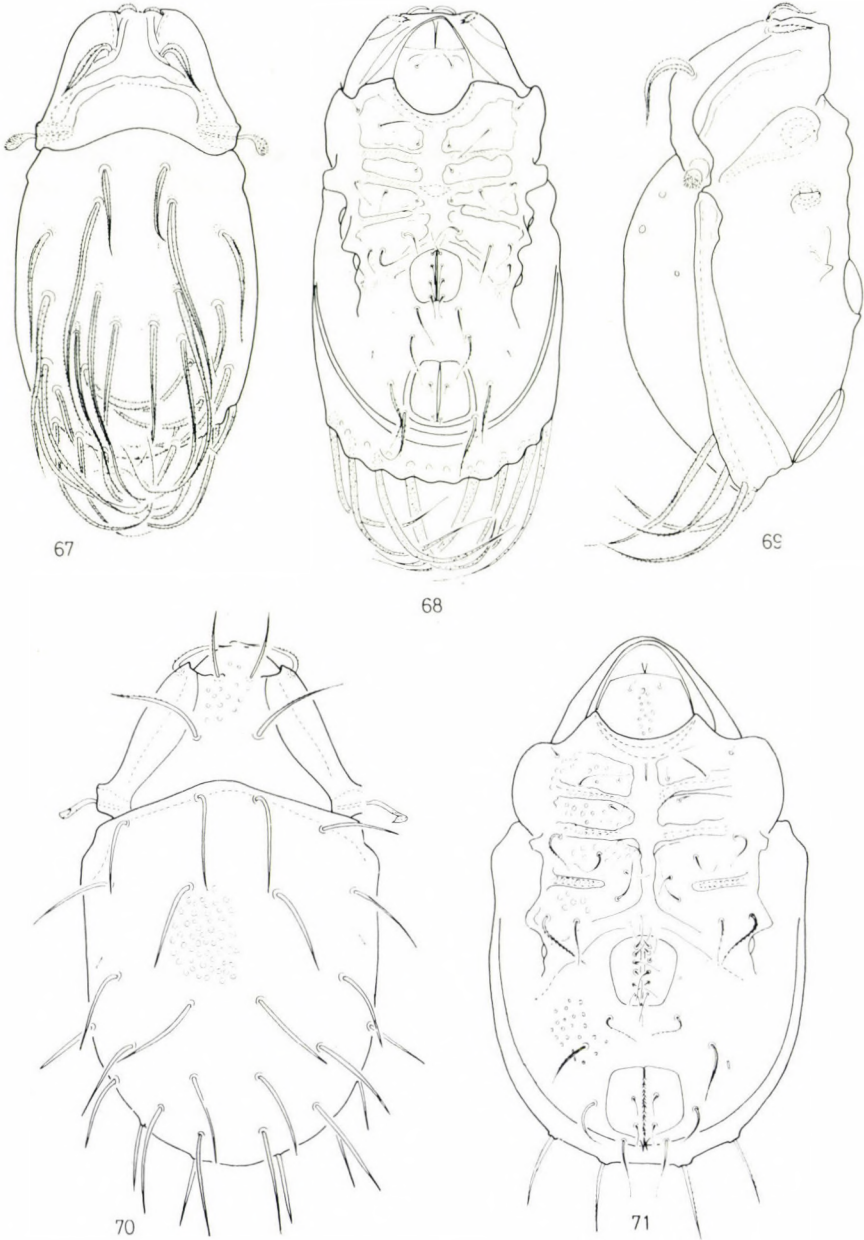
Anogenital region: Without any chitinous structure. Anogenital setal formula: 4—1—2—3. Lyrifissure *iad* originating far from the anal aperture.

Type species: *Tansocephus serratus* MAHUNKA, 1983. Tanzania.

Trichocarabodes BALOGH, 1961 (Figs 70—71, 106)

BALOGH, 1961: 276.

Prodorsum: Its surface evenly convex. Lamellae strongly convergent, with sharp outer cusps. Lamellar setae arising on their lateral surface, rostral and interlamellar setae in interlamellar position. Sensillus gradually thickened, its end bent backwards.



Figs 67–71. 67–69: *Tansocephus serratus* MAHUNKA, 1983, 70–71: *Trichocarabodes celisi* (BALOGH, 1958) (original)

Notogaster: Fourteen pairs of notogastral setae present, notogaster without any structure or hollow.

Coxisternal region: Apodemes and epimeral borders well developed, ap. 3 shorter than the others. Epimeral setal formula: 3-1-3-3.

Anogenital region: Without any structure. Anogenital setal formula: 6-1-2-3. Anal plates with long median spur. Lyrifissure *iad* situate far from the anal aperture.

Type species: *Carabodes celisi* BALOGH, 1958. Dem. Rep. of Congo.

Tuberocephus BALOGH et MAHUNKA, 1969 (Figs 72—73, 107)

BALOGH et MAHUNKA, 1969: 9.

Prodorsum: A pair of strong transversal apophysis present. Lamellae with sharp apex, lamellar setae phylliform, arising on the lateral surface of lamellae. Rostral and interlamellar setae thin, simple, originating in interlamellar region. Sensillus long, its head dilate, laminate. Tutorium strongly developed.

Notogaster: Dorsejugal suture well visible, but behind it a deep hollow present. Median part of notogaster highly elevated, with some crests. Twelve fine notogastral setae, 7 pairs arising in the elevated region, five pairs in posteromarginal position.

Coxisternal region: Epimeral borders well separating the epimeral fields from each other, median longitudinal field very broad. Epimeral setal formula: 3-1-3-3.

Anogenital region: A pair of strong longitudinal crista running parallel with the genital and anal apertures posteriorly. Anogenital setal formula: 4-1-2-3. Two pairs of adanal setae originating in postanal, one pair in preanal position. Lyrifissure *iad* well visible.

Type species: *Machadocephus longus* BALOGH, 1962. Madagascar.

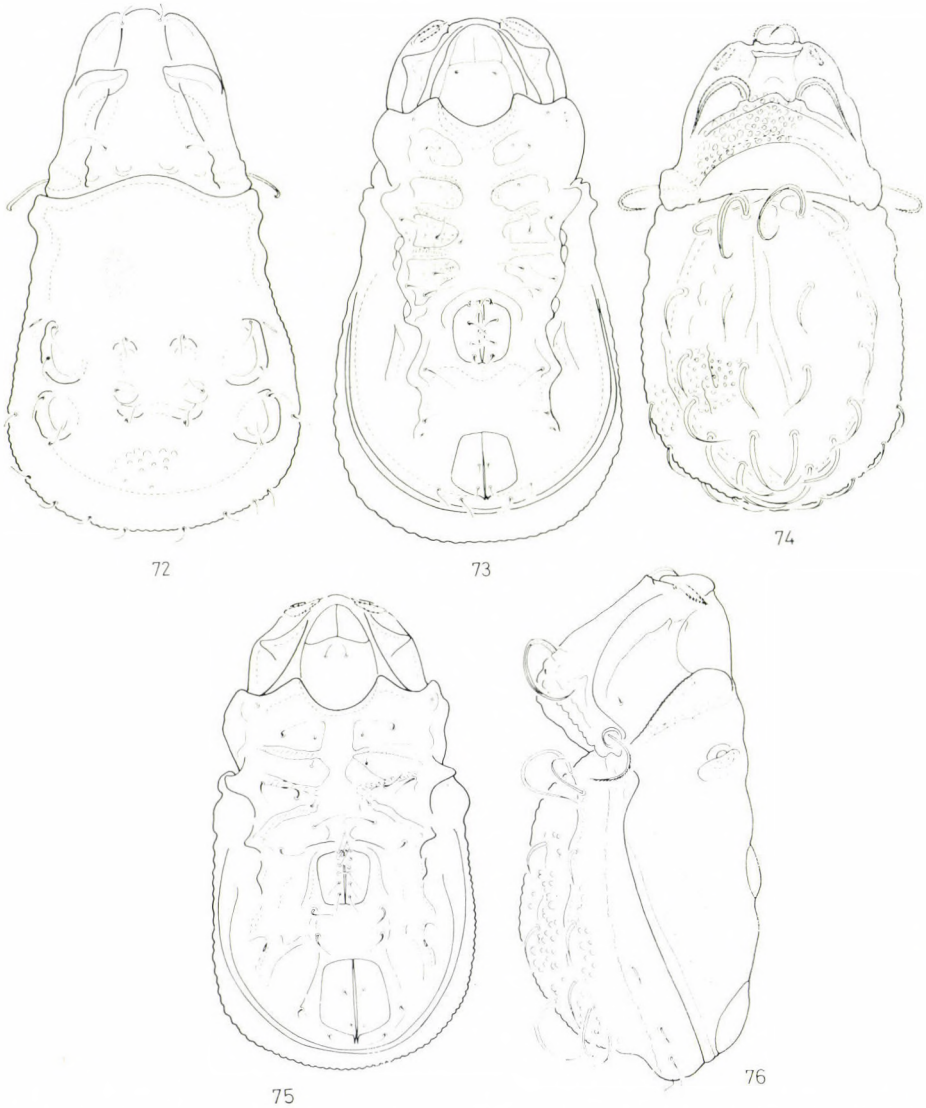
Uluguroides MAHUNKA, 1983 (Figs 74—76, 108)

MAHUNKA, 1983: 171.

Ulugurozetes MAHUNKA, 1984: 430. **nom. nud.**

Prodorsum: A well developed transversal apophysis present, interlamellar setae arising on its anterior margin. Lamellae with short apex, lamellar setae arising near to each other, in interlamellar position. Sensillus uncate. Tutorium strongly developed.

Notogaster: Dorsejugal region normal, median part of notogaster evenly convex, and without any sculpture. Fourteen pairs of notogastral setae present. No setae in humeral position.



Figs 72—76. 72—73: *Tuberocephus longus* (BALOGH, 1962), 74—76: *Uluguroides trichosus* MAHUNKA, 1983 (original)

Coxisternal region: Epimeral fields well framed by borders. Epimeral setal formula: 3-1-3-3.

Anogenital region: Ornamented with strongly chitinized crista or costulae. Anogenital setal formula: 6-1-2-3, among them setae *ag* and *ad*₃ standing very near to each other. Anal plates with long median spur posteriorly. Lyrifissure *iad* situated very far from the anal aperture.

Type species: *Uluguroides trichosus* MAHUNKA, 1983. Tanzania.

Yoshiobodes gen. n.

Subfamily Yoshiobodinae subfam. n.

Prodorsum: Prodorsal margin and lamellae strongly convergent. Lamellar setae arising on the lateral surface of lamellae, rostral setae on the prelamella-like costula. Interlamellar setae originating on the dorsal surface of lamellae. Interlamellar region concave, without any apophysis. Sensillus long, its head dilate, laminate. Tutorium well developed.

Notogaster: Without any structure or hollows, its surface evenly convex. Fifteen pairs of notogastral setae present, one of them in humeral position.

Coxisternal region: Apodemes nearly equal in length, not touching medially. Epimeral borders absent. Epimeral setal formula: 3-1-3-3.

Anogenital region: Without any structure. Anogenital setal formula: 4-1-2-3. Two pairs of adanal setae in postanal, one pair in preanal position. Anal plates with long, sharp median spur. Lyrifissure *iad* in paraanal position, situate far from the anal aperture.

Type species: *Carabodes irmayi* BALOGH et MAHUNKA, 1969. Bolivia.

DESCRIPTION AND REDESCRIPTION SOME NEW
OR LITTLE KNOWN SPECIES

Austrocarabodes ensifer (SELLNICK, 1931)

Measurements. — Length: 495—565 μm , width: 296—324 μm .

Prodorsum: Lamellae without cuspis, narrowing anteriorly and merging into the rostral surface (Fig. 81). Lamellar and rostral setae — similar to all dorsal setae of body — phylliform, their margin and median vein serrate (Fig. 82). Interlamellar setae arising near to the margin of lamellae, longer than notogastral setae. Interlamellar area irregularly areolate (Fig. 9). Sensillus long, directed slightly backwards, its head gradually thickened and rounded distally. Its surface spiculate. Tutorium well observable, but without cuspis.

Notogaster: Its surface covered by pustules, but they are absent marginally. This region also areolate.

Lateral part of podosoma: Pedotecta 1 large, areolate, pedotecta 2 small and smooth. Discidium well visible, triangular (Fig. 80).

Coxisternal region: Whole surface irregularly areolate, sharp borders between epimeres absent. Sejugal borders more visible than the others, composing a compressed ring medially. Epimeral setal formula: 3-1-3-3. All setae fine, short.



Figs 77—82. 77—78: *Aokiella florens* BALOGH et MAHUNKA, 1967: rostrum (77), anterior part of coxisternal region (78); 79—82: *Austrocarabodes ensifer* (SELLNICK, 1931): anogenital region (79), prodorsum in lateral side (80), rostrum (81), notogastral setae (82) (original)

Anogenital region: Irregularly areolate or rugose (Fig. 10). Anogenital setal formula: 4—1—2—3. Genital and aggenital setae setiform, short and fine; anal setae slightly longer, but similar to the preceding ones. Among the adanal setae ad_1 and ad_2 phylliform similar to notogastral setae, ad_3 standing in preanal position and only slightly thickened (Fig. 79). Lyrifissures iad reduced, or not visible owing to the rough sculpture.

Legs: Trochanter and femur of all legs areolate, surface of genu, tibiae and tarsi completely smooth. Femora of legs 3 and 4 with blade-like formation ventrally, their posterior end always elongate.

Material examined: 1 specimen (Neotypus): Levkas, oerhalb Phryni, ca 200 m, 27. 3. 1971, leg. B. HAUSER (1171-HO-1985); 10* exemplar from the same locality; some specimen: Cephalonia: Athera; tamisage sous Qu. coccifera près du bord de la mer; 9. IV. 1970; some specimen: Cephalonie; Assos; environs vers le nord, tamissage sous Qu. coccifera, 8. IV. 1970. Both were collected by Dr. B. HAUSER (Geneva).

Remarks: The holotype of this species does not exist, so on the ground of this material, which was collected near to the locus typicus by Dr. B. HAUSER, Geneva, I designate a neotypus, it is deposited in the Arachnoidea Collection of the Hungarian Natural History Museum, Budapest.

***Austrocarabodes flabellifer* sp. n.**

Measurements. — Length: 369—410 μm , width: 205—240 μm .

Prodorsum: Rostrum wide, rostral setae narrow but phylliform, shape resembling the much larger interlamellar ones. Lamellae short, without lamellar cuspis, lamellar setae very wide (Fig. 111), palmate, their outer margin spinulate. Lamellar surface smooth, interlamellar area granulate anteriorly, pustulate medially and basally, basally also some rugae present (Fig. 109). Sensillus uncate.

Notogaster: Its surface tuberculate, tubercles forming a polygonal reticulation (Fig. 112). Fourteen pairs of narrow, long but phylliform notogastral setae present. All have a strong median rib.

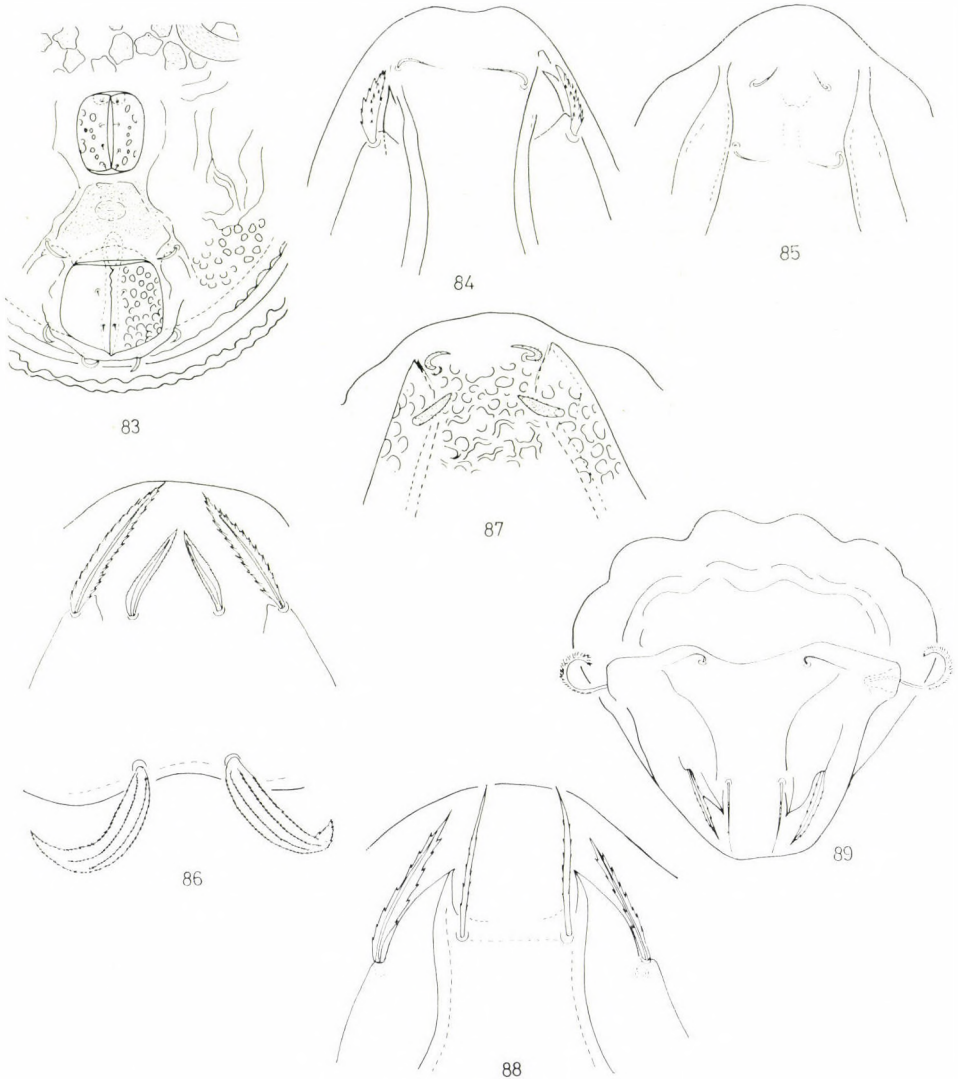
Lateral part of podosoma: Tutorium observable as a lateral crista. This surface areolate. Pedotecta I ornamented only by fine, hardly visible alveolae.

Coxisternal region: Mentum areolate, epimeral surface maculate, a polygonate reticulation also visible. Apodemes and epimeral borders well observable. Epimeral setal formula: 3—1—3—3. Setae *1a*, *1c*, *2a* short, minute, all other long (Fig. 110).

Anogenital region: Anogenital setal formula: 4—1—2—3, all short. Both pairs of anal setae arising on the posterior half of the anal plates. Ventral plate with a semicircular area around the anal aperture, here surface ornamented by a fine polygonal reticulation, elsewhere surface rugose. Genital plates also with some longitudinal ribs.

Material examined: Holotype (1097-HO-85): Angola, Environ Melage, forest litter and moss. 12. V. 1980, leg. Z. SZABÓ. 5 paratypes: from the same sample. Holotype and 2 paratypes (1097-PO-85) deposited in the HNHM, 2 paratypes: MRAT, 1 paratype: MHNG.

* Some of them deposited in the Museum D'Histoire Naturelle, Geneva.

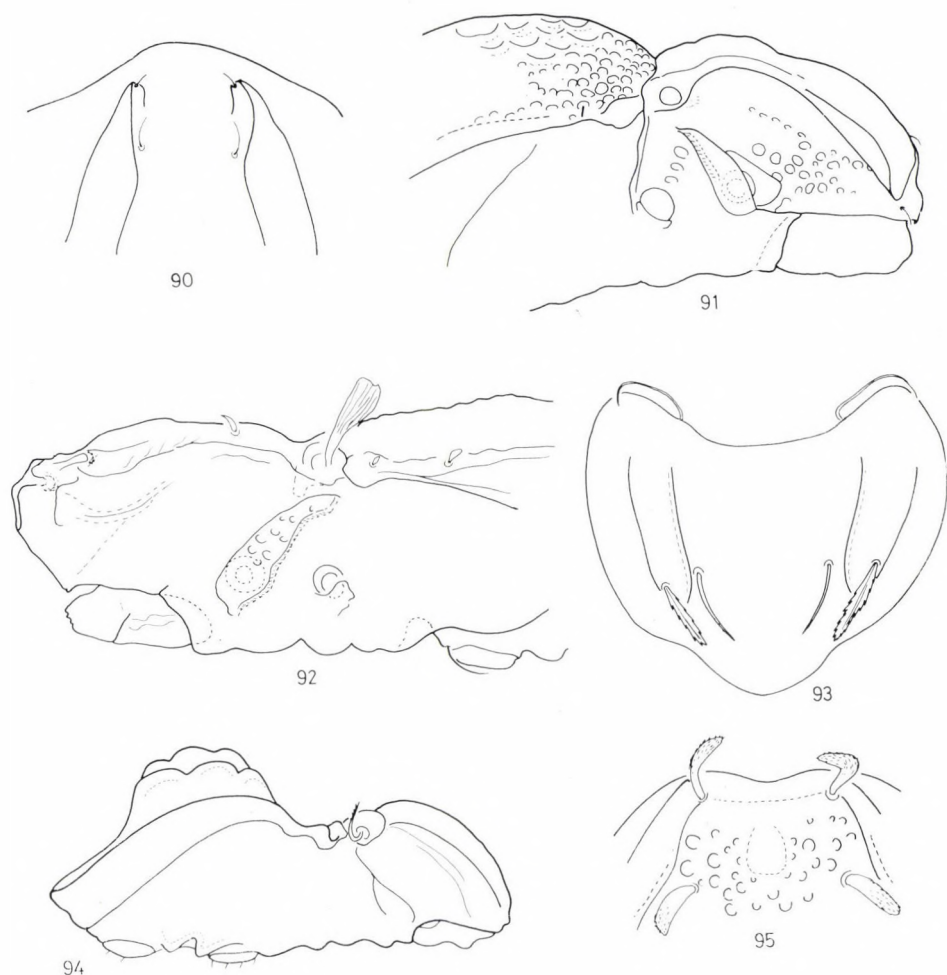


Figs 83—89. 83: *Bathocephus concavus* AOKI, 1978: anogenital region, 84: *Carabodes coriaceus* C. L. KOCH, 1836: rostrum, 85: *Cavernocarabodes perretti* MAHUNKA, 1974: rostrum, 86: *Congocephus heterotrichus* BALOGH, 1958: rostrum, 87: *Cubabodes hexagonalis* BALOGH et MAHUNKA, 1974: rostrum, 88—89: *Gibbicepheus elevatus* BALOGH, 1958: rostrum (88), habitus in anterior view (89) (original)

***Austrocarabodes pinnatus* sp. n.**

Measurements. — Length: 541—588 μm , width: 303—345 μm .

Pro dorsum: Rostrum semicircular, rostral setae long, slightly spathulate, arising on its dorsal surface, on small but well separated tubercles.



Figs 90—95. 90—91: *Gymnobodes fraterculus* (BALOGH, 1963), rostrum (90), prodorsum in lateral view (91), 92: prodorsum in lateral view; 93—94: *Kallioia simpliseta* MAHUNKA, 1985, rostrum (93), body in lateral view (94). 95: *Klapperiches nigrosetosus* MAHUNKA, 1978: rostrum (original)

Lamellae wide, their cusps ending far from rostrum. Lamellar setae phylliform with serrated margin, originating on the lateral part of cusps. Interlamellar setae similar to the rostral ones, but greater, arising also on ribs or tubercles. Rostral surface foveolated, lamellar ones with some wrinkles, in the interlamellar region stronger ribs visible. Sensillus (Fig. 116) long, gradually widened, laminate, this part being concave.

Notogaster: Whole surface covered by round pustules (Fig. 113). Fourteen pairs of spathulate notogastral setae of nearly equal length present

(Fig. 115). Its surface spiculate, a main vein and some thinner ones well observable.

Ventral side (Fig. 114): Mentum foveolated. Margin of pedotecta I with large tubercle, resembling a pock-mark. Epimeral surface smooth, or finely punctate, the apodemes and borders well visible. Epimeral setae straight, some of them finely roughened. Genital and anal apertures framed by chitinous laths, being connected to some other ones in the anogenital surface. Four pairs of genital setae present. All setae of the anogenital region — excepting the phylliform ad_1 and ad_2 setae — similar to the epimeral ones. Lateral margin of the ventral plate ornamented by wrinkles.

Legs: All trochanters and femora with very large foveolae, all genu, tarsi and tibia completely smooth.

Material examined: Holotype: E-Y. No. 1310: Rep. South Africa, S. Cape, Garden of Eden, 34.02 S—23.12 E, 13. 12. 1976, sifted litter, leg. Dr. S. ENDRŐDY-YOUNGA. 6 paratypes from the same sample. Holotype and 2 paratypes deposited in the TMP, 3 paratypes (1098-PO-85): HNHM, 1 paratype: MHNG.

Remarks: The new species is distinguished from all other members of this genus by the peculiar shape of its sensillus.

Austrocarabodes tarandus sp. n.

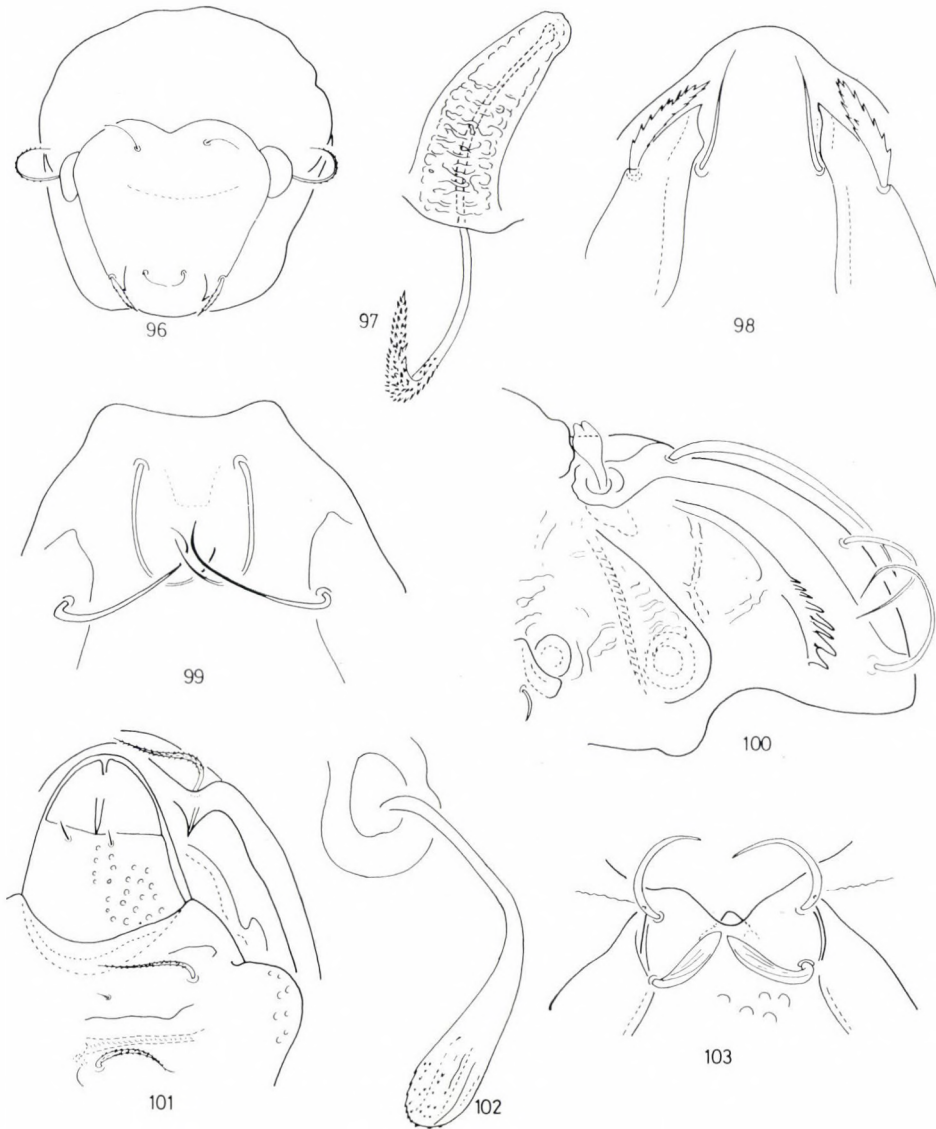
Measurements. — Length: 401—452 μm , width: 172—214 μm .

Prodorsum: Anterior rostral margin widely rounded, lamellae without sharp cuspis. Rostral setae, phylliform, similar to the interlamellar ones, but much smaller than the latter. Lamellar setae very broad (Fig. 118), the margin ramose. Rostral setae arising in front of lamellar ones. Lamellar surface smooth, interlamellar surface pustulate, on its basal part some rugae also present. Sensillus dilated proximally, bent dorsally, its surface distinctly barbed.

Notogaster: Its surface ornamented by a very characteristic sculpture, it consists of tubercles forming polygonate figures (Fig. 119). Fourteen pairs of phylliform, long, thin notogastral setae (Fig. 117), their margin smooth; strong median rib well visible.

Lateral part of podosoma: Tutorium without cuspis but well observable. Surface along tutorium and pedotecta alveolate (Fig. 121).

Coxisternal region: Epimeres and the surface of mentum areolate or partly maculate. Apodemes and borders of epimeres well visible, a transversal tectum in front of the genital aperture also present. Among the epimeral setae $1b$ the longest, $1a$, $1c$, $2a$ and $3a$ very short, all simple (Fig. 120).



Figs 96—103. 96—97: *Machadocepeus excavatus* BALOGH, 1958: body in anterior view (96), trichobothrium (97), 98: *Neocarabodes sexpilosus* BALOGH et MAHUNKA, 1969: rostrum, 99—100: *Odontocepeus elongatus* (MICHAEL, 1879): rostrum (99), prodorsum in lateral view (100), 101: *Pentabodes insolitus* P. BALOGH, 1984: anterior part of coxisternal region, 102—103: *Phyllocarabodes octogonalis* BALOGH et MAHUNKA, 1969: sensillus (102), rostrum (103) (original)

Anogenital region: Anogenital setal formula: 4—1—2—3. All setae simple and thin. Both pairs of the short anal setae arising on the posterior half of the anal plates. Ventral plate rugulose or partly rugose. A well-framed semicircular area around the anal aperture smooth. Lyrifissure *iad* absent.

Legs: Seta l'' G of legs I and II thin phylliform, long with denticulate margin. Setae u of all legs very broad, triangular.

Material examined: Holotype: Ang. 15135.14: Angola, Dundo: Galérie forestière R. Cambuacala, affl. R. du R. Luachimo (7.20 S, 20.52 E), 6. VI. 1960. leg. ED. LUNA DE CARVALHO. 30 paratypes: from the same sample. Holotype and 14 paratypes deposited in the MRAT, 14 paratypes: (1099-PO-85) HNHM, 2 paratypes: MHNG.

Remarks: The new species is well characterized by its very narrow body, its notogastral sculpture and by the shape of lamellar setae. On this ground the new species stands far from all *Austrocarabodes* taxa.

Berndobodes spiculifer sp. n.

Measurements. — Length: 312—376 μm , width: 176—238 μm .

Prodorsum: Lamellae with sharp outer cuspis, the lamellar setae arising on them. All prodorsal setae peach-leaf shaped, marginally and dorsally spiculate (Fig. 126), interlamellar setae greater than the other two pairs, their end bent backwards. Peduncle of sensillus (Fig. 123) gradually thinning outwards, before the head mostly thin. Peduncle finely roughened or spiculate, and spinulate.

Notogaster: Its shape nearly round, not of typical *Carabodes*. Fifteen pairs of notogastral setae present, one of them originating on the humeral apophysis, one other in the humeral region and altogether eight pairs arising on the anterior half of the notogaster. Seven pairs of further notogastral setae present on the posterior end of the notogaster. Three anterior setae thin, all originating anteriorly or anterolaterally, all others spathulate, their surface ispiculate (Fig. 122).

Ventral side: Apodemes and epimeral borders weakly developed, sternal apodeme absent, so epimeres open medially. Mentum with some round foveolae, other part of ventral plates smooth. All epimeral setae simple, short (Fig. 124). Beside the genital plates a pair of semicircular chitinous laths present. Around the anal opening also a well-developed lath observable bearing setae ad_1 and ad_2 . All adanal setae similar to prodorsal ones.

Material examined: Holotype: Malaysia, Sabah, Pal-83/36, leg. Dr. B. HAUSER, 5 paratypes: from the same sample. Holotype and 3 paratypes: MHNG, 2 paratypes (997-PO-84): HNHM.

Remarks: The new species is well distinguished from all congeners by the shape and the surface of the notogastral setae and the shape of the sensillus.

Carabodes coriaceus C. L. KOCH, 1836

C. L. KOCH, 1836: fasc. 3, t. 15 (not seen)

OUDEMANS, 1937: 2644, Fig. 1141.

SELLNICH et FORSSLUND, 1952: 381, Abb. 7.

Examined type series: The holotypus of this species does no longer exist, therefore I designate a neotypus. 1 specimen: Neotypus (1103-HO-85): Regensburg, Germany, from forest litter. 18. IX. 1976. leg. S. MAHUNKA and L. MAHUNKA-PAPP. Some other specimens: from the same sample. Other material: 10 specimens: Hungary, Bares Juniper Woodland, 14. VII. 1981, leg. S. MAHUNKA and L. MAHUNKA-PAPP; some specimens: Bükk hegység, Cotino-Quercetum, 1954, leg. I. LOKSA; Velencei hegység, Nadap, 1950, leg. Z. KASZAB.

Measurements. — Length: 324—562 μm , width: 224—276 μm .

Prodorsum: Lamellae without regular cusps (Fig. 84), but their proximal part continued to the insertion of the rostral setae, which is thin and arising before the phylliform lamellar ones. Lamellae broad, being connected with each other by a spectacles-like transversal projection (Fig. 13), being elevated from the prodorsal surface. Basal part of prodorsum slightly concave. Sensillus gradually dilated proximally, well barbed. Tutorium weak (Fig. 14).

Notogaster: Humeral projection comparatively strong. Cerotegument pustulate, forming a separate group. Ten pairs of dilated notogastral setae, 6 pairs of them in median position much longer than the four pairs in posteromarginal position.

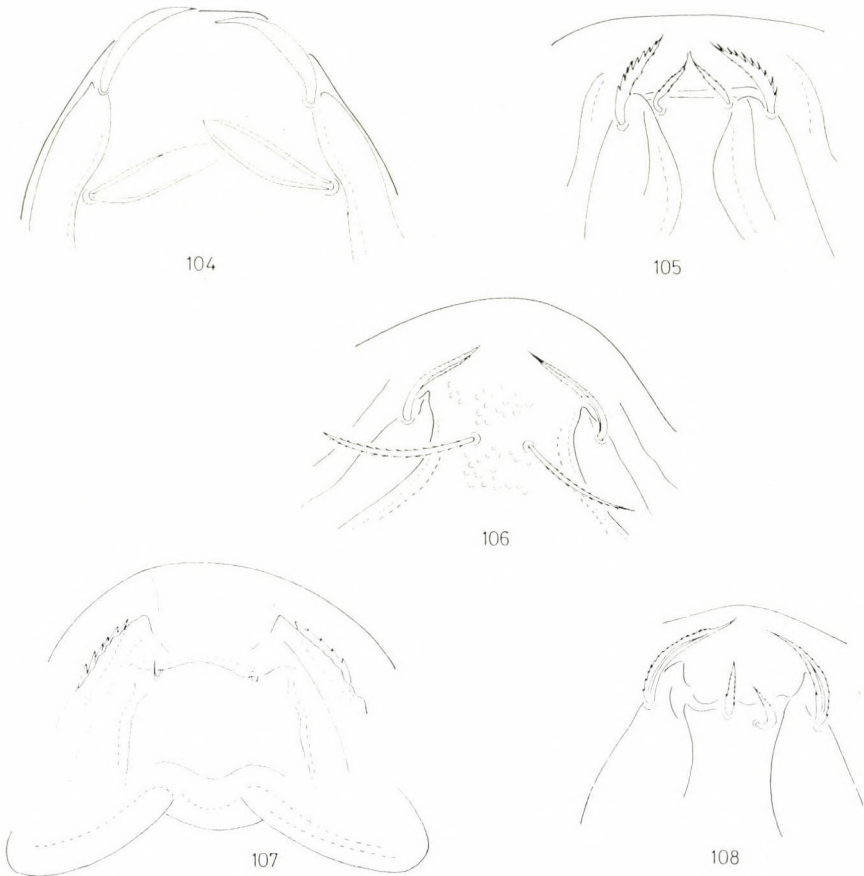
Coxisternal region: Whole surface foveolate. Epimeral borders only partly observable, some epimeres fused with each other. Two fields separated in longitudinal median part of this region (Fig. 15). Epimeral setal formula: 3—1—3—3, among them setae *Ib* much longer than *Ia* or *Ic*. All thin and simple.

Anogenital region: Genital and aggenital setae very long and thin. Adanal setae slightly dilated, with roughened surface, setae *ad*₂ in adanal, *ad*₃ in preanal position. Ventral plate with irregular sculpture partly resembling notogastral ones.

Carabodes coronatus sp. n.

Measurements. — Length: 422 μm , width: 246 μm .

Prodorsum: Lamellae well separated from the prodorsal surface, having a small free cusps, lamellar setae originating on them. Translamella absent. Interlamellar area concave and foveolate anteriorly, convex and pustulate basally (Fig. 127). Lamellar surface with irregular reticulation. Rostral and lamellar setae setiform, strongly curved, glabrous, interlamellar ones erect, finely roughened, arising on the inner border of lamellae. Sensillus

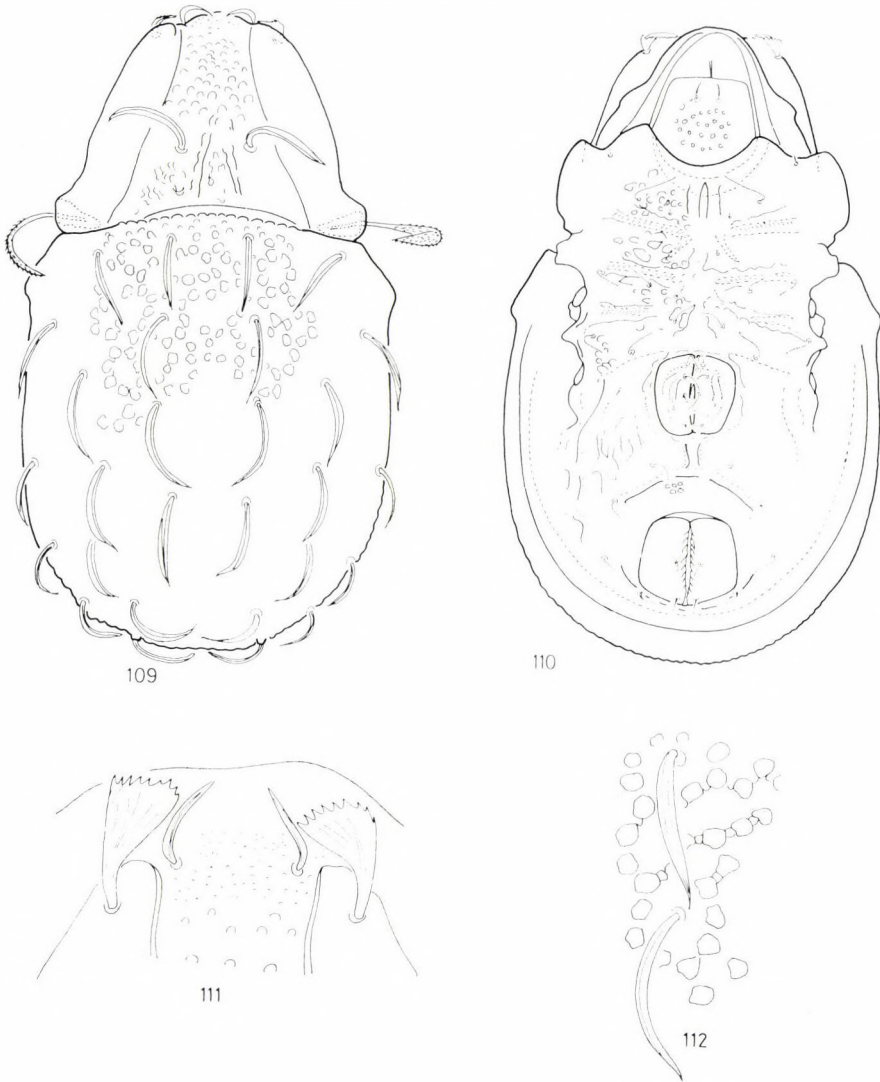


Figs 104—108. 104: *Spathulocepheus amazonicus* BALOGH et MAHUNKA, 1969: rostrum. 105: *Tansocepheus serratus* MAHUNKA, 1983: rostrum, 106: *Trichocarabodes celisi* (BALOGH, 1958): rostrum, 107: *Tuberocepheus longus* (BALOGH, 1962): rostrum, 108: *Uluguroides trichosus* MAHUNKA, 1983: rostrum (original)

(Fig. 128) long, with asymmetrically cuneiform head. Tutorium (Fig. 132) well developed, projecting from the surface of podosoma, its dorsal margin rugged (Fig. 130).

Notogaster: Surface pustulate, pustules with irregular margin (Fig. 127). Ten pairs of nearly spiniform, roughened setae (Fig. 131) present, setae in posteromarginal position slightly shorter than the median ones.

Coxisternal region: Apodemes typical for the genus, three pairs observable, all freely ending medially (Fig. 129); Ap. sej. longer than ap. 3, ap. 4 absent. Epimeral surface areolate, areolae of different size, longer marginally, smaller medially. Epimeral setal formula: 3—1—3—3. All setae slightly spiniform.



Figs 109—112: *Austrocarabodes flabellifer* sp. n. — 109: dorsal side, 110: ventral side, 111: rostrum, 112: sculpture and setae of the notogastr

Anogenital region: Surface pustulate, similar to notogastral ones. Genital plates with some smaller, anal plates with some larger foveolae. Anogenital setal formula: 4—1—2—3. All setae — excepting ad_1 and ad_2 — short, simple, setae ad_1 and ad_2 long, similar to notogastral ones (Fig. 129).

Legs: Trochanter and femur of all legs ornamented by large areolae, genu, tibia and tarsus glabrous.

Material examined: Holotype (1100-HO-85): S.-Afr. 3.: Rep. South Africa, Lottering Forest, Tsitsikamma Mts. cca 45 km E Plettenberg Bay, 33°57' S—23°43' E, 12. XII. 1977. From soil traps. leg. Dr. S. ENDRÓDI. Holotype deposited in the HNHM.

Remarks: The new species may be distinguished from all congeners by the very characteristic form of the tutorium.

Congocepeus heterotrichus BALOGH, 1958

BALOGH, 1985: 21.

Examined type material: Holotype and 62 paratypes: C.B. 10287-48: Congo, district du Kasai, Rivière Luebo, entre Tshikapa et Luluabourg, forêt équatoriale, 14. IX. 1955. Holotype and 30 Paratypes: MRAT, 30 paratypes (1104-PO-85): HNHM, 2 paratypes: MHNG. Other material: 40 specimens: Ang. 16840: Dundo: Galérie forestière Rivière Camaconde (7.21 S, 20.50 E), 25. I. 1962.

Measurements. — Length: 360—451 μm , width: 176—247 μm .

Prodorsum: Median part highly convex medially in lateral view (Fig. 19), beside the dorsosejugal region, excavated. Rostral and lamellar setae arising on a transversal line, both pairs phylliform, with serrate margin, but lamellar setae coarsenally, rostral setae minutely serrate (Fig. 86). Lamellar cuspis hardly observable. Interlamellar setae directed laterally, originating on a transversal lath, an another transversal lath present between the bothridia. Sensillus imbricate, barbed.

Notogaster: Dorsosejugal region excavated, median part highly convex. Notogastral surface areolate. Fourteen pairs of phylliform notogastral setae present, among them two pairs (c_1 , c_2) directed forwards, long, four pairs in median position short, four pairs arising on the posterior slope of the median elevation long, and four pairs, different in their lengths, in postero-marginal position (Fig. 20).

Coxisternal region: Surface of mentum areolate, epimeral surface ornamented by irregular spots. Three pairs of apodemes (ap. 3, ap. sej., ap. 3) well observable, epimeral borders connected with each other. Sejugal and apodemes 2 directed obliquely backwards, ap. 3 slightly forwards. Epimeral setal formula: 3—1—3—3. Setae $1a$, $1c$, $2a$, $3a$ short or minute, all others long and slightly dilated, their surface roughened. Discidium well developed, its outer margin rounded (Fig. 21).

Anogenital region: Genital and anal apertures removed farther from each other than the length of the genital plate. Ventral plate well chitinized, some tectum and ribs observable. Anogenital setal formula: 4—1—2—3, all setae more or less dilated, thinner or broader, phylliform. Genital setae conspicuously long, also dilated. Lyrifissures *iad* well observable, originating far from the anal aperture.

Legs: Setae l'' G of legs I and II asymmetrically phylliform, with serrate margin.

Gibbibodes similis sp. n.

Measurements. — Length: 565—598 μm , width: 303—353 μm .

Prodorsum: Rostrum widely rounded. Lamellae with sharp cuspis (Fig. 134), well observable in frontal view. Lamellar setae phylliform, with serrate margin. Rostral setae slightly dilated, their surface slightly roughened, arising behind the lamellar cuspis. Interlamellar areae slightly concave but the posterior part of prodorsum very convex, without pustules, only some spots present. Sensillus unicate, its outer surface barbed. Interlamellar setae setiform, glabrous.

Notogaster: Median part highly convex, dorsosejugal, lateral and a wider part of posterior end of notogastrer flattened (Fig. 137). Notogastral surface with some longitudinal and transversal crests (Fig. 135), surface ornamented medially and laterally by smaller and finer, posteriorly by large areolae (Fig. 133). Fourteen pairs of very thin, setiform setae present.

Coxisternal region: Second, sejugal and third apodemes thin, ap. 3 shorter than both previously ones. Epimeral borders well observable, all — excepting bo. 3 — connected medially, composing a network. Epimeral setal formula: 3—1—3—3. Setae *1b*, *3b*, *3c*, *4a*, *4b* and *4c* long, thin all other minute. Setae *4b* stronger than the others. Epimeral surface without regular ornamentation, but some irregular spots visible (Fig. 136).

Anogenital region: Anogenital setal formula: 5—1—2—3 all very thin, and — excepting the anal setae — long. Lyrifissures *iad* originating far from the anal aperture in preanal position.

Legs: Setae *l'* G of legs I and II phylliform, elliptic, with finely serrate margin. Setae *u* of all tarsi spiniform, short.

Material examined: Holotype (1101-HO-85): Angola, Environ Melange, forest litter and moss. 12. V. 1980. leg. Z. SZABÓ. 4 paratypes: from the same sample. Holotypus and 2 paratypes (1101-PO-85) deposited in the HNHM, 1 paratype: MRAT, 1 paratype: MHNG.

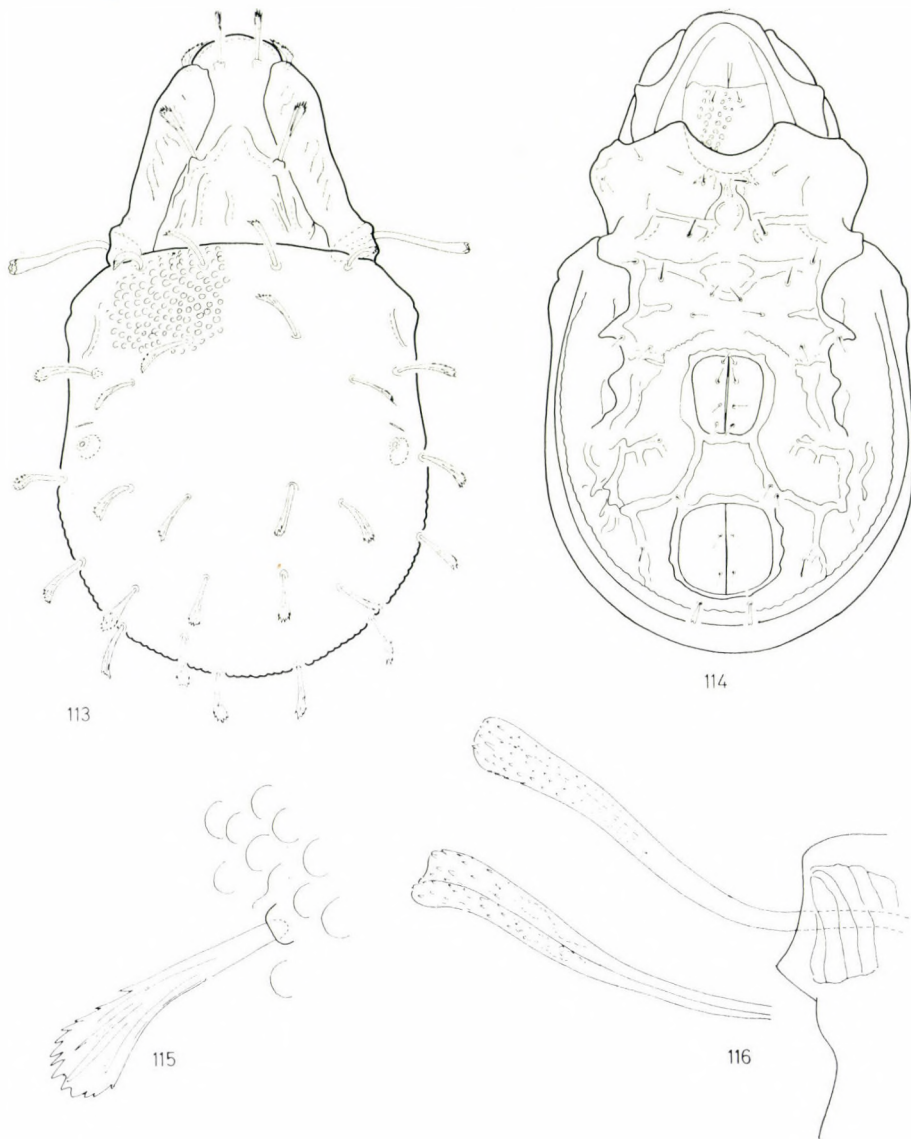
Gibbicepheus elevatus BALOGH, 1958

BALOGH, 1958: 20.

Examined type series: Holotype and 3 paratypes: Ang. 4117-8: Angola; Ruisseau Tcha-Muchito, sous-affl. de la Cavuemba, Alto Cuilo, Cacolo, galerie forestière des sources du ruisseau, l. VI. 1954. Station Ang. Leg. A. DE BARROS MACHADO. Holotypus: 1 ex., paratypus: 1 ex. Holotype and 1 paratype: MRAT, 1 paratype (1105-PO-85): HNHM, 1 paratype: MHNG. Other material: 1 specimen: Angola, Environ Melange, forest litter and moss. 12. IV. 1980. Leg. Z. SZABÓ; 18 specimen: Ang. 14614-16: Dundo, galerie forestière rivière Luachimo (7.21 S, 20.50 E), 7. IV. 1960. leg. A. DE BARROS MACHADO.

Measurements. — Length: 565—572 μm , width: 325—330 μm .

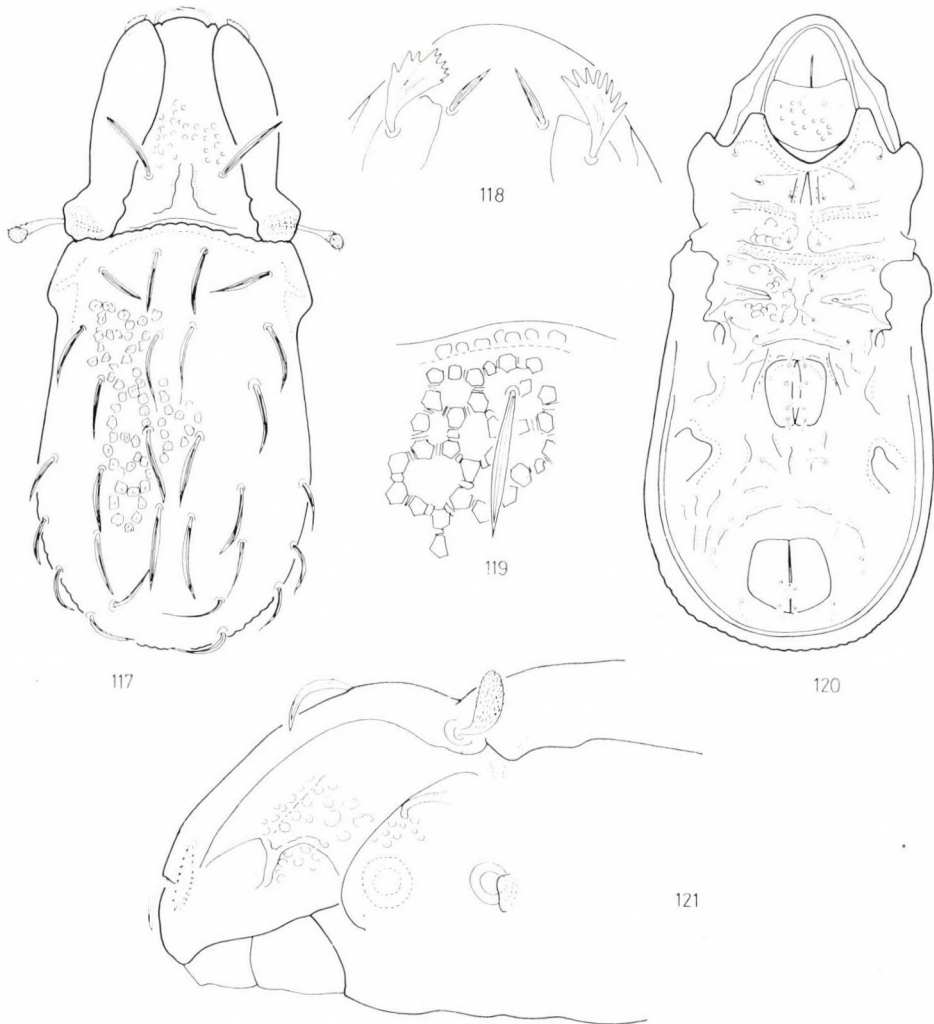
Prodorsum: Rostrum truncate. Lamellar apex sharply pointed (Fig. 88), lamellar setae arising laterally, phylliform, with serrate margin.



Figs 113—116. *Austrocarabodes pinnatus* sp. n. — 113: dorsal side, 114: ventral side, 115: notogastral seta, 116: sensillus

Rostral setae thinner than the lamellar one, but slightly thicker than the interlamellar ones. A weak translamellar line visible in dorsal view. Sensillus unicate, its outer surface verrucate.

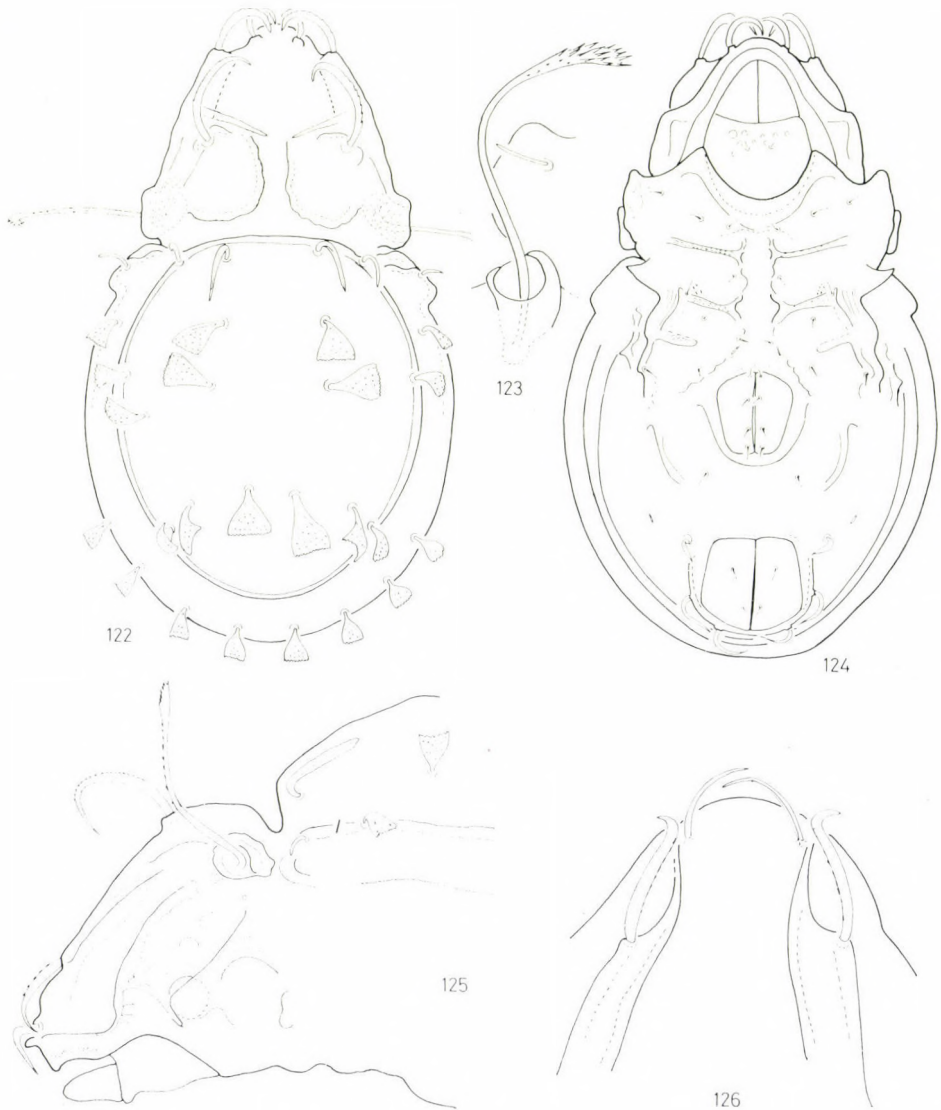
Notogaster: Medium part of notogaster convex, more arched partly broken elevated than dorsosejugal region (Fig. 31). On the surface four



Figs 117—121. *Austrocarabodes tarandus* sp. n. — 117: dorsal side, 118: rostrum, 119: sculpture and seta of the notogaster, 120: ventral side, 121: prodorsum in lateral view

longitudinal crests or ribs (Fig. 89) present. Median surface areolate, between the two ribs a weak polygonate sculpture observable, marginal part also partly polygonate, partly pustulate. Fourteen pairs of very thin, simple notogastral setae present.

Coxisternal region: Three pairs of apodemes well visible, ap. 2, ap. sej. longer than ap. 3. Epimeral borders hardly observable. Epimeral setal formula: 3—1—3—3. Setae *1a*, *1c*, *2a*, *3a* minute, all others thin, long and simple (Fig. 32). Epimeral surface weakly ornamented.



Figs 122—126. *Berndobodes spiculifer* gen. n. sp. n. — 122: dorsal side, 123: sensillus, 124: ventral side, 125: prodorsum in lateral view, 126: rostrum

Anogenital region: Anogenital setal formula: 4—1—2—4, all thin, simple and — with the exception of an_1 — an_2 — long. Both anal setae arising on the posterior half of the anal plates. Lyrifissures *iad* originating far from the anal aperture in preanal position. Ventral plate smooth medially and weakly pustulate posteriorly. Some larger fugae also visible.

Legs: Setae l'' G of legs I and II phylliform, with serrate margin.

Gymnobodes fraterculus (BALOGH, 1958)

Carabodes fraterculus BALOGH, 1958: 38, Figs 6—7.

Examined type series: Holotype and 1 paratype: C.B. 10287-48: Congo: district du Kasai, Rivière Luebo, entre Tshikapa et Luluabourg, forêt équatoriale, 14. IX. 1955. Holotype: MRAT, paratype (1106-PO-85): HNHM. Other material: 63 specimens: Ang. 14614-46: Angola, Environ Melanga, forest litter and moss. 12. IV. 1980. Leg. Z. SZABÓ.

Measurements. — Length: 248—288 μm , width: 120—148 μm .

P r o d o r s u m : Rostrum widely rounded. Lamellae with short cusps. Rostral and lamellar setae short, thin, simple, both pairs arising on the prodorsal surface and in interlamellar position (Fig. 90); lamellar setae not on the outer margin of the lamellae. Lamellae narrow, interlamellar region slightly concave, surface ornamented by a weak polygonal reticulation and, along the lamellae, some large, strong areolae. Interlamellae setae minute. Sensillus short, dilate setiform.

N o t o g a s t e r : Dorsejugal suture concave medially. Notogastral surface pustulate anteriorly and marginally, median part ornamented by a poorly visible polygonal reticulation. Ten pairs of minute notogastral setae present.

L a t e r a l p a r t o f p o d o s o m a : Surface ornamented by strong areolae (Fig. 91).

C o x i s t e r n a l r e g i o n : Apodemes and epimeral borders scarcely visible, epimeral surface irregularly maculate. Epimeral setal formula: $I-I-2-4$. All setae minute, hardly discernible.

A n o g e n i t a l r e g i o n : Surface ornamented by longitudinal ribs and by weak polygonal reticulation. A line of deep alveolae present along the posteromarginal line. Anogenital setal formula: $4-0-2-3$. All minute. Lyrifissure *iad* very poorly observable standing far from the anal aperture.

L e g s : All joints of leg glabrous, without sculpture. Setae of tarsus I spiniform, seta l'' G of leg II very large, longer than genu.

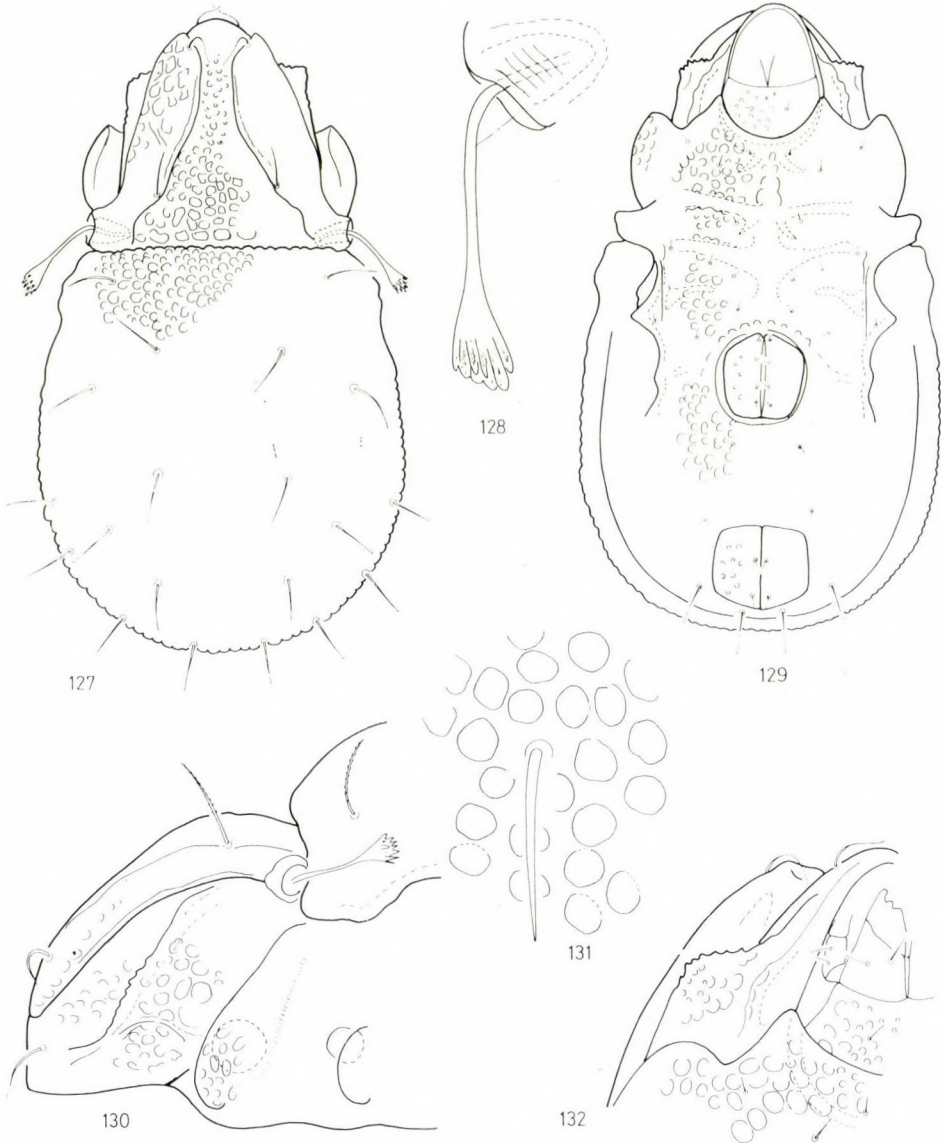
Machadocephus excavatus BALOGH, 1958

BALOGH, 1958: 21.

Examined type series: Holotype and 62 paratypes. Ang. 4370—1: Angola: Riv. Tchimboma, affl. E. du Cuango-Muque, galerie forestière des sources, Alto Chicapa, I.VIII. 1954. Station, Holotype and 30 paratypes: IRAT, 30 paratypes (1107-PO-55): HNHM, 2 paratypes: MHNG. Other material 1 specimen: Ang. 16888: Angola, Environs de Dundo, forêt de la Luachimo, 28. III. 1962. (SANJINJE et BARROS MACHADO coll.) 6 paratypes from the same sample. Holotype and 2 paratypes in the MRAT, 3 paratypes (1102-PO-85): HNHM, 1 paratype: MHNG.

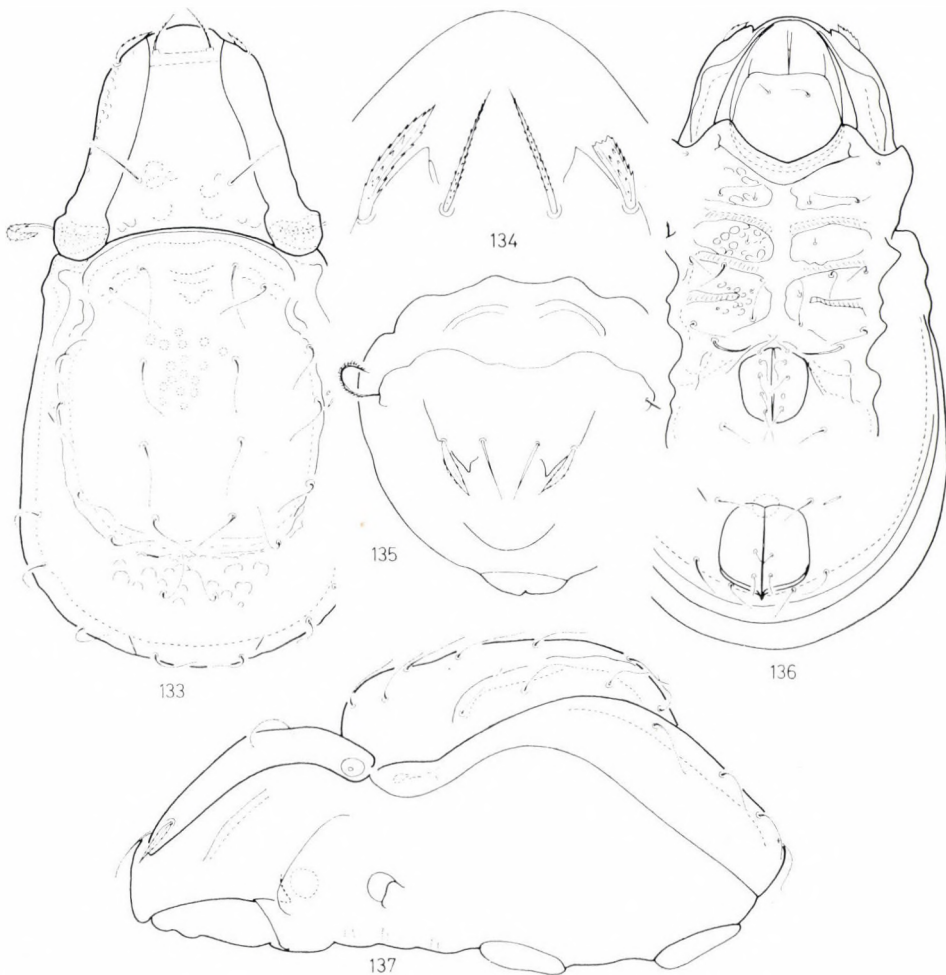
Measurements. — Length: 396—648 μm , width: 214—402 μm .

P r o d o r s u m : Very strongly convex medially (Fig. 43), but concave medially in anterior view (Fig. 96). Lamellae with sharp cusps, lamellar setae



Figs 127—132. *Carabodes coronatus* sp. n. — 127: dorsal side, 128: sensillus, 129: ventral side, 130: prodorsum in lateral view, 131: sculpture and seta of the notogaster, 132: tutarium

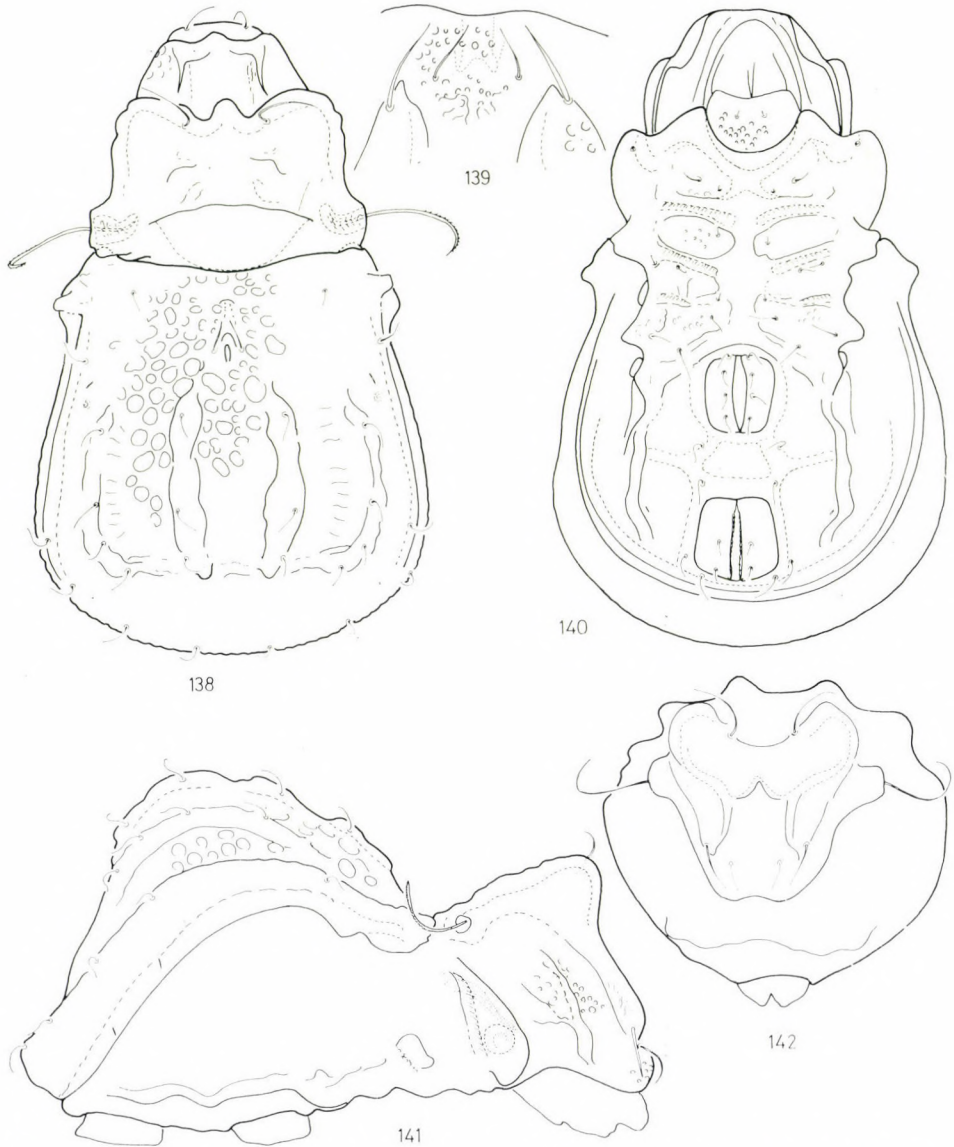
phylliform, with serrate margin. Rostral setae thin, arising comparatively near to each other, in a transversal line with the lamellar ones. Interlamellar setae also very thin, originating on the highest part of prodorsum. Bothridial cup very long (Fig. 97) sensillus unicate, its outer surface barbed. Prodorsal surface smooth, but some areolae marginally visible.



Figs 133—137. *Gibbibodes similis* gen. n. sp. n. — 133: dorsal side, 134: rostrum, 135: body in anterior view, 136: ventral side, 137: lateral side

Notogaster: Very strongly convex medially (Fig. 42) in lateral view. Dorsosejugal suture very sharp, well visible. Anteromedian part of notogaster excavate, a weak median and a pair of lateral crests running to the convex part. Surface smooth anteriorly and areolate on the posterior part of the elevation. Fifteen pairs of very thin, filiform notogastral setae present.

Coxisternal region: Much longer longitudinally than the anogenital region, well chitinized (Fig. 44). Among the apodemes ap. 2, ap. sej. and ap. 3 well observable. Borders also visible and distinctly separate all epimeres from one another. Epimeral setal formula 3—1—3—3. Setae *1b*, *3b*,



Figs 138—142. *Machadocephalus filiferus* sp. n. — 138: dorsal side, 139: rostrum, 140: ventral side, 141: lateral side, 142: body in anterior view

3c and *4a—4c* long, all other minute. Epimeral surface nearly smooth. Discidium well developed, its outer margin rounded.

Anogenital region: Genital and anal apertures originating very near to each other, distance between them much smaller than the length of genital opening. Ventral plate also well chitinized, some tecta or ribs present. Anogenital setal formula: 4—1—2—3. Genital setae very long, being longer

than adanal setae. Anal setae short, an_2 originating on the anterior half of anal plates. Lyrifissure *iad* well visible. Standing very far from the anal aperture.

Legs: Lateral setae ($l'' G$) of genu I and II asymmetrically phylliform.

***Machadocephus filiferus* sp. n.**

Measurements. — Length: 606—722 μm , width: 360—451 μm .

Prodorsum: Rostrum slightly concave, its surface foveolate (Fig. 139). Rostral setae thin. Lamellae with a triangular cuspis, lamellar setae setiform, margin neither serrate nor spinulate. Lamellae with some weak areolae but interlamellar surface smooth. Prodorsum strongly convex medially in lateral view, but the interlamellar area concave. Interlamellar setae setiform, long, reaching outwards. Sensillus very long, uncate but obtuse, its outer surface finely barbed. Dorsosejugal region deeply concave.

Notogaster: Median part strongly convex, with two pairs of strong (Fig. 138) and an unpaired, weaker and shorter crista. Excepting the marginal part — the whole surface irregularly areolate. Fifteen pairs of very thin, short, filiform notogastral setae present.

Lateral part of prodorsoma: A weak tutorium, without free cuspis observable. Pedotecta I with a tube (supracoxal gland) its orifice opening laterally. Surface of pedotecta smooth.

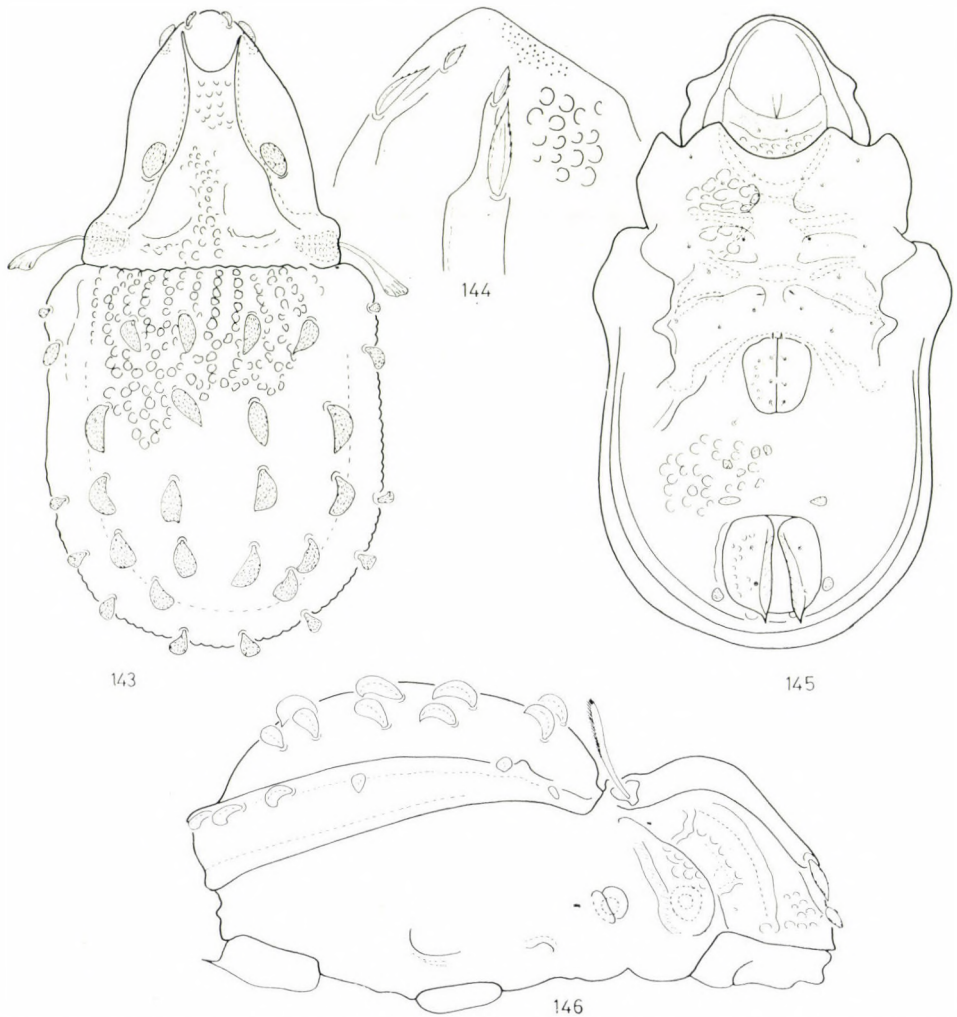
Coxisternal region: Mental and epimeral surface foveolate. Epimeral setal formula: 2—1—3—3. Setae $1c$ reduced. Epimeral borders well developed, being connected medially (Fig. 140).

Anogenital region: Anogenital setal formula: 4—1—2—3 [in one case five (!) pairs of genital setae]. All setae thin and simple. Genital and anal apertures well framed, some other tecta and ribs also present, one pair in marginal position stronger than the others. Lyrifissure *iad* well observable.

Legs: All trochanters and femora strongly foveolate, other joints glabrous. Seta $l'' G$ of the legs I and II spiniform.

Material examined: Holotype: Ang. 16888: Angola, Environs de Dundo, forêt de la Luachimo, 28. III. 1962. (SANJINJE et BARROS MACHADO coll.) 6 paratypes from the same sample. Holotype and 2 paratypes in the MRAT, 3 paratypes (1102-PO-85): HNHM, 1 paratype: MHNG.

Remarks: On the ground of the very thin, filiform setae and the notogastral crests the new species may be well distinguished from all the other *Machadocephus* species.



Figs 143—146. *Yoshiobodes irmayi* (BALOGH et MAHUNKA, 1969). — 143: dorsal side, 144: rostrum, 145: ventral side, 146: lateral side

THE SYSTEMATIC POSITION OF THE GENUS *CARABOCEPHEUS*
BERLESE, 1913

The genus was established with the description of its type-species [*Carabodes (Carabocepheus) lounsburyi* sp. n.] and subsequently as subgenus, it was placed in the genus *Carabodes* C. L. KOCH, 1836 by BERLESE (1913). Later BALOGH (1961, 1965, 1972) also put it in the family Carabodidae. BALOGH and MAHUNKA (1966) without examining the holotype of the nominate subspecies described a new subspecies from South Africa, but they did not discuss the proper place of the genus.

During my present work I had to deal with this question, and on the ground of the examination of the type material of *Carabocephus lounsburyi* latior BALOGH et MAHUNKA, 1966 and of the newly collected material (S. ENDRŐDI and S. ENDRÖDY-YOUNGA of Pretoria) I obtained the following results.

The genus is well distinguished from all other Carabodidae genera and belongs to the relationship of the superfamily Otocepheoidea BALOGH, 1961. In my opinion it may not be ranged among the known families therefore, I propose a new family:

CARABOCEPHEIDAE fam. n.

Type genus. *Carabocephus* BERLESE, 1913

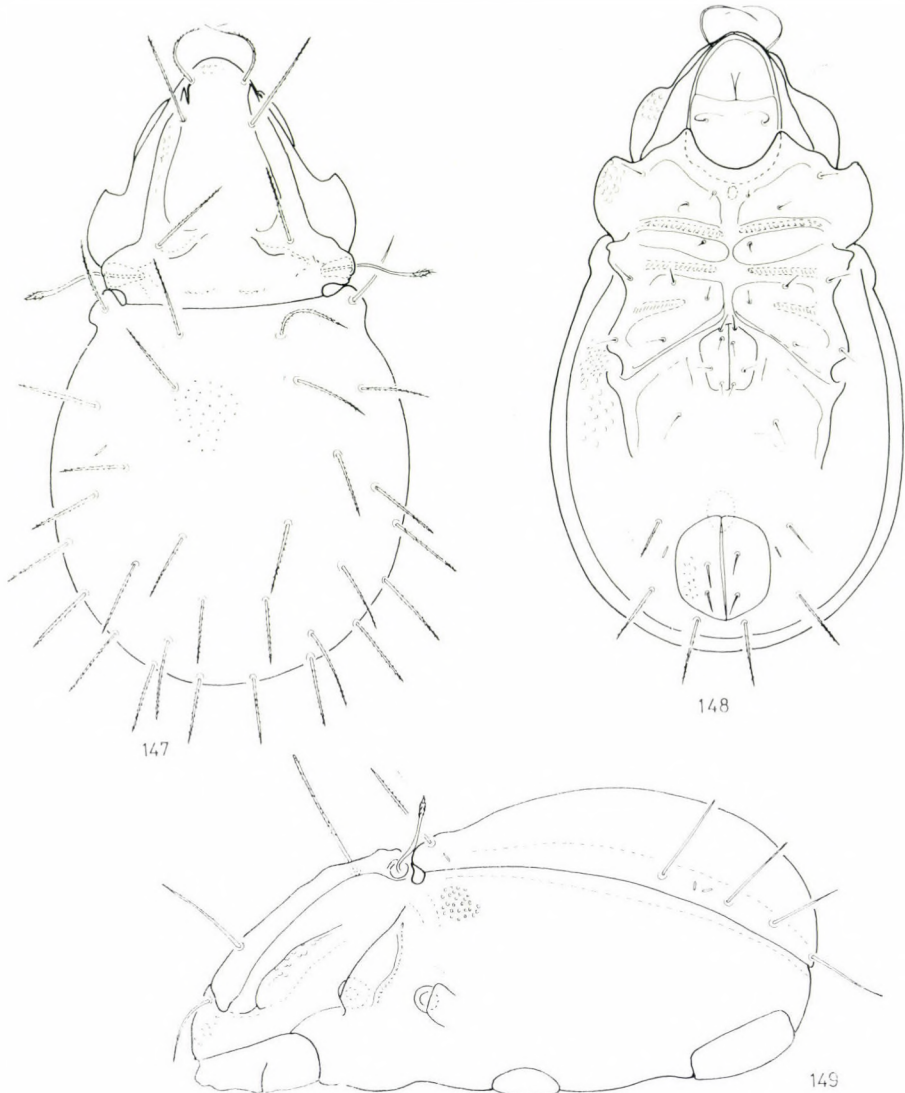
The redescription of the genus and its type-species, as well as the description of the new taxon follow hereunder:

Carabocephus BERLESE, 1913

D i a g n o s i s : Rostrum elongate, lamellae thin, slightly arched towards each other. Tutorium present. All prodorsal setae thin, setiform, lamellar setae arising on the dorsal surface of lamellae. Interlamellar setae arising basally, near to trichobothrium. Bothridium large, protruding from the outline of prodorsum. Sensillus long, with a small, spiculate head. Prodorsum and notogaster with two pairs of condyles each both situated laterally. Fourteen pairs of notogastral setae present, five pairs in posteromarginal position. Epimeral setal formula: 3—1—3—3. Anogenital setal formula: 4—1—2—3. Lyrifissure *iad* situated near to anal aperture.

Type species: *Carabodes (Carabocephus) lounsburyi* BERLESE, 1913.

R e m a r k s : It is well distinguishable from all Carabodoid genera by the shape of the rostrum, the laminiform tutorium, the prodorsal and notogastral condyles, the shape of prodorsal and notogastral setae, the situation of the lyrifissure *iad* and, first of all, the form and ratio of the tarsus and tibia of all legs. On this ground the taxon is well comparable with the Otocepheoid genera. However, it is distinguished from all taxa by the shape of its trichobothrium and by the form and situation of the condyles and the absence of the "spatium lamelliform expansion". Therefore the establishment of a new family is well justified.

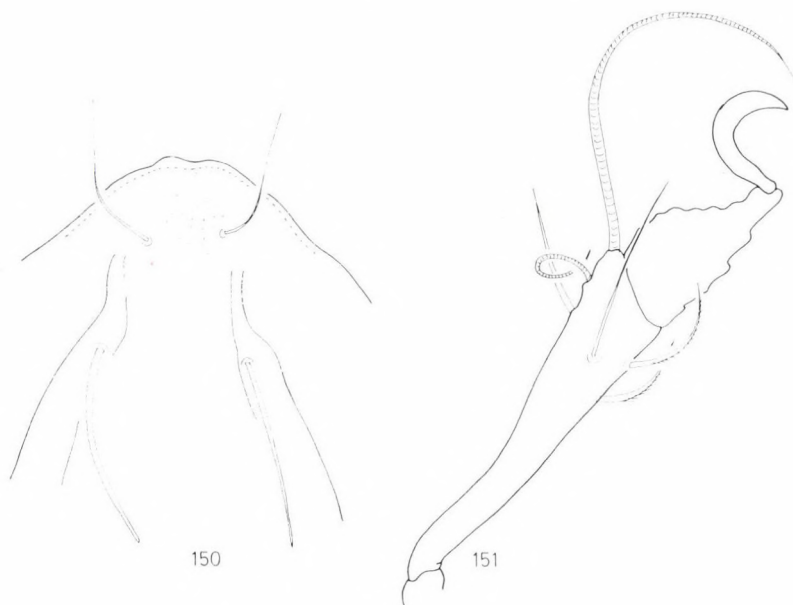


Figs 147–149. *Carabocpeheus lounsburyi* BERLESE, 1910 — 147: dorsal side, 148: ventral side, 149: lateral side

Carabocpeheus lounsburyi BERLESE, 1913 (Figs 147–151)

Measurements. — Length: 780–1450 μm , width: 420–800 μm .

Prodorsum: Rostrum slightly elongated, lamellae running marginally, without a free cuspis. Rostral and lamellar setae long, thin, setiform, lamellar setae arising on the dorsal surface of lamellae. The lamellar surface foveolated. A well-developed laminate turtorium present. Bothridium strongly



Figs 150—151. *Carabocephus lounsburyi* BERLESE, 1910 — 150: rostrum, 151: leg I

elevated from the body outline, sensillus long, directed outwards, with a scarcely dilating, spiculate head. Interlamellar setae arising near trichobothrium on a strongly chitinized region connecting the lamellae, and basally with the median notogastral condyles. Lateral condyles not separated from the bothridium. Interlamellar area very wide, its surface smooth.

Notogaster: Dorsosejugal suture straight medially, between notogastral condyles. Among the latter *co. nl.* resembling a very strong humeral projection, *co. nm.* smaller but sharply pointed. Fourteen pairs of long, setiform notogastral setae present, five of them in posteromarginal, one in humeral position. Surface of notogaster finely foveolate. Lyrifissure *iad* situated in laterodorsal, *in* and *ips* in lateromarginal position, very close to each other.

Lateral region of podosoma: Pedotecta I very large, rounded, pedotecta II—III small, triangular. Discidium small, hardly observable. Posterolateral part of this region granulate. No circumpedal carina present.

Gnathosoma: Chelicerae normal. Diarthric labiogenal articulation.

Coxisternal region: Apodemes — excepting *ap. 3* — long, composing a network. Epimeral surface smooth or only some spots visible. Epimeral setal formula: 3—1—3—3.

Anogenital region: Its surface foveolate only laterally, bearing a strong chitinous lath laterally, directed backwards from the acetabulum of legs IV. Anogenital setal formula: 4(5)—1—2—3, all simple, setiform. Setae *ad*₁ in postanal, *ad*₂ and *ad*₃ in adanal position. Surface of genital plates smooth,

anal plates well foveolate. Lyrifissure *iad* situated near to anal aperture, slightly in paraanal position.

Legs: Tarsus of all legs very short, tibia elongate. Claws very large, all legs monodactylous. Genu of legs I and II without phylliform lateral setae. Blade-like formation of trochanters and femora weakly developed.

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ALEIODES (ALEIODES) SUDATORIUS SP. N.
FROM THE HORTOBÁGY NATIONAL PARK, HUNGARY
(HYMENOPTERA, BRACONIDAE: ROGADINAE)

J. PAPP

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

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Description as well as specific differentiation of the new species *Aleiodes* (*A.*) *sudatorius* are given. *A. bicolor* (SPINOLA) and *A. tristis* WESMAEL are closely related to the new species. With 12 figures.

In a rest of the Braconid material collected in the Hortobágy National Park, East Hungary, among others, a female *Aleiodes* s. str. specimen remained with my provisional label *Aleiodes* sp. n.? ♀ aff. *A. bicolor* (SPINOLA); the faunistic results of the Braconid wasps of the Park were published in two papers (PAPP 1981, 1983). Recently C. v. ACHTERBERG (Leiden) has kindly informed me that he is preparing a survey of the western European *Aleiodes* s. str. species and, on my request, he was kind enough to undertake the examination of my female specimen referred to above. This specimen has been examined by him and he confirmed me that it represents a new species. Herewith I express my sincere thank to Dr. C. v. ACHTERBERG for his co-operative assistance in solving this taxonomic problem.

Subsequently I present the description of the new species: *Aleiodes* (*A.*) *sudatorius* sp. n. The new species is nearest to *A. (A.) bicolor* (SPINOLA) and *A. (A.) tristis* WESMAEL, their specific differences are summarized in tabular form.

***Aleiodes* (*Aleiodes*) *sudatorius* sp. n. ♀ (Figs 1–5)**

♀. Body 5 mm long. Head in dorsal view somewhat less transverse, 1.75–1.8 times broader than long, eye one-third longer than temple, latter rounded constricted (Fig. 1), occiput hardly excavated; ocelli small, POL slightly shorter than greatest diameter of a hind ocellus, OOL twice as long as POL. Eye in lateral view 1.45 times higher than wide; cheek somewhat longer than basal width of mandible; temple broadening ventrally, its widest part somewhat shorter than width of eye. Face 1.3 times wider than high. Oral opening small, its horizontal diameter shorter than distance between two tentorial pits. Fifth joint of maxillary palp unusually somewhat shorter than

sixth joint, and distinctly one-third shorter than fourth joint (Fig. 2). Head evenly and densely shagreened-scabriculous. Antenna somewhat longer than body, with 42 (right antenna) and 43 joints (left antenna); flagellum slightly tapering apically, first flagellar joint almost three times and penultimate joint three times as long as broad.

Mesosoma in lateral view almost twice longer than high. Mesonotum somewhat less broad between tegulae than head. Notaulix distinct. Surface of mesosoma evenly and densely shagreened-scabriculous similar to that of head. Propodeum rugo-rugulose with a weak medio- and a pair of latero-longitudinal keels. Hind femur five times as long as broad. Hind tibia and tarsus equal in length. Hind basitarsus equal with tarsal joints 2—3 combined.

Fore wing about as long as body. Pterostigma four times as long as wide, issuing radial vein from its middle, *r1* shorter than width of pterostigma, *r2* one-third longer than *cuq1*, *r3* approaching tip of wing, *Cu2* subquadrate in form. Nervulus unusually near to *n. bas.*, i.e. *d1* very short, *d2* six times longer than *d1* (Fig. 3, see arrow). Radial vein of hind wing effaced, its run is indicated by a thin, hairless and colourless line on membrane of wing, radial cell evenly wide (Fig. 4).

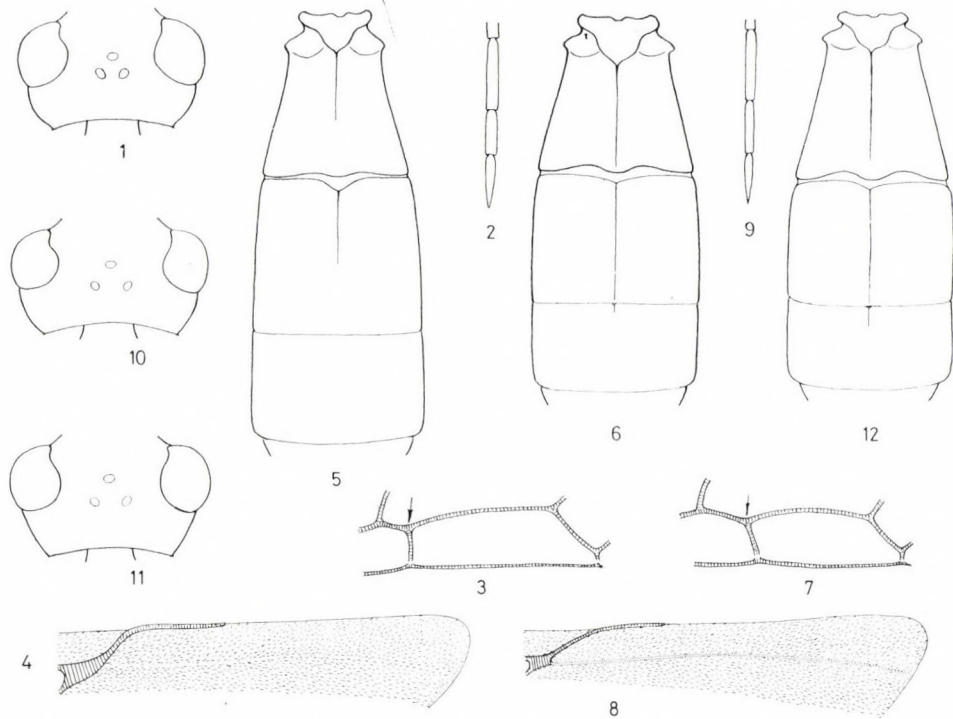
Metasoma as long as head and mesosoma together. First tergite (Fig. 5) minutely longer than wide at hind, distal from spiracle moderately broadening. Second tergite quadrate, slightly wider behind than long medially; third tergite less transverse than usual, 1.6—1.7 times wider behind than long medially; tergites 2—3 almost parallel-sided, i.e. slightly widening posteriorly (Fig. 5). Tergites 1—2 and anterior two-thirds of tergite 3 longitudinally rugose, interspaces shagreened; medio-longitudinal keel of tergites 1—2 rather weak. Rest of tergites rugulose-uneven to almost smooth, subshiny to shiny. Ovipositor sheath in lateral view as long as hind tarsal joint 3.

Ground colour of body reddish yellow. Ocellar field, lateral margin of mesonotum, propodeum entirely, first tergite almost entirely black, a pair of streaks on second tergite and a small spot on mesopleuron close below tegula blackish; first tergite behind and medially as well as a median streak of second tergite whitish. Legs yellowish, coxae and trochanters rather pale, tarsi faintly brownish fumous. Wings subhyaline, pterostigma opaque yellow, veins brownish yellow.

♂ and host unknown.

Locality — Holotype ♀: Hungary, Nagyiván (in Hortobágy National Park), 30. VI. 1976, leg. ZOMBORI. — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7025.

The new species, *Aleiodes (A.) sudatorius* sp. n., is related to the light form of *A. (A.) bicolor* (SPINOLA, 1808) var. *tener* (KOKUJEV, 1898) as well as



Figs 1—5. *Aleiodes sudatorius* sp. n.: 1 = head in dorsal view, 2 = joints 4—6 of maxillary palp, 3 = nervulus with brachial cell of right fore wing, 4 = effaced radial vein of right hind wing, 5 = tergites 1—3. — Figs 6—10. *A. bicolor* (SPINOLA): 6 = tergites 1—3, 7 = nervulus with brachial cell of right fore wing, 8 = effaced radial vein of right hind wing, 9 = joints 4—6 of maxillary palp, 10 = head in dorsal view. — Figs 11—12. *A. tristis* WESMAEL: 11 = head in dorsal view, 12 = tergites 1—3

to *A. (A.) tristis* WESMAEL, 1838, both species distributed in the Palaearctic Region. The following features distinguish the two species:

A. sudatorius sp. n.

1. Second tergite quadrate, minutely wider behind than long medially; third tergite 1.6—1.7 times wider behind than long medially (Fig. 5).
2. Nervulus issuing from *d* more proximally, i.e. *d1* very short, *d2* six times longer than *d1* (Fig. 3).
3. Radial vein of hind wing effaced, its run is indicated by a thin, hairless and colourless line (Fig. 4).
4. Fifth joint of maxillary palp somewhat shorter than sixth joint, and distinctly one-third shorter than fourth joint (Fig. 2).
5. Head in dorsal view 1.75—1.8 times as broad as long (Fig. 1).

A. bicolor (SPIN.)

1. Second tergite transverse, 1.3—1.4 times wider behind than long medially; third tergite distinctly twice wider behind than long medially (Fig. 6).
2. Nervulus issuing from *d* less proximally, i.e. *d1* less short, *d2* 2.5—3 times longer than *d1* (Fig. 7).
3. Radial vein of hind wing distinct (Fig. 8).
4. Fifth joint of maxillary palp as long as sixth joint, and one-fourth to one-fifth shorter than fourth joint (Fig. 9).
5. Head in dorsal view 1.9—2 times as broad as long (Fig. 10).

A. sudatorius sp. n.**A. tristis** WESMAEL

The distinctive features between *A. sudatorius* and *A. bicolor* expounded above under Nos 2—4 refer to the species-pair of *A. sudatorius* and *A. tristis* too, see Figs 2—4 and 7—9.

- | | |
|---|---|
| <p>1. Temple in dorsal view constricted rather rounded (Fig. 1).</p> <p>2. Second tergite quadrate, minutely wider behind than long medially; third tergite 1.6—1.7 times wider behind than long medially (Fig. 5).</p> | <p>1. Temple in dorsal view constricted rather straight (Fig. 11).</p> <p>2. Second tergite transverse, 1.25—1.45 times wider behind than long medially; third tergite twice wider behind than long medially (Fig. 12).</p> |
|---|---|

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TAXONOMIC STUDIES ON THE GENUS AUTOPHILA HÜBNER, 1823. I

L. RONKAY

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

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The description of five new species (*simulata* sp. n., *xena* sp. n., *cryptica* sp. n., *afghana* sp. n. and *vartianae* sp. n.) with the discussion of the *libanotica-ostheldeir* problem and the redescription of *Autophila hirsutula* (ALPHÉRAKY).

The genus *Autophila* HÜBNER (1823), is one of the rich Palaearctic genera with more than forty known species. Its taxonomic position was disputed for a long time, opinions vary even though the genitalic and larval characters are known. Moreover, one and the same group of these characters were the arguments of the different opinions. For example, BOURSIN in his large paper (1955) gave the following features as evidence for placing the genus — with its relatives — into the subfamily Amphipyriinae, as follows: — vein 5 (= medial 2) of hind wing displays the “trifid type”, — the structure of male genitalia, — larvae 16-legged, — imagos resting often in houses and caves. On the other hand, DUFAY (1976) stated: — the structure of male genitalia identical in type with that of the genus *Lygephila* BILLBERG, 1820 (subfamily Othreinae), — the decurrence of vein 5 on hind wing variable in the genus *Autophila*. HAYES (1980) in his revision of the genus *Tathorhynchus* HAMPSON, 1894 maintained that the genus belongs in the subfamily Ophideriinae (= Othreinae) and the closest allied genera are *Lygephila* and *Asticta* HÜBNER (1816). In this work he figured the larva of *T. exsiccata* (LEDERER) and it is clear that it is a typical semi-looper. This fact reflects to the relative value of this feature in the higher taxonomy: it can vary in a genus or between closely related genera (for example, in the subfamily Plusiinae all genera have typical 12-legged larvae except *Abrostola* OCHSENHEIMER, 1816 with fully developed pairs of abdominal legs). And, finally, a number of species of *Catocala*, *Exophyla rectangularis* HÜBNER, *Orectis proboscidata* HERRICH-SCHÄFFER, *Scoliopteryx libatrix* LINNAEUS, *Anomis* spp. etc. are resting (also) in caves and houses, too.

As a result of the examination of the vesica the great similarity between the genera *Autophila* and *Lygephila* was pointed out: the structure of their

vesica is rather complex, consisting of numerous diverticles with field of spines and small cornuti.

Consequently, on the basis of these morphological characteristics, the genus *Autophila* — and the allied *Perinaenia* BUTLER, 1878, *Apopestes* HÜBNER (1823), and *Tathorhynchus* HAMPSON, 1894 — should be placed in the subfamily Othreinae near the genus *Lygephila* (see DUFAY, 1976, HAYES, 1980, LERAUT, 1980, SUGI, 1982).

The known distribution of the species of *Autophila* is solely Palaearctic — contrarily to the nearly wholly tropical *Tathorhynchus* — but a part of them occurs near the “imaginary border” of the Palaearctic Region (Oman, Arabian Peninsula, Pakistan, the Himalaya Range). Zoogeographically a highly specialized eremial-xeromontane group with only few species existing in arboreal habitats.

A large part of the species and subspecies was described in this century, principally on the basis of the characters of male genitalia (BOURSIN, 1940, 1947, 1955a, 1955b, 1962, 1963, 1967; WILTSHIRE, 1952, 1975). During his studies on the male genitalia of *Autophila* BOURSIN revised, beside the description of the new taxa, those species which have been described so far. Unfortunately, he made some mistakes originating from the neglect of studies concerning the genitalia of the female type-specimens. A detailed study of the females resulted in the discovery that the configuration of the female genitalia is useful not only for identification but it sometimes affords better chances for this purpose than do that of the males — indeed in some cases the correct solution rested on the examination of the female genitalia (for example in the *glebicolor-hirsutula* and *libanotica-osthelderi* complex).

The survey of the *Autophila* material of some large museums and the excellent collection of Mrs. VARTIAN (Vienna) revealed that the *Autophila* fauna of Asia, especially of Central Asia and Afghanistan, Nepal, SE Asia is still poorly known. These facts gave the impetus to undertake a full revision of the genus.*

I would like to express my best thanks to Dr. W. DIERL (Munich), Prof. Dr. H.-J. HANNEMANN (Berlin), Dr. F. KASY (Vienna), Dr. V. I. KUZNETSOV and Dr. I. L. SUKHAREVA (Leningrad), Dr. D. STÜNING (Bonn) and Mrs. E. VARTIAN (Vienna) for their extensive help. I am indebted to Dr. L. A. GOZMÁNY and Dr. A. VOJNITS (Budapest) for their useful advice and help in the preparation of this paper.

* Any material of *Autophila* would be welcome for study.

I. THE GLEBICOLOR-HIRSUTULA GROUP

The study of the holotype specimen of *A. hirsutula* revealed the fact that this exemplar and the specimens found in the European museums under the name *hirsutula* represent two distinct species. Both of them are related to *glebicolor* (ERSHOV, 1874), *hirsutula* very closest, the distance between *glebicolor* and the undescribed species being greater. When the type-specimen is compared with the original description the misidentification seems still more surprising since the — correct — description emphasized the reddish-brown ground colour and patternless fore wing of *hirsutula*. The only basis of the confusion can be the similarly small size of both species. Unfortunately, the Catalogue of SEITZ (1911) also made this mistake and the picture of *hirsutula* displays the other, the new, species. The redescription of *hirsutula* and the characterization of the *glebicolor*-group with the description of the new species are given below.

Autophila hirsutula (ALPHÉRAKY, 1893) (Iris VI, p. 347., *Spintherops*)

H o l o t y p e : 1 ♀, "Kumeng, Kunk Dung", "Kol. Vel. Kn. NIKOLAIA MIKHAILOVITSA" (in Russian) and on another label "Kann nach Stgr. vielleicht *Glebicolor* ab. *nana* sein". Deposited in coll. Zoological Institute, Leningrad.

R e d e s c r i p t i o n : alar expanse 32 mm, head and thorax uniformly grey-brown with some greenish-grey hairs and strong yellowish sheen. Ground colour of fore wing reddish-brown with yellowish shade and more or less brownish tinge. Costal margin with darker greenish-grey hairy scales from the base to middle of margin. Wing patternless, only the shade of outer field somewhat lighter and less bright, because ground colour partly covered with long greyish hairy scales. In an oblique view a short, dark vertical line can be observed in middle of cell. Terminal line somewhat darker than subterminal area, cilia reddish-brown. Hind wing unicolorous bright reddish-brown with very pale greyish shade, cilia yellowish red-brown. Underside of both wings very bright yellowish grey, cilia somewhat reddish.

Female genitalia (Fig. 7): ovipositor short and wide, gonapophyses moderately long. Ostium bursae heavily sclerotized, elongate with a strong crest near ductus bursae. Ductus bursae very short and membranous, bursa copulatrix elongate, narrow. Apex bursae finely rugulose with a sacculiform diverticulum.

Male: unknown.

S p e c i f i c d i f f e r e n c e s a n d t a x o n o m i c p o s i t i o n : very closely related to *glebicolor*, the differential characters being as follows: smaller in size, wings unicolorous, patternless. Female genitalia similar in type to *glebi-*

color (Fig. 6), but ostium bursae stronger and narrower with the characteristic crest submarginally. Apex bursae wholly membranous with only some fine wrinkles while *glebicolor* with more heavily sclerotized rugae.

Distribution: known only from the type-locality (Kashgaria).

Autophila simulata sp. n.

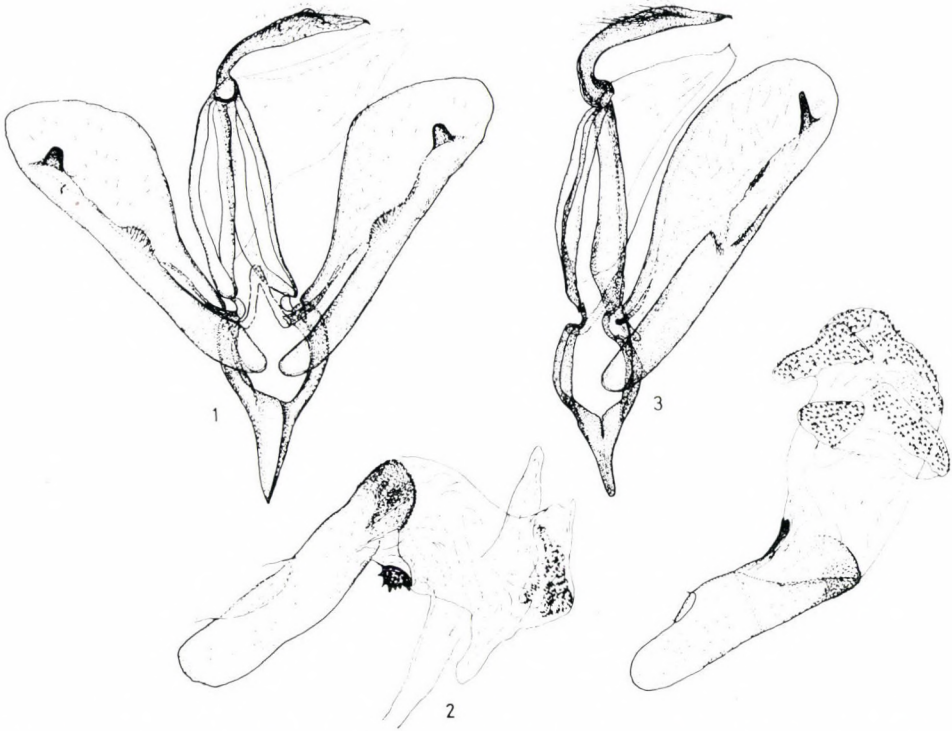
H o l o t y p e: ♂, "Hirsutula Alph., E. Juli, Aksu", slide No. 1672 RONKAY, deposited in the Naturhistorisches Museum, Vienna. **Paratypes:** 1 ♀, "Atrehan" (?) (in coll. Mus. Bonn), slide No. 1721 RONKAY; 1 ♂, 1 ♀, Altyn-Tagh, 1 ♀, Aksu (in coll. PÜNGELER, Berlin); 1 ♂, Issyk-Kul, 1 ♀, Lob-Noor, slide No. 1754 RONKAY (in coll. Naturhistorisches Museum, Vienna), 9 ♂♂ and ♀♀, Altyn-Tagh, 1 ♂, Kashgaria (in coll. Zoologische Staatssammlung, Munich).

Description: alar expanse 32—38 mm, length of fore wing 17—20 mm. Head and thorax yellowish grey with some brownish hairs. Ground colour of fore wing ochreous grey, matt, with some darker brownish irroration, mostly in median and subterminal areas. Pattern well discernible, dark greyish brown. Basal line only a dark spot, antemedial line dentate with a very fine pale line on inner side. Postmedial line sinuous with a narrow lighter band externally, subterminal an obsolete darker stripe with some dark spots on veins. Orbicular very small, an elongate dark brown spot, reniform similarly dark, elliptical. Cilia greyish spotted with darker brownish-grey. Hind wing unicolorous greyish-brown, glossy, its sheen rufous. Cellular lunule small, cilia reddish with blackish spots at base. Underside of wings bright ashen grey with some rufous tinge, fore wing with darker brownish irroration from base to terminal area. Cellular lunules usually well visible, sometimes slight transversal lines also present. Cilia greyish with rufous shade.

Male genitalia (Figs 1—2): large and heavily sclerotized. Uncus relatively long and strong with a dorsal crest, tegumen high and robust, peniculi absent. Vinculum elongate, V-shaped, its apex pointed. Valvae large, characteristically hairy, distal part spatulate, wide. Sacculus with an interesting, rounded lobe (editum?), saccular processus ("harpe") small, rounded. Aedoeagus long and thick with a serrated lamina at distal end. Vesica everted ventrally, consisting of numerous diverticles, one of them — a short, basal one — with a very unusual, large, mace-like cornutus. Spinules of spinulose fields fine, small.

Female genitalia (Fig. 5): ovipositor short and wide, papillae anales rounded. Distal gonapophyses relatively long, proximal pair short. Ostium bursae wide with a narrow, sclerotized lamina, ductus bursae wider, plicate with a sclerotized lateral plate. Bursa copulatrix elongate, apical part membranous, plicate and only slightly sclerotized, signum absent.

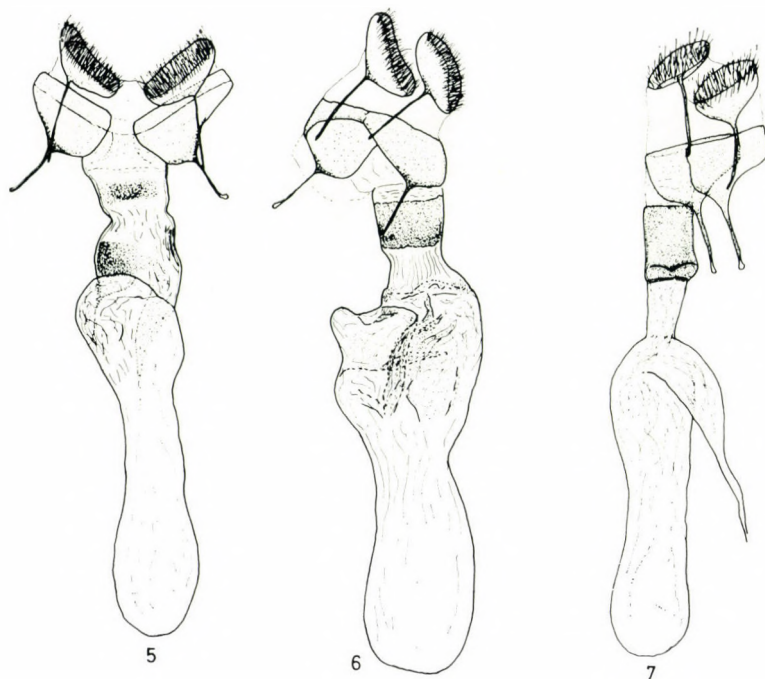
Specific differences and taxonomic position: as suggested previously the closest related species are *glebicolor* and *hirsutula*, but the differences between *simulata* and the two other species are greater than



Figs 1—4. 1—2 = *Autophila simulata* sp. n. Holotype, Aksu, slide 1672 RONKAY. 3—4 = *A. glebicolor* (ERSHOV), Mongolia, slide 1769 RONKAY

in the case of *hirsutula* and *glebicolor*. The differential characters are as follows: ground colour of fore wing ochreous grey (not reddish-brown), wing pattern dark brown, fine and contrast (not diffuse or absent). In the configuration of the male genitalia (it can be compared only with *glebicolor*) (Figs 3—4) the valvae of *simulata* larger, the distal part wider, the saccular processus (harpe) smaller and rounded, the saccular lobe larger. The aedeagus is more robust, the vesica everted ventrally, the distal lamina much stronger and serrate, and the large cornutus is very characteristic. The female genitalia are similar in type in both of the related species (Figs 6—7), but the ostium bursae has only one narrow sclerotized lamina, the ductus bursae is much wider, with a lateral sclerotized plate.

Distribution: Central Asia (Aksu, Altyn-Tagh, Lob-Noor, Issyk-Kul).



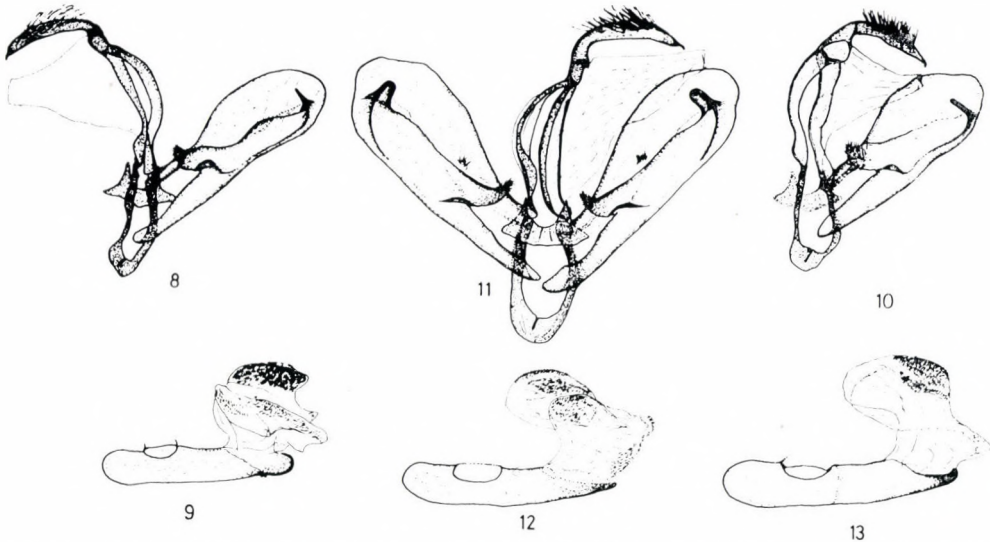
Figs 5—7. 5 = *Autophila simulata* sp. n. Paratype, Lob-Noor, slide 1754 RONKAY. 6 = *A. glebicolor* (ERSHOV), Mongolia, slide 1708 RONKAY. 7 = *A. hirsutula* (ALPHÉRAKY). Holotypus, prep. RONKAY

II. THE DESCRIPTION OF FOUR OTHER NEW SPECIES FROM CENTRAL ASIA

Autophila xena sp. n.

Holotype: ♂, "UdSSR, Pamir, Tadzhikistan, Chorog, VIII—IX. 1966, coll. Vartian", slide No. 1662 RONKAY. Deposited in coll. VARTIAN, Vienna. Paratypes: 1 ♀, Afghanistan, Ghorbandtal, N of Kabul, 1900 m, 30. 7. 1965, KASY et VARTIAN, slide No. 1691 RONKAY (in coll. VARTIAN), 1 ♀, E Afghanistan, Salang Pass, N slope (Khinjan), 2100 m, 5—11. VII. 1966, leg. G. Ebert, slide No. 1911 Ronkay, (in coll. Landesmuseum für Naturkunde, Karlsruhe).

Description: alar expanse 40—46 mm, length of fore wing 20—23 mm. Head and thorax ochreous brown with darker brown scales and hairs. Fore wing bright ochreous brown with a very fine yellowish shade and more or less strong darker brown irroration. Elements of pattern dark brown, orbicular well discernible, a very small spot, reniform thick and relatively large, slightly arcuate. Transversal lines beginning with dark blotches, following parts usually diffuse, especially median and subterminal lines. Cilia yellowish brown with darker spots at termination of veins. Hind wing very glossy, pale ochreous grey with a fine reddish-grey shade. Marginal field

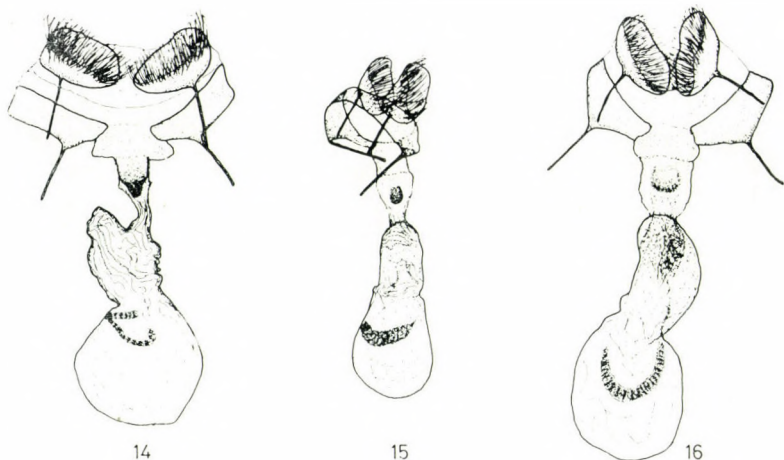


Figs 8—13. 8—10 = *Autophila subfusca* (CHRISTOPH), 8—9 = Turkmenia, slide 1736 RONKAY, 10 = Paralectotype, Transcaspia, slide MB 435 BOURSIN. 11—12 = *A. xena* sp. n. Holotype: Pamir, slide 1662 RONKAY. 13 = *A. luxuriosa taurica* BOURSIN, Paratype, Taurus, slide 1742 RONKAY

darker, transversal line paler and diffuse, cellular lunule absent. Cilia unicolorous pale grey. Underside of wings pale ochreous, inner area of fore wing with greyish irroration. Transversal lines on male absent, very pale in female, cellular lunule absent on hind wing but well visible on fore wing, fine and arcuate, especially in female. Darker terminal area of fore wing consisting of two parts, inner one stronger and darker, outer part becoming obsolescent at cubital veins, in females somewhat darker. Terminal field of hind wing narrow, diffuse. Cilia pale ochreous with yellowish scales at base, cilia of fore wing spotted with greyish-brown.

Male genitalia (Figs 11—12): uncus moderately long, without dorsal hook or crest, tegumen high and gracile, peniculi absent. Fultura inferior of characteristic shape, vinculum short and rounded. Valvae elongate, apically rounded, editum well developed and pointed, saccular processus ("harpe") short with rounded apex, its basis wide. Aedoeagus long and narrow, distal end of ventral side beak-shaped, slightly upturned. Vesica everted dorsally, with four diverticles, spinulose fields consisting of fine spinules.

Female genitalia (Fig. 14): ovipositor short and wide, papillae anales rounded, gonapophyses moderately long. Ostium bursae membranous with a heavily sclerotized subtriangular excrescence at proximal end. Ductus bursae membranous, finely rugulose, short and narrow, apex bursae strongly plicate but not sclerotized. Corpus bursae rounded, with a narrow and relatively short, ribbon-like signum.



Figs 14—16. 14 = *Autophila xena* sp. n. Paratype, Afghanistan, slide 1691 RONKAY. 15 = *A. subfusca* (CHRISTOPH), Turkmenia, slide 1637 RONKAY. 16 = *A. luxuriosa taurica* BOURSIN, Taurus, slide 1719 RONKAY

Specific differences and taxonomic position: an interesting species, its groups of characters showing similarities to divers types of species groups in the genus: the distance between *xena* and any other related species appears to be large. The coloration and wing pattern of *xena* somewhat resemble to the *dilucida* group, but the genitalia of both sexes are very different and the details of the pattern elements also differ. The absence of peniculi and the shape of the valva recall, at the first sight, *subfusca* (CHRISTOPH, 1893) (Figs 8—10), but these similarities should be considered as convergences, as the size of the entire genitalia, the shape of the “harpe”, the configuration of the aedoeagus and the colouration of wings are very different. The configuration of the aedoeagus and vesica is similar to that in *luxuriosa* ZERNY, 1933 (Fig. 13), but the distal end of the aedoeagus is more gracile and not upturned, and the size of the spinulose fields (not the spinules!) are larger. Further distinguishing characters are the absence of peniculi and the shape of the “harpe”. The female genitalia are similar in type to those of *subfusca* and *luxuriosa* (Figs 15—16) but the shape of the ostial appendage and the size of the signum are very different.

To sum up, *xena* should, on the basis of the features, be placed into the *limbata-luxuriosa* complex, but as a very strongly modified member of this group which — as its unusual eastern distribution also shows — probably had been isolated very early.

Distribution: Pamir, E Afghanistan.

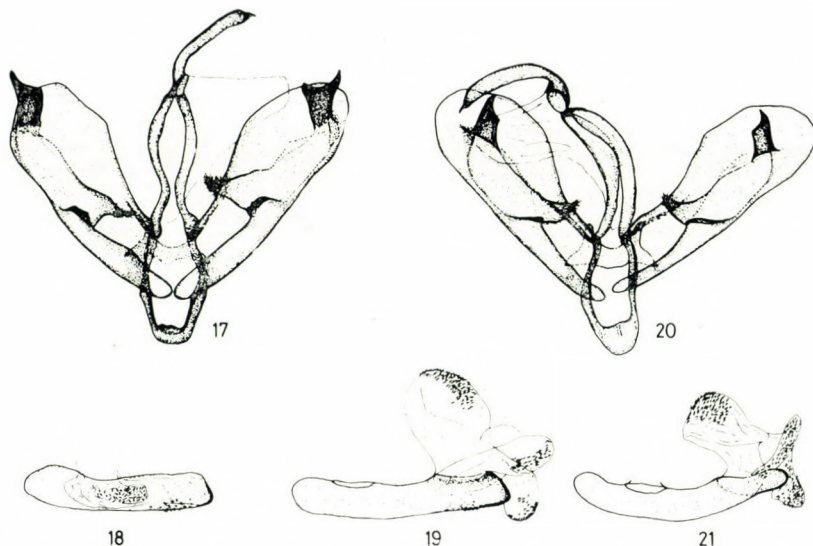
***Autophila cryptica* sp. n.**

H o l o t y p e : ♂, "Askh. (abad)", "Kol. Vel. Kn. Nikolaia Mikhailovitsa" (in Russian), slide No. 1634 RONKAY, deposited in coll. Zoological Institute, Leningrad. Paratypes: 1 ♀, from same locality and data (slide No. 1633 RONKAY), 2 ♂, 1 ♀, "Askhabad. Zhakavkazhskij obl., Anger, 96." (in Russian), 1 ♀, Aidara, 8. 6. 1892, 1 ♂, "Sultan-bent, Mervskij oasis, 17. V. 95, Korzhinsk(i-)" (in Russian), 1 ♂, without locality, coll. O. JOHN. All paratypes deposited in coll. ZIN Leningrad.

D e s c r i p t i o n : alar expanse 36—39 mm, length of fore wing 20—22 mm. Head and thorax sand-brown with darker scales and hairs. Fore wing only slightly glossy, sandy grey with some ochreous shade and a strong dark brownish irroration, mostly in terminal area. Antemedial and postmedial lines diffuse, sinuous with darker blotches at their origins. Median line obsolescent, only its costal spot and terminal part appearing as darker shadows. Orbicular absent or a very small spot, reniform an undefined dark arch. Darkest part of wing at terminal area and vicinity of subterminal line. Subterminal line a wide diffuse brownish band consisting of triangular and subtriangular spots, terminal area brown mixed with ochreous grey, apical spot light. Inner side of cilia yellowish with dark brown spots, outer part unicolorous, whitish. Hind wing greyish, cellular lunule absent, transversal line diffuse and relatively wide. Terminal area dark brownish, usually wide, cilia whitish with some brownish spots. Underside of wings light ochreous, coloration of costal parts somewhat more intensive. Fore wing with obsolescent cellular lunule and origin of transversal line, inner area of wing slightly covered with grey. Terminal field very wide and an intense dark brown with only some yellowish scales on veins. Cilia basally dark yellowish, outer part paler, dark spots of cilia well visible. Cellular lunule of hind wing absent, terminal field similarly wide and dark, cilia less spotted.

Male genitalia (Figs 20—21): uncus moderately long, tegumen long and narrow, peniculi absent. Fultura inferior large but less sclerotized, vinculum short and rounded. Valvae elongate, apex rounded, wide. Sacculus with large, pointed editum, saccular process ("harpe") symmetric on both valvae, its outer edge more elongate and pointed, slightly arcuate. Aedoeagus curved distally, distal end a smooth hook-like chitinous lath without teeth on ventral side. Vesica everted dorsally, consisting of four diverticles with relatively large spinulose fields.

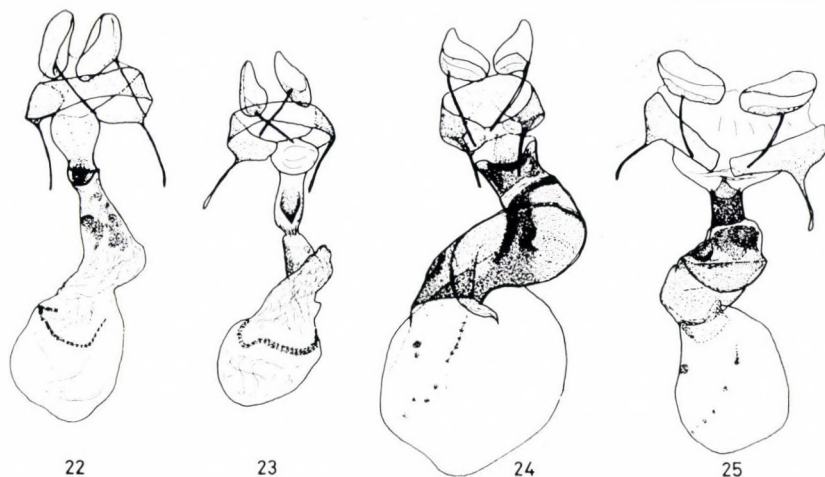
Female genitalia (Fig. 23): ovipositor short, apophyses moderately long. Ostium bursae elongate, its appendage sacculiform with a heavily sclerotized triangular termination. Ductus bursae caudally membranous, central part becoming wider with a sclerotized lamina on one side and locally some sclerotized maculae. Apex bursae strongly plicate but not sclerotized, corpus bursae elliptical, signum long and relatively wide.



Figs 17—21. 17—19 = *Autophila laetifica* (STAUDINGER). 17—18 = Lectotype, Sumbar, slide MB 121 BOURSIN, 19 = Kara-Kala, Turkmenia, slide 1636 RONKAY. 20—21 = *A. cryptica* sp. n. Holotype, Askhabad, slide 1634 RONKAY

Specific differences and taxonomic position: the new species is similar in its appearance to *laetifica* (STAUDINGER, 1888) and *eremochroa* BOURSIN, 1940, but *laetifica* is much lighter and glossy, its wing pattern more contrasty, the terminal field of the underside much lighter and not so wide. The other related species, *eremochroa*, displays a much more marked pattern on both surfaces: the transversal lines and the reniform are very distinct, the terminal field of the underside is wider, especially on the hind wing. The configuration of the male genitalia of *cryptica* is similar in type to that of *laetifica* (Figs 17—19) but the “harpe” are symmetric and not so large while in *laetifica* they are characteristically asymmetric and longer. The aedeagus of *cryptica* is strongly curved and the distal end without small teeth, the aedeagus of *laetifica* is straight with small teeth on the distal end. The genitalia of *eremochroa* is much smaller and gracile, the “harpe” shorter with a rounded apex. To compare the female genitalia of *cryptica* and *laetifica* (Fig. 22): *cryptica* has a sac-like appendage on the ostium bursae with a sclerotized triangular apex on it, the ductus bursae is shorter with a sclerotized lateral plate, the signum longer and wider. Unfortunately I had no opportunity to examine the female genitalia of *eremochroa*.

From the taxonomic and zoogeographic points of view the new species is situated between the Transcaspian *laetifica* (with lighter coloration and asymmetric “harpe”) and the Central Asian *eremochroa* (with darker coloration and small symmetric “harpe”); and these species probably represent the



Figs 22—25. 22 = *Autophila laetifica* (STAUDINGER), Turkmenia, slide 1635 RONKAY. 23 = *A. cryptica* sp. n. Paratype, Askhabad, slide 1633 RONKAY. 24 = *A. afghana* sp. n. Paratype, Afghanistan, slide 1679 RONKAY. 25 = *A. ligaminosa* (EVERSMANN) Armenia, slide 1680 RONKAY

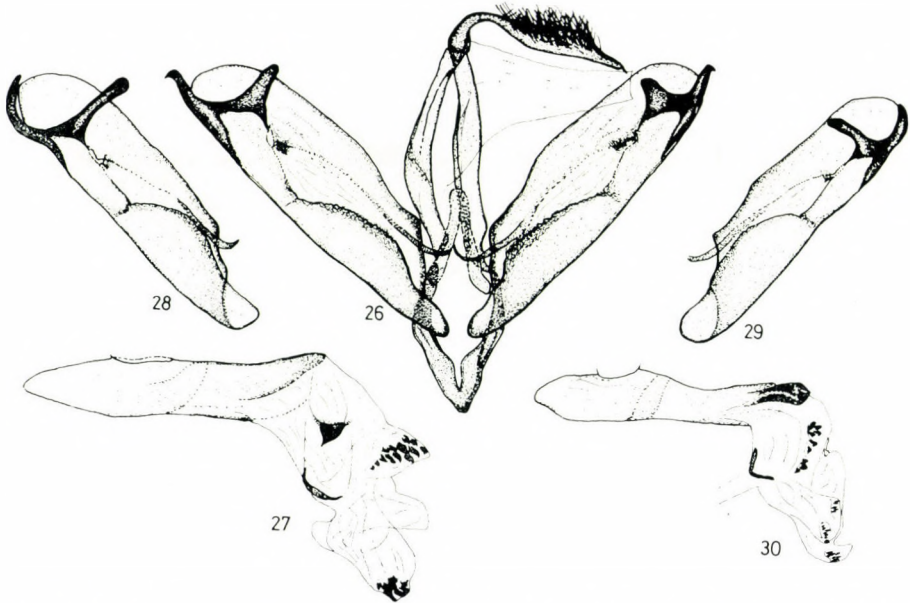
known steps of the development of species through the *eremochroa* → *cryptica* → *laetifica* line.

Distribution: Turkmenia (Askhabad, Aidara, Merv).

Autophila afghana sp. n.

Holotype: ♂, "Afghanistan, Khurd-Kabul, 1900 m, S v. Kabul, 19. VI. 1969, leg. VARTIAN", slide No. 1663 RONKAY, deposited in coll. VARTIAN. Paratypes: 1 ♀, Afghanistan, Paghman, 30 km NW v. Kabul, 2500 m, 20—28. VI. 1965, KASY et VARTIAN, slide No. 1679 RONKAY, 1 ♂, 1 ♀ from same locality. 22. VII. 1963 (♂), 20—30. 1962 (♀), leg. VARTIAN, 2 ♂, Khurd-Kabul, SO v Kabul, 1900 m, 3. VII. 1965, leg. KASY et VARTIAN, 19. VI. 1969 leg. VARTIAN, 1 ♂ from same locality, 5. VII. 1963, leg. VARTIAN, 1 ♂, 40 km SW v Kabul, 2300 m, 3. VII. 1965, leg. KASY et VARTIAN (in coll. VARTIAN), 1 ♀, O-Afghanistan, Sarobi, 1100 m, 22. IV. 1961, leg. EBERT, slide No. 2706 HACKER (in coll. Zoologische Staatssammlung, Munich), 1 ♂, C Afghanistan, Koh-i-Baba, Band-i-Amir, 2900 m, 24—26. VII. 1966, leg. G. EBERT, (in coll. Landesmuseum für Naturkunde Karlsruhe).

Description: alar expanse 37—40 mm, length of fore wing 18—20 mm. Head, thorax and fore wing olive-grey with strong brownish-grey irroration and slight yellowish sheen. Elements of pattern very indistinct, diffuse or obsolescent with the exception of costal spots. Transversal lines sinuous, finely double, especially postmedian line (defined by a light greyish line). Orbicular absent or a less visible spot, reniform narrow, arcuate. Subterminal line sinuous with a darker blotch at its origin, terminal area somewhat lighter with blackish spots at base of cilia. Cilia greyish with more or less brownish scales. Hind wing pale greyish, terminal area wide and dark, transversal line relatively wide and diffuse, enclosed lighter stripe also broad.



Figs 26—30. 26—27 = *Autophila afghana* sp. n. Holotype, Afghanistan, slide 1663 RONKAY
28—30 = *A. ligaminosa* (EVERSMANN), Iran, slide 1664 RONKAY

Cellular lunule not visible, basal part with darker grey scales. Underside of male pale ochreous grey, cellular lunules obsolescent, transversal lines wide, diffuse, dark greyish brown stripes. Inner area of wings, especially on fore wing, strongly covered with dark greyish-brown scales. Terminal field of both wings wide and dark, fore wing with relatively strong greyish irroration terminad, inner margin somewhat diffuse, cilia ochreous grey. Underside of females darker, cellular lunules more visible, light irroration at terminal fields reduced, cilia brownish.

Male genitalia (Figs 26—27): uncus long, dorsal crest strong, tegumen high and slender, fultura inferior an inverted V, vinculum pointed. Valvae elongate with rounded apex, saccular processes strongly asymmetric. Outer horn of double processus on both valvae slightly excurved, inner extension on right valva much shorter and thicker than that on left side. Aedoeagus large and strong without sclerotized dorsal plate at distal end. Vesica everted ventrally, constructed from numerous diverticles: one short, basal, with a very characteristic large cornutus, two others with spinulose fields consisting of strong spines, and another with a short and narrow chitinized lamina.

Female genitalia (Fig. 24): ovipositor short, ostium bursae broad and thick, yet short. Caudal part of ductus bursae without a pocket-like extension, its margins strongly sclerotized and continuing into a heavily sclerotized crest. Central part of ductus bursae a wide and smooth tube without large reflexed lobe, bursa copulatrix round, signa small, deployed into two rows.

Specific differences and taxonomic position: The new species is similar in appearance to the Caucasian and Iranian *ligaminosa* (EVERSMANN, 1851) specimens, but it differs from those in a series of characters. The best distinguishing characters of *afghana* are as follows: elements of pattern on upper side paler, diffuse or obsolescent, on underside inner area of both wings with characteristic dark irroration. Male genitalia with outer horn of saccular processus shorter and not straight as in *ligaminosa* (Figs 28—30), but slightly excurved. Inner processus of right valva much shorter and rounded in apex. Aedoeagus without strong dorsal plate at distal end, vesica with a large cornutus and two spinulose fields consisting of relatively large spines. In *ligaminosa* aedoeagus with a large dorsal plate with a tooth (at distal end), spinulose fields of vesica made up of spines of different size, the large cornutus absent. Female genitalia of *afghana* with a much wider ostium bursae than that of *ligaminosa* (Fig. 25), caudal part of ductus bursae with a heavily sclerotized crest, central part very wide without large reclinate lobe.

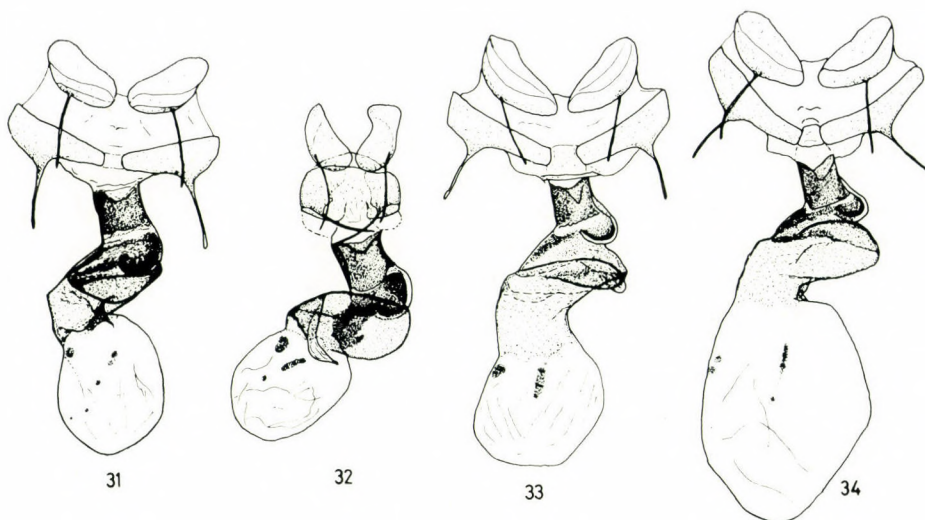
From the taxonomic point of view, *afghana* is closely related to *ligaminosa*, and, on the basis of the configuration of the vesica, it should be considered a more developed sibling species of *ligaminosa*. The other related species similar in coloration and wing pattern, namely *chamaephanes* BOURSIN, 1940 and *plattneri* BOURSIN, 1955, have symmetric male genitalia and a pocket-like extension caudally of the ductus bursae. The known distribution of the species-pair *ligaminosa-afghana* is sympatric in E Afghanistan, but the distribution of *afghana* is much more restricted.

Distribution: Afghanistan.

***Autophila vartianae* sp. n.**

H o l o t y p e: ♀, "Afghan.(istan) centr., 67° L, 34°25' B, 15—16. VII. 1971, Band-i-Amir, 2800 m, leg. VARTIAN", slide No. 1698 RONKAY. Deposited in coll. VARTIAN.

D e s c r i p t i o n: alar expanse 42 mm, length of fore wing 22 mm. Head and thorax violaceous grey mixed with brown, labial palp long and slightly upturned. Fore wing brownish sand-grey with a very strong golden-grey sheen and violet-grey shade (one of the most shiny of the known *Autophila* species), scales very fine. Wing pattern strong and conspicuous, dark brown. Transversal lines very sinuous or serrated, costal blotches well developed. Orbicular a well defined ring with light centre, reniform relatively big, arcuate, with a lighter internal part. Subterminal line dentate with some subtriangular dark spots joining its inner side. Terminal area unicolorous with some blackish spots on veins at base of cilia. Cilia pale greyish with a much darker basal part. Hind wing pale grey, very glossy, dark terminal area very



Figs 31—34. 31 = *Autophila platneri* BOURSIN, Iran, slide 1673 RONKAY. 32 = *A. vartianae* sp. n. Holotype, Afghanistan, slide 1698 RONKAY. 33—34 = *A. eremocharis* BOURSIN, 33 = Paratype, slide 1690 RONKAY, 34 = Mongolia, slide 1689 RONKAY

wide. Transversal line diffuse, cellular lunule obsolescent, inner area of wing with an intensive dark suffusion. Underside fine pinkish grey in a pastel shade with a very strong shine. Both of wings with a heavy pattern, fore wing with dark grey-brown spots of orbicular and reniform and an obsolescent shadow of median line. Postmedian line strong and wide, marginal field very extensive, apical spot yellowish-grey with a dark brown spot at outer edge. Costal spots of transversal lines large and dark, median area of wing with brownish irroration below the cell. Cilia rose-grey, terminal line pinkish. Hind wing lighter roseate, cellular lunule large with a fine brown line decurrent into cell, transversal line a strong stripe, marginal field very wide and dark, cilia brownish grey with rufous scales.

Female genitalia (Fig. 32): ovipositor short and wide, apophyses thin and short. Ostium bursae large and wide with a strong costula on one side. Pocket-like diverticulum large and rounded, heavily sclerotized. Caudal part of ductus bursae with a strongly chitinized, serrated crest in the middle of a sclerotized field. Central part of ductus bursae very wide, smooth, with a short, membranous diverticulum. Bursa copulatrix small, elliptical with some small signa.

Specific differences and taxonomic position: With regard to its coloration and wing pattern the new species resembles the *chamaephanes-platneri* group, but it can be separate very easily. The differential characters are as follows: the scales of *vartianae* are very fine, the shine of the wings much more intense than its relatives. Elements of pattern

sharper, cilia darker. Ground colour of underside not yellowish and only slightly glossy, but characteristically pinkish grey and very shiny. Dark pattern more extensive than in its relatives. The configuration of the female genitalia also shows specific differences: caudal part of ductus bursae with a strong, serrated crest, absent in case of allied species (Figs 31, 33—34) with the exception of some small teeth. Central part of ductus bursae smooth without a large reclinate lobe present in the related species.

On the basis of its characters, the new species belongs in the *chamaephanes-plattneri* group, however, for an exact relegation a knowledge of the male genitalia is needed.

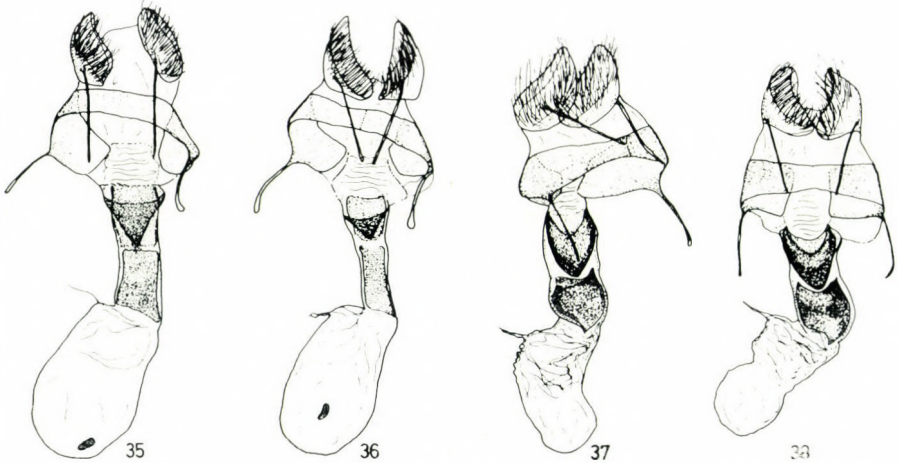
Distribution: Central Afghanistan.

III. A DISCUSSION OF THE *LIBANOTICA*-*OSTHELDERI* PROBLEM

The species *Autophila libanotica* was described — as a “var. an sp. div.” of *dilucida* — by STAUDINGER in 1901, from Lebanon, on the basis of a single female specimen (in the genus *Apopestes* HÜBNER). Next, BOURSIN described (1940) a new species related to *libanotica*, named *osthelderi* from Anatolia and Iran. In this paper he synonymized two other species, *A. depressa* (PÜNGELER, 1914) and *A. draudti* OSTHELDER, 1933, as subspecies of *libanotica*. In the following years both species have been discovered in Iran and Afghanistan; then BOURSIN described two subspecies and relegated them to these two species (*osthelderi libanopsis* BOURSIN, 1962, *libanotica perornata* BOURSIN, 1947).

During the study of the female genitalia of the *Autophila* species I could find very characteristic differences between *libanotica* and *osthelderi*. The problem mentioned in the title of this chapter arose through the examination of the female genitalia of the type-specimen of *libanotica*. The surprising fact to be pointed out is that the type-specimen of *libanotica* was evidently conspecific with the females of the species named *osthelderi*! As a result of further studies I can now state that the sexes of this nearly completely sympatric species-pair have been combined correctly by BOURSIN, except in the case of the Lebanon race, the nominate race of *libanotica*. Consequently, the males of “*osthelderi libanopsis*” represent the true males of *libanotica* and the species “*osthelderi*” is synonymous with *libanotica*, while the other distinct species must be named *depressa*, by its oldest available name.

In the following the redescription of *Autophila libanotica* with the diagnosis of the female genitalia of this species-pair, and the correct nomenclature and distribution of these taxa are given.



Figs 35—38. 35—36 = *Autophila libanotica* (STAUDINGER). 35 = Holotype, Libanon, slide 1749 RONKAY, 36 = Afghanist.n, slide 1699 RONKAY. 37—38 = *A. depressa* (PÜNGELER), 37 = *A. depressa draudti* OSTHELDER, Iran, slide 1700 RONKAY. 38 = *A. depressa perornata* BOURSIN, Iran, Balouchistan, slide 1709 RONKAY

Autophila libanotica (STAUDINGER, 1901)

(Cat. Lep. Pal., III., p. 251, *Apopestes*)

H o l o t y p e : ♀, "Libanon, 97, Crem.", "Origin.", "Libanotica", slide No. 1749 RONKAY, deposited in coll. STAUDINGER, Berlin.

R e d e s c r i p t i o n : alar expanse 43 mm, length of fore wing 21 mm. Head, thorax and fore wing pale rufous with some ochreous tinge and brownish irroration, sheen of wing relatively strong. Basal field of a stronger rufous shade, antemedian and postmedian lines pale, obsolescent, orbicular and reniform not visible. Median field with brownish scales, especially at median line. Subterminal line sinuous, defined by a wide, dark brownish shadow basally and a narrower rufous stripe externally. Terminal line brownish, cilia pale rufous with darker reddish brown scales basally. Hind wing ochreous with a fine rufous tinge, basal field slightly covered with brown, cellular lunule absent, transversal line diffuse, pale. Marginal field wide, darker brown, inner part of cilia rufous with brownish spots, outer part whitish. Underside ochreous with some rufous shade on costa and at base of cilia. Cellular lunule and transversal lines absent, marginal field brown, wider but shorter on fore wing, its borders diffuse and becoming lighter at cubital veins.

Female genitalia (Fig. 35): ovipositor short and wide, gonapophyses relatively short. Ostium bursae heavily sclerotized, large, its ventral lamina characteristically triangular. Ductus bursae a sclerotized, moderately long, slightly flattened tube. Bursa copulatrix small, elliptical with a special signum near its bottom.

Specific differences and taxonomic position: The coloration and wing pattern of *libanotica*, similarly to the related *depressa* are rather varying even in one and the same race, but the underside of *libanotica* is pure yellowish, the dark marginal field shorter and usually narrower, and the cellular lunules usually absent. In *depressa* the inner area of both wings are more or less covered by greyish brown on the underside, the transversal lines are usually well discernible, the cellular lunules brownish. The configurations of genitalia differ very strongly in both sexes. The male of *libanotica* (figured by BOURSIN as *osthelderi*, 1947, 1967) differs from *depressa* (figured by BOURSIN as different races of *libanotica*, 1947) in the shape of uncus, the saccular processes ("harpe"), the peniculi and the totally different aedoeagus. The specific differences of the female genitalia are as follows: shape of ostium triangular in *libanotica*, calycular in *depressa* (Figs 37—38), ductus bursae of *libanotica* tubular but somewhat asymmetric, cordiform and shorter in *depressa*, *libanotica* possesses a signum, *depressa* does not. (It is also of interest that the length of the ductus bursae displays a relative strong variability in *libanotica*, see Figs 35—36.)

On the basis of their external and genitalic characters this pair of species, together with *A. vespertalis* (STAUDINGER, 1896) and *A. lia* (PÜNGELER, 1906), forms a small group within the genus.

The nomenclature and distribution of the *libanotica-depressa* species-pair:

Autophila libanotica (STAUDINGER, 1901)

(= *A. osthelderi libanopsis* BOURSIN, 1962, **syn. n.**); Lebanon

Autophila libanotica osthelderi BOURSIN, 1940, **stat. n.**

(= *A. osthelderi* BOURSIN, 1940); Anatolia, Iran: Elburs, Teheran, Farsistan, Semnan; Afghanistan, Pakistan (Quetta)

Specimens from North-Eastern Iran, Afghanistan and Pakistan are more gracile and show some slight differences in coloration and wing pattern as compared with the race occurring in Anatolia and the Elburs Range. They probably belong in another (or two?) distinct subspecies, but the variability in every race is so large that in view of the meagre available material I desist to separate them.

Autophila depressa (PÜNGELER, 1914) **stat. n.**

(= *A. libanotica depressa* PÜNGELER, 1914, **sensu BOURSIN**); Askhabad, Ferghana, Pamir, Iran: Khorassan; E Afghanistan (?)

Autophila depressa draudti OSTHELDER, 1933, comb. n.

(= *A. libanotica draudti* OSTHELDER, 1933, sensu BOURSIN); Syria, Anatolia, Iraq, Iran: Elburs, Teheran, Farsistan

Autophila depressa perornata BOURSIN, 1947, comb. n.

(= *A. libanotica perornata* BOURSIN, 1947); Iran: Balouchistan, Pakistan: Quetta (?), Afghanistan (?)

The Pakistan population differs from the Iran specimens by narrower fore wings, darker coloration and more marked wing pattern; the configuration of the genitalia is nearly identical with those of the Iranian race. They probably represent two distinct subspecies, but the material is too small (only five specimens) for an acceptable solution of the problem; a similarly small Afghan material is also problematic in other respects.

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DESCRIPTION OF SOME NEW TAXA
OF AMPHISTOME (TREMATODA: AMPHISTOMIDA)
FROM VIETNAMESE FRESHWATER FISHES

O. SEY

Department of Zoology, Janus Pannonius University,
H-7604 Pécs, Ifjúág útja 6, Hungary

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Platycladorchis gen. n., comprising two new species, *P. microacetabularis* and *P. macroacetabularis* were recovered in *Spinibarbichthys denticulatus* and *Lissochilus krempfi*, respectively. *Neocladorchis multilobularis* sp. nov. was also found in *Spinibarbichthys denticulatus*. Gross-morphology and surface topography of the species were fully studied.

Helminth parasites of freshwater fishes of Viet-Nam have been scantily investigated (OSHMARIN, 1965; HA KI, 1969). Of the trematodes described, one species of amphistomes: *Amurotrema dombrowskajae* was recorded. The present paper is a contribution to the knowledge of fish amphistomes of this country and an analysis of their biogeographical affinities.

MATERIALS AND METHODS

Fishes, forming the basis of these examinations, were collected in 1966, Red River, Hanoi district and stored (10% formaline) at the Department of Vertebrate Zoology, Hanoi University. Thirty-three species, altogether 179 specimens were examined and helminths were only collected from the alimentary tract; all the specimens were in good condition.

Whole mounts were stained in carmine, median sagittal sections were prepared by the usual method, technique applied for the examination of surface topography was the same as described by the author elsewhere (SEY, 1984).

All measurements are in mm if not otherwise stated.

RESULTS

Platycladorchis gen. n.

D i a g n o s i s. Dadaytrematidae, Caballeroinae. Body foliaceous, strongly flattened. Anterior extremity covered by several rows of tegumental papillae. Pharynx with fairly long primary pharyngeal sacs. Ventral sucker ventro-terminal, smaller or bigger. Intestinal caeca terminating in front of ventral sucker or partially overlapping it. Oesophagus with oesophageal bulb. Genital opening central, before or behind bifurcation. Testes, at same zone or oblique, equatorial, touching each other. Cirrus pouch present. Ovary sinistral in position at posterior part of body. Laurer's canal present. Uterus pre-ovarian,

intercaecal. Vitellaria post-equatorial, lateral, caecal and extra-caecal; extending middle part of area between testes and acetabulum. Eggs with miracidium. Parasitic in fishes. Type species: *Platycladorchis microacetabularis* sp. nov.

***Platycladorchis microacetabularis* sp. n.**

Description. Body foliaceous, transparent, strongly flattened dorso-ventrally (Fig. 1). Anterior end tapering, with eyespots even in fully mature specimens; posterior extremity rounded. Length of body 1.8–2.8, greatest width at equatorial zone, 0.8–1.1; dorso-ventral dimension 0.25. Along the anterior extremity three types of tegumental papillae (crateriform; long papillae with small branches; dome to conical, non-ciliated) in several rows (Figs 2–4).

The mouth terminal, surrounded by the pharynx, size 0.15–0.20, with two primary pharyngeal sacs measuring 0.16–0.20 in length. Oesophagus measuring 0.35–0.45; posteriorly with an oesophageal bulb, dimensions 0.10 by 0.05. Intestinal caeca somewhat sinuous and passing posteriorly ending before acetabulum.

Testes intercaecal, equatorial in the same zone or slightly oblique, lobed, comprising 5–8 lobuli. Horizontal zones of testes touching or partially overlapping each other. Vesicula seminalis externa forms several convolutions at bottom of cirrus pouch. Cirrus pouch strongly developed, dimensions 0.32–0.4 by 0.12–0.17, situated between bifurcation and testes. Anterior testis 0.2–0.3 by 0.2–0.25; posterior one 0.15–0.32 by 0.2–0.25. Genital opening situated behind bifurcation (100 μ m); diameter: 0.1–0.12. Ovary oval or round, 0.10–0.12 by 0.05–0.1 in diameter, situated at the end of left caeca. Mehlis gland complex, found posterior to ovary with Laurer's canal. Uterus intercaecal, uterine coils filling up all intercaecal space between ovary and testes. Vitellaria extracaecal or partially caecal, in the middle part of area between testes and acetabulum. Size of eggs 0.10–0.12 by 0.05–0.06, containing developed miracidium.

Excretory bladder spherical, situated between intestinal caeca and acetabulum. Two pairs of main descending trunks were observable. Lymphatic system was not studied. Laurer's canal and excretory duct do not cross each other.

Acetabulum ventro-terminal, small, 0.20–0.25 in diameter, surrounded by dome-shaped papillae (Figs 5–6).

Type host: *Spinibarbichthys denticulatus* (Cyprinidae).

Localisation: posterior thirds of intestine.

Type locality: Red River, Hanoi district.

Type specimens: Department of Zoology, Janus Pannonius University, Pécs, Hungary, No. 1661(1–5).

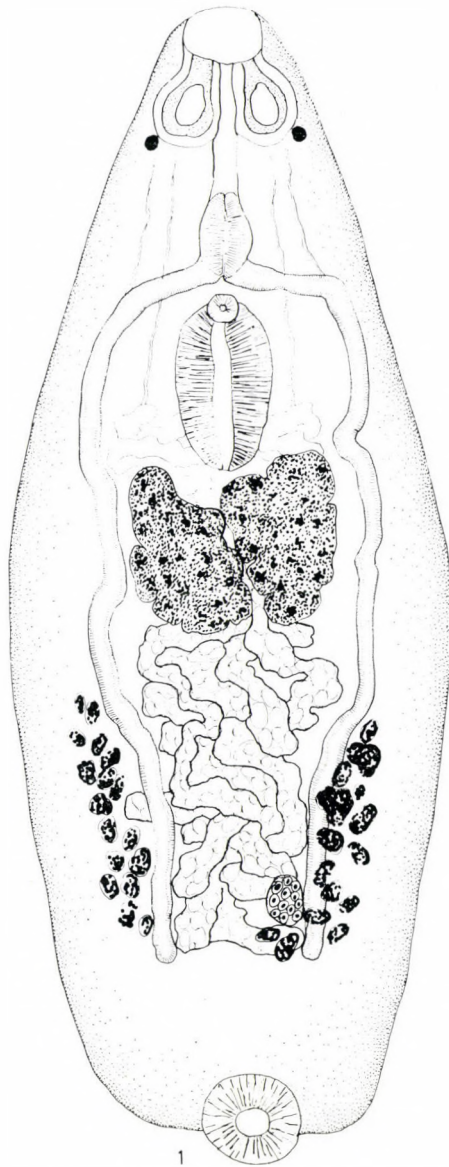
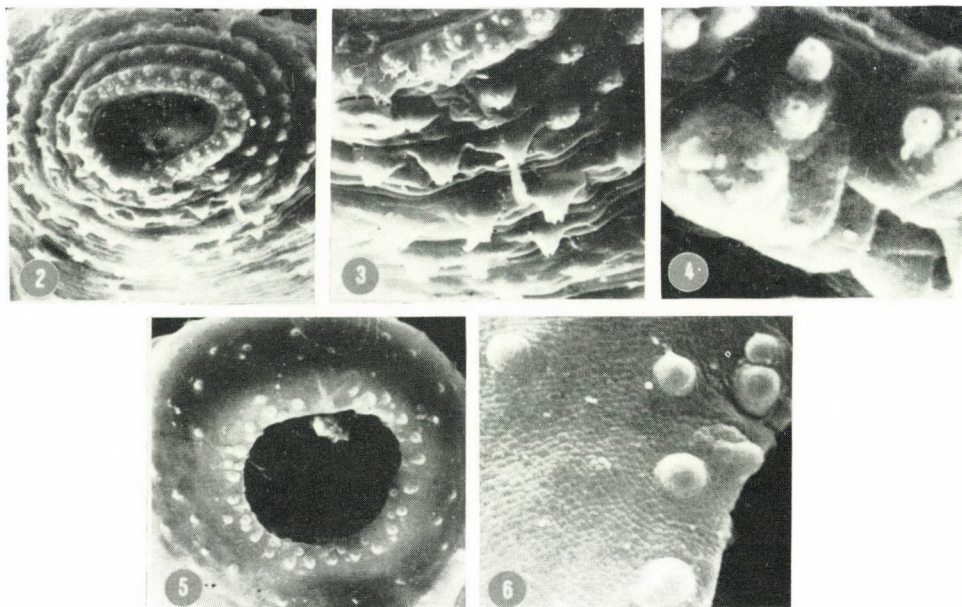


Fig. 1. *Platycladorchis microacetabularis* sp. n., ventral view

***Platycladorchis macroacetabularis* sp. n.**

Description. Body foliaceous, transparent, strongly flattened dorso-ventrally, without eyespots (Fig. 7). Anterior end tapering, posterior extremity rounded. Length of body 2.0—2.2; greatest width at level before



Figs 2—6. Tegumentalis papillae of *Platycladorchis microacetabularis* sp. n. — 2—4 = Tegumental papillae around anterior part of body (2 — X213, 3 — X667, 4 — X806). — 5—6 = Tegumental papillae around acetabulum (5 — X303, 6 — X1322)

acetabulum: 0.75—1.0; dorso-ventral dimension 0.25. Anterior part of body covered with tegumentary papillae in several rows (Fig. 8).

Mouth terminal, surrounded by pharynx measuring 0.20—0.23, with two primary pharyngeal sacs, 0.15—0.17 in length. Oesophagus 0.50—0.54 in length, posteriorly it has an oesophageal bulb, dimensions 0.15—0.18 by 0.10—0.12. Intestinal caeca sinuous, passing posteriorly to the middle region of acetabulum.

Testes intercaecal, equatorial, slightly oblique to each other, with 4—5 lobuli. Horizontal zones of testes touching each other. Anterior testis 0.25—0.28 by 0.30—0.32; posterior one 0.27—0.29 by 0.25—0.28. Ovary spherical, 0.10—0.13 in diameter, sinistral, at anterior margin of acetabulum. Ootype complex contains Mehlis' gland, common vitelline duct and Laurer's canal, near to ovary. Genital opening before bifurcation at level of oesophageal bulb, 0.10—0.12 in diameter.

Excretory bladder postero-dorsal, pyriform, situated between anterior margin of acetabulum and dorsal body surface. Excretory duct and Laurer's canal do not crossing each other.

Acetabulum ventro-terminal, 0.55—0.59 in diameter. Uterus intercaecal, without eggs; vitellaria was not observable.

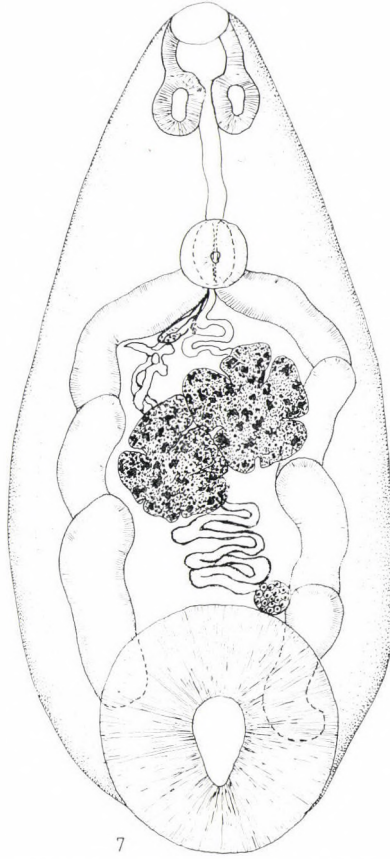


Fig. 7. *Platycladorchis macroacetabularis* sp. n., ventral view

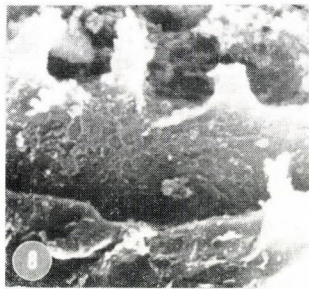


Fig. 8. Tegumental papillae of *Platycladorchis macroacetabularis* sp. n. around anterior part of body, X992

Type host: *Lissochilus krempfi* (Cyprinidae).

Localisation: posterior thirds of intestine.

Type locality: Red River, Hanoi district.

Type specimens: Department of Zoology, Janus Pannonius University, Pécs, Hungary; No. 1662 (1—8).

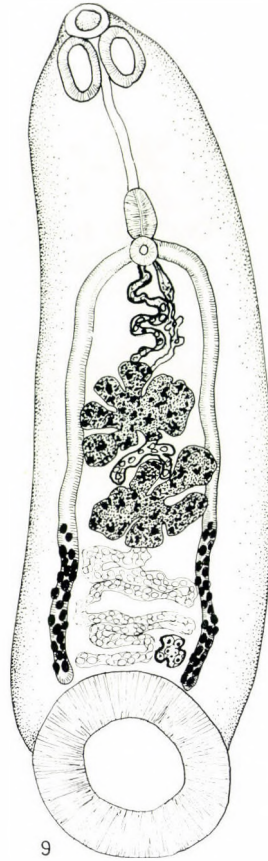
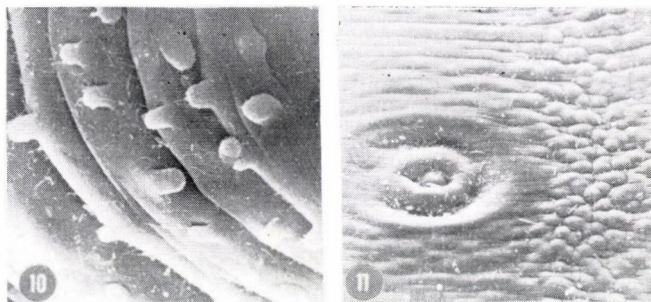


Fig. 9. *Neocladorchis multilobularis* sp. n., ventral view

Neocladorchis multilobularis sp. n.

Description. Body cylindrical, 4.2–5.0 in length; greatest width before acetabulum, measuring 0.11–0.15; dorso-ventral dimension 1.15 (Fig. 9). Anterior part of body covered with tegumenta papillae (Fig. 10).

Mouth terminal, surrounded by pharynx, measuring 0.20–0.23 in length, with two primary pharyngeal sacs, 0.30–0.32 in length. Pharynx with well-developed anterior sphincter and moderately developed middle circular and inner circular layers, of *Megacotyle*-type (SEY, 1983). Oesophagus 0.60–0.83 in length, posteriorly having an oesophageal bulb, dimensions 0.15–0.22 by 0.15–0.23. Intestinal caeca straight or slightly sinuous and passing posteriorly to anterior margin of acetabulum. Acetabulum ventro-terminal 1.0–1.3 in diameter, of *Neocladorchis*-type; DE: 67–69, DI: 30–32, VE: 50 + 25–27 (with a 100 μ empty space), VI: 30–32.



Figs 10—11. Tegumental papillae of *Neocladorchis multilobularis* sp. n. 10 = Tegumental papillae around anterior part of body, X511. — 11 = Tegumental papillae around genital opening, X111

Testes branching (7—12 lobuli), intercaecal, tandem or slightly oblique, uterine coils separate each other. Anterior testis measuring 0.41—0.45 by 0.45—0.50, posterior one 0.35—0.40 by 0.45. Cirrus pouch present measuring 0.2 by 0.1. Vesicula seminalis interna lying at the base of cirrus pouch, prostatic cells well developed. Genital opening bifurcal, 0.12—0.20 in diameter, of Scleroporum-type, surrounding with dome-shaped papillae (Fig. 11). Ovary lobed (3 lobuli) situated centrally or somewhat dextral, slightly before acetabulum. Ootype complex situated immediately posterior to ovary, between ventral sucker and ovary. Uterus passing centrally on dorsal aspect, filling up all the intercaecal area between ovary and posterior testis.

Vitellaria caecal, extending from posterior testis to extremity of intestinal caeca. Eggs' dimensions 0.11—0.13 by 0.05.

Type host: *Spinibarbichthys denticulatus* (Cyprinidae).

Localisation: posterior thirds of intestine.

Type locality: Red River, Hanoi district.

Type specimens: Department of Zoology, Janus Pannonius University, Pécs, Hungary; No. 1663 (1—5).

DISCUSSION

R e l a t i o n s h i p. Amphistomes are often characterized as trematodes having conically or cylindrically shaped body. Of the presently known genera there are only a few with strongly (*Zygocotyle*, *Platyamphistoma*) or more or less flattened (*Gastrodiscus*, *Homalogaster*, *Choerocotyle*, etc.) body. This trait, exceptional among amphistomes, emerges in phylogenetically removed taxa, parasitizing various definitive hosts (birds, mammals) indicating that it is rather the consequence of the convergent or parallel development (homoplastic features) than that of the manifestation of phylogenetic kinship.

The presently designated new genus, *Platycladorchis* has a dorso-ventrally strongly flattened body, which is the most characteristic feature of this genus, separating it from the known other fish amphistome genera.

Platycladorchis shows the closest resemblance, on the basis of the reproductive organ system to the genera *Caballeroia* and *Neocladorchis*, both of them including parasites of cyprinid fishes of India. *Platycladorchis* is regarded to be a sister-group of *Caballeroia-Neocladorchis* ancestry of Indian origin.

Platycladorchis differs from *Caballeroia* in having an oesophageal bulb, more lobulated testes and embryonated eggs, and from *Neocladorchis* in the relative position of testes and their lobulation as well as the position of testes to each other.

Species of the genus *Platycladorchis* differ from each other in measurements of acetabulum, cirrus pouch and position of genital opening.

The genus *Neocladorchis* was set up by BHALERAO, 1937 for the single species: *N. poonaensis*. *Neocladorchis multilobularis* differs from it in having slightly oblique, dendritic testes which are separated by the penetrating uterine coils.

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A NEW GENERIC CLASSIFICATION
FOR THE DIPLATYS SPECIES-GROUPS
(DERMAPTERA: PYGIDICRANIDAE)

H. STEINMANN

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

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A generic classification of Diplatyinae VERHOEFF, 1911 (Dermaptera: Pygidicranidae), based on a consistent grouping of the characters of male genitalia is given in a key suitable for identifying world genera and subgenera.

By consistently applying the generic characteristics and features it was revealed that comparative morphological studies of the male genitalia are highly suitable for separating the species-groups of the genus *Diplatys*, thereby rendering classification reliable. First of all, the morphology of the external parameres originating on the anterolateral margin of the male's genital apparatus was found to be suitable for this purpose, along with the highly diversified types of the virga of the genital lobe. I have already drawn attention in one of my earlier revisionary works (STEINMANN, 1974) to the morphology of the external parameres; in the present contribution I draw taxonomic conclusions concerning the interdependence existing between the external parameres and the virga.

Diplatyinae VERHOEFF, 1911

Body more or less flattened dorsoventrally, in its entirety bearing primordial features; surface covered with longer or shorter pubescence, rendering it lustreless and matt. Neck of blattoid-type, as in every member of the Pygidicranidae (suborder Catadermaptera STEINMANN, 1986), that is, posteroventral sclerite anterior to prothoracal sternum small and distinct, its posterior border not or just met by anterior margin of prosternum. Anteroventral sclerite never touching posteroventral plate, or indeed meeting it along an extensive section. Males with two genital lobes, directed posteriorad when at rest. Virga double. Paramere wide, external parameres on its anterolateral angles rich in form; epimeres possibly present.

Identification key to genera

- 1 (2) Paired external parameres on anterolateral margin of paramere simple, dentiform, apically not cleft or only very shallowly so, its inner margin not conspicuously excavated, and without tooth or teeth (a minute projection may occur near the base in some African species, but this is not to be confused with the teeth of *Diplatys* species). On anterior margin of paramere a shallow or slightly deeper excision between external parameres, or the plate not incised. Paired genital lobes extremely varying as to size and shape **Haplodiplatys** HINCKS, 1955
- 2 (1) The paired external parameres of male genitalia situated anterolaterally on paramere not simple, dentiform, but deeply cleft, thus constituting 2 (rarely more) large and sharply divided appendages; or this cleft shallow, as if recessed, thereby plate single but bearing diverse teeth or a movable epimere.
- 3 (6) Paired external parameres deeply cleft or conspicuously dentate, without a movable epimere.
- 4 (5) Apical part of paired external paramere deeply cleft, forming two or more large-sized, sharply divided lobes. Apical cleft dividing external parameres into an outer and inner, obtuse or pointed, dentiform excrescences, of which inner one usually terminating in an elongated apex **Schizodiplatys** STEINMANN, 1974
- 5 (4) Apical part of paired external parameres not deeply cleft, the originally outer lobe uniform and distinct, apically mostly with an elongated process, or without it. The original inner plate mostly unrecognizably reduced, forming only the extremely varying dentition (rich in form) or a single tooth on the inner margin of the uniform plate **Diplatys** SERVILLE, 1831
- 6 (3) Paired external parameres not cleft, not dentate, but forming a more or less elongated obtuse tooth, with a simple or double epimere.
- 7 (8) Epimere of external paramere monoarticulate, single, small and thin, apically extending beyond apex of external paramere, or of equal length with it, but occasionally also wider and in some cases also paired **Lobodiplatys** STEINMANN, 1974
- 8 (7) Epimere of external paramere biarticulate, paramere of male genitalia heart-shaped, virga specific, reclinate and forked **Circodiplatys** STEINMANN, 1985

Haplodiplatys HINCKS, 1955

The genital apparatus of these advanced species among the members of the subfamily Diplatyinae is very simple, especially its external parameres. Central paramere wide, on its surface the lobes of the paired lobus genitalis parallel, decurrent posteriorad or based when at rest. Virga of various development. External parameres, articulating on anterolateral angles of paramere, simple, generally constituting an obtuse tooth, uniform, without any excisions, appendages or well definable teeth.

Type-species: *Haplodiplatys niger* HINCKS, 1955.

Identification key to subgenera

- 1 (2) Virga within male genital lobe with a short unpaired and a longer paired section (Fig. 1); apex of external paramere bifurcated, specific, as in Fig. 2 **Eudiplatys** subgen. n.
- 2 (1) Virga within male genital lobe without unpaired section, and apex of external paramere simple, without excision.

- 3 (4) Paired virga within male genital lobe very long, and with strongly sclerotized section basally (Fig. 3); external paramere simple, more or less broadened basally (Fig. 4)
Mesodiplatys subgen. n.
- 4 (3) Paired virga within male genital lobe short, and without sclerotized section basally (Fig. 5); external paramere as in Fig. 6
Haplodiplatys HINCKS

Eudiplatys subgen. n.

Male genitalia characteristic, central parameral plate oval, well developed, with a smaller, and a larger genital lobe. Paramere parallel-sided laterally, median incision of anterior margin present but small. Genital lobe with Y-shaped virga, with a smaller, short unpaired, and a very long paired section (Fig. 1). External paramere elongated, with apex bifurcated (Fig. 2).

Type-species: *Diplatys milloti* CHOPARD, 1940.

List of species: *milloti* (CHOPARD, 1940)

Mesodiplatys subgen. n.

Male genitalia comparatively robust, central parameral plate fully developed, broad, median longitudinal incision not deep, but median longitudinal furrow very long. Genital lobes well marked, longer or shorter, and directed backwards; virga within genital lobe characteristic, without unpaired but with very long paired sections (Fig. 3). External paramere simple, strongly expanded basally, apices rounded (Fig. 4).

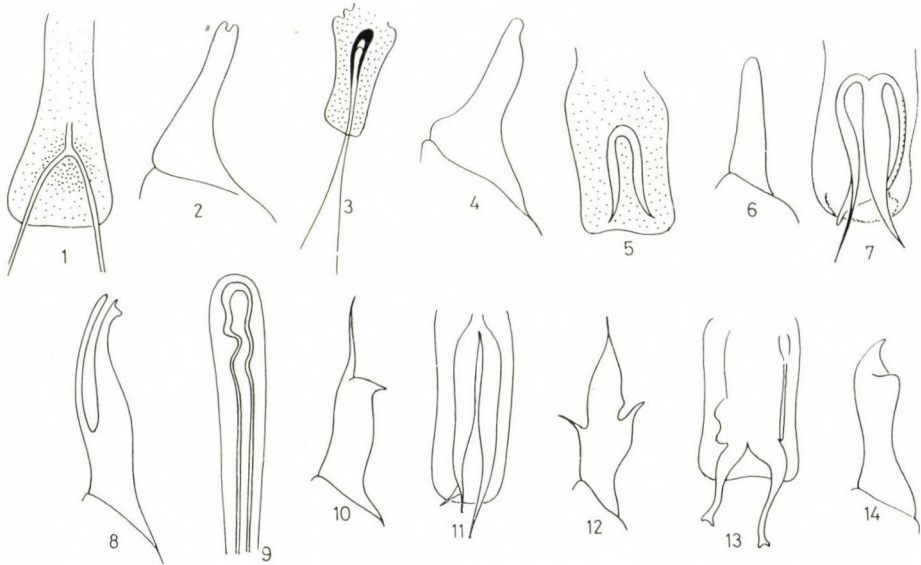
Type-species: *Diplatys nanus* BURR, 1914.

List of species: *gracillimus* (HINCKS, 1957)
longicornis (HINCKS, 1955)
major (BRINDLE, 1966)
mucronatus (HINCKS, 1957)
nanus (BURR, 1914)
raharizoninai (BRINDLE, 1966)

Haplodiplatys (*Haplodiplatys* HINCKS) HINCKS, 1955

The genital apparatus of these advanced species among the members of the subfamily Diplatyinae is very simple, especially its external parameres. Central paramere wide, on its surface the lobes of the paired lobus genitalis parallel, decurrent posteriorad or based when at rest. Paired virga within genital lobe short (Fig. 5), and without sclerotized section basally. External parameres, articulating on anterolateral angles of central paramere, simple, uniform as in Fig. 6.

Type-species: *Haplodiplatys niger* HINCKS, 1955.



Figs 1—14. 1 = Male genital lobe of *Haplodiplatys (Eudiplatys) milloti* (CHOPARD, 1940), and 2 = ditto, external paramere. — 3 = Male genital lobe of *H. (Mesodiplatys) nanus* (BURR, 1914), and 4 = ditto, external paramere. — 5 = Male genital lobe of *H. (Haplodiplatys) niger* HINCKS, 1955, and 6 = ditto, external paramere. — 7 = Male genital lobe of *Schizodiplatys nigriceps* (KIRBY, 1891), and 8 = ditto, external paramere. — 9 = Male genital lobe of *Diplatys (Neodiplatys) aethiops* BURR, 1904, and 10 = ditto, external paramere. — 11 = Male genital lobe of *D. (Hypodiplatys) bormansi* BURR, 1910, and 12 = ditto, external paramere. — 13 = Male genital lobe of *D. (Nannopygia) gerstaeckeri* DOHRN, 1863, and 14 = ditto, external paramere

- List of species: *basileuskyi* (BRINDLE, 1966)
bhowmiki (SRIVASTAVA & SAHA, 1975)
bidentatus (HINCKS, 1955)
bilobus (BEY-BIENKO, 1959)
brancuccii SRIVASTAVA, 1983
chinensis (HINCKS, 1955)
convexusculus BRINDLE, 1984
darwinii (BEY-BIENKO, 1959)
fengyangensis (WENBAO, 1985)
flavens (HINCKS, 1955)
glenis (KAPOOR, 1968)
hamatus (BRINDLE, 1972)
hincksi STEINMANN, 1974
insularis (BORELLI, 1932)
jansoni (KIRBY, 1891)
kivuensis (HINCKS, 1951)
malaisi (HINCKS, 1947)
niger HINCKS, 1955
olsufiewi (BORELLI, 1932)
orientalis STEINMANN, 1974
rileyi (HINCKS, 1955)
rufescens (KIRBY, 1896)
ruenzoricus (HINCKS, 1955)
severus (BORMANS, 1893)
signatus (BEY-BIENKO, 1970)

similis (BEY-BIENKO, 1959)
simlaensis (KAPOOR, 1966)
siva (BURR, 1904)
srivastavai (KAPOOR, 1974)
stemmleri (BRINDLE, 1975)
tibetanus (HINCKS, 1955)
tonkinensis (HINCKS, 1955)
urbani (BRINDLE, 1975)
viator (BURR, 1904)
wallacei (BEY-BIENKO, 1959)

Schizodiplatys STEINMANN, 1974

Apical section of external parameres articulating on anterolateral margin of central paramere with a cleft dividing plate into a conspicuous outer and inner lobe, cleavage generally cutting metaparamere deeply and only rarely to a shallow extent. Direction of cleavage parallel with longitudinal axis of plate, occasionally also oblique or transverse to it (Fig. 8). Virga within genital lobe (Fig. 7) paired beyond a shorter to longer undivided section.

Type-species: *Cylindrogaster nigriceps* KIRBY, 1891.

List of species: *angustatus* (BURR, 1910)
bensoni (HINCKS, 1955)
feae (BORELLI, 1907)
hoogstraali (SRIVASTAVA, 1978)
karnyi (BORELLI, 1926)
komodoensis (BEY-BIENKO, 1965)
malayanus (HINCKS, 1957)
mixtus (BORELLI, 1923)
nigriceps (KIRBY, 1891)
palawanensis (SRIVASTAVA, 1978)
subangustatus STEINMANN, 1974
sublobatus (BORELLI, 1923)
sumatranus (BOESEMAN, 1954)
rosseleri (BURR, 1907)

Diplatys SERVILLE, 1831

External parameres articulating on anterolateral sides of central parameral plate uniform, their apical section not cleft into an outer and inner lobiform tooth. Exterior margin of uniform plate generally smooth, without excrescences, but inner margin with richly and diversely formed tooth or dentition (excellently suitable for identification). In some species, a smaller incision or shallow depression observable between these teeth, sharply differing, however, from those of the *Schizodiplatys* species by being present on the inner side of the plate and not apically.

Type-species: *Forficula macrocephala* BEAUVOIS, 1805.

Identification key to subgenera

- 1 (4) Virga within male genital lobe with very long paired section (Figs 9 and 11).
- 2 (3) Virga within male genital lobe without unpaired section basally (Fig. 9). The virga extremely long and thin, without large, infundibuliform aperture apically. External parameres long, each plate with apex narrow and with a large inner tooth-like process (Fig. 10) **Neodiplatys** subgen. n.
- 3 (2) Virga within male genital lobe with a very short but well-marked unpaired section basally (Fig. 11). The virga extremely long but not thin. External parameres various, with smaller or larger outer and inner tooth or teeth (Fig. 12) **Hypodiplatys** subgen. n.
- 4 (1) Virga within male genital lobe with short paired section.
- 5 (8) Virga within male genital lobe with shorter or longer thick unpaired section (Figs 13 and 15).
- 6 (7) Virga within male genital lobe characteristic, with a lobiform unpaired section basally (Fig. 13). External paramere not of *Diplatys*-type, obtuse, inner margin of external paramere with only one tooth, it is obtuse and large (Fig. 14) **Nannopygia** DOHRN, 1863
- 7 (6) Virga within male genital lobe with a well-marked and developed unpaired section basally (Fig. 15). External paramere of *Diplatys*-type, various, e.g. as in Fig. 16 **Syndiplatys** subgen. n.
- 8 (5) Virga within male genital lobe with shorter or longer, narrow or very narrow basal, and very short apical or paired sections **Diplatys** SERVILLE

Neodiplatys subgen. n.

Male genitalia with characteristic, very long genital lobes. The lobes a little of *Epilandex*-type (Carcinophoridae). Central parameral plate broad, more or less oval or ovoid; median incision of anterior margin smaller or larger, but not deep though narrow, linear. Genital lobes very long (Fig. 9), virga within genital lobe paired along its entire length, extending beyond parameral base. Virga extremely long and thin, without large, infundibuliform aperture apically.

Type-species: *Diplatys aethiops* BURR, 1904.

- List of species: *aethiops* BURR, 1904
annandalei BURR, 1911
borellii HINCKS, 1955
brindlei STEINMANN, 1974
chopardi HINCKS, 1955
dolens HINCKS, 1957
excidens HINCKS, 1954
gedyei HINCKS, 1955
lefroyi BURR, 1910
longipennis BRINDLE, 1969
pictus (ZACHER, 1910)
poonaensis KAPOOR, 1968
popovi BEY-BIENKO, 1959
simplex HINCKS, 1961

Hypodiplatys subgen. n.

Male genitalia characteristic; central parameral plate oval, broad, well developed, narrowed basally; median incision of anterior margin between external parameres specific, more or less broad. Genital lobes fully developed, virga within genital lobe paired along its entire length, and broad, rather short or longer, just reaching or hardly longer than length of genital lobe. Virga with a very short unpaired section basally (Fig. 11). External paramere with or without a well-discernible so-called third tooth, its point acute in outer margin, e.g. as in Fig. 12.

Type-species: *Diplatys bormansi* BURR, 1910.

List of species: *bormansi* (BURR, 1910)
denticulatus (HINCKS, 1957)
devlensis (SRIVASTAVA, 1974)
fletcheri (BURR, 1910)
javanicus (HINCKS, 1955)

Nannopygia DOHRN, 1863

Male genitalia specific, central parameral plate cordiform, very broad apically, and narrow basally; median incision of anterior margin deep. Genital lobe well developed, virga within genital lobe fully developed, with a large and broad unpaired, basal section, and a narrower paired, apical section (Fig. 13). External paramere not of *Diplatys*-type, obtuse and large (Fig. 14).

Type-species: *Nannopygia gerstaeckeri* DOHRN, 1863.

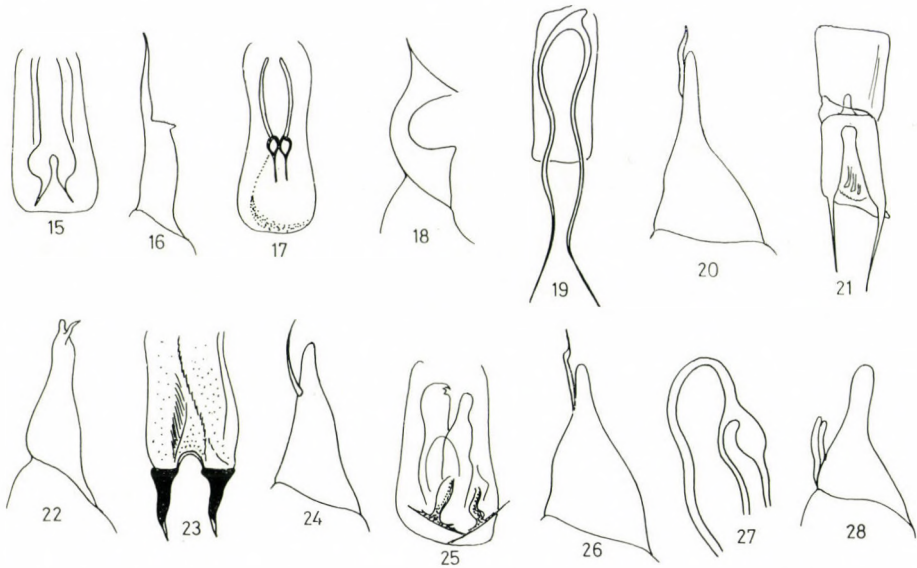
List of species: *gerstaeckeri* (DOHRN, 1863)

Syndiplatys subgen. n.

Male genitalia well developed; central parameral plate more or less cordiform, generally narrowed basally; median incision of anterior margin present, comparatively deep. Genital lobes moderately smaller, extending to minor part of parameral plate, not projecting beyond or at most reaching median line of plate. Virga within genital lobe dividing at apical third of lobe, with well-developed unpaired section, and characteristic paired sections (Fig. 15). External paramere various, e.g. as in Fig. 16.

Type-species: *Diplatys ernesti* BURR, 1910.

List of species: *adjacens* HINCKS, 1955
anamalaiensis SRIVASTAVA, 1970
coelebs HINCKS, 1955
confusus HINCKS, 1955



Figs 15—28. 15 = Male genital lobe of *Diplatys (Syndiplatys) ernesti* BURR, 1910, and 16 = ditto, external paramere. — 17 = Male genital lobe of *D. (Diplatys) macrocephalus* (BEAUVOIS, 1805), and 18 = ditto, external paramere. — 19 = Male genital lobe of *Lobodiplatys (Heterodiplatys) bicolor* (DUBRONY, 1879), and 20 = ditto, external paramere. — 21 = Male genital lobe of *L. (Epidiplatys) gladiator* (BURR, 1905), and 22 = ditto, external paramere. — 23 = Male genital lobe of *L. (Lobodiplatys) coriaceus* (KIRBY, 1891), and 24 = ditto, external paramere. — 25 = Male genitalia of *L. (Paradiplatys) conradi* (BURR, 1904), and 26 = ditto, external paramere. — 27 = Male genital lobe of *Circodiplatys kjellenderi* (BRINDLE, 1967), and 28 = ditto, external paramere

ernesti BURR, 1910
fallax BORELLI, 1926
flavicollis SHIRAKI, 1907
greeni BURR, 1904
griffithsi BURR, 1911
incisus BRINDLE, 1974
jacobsoni BURR, 1911
jogiensis KAPOOR, 1968
liberatus BURR, 1910
nilgiriensis HINCKS, 1955
propinquus HINCKS, 1955
reconditus HINCKS, 1955
santoshi SRIVASTAVA, 1975
singularis STEINMANN, 1985
sinuatus HINCKS, 1955
truncatus HINCKS, 1947
yunnaneus BEY-BIENKO, 1959

Diplatys (Diplatys) SERVILLE, 1831

External parameres articulating on anterolateral sides of central paramere uniform, their apical section not cleft into an outer and inner lobiform tooth. Exterior margin of uniform plate generally smooth, without excrescences, but inner margin with richly and diversely formed tooth or dentition.

Type-species: *Forficula macrocephala* BEAUVOIS, 1805.

- List of species: *bajjali* DUDA & MALHOTRA, 1970
beroni BRINDLE, 1982
coerulescens BRINDLE, 1979
croixi BURR, 1904
degerboliae RAMAMURTHI, 1973
dohrni BURR, 1911
fella BURR, 1911
flavobrunneus CHOPARD, 1924
hakasonei NISHIKAWA, 1973
hayashidai NISHIKAWA, 1973
himalayanus BAIJAL & SINGH, 1954
jawalagiriensis KAPOOR & BANERJEE, 1971
leleupi BRINDLE, 1966
macrocephalus (BEAUVOIS, 1805)
menoni KAPOOR & BHARADWAJ, 1968
nathani HINCKS, 1960
raffrayi DUBRONY, 1879
rehni HINCKS, 1955
ridleyi KIRBY, 1903
saxeus BRINDLE, 1982
shirakii NISHIKAWA, 1973
taurinus BRINDLE, 1982
torrevillasi SRIVASTAVA, 1976
transversalis BRINDLE, 1983
ugandanus HINCKS, 1955
vittatus BEY-BIENKO, 1970

Lobodiplatys STEINMANN, 1974

External parameres articulating on anterolateral margin of central parameral plate, not cleft, not dentate, but forming a more or less elongated plate or lobe with a movable epimere (Figs 20, 22, 24 and 26).

Type-species: *Forficula coriaceus* KIRBY, 1891.

Identification key to subgenera

- 1 (4) Virga within male genital lobe with very long paired section (Figs 19 and 21).
- 2 (3) Virga within genital lobe of male genitalia paired in its entire length, long, projecting far beyond plate of paramere (Fig. 19) **Heterodiplatys** subgen. n.
- 3 (2) Virga not paired in its entire length within genital lobe, short, thus just about reaching or projecting somewhat beyond apex of genital lobe **Epidiplatys** subgen. n.
- 4 (1) Virga within male genital lobe with very short paired section (Figs 23 and 25).
- 5 (6) Virga within male genital lobe characteristic, apically heavily sclerotized, and ending in two specific triangular denticles (Fig. 23) **Lobodiplatys** STEINMANN
- 6 (5) Virga within male genital lobe very short, and without two heavily sclerotized denticles (Fig. 25) **Paradiplatys** ZACHER, 1910

Heterodiplatys subgen. n.

Male genitalia very broad, central parameral plate broad, well or fully developed, median incision of anterior margin between external parameres

very small, specific, incision by far not reaching line of origin of genital lobe. Virga within genital lobe with very long paired section (Fig. 19).

Type-species: *Labia bicolor* DUBRONY, 1879.

List of species: *bicolor* (DUBRONY, 1879)
bihamatus (HINCKS, 1955)
burri (HINCKS, 1936)
rotundicollis (HINCKS, 1952)
shoudeteni (HINCKS, 1937)

Epidiplatys subgen. n.

Male genitalia characteristic, elongate, large; central parameral plate broad, sometimes robust; median incision of anterior margin well marked, wide. Genital lobes moderately small, specific, paired section of virga within genital lobe comparatively long, as in Fig. 21. External parameres fully developed, epimere on outer margin of external paramere small (Fig. 22).

Type-species: *Diplatys gladiator* BURR, 1905.

List of species: *gladiator* (BURR, 1905)

Lobodiplatys (*Lobodiplatys* STEINMANN) STEINMANN, 1974

Male genitalia with oval central parameral plate; median incision of anterior margin deep and wide; genital lobes well developed, virga apically heavily sclerotized, characteristic, as in Fig. 23. External paramere comparatively small, epimeres large, nearly half as long as half length of external parameres (Fig. 24).

Type-species: *Forficula coriacea* KIRBY, 1891.

List of species: *coriaceus* (KIRBY, 1891)

Paradiplatys ZACHER, 1910

Male genitalia with very large, broad central parameral plate, median incision of anterior margin comparatively small; genital lobes well or fully developed, virga within genital lobe very short, various in shape and size, e.g. as in Fig. 25.

Type-species: *Diplatys conradti* BURR, 1904.

List of species: *conradti* (BURR, 1904)
lamottei (HINCKS, 1954)
pectinatus (HINCKS, 1955)
salvazai (BURR, 1917)
spinulosus (HINCKS, 1961)

Circodiplatys STEINMANN, 1985

Male genitalia very specific, central parameral plate cordiform, median incision of anterior margin very broad and deep. Genital lobes equally sclerotized, the inner lobe being the longest. Virga within genital lobe (Fig. 27) characteristic, curved strongly with a bifurcated part distally, one branch of this part being dilated at one point. Epimerite of external paramere of male genitalia biarticulate (Fig. 28).

Type-species: *Diplatys kjellenderi* BRINDLE, 1967.

List of species: *kjellenderi* (BRINDLE, 1967)

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NEUE EMINOSCOLEX-ARTEN
AUS DEM KONGO-GEBIET
(OLIGOCHAETA: EUDRILIDAE)

A. ZICSI und Cs. CSUZDI

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

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Representants of the genus *Eminoscolex* collected by the Hungarian Soil Zoological Expedition in Africa are elaborated. Four new species: *E. baloghi* sp. n., *E. youngai* sp. n., *E. seidlæ* sp. n. and *E. thibaudi* sp. n., furthermore a new subspecies *E. steindachneri franzi* ssp. n. are described. Additional data to the original descriptions of the species *E. kisantuanus* MICH., 1935, *E. lamani* MICH., 1921, and *E. congicus* MICH., 1910, and at last an identification key to the *Eminoscolex* species is given.

Von den Teilnehmern der Ungarischen Bodenzoologischen Expedition wurden in der Volksrepublik Kongo in der Zeit vom 16. X. 1963 bis zum 21. I. 1964 u. a. auch zahlreiche Regenwürmer gesammelt, deren Bearbeitung jetzt fortlaufend erfolgen soll. Die Teilnehmer der Expedition (Prof. Dr. J. BALOGH, Dr. A. ZICSI und Dr. S. ENDRÖDY-YOUNGA), deren Tätigkeit von der UNESCO und dem Office de la Recherche Scientifique et Technique Outre-Mer Paris und Brazzaville (ORSTOM) unterstützt wurde, sammelten vorwiegend an folgenden Stellen:

1. Meya, in der Umgebung von Kindamba, W—NW von Brazzaville (S. 3°50'19"—Ö. 14°30'08") vom 29. X.—14. XI. 1963.
2. Sibiti, 5 km entfernt von der Stadt in der Umgebung des Institute de Recherches pour les Huites et Oleagineux (IRHO), und beim Bouenza Wasserfall und dessen Umgebung (S. 3°40'22"—Ö. 13°20'23") vom 23. XI.—3. XII. 1963.
3. Loudima, landwirtschaftlich bebaute Gebiete, Plantagen (S. 4°10'00"—Ö. 13°00'39") vom 4. XII.—15. XII. 1963.
4. Reservat Mt. Fourori, an der Grenze von Gabon (S. 2°38'00"—Ö. 11°34'04") vom 12. XII.—15. XII. 1963.
5. Reservat Lefini (S. 2°30'00"—Ö. 15°29'00") vom 5. I.—14. I. 1964.
6. Brazzaville und Umgebung (S. 4°10'38"—Ö. 15°10'28") vom 16. X.—28. X. 1963; vom 15. XI.—22. XI. 1963; 15. XII.—4. I. 1964; und vom 15. I.—21. I. 1964.

Nähere Fundortsangaben werden im nachfolgenden bei der Bekanntmachung der Arten angeführt, auf weitere Fundortsangaben wird auf die von BALOGH—ZICSI—ENDRÖDY-YOUNGA (1965) zusammengestellte Fundortsliste verwiesen.

Das reiche Regenwurm-Material, welches entweder mit der Formol-Methode oder durch Graben erlangt wurde, befindet sich in gut erhaltenem Zustand und ermöglicht, verschiedene Regenwurm-Gruppen betreffend, ein-

gehende Studien durchzuführen. Es wurden zuerst die Vertreter der Familie Eudrilidae ausgelesen und bestimmt. In vorliegender Arbeit wollen wir uns zuerst mit derjenigen Gattung eingehender befassen, von der die meisten Arten vorgefunden wurden. Es handelt sich um die Gattung *Eminoscolex* MICHAELSEN, 1896.

Gattung *Eminoscolex* MICHAELSEN, 1896

Syn. *Haaseina* Michaelsen, 1935 (MICHAELSEN 1937, p. 512).

Die Diagnose der Gattung wurde 1903 von MICHAELSEN, nachdem zahlreiche Arten ihr eingereiht wurden, umgeformt. Neuerdings empfiehlt OMODEO (1973) bezüglich der Lage der Samentaschenporen, eine Ergänzung der Gattungsdiagnose vorzunehmen. Wir fügen ebenfalls einige Ergänzungen bei, die sich aus unseren Untersuchungen ergaben.

Es handelt sich um die von MICHAELSEN bereits 1910 bei *Eminoscolex congicus* beobachtete Borstenanordnung, wobei besonders hinter dem Gürtel die 3 Borstenlinien b, c and d in gleichmäßiger, geringer Entfernung voneinander zu liegen kommen. Diese später auch bei *E. navanus* MICHAELSEN, 1936 angetroffene Borstenanordnung wurde in unserem Material bei mehreren Arten beobachtet, so daß wir ihr künftig eine größere Bedeutung zusprechen wollen.

Diagnose: Borsten ventral sehr weit gepaart, lateral enger gepaart oder hinter dem Gürtel Borsten b, c, d in gleicher Entfernung enger gepaart. Nephridialporen in der Borstenlinie cd. Männliche Poren und Samentaschenporen paarig. Männliche Poren auf Intersegmentalfurche 17/18 (selten 16/17?). Samentaschenporen auf Intersegmentalfurche 12/13 oder 13/14. Muskelmagen im 5. oder 6. Segment beginnend, unpaarige ventrale Chylustaschen im 9.—11. Segment und ein Paar Kalkdrüsen im 13. Segment. Holoandrisch. Samenmagazine vorhanden. Prostaten durch eine Kopulationstasche oder einen dieser entsprechenden Begattungsschlauch ausmündend. Penilaborsten fehlen. Ovarien von Ovarialblasen umgeben, die nach hinten in Eitrichterblasen übergehen und direkt oder durch Verbindungsschläuche mit den Samentaschen in Kommunikation treten oder diese umhüllen. Samentaschen ganz paarig oder den Darm ringförmig umfassend, proximal verschmolzen.

Wie der einschlägigen Literatur entnommen werden konnte, wurden 35 Taxa dieser Gattung eingeordnet. Der überwiegend größte Teil der Arten wurde von MICHAELSEN (26 Taxa) beschrieben, die übrigen von COGNETTI DE MARTIS (3 Taxa), ČERNOSVITOV (3 Arten), SEGUN (2 Arten) und BEDDARD (1 Art). Interessant ist die Tatsache, daß kaum eine der beschriebenen Arten, mit Ausnahme der wenigen die von MICHAELSEN, 1921, 1937, SIMS, 1971, OMODEO, 1973, SEGUN, 1978 erwähnt wird, wieder gesammelt und in der Literatur erscheint. Unserer Meinung nach kann dies einerseits damit zusam-

menhängen, daß verhältnismäßig wenige Sammlungen im Verbreitungsgebiet dieser Arten (tropisches Ost-, West- und Zentralafrika) durchgeführt werden, andererseits ergeben sich aber Schwierigkeiten bei der Identifizierung der Arten, da 16 aufgrund eines Exemplares, über 10 Arten anhand von schlechterhaltenem Material beschrieben wurden.

Bei der Bearbeitung unseres Materials sind wir diesen Schwierigkeiten ebenfalls begegnet. Da es sich eben wegen der schlechten Erhaltung des Typenmaterials in den meisten Fällen nicht lohnte, Original-Material einzusehen, sehen wir uns gezwungen, Arten, die aus der weiteren Umgebung unserer Fundorte gesammelt und beschrieben wurden, mit Ergänzung der Originalbeschreibung diesen einzureihen. Diesem Umstand sowie den unzulänglichen Beschreibungen bzw. unseren mangelnden Kenntnissen zufolge, konnte eine Revision der Gattung einstweilen nicht ins Auge gefaßt werden.

BESCHREIBUNG DER ARTEN

Eminoscolex kisantuanus MICHAELSEN, 1935

Diese Art wurde aufgrund eines stark erweichten, vielleicht nicht ganz vollständigen Exemplares, wie dies in der Originalbeschreibung erwähnt wird, beschrieben. Einige Jahre später wurde eine etwas abweichende Form dieser Art ebenfalls von MICHAELSEN (1937) unter der Benennung *E. kisantuanus* f. *tinanti* bekanntgegeben. Als ausschlaggebender Unterschied werden die äußeren akzessorischen Pubertätsorgane erwähnt. Außerdem führt MICHAELSEN in der kurzgefaßten Beschreibung noch einige, weniger wesentliche Unterschiede an, so daß ohne Material gesehen zu haben, die Aufstellung einer Unterart für uns nicht möglich ist. Dies desto weniger, da Exemplare mit solchen akzessorischen Pubertätsorganen in dem reichen Material nicht angetroffen werden konnten.

Neuerdings wurde *E. kisantuanus* MICHAELSEN, 1935 von OMODEO (1973) aus der Volksrepublik Kongo und aus Angola erwähnt (je ein Exemplar) und als fragliche Varietät beschrieben. In der Ausbildung der Euprostata sind die Unterschiede jedoch so eindeutig, daß es uns fraglich erscheint, ob wir einer *kisantuanus* im Sinne von MICHAELSEN gegenüberstehen.

In unserem Material liegen uns von verschiedenen Fundorten sehr zahlreiche Exemplare vor, die wir trotz der in manchen Charakteren unzulänglichen Beschreibung MICHAELSEN's dieser Art einreihen. Die fehlenden Kennzeichen werden anhand unseres sehr gut erhaltenen Materials ergänzt. An dieser Stelle sei noch erwähnt, daß dies die häufigste in unserer Ausbeute vorkommende Art ist, die im Acker, in Urwäldern, in verschiedenen organischen Abfällen, in faulenden Früchten des Urwaldes und der Obstplantagen und im Kompost anzutreffen war.

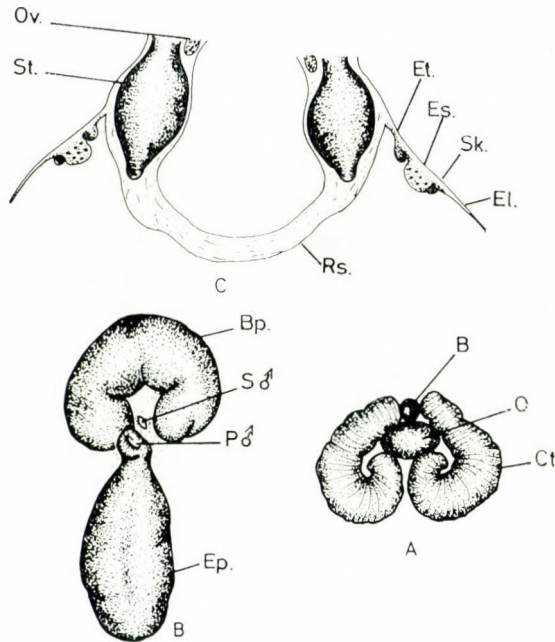


Abb. 1. *Eminoscolex kisantuanus* MICHAELSEN, 1935. — A = Form der Kalkdrüsen (Ct: Chylustaschen, O: Oesophagus, B: Blutgefäß). — B = Form der Euprostate (Ep: Euprostate, P♂: primärer männlicher Porus, S♂: sekundärer männlicher Porus, Bp: Bursa propulsoria oder Begattungsschlauch). — C = Weibliche Geschlechtsorgane und Samentaschenapparat (Ov: Ovarien, St: Samentaschen, El: Eileiter, Sk: Samenkammerchen, Es: Eiersack, Et: Eitrichter, Rs: Ringschlauch)

B e s c h r e i b u n g. Äußeres: Länge 55—92 mm, Dicke 2,5—4,5 mm, Segmentzahl 138—198.

Farbe: im allgemeinen schmutziggrau, manchmal auch dunkelgrau.

Kopf epilobisch 2/3 offen. Nephridialporen im 3. Segment beginnend in der Borstenlinie cd. Borsten ventral weit gepaart, lateral mäßig eng gepaart. Borstendistanz wie:

$$\begin{array}{l} aa : ab : bc : cd \\ 13. \text{ Seg. } 2,5 : 1,6 : : 1 \\ 30. \text{ Seg. } 2,7 : 2 : 2,2 : 1 \end{array}$$

Gürtel am 14.—17. Segment, manchmal auch auf das 18. Segment übergehend, ringförmig.

Männliche Poren paarig, ventral auf Intersegmentalfurche 17/18, zwischen der Borstenlinie a und b mit einem etwas helleren ovalen Hof. Manchmal sind die ektalen Teile des männlichen Ausführungsapparates verschieden weit ausgestülpt. Borsten des 17. Segmentes fehlen.

Samentaschenporen auf Intersegmentalfurche 12/13, liegen tief in den Intersegmentalfurchen.

Weibliche Poren auf Intersegmentalfurche 14/15, oberhalb der Borstenlinie c, gegenüber den Nephridialporen des 15. Segmentes.

Innere Organisation. Dissepimente 5/6—6/7 zart, 7/8—10/11 stärker 11/12—12/13 wieder mäßiger verdickt.

Darm. Ein großer Muskelmagen im 5. Segment beginnend und auch das 6. Segment einnehmend. Drei dickeiförmige unpaarige Chylustaschen im 9.—11. Segment, Kalkdrüsen im 13. Segment (Abb. 1A). Kalkdrüsen seitlich am Oesophagus hängend, im unteren Teil mit einem tiefen Einschnitt, der aus der allgemeinen Ebene der Kalkdrüsen herausgeschoben wird. Herzen im 6.—11. Segment.

Vordere männliche Geschlechtsorgane: holoandrisch. Zwei Paar Samensäcke (bei den einzelnen Exemplaren verschieden groß) ragen vom Dissepiment 10/11 und 11/12 in das Segment 11 und 12 hinein. An der Vorderseite dieser Segmente, im 10. und 11. Segment liegen 2 Paar mäßig angeschwollene, nicht gewundene, einfach keulenförmige Samenmagazine. Das Ende dieser immer dünner werdenden Magazine durchbohrt die betreffenden Segmente und geht in einen Samentrichter über, der in den Samensäcken eingebettet ist. Die ektalen Enden der Samenmagazine gehen in je einen Samenleiter über. Hoden sind nicht erkannt worden. Mit SIMS (1964, 1969) und OMODEO (1973) übereinstimmend ist es anzunehmen, daß diese ebenfalls in den Samenmagazinen eingeschlossen sind.

Hintere männliche Geschlechtsorgane (Abb. 1B) Vollständig getrennt paarig. Jederseits befindet sich eine dick wurstförmige dem Ende zu verdünnte Euprostata, die äußerlich ganz glatt, muskulös glänzend ist. Die von vorn herkommenden, sich an der Euprostata entlang ziehenden Samenleiter sind eng aneinander gelegt, aber unverschmolzen und treten etwas unterhalb der Euprostata-Mitte in diese ein. Ektal verengt sich die Euprostata zu einem dünnen, von einem Achsenlumen durchzogenen Knopf, der in eine dünnwandige Blase hineinragt. Diese dünnwandige Blase, die wir als Kopulationstasche auffassen, ist bei mehreren Exemplaren durch den sekundären männlichen Porus ausgestülpt. Die Öffnung an der Kuppe des ektalen Euprostata-Knopfes ist als primärer männlicher Porus zu betrachten. Wie bereits von MICHAELSEN richtig erkannt, setzt sich die Blase nach vorne hin in ein gesondertes Organ fort, welches von ihm als ausstülpbarer Begattungsschlauch bezeichnet wird. Dieser sich den Seitenrändern nähernde Strang ist in unregelmäßige, z. Teil kreisbogenförmige oder spiralförmige Windungen gebogen, so daß sein entales Ende dem ektalen Ausgangspunkt nahe zu liegen kommt. Der Schlauch selbst ist in ein System von Muskelfäden eingebettet, die von einem Häutchen zusammengehalten werden und das ganze Organ überragen. Ob die Erklärung von MICHAELSEN, dies Organ als einen ausstülpbaren Begattungsschlauch zu betrachten, richtig ist, mag dahingestellt bleiben, wir nehmen an, einer Bursa propulsoria gegenüberzustehen, die als Retraktor der ausstülpbaren Kopula-

tionstasche dient. In der einschlägigen Literatur haben wir bisher keinen Hinweis auf ein solches Organ gefunden, und da unsere Tiere in diesem Organ mit denen von MICHAELSEN beschriebenen übereinstimmen, wurden sie dieser Art zugestellt.

Weibliche Geschlechtsorgane und Samentaschenapparat (Abb. 1C). Die beiden Samentaschenporen führen in die breite Basis einer birnförmigen Samentasche, die am Ende knopfförmig endet. Die Samentaschen sind vollständig geschlossen, verhältnismäßig klein. An der Hinterseite von Dissepiment 12/13 sitzen ein Paar winzige Ovarien. Diese und die Samentaschen sind von einer Ovarial-Eitrichterblase umgeben, die sich an der Basis der Samentaschen eng um diese schließen. Weiter höher umschließt dieser zöломatische Schlauch nur lockerer die Samentaschen und bildet einen Ringschlauch um den Oesophagus. Durch die weiblichen Poren (Abb. 1C) gelangt man in je einen gestreckten, geraden Eileiter, der sich in einen zusammengerollten Eitrichter fortsetzt und in die Ovarial-Eitrichterblase hineinragt. An der Rückseite des Eitrichters ist ein nierenförmiger Eiersack zu erkennen, davor ein deutliches Samenkammerchen.

Fundorte: AF/19. 1 Ex. 21. IX. 1963; AF/16. 1 Ex. 21. IX. 1963; AF/26. 1 Ex. 19.—21. I. 1964. Brazzaville, ORSTOM Park, leg. ZICSI u. BALOGH. — AF/8. 2 Ex. AF/15. 2 Ex. Loudima, Garten am Bahnhof, 6. XII. 1963, AF/12. 1 Ex. Loudima, SAGRO im Wald und auf Weiden, 8. XII. 1963; AF/14. 4 Ex. Loudima SAGRO im Kompost, 8. XII. 1963; AF/61—64. 38 Ex., AF/66—71. 11 Ex. Loudima, IRHO, Jakob, in Ackerböden, in Galeriewäldern, in Bambuswäldern, in Obstplantagen, im Kompost, 4. XII.—15. XII. 1963. leg. ZICSI und BALOGH. — AF/33—34. 30 Ex. Dorf Meya bei Kindamba, nach einem großen Regen. AF/35. 1 Ex. Kindamba, Meya am Ufer des Louolo Flusses, AF/44., 47. 2 Ex. Kindamba, Meya, im Urwald, 30. X.—15. XI. 1963. leg. ZICSI u. BALOGH. — AF/74., 81. 10 Ex. SIBITI IRHO im Urwald. AF/75. 5 Ex. Ölpalmen-Plantagen, in faulenden Früchten, 24.—29. XI. 1963. leg. ZICSI und BALOGH. — AF/91. 2 Ex. Reservat Lefini, am Ufer des Nambouli Flusses, 11. 1. 1964. leg. ZICSI u. BALOGH.

Eminoscolex baloghi sp. n.

Äußeres. Dimensionen: Holotypus Länge 39 mm, Dicke 3 mm, Segmentzahl 91. Bei den übrigen Tieren Länge 37—45 mm, Dicke 2—3 mm, Segmentzahl 89—117.

Farbe: gelblichgrau.

Kopf epilobisch 1/3 offen. Nephridialporen im 3. Segment beginnend in der Borstenlinie cd. Borsten ventral weit gepaart, lateral enger gepaart. Borstendistanz:

	<i>aa</i>	<i>: ab</i>	<i>: bc</i>	<i>: cd</i>
13. Segment	2,3	: 1,8	: 2,2	: 1
30. Segment	3,1	: 2,2	: 2,2	: 1

Gürtel am 14.—17. Segment, ringförmig.

Männliche Poren auf Intersegmentalfurche 17/18, paarig zwischen der Borstenlinie a—b, augenförmige, an den Rändern stark gefurchte Schlitzte,

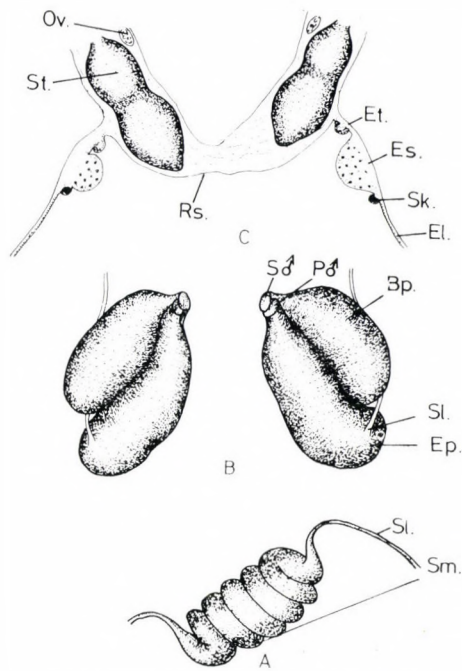


Abb. 2. *Eminoscolex baloghi* sp. n. — A = Form der Samenmagazine (Sm: Samenmagazin, Sl: Samenleiter). — B = Form der Euprostaten (Ep: Euprostata, Sl: Samenleiter, Bp: Bursa propulsoria, P♂: primärer männlicher Porus, S♂: sekundärer männlicher Porus). — C = Weibliche Geschlechtsorgane und Samentaschenapparat (Ov: Ovarien, St: Samentaschen, El: Eileiter, Sk: Samenkammerchen, Es: Eiersack, Et: Eitrichter, Rs: Ringschlauch)

aus denen bei den meisten Exemplaren die ektalen Teile des männlichen Ausführungsapparates hervorstehen und ausgestüpt sind. Borsten des 17. Segmentes fehlen.

Samentaschenporen auf Intersegmentalfurche 12/13, zwischen der Borstenlinie b und c, ziemlich große und deutliche Öffnungen, die etwas verfarbt umrandet sind.

Weibliche Poren auf Intersegmentalfurche 14/15 in der Linie der Nephridialporen, am hinteren Teil des 14. Segmentes.

Innere Organisation. Verdickte Dissepimente fehlen.

Darm. Ein großer Muskelmagen im 5.—7. Segment. Drei kleine birnförmige, unpaarige ventrale Chylustaschen im 9., 10., 11. Segment. Kalkdrüsen im 13. Segment, ohrenförmig, sind vom zöломatischen Schlauch der Samentaschen überdeckt. Herzen im 6.—11. Segment.

Vordere männliche Geschlechtsorgane: holoandrisch. Zwei Paar sehr große Samensäcke ragen vom Dissepiment 10/11 und 11/12 nach hinten bis ins 13., 14. Segment. Samenmagazine im 10. und 11. Segment mächtig groß, mehrmals gewunden, jedoch zu einem Paket zusammengedrängt (Abb. 2A).

Das Ende der sich verdünnenden Magazine durchbohrt die betreffenden hinteren Segmente und setzt sich in einem Samentrichter fort, die in die mächtigen Samensäcke eingebettet sind.

Hintere männliche Geschlechtsorgane (Abb. 2B). Getrennt paarige, wurstförmige, am Ende etwas gebogene Euprostaten, die einfach glatt, muskulös glänzend sind. Samenleiter münden nahe dem entalen Ende der Euprostata ein. Am ektalen Ende verengt sich die Euprostata zu einem kleinen, knopfartigen, zurückgebogenen Gebilde, auf dem der primäre männliche Porus liegt. Der zurückgebogene primäre männliche Porus wird von einer kleinen, dünnwandigen Blase, die auch als Kopulationstasche aufgefaßt werden kann umgeben. Diese ist ausstülpbar. Um den sekundären männlichen Porus liegt ein mächtiges Organ, eine Bursa propulsoria oder ein muskulöser Begattungsschlauch, der an den von *kisantuanus* erinnert. Er ist ebenfalls von Muskelfäden umgeben und von einem Häutchen überdeckt. Wahrscheinlich ist er ebenfalls als Retraktor des ausstülpbaren Kopulations Schlauches zu betrachten.

Weibliche Geschlechtsorgane und Samentaschenapparat (Abb. 2C). Die beiden Samentaschenporen führen in die breite Basis pilzhutförmiger, in der Mitte etwas verengter Samentaschen. Die Samentasche ist geschlossen und von einem zöломatischen Schlauch umgeben, der ringförmig den Oesophagus umgibt und zur anderen Samentasche führt. An der Basis der Samentaschen sind am Dissepiment 12/13 ins 13. Segment reichend kleine Ovarien zu erkennen, die von einer Ovarial-Eitrichterblase umgeben sind und mit dem zöломatischen Schlauch in Verbindung stehen. Durch die weiblichen Poren (Abb. 2C) gelangt man in je einen, gestreckten geraden Eileiter, der in einen eingerollten Eitrichter endet. An der Hinterseite des Eitrichters ist ein mächtiger Eiersack und davor ein Samenkammerchen zu erkennen. Der Eitrichter mündet in den zöломatischen Schlauch der Samentasche ein.

Die neue Art steht aufgrund der Ausbildung der Euprostaten der *E. kisantuanus* am nächsten. Unterscheidet sich von dieser durch die andere Form der Samentaschen, durch die Form der Samenmagazine, durch das Einmünden der Samenleiter am Ende der Prostaten und nicht zuletzt durch die verschiedene Größe.

Die neue Art wird zu Ehren nach Herrn Prof. Dr. J. BALOGH, dem Leiter der Ungarischen Bodenzoologischen Expedition benannt.

Fundorte: AF/94. Holotypus. Kindamba Meya. Im Gesiebe von Bodenproben aus dem Bangu-Urwald. 9. XI. 1963. leg. BALOGH und ZICSI. — AF/32. Paratypen 7 + 3 juv. Ex. Fundort wie beim Holotypus. Weitere Paratypen: AF/36. 1 + 1 juv. Ex. Kindamba Meya am Ufer des Louolo Flusses. 2. XI. 1963. leg. ZICSI u. BALOGH. — AF/37. 8 Ex. Kindamba Meya Adam-Höhle, am Ufer eines kleinen Bächleins. 7. XI. 1963. leg. ZICSI u. BALOGH. AF/50. 2 Ex. Kindamba Meya im Bachbett unter Steinen bei der Adam-Höhle. 5. XI. 1963. leg. ZICSI und BALOGH. — AF/52. 1 Ex. Kindamba Meya, Urwald Bangu. 12. XI. 1963. leg. ZICSI und BALOGH. — AF/85. 11 + 1 juv. Exemplare Bouenza Wasserfall, am Ufer der Spritzzone, mit Formol erbeutet. 30. XI. 1963. leg. ZICSI und BALOGH. — AF/88. 3 Ex. Bouenza Wasserfall in der Streu des Urwaldes. 30. XI. 1963. leg. ZICSI und BALOGH.

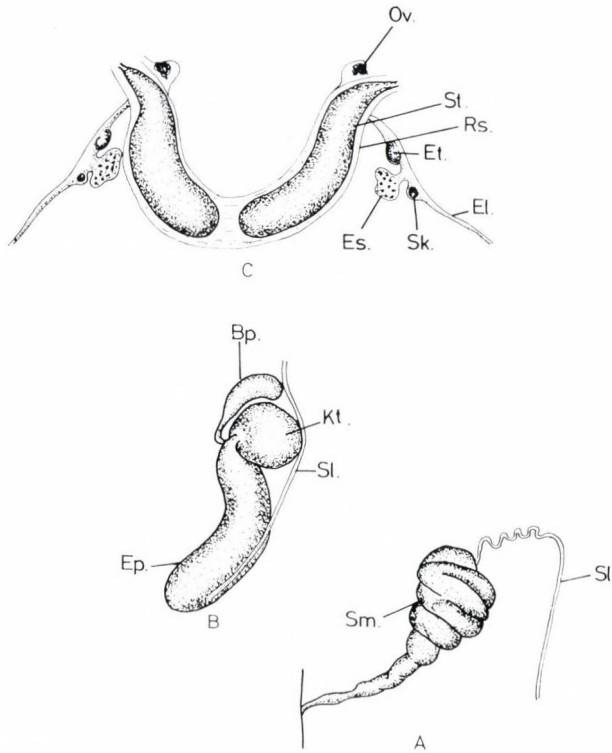


Abb. 3. *Eminoscolex youngai* sp. n. — A = Form der Samenmagazine (Sm: Samenmagazin, Sl: Samenleiter). — B = Form der Euprostate (Ep: Euprostate, Sl: Samenleiter, Kt: Kopulationstasche, Bp: Bursa propulsoria). — C = Weibliche Geschlechtsorgane und Samen-taschenapparat (Ov: Ovarien, St: Samentasche, Rs: Ringschlauch, Et: Eitrichter, Es: Eier-sack, Sk: Samenkammerchen, El: Eileiter)

Eminoscolex youngai sp. n.

Äußeres. Dimensionen: Länge des Holotypus 55 mm, Dicke 2 mm, Segmentzahl 183. Bei den übrigen Exemplaren Länge 55—64 mm, Dicke 2—2,5 mm, Segmentzahl 150—190.

Farbe: dunkelgrau, etwas rötlich irisierend.

Kopf epilobisch 1/2 offen. Nephridialporen im 3. Segment beginnend, in der Borstenlinie cd. Borsten vorne ventral weit gepaart, lateral enger gepaart, am Hinterkörper, hinter dem Gürtel beginnend Borsten b, c und d einander genähert, Borstendistanz wie:

	aa	ab	bc	cd
13. Segment	3,5	2,5	1,8	1,5
30. Segment	2,7	2,8	1	1

Gürtel am 14.—17. Segment, ringförmig.

Männliche Poren augenförmige Schlitze auf Intersegmentalfurche 17/18, zwischen der Borstenlinie a und b. Kreisförmiger Bogen auf dem 17. Segment dicht gefurcht. Bei einigen Exemplaren ragt der ektale Teil des männlichen Geschlechtsapparates hervor. Borsten des 17. Segmentes fehlen.

Samentaschenporen auf Intersegmentalfurche 12/13 zwischen der Borstenlinie b und c, mit etwas hellem Hof.

Weibliche Poren in der Intersegmentalfurche 14/15, am Hinterende des 14. Segmentes, oberhalb der Nephridialporen.

Innere Organisation: Verdickte Dissepimente 7/8—10/11 etwas verdickt, 5/6 und 11/12 weniger stark verdickt.

Darm. Muskelmagen im 5. Segment, tonnenförmig groß. Drei mäßig große, feigenförmige ventrale unpaarige Chylustaschen im 9.—11. Segment. Nierenförmige Kalkdrüsen im 13. Segment, die vom zöломatischen Schlauch der Samentaschen überdeckt sind. Herzen im 6.—11. Segment.

Vordere männliche Geschlechtsorgane: holoandrisch. Zwei Paar Samensäcke ragen vom Dissepiment 10/11 und 11/12 in die hinteren Segmente weit hinein, reichen bei einigen Exemplaren auch bis ins 14. Segment. Samenmagazine im 10. und 11. Segment, geschlängelte Erweiterungen, die zu einem Paket zusammengedrängt sind (Abb. 3A). Das Ende der sich verdünnenden Samenmagazine durchbohrt die betreffenden hinteren Segmente und setzt sich in Samentrichtern fort, die in die Samensäcke eingebettet sind.

Hintere männliche Geschlechtsorgane (Abb. 3B). Getrenntpaarige Euprostaten, die etwas gebogen wurstförmig und metallisch glänzend sind. Samenleiter treten an das distale Ende der Euprostaten heran, verlaufen eng gepaart an ihnen entlang und münden in den proximalen Teil der Euprostaten ein. Distal verengen sich die Euprostaten und münden in eine Kopulations-tasche ein. Dieser schließen sich zwei gesonderte Organe an, welche auch als Bursa propulsoria betrachtet werden können. Beide Organe sind von Muskelfäden umgeben und werden von einem Häutchen zusammengehalten. Ob wir es tatsächlich mit einer Kopulationstasche zu tun haben, ist fraglich; eine ähnliche Gestaltung der Prostata finden wir noch bei *E. thibaudi* sp. n., wo diese beiden muskulösen Gebilde als Retraktoren zu betrachten sind.

Weibliche Geschlechtsorgane und Samentaschenapparat (Abb. 3C). Die beiden Samentaschenporen führen vorerst durch eine Verengung sich nach innen wendend in mächtige Schläuche, die sich über dem Oesophagus fast berühren. Die Samentaschen sind von einem mächtigen zöломatischen Schlauch umgeben, der auch die Kalkdrüsen einhüllt, einen Bogen über den Oesophagus bildend. In einer Ovarialblase eingeschlossen sitzen etwas erhöht an der Hinterseite vom Dissepiment 12/13, etwas distal vom Ausmündungspunkt der Samentaschen die kleinen Ovarien. Die weiblichen Poren, gelegen am Hinterrande des 14. Segmentes, gehen in einen gestreckten, geraden Eileiter über, der die

Samenleiter überquerend in einen verhältnismäßig großen eingerollten Eitrichter endet. Dieser schließt sich der Ovarial-Eitrichterblase an. Der Eitrichter trägt an der Hinterseite einen nierenförmigen, ziemlich großen Eiersack, vor diesem liegt ein kleines Samenkammerchen.

Die neue Art gehört in den Kreis der Arten, bei denen die Borsten b, c, d hinter dem Gürtel nahe voneinander, in gleicher Entfernung liegen. Den Samentaschenapparat betreffend ähnelt sie den Arten *E. japomanus* MICHAELSEN, 1915 und *E. thibaudi* sp. n. Mit *E. thibaudi* besteht auch eine Ähnlichkeit in der Form der Euprostaten und deren Gebilden. Von beiden Arten unterscheidet sie sich in der Anordnung der Borsten. Von *E. thibaudi* auch in der Form der Samenmagazine, von *E. japomanus* auch in der Ausbildung der Euprostaten.

Die neue Art wird zu Ehren nach Herrn Dr. ENDRÖDY-YOUNGA, dem Teilnehmer der Expedition benannt.

Fundorte: AF/98 Holotypus. Brazzaville, ORSTOM äußerer Park, in der Laubstreu des Waldes. 29. XII. 1963. leg. ZICSI und BALOGH. — AF/23. 2 + juv. Ex. Paratypen-Fundort wie beim Holotypus. Weitere Paratypen: AF/17., 18., 21. 4 Ex. Brazzaville ORSTOM Park. 21. XI. 1963, und 29. XII. 1963. leg. ZICSI und BALOGH. — AF/25. 7 + 3 juv. Ex. Brazzaville ORSTOM Park. 19.—21. I. 1964. leg. BALOGH und ZICSI. — AF/30. 2 Ex. Brazzaville, ORSTOM äußerer Park. 21. XII. 1963. leg. ZICSI und BALOGH. AF/31. 1 Ex. 25 km SW von Brazzaville am Ufer des Kong-Flusses mit der Formol-Methode gesammelt. 20. XII. 1963. leg. ZICSI und BALOGH. AF/65. 1 Ex. Loudima IRHO Park. 4. XII. 1963. leg. ZICSI und BALOGH.

Eminoscolex lamani MICHAELSEN, 1921

Von verschiedenen Fundorten liegen uns einige Exemplare vor, die zwar in einigen Merkmalen von *E. lamani* abweichen, in anderen hingegen mit der Originalbeschreibung von MICHAELSEN soweit übereinstimmen, daß wir uns gezwungen sehen, unsere Exemplare dieser Art einstweilen einzureihen. Leider sind unsere Kenntnisse dieser Gattung gegenüber noch unzulänglich, um mit Sicherheit entscheiden zu können, welche Merkmale oder Merkmalkombinationen uns berechtigen, eine Abtrennung, wie in diesem Fall, durchzuführen.

Wie der Originalbeschreibung zu entnehmen ist, lagen zur Beschreibung 3 sehr erweichte, fast mazerierte Exemplare vor, so daß die Organisation — wie MICHAELSEN erwähnt — nur lückenhaft festzustellen war. Dies bezieht sich auch auf ein von uns sehr wesentlich gehaltenes Merkmal, u. zw. auf die Borstenanordnung. MICHAELSEN stellte fest, daß am Vorderkörper die Borsten ventral getrennt, dorsal mäßig eng gepaart sind, weiter hinten meint er »anscheinend ebenso angeordnet« aber in Klammer mit der Bemerkung »nicht genau untersucht«. Bei allen unseren Exemplaren kann vor dem Gürtel diese Anordnungsweise bekräftigt werden, doch muß schon hier bemerkt werden, daß die Borstenlinie b sich der Borstenlinie c nähert, Während hinter dem Gürtel die Borstenlinien b, c und d gleich weit entfernt sind und nahe zueinander liegen.

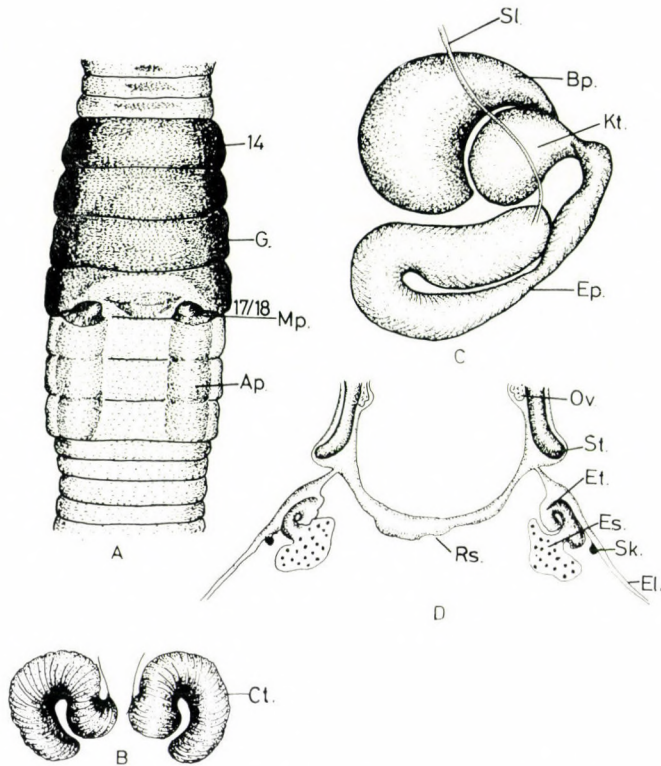


Abb. 4. *Eminoscolex lamani* MICHAELSEN, 1921. — A = Ventralansicht der Gürtelorgane (Ap: Akzessorische Pubertätsorgane, Mp: Männliche Poren mit ausgestülpten Geschlechtsorgan, G: Gürtelsegmente, ringförmig). — B = Form der Kalkdrüsen (Cl: Chylustaschen). — C = Form der Euprostate (Ep: Euprostate, Kt: Kopulationstasche, Bp: Bursa propulsoria, Sl: Samenleiter). — D = Weibliche Geschlechtsorgane und Samentaschenapparat (Ov: Ovarien, St: Samentasche, Et: Eitrichter, Es: Eiersack, Sk: Samenkammerchen, El: Eileiter, Rs: Ringschlauch)

Abweichend ist auch die Gestaltung der männlichen Poren (Abb. 4A), wo meistens die ektalen Teile des männlichen Geschlechtsapparates ausgestülpt und wo Anschwellungen in der Linie der männlichen Poren bis ins 20. Segment zu verfolgen sind. Dies ist bei allen Tieren ein sehr kennzeichnendes akzessorisches Merkmal, welches von MICHAELSEN nicht erwähnt wurde. Ebenso wurden auch die querovalen heller gefärbten Drüsenfelder auf dem 11.—13. Segment nicht angeführt.

Länge der jetzt untersuchten Tiere 6,5—9,7 mm, Dicke 3—4 mm, Segmentzahl 156—179.

Innere Organisation: Muskelmagen im 5. Segment. Unpaarige ventrale Chylustaschen im 9., 10., 11. Segment. Kalkdrüsen im 13. Segment (Abb. 4B) Mächtig große, nach hinten gebogene Lamellentaschen.

Vordere männliche Geschlechtsorgane: holoandrisch. Zwei Paar mäßig große Samensäcke ragen vom Dissepiment 10/11 und 11/12 in das 11. und 12. Segment hinein. Samenmagazine, die von MICHAELSEN nicht erkannt werden konnten, liegen im 10. und 11. Segment, dicht geschlängelte, aber nicht angeschwollene kleine Fäden, die die betreffenden hinteren Segmente durchbohren und sich in Samentrichtern fortsetzen, welche in den Samensäcken eingebettet sind.

Hintere männliche Geschlechtsorgane (Abb. 4C). Getrenntpaarige Euprostaten, die zurückgebogen sind, muskulöse glänzende, glatte Gebilde. Die Samenleiter münden am Ende der Schleife, dicht nebeneinander ein. Am distalen Ende verengt sich die Euprostata zu einem langen, etwas gewundenen Ausführungsgang. Dieser führt in eine Kopulationstasche hinein, die wie auf Abb. 4A ersichtlich, ausstülpbar ist. In die Vorderseite der Kopulationstasche mündet eine mit weitem Lumen versehene und über eine ziemlich dicke muskulöse Wandung verfügende Bursa propulsoria ein.

Weiblicher Geschlechtsapparat und Samentaschen (Abb. 4D). Samentaschen klein, hakenförmig gebogen, äußerlich glatt, metallisch glänzend, geschlossen. Von einem zöломatischem Schlauch umgeben, der bogenförmig, in der Mitte etwas verdickt, den Oesophagus umgibt. Aus den weiblichen Poren geht ein gestreckter Eileiter hervor, der in einen eingerollten Eitrichter übergeht. An der Oberseite ein nierenförmiger Eiersack, von diesem durch einen deutlichen Zwischenraum getrennt ein Samenkammerchen vorhanden. Ovarien an der Innenseite der Samentaschenporen von einer Ovarial-Eitrichterblase umgeben, die ebenfalls innerhalb des zöломatischen Schlauches liegt.

Fundorte: AF/29. 2 Ex. Brazzaville ORSTOM Park, in faulenden Früchten. 23. XII. 1963. leg. ZICSI u. BALOGH. — AF/78. 1 Ex. SIBITI, IRHO Urwald. 25. XI. 1963. leg. ZICSI u. BALOGH. — AF/45. 1 Ex. Kindamba, Meya Urwald. 11. XI. 1963. leg. ZICSI u. BALOGH. — AF/82. 1 Ex. Sibiti, IRHO unter Baumrinde. 29. XI. 1963. leg. ZICSI u. BALOGH.

Bemerkung. Die Ausbildung der Samentaschen und die der Euprostaten veranlaßten uns, trotz der abweichenden Merkmale, die in verschiedenen Teilen des Landes gesammelten Tiere, der aus Zaire, Belgisch-Kongo beschriebenen *E. lamani* MICHAELSEN einzureihen.

Eminoscolex seidlæ sp. n.

Äußeres. Holotypus: Länge 57 mm, Dicke 2 mm, Segmentzahl 151. Bei den übrigen Exemplaren: Länge 35—62 mm, Dicke 2—2,5 mm, Segmentzahl 81—167.

Farbe: grau.

Kopf epilobisch 2/3 offen. Nephridialporen im 3. Segment beginnend, in der Borstenlinie cd. Borsten vorne ventral weit gepaart, lateral enger ge-

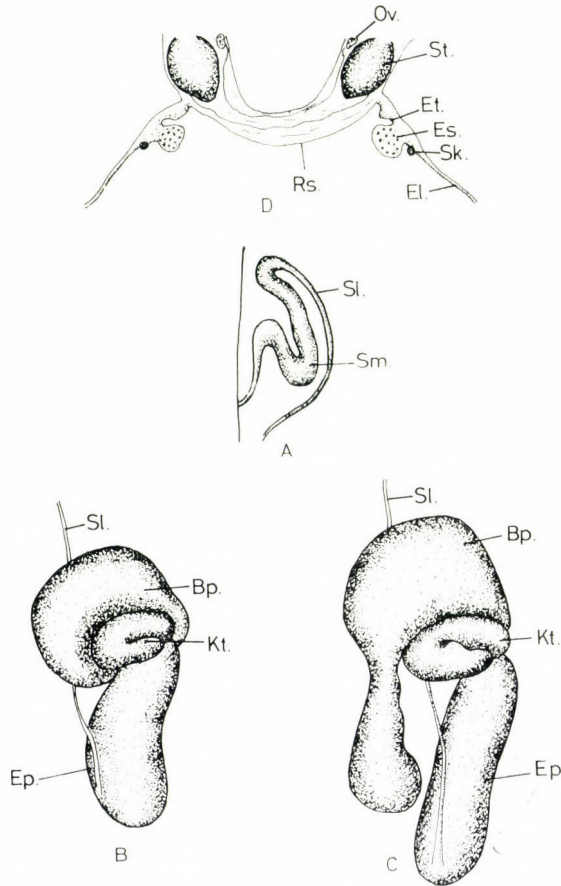


Abb. 5. *Eminoscolex seidlai* sp. n. — A = Form der Samenmagazine (Sm: Samenmagazin, Sl: Samenleiter). — B und C = Form der Euprostaten (Ep: Euprostate, Kt: Kopulations-tasche, Bp: Bursa propulsoria, Sl: Samenleiter). — D = Weibliche Geschlechtsorgane und Samentaschenapparat (Ov: Ovarien, St: Samentasche, Et: Eitrichter, Es: Eiersack, Sk: Samenkammerchen, El: Samenleiter, Rs: Ringschlauch)

paart, hinter dem Gürtel nähert sich die Borstenlinie b der Borstenlinie c und d, die drei Borstenlinien verlaufen gleichweit voneinander entfernt. Borstendistanz wie:

	aa	ab	bc	cd
am 13. Segment	3	2,8	2,2	1
am 30. Segment	5	4	1	1

Gürtel am 14.—17. Segment, ringförmig.

Männliche Poren paarig, ventral auf Intersegmentalfurche 17/18 zwischen der Borstenlinie a und b. Bei fast allen Exemplaren sind die ektalen Teile des männlichen Ausführungsapparates stark ausgestülpt. Borsten des 17. Segmentes fehlen.

Samentaschenporen auf Intersegmentalfurche 12/13, zwischen der Borstenlinie b und c, deutlich große Öffnungen, die beiderseits von einem helleren Hof umgeben sind. Bei einem Teil der Tiere kann dieser weiße Hof zwischen der Borstenlinie b und c in der Intersegmentalfurche 13/14 beiderseits erkannt werden, ohne daß dort irgendwelche Samentaschenporen liegen. Weibliche Poren in der Intersegmentalfurche 14/15 in Höhe der Nephridialporen am hinteren Ende des 14. Segmentes. Manchmal treten aus den Samentaschenporen kleine kuglige Spermatropfen hervor.

Innere Organisation: Dissepimente 6/7—9/10 sehr zart verdickt.

Darm. Ein großer Muskelmagen im 5. Segment. Unpaarige Chylustaschen im 9., 10. u. 11. Segment, klein birnenförmig. Kalkdrüsen im 13. Segment, hornförmig nach unten gebogen. Herzen im 6.—11. Segment.

Vordere männliche Geschlechtsorgane: holoandrisch. Zwei Paar große Samensäcke im 11. und 12. Segment, die des 12. Segmentes reichen bis ins 14.—15. Segment. Samenmagazine (Abb. 5A) im 10. und 11. Segment, einfach gewunden, bei manchen Exemplaren stark gefüllt. Das Ende der sich verdünnenden Samenmagazine durchbohrt die entsprechenden Dissepimente und setzt sich in den Samentrichtern fort, die in die großen Samensäcke eingebettet sind.

Hintere männliche Geschlechtsorgane (Abb. 5B und C). Jederseits eine einfache, etwas gebogene wurstförmige, nur ganz wenig verdünnt auslaufende Euprostata, die muskulös, glatt, mäßig glänzend ist. Samenleiter schwach zu erkennen, getrennt, verlaufen vom 12. Segment sehr nahe zueinander, sehen beinahe verschmolzen aus. Münden etwas vor dem entalen Ende in die Euprostaten ein. Hier gehen sie etwas auseinander, so daß es deutlich zu erkennen ist, daß sie nicht verschmolzen sind. Am ektalen Ende verdünnen sich die Euprostaten und gehen in eine ausstülpbare Kopulationstasche über. Die Kopulationstasche wird von einer muskulösen Bursa propulsoria umgeben, die von einem Häutchen mit den Kopulationstasche zusammengehalten wird. Bei einigen Exemplaren ist die Bursa propulsoria mit einem mächtigen Fortsatz versehen, der beinahe so lang wie die Euprostata ist (Abb. 5C).

Weibliche Geschlechtsorgane und Samentaschenapparat (Abb. 5D). Die beiden Samentaschenporen führen in tropfenförmige, meist kleine geschlossene Samentaschen. Bei einigen Exemplaren sind diese Taschen auch bedeutend größer. An der Innenseite des 12/13. Dissepimentes, ins 13. Segment ragend, dicht neben den Samentaschen kleine Ovarien vorhanden, die von einer Ovarien-Eitrichterblase umgeben sind. Diese geht in einen Ringschlauch über, der einen Bogen um den Oesophagus bildet. Durch die weiblichen Poren gelangt man in je einen geraden, gestreckten Eileiter, der sich in einen eingewickelten Eitrichter fortsetzt. Dieser ragt in die Ovarial-Eitrichterblase hinein. Auf der Rückseite des Eitrichters liegt ein mächtiger Eiersack, vor dem ein Samenkammerchen.

Die neue Art steht der Art *E. sibutanus* MICHAELSEN und *E. violaceus* ČERNOSVITOV, 1938, was die Form und Ausbildung der Samentaschen anbelangt, am nächsten. Der *E. sibutanus* nähert sie sich auch in der Ausbildung der Euprostaten (neue Beschreibung von MICHAELSEN, 1921). Von beiden unterscheidet sie sich jedoch in der Anordnung der Borsten hinter dem Gürtel (*b*, *c*, *d* Borstenreihen verlaufen ziemlich eng zueinander). Von *E. sibutanus* unterscheidet sie sich noch durch die Lage der Samentaschenporen.

Die neue Art wird zu Ehren nach Frl. M. SEIDL benannt, die uns bei der Zusammenstellung der Literatur äußerst große Hilfe leistete.

Fundorte: AF/93. Holotypus. Kindamba, Meya Adam-Höhle, am Bachrand mit der Formol-Methode gesammelt. 7. XI. 1963. leg. ZICSI und BALOGH. — Paratypen AF/40. 55 + 13 juv. Ex. Fundort wie beim Holotypus. — AF/41. 1 Ex. Anomalie, Fundort wie beim Holotypus. AF/38., 39. 4 Ex. Kindamba, Meya, Louolo-Fluß, in der Laubstreu. 2. XI. 1963. leg. ZICSI und BALOGH. — AF/51. 1 Ex. Kindamba Meya, Bambuswald, Urwald. 12. XII. 1963. leg. ZICSI und BALOGH. — AF/99. 1 + 1 Ex. Kindamba Meya, Adam-Höhle in der Laubstreu. 7. XI. 1963. leg. ZICSI und BALOGH. AF/72. 1 Ex. Loudima, Bambuswald. 5. XII. 1963. leg. ZICSI und BALOGH.

Bemerkung. Bei einem Exemplar konnte nur ein männlicher Porus auf der linken Seite im 17/18. Segment wahrgenommen werden. Innen war dementsprechend auch nur eine Prostata vorhanden. Auf der rechten Seite verliefen die Samenleiter bis zum 17/18. Segment und endeten frei. Es fehlte auch der Samensack aus dem 12. Segment. Es ist mit Sicherheit anzunehmen, daß es sich um eine Anomalie handelt.

Eminoscolex thibaudi sp. n.

Äußeres. Dimensionen Holotypus: Länge 74 mm, Dicke 3,5 mm, Segmentzahl 154. Bei den übrigen Tieren Länge 5,5—8,8 mm, Dicke 2,5—3,7 mm, Segmentzahl 144—198.

Kopf epilobisch 1/2 zu. Farbe grau. Borsten ventral weit gepaart, lateral enger gepaart. Borstendistanz wie:

	<i>aa</i> : <i>ab</i> : <i>bc</i> : <i>cd</i>
13. Segment	2,1 : 1,5 : 2,1 : 1
30. Segment	3 : 2 : 3 : 1

Nephridialporen im 3. Segment beginnend in der Borstenlinie *cd*.

Gürtel am 14.—17., 1/2 18. Segment, ringförmig.

Männliche Poren auf Intersegmentalfurche 17/18 zwischen der Borstenlinie *a* und *b*, augenförmige, etwas hervorstehende Schlitze, deren Hof gefurcht ist. Bei einigen Exemplaren sind die ekatlen Teile des männlichen Ausführungsapparates zu erkennen oder z. T. ausgestülpt. Borsten des 17. Segmentes fehlen.

Samentaschenporen auf Intersegmentalfurche 12/13, deutliche Schlitze etwas oberhalb der Borstenlinie *b*, mit mehr oder weniger deutlichem hellen Hof.

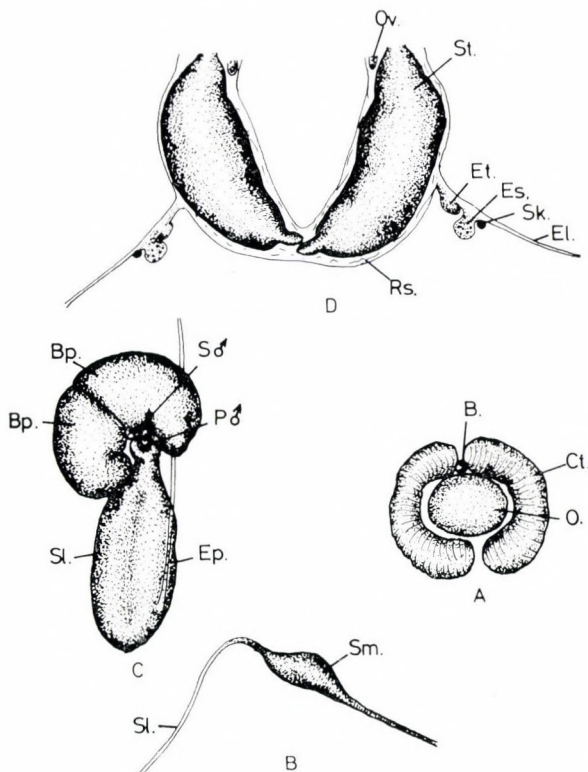


Abb. 6. *Eminoscolex thibaudi* sp. n. — A = Form der Kalkdrüsen (O: Oesophagus, Cl: Chylustaschen, B: Blutgefäß). — B = Form der Samenmagazine (Sm: Samenmagazin, Sl: Samenleiter). — C = Form der Prostata (Ep: Euprostate, P ♂: primärer männlicher Porus, S ♂: sekundärer männlicher Porus, Bp: Bursa propulsoria, Sl: Samenleiter). — D = Weibliche Geschlechtsorgane und Samentaschenapparat (Ov: Ovarien, St: Samentasche, Et: Eitrichter, Es: Eiersack, Sk: Samenkammerchen, El: Eileiter, Rs: Ringschlauch)

Weibliche Poren auf Intersegmentalfurche 14/15 in der Linie der Nephridialporen, am hinteren Ende des 14. Segmentes.

Innere Organisation: Verdickte Dissepimente: 6/7—9/10 etwas verdickt.

Darm. Muskelmagen im 5. Segment beginnend bis ins 6. Segment reichend. Drei unpaarige Chylustaschen im 9.—11. Segment. Einfache gebogene Kalkdrüsen im 13. Segment, die am Ende etwas zurückgebogen sind (Abb. 6A). Herzen im 6.—11. Segment.

Vordere männliche Geschlechtsorgane: holoandrisch. Zwei Paar Samensäcke ragen vom Dissepiment 10/11 und 11/12 in die hinteren Segmente hinein. Samentaschen einfach, groß. Samenmagazine einfach, nicht gewunden, etwas angeschwollen (Abb. 6B). Das Ende der sich verdünnenden Samenmagazine durchbohrt die hinteren Dissepimente der entsprechenden Segmente und setzt sich in Samentrichtern fort, die in die Samentaschen eingebettet sind.

Hintere männliche Geschlechtsorgane (Abb. 6C). Getrenntpaarige Euprostaten wurstförmig, glatt glänzend. Samenleiter laufen entlang der Prostata und münden weit voneinander getrennt im proximalen Teil der Euprostaten ein. Distal verengen sich die Euprostaten, und legen sich in den Zwischenraum der beiden gesonderten Organe, die als je eine Bursa propulsoria aufgefaßt werden. Unterhalb des primären männlichen Porus befindet sich eine kragenartige Blase die auch als Kopulationstasche angesehen werden kann, sie ist ausstülpbar. Die beiden muskulösen Schläuche sind von Muskelfäden umgeben und werden von einem Häutchen zusammengehalten. Es wird angenommen, daß beide muskulösen Gebilde Retraktoren des ausstülpbaren männlichen Geschlechtsapparates sind.

Weibliche Geschlechtsorgane und Samentaschenapparat (Abb. 6D). Die beiden Samentaschenporen führen in mächtige kolbenförmige, am Ende etwas zugespitzte, geschlossene Samentaschen, die von einem zöломatischen Schlauch umgeben sind und einen Ringschlauch bilden. Die Samentaschen berühren sich über dem Oesophagus, sind aber nicht verschmolzen. An der Basis der Samentaschen befinden sich die kleinen Ovarien, die von einer Ovarial-Eitrichterblase umgeben sind und sich dem zöломatischen Schlauch anschließen. Durch die weiblichen Poren gelangt man in einen gestreckten, geraden Eileiter, der beiderseits sich in einen eingerollten Eitrichter fortsetzt. An der Hinterseite des Eitrichters ist ein Eiersack und davor ein Samenkammerchen zu erkennen. Der Eitrichter mündet in die Ovarial-Eitrichterblase.

Die neue Art steht in der Ausbildung des Samentaschenapparates der Art *E. japomanus* und *E. youngai* sp. n. am nächsten. Mit der letzteren besteht auch eine gewisse Ähnlichkeit in der Ausbildung des hinteren Geschlechtsapparates, der Euprostaten. Von beiden Arten unterscheidet sie sich in der Ausbildung der Samenmagazine, von *E. japomanus* in der Ausbildung der Euprostaten, von *E. youngai* sp. n. auch in der Anordnung der Borsten (*b*, *c* und *d* am Hinterkörper, hinter dem Gürtel).

Die neue Art wird zu Ehren nach Herrn Dr. J. M. THIBAUD (Paris, Mus. Nat. Hist. Nat.) benannt, der seinerzeit den Teilnehmern der Expedition im Kongo-Gebiet weitgehende Hilfe erwies.

F u n d o r t e : Holotypus AF/95. 20 km westlich von Loudima, Galeriewald, in der Bodenstreu. 9. XII. 1963. leg. ZICSI und BALOGH. — Paratypen: AF/59. 23 Ex. Fundort wie beim Holotypus. AF/57., 58. 18 Ex. 20 km westlich von Loudima, Galeriewald, am Ufer eines Baches, mit der Formol-Methode gesammelt. 9. XII. 1963. leg. ZICSI und BALOGH.

***Eminoscolex steindachneri franzi* ssp. n.**

Da die Beschreibung der Stammform aufgrund eines adulten Exemplares erfolgte, bei dem die letzten 45 Segmente regeneriert waren, soll eine ausführliche Beschreibung der Unterart gegeben werden. Dies auch deswegen, da der

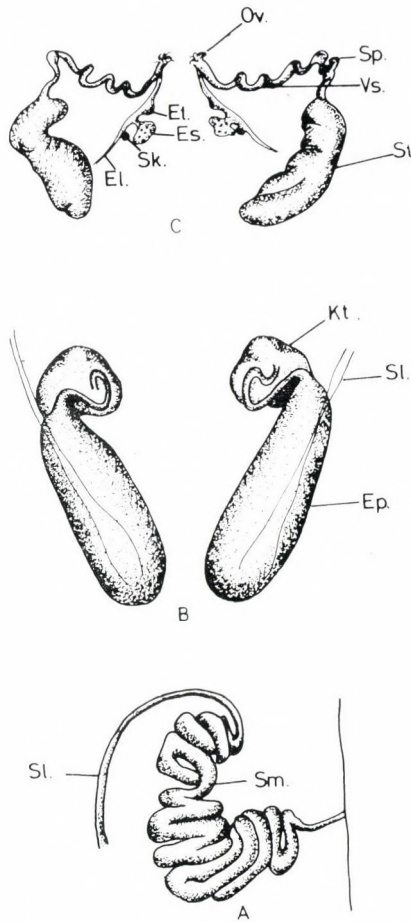


Abb. 7. *Eminoscolex steindachneri franzi* ssp. n. — A = Form der Samenmagazine (Sm: Samenmagazin, Sl: Samenleiter). — B = Form der Euprostaten (Ep: Euprostate, Sl: Samenleiter, Kt: Kopulationstasche). — C = Weibliche Geschlechtsorgane und Samentaschenapparat (Ov: Ovarien, Sp: Samentaschen Poren, Vs: Verbindungsschlauch, Es: Eiersack, Sk: Samenkammerchen, El: Eileiter)

von SIMS (1971) gemeldete Wiederfund aus Nigerien und die Beschreibung seiner Exemplare von der Originalbeschreibung abweichen, eventuell ebenfalls die Aufstellung einer neuen Unterart benötigen.

Äußeres. Dimensionen Holotypus: Länge 84 mm, Dicke 4,5 mm, Segmentzahl 150. Bei den übrigen Tieren: Länge 75—85 mm, Dicke 4—5 mm, Segmentzahl 140—150.

Farbe: rotgrau bis rotbraun.

Kopf epilobisch 1/2 offen. Nephridialporen im 3. Segment beginnend, zwischen der Borstenlinie *cd*. Borsten ventral weit gepaart, lateral enger gepaart. Borstendistanz wie:

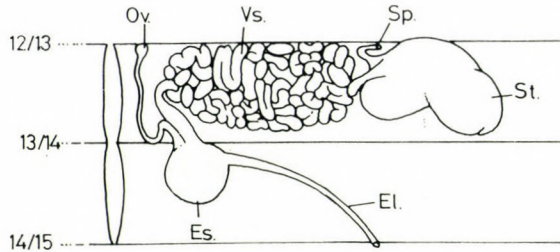


Abb. 8. *Eminoscolex steindachneri* COGNETTI, 1909. Weibliche Geschlechtsorgane und Samentaschenapparat nach SIMS, 1971 (Ov: Ovarium, Vs: Verbindungs-Schlauchsystem, Sp: Samentaschenporen, St: Samentasche, El: Eileiter, Es: Eiersack)

	<i>aa</i>	<i>ab</i>	<i>bc</i>	<i>cd</i>
13. Segment	2,7	1,5	3,4	1
30. Segment	3,7	2,2	2,2	1

Gürtel am 14.—17. Segment, ringförmig.

Männliche Poren paarig, ventral auf Intersegmentalfurche 17/18, zwischen der Borstenlinie *a* und *b*. Kleine augenförmige Schlitze, an den Rändern dicht gefurcht. Bei einigen Exemplaren ragen die ektalen Teile der männlichen Geschlechtsapparates verschieden weit hervor. Borsten des 17. Segmentes fehlen.

Samentaschenporen auf Intersegmentalfurche 12/13, auf deutlichen kleinen Erhebungen, die gut sichtbar sind; sie liegen zwischen der Borstenlinie *c* und *d*.

Weibliche Poren auf Intersegmentalfurche 14/15, in Höhe der Borstenlinie *c*.

Innere Organisation: Dissepimente 7/8—9/10 zart verdickt, die übrigen nicht verdickt.

Darm. Muskelmagen groß im 5.—7. Segment. Drei unpaarige Chylustaschen im 9., 10. und 11. Segment, ventral, feigenförmig. Kalkdrüsen im 13. Segment, einfach nierenförmig, beiderseits am Oesophagus hängend. Herzen im 6.—11. Segment.

Vordere männliche Geschlechtsorgane: holoandrisch. Zwei Paar große Samensäcke im 11. und 12. Segment. An der Vorderseite dieser Segmente, im 10. und 11. Segment, gewundene, ziemlich dicke Samenmagazine (Abb. 7A), die sich in einen Samentrichter fortsetzen und in den betreffenden Samensäcken eingebettet sind.

Hintere männliche Geschlechtsorgane (Abb. 7B) Jederseits eine einfache wurstförmige Euprostate, die äußerlich glatt, muskulös und glänzend ist. Die Samenleiter laufen gepaart an den Euprostaten entlang und treten weit voneinander getrennt am entalen Ende in die Euprostaten ein. Ektal verengen sich die Euprostaten zu einem dünnen, langen und gewundenen Ausführungsgang, der in eine große Kopulationstasche mündet.

Weibliche Geschlechtsorgane und Samentaschenapparat (Abb. 7C). Die Samentaschenporen führen in je eine zuerst schleuchförmige, sich später verdickende, formlose, große Ampulle, die geschlossen ist. Diese formlosen Ampullenschläuche sind miteinander nicht verbunden, liegen über dem Oesophagus nebeneinander. Jederseits im 13. Segment, vorn an das Dissepiment 12/13 stoßend ein Ovarium, welches von einem dicken Schlauch? Ovarial — Eitrichterblase? umgeben ist. Dieser läuft geschlängelt, deutlich rohrförmig bis zum dünnen schlauchförmigen Gebilde der Samentaschen und mündet in diese in Höhe der Samentaschenporen ein. Aus den weiblichen Poren verläuft ein gestreckter Eileiter hervor, der in einen eingerollten Eitrichter mündet. Dieser schließt sich diesem rohrförmigen Verbindungsschlauch an. Auf der Rückseite des Eitrichters ist ein mächtiger Eiersack und ein Samenkammerchen vorhanden.

Die neue Unterart unterscheidet sich von der Stammform sowie von der als *E. steindachneri* von SIMS aus Nigerien beschriebenen Form vorwiegend in der Ausbildung der weiblichen Geschlechtsorgane und des Samentaschenapparates. Wie aus Abb. 7 zu ersehen ist, führt bloß je ein gewundener dünner Schlauch von den Ovarien zu den Samentaschen und mündet an der Basis dieser ein. In der Originalbeschreibung ist es ein kurzes gerades Rohr, welches die Ovarien mit der Samentaschen-Ampulle verbindet. Bei SIMS, 1971 (Abb. 8) ist es ein langes, dicht geschlängeltes Schlauchsystem, welches die Samentaschen-Ampulle mit dem Leiter des Eitrichters verbindet. Ausschlaggebend unterscheidet sich noch die Unterart in der Form und Größe der Samentaschen, die über dem Oesophagus nebeneinander liegend anzutreffen sind.

Die neue Unterart benennen wir zu Ehren nach Herrn Prof. Dr. H. FRANZ (Wien) der die Untersuchungen der Ungarischen Bodenzoologischen Expedition weitgehend förderte.

F u n d o r t e : AF/97. Holotypus Sibiti IRHO Urwald, Bodenproben gegraben. 27. XI. 1963. leg. ZICSI und BALOGH. Paratypen: Z/80. 1 + 2 juv. Exemplare Fundort wie beim Holotypus. AF/79. 2 Ex. Sibiti IRHO Urwald. 25. XI. 1963. leg. ZICSI und BALOGH. — AF/76. 1 Ex. Sibiti IRHO. Ölpalmenplantage, in faulenden Früchten. AF/90. 1 Ex. Buena-Wasserfall, Spritzzone unter Moos. 30. XI. 1963. leg. ZICSI und BALOGH. AF/27. 1 Ex. Brazzaville ORSTOM Park, in faulenden Früchten. 27. XII. 1963. leg. ZICSI und BALOGH. — AF/28. 1 + 3 juv. Ex. Brazzaville, ORSTOM Park, in faulenden Früchten. 23. XII. 1963. leg. ZICSI und BALOGH. AF/46. 2 + 2 juv. Ex. (etwas ausgetrocknet) Kindamba, Meya Urwald. 11. XI. 1963. leg. ZICSI und BALOGH. — AF/73. 1 + 5 juv. Ex. Sibiti, am Ufer des Zanzi Flusses. 28. XI. 1963. leg. ZICSI und BALOGH.

Eminoscolex congicus MICHAELSEN, 1910

Es liegen uns 2 Exemplare vor, die wir trotz der abweichenden Kennzeichen dieser Art einreihen. Wir geben eine kurze Beschreibung, wo vorwiegend die Abweichungen hervorgehoben werden.

Äußeres. Dimensionen: Länge 43—52 mm, Dicke 2 mm, Segmentzahl 170—185.

Borstenanordnung typisch für *congicus*, vor und hinter dem Gürtel nähern sich die Borstenlinien *b*, *c* und *d*, so daß sie gleichentfernt voneinander laufen. Samentaschenporen nicht groß und auch nicht augenförmig, jedoch in der Intersegmentalfurche 12/13, zwischen der Borstenlinie *b* und *c*.

Weibliche Poren kennzeichnend wie bei *congicus*, am Hinterrande des 14. Segmentes auf winzigen Papillen, die nach hinten hin die Intersegmentalfurchen 14/15 überragen.

Männliche Poren auf Intersegmentalfurche 17/18, zwischen der Borstenlinie *a* und *b*, es ragen keine Teile des Geschlechtsapparates hervor.

Innere Organisation: Verdickte Dissepimente 6/7—10/11 stark, die übrigen mäßig.

Darm. Muskelmagen im 5. Segment, mäßig groß, Kalkdrüsen im 13. Segment, nierenförmig groß. Herzen im 6.—11. Segment.

Hintere männliche Geschlechtsorgane. Paarige, metallisch glänzende Euprostaten, etwas S-förmig gebogen, bis ins 23. Segment reichend. Samenleiter treten am distalen Teil an die Euprostaten heran und münden am proximalen Pol unverschmolzen ein. Distal verengen sich die Euprostaten und münden in eine, die primären männlichen Poren kragenförmig umrandende Kopulations-tasche ein, diese ist von einer muskulösen Bursa propulsoria umgeben.

Weibliche Geschlechtsorgane und Samentaschenapparat. In der Ausbildung des Samentaschenapparates weichen unsere Exemplare ebenfalls von *congicus* ab. Die Samentaschenporen führen in etwas schlauchförmige, verengte, sich dann stark erweiternde mächtige Samentaschenampullen, die durch einen dünneren Ringschlauch miteinander verbunden sind. Dieser Ringschlauch ist über dem Oesophagus eingeknickt. Ovarien sind von einer Ovarial-Eitrichterblase umgeben und sitzen erhöht an der Hinterseite vom Dissepiment und etwas medial von dem distalen Ausmündungsende der Samentaschenatrien, mit denen sie in Verbindung stehen.

Unsere Exemplare weichen vor allem in der Ausbildung der Samentaschen von *congicus* ab, da wir die unpaarige große Samentaschen-Ampulle nicht erkannt haben, sondern nur einen dünnen Ringschlauch sahen, der in der Mitte eingeknickt war. Im Prinzip scheinen beide dieselbe Funktion zu besitzen.

F u n d o r t : AF/92. 2 Ex. Reservat Lefini, am Ufer des Nambouli-Flusses, mit der Formol-Methode gesammelt. 11. I. 1964. leg. ZICSI und BALOGH.

Nachdem es uns gelungen ist, einige z. T. nicht wieder gemeldete und auch für die Wissenschaft neue Arten und Unterarten zu beschreiben, wodurch die Zahl der Taxa dieser Gattung auf 40 gestiegen ist, wollen wir versuchen, einen Bestimmungsschlüssel zu geben. Wie schon in der Einleitung darauf hingewiesen, sind uns die lückenhaften, anhand von schlecht erhaltenem Material durchgeführten Beschreibungen — die des Öfteren noch aufgrund eines

Exemplares erfolgten — bekannt. Eben deswegen wollen wir eine Übersicht geben, um künftig auch kritisch die Vertreter dieser Gattung beurteilen zu können.

BESTIMMUNGSSCHLÜSSEL FÜR DIE ARTEN
DER GATTUNG EMINOSCOLEX MICHAELSEN, 1896

- | | | |
|--|---|----|
| 1 Samentaschenporen im 14. Segment | ifensis SEGUN, 1978 | 1 |
| — Samentaschenporen im 13/14. Segment | | 2 |
| — Samentaschenporen im 12/13. Segment | | 5 |
| 2 Samentaschenporen in der Borstenlinie <i>aa</i> | | 3 |
| — Samentaschenporen in der Borstenlinie <i>bc</i> | | 4 |
| 3 Samentaschen nicht geschlossen mit Ringschlauch | sundinus MICHAELSEN, 1935 | |
| — Samentaschen reduziert!? | viridescens MICHAELSEN, 1896 | |
| 4 Samentaschen separiert geschlossen mit Ringschlauch | sibutanus MICHAELSEN, 1915 | |
| — Samentaschen nicht geschlossen mit Ringschlauch | nigeriensis SEGUN, 1978 | |
| 5 Borstenreihen hinter dem Gürtel ventral weit, lateral enger gepaart | | 8 |
| — Borstenreihen hinter dem Gürtel <i>b</i> , <i>c</i> und <i>d</i> in gleicher Entfernung | | 6 |
| 6 Samentaschen nicht geschlossen mit Ringschlauch | congicus MICHAELSEN, 1910 | |
| — Samentaschen separiert geschlossen mit Ringschlauch | | 7 |
| — Samentaschen separiert geschlossen ohne Ringschlauch, schlauchförmig bis zu den Euprostaten reichend | navanus MICHAELSEN, 1936 | |
| 7 Samentaschen klein tropfenförmig | seidlai sp. n. | |
| — Samentaschen groß über dem Oesophagus sich berührend | youngai sp. n. | |
| — Samentaschen hakenförmig | lamani MICHAELSEN, 1921 | |
| 8 Männliche Poren auf Intersegmentalfurche 16/17 | variabilis MICHAELSEN, 1903 | |
| — Männliche Poren auf dem 17. Segment | kabilanus MICHAELSEN, 1937 | |
| — Männliche Poren auf Intersegmentalfurche 17/18 | | 9 |
| 9 Männliche Poren median auf eine Öffnung reduziert | nakitawae COGNETTI, 1907 | |
| — Männliche Poren zwischen der Borstenlinie <i>aa</i> | | 10 |
| — Männliche Poren zwischen der Borstenlinie <i>ab</i> | | 16 |
| 10 Samentaschen unsymmetrisch | ornatus MICHAELSEN, 1927 | |
| — Samentaschen symmetrisch | | 11 |
| 11 Samentaschen nicht geschlossen mit Ringschlauch | | 12 |
| — Samentaschen separiert geschlossen mit Ringschlauch | | 13 |
| — Samentaschen separiert geschlossen ohne Ringschlauch .. | silvestris MICHAELSEN, 1903 | |
| 12 Ventrale Borstenpaare des 13. Segmentes auf erhabenen Drüsenhöfen | affinis MICHAELSEN, 1903 | |
| | a. f. parvicistis MICHAELSEN, 1903 | |
| — Ventrale Borstenpaare des 13. Segmentes auf nicht erhabenen Drüsenhöfen | ater MICHAELSEN, 1903 | |
| 13 Kopf tanylobisch | | 14 |
| — Kopf epilobisch-prolobisch | | 15 |
| 14 Samentaschenporen auf querovalen, spindelförmigen Papillen | elgonensis MICHAELSEN, 1927 | |
| — Samentaschenporen ohne Papillen | rochei COGNETTI, 1907 | |
| 15 Samenleiter münden distal in die Euprostaten | barnimi MICHAELSEN, 1900 | |
| — Samenleiter münden ektal in die Euprostaten | aberdarensis ČERNOSVITOV, 1938 | |

- 16 Samentaschenporen zwischen der Borstenlinie *ab* **crassus** ČERNOSVITOV, 1938
 — Samentaschenporen zwischen der Borstenlinie *cd* 17
 — Samentaschenporen zwischen der Borstenlinie *bc* 18
 — Samentaschenporen in der Borstenlinie *b* 21
 — Samentaschenporen oberhalb der Borstenlinie *d* **neumanni** MICHAELSEN, 1897
- 17 Samentaschen klein, umrahmen den Oesophagus nicht . . . **steindachneri** COGNETTI, 1909
 — Samentaschen groß umrahmen den Oesophagus **steindachneri franzi** ssp. n.
- 18 Samenmagazine einfach keulenförmig 19
 — Samenmagazine stark gewunden, angeschwollen 20
- 19 Euprostaten mit einem gesonderten Begattungs-Schlauch oder Bursa propulsoria
 **kisantuanus** MICHAELSEN, 1935
 (**k. f. tinanti** MICHAELSEN, 1937)
 — Euprostaten mit zwei gesonderten Begattungs-Schläuchen oder Bursae propulsoria
 **thibaudi** sp. n.
- 20 Männliche Poren zwischen der Borstenlinie *cd* **langi** MICHAELSEN, 1936
 — Männliche Poren zwischen der Borstenlinie *ab* **baloghi** sp. n.
- 21 Euprostaten tief in die Muskelwand eingedückt **congulus** MICHAELSEN, 1937
 — Euprostaten frei in der Körperhöhle 22
- 22 Samentaschen separiert ohne Ringschlauch 23
 — Samentaschen geschlossen mit Ringschlauch 25
 — Samentaschen nicht geschlossen mit Ringschlauch **montanus** MICHAELSEN, 1903
- 23 Samentaschen von Ovarial-Eitrichterblasen umgeben **toiretus** MICHAELSEN, 1896
 — Samentaschen sind von Ovarial-Eitrichterblasen nicht umgeben 24
- 24 Samentaschen kugelförmig rund **ruwenzorii** BEDDARD, 1907
 — Samentaschen schlauchförmig **kaffaensis** MICHAELSEN, 1903
- 25 Samentaschen klein tropfenförmig **violaceus** ČERNOSVITOV, 1938
 — Samentaschen flaschenförmig groß **angolanus** (MICHAELSEN, 1933)
 **a. f. symmetricus** (MICHAELSEN, 1937)
 — Samentaschen schlauchförmig groß, über dem Oesophagus sich berührend
 **japomanus** MICHAELSEN, 1915

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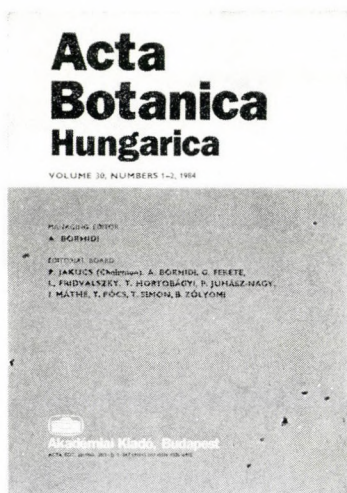
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Acta Zoologica is indexed in *Current Contents*

THE GENUS *MESODORYLAIMUS* ANDRÁSSY, 1959
AND ITS RELATIVES
(NEMATODA: DORYLAIMIDAE)

I. ANDRÁSSY

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

(Received 15 November, 1985)

The genus *Mesodorylaimus* ANDRÁSSY, 1959 is discussed and redefined. A list of the valid species is given, and eleven new species are described: *M. graciosus*, *pulcher*, *margaritifer*, *plicatus*, *trapaefructus*, *aequatorialis*, *arcuatus*, *vulneratus*, *cognatus*, *procerus* and *aduncus* spp. n. Two new genera are proposed. *Miodorylaimus* gen. n. (with two species) resembles *Mesodorylaimus* but differs from that in having non-cuticularized vulval lips, small spicula and a comparatively longer, more conoid male tail. Type-species: *M. decens* sp. n.; an other new species: *M. iucundus* sp. n. *Calcardorylaimus* gen. n. (with five species) may be characterized by the large aberrant spicula and the presence of a spur-like process near the tip of the spicula. Type-species: *C. calcarifer* sp. n.; other new species: *C. promissus* and *simillimus* spp. n. A new species of the genus *Calodorylaimus* ANDRÁSSY, 1969 is also described: *C. gravidus* sp. n. Keys to species of the above genera are added. Several new combinations are proposed.

In a recent paper (1968) I gave a review of the genus *Eudorylaimus* ANDRÁSSY, 1959, one of the largest genera of the free-living Nematoda. In the same year when I revalued the old genus *Dorylaimus* DUJARDIN, 1845 and established *Eudorylaimus*, I proposed another genus which similarly became meanwhile very rich in species. This genus, *Mesodorylaimus* ANDRÁSSY, 1959, shall be discussed here.

Mesodorylaimus was proposed for those species of *Dorylaimus* s. lato which showed a "single" thin guiding ring for the spear and a sexual dimorphism in the tail. In the papers 1959/60 I ordered 39 species to the genus. The number of species either described as *Mesodorylaimus* or transferred from other genera to that increased however to 153 till now. This high number of specific taxa was described by 54 authors of which merely five (with some co-authors occasionally) were responsible for almost 60% of the species. Thus, ANDRÁSSY described 31 species (20%), THORNE (and SWANGER, in part) 24 species (16%), HEYNS (and BASSON or DASSONVILLE as co-authors) 15 species (10%), COBB (either in THORNE & SWANGER or in HOEPPLI or alone) 9 species (6%) and LOOF 8 species (5%).

The representatives of *Mesodorylaimus* are distributed over the world and fairly common in various terrestrial and limnic habitats. The large number of species made, however, any orientation within the genus hardly possible.

Although several species have been transferred to other genera — *Afrodorylaimus*, *Drepanodorylaimus*, *Epidorylaimus*, *Eudorylaimus*, *Idiodorylaimus*, *Laimydorus*, *Paradorylaimus* — the remaining ones are still too numerous and cause inhomogeneity within the genus. This was the reason that inspired me, similar to *Eudorylaimus*, to make some order in this group.

No paper has been published hitherto dealing with any reevaluation or revision of the genus. Notwithstanding, two authors shall be mentioned. The one is GOODEY who transferred several further species from *Dorylaimus* to *Mesodorylaimus* in his book (1963), and the other LOOF who published useful critical comments in some of his papers, especially in 1969, on the taxonomic status of different *Mesodorylaimus* species.

In the present article I take a census of the “*Mesodorylaimus*” species and propose a new grouping of them. I went through the original diagnoses of every nominate species and compared them with younger descriptions, if they were ever published, as well as with the rich material of my slide collection. To make the genus more homogeneous, I removed further species from *Mesodorylaimus* and transferred them to other genera. Besides, I propose two new genera for some “*Mesodorylaimus*-like” species, *Miodorylaimus* gen. n. and *Calcaridorylaimus* gen. n. As a final outcome I give an emended definition of *Mesodorylaimus* s. stricto and enumerate the valid species remaining in it (96 versus 153).

Genus *Mesodorylaimus* ANDRÁSSY, 1959

Dorylaimidae, Mesodorylaiminae. Small to moderately long nematodes, between 0.8 and 2.3 mm. Cuticle smooth, occasionally very finely annulated. Lips angular or rounded, labial region continuous with neck or set off from that. Amphids large, caliciform. Atrium with thin cuticularized lining. Spear straight, varying in length between 7 and 25 μm ; aperture occupying generally one-third of its length. Guiding ring thin, single. Oesophagus enlarged in its middle or posterior to it. Cardia conoid. Prerectum distinct, varying in length, junction of prerectum and intestine in males level with supplements or located anterior to them. A long and slender tongue-like structure may occur in the posterior end of intestine. Gonads of both sexes paired, each lying on the same side of body, predominantly on the right one. Vulva transverse or, rarely, longitudinal, vulval lips always strongly cuticularized. Spicula dorylaimid, 26 to 72 μm long. Ventromedial supplements 4 to 26 in number, contiguous or spaced, flat. Tail different in both sexes, in females more or less elongate, conoid or in anterior part convex-conoid, in posterior part slender, process-like, straight or often dorsally curved, varying in length from 1 to 20 anal body diameters; in males short and bluntly rounded. Posterior part of male body straight or slightly bent ventrally.

Type-species: *Dorylaimus mesonyctius* KREIS, 1930 = *Mesodorylaimus mesonyctius* (KREIS, 1930) ANDRÁSSY, 1959.

Although so many species have been transferred from *Mesodorylaimus* s. lato to other genera (more than fifty) the remaining species are still very great in number. Nevertheless, the genus, as redefined above, seems to be quite homogeneous. Of course, there are characters which vary in their occurrence — thus, tongue-like organ in intestine present or absent; vulva longitudinal or transverse; male prerectum level with, or anterior to supplements; supplements contiguous or spaced; female tail straight or dorsally curved — none of them is, however, suitable for a further grouping the species (for dividing the genus to additional genera). They never occur consistently one with the other but in the most variable combinations in the different species. Always constant are the following characteristics: body moderately long, cuticle practically smooth and devoid of longitudinal ridges, atrium lined, spear moderate in length, guiding ring thin, gonads amphidelphic and both lying on the same side of body, vulval lips cuticularized, spicula dorylaimid, ventromedial supplements located anterior to the spicula, female tail more or less conoid and finely pointed, male tail shorter and blunt.

Mesodorylaimus belongs to the family Dorylaimidae DE MAN, 1876 and within it to the subfamily Mesodorylaiminae ANDRÁSSY, 1969. In addition to this genus the following genera may be ordered to the subfamily: *Afrodorylaimus* ANDRÁSSY, 1964, *Calcaridorylaimus* gen. n., *Calodorylaimus* ANDRÁSSY, 1969, *Drepanodorylaimus* JAIRAJPURI, 1966, *Minidorylaimus* ANDRÁSSY, 1972, *Miodorylaimus* gen. n. and *Opisthodorylaimus* AHMAD & JAIRAJPURI, 1982. *Mesodorylaimus* can be distinguished a) from *Afrodorylaimus* by the straight, not sinuate and generally shorter spear, the not so prominent prerectum, the small papillae on the male tail, and especially by the bluntly rounded, never tipped tail in male; b) from *Calcaridorylaimus* by the lined atrium, the larger supplements, the not twisted posterior body of male, and especially by the shape and size of the spicula; c) from *Calodorylaimus* by the not so back located spear and guiding ring, the shorter spicula, and especially by the continuously arranged — not grouped — supplements; d) from *Drepanodorylaimus* by the straight, not sinuate and shorter spear, the somewhat other arrangement of labial papillae, the generally longer and not so prominent prerectum, an S-like curvature not showing female tail, and especially by the bisexuality (males are completely lacking in most of the *Drepanodorylaimus* species, and if present, they are extremely rare); e) from *Minidorylaimus* by the less prominent lips, the larger body, the shorter tail, and especially by the cuticularized vulva; f) from *Miodorylaimus* by the generally thicker cuticle, the shorter male prerectum, the more numerous supplements, and especially by the cuticularized vulva and the shorter, not conoid male tail; g) from

Opisthodorylaimus by the lined atrium, the mostly thinner spear, and especially by the amphidelphic female reproductive system.

The members of the genus *Mesodorylaimus* live predominantly in terrestrial habitats, briefly in soil and mosses, but occasionally occur also in semi-aquatic or limnic biotopes. They are distributed over the world and inhabit every continent, including the Antarctic. They seem to be especially common in Europe, Africa, North and South America. Females are generally somewhat more frequent than males but these latter are also present in almost every case.

Ninety-six species may be ordered to the genus:

- M. aberrans** LOOF, 1969
M. adalberti ANDRÁSSY, 1963
M. aduncus sp. n.
M. aegypticus (ANDRÁSSY, 1958) ANDRÁSSY, 1959
Dorylaimus aegypticus ANDRÁSSY, 1958
M. aequatorialis sp. n.
M. aestuarii (TIMM, 1952) ANDRÁSSY, 1959
Dorylaimus aestuarii TIMM, 1952
M. alpestris (THORNE, 1939) ANDRÁSSY, 1959
Dorylaimus alpestris THORNE, 1939
M. americanus nom. n.
Mesodorylaimus recurvus THORNE, 1974. nec ANDRÁSSY, 1964
M. angustus ANDRÁSSY, 1964
M. arcuatus sp. n.
M. bainsi BASSON & HEYNS, 1974
M. bastiani (BÜTSCHLI, 1873) ANDRÁSSY, 1959
Dorylaimus bastiani BÜTSCHLI, 1873
Dorylaimus macrourus LINSTOW, 1876
M. bastianoides (MEYL, 1961) ANDRÁSSY, 1967
Dorylaimus bastiani longicaudatus DADAY, 1894
M. biroi (DADAY, 1899) ANDRÁSSY, 1959
Dorylaimus biroi DADAY, 1899
Dorylaimus biroi zeylandicus LOOS, 1945
M. brassicus SONI & NAMA, 1981
M. brevidens THORNE, 1974
M. brevispicatus (SCHUURMANS STEKHOVEN, 1951) ANDRÁSSY, 1986
Dorylaimus brevispicatus SCHUURMANS STEKHOVEN, 1951
Eudorylaimus brevispicatus (SCHUURMANS STEKHOVEN, 1951) ANDRÁSSY, 1959
M. cardiacus THORNE, 1974
M. chekiangensis (WU & HOEPLI, 1929) comb. n.
Dorylaimus filiformis chekiangensis WU & HOEPLI, 1929
M. clavicaudatus (THORNE & SWANGER, 1936) ANDRÁSSY, 1959
Dorylaimus clavicaudatus THORNE & SWANGER, 1936
M. cognatus sp. n.
M. conurus (THORNE, 1939) GOODEY, 1963
Dorylaimus conurus THORNE, 1939
Laemydorus conurus (THORNE, 1939) SIDDIQI, 1969
Mesodorylaimus sabaudiensis JUGET, 1969 syn. n.
M. cryptosperma LOOF, 1969
Dorylaimus agilis apud THORNE & SWANGER, 1936
M. delicatus LORDELLO, 1965
M. dorni LOOF, 1969
M. deuberti (ANDRÁSSY, 1958) GOODEY, 1963
Dorylaimus deuberti ANDRÁSSY, 1958
M. dolomiticus VINCIGUERRA, 1982
M. erdelyii ANDRÁSSY, 1965

- M. exilis** (COBB, 1893) ANDRÁSSY, 1959
Dorylaimus exilis COBB, 1893
Dorylaimus filiformis exilis COBB, 1893 (MICOLETZKY, 1922)
- M. flagellatus** (WILLIAMS, 1959) ANDRÁSSY, 1960
Dorylaimus flagellatus WILLIAMS, 1959
- M. flavomaculatus** (LINSTOW, 1876) GOODEY, 1963
Dorylaimus flavomaculatus LINSTOW, 1876
Laimydorus flavomaculatus (LINSTOW, 1876) SIDDIQI, 1969
Dorylaimus pusillus DADAY, 1905, nec COBB, 1893
Dorylaimus dadayi THORNE & SWANGER, 1936
Mesodorylaimus dadayi (THORNE & SWANGER, 1936) GOODEY, 1963
Laimydorus dadayi (THORNE & SWANGER, 1936) ANDRÁSSY, 1969
- M. ghanæ** ANDRÁSSY, 1965
- M. globiceps** LOOF, 1964
- M. graciosus** sp. n.
- M. guarani** ANDRÁSSY, 1968
- M. hofmaenneri** (MENZEL in HOFMÄNNER & MENZEL, 1914) GOODEY, 1963
Dorylaimus hofmaenneri MENZEL in HOFMÄNNER & MENZEL, 1914
Dorylaimus filiformis hofmaenneri MENZEL in HOFMÄNNER & MENZEL, 1914 (MICOLETZKY, 1922)
Laimydorus hofmaenneri (MENZEL in HOFMÄNNER & MENZEL, 1914) ANDRÁSSY, 1969
- M. imperator** LOOF, 1975
- M. importunus** BASSON & HEYNS, 1974
- M. intermedius** DASSONVILLE & HEYNS, 1984
- M. intervallis** (THORNE & SWANGER, 1936) ANDRÁSSY, 1959
Dorylaimus intervallis THORNE & SWANGER, 1936
- M. japonicus** (COBB in THORNE & SWANGER, 1936) comb. n.
Dorylaimus japonicus COBB in THORNE & SWANGER, 1936
Oxydirus japonicus (COBB in THORNE & SWANGER, 1936) ANDRÁSSY, 1960
Dorylaimus arvensis COBB in THORNE & SWANGER, 1936 syn. n.
Mesodorylaimus arvensis (COBB in THORNE & SWANGER, 1936) ANDRÁSSY, 1959
Mesodorylaimus musæ GERAERT, 1962 syn. n.
- M. johanni** BASSON & HEYNS, 1974
- M. kamandeanus** BAQRI & COOMANS, 1973
Dorylaimus filiformis apud SCHUURMANS STEKHOVEN, 1944
- M. kowyni** BASSON & HEYNS, 1974
- M. lissus** THORNE, 1974
- M. litoralis** LOOF, 1969
Mesodorylaimus prerectus THORNE, 1974 syn. n.
- M. lopadusæ** VINCIGUERRA & LA FAUCI, 1978
- M. lourdesæ** (LORDELLO, 1955) ANDRÁSSY, 1959
Dorylaimus lourdesæ LORDELLO, 1955
- M. luci** BRZESKI & SZCZYGIEL, 1961
- M. macrophallus** THORNE, 1974
- M. margaritifera** sp. n.
- M. margaritus** BASSON & HEYNS, 1974
- M. meridianus** ANDRÁSSY, 1963
- M. mesonyctius** (KREIS, 1930) ANDRÁSSY, 1959
Dorylaimus mesonyctius KREIS, 1930
Dorylaimus subulatus COBB in THORNE & SWANGER, 1936 syn. n.
Mesodorylaimus subulatus (COBB in THORNE & SWANGER, 1936) ANDRÁSSY, 1959
Aporcelaimus subulatus (COBB in THORNE & SWANGER, 1936) BRZESKI, 1962
- M. mexicanus** ZULLINI, 1973
- M. nigrutilus** (SCHNEIDER, 1937) ANDRÁSSY, 1959
Dorylaimus nigrutilus SCHNEIDER, 1937
- M. nudus** (THORNE, 1939) ANDRÁSSY, 1959
Dorylaimus nudus THORNE, 1939
- M. obscurus** THORNE, 1974
- M. orientalis** ANDRÁSSY, 1970
- M. paetzoldi** ALTHERR, 1965
- M. paraguayensis** (KREIS, 1932) ANDRÁSSY, 1959
Dorylaimus paraguayensis KREIS, 1932
- M. paralitoralis** BASSON & HEYNS, 1974

- M. parasubtilis** (MEYL, 1957) ANDRÁSSY, 1959
Dorylaimus parasubtilis MEYL, 1957
- M. parasubulatus** (MEYL, 1954) ANDRÁSSY, 1959
Dorylaimus parasubulatus MEYL, 1954
- M. paulbuchneri** (MEYL, 1956) ANDRÁSSY, 1959
Dorylaimus paulbuchneri MEYL, 1956
- M. pendschikenticus** (TULAGANOV, 1949) ANDRÁSSY, 1959
Dorylaimus pendschikenticus TULAGANOV, 1949
- M. pizai** LORDELLO, 1965
- M. plicatus** sp. n.
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- M. procerus** sp. n.
- M. pseudobastiani** LOOF, 1969
Dorylaimus bastiani apud THORNE & SWANGER, 1936
- M. pseudosubtilis** BASSON & HEYNS, 1974
- M. puellae** ANDRÁSSY, 1963
- M. pulcher** sp. n.
- M. pusillus** (COBB, 1893) ANDRÁSSY, 1959
Dorylaimus pusillus COBB, 1893
- M. recurvus** ANDRÁSSY, 1964
- M. rhenanus** ALTHERR, 1965
- M. rotundolabiatus** BASSON & HEYNS, 1974
- M. sanctus** BASSON & HEYNS, 1974
- M. simplex** THORNE, 1974
- M. spengelii** (DE MAN, 1912) ANDRÁSSY, 1959
Dorylaimus spengelii DE MAN, 1912
- M. subtiliformis** (ANDRÁSSY, 1959) ANDRÁSSY, 1959
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Dorylaimus krishnaraoi MOORTHY, 1938 **syn. n.**
Mesodorylaimus krishnaraoi (MOORTHY, 1938) GOODEY, 1963
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Dorylaimus subtiloides PAETZOLD, 1958
- M. sveltus** (MEYL, 1957) ANDRÁSSY, 1959
Dorylaimus sveltus MEYL, 1957
- M. sylphus** (THORNE, 1939) GOODEY, 1963
Dorylaimus sylphus THORNE, 1939
Laimydorus sylphus (THORNE, 1939) SIDDIQI, 1969
- M. szechenyii** ANDRÁSSY, 1961
- M. szunyoghyi** ANDRÁSSY, 1968
- M. tenellus** (THORNE & SWANGER, 1936) ANDRÁSSY, 1959
Dorylaimus tenellus THORNE & SWANGER, 1936
Mesodorylaimus vaalensis HEYNS & KRUGER, 1983 **syn. n.**
- M. thermae** (COBB in HOEPLI, 1926) GOODEY, 1963
Dorylaimus thermae COBB in HOEPLI, 1926
- M. tholocercus** ANDRÁSSY, 1968
- M. thorneiswangerae** ANDRÁSSY, 1968
Dorylaimus biroi apud THORNE & SWANGER, 1936
- M. transkeiensis** BASSON & HEYNS, 1974
- M. trapaeifructus** sp. n.
- M. usitatus** BASSON & HEYNS, 1974
- M. vulneratus** sp. n.
- M. vulvapapillatus** BAGATURIA & ELIAVA, 1966

The following "*Mesodorylaimus*" species must be transferred to other genera: A) to *Afrodorylaimus*: *beaumonti* (ALTHERR, 1952); B) to *Aporcelaimus* (?): *profundis* (COBB, 1904) comb.n.; C) to *Drepanodorylaimus*: *argentinus* (ALTHERR, 1963) comb.n., *fastigatus* (THORNE & SWANGER, 1936) comb.n., *filicaudatus* (DADAY, 1905) comb.n., *flexus* (THORNE & SWANGER, 1936), *meyli* (ANDRÁSSY, 1958) comb.n., *renuicki* (VAN DER LINDE, 1938), *szekessyi* (ANDRÁSSY, 1960), *williamsi* (HEYNS & KRUGER, 1983) comb.n.; D) to *Epidorylaimus*: *pseudoagilis* (ALTHERR, 1952); E) to *Eudorylaimus*: *centrocercus* (DE MAN, 1880); F) to *Idiodorylaimus*: *annulatus* (DADAY, 1905), *novaezealandiae* (COBB, 1904); G) to *Laimydorus*: *acris* (THORNE, 1939),

agilis (DE MAN, 1880), *callosus* (SKWARRA, 1921), *crassoides* (JÄGERSKIÖLD, 1908), *crassus* (DE MAN, 1884), *effilatus* (SCH. STEKHOVEN & TEUNISSEN, 1938), *fecundus* (COBB, 1914) *gaussi* (STEINER, 1916) comb.n., *imamurai* (THORNE & SWANGER, 1936) = *Laimydorus pseudostagnalis*, *incae* (STEINER, 1920), *jankowskyi* (THALOLIKHIN, 1977) comb.n., *keilini* (LEE, 1961) comb.n., *marinus* (DUJARDIN, 1845), *merogaster* (STEINER, 1916) = *Laimydorus unipapillatus*, *prolificus* (THORNE & SWANGER, 1936), *proximus* (THORNE & SWANGER, 1936), *pseudostagnalis* (MICOLETZKY, 1927), *selangorensis* = *Laimydorus pseudostagnalis*, *serpentinus* (THORNE & SWANGER, 1936), *tenuicaudatus* (BASTIAN, 1865), *unipapillatus* (DADAY, 1905); H) to **Paradorylaimus**: *filiformis* (BASTIAN, 1865), *lordelloi* (MEYL, 1957) comb.n.; I) to **Prodorylaimus**: *paraagilis* (ALTHERR, 1953) comb.n. — Species inquirendae: *africanus* (DADAY, 1908), *attenuatus* (DE MAN, 1880), *festivus* (PAESLER, 1941), *polyblastus* (BASTIAN, 1865). — Nomen nudum: *adjariensis* TSKITISHVILI, 1969.

KEY TO THE SPECIES OF MESODORYLAIMUS

- 1 Female tail very long, 14–20 times anal diameter 2
 — Female tail shorter, at most 12 times anal diameter 6
- 2 Body 1 mm long; core in tail articulate at its basis. — ♀: L = 1.0 mm; a = 35–38; b = 4.4–4.7; c = 3.9; V = 43–46%; c' = 18–20. ♂ unknown. (Mauritius)
 **flagellatus** (WILLIAMS)
 — Body 1.4–1.9 mm long; core in tail not articulate at its basis 3
- 3 Lips angular, well set off from neck. — ♀: L = 1.5–1.8 mm; a = 35–43; b = 4.6–5.5; c = 4–5; V = 40–45%; c' = 14–20. ♂: L = 1.0–1.3 mm; a = 27–39; b = 2.9–6.6; c = 57–83; PO: 11–14. (South Africa) **bainisi** BASSON & HEYNS
 — Lips rounded, not set off from neck 4
- 4 Supplements 7, spaced. — ♀: L = 1.45 mm; a = 41; b = 4.9; c = 4.1; V = 44%; c' = 20. ♂: L = 1.0–1.1 mm; a = 32–35; b = 3.6–3.7; c = 50–52; PO: 7. (Ecuador)
 **graciosus** sp. n.
 — Supplements 17 or more, contiguous 5
- 5 Body shorter, 1.5 mm; supplements 17. — ♀: L = 1.5 mm; a = 44; b = 5.1; c = 3.5; V = 44%; c' = 21. ♂: L = 1.1 mm; a = 34; b = 4.0; c = 68; PO: 17. (Ecuador)
 **pulcher** sp. n.
 — Body longer, 1.7–1.8 mm; supplements 24–28. — ♀: L = 1.7–1.8 mm; a = 36–42; b = 4.9–5.5; c = 4.6–5.6; V = 41%; c' = 14. ♂: L = 1.3 mm; a = 33; b = 4.1; c = 50; PO: 24–28. (United States: Virginia, Utah, South Dakota) **sylphus** (THORNE)
- 6 Tip of female tail conspicuously swollen 7
 — Tip of female tail not swollen 9
- 7 Tail longer, 5–6 anal diameters. — ♀: L = 1.3–1.4 mm; a = 36–39; b = 3.7–4.6; c = 12–13; V = 49–51%; c' = 5–6. ♂ unknown. [Denmark, Sweden, Soviet Union (Russia, Kirghizia), Egypt, Kerguelen Islands] **aegypticus** (ANDRÁSSY)
 — Tail shorter, 3–4 anal diameters 8
- 8 Labial region set off; supplements 13, spaced. — ♀: L = 1.2–1.3 mm; a = 33–39; b = 4.4–4.8; c = 15–17; V = 50%; c' = 4. ♂: L = 1.0–1.2 mm; a = 32–39; b = 4.1–4.3; c = 47–51; PO: 13. (Brazil) **paulbuchneri** (MEYL)
 — Labial region not set off; supplements 17, contiguous. — ♀: L = 1.2 mm; a = 31; b = 4.7; c = 12.5; V = 49%; c' = 3. ♂: L = 1.2 mm; a = 35; b = 5.0; c = 59; PO: 17. (Poland, Spain) **clavicaudatus** (THORNE & SWANGER)
- 9 Posterior half of female tail distinctly bent dorsally 10
 — Posterior half of female tail straight or slightly bent ventrally 32
- 10 Tail longer, 4 to 10 anal diameters 11
 — Tail shorter than 4 anal diameters 19
- 11 Posterior end of intestine with a long tongue-like structure; vulval lips angular. — ♀: L = 1.5–1.9 mm; a = 38–46; b = 3.9–4.3; c = 14–18; V = 52–55%; c' = 5–6. ♂ unknown. (Peru) **trapaefructus** sp. n.
 — Posterior end of intestine without such a structure 12

- 12 Supplements 7–8, spaced 13
 — Supplements 9 to 16, contiguous 14
- 13 Vulva pre-equatorial; female tail as long as 6–7 anal diameters. — ♀: L = 1.5 mm; a = 34; b = 4.8; c = 10; V = 44%; c' = 6–7. ♂: L = 1.3 mm; a = 36; b = 4.0; c = 51; PO: 7–8. (United States: South Dakota) **obscurus** THORNE
 — Vulva post-equatorial female tail as long as 4–5 anal diameters. — ♀: L = 1.5–1.8 mm; a = 38–40; b = 4.7–4.9; c = 14–18; V = 53–55%; c' = 4–5. ♂: L = 1.4 mm; a = 36–40; b = 4.2–4.8; c = 63–66; PO: 8. (Ghana) **ghanae** ANDRÁSSY
- 14 Spear 16–17 μ m long, robust, almost as thick as 1/3 labial diameter. — ♀: L = 1.5–2.0 mm; a = 35–38; b = 4.5–5.4; c = 14–17; V = 44–46%; c' = 4–6. ♂: L = 1.7 mm; a = 34; b = 5.0; c = 56; PO: 15. (Tanzania) **szechenyii** ANDRÁSSY
 — Spear 7–13 μ m long, never so robust 15
- 15 Cuticle perceptibly thickened on neck region 16
 — Cuticle not thickened on neck region 17
- 16 Head continuous with neck contour. — ♀: L = 1.1–1.6 mm; a = 28–40; b = 5.1–7.6; c = 8–16; V = 39–43%; c' = 10–11. ♂: L = 1.3–1.4 mm; a = 36–38; b = 5.2–7.5; c = 48–63; PO: 11–15. (South Africa) **sanctus** BASSON & HEYNS
 — Head slightly set off from neck. — ♀: L = 1.1–1.2 mm; a = 24–31; b = 4.5–5.4; c = 8–10; V = 43–46%; c' = 6–7. ♂: L = 0.9–1.1 mm; a = 22–27; b = 4.1–4.9; c = 36–55; PO: 11–14. (South Africa) **kowyni** BASSON & HEYNS*
- 17 Head distinctly set off; spear 7–9 μ m long. — ♀: L = 1.0–1.2 mm; a = 27–47; b = 3.9–4.9; c = 8–12; V = 37–47%; c' = 6–7. ♂: L = 0.9–1.1 mm; a = 24–29; b = 3.8–4.4; c = 51–61; PO: 9–10. (South Africa) **transkeiensis** BASSON & HEYNS
 — Head not or hardly set off; spear 11–13 μ m long 18
- 18 Supplements 11; female tail 110–153 μ m (6–9 anal diameters) long. — ♀: L = 1.4–1.7 mm; a = 29–40; b = 5.3–6.5; c = 9–13; V = 38–44%; c' = 6–9. ♂: L = 1.4 mm; a = 29; b = 5.4; c = 62; PO: 11. (South Africa) **johanni** BASSON & HEYNS
 — Supplements 13 female tail 90–128 μ m (4–6 anal diameters) long. — ♀: L = 1.5–1.7 mm; a = 35–47; b = 5.5–6.8; c = 13–16; V = 43%. ♂: L = 1.4–1.6 mm; a = 36–44; b = 5.2–6.2; c = 59–66; PO: 13. (South Africa) .. **importunus** BASSON & HEYNS**
- 19 Female tail unusually shaped: short-conoid and bluntly rounded on its tip. — ♀: L = 1.3 mm; a = 33; b = 4.3; c = 40; V = 49%; c' = 1.5. ♂: L = 1.4–1.5 mm; a = 36; b = 4.2–4.6; c = 61–62; PO: 10–19. (Hungary) **deuberti** (ANDRÁSSY)
 — Female tail not so unusually shaped, never bluntly rounded 20
- 20 Female tail cupola-shaped, abruptly narrowing to a thin appendix; posterior end of intestine with a tongue-like structure 21
 — Female tail not so, at least its ventral contour continuous, not abruptly narrowing .. 23
- 21 Prerectum unusually short, shorter than rectum; intestinal “tongue” 45–48 μ m long. — ♀: L = 1.4–1.5 mm; a = 22–25; b = 3.9–4.3; c = 18–25; V = 52–54%; c' = 2. ♂ unknown. (Cuba, Paraguay) **tholocercus** ANDRÁSSY
 — Prerectum twice as long as rectum; intestinal “tongue” 10–20 μ m long 22
- 22 Spear robust, 23–24 μ m long; lips rounded and amalgamated. — ♀: L = 1.3–1.4 mm; a = 24–25; b = 3.8–3.9; c = 20–30; V = 54–58%. ♂ unknown. (Mexico) **mexicanus** ZULLINI
 — Spear slender, 15 μ m long; lips angular and separate. — ♀: L = 1.2 mm; a = 31; b = 4.5; c = 25; V = 52%; c' = 2–2.5. ♂ unknown. (Brazil) **thorneiswangerae** ANDRÁSSY
- 23 Female tail shorter than two anal diameters, its anterior rounded part longer than the posterior tapering one 24
 — Female tail two anal diameters or longer, its anterior rounded part as long as, or shorter than the posterior tapering one 28
- 24 Vulva longitudinal, opened (cuticularized lips separate) 25
 — Vulva transverse, closed (cuticularized lips not separate) 27

* Maybe that *M. kowyni* and *M. sanctus* are one and the same species. If so, the name *kowyni* must be regarded as valid.

** HEYNS and KRUGER (1983) found specimens that combined the characters of *M. johanni* and *M. importunus*; the identity of both species is therefore possible.

- 25 Body 1.8–2 mm, spear 22–24 μm long. — ♀: L = 1.8–2.0 mm; a = 33–40; b = 4.3–4.5; c = 38–49; V = 53–55%; c' = 1.3–1.4. ♂: L = 1.8–2.0 mm; a = 34–38; b = 4.2–4.7; c = 73–85; PO: 10–11. (Australia) **procerus** sp. n.
 — Body 1.2–1.4 mm, spear 14–16 μm long 26
- 26 Female tail as long as anal body diameter, its tip strongly bent; cuticle 3–3.5 μm thick on mid-body. — ♀: L = 1.4 mm; a = 24–28; b = 4.3–4.5; c = 39–46; V = 50–52%; c' = 1. ♂: L = 1.2 mm; a = 29; b = 4.0; c = 5; PO: 19. (Hungary) **aduncus** sp. n.
 — Female tail distinctly longer than anal body diameter, its tip slightly bent; cuticle 2–2.5 μm thick on mid-body. — ♀: L = 1.2–1.3 mm; a = 29–31; b = 4.0–4.6; c = 31–33; V = 53–55%; c' = 1.3–1.6. ♂ unknown. (Hungary) **recurvus** ANDRÁSSY
- 27 Lips angular; spear as thick as cuticle at the same level; supplements 13–14. — ♀: L = 1.2 mm; a = 24–25; b = 3.8–3.9; c = 28–31; V = 52–53%; c' = 1.4–1.8. ♂: L = 1.1–1.2 mm; a = 27–30; b = 3.6–3.8; c = 46–49; PO: 13–14. (Ecuador) **vulneratus** sp. n.
 — Lips rounded; spear thinner than cuticle at the same level; supplements 17–18. — ♀: L = 1.2–1.4 mm; a = 26–31; b = 4.1–4.3; c = 29–39; V = 52–54%; c' = 1.4–1.5. ♂: L = 1.1–1.2 mm; a = 26–28; b = 4.1–4.6; c = 58–69; PO: 17–18. (Ecuador) **cognatus** sp. n.
- 28 Spear long, 20 to 25 μm 29
 — Spear shorter, 9 to 15 μm 30
- 29 Spear twice as thick as cuticle at the same level; female tail strongly bent dorsally. — ♀: L = 1.6–1.7 mm; a = 32–34; b = 4.1–4.2; c = 25–32; V = 51–52%; c' = 1.9–2.3. ♂: L = 1.4–1.6 mm; a = 25–32; b = 3.9–4.1; c = 58–63; PO: 15–20. (Bolivia) **arcuatus** sp. n.
 — Spear as thick as cuticle at the same level female tail slightly bent dorsally. — ♀: L = 1.2–1.4 mm; a = 26–31; b = 3.8–4.3; c = 20–24; V = 49–50%; c' = 2–2.3. ♂: L = 1.5 mm; a = 33; b = 4.5; c = 62; PO: 16. (Ecuador) **aequatorialis** sp. n.
- 30 Head well set off. — ♀: L = 1.4–1.7 mm; a = 30–39; b = 4.8–6.1; c = 20–31; V = 41–46%. ♂: L = 1.3–1.7 mm; a = 31–39; b = 5.1–6.2; c = 48–60; PO: 12–16. (South Africa) **margaritus** BASSON & HEYNS
 — Head not set off 31
- 31 Body about 2 mm long, slender. — ♀: L = 1.8–2.1 mm; a = 40; b = 4.8; c = 32–46; V = 53%; c' = 2.5. ♂ unknown. (United States: North Dakota) **americanus** nom. n.
 — Body 1–1.5 mm long, less slender. — ♀: L = 1.0–1.5 mm; a = 21–34; b = 4.1–5.5; c = 12–22; V = 47–52%; c' = 2–4. ♂: L = 1.3–1.5 mm; a = 30–35; b = 4.6–5.3; c = 48–61; PO: 12–15. (South Africa) **rotundolabiatius** BASSON & HEYNS
- 32 Vulval region — both sides of vulva — with prominent papillae or cuticular folds ... 33
 — Vulval region without papillae or cuticular folds 39
- 33 Labial region set off from neck 34
 — Labial region practically continuous with neck 36
- 34 Female tail shorter, 3 anal diameter. — ♀: L = 1.4 mm; a = 31; b = 4.4; c = 17; V = 53%; c' = 2.7. ♂: L = 1.3 mm; a = 34; b = 3.6; c = 43; PO: 16. (Soviet Union: Georgia) **vulvapapillatus** BAGATURIA & ELIAVA
 — Female tail longer, 6–8 anal diameters 35
- 35 Tip of female tail rounded; supplements 9–13. — ♀: L = 1.4–1.6 mm; a = 25–40; b = 4.8–5.2; c = 7.7–10; V = 48–50%; c' = 6–8. ♂: L = 1.1–1.5 mm; a = 23–37; b = 3.8–5.1; c = 43–56; PO: 9–13. (Italy) **lopadusae** VINCIGUERRA & LA FAUCI
 — Tip of female tail pointed; supplements 16–19. — ♀: L = 1.0–1.4 mm; a = 29–36; b = 4.4–5.8; c = 7.5–9.4; V = 42–46%; c' = 7–8. ♂: L = 1.0–1.4 mm; a = 28–33; b = 4.1–5.5; c = 44–58; PO: 16–19. (Venezuela) **globiceps** LOOF
- 36 Female tail 9–10 anal diameters in length; vulva with one papilla on each side. — ♀: L = 1.0–1.1 mm; a = 30–34; b = 5.3–5.8; c = 6.4–7.3; V = 44–45%; c' = 9–10. ♂: L = 0.9 mm; a = 29; b = 5; c = 50; PO: 13. (Vietnam) **orientalis** ANDRÁSSY
 — Female tail 4–7 anal diameters in length; vulval region with cuticular folds 37
- 37 Cuticular folds deep; spear 17–19 μm long. — ♀: L = 1.6–1.9 mm; a = 38–45; b = 4.2–4.7; c = 15–19; V = 49–53%; c' = 5.2–6.5. ♂: L = 1.4–1.5 mm; a = 35–37; b = 4.0–4.5; c = 74–90; PO: 7–10. (Ecuador) **plicatus** sp. n.
 — Cuticular folds not so deep, more superficial; spear 12–14 μm long 38

- 38 Female tail 3–5 anal diameters long; cuticle densely wrinkled on vulval region. — ♀: L = 1.2–1.5 mm; a = 26–30; b = 3.9–4.8; c = 13–18; V = 50–55%; c' = 3.6–4.6. ♂: L = 1.1–1.5 mm; a = 29; b = 3.8–4.5; c = 55–68; PO: 11–13. (Antarctic) **imperator** LOOF
- Female tail 6–7 anal diameters long; cuticle with some innervations on vulval region. — ♀: L = 1.6 mm; a = 39; b = 6.3; c = 12; V = 50%; c' = 6–7. ♂: L = 1.3 mm; a = 40; b = 5.6; c = 50; PO: 11. [Egypt, United States (Nebraska)] **intervallis** (THORNE & SWANGER)
- 39 Female tail of *mesonyctius*-type: first convex-conoid then suddenly narrowing both on ventral and dorsal side and continuing in a thinner subdigitate part; this latter once to twice as long as the anterior rounded part 40
- Female tail not so: either long, more or less uniformly attenuated, or narrowing on the dorsal side only, or the posterior subdigitate part more than twice as long as the anterior rounded one 54
- 40 Lips set off by deep constriction 41
- Lips not or only slightly set off 43
- 41 Female tail longer (c = 12). — ♀: L = 1.2 mm; a = 22; b = 4.9; c = 12; V = 49%; c' = 4. ♂ unknown. (Soviet Union: Lithuania, Uzbekistan) **pendschikenticus** (TULAGANOV)
- Female tail shorter (c = 13–22) 42
- 42 Supplements 8, spaced; tip of female tail rounded. — ♀: L = 0.9 mm; a = 28; b = 4.1; c = 18; V = 52%; c' = 2.5. ♂: L = 0.9–1.2 mm; a = 29–33; b = 4.1–4.7; c = 50–61; PO: 8. [West Germany, Czechoslovakia, Soviet Union (Far East), Mongolia] **parasubulatus** (MEYL)
- Supplements 17–20, contiguous; tip of female tail pointed. — ♀: L = 1.1–1.2 mm; a = 26–34; b = 3.7–5.1; c = 18–22; V = 47–51%; c' = 2.4–3.6. ♂: L = 1.0–1.3 mm; a = 25–38; b = 4.1–5.2; c = 46–61; PO: 17–20. (South Africa) **paralitoralis** BASSON & HEYNS
- 43 Posterior end of intestine with a tongue-like organ; vulva longitudinal. — ♀: L = 1.5 mm; a = 32; b = 5.0; c = 16; V = 49%; c' = 3–4. ♂ unknown. (United States: South Dakota) **simplex** THORNE
- Posterior end of intestine without such an organ; vulva mostly transverse 44
- 44 Posterior tapering part of female tail as long as, or shorter than the anterior rounded part 45
- Posterior tapering part of female tail distinctly longer than the anterior rounded part 46
- 45 Lips completely amalgamated; body about 1 mm long. — ♀: L = 1.1 mm; a = 21–26; b = 4.6–5.3; c = 17–18; V = 49%; c' = 2–2.5. ♂: L = 1.0–1.1 mm; a = 27; b = 4.9–5.9; c = 44–47; PO: 11–12. (Brazil) **pizai** LORDELLO
- Lips more or less separated; body about 1.5 mm long. — ♀: L = 1.5 mm; a = 33; b = 4.4; c = 27; V = 55%; c' = 2. ♂ unknown. (Germany) **rhenanus** ALTHERR
- 46 Tip of female tail conoid and pointed (very narrowly rounded) 47
- Tip of female tail cylindrical, rounded 48
- 47 Supplements 9–13, spaced. — ♀: L = 1.5–1.7 mm; a = 38–48; b = 4.5–5.0; c = 12–22; V = 52–60%; c' = 3–4. ♂: L = 1.5–1.7 mm; a = 41–53; b = 4.5–4.9; c = 65–80; PO: 9–13. [Holland, Germany, Sweden, Austria, Czechoslovakia, Hungary, Poland, Jugoslavia, Spain, France, Italy, Soviet Union (Russia, Belorussia, Ukraine, Estonia, Latvia, Lithuania, Georgia, Armenia, Uzbekistan, Tadzhikistan), Sumatra, Java, Canary Islands, Morocco, Tanzania, Zambia, Zaire, Cameroon, Annobon, Mauritius, South Africa, United States, Mexico, Australia. It is questionable whether all these data refer to the true *bastiani*] **bastiani** (BÜTSCHLI)
- Supplements 18–24, contiguous. — ♀: L = 1.4–2.1 mm; a = 34–41; b = 4.3–5.3; c = 14–28; V = 52–59%; c' = 2–3. ♂: L = 1.4–1.5 mm; a = 39–40; b = 5.1–5.2; c = 62–68; PO: 18–24. (United States: Utah) **pseudobastiani** LOOF
- 48 Spear 18–20 μ m long 49
- Spear shorter, 10 to 16 μ m long 50
- 49 Body about 2 mm long; vagina heavily swollen. — ♀: L = 1.9 mm; a = 36; b = 4.3; c = 17; V = 55%; c' = 4. ♂ unknown. (Germany) **paetzoldi** ALTHERR

- Body 1.2–1.7 mm; vagina not so swollen. — ♀: L = 1.2–1.7 mm; a = 27–34; b = 3.7–5.5; c = 7–25; V = 47–53%; c' = 4–5(–8). ♂: L = 1.3–1.5 mm; a = 30–35; b = 3.9–4.4; c = 52–58; PO: 10–15. (Holland, Switzerland, Jugoslavia, Italy) **aberrans** LOOF
- 50 Posterior tapering part of female tail comparatively shorter, about 1.5 times as long as anterior rounded part 51
- Posterior tapering part of female tail comparatively longer, about twice as long as anterior rounded part 52
- 51 Body longer (1.5 mm) and very slender (a = 50–70). — ♀: L = 1.5 mm; a = 50–70; b = 4.5; c = 30; V = ?; c' = 3. ♂: unknown. [Soviet Union (Russia), India, Mauritius, Brazil, New Guinea] **biroi** (DADAY)
- Body shorter (0.8–1.2 mm) and much stouter (a = 23–33). — ♀: L = 0.8–1.2 mm; a = 23–33; b = 3.8–4.7; c = 15–20; V = 50–56%; c' = 3–5. ♂: L = 0.9–1.1 mm; a = 24–33; b = 3.8–4.9; c = 45–70; PO: 9–12. [Poland, Czechoslovakia, Hungary, Italy, Soviet Union (Russia), China, India, South Africa, Jamaica, Venezuela] **mesonyctius** (KREIS)*
- 52 Vulva longitudinal; cardia about as long as body width. — ♀: L = 1.4 mm; a = 34; b = 4.3; c = 13–15; V = 52%; c' = 3.5. ♂: L = 1.3 mm; a = 35; b = 4.1; c = 65; PO: 8–10. (United States: Montana, Nebraska, North and South Dakota) **cardiacus** THORNE
- Vulva transverse; cardia shorter 53
- 53 Spicula unusually massive; body 1.6 mm long. — ♀: L = 1.6 mm; a = 37; b = 4.5; c = 15–28; V = 54%; c' = 4. ♂: L = 1.6 mm; a = 37; b = 4.6; c = 80; PO: 7. (United States: Nebraska) **macrophallus** THORNE
- Spicula normal; body 1.0–1.4 mm long. — ♀: L = 1.0–1.4 mm; a = 28–41; b = 3.8–5.0; c = 9–15; V = 47–53%; c' = 4–9. ♂: L = 0.9–1.3 mm; a = 28–39; b = 4.0–4.7; c = 45–74; PO: 5–9. (South Africa) **usitatus** BASSON & HEYNS
- 54 Female tail shorter, 2 to 5 anal diameters 55
- Female tail longer, 6 to 12 anal diameters 62
- 55 Tail 2–2.5 times anal diameter 56
- Tail 3–5 times anal diameter 58
- 56 Labial region completely continuous with neck contour. — ♀: L = 1.2–1.6 mm; a = 30–36; b = 4.3–5.2; c = 20–35; V = 50–53%; c' = 2. ♂: L = 1.2–1.4 mm; a = 31–38; b = 4.5–4.8; c = 59–83; PO: 7–9. (India) **brassicus** SONI & NAMA
- Labial region well set off 57
- 57 Tail ventrally curved; body about 1 mm long. — ♀: L = 1.1 mm; a = 33; b = 3.3; c = 20; V = 50%; c' = ?. ♂: L = 1.1 mm; a = 40; b = 4.1; c = 71; PO: 4. (Holland) **spengeli** (DE MAN)
- Tail straight; body about 2 mm long. — ♀: L = 1.9 mm; a = 44; b = 4.5; c = 30; V = 53%; c' = 2–2.5. ♂ unknown. (Zaire) **brevispicatus** (SCHUURMANS STEKHOVEN)
- 58 Body shorter, 0.8–1.1 mm 59
- Body longer, 1.3–1.7 mm 61
- 59 Intestine blackish coloured. — ♀: L = 0.9 mm; a = 26–33; b = 3.3–3.7; c = 12–14; V = 51–59%; c' = 3.5–4.5. ♂ unknown. (Sumatra) **nigritulus** (SCHNEIDER)
- Intestine light in colour 60
- 60 Supplements 8, well spaced. — ♀: L = 0.8–1.0 mm; a = 28–35; b = 3.7–5.1; c = 6–8; V = 43–47%; c' = 5–6. ♂: L = 0.7–0.8 mm; a = 24; b = 5; c = 40–50; PO: 8. (Hungary, Brazil, Venezuela) **parasubtilis** (MEYL)
- Supplements 11, contiguous. — ♀: L = 1.1 mm; a = 27–28; b = 3.9–4.1; c = 12–18; V = 55–59%; c' = 3–4. ♂: L = 1.0–1.1 mm; a = 27–28; b = 3.9–4.7; c = 47–54; PO: 11. (Argentina) **adalberti** ANDRÁSSY
- 61 Tail ventrally bent; spear about 1.5 times as long as labial width. — ♀: L = 1.4 mm; a = 20; b = 5.2; c = 15; V = 41%; c' = 3.5–4. ♂: L = 1.8 mm; a = 26; b = 4.7; c = 63; PO: ? (China) **chekiangensis** (WU & HOEPLI)

* *Mesodorylaimus subulatus* (COBB in THORNE & SWANGER, 1936) ANDRÁSSY, 1959 cannot be separated from *M. mesonyctius*.

- Tail straight; spear about as long as labial width. — ♀: L = 1.3–1.6 mm; a = 30–43; b = 4.8–6.1; c = 13–21; V = 49–50%; c' = 3–5. ♂: L = 1.4–1.6 mm; a = 30–37; b = 5.0–5.6; c = 56–75; PO: 15–18. [Holland, United States (South Dakota)] **litoralis** LOOF*
- 62 Marine species. — ♀: L = 1.7 mm; a = 31; b = 5; c = 16; V = 45%. ♂ unknown. (United States: Maryland) **aestuarii** (TIMM)
— Continental species 63
- 63 Large species, 1.8–2.3 mm, body generally very slender 64
— Smaller species, less than 1.8 mm, body not so slender 69
- 64 Dorsal side of body, opposite the vulva, perceptibly impressed; male tail constricted in the middle. — ♀: L = 2.0–2.2 mm; a = 47–57; b = 4.6–5.1; c = 11–15; V = 47–52%; c' = 7–10. ♂: L = 1.7–2.5 mm; a = 46–58; b = 3.9–5.1; c = 66–93; PO: 8–10. (Kenya) **angustus** ANDRÁSSY
— Dorsal side of body not impressed; male tail not constricted in the middle 65
- 65 Head set off by constriction 66
— Head not set off 67
- 66 Supplements 21–26. — ♀: L = 1.9–2.3 mm; a = 25–40; b = 4.0–5.2; c = 10–12; V = 45–48%; c' = 6–7. ♂: L = 1.8–2.1 mm; a = 32–41; b = 4.0–5.6; c = 64–84; PO: 21–26. (United States: Utah) **cryptosperma** LOOF
— Supplements 16. — ♀: L = 1.8 mm; a = 41; b = 3.7; c = 12; V = 55%; c' = 6. ♂: L = 1.6–2.0 mm; a = 37; b = 5; c = 66; PO: 16. (Fiji, Ivory Coast, Suriname) **exilis** (COBB)
- 67 Supplements 6; male tail conoid, with narrowly rounded tip. — ♀: L = 1.8–2.0 mm; a = 32–34; b = 4.8–5.8; c = 4.6–5.9; V = 39–41%; c' = 7–12. ♂: L = 1.3 mm; a = 31; b = 5.1; c = 62; PO: 6. (Poland) **luci** BRZESKI & SZCZYGIEL
— Supplements 12–16; male tail not conoid, with blunt tip 68
- 68 Male tail ventrally concave; musculature of spear compact, yellowish coloured, more conspicuous than in general. — ♀: L = 1.8–2.3 mm; a = 50–68; b = 5–6; c = 14–20; V = 42–46%. ♂: L = 1.6–2.2 mm; a = 45–60; b = 5–6; c = 60–80; PO: 12–18. [Germany, Denmark, Sweden, Austria, Hungary, Poland, Soviet Union (Russia), Sumatra, Java, Bali, Ethiopia, Tanzania, Zaire, South Africa, United States, Suriname, Columbia, Paraguay] **flavomaculatus** (LINSTOW)
— Male tail hemispherical, ventrally not concave; musculature of spear normal, not yellowish. — ♀: L = 1.8 mm; a = 45; b = 4.5; c = 6.7; V = 44%; c' = 10–11. ♂: L = 1.6 mm; a = 47; b = 4.5; c = 67; PO: 12–14. [Italy, United States (Virginia)] **nudus** (THORNE)
- 69 Body 1 mm or smaller 70
— Body over 1 mm 78
- 70 Labial region set off by deep constriction 71
— Labial region set off by slight depression or continuous with neck 72
- 71 Orifice occupying 1/2 of spear length. — ♀: L = 1.0 mm; a = 33–34; b = 4.9; c = 5.0–5.4; V = 43–47%; c' = 10. ♂ unknown. (Brazil) **delicatus** LORDELLO
— Orifice occupying 1/3 of spear length. — ♀ (juv.): a = 30–33; b = 3.8–4.0; c = 5.8–6.6; c' = 8–10. ♂: L = 0.9 mm; a = 30–32; b = 4.0–4.1; c = 40–43; PO: 10–12. (Tanzania) **szunyoghyi** ANDRÁSSY
- 72 Spear almost twice as long as labial width. — ♀: L = 0.9 mm; a = 33; b = 4.3; c = 5.6; V = 44%; c' = 10–11. ♂ unknown. [Soviet Union (Georgia), Jamaica, Australia] **pusillus** (COBB in THORNE & SWANGER)
— Spear as long as labial width or somewhat longer 73
- 73 Supplements 5 to 8, spaced 74
— Supplements 15 to 17, contiguous 76

* *Mesodorylaimus prerectus* THORNE, 1974 seems to be identical with *M. litoralis*. Both have longitudinal vulva, long prerectum, slightly offset head, short spear, 3–5 anal diameters long tail and the same number of supplements (14–17 : 15–18).

- 74 Supplements 7-8 (mostly 8). - ♀: L = 1.0-1.1 mm; a = 31-36; b = 4.1-4.8; c = 7.6-9.5; V = 47-51%; c' = 7. ♂: L = 0.8-1.0 mm; a = 29-34; b = 3.7-4.7; c = 43-59; PO: 7-8. (Germany, Mauretania) **subtiloides** (PAETZOLD)
- Supplements 5 or 6 75
- 75 Supplements 5; spicula 26-28 μ m long. - ♀: L = 0.9 mm; a = 27-32; b = 4.1-4.3; c = 6-7; V = 46-49%; c' = 9-11. ♂: L = 0.8 mm; a = 30; b = 3.7; c = 48; PO: 5. (Paraguay) **guarani** ANDRÁSSY
- Supplements 6; spicula 35 μ m long. - ♀: L = 0.8 mm; a = 28; b = 4.1; c = 6.7; V = 46%; c' = 7-8. ♂ unknown. [Soviet Union (Far East), Japan, Zaire, Angola, South Africa, United States (Virginia)] **japonicus** (COBB in THORNE & SWANGER)*
- 76 Spear massive, nearly as wide as 1/3 labial diameter. - ♀: L = 1.0-1.1 mm; a = 30-32; b = 4.8-5.6; c = 8.9-9.3; V = 46-47%; c' = 7. ♂: L = 1.0 mm; a = 29; b = 4.8; c = 43; PO: 17. (Ghana) **erdelyii** ANDRÁSSY
- Spear thin, as wide as 1/6-1/8 labial diameter 77
- 77 Female tail 11-12 times anal diameter (c = 4-5). - ♀: L = 1.1 mm; a = 27; b = 5.4; c = 4.6; V = 39%; c' = 11-12. ♂: L = 0.9 mm; a = 22; b = 4.5; c = 41; PO: 16. (Argentina) **puellae** ANDRÁSSY
- Female tail 6 times anal diameter (c = 9-11). - ♀: L = 0.8-1.0 mm; a = 26-32; b = 4.3-5.5; c = 8.8-10.6; V = 39-58%; c' = 6. ♂: L = 0.7-0.9 mm; a = 26-29; b = 4.3-5.2; c = 43-53; PO: 15-16. (Paraguay, Brazil) **paraguayensis** (KREIS)
- 78 Spear 25 μ m long. - ♀: L = 1.4-1.5 mm; a = 25-30; b = 3.8-4.3; c = 5.4-5.6; V = 46-48%; c' = 10. ♂ unknown. (Brazil) **lourdesae** (LORDELO)
- Spear length between 9 and 20 μ m 79
- 79 Cuticle in entire length of body finely annulated; female tail ventrally arcuate. - ♀: L = 1.5 mm; a = 41-44; b = 4.5; c = 6.0; V = 40-41%; c' = 11-12. ♂ unknown. (Hungary) **margaritifer** sp. n.
- Cuticle at most on both ends of body annulated; female tail predominantly straight 80
- 80 Supplements spaced, 6 to 15 in number 81
- Supplements contiguous, 11 to 21 in number 86
- 81 Supplements 6-9. - ♀: L = 1.4-1.5 mm; a = 37-38; b = 4.9-5.0; c = 8.3-8.5; V = 44-50%; c' = 8. ♂: L = 1.3 mm; a = 32-36; b = 4.6-4.7; c = 62-67; PO: 6-9. [Holland, Germany, Jugoslavia, Israel, India, United States (Utah, South Dakota), Brazil] **subtilis** (THORNE & SWANGER)**
- Supplements 10-15 82
- 82 Posterior part of intestine with a long tongue-like structure. - ♀: L = 1.5-1.6 mm; a = 28-36; b = 4.8-5.4; c = 5.2-5.7; V = 43-44%; c' = 9-10. ♂: L = 1.0-1.3 mm; a = 22-35; b = 3.1-4.2; c = 38-48; PO: 10-13. (Italy) **dolomiticus** VINCIGUERRA
- Posterior part of intestine without such an organ 83
- 83 Supplements 10 84
- Supplements 13-15 85
- 84 Spear conspicuously thicker than cuticle at the same level; male tail narrowly rounded. - ♀: L = 1.3 mm; a = 33; b = 4.6; c = 11; V = 52%; c' = 5.8-7.5. ♂: L = 1.2 mm; a = 32; b = 3.8; c = 63; PO: 10. (Czechoslovakia, Romania, Mauretania) **subtiliformis** (ANDRÁSSY)
- Spear as thick as cuticle at the same level; male tail broadly rounded. - ♀: L = 0.9-1.5 mm; a = 24-37; b = 4.4-5.0; c = 5-7; V = 46-50%; c' = 7-12. ♂: L = 1.0 mm; a = 30; b = 4.0; c = 65; PO: 10. (South Africa) .. **pseudosubtilis** BASSON & HEYNS

* The species *M. japonicus* (COBB in THORNE & SWANGER, 1936) and *M. arvensis* (COBB in THORNE & SWANGER, 1936) are on the basis of their descriptions completely identical. The shall be synonymized, and the name *japonicus* must be regarded as valid since this species was described one page earlier than *arvensis* in the monograph of THORNE and SWANGER (1936). BASSON and HEYNS (1974) called the attention to a probable synonymy of *M. musae* GERAERT, 1962 with *M. arvensis*. Their opinion concurs with mine: *musae* is identical with *arvensis* = *japonicus*.

** *M. krishnaraoi* (MOORTHY, 1938) seems to be identical with *M. subtilis*. Already MOORTHY noted the very close relation of the species. He could separate one from the other by size of the egg only (70 × 30 μ m in *subtilis*, and 96 × 20 μ m in *krishnaraoi*).

- 85 Body very slender ($a = 50-55$); spear $20-21 \mu\text{m}$ long. — ♀: $L = 1.5 \text{ mm}$; $a = 50-55$; $b = 4.5-4.8$; $c = 9-12$; $V = 50-60\%$; $c' = 8-9$. ♂: $L = 1.3-1.5 \text{ mm}$; $a = 50-60$; $b = 4.0-4.5$; $c = 65-75$; PO: 13-15. (Brazil) **sveltus** (MEYL)
- Body not so slender ($a = 36-45$); spear $11-13 \mu\text{m}$ long. — ♀: $L = 1.0-1.6 \text{ mm}$; $a = 36-45$; $b = 4.7-6.3$; $c = 9-14$; $V = 42-49\%$; $c' = 6.5-7.8$. ♂: $L = 1.3 \text{ mm}$; $a = 40$; $b = 5.3$; $c = 78$; PO: 14. (South Africa) **intermedius** DASSONVILLE & HEYNS
- 86 Lips well set off 87
- Lips not or hardly set off 89
- 87 Spear massive, twice as thick as cuticle at the same level; supplements 14-16 in number. — ♀: $L = 1.3-1.6 \text{ mm}$; $a = 27-42$; $b = 5.0-6.2$; $c = 6-8$; $V = 40-47\%$; $c' = 9-12$. ♂: $L = 1.1-1.4 \text{ mm}$; $a = 24-38$; $b = 4.8-5.2$; $c = 49-66$; PO: 14-16. [Soviet Union (Russia), South Africa] **potus** HEYNS
- Spear slender, about as thick as cuticle at the same level; supplements 18-21 in number 88
- 88 Spear twice as long as labial width. — ♀: $L = 1.6 \text{ mm}$; $a = 32$; $b = 5.9$; $c = 6.0$; $V = 42\%$; $c' = 10-11$. ♂: $L = 1.6 \text{ mm}$; $a = 34$; $b = 4.1$; $c = 45$; PO: 20. (United States: South Dakota) **lissus** THORNE
- Spear only slightly longer than labial width. — ♀: $L = 1.4-1.8 \text{ mm}$; $a = 24-31$; $b = 4.5-5.0$; $c = 9.4-12.7$; $V = 47\%$. ♂: $L = 1.3-1.7 \text{ mm}$; $a = 26-37$; $b = 4-5$; $c = 50-65$; PO: 18-21. (Germany, Hungary) **bastianoides** (MEYL)
- 89 Spear $18-20 \mu\text{m}$, nearly twice as long as labial diameter. — ♀: $L = 1.6 \text{ mm}$; $a = 35$; $b = 4.3$; $c = 9.0$; $V = 48\%$; $c' = 9$. ♂: $L = 1.6 \text{ mm}$; $a = 32$; $b = 4.3$; $c = 125$; PO: 21. [Switzerland, Tanganyika Lake, United States (Washington D.C.)] .. **conurus** (THORNE)*
- Spear 9 to $15 \mu\text{m}$, as long as, or slightly longer than labial diameter 90
- 90 Vulva equatorial or a little post-equatorial in position 91
- Vulva pre-equatorial of position. (Very closely related species, not easy to separate one from the other) 92
- 91 Female tail shorter, 5-6 anal diameters; spear as long as labial width. — ♀: $L = 1.3 \text{ mm}$; $a = 30$; $b = 4.1$; $c = 11$; $V = 51\%$; $c' = 6$. ♂: $L = 1.3 \text{ mm}$; $a = 36$; $b = 4.0$; $c = 62$; PO: 14-17. [South Africa, United States (Utah)] **alpestris** (THORNE)**
- Female tail longer, 9-10 anal diameters; spear distinctly longer than labial width. — ♀: $L = 1.5 \text{ mm}$; $a = 41$; $b = 4.7$; $c = 8.3$; $V = 51\%$; $c' = 9-10$. ♂: $L = 1.2 \text{ mm}$; $a = 37$; $b = 4.5$; $c = 59$; PO: 15-16. (United States: Virginia) .. **tenellus** (THORNE & SWANGER)
- 92 Spear $9-10 \mu\text{m}$, hardly as long as cephalic diameter 93
- Spear $11-15 \mu\text{m}$, longer than cephalic diameter 95
- 93 Female tail uniformly conoid in its entire length. — ♀: $L = 1.1-1.6 \text{ mm}$; $a = 33-37$; $b = 5.3-6.0$; $c = 10-12$; $V = 43-45\%$; $c' = 5-8$. ♂: $L = 1.1-1.6 \text{ mm}$; $a = 36$; $b = 4.8$; $c = 90$; PO: 18-20. (United States: Wyoming, Utah) **thermae** (COBB in HOEPLI)
- Female tail at first convex-conoid then subcylindrical 94
- 94 Tip of female tail sharply pointed; body $1.5-1.7 \text{ mm}$ long. — ♀: $L = 1.5-1.7 \text{ mm}$; $a = 32-35$; $b = 6.1-6.8$; $c = 9-10$; $V = 43-44\%$; $c' = 7.5-8$. ♂: $L = 1.2-1.5 \text{ mm}$; $a = 31-33$; $b = 5.1-6.1$; $c = 67-76$; PO: 15-20. (Mexico, Argentina) **meridianus** ANDRÁSSY
- Tip of female tail finely rounded; body 1.3 mm long. — ♀: $L = 1.3 \text{ mm}$; $a = 35$; $b = 6.0$; $c = 9.5$; $V = 45\%$; $c' = 7$. ♂: $L = 1.2 \text{ mm}$; $a = 38$; $b = 5.2$; $c = 55$; PO: 16. (United States: South Dakota) **brevidens** THORNE
- 95 Lips separate, head slightly set off. — ♀: $L = 1.4-1.8 \text{ mm}$; $a = 34-41$; $b = 4.5-5.2$; $c = 7.5-8.6$; $V = 46-49\%$; $c' = 8-10$. ♂: $L = 1.0-1.4 \text{ mm}$; $a = 29-42$; $b = 3.7-4.6$; $c = 45-65$; PO: 11-20. (Germany, India) **dermi** LOOF
- Lips completely amalgamated, head continuous with neck 96

* *M. sabaudiensis* (JUGET, 1969) cannot be separated from *M. conurus*: the same length of body ($1.4-1.8$ versus 1.6) and of spear, the same length and shape of tail and the same number of supplements ($19-21$ versus 21).

** *M. vaalensis* HEYNS & KRUGER, 1983 is most probably identical with *M. alpestris*. They agree both in measurements and in shape and length of tail, position of vulva, length of spear, etc.

- 96 Supplements 12–16. — ♀: L = 1.2–1.6 mm; a = 30–39; b = 4.0–5.5; c = 5–10; V = 43%; c' = 12. ♂: L = 1.4 mm; a = 30–35; b = 4.0; c = 45–57; PO: 12–16. [Germany, Switzerland, Austria, Jugoslavia, Soviet Union (Latvia), Sumatra, Java, United States (California, Virginia)] **hofmaeneri** (MENZEL in HOFMÄNNER & MENZEL)
 — Supplements 18–21. — ♀: L = 1.0–1.3 mm; a = 32–37; b = 4.4–5.1; c = 9–11; V = 43–48%; c' = 6–7. ♂: L = 1.1–1.2 mm; a = 32–41; b = 4.2–5.1; c = 53–70; PO: 18–21. (Zaire) **kamandeanus** BAQRI & COOMANS

Mesodorylaimus graciosus sp. n. (Figs 1A–G)

♀: L = 1.45 mm; a = 41; b = 4.9; c = 4.1; V = 44%; c' = 20.

♂: L = 1.03–1.11 mm; a = 32–35; b = 3.6–3.7; c = 50–52.

Body slender, arcuate, 33–35 μm wide. Cuticle in mid-body 1.5–1.6 μm thick, in anterior region of tail 3 μm thick, smooth. Head 10–12 μm wide, not set off from neck, lips amalgamated. Body at posterior end of oesophagus 2.8–3.1 times as wide as head. Amphid caliciform, about 1/2 cephalic diameter wide.

Atrium lined. Spear 12–13 μm , 1.1–1.3 times labial diameter, about as thick as cuticle at the same level; orifice occupying something more than 1/3 spear length. Guiding ring simple, very thin. Oesophagus 280–307 μm long, in 51–58% of its length expanded; distance between oesophagus and vulva somewhat longer than oesophagus. Cardia conoid. Rectum 2, prerectum 2.5 anal diameters long.

Vulva transverse, with well cuticularized lips. Vagina 18 μm long (measured from body surface). Both female gonads lying on the left side of body. Each gonad 5.6–5.8 times as long as body width. Egg 90 \times 25 μm , 2.6 times as long as corresponding body diameter. Distance vulva-anus 1.3 times longer than tail.

Female tail filiform, very finely narrowing, 350 μm , 20 times as long as anal width, or 24% of total length of body, respectively.

Male tail 20–21 μm , nearly as long as anal diameter, broadly rounded. Spicula 36–37 μm long, 1.8 times as long as tail. Ventromedial supplements 7, spaced; distance between them 9 to 12 μm , distance between hindermost supplement and anus 58 μm . Prerectum beginning within the row of supplements.

Brief characteristics: Body of medium length, slender, cuticle rather thin, labial region not set off, spear short, vulva transverse, supplements few in number and spaced, female tail very long and thin.

Holotype: female on the slide No. 11505 in the collection of the author. **Paratypes:** 2 males and 1 juv.

Type-locality: Volcano Cotopaxi, 2000 m, Ecuador, soil around roots of *Festuca* sp.; collected November 1984 by DR. J. BALOGH.

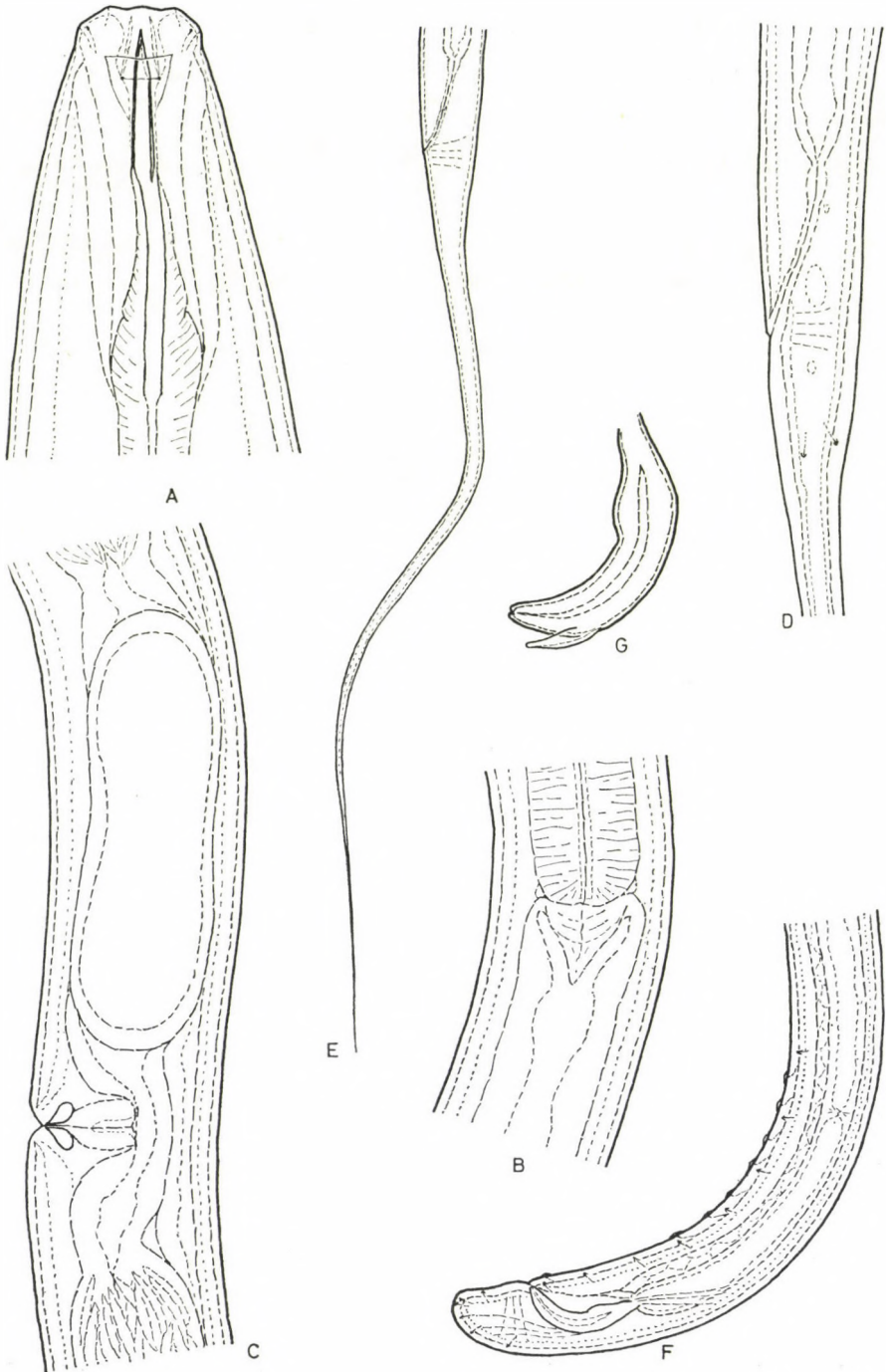


Fig. 1. *Mesodorylaimus graciosus* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C_v = vulval region ($\times 700$); D = anal region of female ($\times 700$); E = female tail ($\times 400$); F = posterior end of male ($\times 400$); G = spiculum ($\times 1000$)

In the general appearance and the exceedingly long tail the new species resembles *Mesodorylaimus flagellatus* (WILLIAMS, 1959) ANDRÁSSY, 1960 very much. It differs in two characters from that: the body is longer, 1.5 times the body of *flagellatus*, and the core in tail not articulate at its basis. (WILLIAMS regards the latter character as an important criterium for his species.) Unfortunately, *flagellatus* was described on the basis of female specimens only. Besides, there are two other species showing a similarly long female tail: *Mesodorylaimus sylphus* (THORNE, 1939) GOODEY, 1963 and *M. bainsi* BASSON & HEYNS, 1974. Our new species may be distinguished from both of them in having a shorter spear (17 μm in *sylphus*, 14–19 μm in *bainsi*), and less and spaced supplements (24–28 in *sylphus*, 11–14 in *bainsi*).

Mesodorylaimus pulcher sp. n. (Figs 2A–G)

♀: L = 1.46 mm; a = 44; b = 5.1; c = 3.5; V = 44%; c' = 21.
♂: L = 1.12 mm; a = 34; b = 4.0; c = 68.

Body slender, 32–33 μm wide. Cuticle in mid-body 1.5 μm , in anterior part of tail 3 μm thick. Head 10–11 μm wide, not set off at all, lips rounded. Body at posterior end of oesophagus 2.9–3.2 times as wide as head. Amphid broader than 1/2 corresponding body diameter.

Atrium lined. Spear 14–15 μm , 1.3–1.4 times as long as cephalic diameter, straight, about as thick as cuticle at the same level. Orifice occupying something more than 1/3 of spear length. Guiding ring simple and thin. Oesophagus 272–280 μm long, shorter than distance between oesophagus and vulva; enlarging in 54–55% of its length. Dorsal nucleus located at 18 μm from the anterior end of the widened portion. Cardia conoid. Rectum 1.8 times, prerectum 2.6 times as long as anal diameter.

Vulva transverse, with strongly cuticularized lips. Vagina 21 μm long measured from body surface. Both female gonads lying on the right side of body; each 5.5–5.8 times as long as body diameter. No eggs in uteri. Distance vulva-anus approximately as long as tail.

Female tail 410 μm , 21 times as long as anal body diameter, or 28% of entire length of body; filiform, with very fine terminus.

Male tail 18 μm , shorter than anal diameter (0.8 times), bluntly rounded. Spicula 38 μm long. Ventromedial supplements 17, flat, contiguous, at a distance of 3.5–6 μm one from the other. Distance between hindermost supplement and anus 62 μm . Prerectum beginning within the range of supplements.

Brief characters: Medium long and slender species, cuticle thin, head not set off, spear moderate in length, vulva transverse, supplements numerous, female tail very long and fine.

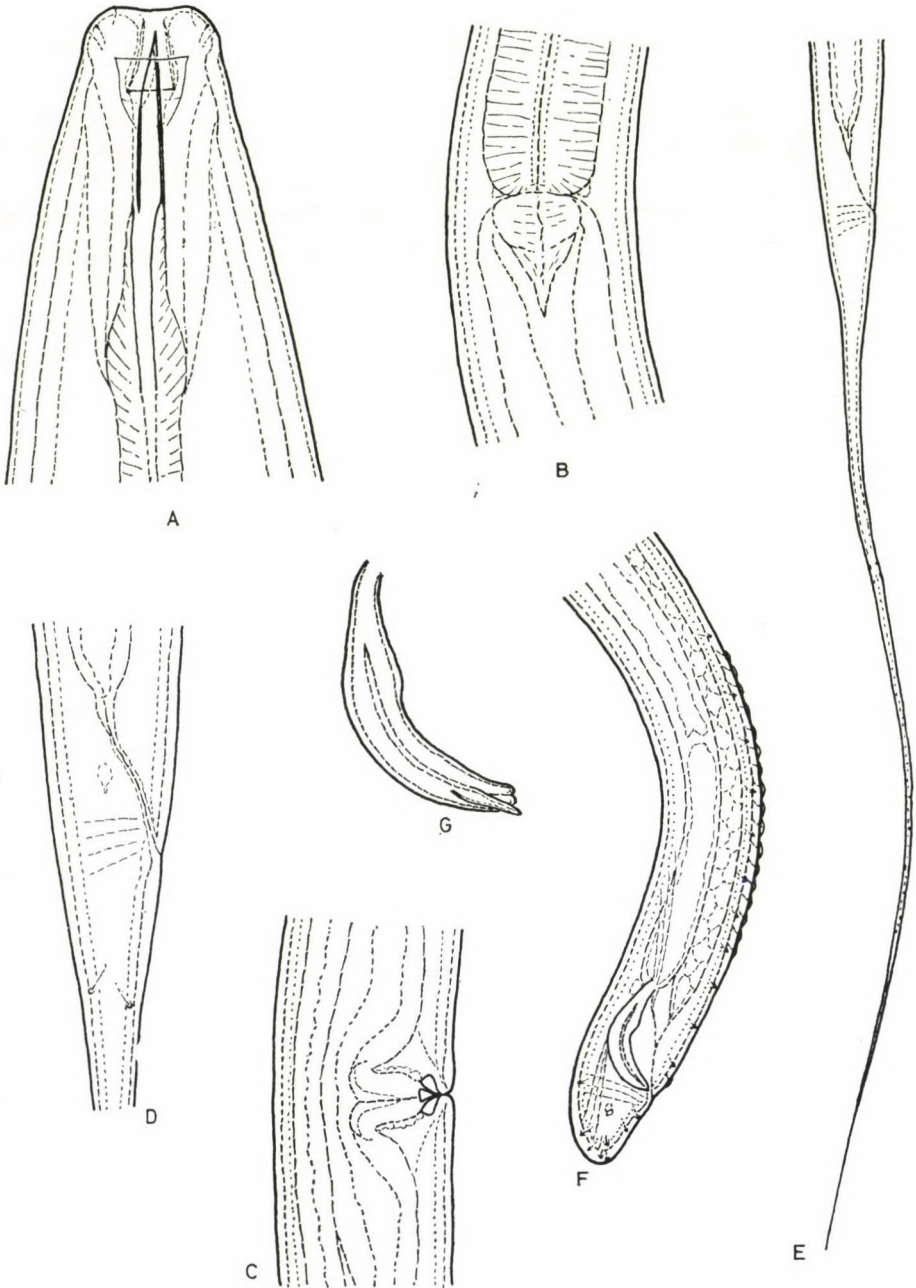


Fig. 2. *Mesodorylaimus pulcher* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C = vulval region ($\times 700$); D = anal region of female ($\times 700$); E = female tail ($\times 350$); F = posterior end of male ($\times 400$); G = spiculum ($\times 1000$)

Holotype: female on the slide No. 11368 in the collection of the author.
Paratypes: 3 females and 1 male.

Type-locality: Volcano Pichinoha, Quito, Ecuador, mosses from soil; collected November 1984 by DR. J. BALOGH.

Very closely related to *Mesodorylaimus graciosus* sp. n., especially the female, but can easily be distinguished from that by the much greater number of the supplements (17 versus 7). Besides, the spear in *pulcher* is somewhat longer (14–15 versus 12–13 μm) and the supplements are contiguous, not spaced. *Mesodorylaimus pulcher* sp. n. may be separated from the other long-tailed species as follows: *a*) from *M. sylphus* (THORNE, 1939) GOODEY, 1963: body shorter (1.5 : 1.7–1.8 mm), female tail longer (21 : 13–14 anal diameters), supplements fewer (17 : 24–28); *b*) from *M. flagellatus* (WILLIAMS, 1959) ANDRÁSSY, 1960: body longer (1.5 : 1.0 mm), spear somewhat longer (14–15 : 12 μm), core in tail not articulate; *c*) from *M. bainsi* BASSON & HEYNS, 1974: head not set off, supplements more numerous (17 : 11–14).

***Mesodorylaimus margaritifer* sp. n. (Figs 3A–E)**

♀: L = 1.50–1.54 mm; a = 41–44; b = 4.5–4.6; c = 6.0; V = 40–41%; c' = 11–12.

Body ventrally arcuate, 35–36 μm wide. Cuticle fairly thin, 1.8–2 μm in mid-body and 3.6 μm in anterior part of tail; very finely but distinctly annulated in total length of body. The annulation resembles a necklace of pearls, hence the specific name "*margaritifer*". Head 12 μm wide, set off from neck. Body at posterior end of oesophagus 2.7 times as wide as head. Amphid caliciform, half as wide as body at the same level.

Atrium lined. Spear straight, 16 μm , 1.3 times as long as cephalic diameter; aperture occupying 1/3 spear length. Oesophagus 330–340 μm long, a little longer than distance between oesophagus and vulva; in 61–63% of its length widened. Dorsal oesophageal nucleus longitudinal. Cardia rounded. Rectum 1.3, prerectum 2.5 times as long as anal body diameter.

Vulva a transverse slit, with strongly cuticularized inner lips. Vagina 18 μm long measured from body surface. Both gonads located on the right side of body; each 6 times as long as body diameter. Eggs were not found in the uteri. Distance between vulva and anus 2.5 times as long as tail.

Tail 246–252 μm , 11–12 anal diameters in length, or 16% of entire length of body, respectively; ventrally arcuate, first convex-conoid then gradually tapering to the very finely rounded tip. Core occupying only 56–58% of tail length.

Male unknown.

Brief characters: Body moderately long, slender, head set off,

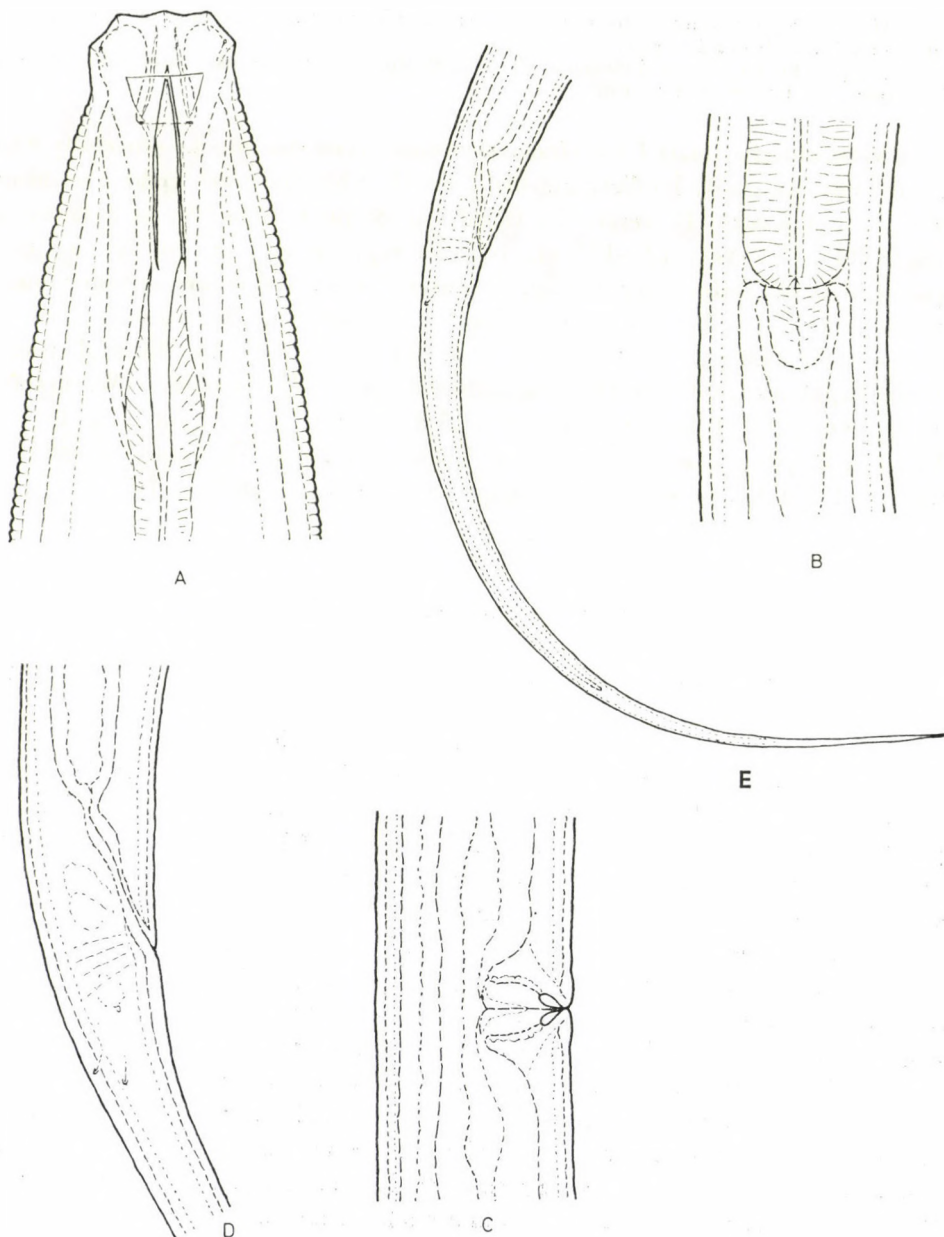


Fig. 3. *Mesodorylaimus margaritifer* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C = vulval region ($\times 700$); D = anal region ($\times 700$); E = female tail ($\times 400$)

spear of middle length, oesophagus enlarging posterior to its middle, vulva transverse, cuticle thin and finely annulated, tail long and bent ventrally.

Holotype: female on the slide No. 10488 in the collection of the author. **Paratypes:** 3 females.

Type-locality: Kemence Creek in the Börzsöny Mountains, Hungary, wet soil around roots of *Urtica dioica*, collected June 1983.

In its general habit and the length of spear and tail, *Mesodorylaimus margaritifera* sp. n. resembles *M. bastianoides* (MEYL, 1961) ANDRÁSSY, 1967, *M. dorni* LOOF, 1969 and *M. pseudosubtilis* BASSON & HEYNS, 1974. It can be separated *a*) from *bastianoides* by the annulated cuticle, the slender body ($a = 41-44$ vs. $28-31$), the anteriorly located vulva ($V = 40-41\%$ vs. 47%), the longer tail ($c = 6$ vs. $10-13$) and the core ending far from tail tip; *b*) from *dorni* by the cuticle annulated in the entire length of body, the transverse vulva and the shape of tail; *c*) from *pseudosubtilis* by the cuticle annulated in total length of body, the slender body ($a = 41-44$ vs. $24-37$), the longer spear ($16 \mu\text{m}$ vs. $10-14 \mu\text{m}$), the well offset labial region, the vulva located more anterior ($40-41\%$ vs. $46-50\%$) and the core extending not so near to tail tip ($56-58\%$ vs. 85%).

Mesodorylaimus plicatus sp. n. (Figs 4A—G)

♀: $L = 1.62-1.86$ mm; $a = 37-45$; $b = 4.2-4.7$; $c = 15-19$; $V = 49-53\%$; $c' = 5.2-6.5$.

♂: $L = 1.42-1.50$ mm; $a = 35-37$; $b = 4.0-4.5$; $c = 74-90$.

Body usually ventrally arcuate, $41-48 \mu\text{m}$ wide. Cuticle on mid-body $2.0-2.3 \mu\text{m}$, on anterior part of tail $3.0-3.6 \mu\text{m}$ thick, smooth. Head $12-13 \mu\text{m}$ wide, not set off in any manner, lips amalgamated. Body at proximal end of oesophagus $3.1-3.2$ times as wide as head. Amphids a little wider than $1/2$ body diameter at the same level.

Walls of atrium lined. Spear $17-19 \mu\text{m}$, $1.3-1.6$ times as long as cephalic diameter, straight, slender, about as thick as cuticle opposite the spear. Aperture occupying $1/3$ of spear length. Oesophagus $345-443 \mu\text{m}$ long, shorter than the distance between oesophagus and vulva; in $51-53\%$ of its length enlarged. Dorsal nucleus $3.5-4.5 \mu\text{m}$ large, located $20-25 \mu\text{m}$ from anterior end of the enlarged portion of oesophagus. Cardia conoid, $1.5-2$ times as long as wide on its basis. Guiding ring of spear very thin. Rectum $2-2.2$ times, prerectum $1.7-2.8$ times as long as anal body width.

Vulva a transverse slit, a little sunk in body, with heavily cuticularized inner lips. Vulval region obviously marked by deep folds or wrinkles on the cuticle numbering 1 to 6 (mostly 2—3) on both side of the vulva. Vagina strong, $25-29 \mu\text{m}$ long measured from surface of body, often extending

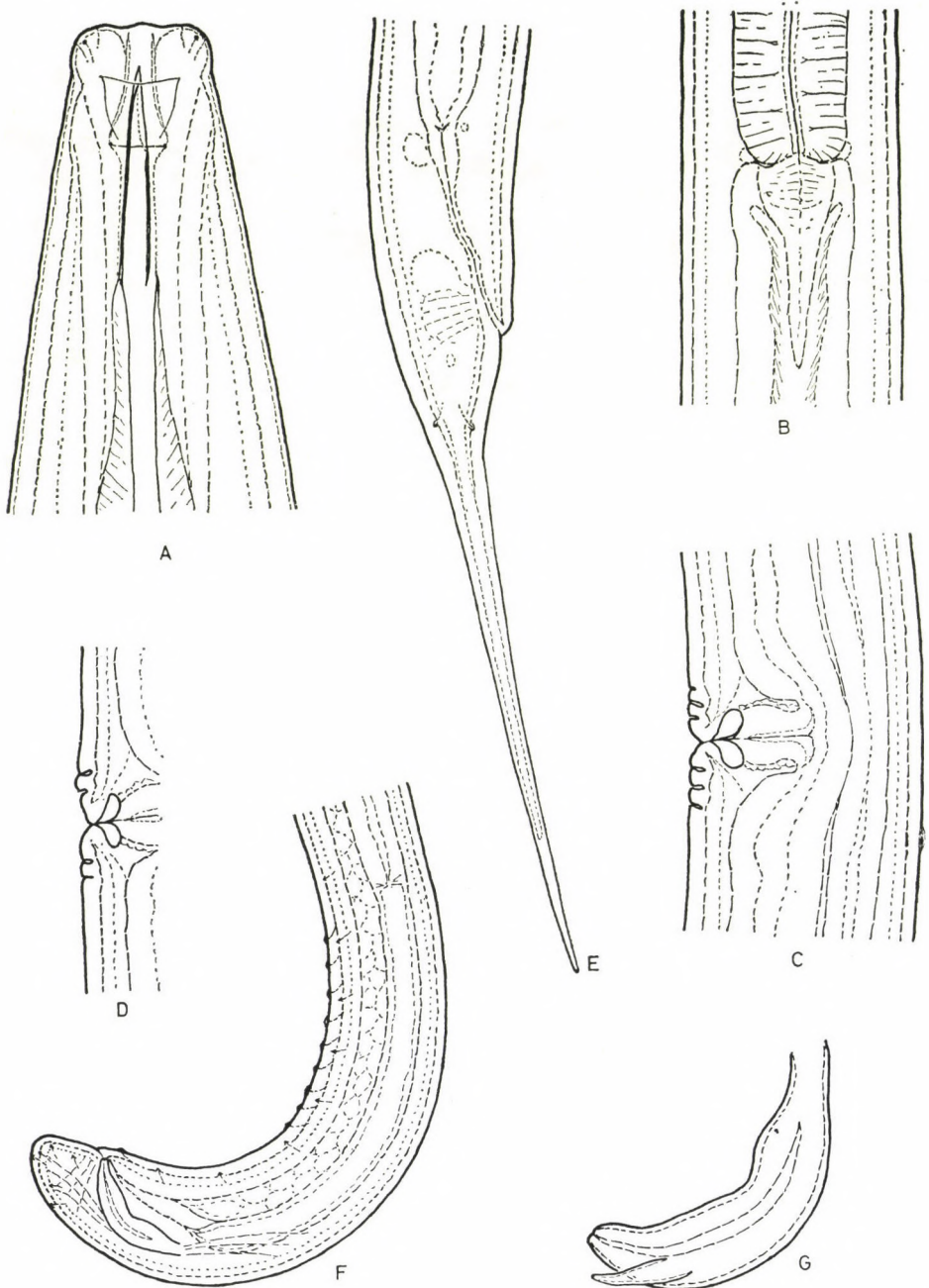


Fig. 4. *Mesodorylaimus plicatus* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C and D = vulval regions ($\times 700$); E = female tail ($\times 700$); F = posterior end of male ($\times 400$); G = spiculum ($\times 1000$)

obliquely into the body. Both gonads located predominantly on the right, rarely on the left to the body axis: each 5.8–7 times as long as body diameter. Eggs 1 to 4 in number at the same time, $85-110 \times 26-43 \mu\text{m}$, 2–2.6 times as long as body width.

Female tail first convex-conoid then tapering uniformly to the finely rounded tip, $98-137 \mu\text{m}$, 5.2–6.5 times as long as anal diameter. Distance vulva-anus 6–8 times longer than tail.

Male tail shorter than wide, bluntly rounded, with 5–6 pairs of small papillae. Spicula $45-48 \mu\text{m}$ long, fairly robust. Supplements 7–10 (generally 8) in number, spaced, $8-12 \mu\text{m}$ one from the other. Posterior-most supplements lying $60-72 \mu\text{m}$ from anal opening. Prerectum beginning at the anterior-most supplement.

Brief characters: Body long and slender, head continuous with neck, spear longer than usual, vulva transverse and showing very conspicuous cuticular folds on its both sides, egg large, rectum long, supplements spaced.

Holotype: female on the slide No. 11432 in the collection of the author. **Paratypes:** 33 females and 9 males.

Type-locality: Volcano Chimborazo, Ecuador, 5000 m above sea level, soil around the roots of some low plants on the bank of a glacier rivulet, collected November 1984 by DR. J. BALOGH.

Mesodorylaimus plicatus sp. n. resembles *M. intervallis* (THORNE & SWANGER, 1936) ANDRÁSSY, 1959 and *M. imperator* LOOF, 1975, both showing cuticular structures on the vulval region. It may be distinguished from *intervallis* by the longer spear (spear as long as labial diameter in *intervallis*), the less numerous supplements (7–10 vs. 11) and the nature of the cuticular ornaments near the vulva (they are not deep folds but “innervate organs”); from *imperator* by the longer body (1.6–1.9 vs. 1.2–1.5 mm), the slender shape ($a = 37-45$ vs. $26-30$), the longer spear ($17-19 \mu\text{m}$ vs. $12-14 \mu\text{m}$), the oesophagus widening more anteriorly ($51-53\%$ vs. $62-65\%$), the deeper folds on the vulval region, the longer tail (5.2–6.5 vs. 3.6–4.6 anal diameters) and the fewer supplements (7–10 vs. 11–13). I note that LOOF presented me a paratype specimen which have the following measurements: $L = 1.48$ mm; $a = 30$; $b = 4.5$; $c = 16.5$; $V = 53\%$; $c' = 4.1$.

Mesodorylaimus trapaefructus sp. n. (Figs 5A–G)

♀: $L = 1.48-1.90$ mm; $a = 38-46$; $b = 3.9-4.3$; $c = 14-18$; $V = 52-55\%$; $c' = 4.7-5.7$.

Body ventrally arcuate, fairly slender, $38-41 \mu\text{m}$ wide. Cuticle smooth and thin, $1.5 \mu\text{m}$ on mid-body and $2.5 \mu\text{m}$ on anterior end of tail. Head $11.5-12 \mu\text{m}$ wide, narrower than adjacent neck region; lips slightly angular. Body at

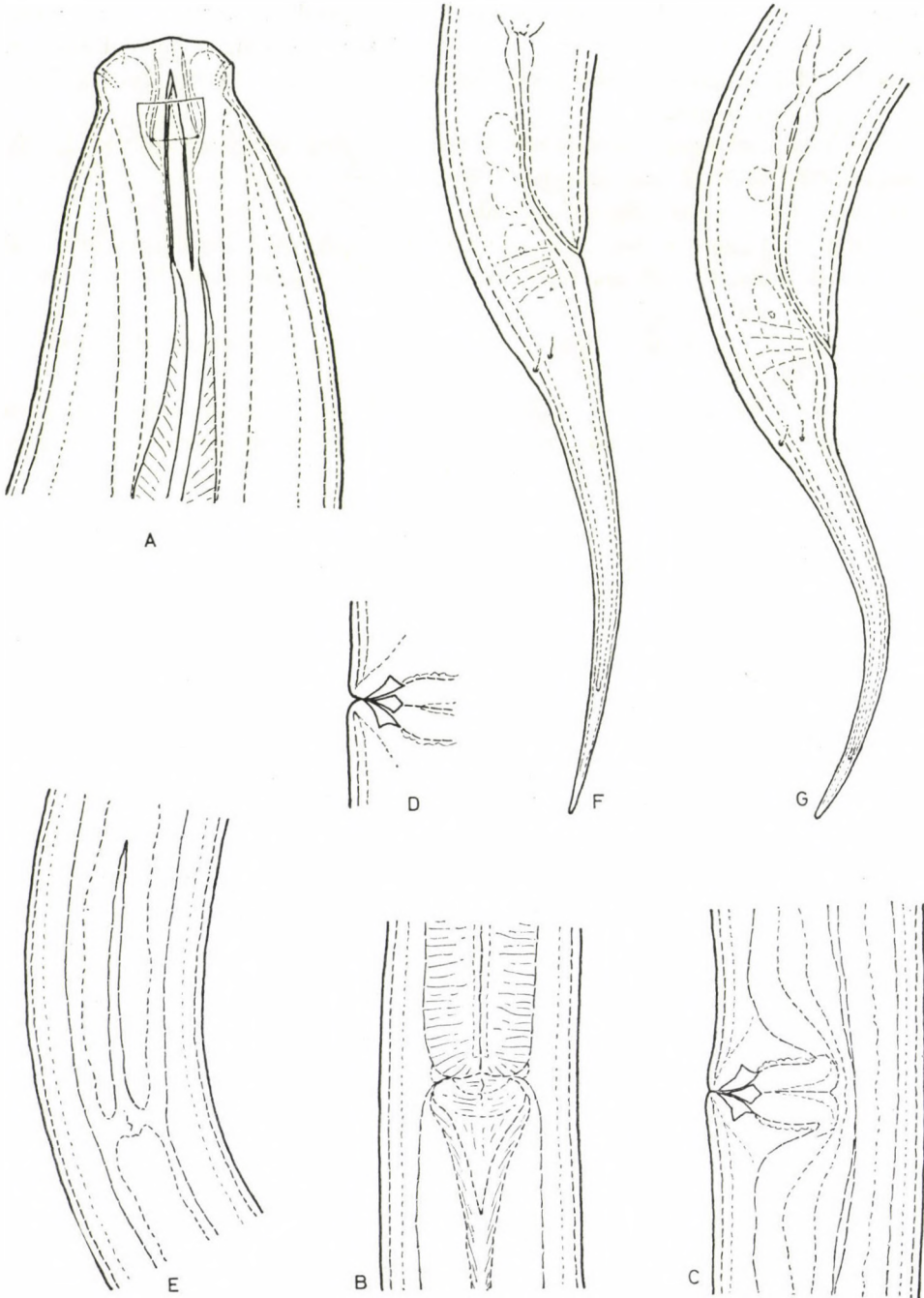


Fig. 5. *Mesodorylaimus trapae-fructus* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C and D = vulval regions ($\times 700$); E = junction between intestine and preectum ($\times 700$); F and G = female tails ($\times 700$)

posterior end of oesophagus 3—3.2 times as wide as head. Amphids as wide as 1/2 corresponding body diameter, caliciform.

Walls of atrium lined. Spear 16—17 μm , 1.3—1.5 times as long as labial diameter, thicker than cuticle at the same level. Aperture occupying somewhat more than 1/3 spear length. Guiding ring simple, thin. Oesophagus 378—433 μm long, somewhat shorter than the distance between oesophagus and vulva; gradually widening in 49—52% of its length. Cardia comparatively long. Intestine with microvilli, and in its posterior end with a long tongue-like structure measuring 46—52 μm , 1.5—1.7 body diameters. Rectum 2—2.2, prerectum 2.6—2.8 times as long as anal body width.

Vulva transverse; its inner lips are heavily cuticularized and very characteristic in shape: they resemble the crop of the water-chestnut (*Trapa natans*) — hence the specific name "*trapaefructus*". Vagina often oblique a little to the body axis, 25—27 μm long, mostly longer than half a diameter of body. Female gonads each 6—7.5 times as long as body width, both lying on the right side of body. Distance vulva-anus 5.7—7.6 times longer than tail.

Tail 96—112 μm , 4.7—5.7 anal diameters long, 5—7% of entire length of body; first convex-conoid then more or less uniformly tapering to the spicate terminus; this posterior part of tail nearly twice as long as the anterior, and always curved slightly dorsally.

Male not known.

Brief characters: Body comparatively long and slender, cuticle thin, labial region narrow, spear longer than general, vulva transverse with characteristic lips, intestinal tongue present, tail of medium length and slightly bent dorsally.

Holotype: female on the slide No. 9580 in the collection of the author. **Paratypes:** 14 females.

Type-locality: Pucallpa, Peru, soil around grass roots, collected November 1971 by DR. J. BALOGH.

Mesodorylaimus trapaefructus sp. n. may be especially characterized by the peculiar shape of the vulval lips. In the general habit, the length of spear and the shape of tail it comes close to *M. ghanae* ANDRÁSSY, 1965 and *M. sanctus* BASSON & HEYNS, 1974. It differs from *ghanae* by the thinner cuticle (1.5 : 2.5 μm), the narrowing head, the oesophagus enlarging in the middle (49—52 : 59—60%), the presence of an intestinal tongue and differently shaped vulval lips; from *sanctus* by the larger body (1.5—1.9 : 1.1—1.6 mm), the spear being thicker than the cuticle, the vulva lying farther back (52—55 : 41%) and showing characteristic lips and the presence of a "tongue" in the intestine.

Mesodorylaimus aequatorialis sp. n. (Figs 6A—F)

♀: L = 1.20–1.45 mm; a = 26–31; b = 3.8–4.3; c = 20–24; V = 49–50%;
 c' = 2.0–2.3.
 ♂: L = 1.50 mm; a = 33; b = 4.5; c = 62; c' = 0.9.

Body ventrally curved when relaxed, 44–48 μm wide. Cuticle smooth, in mid-body region 2–2.2 μm , opposite to the spear 2.8–3 μm thick. Head 15 μm wide, slightly separated from neck, lips more or less angular. Body at posterior end of oesophagus 3–3.2 times as wide as head. Amphids caliciform, wider than 1/2 body diameter at the same level.

Atrium lined. Spear 20 μm long, 1.3 times head diameter, about as thick as cuticle opposite to it. Aperture occupying 1/3 or more of spear length. Oesophagus 312–338 μm long, somewhat longer than distance between posterior end of oesophagus and vulva; it begins to widen at 51–55% of its length. Dorsal nucleus located 20 μm from the anterior end of the widened portion of oesophagus. Cardia conical. Guiding ring for spear thin. Rectum 1.7–1.8, prerectum 1.2–1.4 times as long as anal diameter of body.

Vulva transverse, with cuticularized lips. Vagina 25 μm long. Female gonads each 3.9–5.7 times as long as body diameter, both lying on the right side of body. Distance vulva-anus 10–12 times longer than tail.

Tail 58–61 μm , 2–2.3 times anal diameter, first convex-conoid then tapering uniformly to the very finely rounded or pointed tip. Tail both in females and in larvae slightly bent dorsally.

Male tail 22 μm long, broadly rounded, shorter than anal diameter. Spicula 50 μm long, strongly narrowing anteriorly. Apart from the adanal pair there is a series of 16 hardly spaced or contiguous mid-ventral supplements. Hindermost supplement at a distance of 56 μm from the cloacal opening. Copulatory glands large, globular. Prerectum beginning within the row of supplements.

Brief characters: Body medium-sized and moderately slender, head hardly separate, spear strong and long, oesophagus enlarging in its middle, prerectum very short, vulva transverse, numerous supplements, and short, slightly dorsally curved tail.

Holotype: female on the slide No. 11504 in the collection of the author. Paratypes: 5 females, one male and three juveniles.

Type-locality: Volcano Cotopaxi, Ecuador, soil with *Festuca* roots, collected November 1984 by DR. J. BALOGH.

Among the species showing dorsally curved tails, *Mesodorylaimus aequatorialis* sp. n. seems to be related with *M. margaritus* BASSON & HEYNS, 1974, *M. rotundilabiatu*s BASSON & HEYNS, 1974 and *M. americanus* nom. n. It differs a) from *margaritus*: head hardly set off, spear much longer (20 : 9–12 μm) prerectum much shorter (1.2–1.4 : 2.5–3 anal diameters), vulva located more

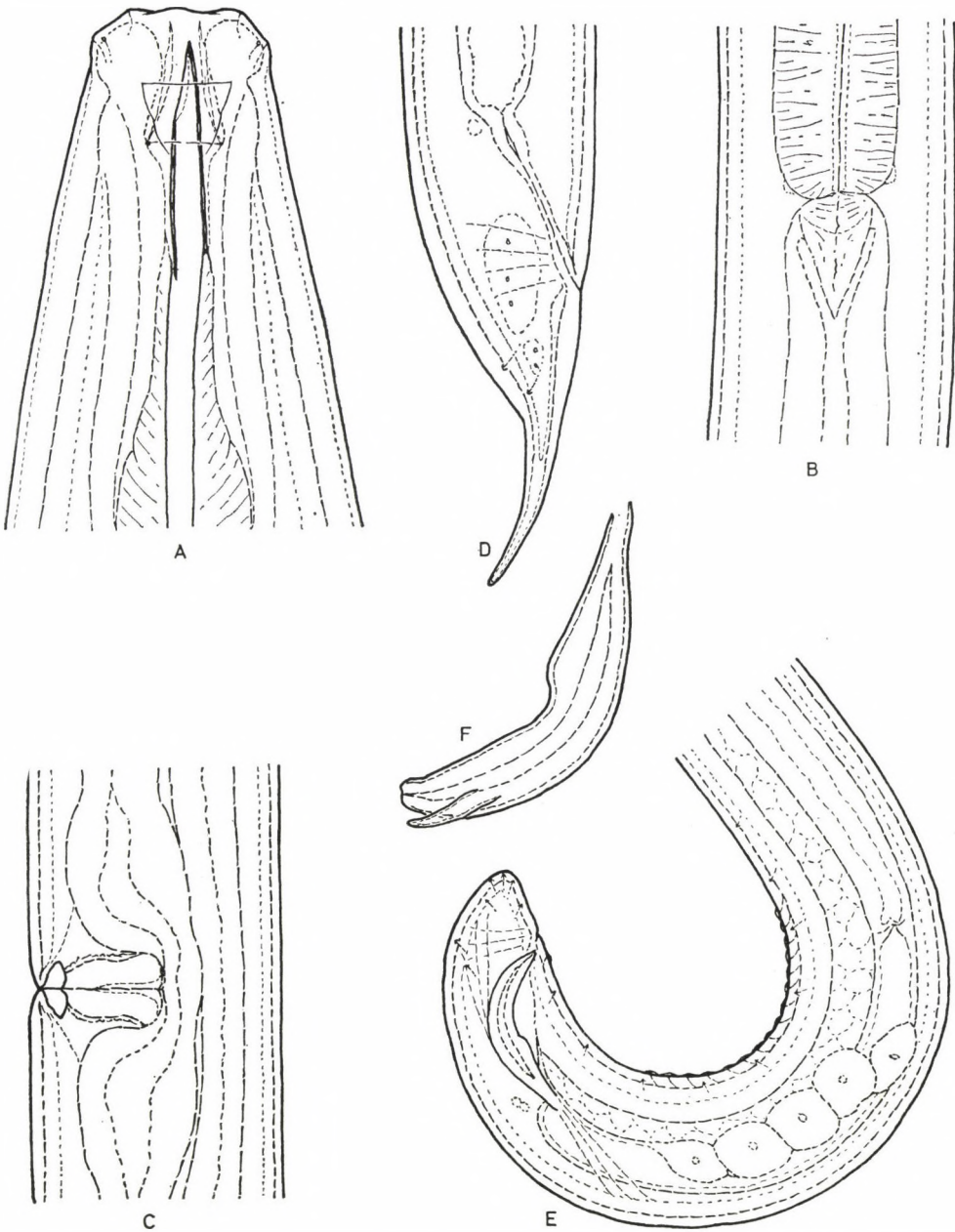


Fig. 6. *Mesodorylaimus aequatorialis* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C = vulval region ($\times 700$); D = female tail ($\times 700$); E = posterior end of male ($\times 400$); F = spiculum ($\times 1000$)

posterior (49–50 : 41–46%), posterior half of tail slender and pointed; *b*) from *rotundilabiatus*: lips not amalgamated, spear much longer (20 : 10–13 μm), prerectum shorter (1.2–1.4 : 2–5 anal diameters), supplements more numerous (16 : 12–15) and posterior half of tail conoid, not bluntly rounded; *c*) from *americanus*: body shorter (1.2–1.4 : 1.8–2.1 mm), spear longer (20 : 15 μm) and tail tip pointed.

Mesodorylaimus arcuatus sp. n. (Figs 7A–F)

♀: L = 1.60–1.70 mm; a = 32–34; b = 4.1–4.2; c = 25–32; V = 51–52%; c' = 1.9–2.3.

♂: L = 1.39–1.60 mm; a = 25–32; b = 3.9–4.1; c = 58–63.

Body 50–55 μm wide in the mid-region. Cuticle very finely annulated on both ends of body, in mid-body 1–1.2 μm thick. Head 16–18 μm wide, slightly set off from neck, lips angular. Body at posterior end of oesophagus 2.6–2.8 times as wide as head. Amphids caliciform, a little wider than 1/2 corresponding body diameter.

Walls of atrium lined. Spear 23–25 μm , 1.4–1.5 times cephalic diameter, twice as thick as cuticle at the same level. Aperture 1/3 of spear length. Oesophagus 380–410 μm long, in 51–55% widening. Distance oesophagus-vulva 1.1–1.2 times as long as oesophagus. Cardia short. No tongue in posterior part of intestine. Rectum 1.5, prerectum 2 anal diameters long.

Vulva transverse, with strongly cuticularized inner lips. Vagina 25–26 μm long measured from body surface. Each gonad 6–7.5 times as long as body width, both on the right side of body. Distance vulva-anus 11.5–14.5 times longer than tail.

Female tail 55–67 μm , 1.9–2.3 times anal diameter, 3–4% of total length of body. Its anterior half convex-conoid, the posterior half thinner and dorsally curved; ventral contour of tail regularly arcuate.

Male tail 22–26 μm long, somewhat shorter than anal diameter, conoid-rounded, with six pairs of small papillae. Spicula dorylaimid, 50–52 μm long. Ventromedial supplements contiguous, 15–20 in number, lying 5–7 μm one from the other, and the posteriormost 49–51 μm from anus. Prerectum beginning within the range of the supplements.

Brief characters: Body less slender, cuticle very thin, lips angular, spear strongly developed, vulva transverse, supplements numerous and female tail strongly bent dorsally.

Holotype: female on the slide No. 10624 in the collection of the author. Paratypes: 6 females and 6 males.

Type-locality: Copacabana, Bolivia, moss from soil, collected December 1966 by DR. J. BALOGH.

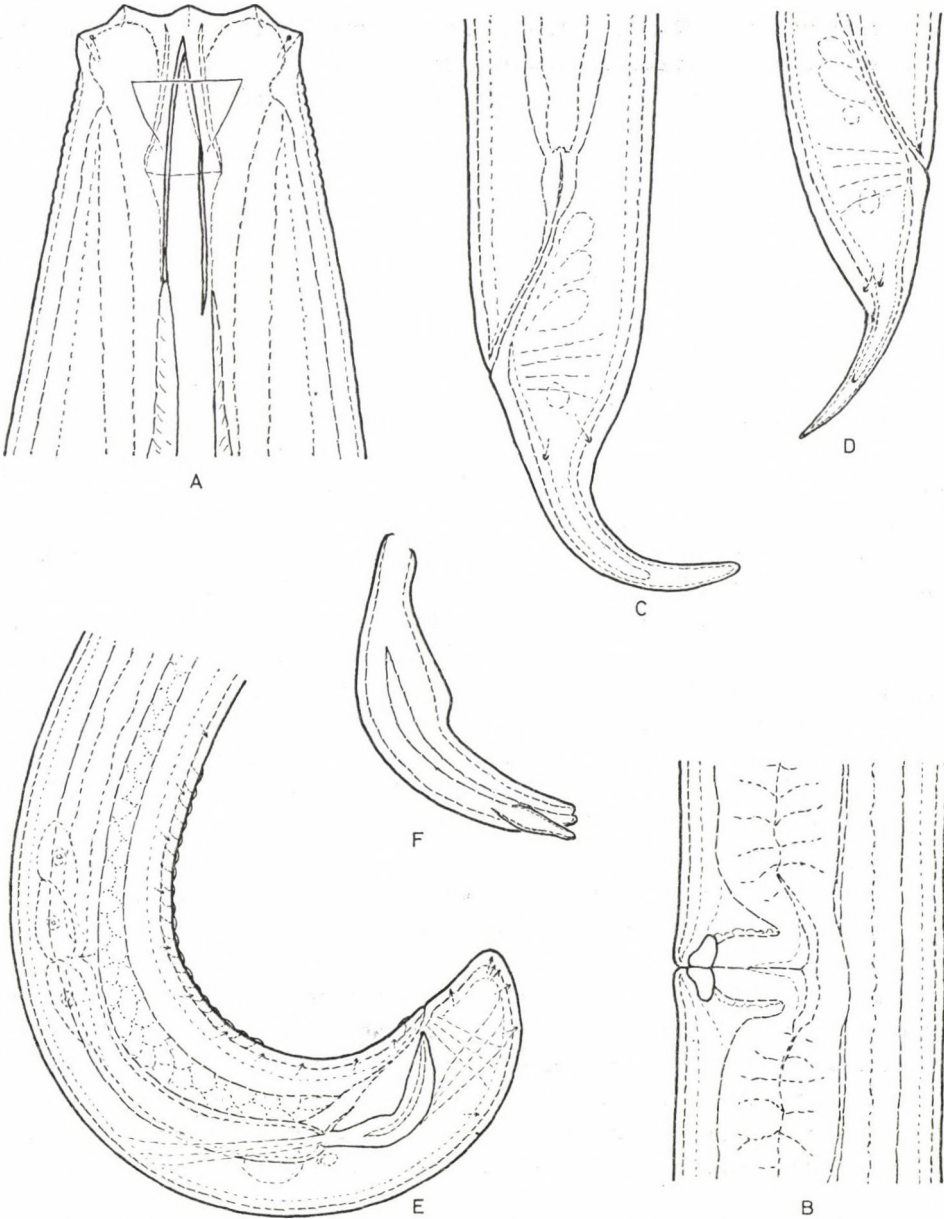


Fig. 7. *Mesodorylaimus arcuatus* sp. n. A = anterior end ($\times 1600$); B = vulval region ($\times 700$); C and D = female tails ($\times 700$); E = posterior end of male ($\times 400$); F = spiculum ($\times 1000$)

In shape of the tail *Mesodorylaimus arcuatus* sp. n. much resembles *M. aequatorialis* sp. n. but its cuticle is thinner ($1-1.2 : 2-2.2 \mu\text{m}$), the spear longer ($23-25 : 20 \mu\text{m}$) and twice as thick as cuticle, and the female tail more heavily curved dorsally. *M. arcuatus* comes close to *M. margaritus*

BASSON & HEYNS, 1974, *M. rotundilabiatum* BASSON & HEYNS, 1974 and *M. americanus* nom. n.; it differs, however, from them all by its thinner cuticle, much longer spear (25 : 9–15 μm) and the exact shape of tail.

Mesodorylaimus vulneratus sp. n. (Figs 8A–F)

♀: L = 1.20–1.22 mm; a = 24–25; b = 3.8–3.9; c = 28–31; V = 52–53%;
 c' = 1.4–1.8.
 ♂: L = 1.13–1.20 mm; a = 27–30; b = 3.6–3.8; c = 46–49.

Body comparatively robust, 48–50 μm (♀) or 38–44 μm (♂) wide. Cuticle smooth, in mid-body 1.8–2 μm , in anterior half of tail 4–4.5 μm thick. Head 14–15 μm wide, set off from neck, lips angular. Body at posterior end of oesophagus 3.3–3.8 times as wide as head. Amphids stirrup-shaped, about as wide as 1/2 corresponding body diameter.

Atrium lined. Spear 16–17 μm long, 1.1–1.2 times longer than head diameter, about as thick as cuticle opposite to it. Aperture occupying 1/3 spear length. Oesophagus 310–316 μm , longer than 1/4 of body length, in 51–56% widened. Dorsal nucleus globular. Cardia short-conoid. Rectum as long as, prerectum 1.1–1.4 times longer than body diameter.

Vulva transverse, inner lips cuticularized. Vagina 26–28 μm long. Both gonads lying either on the right or on the left side of body, each 4–5 times as long as body diameter. One to three eggs in the uteri; 76–80 \times 26–28 μm . Distance vulva-anus 12–14 times as long as tail.

Female tail 36–45 μm long, 1.4–1.8 times as long as anal body width, 3–3.5% of entire length of body, first slowly then more rapidly narrowing to the finely rounded, almost tipped terminus. Ventral contour of tail regularly arcuate.

Male tail 24–25 μm , somewhat shorter than anal diameter, broadly rounded. Spicula 46–48 μm long. Supplements 13–14, almost contiguous, 5–6 μm one from the other. Prerectum shorter than the row of supplements.

Brief characters: A smaller and plumper species, head well set off, lips angular, spear of medium length, oesophagus long, vulva transverse, prerectum short, supplements more than one dozen, female tail dorsally curved.

Holotype: female on the slide No. 11309 in the collection of the author. **Paratypes:** 1 female and 3 males.

Type-locality: Volcano Pichuacha, Ecuador, 3600 m above sea level, humus and litter, collected November 1984 by DR. J. BALOGH.

In the shape of tail *Mesodorylaimus vulneratus* sp. n. is close to *M. recurvus* ANDRÁSSY, 1964, *M. procerus* sp. n. and *M. aduncus* sp. n. but can be easily distinguished from all of them by its transverse vulva.

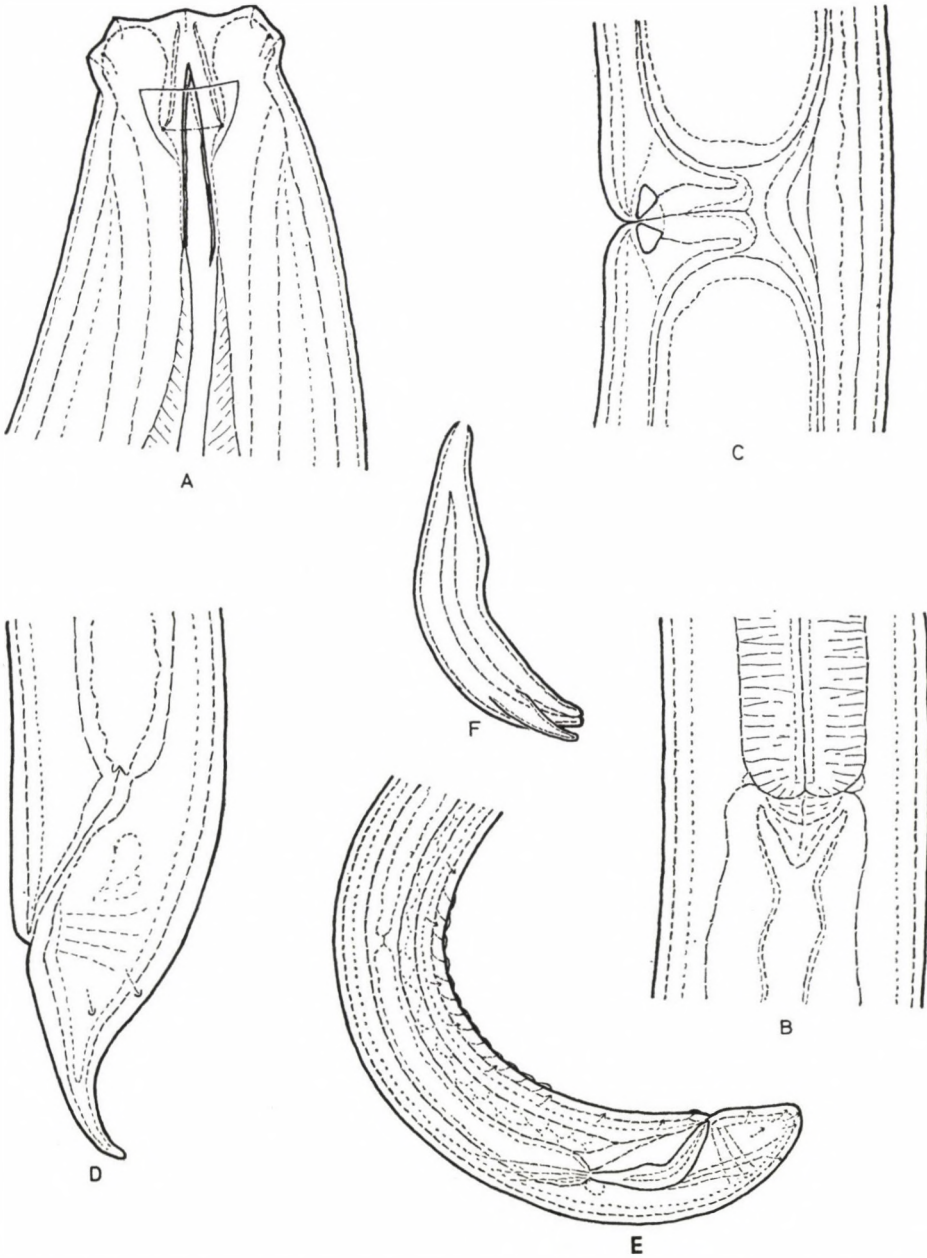


Fig. 8. *Mesodorylaimus vulneratus* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); D = female tail ($\times 700$); E = posterior end of male ($\times 400$); F = spiculum ($\times 1000$)

Mesodorylaimus cognatus sp. n. (Figs 9A—H)

♀: L = 1.17–1.36 mm; a = 26–31; b = 4.1–4.3; c = 29–39; V = 52–54%;
 c' = 1.4–1.5.
 ♂: L = 1.13–1.23 mm; a = 26–28; b = 4.1–4.6; c = 58–69; c' = 0.6–0.7.

Body comparatively robust, 42–44 μm wide. Cuticle smooth, in mid-body 2.5–3 μm , in anterior part of tail 5 μm thick. Head 13–13.5 μm wide, hardly set off, lips rounded. Body at posterior end of oesophagus 2.8–3.3 times as wide as head. Amphids 1/2 as wide as corresponding body diameter.

Atrium well lined. Spear 13–14 μm long, about as long as labial diameter, aperture occupying more than 1/3 of its length. Guiding ring thin and simple. Oesophagus 272–333 μm long, shorter than distance between oesophagus and vulva; in 58–60% widened. Cardia conoid. Rectum 1.3–1.4, prerectum 2–2.5 anal diameters in length.

Vulva a transverse slit with strongly cuticularized inner lips. Vagina 21–24 μm long. Female gonads lying on the right side of body, each 4–5 times as long as body width. Distance vulva-anus 13–17 times longer than tail.

Female tail 35–39 μm long, 1.4–1.5 times as long as anal diameter, 2.5–3.5% of entire length of body; first convex-conoid then tapering to the rounded tip. Ventral contour of tail regularly arcuate.

Male tail 16–21 μm long, 0.6–0.7 anal diameter, rounded. Spicula 45–46 μm long. Ventromedial supplements 17–18, contiguous, each 5–7 μm from the other; hindermost supplement 44–50 μm from the cloacal opening. Prerectum beginning within the range of supplements.

Brief characters: A shorter and plumper species with slightly offset head, short spear, back widened oesophagus, transverse vulva, numerous supplements and short, dorsally curved female tail.

Holotype: female on the slide No. 11573 in the collection of the author. **Paratypes:** 4 females, 2 males and 9 juveniles.

Type-locality: Volcano Chimborazo, Ecuador, 4000 m above sea level, mosses from rocks, collected November 1984 by Dr. J. BALOGH.

This new species much resembles *Mesodorylaimus vulneratus* sp. n. but the lips are rounded and hardly set off, the spear is shorter (13–14 vs. 15–16 μm) and thinner than the cuticle, and the supplements are present in a greater number (17–18 vs. 13–14).

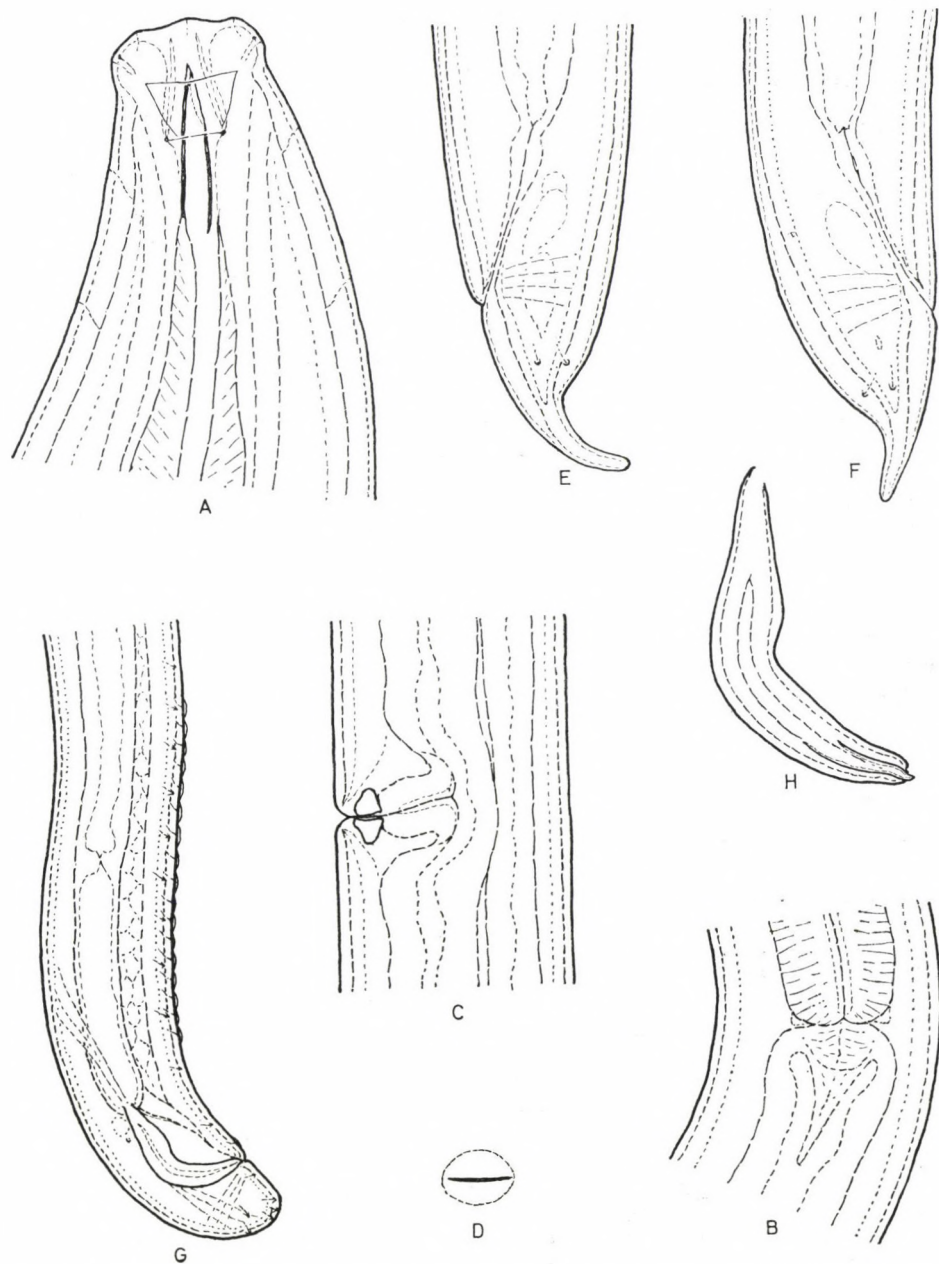


Fig. 9. *Mesodorylaimus cognatus* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C = vulval region ($\times 700$); D = vulva ($\times 700$); E and F = female tails ($\times 700$); G = posterior end of male ($\times 400$); H = spiculum ($\times 1000$)

Mesodorylaimus procerus sp. n. (Figs 10A–F)

♀: L = 1.78–2.00 mm; a = 33–40; b = 4.3–4.5; c = 38–49; V = 53–55%;
 c' = 1.3–1.4.
 ♂: L = 1.79–1.98 mm; a = 34–38; b = 4.2–4.7; c = 73–85; c' = 0.6–0.7.

Body long and fairly slender, 50–60 μm wide. Cuticle smooth, in mid-body 2.2–2.5 μm , in anterior half of tail 5.5–7 μm thick; subcuticle finely annulated. Head 17–19 μm wide, not set off, lips somewhat angular. Body at posterior end of oesophagus 2.5–3.3 times as wide as head. Amphid as wide as 1/2 corresponding body diameter.

Atrium slightly covered by cuticular lining. Spear 22–24 μm long and 3–3.5 μm thick, 1.2–1.3 times as long as labial diameter, somewhat thicker than cuticle at the same level. Aperture occupying 1/3 spear length. Guiding ring simple and thin. Oesophagus 430–460 μm long, in 52–55% widening; distance between oesophagus and vulva 1.3–1.4 times longer than oesophagus. Dorsal nucleus transverse in position. Cardia more or less cylindrical with pointed tip. Rectum 1.2–1.4, prerectum 2.1–3.2 times as long as anal body diameter.

Vulva longitudinal, with relatively slightly cuticularized and “opened” inner lips. On both sides of vulva, 18–35 μm from that, one or two small papillae may be observed. Vagina 27–31 μm long measured from body surface. Both gonads located on the right side of body, each 5.5–7.2 times as long as body width. Distance vulva-anus 16–22 times longer than tail.

Female tail 40–46 μm , 1.3–1.4 times as long as anal body width, 2–2.5% of entire length of body; in its anterior half convex-conoid then rapidly narrowing in its dorsal contour and directed dorsally. Ventral contour of tail regularly arcuate.

Male tail 23–25 μm , shorter than anal body diameter, broadly rounded. Spicula 54–56 μm long. Ventromedial supplements 10 or 11, flat, spaced, each lying 9–12 μm from the other. Posterior supplement at a distance of 74–80 μm from cloacal opening. Prerectum beginning within the row of supplements.

Brief characters: A large, moderately slender species, with continuous head, long spear, transverse dorsal oesophageal nucleus, longitudinal vulva, spaced supplements and short, dorsally bent female tail.

Holotype: female on the slide No. A-6524 in the collection of the author. Paratypes: 8 females, 9 males and 2 juveniles.

Type-locality: Perth, Southwest Australia, soil from Eucalyptus forest, collected September 1970 by DR. H. FRANZ.

In the longitudinal vulva and the shape of female tail, *Mesodorylaimus procerus* sp. n. comes closest to *M. recurvus* ANDRÁSSY, 1964. It differs from that by the much longer body (1.8–2.0 : 1.2–1.3 mm), the much longer spear (22–24 : 14 μm) and the not separated labial region.

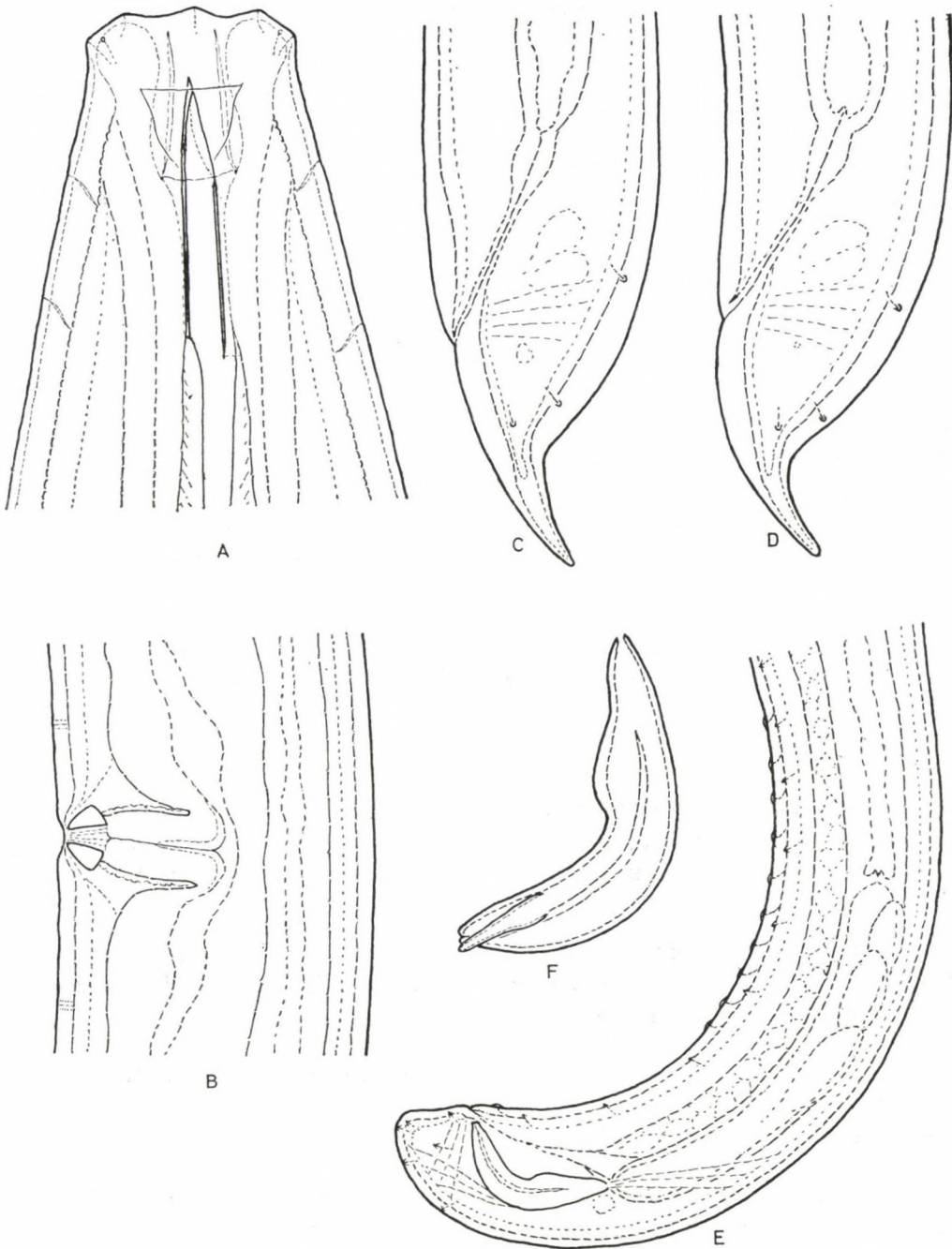


Fig. 10. *Mesodorylaimus procerus* sp. n. A = anterior end ($\times 1600$); B = vulval region ($\times 700$); C and D = female tails ($\times 700$); E = posterior end of male ($\times 400$); F = spiculum ($\times 1000$)

Mesodorylaimus aduncus sp. n. (Figs 11A—G)

♀: L = 1.37–1.40 mm; a = 24–28; b = 4.3–4.5; c = 3.9–4.6; V = 50–52%;
c' = 1.0–1.1.

♂: L = 1.25 mm; a = 29; b = 4.0; c = 51; c' = 0.8.

Body rather plump, 49–57 μm wide in the mid-region. Cuticle finely annulated, in mid-body 3.2–3.4 μm , in anterior part of female tail 7–7.5 μm thick. Subcuticle very finely annulated. Head 13–14 μm wide, set off from neck, lips rounded. Body at posterior end of oesophagus 3–3.2 times as wide as head. Amphids nearly occupying $3/4$ corresponding body diameter.

Atrium slightly lined. Spear 15–16 μm long. 1.1–1.2 times cephalic diameter, with an aperture of $1/3$ spear length. Guiding ring thin. Oesophagus 210–318 μm long, in 51–52% widening. Dorsal nucleus globular. Distance between oesophagus and vulva 1.2–1.3 times longer than oesophagus. Cardia short, conoid. Rectum 1.2–1.3, prerectum 2–2.3 times as long as anal diameter. Intestinal tongue absent.

Vulva longitudinal, with well cuticularized, “opened” inner lips. Vagina 27–28 μm long. Gonads lying on the right side of body. Eggs 80–83 \times 34–36 μm , 1.6–1.7 times as long as body width. Distance vulva-anus 18–21 times as long as tail.

Female tail very short, 30–36 μm , about as long as anal body diameter, first convex-conoid then rapidly narrowing on the dorsal contour and bent dorsally; the latter part unusually short, hardly $1/3$ of the anterior cupola-like part. Tip of tail rounded. Cuticle strongly thickened in anterior part of tail.

Male tail 24 μm , shorter than anal diameter, with comparatively thin cuticle. Spicula 52 μm long. Ventromedial supplements 19, contiguous, each 3–4 μm from the other; posteriormost supplement at a distance of 52 μm from the anus.

Brief characters: Body plump, head set off, spear of middle length, vulva longitudinal, female tail very short with thick cuticle, supplements numerous and not spaced.

H o l o t y p e: female on the slide No. 9226 in the collection of the author. Paratypes: 8 females, 1 male and 1 juvenile.

T y p e - l o c a l i t y: Püspökladány, Hungary, sandy soil with grass roots on a meadow, collected June 1976.

Mesodorylaimus aduncus sp. n. resembles *M. recurvus* ANDRÁSSY, 1964 and *M. procerus* sp. n., both having a longitudinal vulva and a short, dorsally curved female tail. It differs from *recurvus* by the longer body (1.4 : 1.1–1.2 mm), the very thick cuticle, and the shorter and more strongly curved

female tail; from *procerus* by the shorter body (1.4 : 1.8—2.0 mm), the shorter spear (15—16 : 22—24 μm), the shorter female tail (30—36 : 40—46 μm) and the greater number of supplements (19 : 10—11).

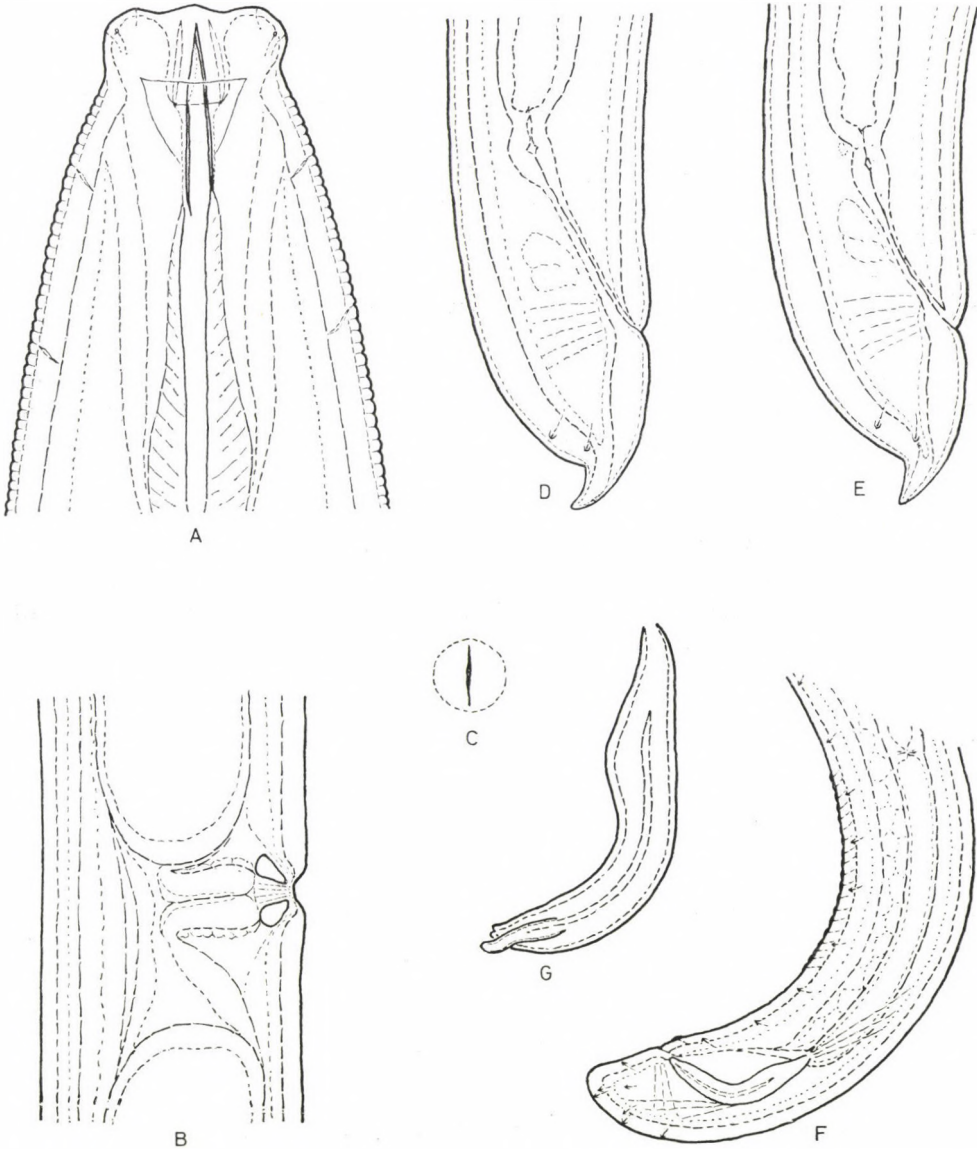


Fig. 11. *Mesodorylaimus aduncus* sp. n. A = anterior end ($\times 1600$); B = vulval region ($\times 700$); C = vulva ($\times 700$); D and E = female tails ($\times 700$); F = posterior end of male ($\times 400$); G = spiculum ($\times 1000$)

Genus *Miodorylaimus* gen. n.

Dorylaimidae, Mesodorylaiminae. Body small and slender, 0.9–1.2 mm. Cuticle very thin and smooth. Labial region not or slightly set off, lips angular. Amphids large, caliciform. Atrium without cuticular lining. Spear straight, moderately long, 11–12 μm ; aperture occupying one-third of its length. Guiding ring single, thin. Oesophagus enlarged posterior to its middle, conoid with pointed tip. Prerectum long, especially in males. Posterior end of intestine with a long, tongue-like structure. Gonads of both sexes paired, each lying on the same side of body, predominantly on the right one. Vulva transverse, vulval lips not cuticularized. Spicula dorylaimid, comparatively weakly cuticularized, about as long as tail. Spermatozoa elongate. Ventromedial supplements very few in number, far spaced. Tails of both sexes different, in females long and filiform, 7 to 15 anal body diameters, in males more or less crescent-shaped, ventrally bent, with rounded tip, longer than anal body diameter.

Type-species: *Miodorylaimus decens* sp. n.

The new genus comes closest to the genera *Mesodorylaimus* ANDRÁSSY, 1959 and *Minidorylaimus* ANDRÁSSY, 1972. It may be distinguished from *Mesodorylaimus* by the very thin cuticle, the not lined atrium, the not cuticularized vulval lips, the very long male prerectum, the few supplements, the short spicula and the shape of the male tail. It differs from *Minidorylaimus* by the very thin cuticle, the not so sharply offset head, the transverse vulva and the presence of a tongue-like organ in the posterior end of the intestine.

Both known species of *Miodorylaimus* inhabit terrestrial biotopes and occur in South America.

Two species may be ordered here:

M. decens sp. n.

M. iucundus sp. n.

KEY TO THE SPECIES OF MIODORYLAIMUS

- 1 Body very slender ($a = 50$); female tail shorter, 7–8 anal diameters. — ♀: $L = 1.23$ mm; $a = 50$; $b = 4.5$; $c = 10$; $V = 52\%$; $c' = 7.5$. ♂: $L = 1.1$ mm; $a = 46-49$; $b = 4.2-5.0$; $c = 44-50$; PO: 4. (Peru) *decens* sp. n.
 — Body less slender ($a = 33$); female tail longer, 15 anal diameters. — ♀: $L = 0.9$ mm. $a = 33$; $b = 4.5$; $c = 4.0$; $V = 43\%$; $c' = 15$. ♂ unknown. (Peru) *iucundus* sp. n;

Miodorylaimus decens sp. n. (Figs 12A–H)

♀: $L = 1.23$ mm; $a = 50$; $b = 4.5$; $c = 10$; $V = 52\%$; $c' = 7.5$.

♂: $L = 1.08-1.12$ mm; $a = 46-49$; $b = 4.2-5.0$; $c = 44-50$.

Body small and very slender, 22–25 μm wide in the mid-region. Cuticle extremely thin, 0.7–0.8 μm in mid-body and 1.6 μm in anterior part of female

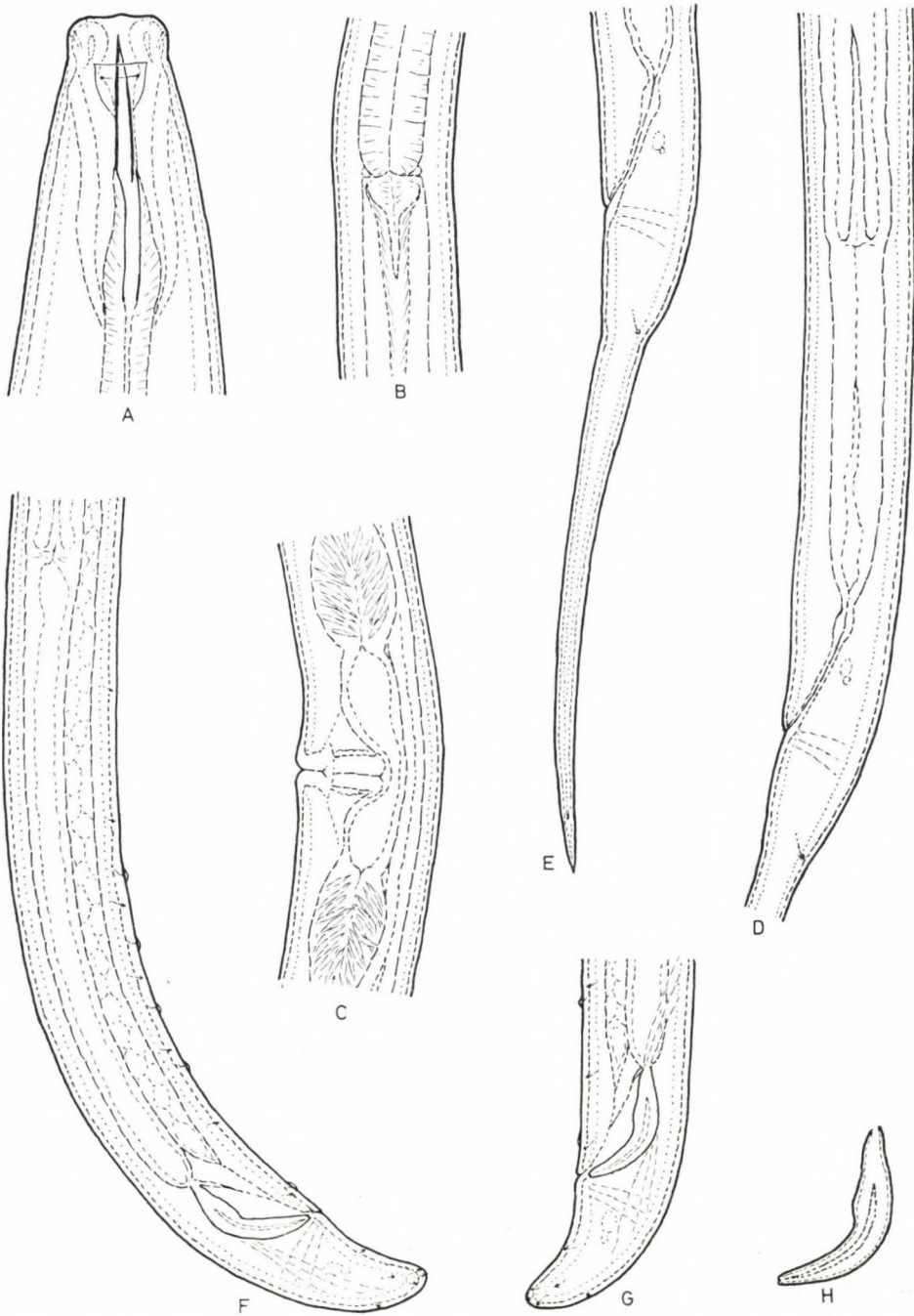


Fig. 12. *Miodorylaimus decens* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C = vulval region ($\times 700$); D = anal-prerectal region of female ($\times 700$); E = female tail ($\times 700$); F and G = posterior ends of males ($\times 700$); H = spiculum ($\times 1000$)

tail; smooth. Head $7.5-8 \mu\text{m}$ wide, not set off from neck, lips hardly angular. Body at posterior end of oesophagus 2.8–2.9 times as wide as head. Amphids wider than half of corresponding body diameter.

Atrium not lined. Spear rather weak, $12 \mu\text{m}$, 1.5–1.6 times as long as labial width, straight; aperture occupying somewhat more than $1/3$ spear length. Guiding ring thin. Oesophagus $230-270 \mu\text{m}$ long, shorter than distance between oesophagus and vulva; in 58–62% widening. Cardia conoid, sharply pointed. Rectum 1.4, prerectum 3.3 times as long as anal body diameter.

Vulva transverse, inner lips not cuticularized. Vagina $15 \mu\text{m}$ long. Body a little swollen on the vulval region. Each gonad 6.6 times as long as body diameter. Distance vulva-anus 3.8 times longer than tail.

Female tail $123 \mu\text{m}$, 7.5 times as long as anal body width, 10% of total length of body, respectively; first somewhat convex-conoid then uniformly tapering to its pointed terminus.

Male tail $22-25 \mu\text{m}$, longer than anal diameter, more or less semilunar, ventrally bent, with rounded tip. Spicula small and comparatively weakly cuticularized, $24-25 \mu\text{m}$ long, dorylaimid. Ventromedial supplements numbering only four, at a distance of $12-14 \mu\text{m}$ each from the other. Posteriormost supplement lying $26-34 \mu\text{m}$ from the cloacal opening. Spermatozoa slender, spindle-shaped. Prerectum beginning far — about three body widths — before the supplements.

Brief characters: A small and very slim species with very thin cuticle, not offset head, weak spear, behind its middle enlarging oesophagus, not cuticularized vulva, fairly long female tail, crescent-shaped male tail and few supplements.

Holotype: female on the slide No. 10816. Paratypes: 3 males.

Type-locality: Pucallpa, Peru, litter from a primary rain forest, collected November 1971 by DR. J. BALOGH.

Miodorylaimus iucundus sp. n. (Figs 13A–E)

♀: $L = 0.88-0.90 \text{ mm}$; $a = 32-33$; $b = 4.3-4.6$; $c = 4.0-4.1$; $V = 43\%$; $c' = 14-15$.

Body small, moderately slender. Cuticle very thin, $0.6-0.7 \mu\text{m}$ on mid-body, smooth. Labial region $8 \mu\text{m}$ wide, slightly set off from body, lips angular. Body at posterior end of oesophagus 3.5 times as wide as head. Amphids a little wider than half of corresponding width of body.

Walls of atrium without lining. Spear straight, $11 \mu\text{m}$, 1.4 times as long as labial width, twice as thick as cuticle opposite to it. Aperture occupying

more than $1/3$ spear length. Guiding ring simple and thin. Oesophagus 192—195 μm long, nearly as long as distance between oesophagus and vulva; expanding in 58% of its length. Cardia conoid. Rectum 1.4 times, prerectum 1.8 times as long as anal body diameter. Intestinal tongue conspicuous, 23 μm long, somewhat longer than body width.

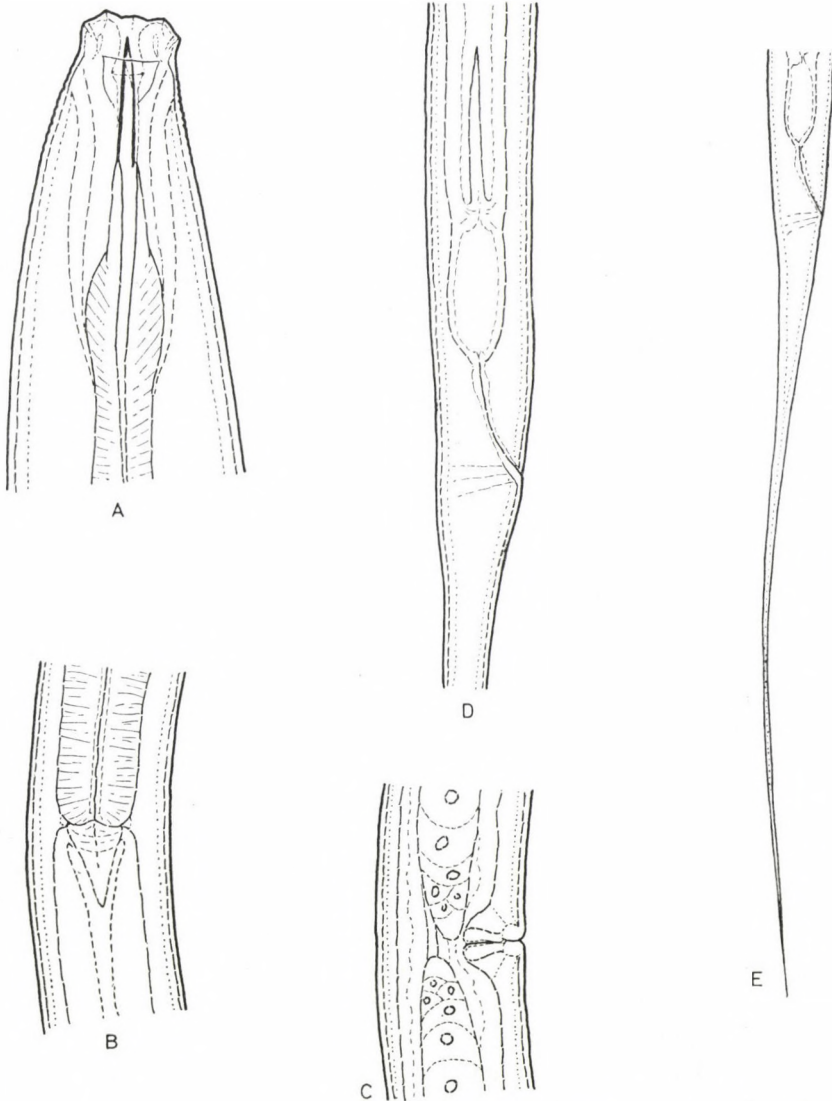


Fig. 13. *Miodorylaimus iucundus* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C = vulval region ($\times 700$); D = anal-prerectal region of female ($\times 700$); E = female tail ($\times 400$)

Vulva transverse, with not cuticularized lips. Vagina 12 μm long. Female gonads located on the right side of body, each 3 times as long as body diameter. Body a little swollen on the vulvar region. Distance vulva-anus 1.2 times longer than tail.

Female tail 222—225 μm , 1.5 times as long as anal diameter, 25% of entire length of body, nearly uniformly tapering to the very fine, setose tip.

Male unknown.

Brief characters: Body small and less slender, head slightly set off, cuticle extremely thin, spear short, oesophagus widening posterior to its middle, prerectum short, tail long, filiform.

Holotype: female on the slide No. 10798 in the collection of the author. **Paratypes:** 1 female and 1 juvenile.

Type-locality: Lima, Peru, litter and humus around roots of coffee, collected November 1971 by DR. J. BALOGH.

Although male specimens were not found, the females showed well the general characteristics of the genus: the short body, very thin cuticle, not lined atrium, not cuticularized vulva as well as a long tongue in the intestine. *Miodorylaimus iucundus* sp. n. is similar to *M. decens* sp. n. in its general habit but differs from that in having a shorter and not so slender body (0.9 vs. 1.2 mm; $a = 32-33$ vs. 50), a shorter prerectum (1.8 vs. 3.3 anal diameters), and, especially, a much longer tail (14—15 vs. 7.5 anal diameters).

Genus *Calcaridorylaimus* gen. n.

Dorylaimidae, Mesodorylaiminae. Body of medium length, 1.2 to 1.7 mm, slender. Cuticle thin and smooth. Labial region not or slightly set off from body, lips rounded or slightly angular. Amphids caliciform. Atrium simple, not lined. Spear short or longer, 11 to 20 μm , straight with aperture occupying 1/3 spear length. Guiding ring thin and simple. Oesophagus widening posterior to its middle. Prerectum comparatively short, in males beginning within the range of the supplements. An intestinal tongue may be present. Gonads paired, both of them lying on the same side of body. Vulva transverse or longitudinal, with strongly cuticularized inner lips. Spicula somewhat differing from the general dorylaimid type: elongate, about twice as long as tail, with double dorsal contours and a small but distinct spur before the distal tip. Ventromedial supplements small, spaced, numbering 7 to 13. Spermatozoa spindle-shaped. Female tail elongate, 3 to 11 anal diameters in length, male tail very short and rounded, shorter than anal diameter; posterior end of male body generally strongly twisted.

Type-species: *Calcaridorylaimus calcarifer* sp. n.

The new genus comes closest to *Mesodorylaimus* ANDRÁSSY, 1959, the differences between them are to be found in the male characters: the spicula are larger and shaped differently showing a double contour on the dorsal side and a spur near the tip, the posterior end of body is strongly twisted, and the supplements are very small.

The representatives of the genus *Calcaridorylaimus* seem to be limited to the southern hemisphere: two of the five species occur in Africa, and one of each remaining occurs in South America, Australia and the Antarctic, respectively.

Five species:

C. calcarifer sp. n.

C. promissus sp. n.

C. ruwenzorii (DE CONINCK, 1935) comb. n.

Dorylaimus ruwenzorii DE CONINCK, 1935

Mesodorylaimus ruwenzorii (DE CONINCK, 1935) ANDRÁSSY, 1959

C. signatus (LOOF, 1975) comb. n.

Mesodorylaimus signatus LOOF, 1975

C. simillimus sp. n.

KEY TO THE SPECIES OF CALCARIDORYLAIMUS

- 1 Spear 16–20 μm , body 1.3–1.7 mm long 2
 – Spear 11–14 μm , body 1.2–1.4 mm long 3
- 2 Supplements 12; female tail 3–4 anal diameters in length. – ♀: L = 1.3–1.7 mm; a = 25–33; b = 3.9–4.6; c = 12–18; V = 49–56%; c' = 2.9–4.2. ♂: L = 1.7 mm; a = 29; b = 4.0; c = 61; PO: 12. (Antarctic) **signatus** (LOOF)
 – Supplements 7; female tail 7 anal diameters in length. – ♀: L = 1.6 mm; a = 32; b = 4.3; c = 10; V = 47%; c' = 7. ♂: L = 1.3–1.5 mm; a = 35–40; b = 3.5–4.3; c = 44–74; PO: 7–8. (Zaire) **ruwenzorii** (DE CONINCK) 4
- 3 Vulva longitudinal with open lips; supplements 8–9. – ♀: L = 1.2–1.3 mm; a = 30–32; b = 4.2–4.4; c = 8–10; V = 49–52%; c' = 6–8. ♂: L = 0.9–1.1 mm; a = 26–28; b = 3.3–3.4; c = 45–46; PO: 8–9. (Congo Republic) **calcarifer** sp. n.
 – Vulva transverse with closed lips; supplements 10–13 4
- 4 Posteriormost supplement(s) located at level of the spicula; spear 11 μm long. – ♀: L = 1.3 mm; a = 43; b = 4.4; c = 7.4; V = 50%; c' = 11. ♂: L = 1.1 mm; a = 33; b = 3.8; c = 0.7; PO: 11. (Bolivia) **simillimus** sp. n.
 – Posteriormost supplement located before the spicula; spear 13 μm long. – ♀: L = 1.3–1.4 mm; a = 36–38; b = 4.3–4.5; c = 7.7–8.4; V = 45–47%; c' = 8.4–9.0. ♂: L = 1.0–1.1 mm; a = 28–30; b = 3.5–3.8; c = 47–57; PO: 10–13. (Australia) **promissus** sp. n.

Calcaridorylaimus calcarifer sp. n.* (Figs 14A–F)

♀: L = 1.18–1.30 mm; a = 30–32; b = 4.2–4.4; c = 7.8–10.3; V = 49–52%; c' = 6–8.
 ♂: L = 0.95–1.07 mm; a = 26–28; b = 3.3–3.4; c = 45–46; c' = 0.7–0.8.

Body moderately slender, 38–41 μm wide. Cuticle very thin, 1–1.2 μm on mid-body, smooth, subcuticle finely annulated. Head 10–12 μm wide,

* Calcar (Latin) means “the spur”.

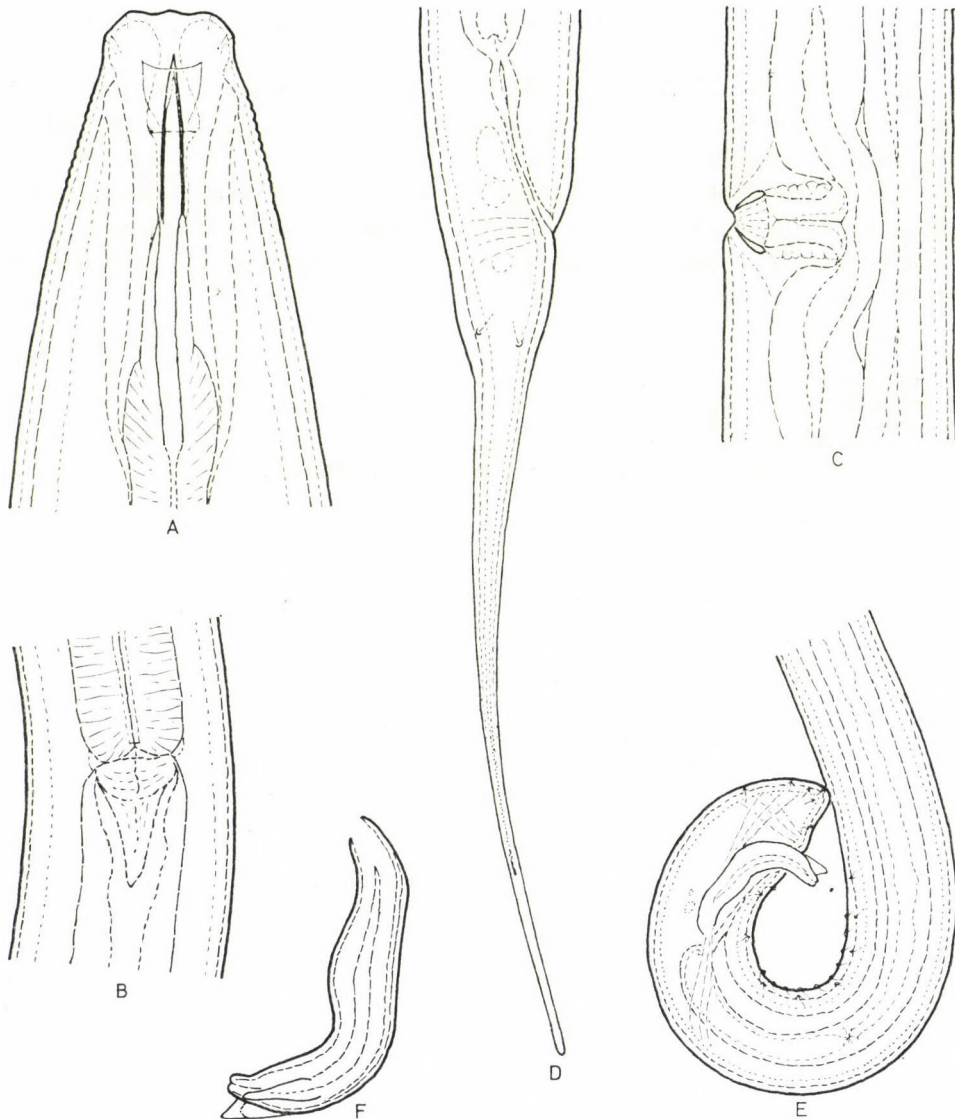


Fig. 14. *Calcaridorylaimus calcarifer* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C = vulval region ($\times 700$); D = female tail ($\times 700$); E = posterior end of male ($\times 700$); F = spiculum ($\times 1000$)

practically not set off, lips rounded. Body at posterior end of oesophagus 3.3–3.6 times as wide as head. Amphids nearly as wide as corresponding width of body.

Atrium not lined. Spear 13–14 μm , 1.1–1.2 times as long as labial diameter, straight, with aperture occupying somewhat more than 1/3 of its length. Spear thicker than cuticle at the same level. Guiding ring very thin. Oesophagus 276–295 μm long, a little shorter than the distance between oesophagus and vulva; widening in 55–57% of its length. Dorsal nucleus transverse-oval. Cardia elongate. Rectum 1.6–1.8 times, prerectum 2.1–2.2 times as long as anal body width. Posterior end of intestine supplied by a long tongue-like organ.

Vulva longitudinal with cuticularized lips, "open". Vagina 19–21 μm long measured from body surface. Both gonads located on the left side of body, each 4.7–5.3 times as long as body diameter. One egg: $72 \times 30 \mu\text{m}$, 2.2 times as long as body width. Distance vulva-anus 2.7–4 times longer than tail.

Female tail 115–167 μm , 6–8 anal diameters long, or 10–13% of total length of body, in anterior part convex-conoid then tapering to the almost cylindrical terminal part. Tip of tail finely rounded; core far from tip.

Male tail 21–23 μm , shorter than anal body diameter, rounded. Spermatozoa elongate spindle-shaped. Spicula 52–54 μm , 2.2–2.6 times longer than tail, proximal bent ventrally, distal with a comparatively strong spur. Supplements numbering 8–9, small, spaced; last of them lying 44–48 μm from cloacal opening. Prerectum beginning within the row of supplements.

Brief characters: Body small, not too slender, cuticle thin, head not set off, spear of medium length, intestinal tongue present, vulva longitudinal, female tail elongate, spicula with well-developed spurs.

H o l o t y p e: male on the slide No. 10875 in the collection of the author. Paratypes: 6 females, 10 males and 2 juveniles.

T y p e - l o c a l i t y: Sibiti, Congo Republic, soil from a rain forest, collected October 1963 by Dr. A. Zicsi.

In having a longitudinal vulva, *Calcaridorylaimus calcarifer* sp. n. resembles *C. signatus* (LOOF, 1975) comb. n. It differs from that by the somewhat shorter body (1.2–1.3 : 1.3–1.7 mm), the shorter spear (13–14 : 16–18 μm), the longer tail of female (6–8 : 3–4 anal diameters), the fewer supplements (8–9 : 12) and the stronger spur. It is comparable to *C. ruwenzorii* (DE CONINCK, 1935) comb. n. as well but the body is shorter (1.2–1.3 : 1.7 mm), the spear smaller (13–14 : 16–20 μm), the cuticle thinner (1 : 2 μm) and the spur stronger. It is not known whether *C. ruwenzorii* has a longitudinal or transverse vulva.

Calcaridorylaimus promissus sp. n. (Figs 15A—G)

♀: L = 1.28—1.37 mm; a = 36—38; b = 4.3—4.5; c = 7.7—8.4; V = 45—47%;
c' = 8.4—9.0.

♂: L = 1.02—1.10 mm; a = 28—30; b = 3.5—3.8; c = 4.7—5.7; c' = 0.8—0.9.

Head 10—11 μm wide, hardly set off from neck, lips somewhat angular. Body at posterior end of oesophagus 3—3.5 times as wide as head. Cuticle very thin, 1 μm on mid-body, smooth. Amphids nearly as wide as $2/3$ corresponding body diameter.

Atrium not lined. Spear 13 μm , 1.2—1.3 times as long as cephalic diameter, much thicker than cuticle at the same level. Aperture occupying about $1/3$ spear length. Guiding ring thin. Oesophagus 290—312 μm long, nearly as long as distance between oesophagus and vulva; widening in 53—57% of its length. Dorsal nucleus, large, globular. Cardia conical. Rectum 1.3—1.6 times, prerectum 1.4—2 times as long as anal diameter. Intestinal tongue not present.

Vulva transverse, with cuticularized inner lips. Vagina slender, 21—23 μm long. Both gonads located either on the right or on the left side of body, each measuring 5—6.5 body diameters in length. One egg: $81 \times 31 \mu\text{m}$, 2.1 times as long as body width. Distance vulva-anus 3—3.5 times longer than tail.

Female tail long, uniformly tapering to its very fine tip, 158—178 μm , 8.4—9 times as long as anal body width, or 12—13% of entire length of body.

Male tail 18—22 μm , shorter than anal diameter; posterior end strongly twisted. Spicula large, 50—53 μm , 2.5—2.7 times longer than tail, characteristic in shape, each with a small triangular spur. Supplements 10—13 (mostly 11), small and spaced, each 4.5—5.5 μm from the other; the last one lying 33—36 μm from anus. Prerectum beginning within the row of supplements.

Brief characters: Medium-sized species, head hardly set off, spear short, cuticle very thin, vulva transverse, female tail long, nearly one dozen supplements, spicula large with small spurs.

H o l o t y p e: male on the slide No. 9681 in the collection of the author. Paratypes: 16 females, 7 males and 4 juveniles.

T y p e - l o c a l i t y: Canberra, Australia, Uriaria Forest, wet mosses from a rock, collected July 1968 by Dr. J. BALOGH and Dr. I. LOKSA.

In the shape of tail the new species resembles *Calcaridorylaimus ruwen-zorii* (DE CONINCK, 1935) comb. n. but its body is shorter (1.3 vs. 1.65 mm in female, 1.0—1.1 vs. 1.3—1.5 mm in male), the cuticle thinner (1 vs. 2—3 μm), the spear shorter (13 vs. 16—20 μm) and the ventromedial supplements are in greater number present (10—13 vs. 7—8). The differences between *C. promissus* sp. n. and the very closely related *C. simillimus* sp. n. see in the diagnosis of the latter species.

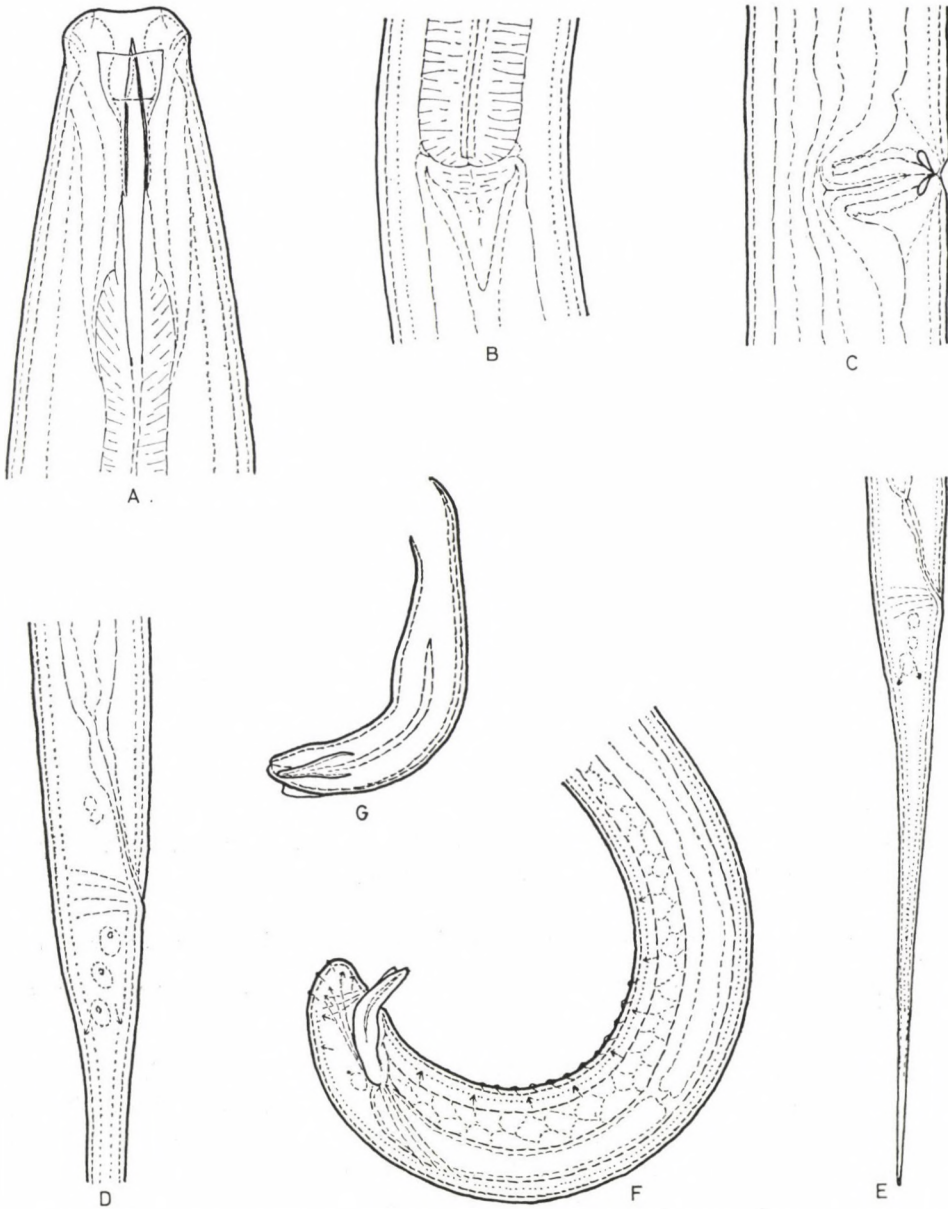


Fig. 15. *Calcaridorylaimus promissus* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C = vulval region ($\times 700$); D = anal region of female ($\times 700$); E = female tail ($\times 400$); F = posterior end of male ($\times 400$); G = spiculum ($\times 1000$)

Calcaridorylaimus simillimus sp. n. (Figs 16A—G)

♀: L = 1.30 mm; a = 43; b = 4.4; c = 7.4; V = 50%; c' = 11.
 ♂: L = 1.14 mm; a = 33; b = 3.8; c = 90; c' = 0.7.

Body slender, 30—35 μm wide. Cuticle thin, 1 μm , smooth. Head 9.5—10 μm wide, slightly set off, lips rounded-angular. Body at posterior end of oesophagus 3.3—3.4 times as wide as head. Amphids as wide as 1/2 corresponding body diameter.

Atrium not lined. Spear 11.5 μm , 1.1—1.2 times as long as cephalic diameter, straight, a little thicker than cuticle at the same level. Aperture occupying 1/3 spear length. Oesophagus 297—300 μm , shorter than distance between oesophagus and vulva; widening in 57—59% of its length. Dorsal nucleus transverse in position. Cardia more or less cylindrical. Rectum 1.8, prerectum 2.3 times as long as anal body width.

Vulva transverse, with well-cuticularized inner lips. Vagina somewhat longer than 1/2 body width. Both gonads located on the left side of body. Egg $88 \times 25 \mu\text{m}$, three times as long as body diameter. Distance vulva-anus 2.7 times longer than tail.

Female tail 175 μm , 11 anal diameters in length, or 13.5% of total length of body, posterior portion cylindrical with finely rounded tip.

Male tail 12 μm , 0.7 times as long as anal width, rounded. Posterior end of body twisted. Spicules 45 μm long. Ventromedial supplements 11, very small, spaced, the last one lying only 20 μm from anal opening.

Brief characters: Body slender, cuticle very thin, head hardly set off, spear small, vulva transverse, female tail elongate, spicular spur strong, posteriormost supplement lying opposite to the spicula.

Holotype: male on the slide No. 10618 in the collection of the author. Paratype: 1 female.

Type-locality: Copacabana, Bolivia, roots of *Stipa* sp., collected December 1966 by DR. S. MAHUNKA.

Calcaridorylaimus simillimus sp. n. comes very close to *C. promissus* sp. n. but there are some distinguishing characteristics between them. Thus, the female tail of *simillimus* is longer (11 vs. 8—9 anal diameters) and the spear shorter (11 vs. 13 μm). These are small differences between the females, on the basis of males, however, they may be well separated: the shape of spicula are different, the spur of *simillimus* is much stronger, and the row of supplements begins closer to the anus (20 vs. 33—36 μm).

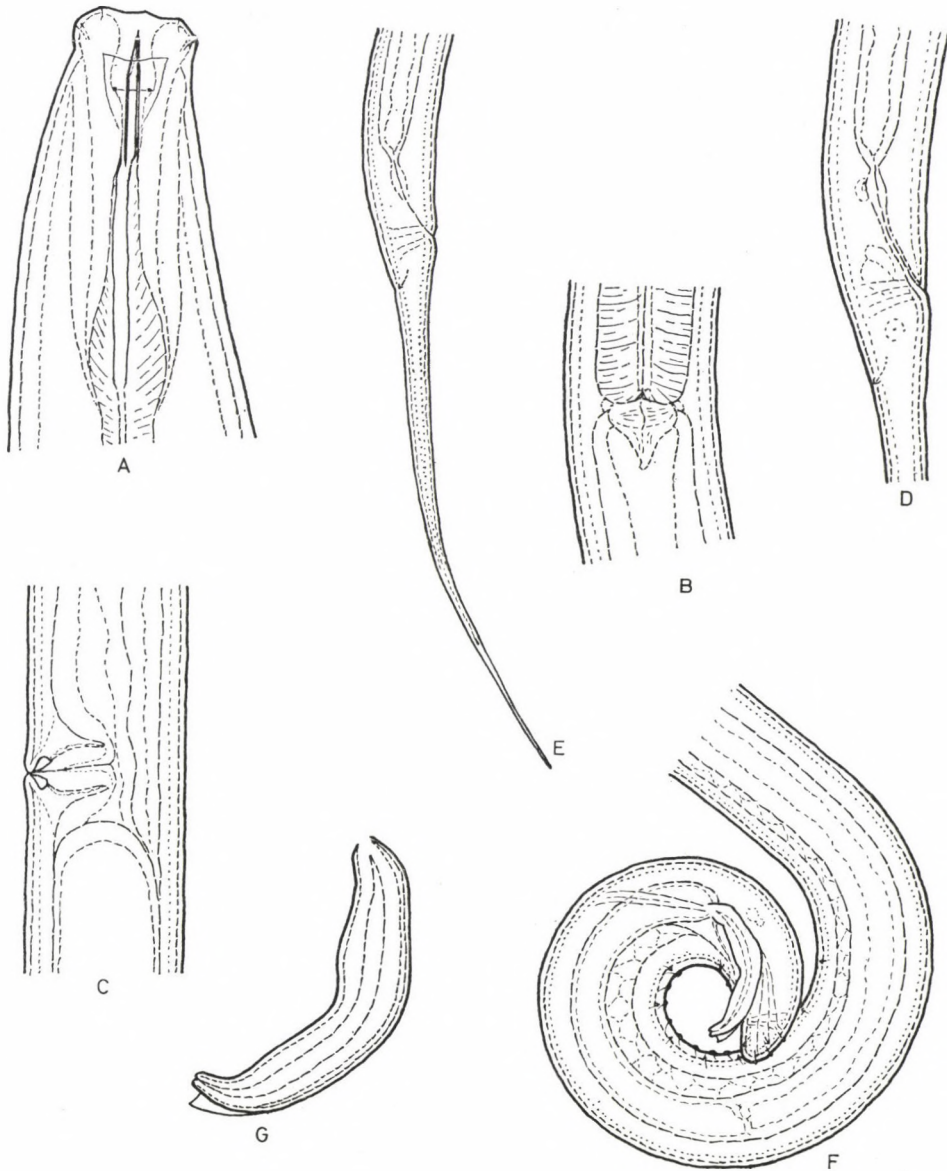


Fig. 16. *Calcaridorylaimus simillimus* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C = vulval region ($\times 700$); D = anal region of female ($\times 700$); E = female tail ($\times 400$); F = posterior end of male ($\times 400$); G = spiculum ($\times 1000$)

Genus *Calodorylaimus* ANDRÁSSY, 1969

Dorylaimidae, Mesodorylaiminae. Body large, between 1.6 and 3.6 mm. Cuticle smooth, moderately thick. Cephalic region continuous with neck or set off from that, lips angular. Amphids caliciform. Spear and guiding ring located farther back in mouth cavity than in other genera of the family. Spear relatively long and slender, between 19 and 35 μm , aperture occupying 1/3 or more of its length. Guiding ring single and thin. Oesophagus widening from its middle or farther back. Gonads of both sexes paired and well developed, both anterior and posterior gonad located on the same side of body. Vulva transverse or longitudinal. Spicula long and slim, generally twice as long as tail. Supplements 16 to 22 in number, always arranged in three groups: two contiguous rows and between them 1–3 separate supplements. Intestinal tongue not present. Tails of both sexes different, in females long and filiform, in males short and rounded.

Type-species: *Calodorylaimus octo* ANDRÁSSY, 1969.

The genus differs from *Mesodorylaimus* ANDRÁSSY, 1959 by the position of the spear and guiding ring, the long spicula, the male prerectum beginning far before the row of supplements, and the characteristic grouping of the supplements.

The representatives of *Calodorylaimus* have been recorded from Asia (India) and Africa (Ivory Coast and Ethiopia). The males occur as frequently as females.

Four species belong to the genus:

C. andrassyi BAQRI & JANA, 1983

C. gravidus sp. n.

C. indicus AHMAD & JAIRAJPURI, 1982

Calodorylaimus simplex BAQRI & JANA, 1983 {syn. n.}

C. octo ANDRÁSSY, 1969

KEY TO THE SPECIES OF CALODORYLAIMUS

- 1 Body smaller, 1.6 mm, strongly tapering to both ends; spear 19 μm long; female tail as long as 9–10 anal diameters. — ♀: L = 1.6 mm; a = 27–29; b = 5.0–5.3; c = 9–11; V = 44–47%; c' = 9–10. ♂: L = 1.3 mm; a = 23; b = 4.8; c = 80; PO: 18 (9 + 2 + 7). (Ethiopia) **gravidus** sp. n.
- Body bigger, 2.1 to 3.6 mm, slightly tapering to both ends; spear 23 to 35 μm long; female tail as long as 12 to 27 anal diameters 2
- 2 Lip region almost continuous with neck; body and spicula shorter: 2.1–2.7 mm and 40–46 μm , respectively. — ♀: L = 2.1–2.7 mm; a = 35–51; b = 4.3–5.4; c = 5–7; V = 43–47%; c' = 14–20. ♂: L = 1.7–2.0 mm; a = 29–49; b = 3.9–4.6; c = 98–118; PO: 20–22 (9–10 + 1–2 + 9–10). (India) **indicus** AHMAD & JAIRAJPURI
- Lip region set off from neck by a constriction; body and spicula longer: 2.9–3.6 mm and 50–60 μm , respectively 3
- 3 Vulva in 36–37% of body length; female tail 20–27 anal diameters in length; spear 32–35 μm long. — ♀: L = 3.0–3.6 mm; a = 40–45; b = 6.0–6.6; c = 5.0–5.5; V = 36–37%; c' = 20–27. ♂: L = 2.2–2.6 mm; a = 30–36; b = 5.0–5.6; c = 100–130; PO: 17–20 (9–10 + 2 + 7–9). (Ivory Coast) **octo** ANDRÁSSY

— Vulva in 44–45% of body length; female tail 12–15 anal diameters in length; spear 26–29 μm long. — ♀: L = 2.9–3.5 mm; a = 60–64; b = 5.6–6.1; c = 8–11; V = 44–45%; c' = 12–15. ♂: L = 2.6–3.1 mm; a = 58–61; b = 4.8–5.6; c = 131–260; PO: 16–18. (India) **andrassyi** BAQRI & JANA

Calodorylaimus gravidus sp. n. (Figs 17A–F)

♀: L = 1.62–1.65 mm; a = 27–29; b = 5.0–5.3; c = 9–11; V = 44–47%; c' = 9–10.
♂: L = 1.30 mm; a = 28; b = 4.8; c = 80.

Body plump in its middle region, 60 μm (♀) or 50 μm (♂) wide, but strongly tapering towards both ends. Cutice smooth, 2.2–2.4 μm thick. Head narrow, only 7.5–8 μm wide, not set off, with amalgamated lips. Body at posterior end of oesophagus 53 μm (♀) or 46 μm (♂) wide, i.e. 7 times (♀) or 5.8 times (♂) wider than head. Amphids somewhat wider than 1/2 corresponding diameter of body.

Atrium not lined. Spear 19 μm , 2.4–2.6 times longer than labial diameter, or about 1/17 of entire length of oesophagus (measured from head end), very slender, nearly 12 times as long as wide, a little thicker than cuticle at the same level. Aperture occupying more than 1/3 of its length. Guiding ring far back in location, 11 μm from anterior margin of body, simple and thin. Oesophagus 270–315 μm long, widening in 58–60%. Cardia long-conoid. Rectum 2 times, prerectum 3.2 times as long as anal body width. Distance between oesophagus and vulva 1.4 times longer than oesophagus.

Vulva transverse, with cuticularized lips. Gonads greatly developed, each about 7 times as long as body width, the anterior one reaching to the oesophagus. Both gonads lying on the left side of body. Two eggs at the same time: 70–82 \times 33–37 μm , 1.2–1.4 times as long as body diameter.

Distance vulva-anus 4.4 times longer than tail. Female tail 160–168 μm , 9–10 anal diameters in length, or 10% of body length, elongate-conoid. Body strongly narrowing in its posterior part, at anus only 1/3 as wide as at the beginning of the prerectum.

Male tail 20 μm , somewhat shorter than anal diameter, bluntly rounded. Spicula 46 μm , more than twice as long as tail. Ventromedial supplements 18 in number, arranged in three groups: 9 + 2 + 7; both larger groups are contiguous but the two intermediate supplements spaced. Hindermost supplement at a distance of 50 μm from the cloacal opening. The prerectum begins far before the supplements.

Brief characters: Body robust but strongly narrowing towards both ends, head not set off, spear long and slender, guiding ring located far back, gonads strongly developed, female tail elongate, spicula large, supplements arranged in three groups.

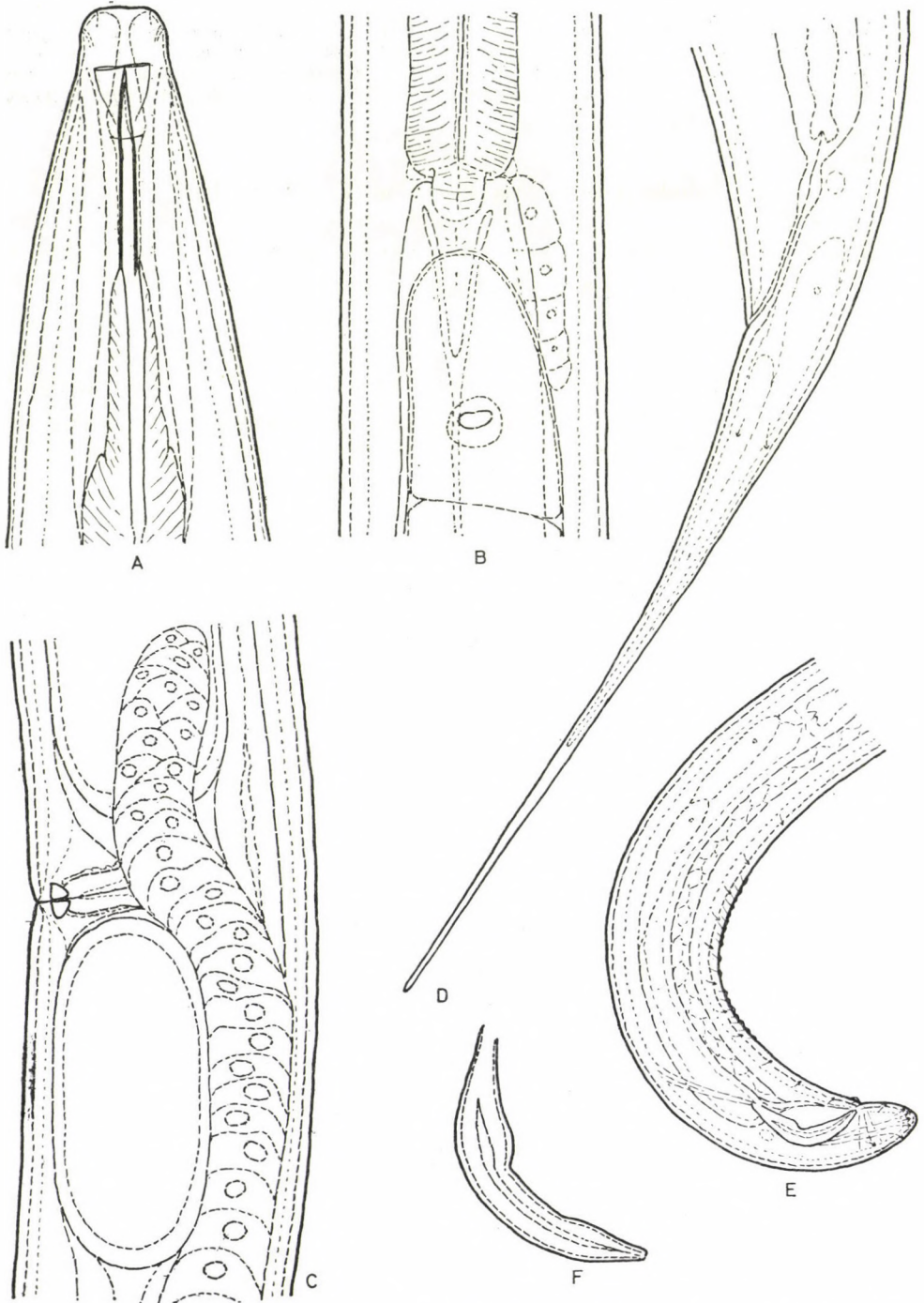


Fig. 17. *Calodorylaimus gravidus* sp. n. A = anterior end ($\times 1600$); B = cardial region ($\times 700$); C = vulval region ($\times 700$); D = female tail ($\times 700$); E = posterior end of male ($\times 400$); F = spiculum ($\times 1000$)

H o l o t y p e : female on the slide No. 11353 in the collection of the author. **Para-**
t y p e s : 4 females and 1 male.

T y p e - l o c a l i t y : The Blue Nile in Ethiopia, roots of submerse plants, collected
in 1972 by DR. A. POR.

Calodorylaimus gravidus sp. n. may easily be distinguished from the three* known species of the genus in having a smaller (1.6 vs. 2.1–3.6 mm) and towards both ends heavily narrowing body ($a = 28$ vs. 35–64), a shorter and slenderer spear (19 vs. 23–35 μm), unusually strongly developed gonads and a shorter female tail (9 vs. 16–22 anal diameters).

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* *Calodorylaimus indicus* AHMAD & JAIRAJPURI, 1982 and *C. simplex* BAQRI & JANA, 1983 completely agree in every respect; the latter is a junior synonym of the former.

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SOME ORIBATID MITES COLLECTED IN THE WESTERN PACIFIC AREA

J. BALOGH and P. BALOGH

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

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The distribution of some Oribatid mites discussed. Six new species and one new subspecies described.

The Oribatid fauna of some parts of the Western Pacific Area may be qualified as quite well known. These "fairly well explored areas" are New Zealand, Fiji, Tahiti and Samoa. It was HAMMER who reported numerous data from these islands. According to these the following number of Oribatid mite species are known from these areas: New Zealand 312, Fiji 83, Tahiti 102, Samoa 128. However, these numerical data are unsuitable for comparative purposes since the Oribatid fauna of the World, excepting that of Europe, is rather inadequately known. Theoretically any one area is well explored, or should be considered as such, if repeated collecting there bring forward identical species, that had been collected before. Consequently, in a poorly explored area the repeated collectings always produce several or many species new to that region. In wholly unexplored places any species collected there, of course, will be new to the fauna of that territory. Consequently in the best collected places not one species may be collected as new for the fauna. Between the two extreme limits the degree of exploration may be expressed in the value of percentage.

Our Earth is rather disproportionately explored as far as Oribatids are concerned. This is why many oribatidologists are compelled to devote much of their time for the description of new species. The degree of exploration in the much neglected groups can be expressed by the proportion of the number of known and the new, unknown species. These proportions in HAMMER's publications may be tabulated as follows:

Islands	No. of coll. species	No. of new species	% of new species
Fiji	83	43	52
Tahiti	102	41	40
Samoa	124	54	44

These numbers clearly reflect that at the time of HAMMER's collectings some 40—50%, i.e. every other species was new to science. These species, at the present moment, cannot be considered from distribution point of view.

It is quite evident thus, that from the point of view of exploration of Oribatid mites the knowledge of the area of the already known species, i.e. their distribution, is at least as important as is the description of the yet unknown species. It would be highly desirable that new oribatidologists start working especially in the countries of the Southern Hemisphere, mainly to collect and then to elaborate their home fauna of Oribatid mites.

The authors of the present contribution carried out work on some points of the Western Pacific Area. From the unselected material 35 Oribatid species were identified. Owing to the comparatively small number of species the pertaining data should be handled with caution. With this in mind we herewith present the same data as were given for the publications of HAMMER: 35, 9, 26%.

According to this the proportion of new species is significantly smaller, since only every fourth species qualifies to be as such. This sudden decrease is quite natural because the first elaborations, the previous works of HAMMER, comprise the most common species, found in great individual numbers. This is why we agree with HAMMER's opinion: biogeographical conclusions may be drawn with utmost care when only a small number and rather dispersed data are available. Bearing all these points of view in mind we venture to make the following statements.

1. *Mucronothrus rostratus* TRÄGARDH, 1931. — The species has so far been collected in the Northern Hemisphere, South America and New Zealand, in very wet montane or subalpine localities. The recorded places of collecting are very far from one another. In the Southern Hemisphere it seems to follow the distribution of *Nothofagus*. It might be supposed that in the presently recorded places the species has prevailed since a very long geological time, perhaps from as early as the Upper Cretaceous, and this disjunct distribution is the outcome of plate tectonic movements. In spite of the disjunct localities and the long-term isolation the species, originating from the various continents, do not show any morphological variations.

2. *Holonothrus papua* sp. n. — The three known species of the genus come from Maquarie Island (*H. foliatus* WALLWORK, 1963), Campbell Island (*H. concavus* WALLWORK, 1966), New Zealand: North Island, Puketi, Waitakere (*Holonothrus pulcher* HAMMER, 1966). The disjunct appearance in New Guinea is quite surprising, and somehow seems to support the views of J. BALOGH (1970) given in connection with *Pseudantarcticola tropica* BALOGH, 1970 and *Cryptobothria papuana* BALOGH, 1970. The moss forests of New Guinea should deserve greater attention especially what their Oribatid fauna is concerned in biogeographical point view.

3. *Malacoangelia remigera* BERLESE, 1913. — This species inhabits the

rain forest zone of Africa, Asia, the South Sea Islands and the Neotropical Region. The specimens collected in these different regions are quite similar, displaying no morphological differences, this is why it is considered as a "circumtropical" species.

The species *Rostrozetes foveolatus* (SELLNICK, 1923) seems to have the same distribution. BECK (1965) described various form within this species, interestingly enough some specialists are on the opinion that these local forms be considered as independent species. According to our present state of knowledge it is rather difficult to take sides. Similar problems have arisen in connection with *Archegozetes magna* (SELLNICK, 1925) and *A. longisetosus* AOKI, 1965. To give any definite answer in these questions will only be possible when a long series of these species will be available, perhaps then we might be able to say that they are in fact one species, though highly variable, distributed along the circumtropical region, or perhaps several closely related species.

4. The "cosmopolite" or almost "cosmopolite" species having wide distribution.

Oppiella nova (OUDEMANS, 1902) — Into this group we may include *Tectocephus velatus* (MICHAEL, 1880), *Quadroppia quadricarinata* (MICHAEL, 1885) and several other species with similar distribution. These animals live under different climatic conditions and habitats. Unambiguous differences were not found in the morphology of the different populations. Some Oribatid specialists in lack of interpretable morphological features consider these species as one, others, heavily influenced by the various habitats and the climatic zones stress that speciation must have taken place, they try on the strength of minute, quantitative differences to suggest individual species of each. We consider the first solution as practical, at least for the time being.

5. Species occurring in other biogeographical regions, having a large area of distribution. Their known distribution at present is disjunct, but seems quite probable that in the intermediate areas these species will be shown eventually. After their name the two places of occurrence are given.

Erioppia problematica (BALOGH, 1966): East Africa — Samoa.

Lohmannia javana BALOGH, 1961: Java — Fiji.

Meristacarus heterotrichus CSISZÁR, 1961: Java — Fiji.

The species *Lohmannia javana* is very close to *L. lanceolata* GRANDJEAN, 1950. It seems quite possible that it is only a subspecies of the latter, or perhaps identical with the latter. The species *Meristacarus heterotrichus* is highly similar to *Meristacarus douhereti* J. BAL. and P. BAL., 1983 (New Caledonia). It is possible that the latter is only a subspecies.

In the following we give the list of the collected species, together with the description of the new species and illustrations.

HYPOCHTHONIIDAE

Malacoangelia remigera BERLESE, 1913.

Western Samoa near Wailima, Mt. Vaea cca 426 m, 18. X. 1969. Secondary forest, Leg.: J. BALOGH; 1 ex.

***Steganacarus tenuiseta* sp. n. (Figs 1—5)**

Length of aspis: 533 μm , width: 418 μm ; length of notogaster: 1025 μm ; height: 697 μm .

Aspis: Sensillus short, S-shaped; apical half slightly lanceolate with pointed tip. Lanceolate part with transparent cerotegument cover. Aspidial setae short, very thin, hardly visible; setae *in* and *ex* about twice longer than setae *le* and *ro*.

Notogaster: 14 pairs of very thin and short notogastral setae; setae f_1 and f_2 absent. Notogastral setae c_1 , d_1 , e_1 , h_1 , c_2 , cp curved anteriorad.

Anogenital region: Ano-adanal plates with 5 pairs of very thin and short, hardly visible setae. The two setae of the medial rows close to each other. Lateral row with 3 pairs of setae: the 1st pair far a head; the 2nd pair very near to the first pair of the medial rows, the 3rd pair near to 2nd pair of median setae. Ano-adanal plates with weak foveolae; latter visible only on the outer margin of plates.

Remarks: The very thin and short notogastral setae combined with the peculiar position of the ano-adanal setae are unique within the genus.

Material examined: Papua New Guinea, Mt. Wilhelm, moss forest near Kambugomambuno, cca 3200 m. Leg.: J. BALOGH. Holotype (dissected) and paratype 1 ex.

Steganacarus craterifer HAMMER, 1971

HAMMER collected one specimen (holotype) in Suva, Viti Levu. Habitat: dead leaves on the floor of the rain forest.

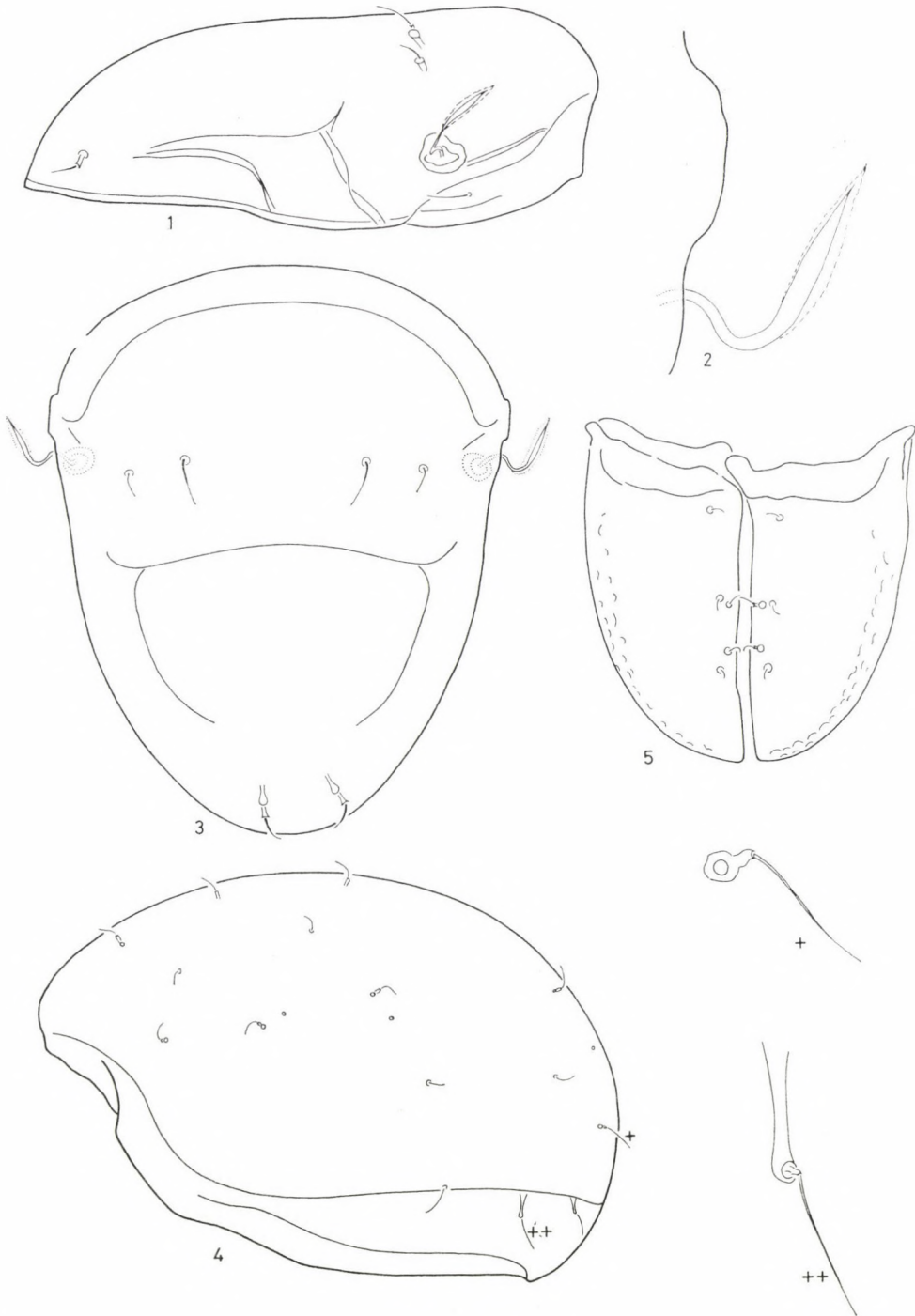
Our material: 3 exemplars. Length of aspis: 226, 254, 328 μm ; length of notogaster: 390, 492, 590 μm , length of notogaster: 279, 369, 443 μm .

Locality: Fiji, Viti Levu, Wainandoi, 17. VII. 1966, leaf mould mixture.

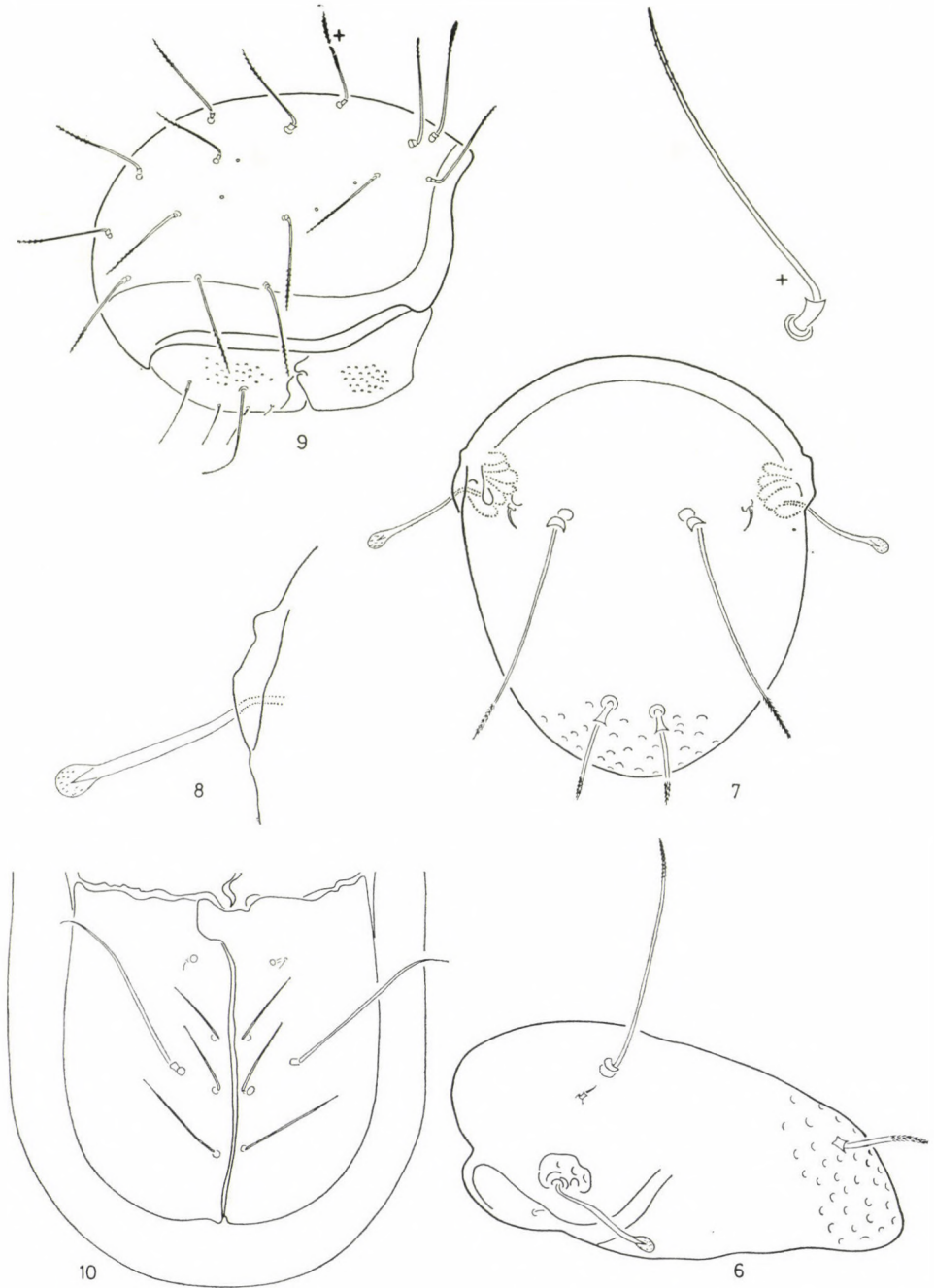
Hoplophthiracarus fatidicus NIEDBALA, 1982 (Figs 6—10)

The species easily recognizable by the following combination of characters: 1. the first setae of the median row very short, almost absent; 2. setae *ro* rodlike, thick; setae in very short, curved inwards. Rostrum with scattered foveolae; genital plates with small, evanescent foveolae. Length of aspis: 199 μm ; width: 164 μm ; length of notogaster: 361 μm , height: 258 μm .

Papua New Guinea, Mt. Wilhelm, near Kambugomambuno, cca 3200 m, moss forest, litter, 14. IX. 1968. Leg.: J. BALOGH; 2 ex.



Figs 1—5. *Steganacarus tenuiseta* sp. n. 1 = aspis lateral, 2 = sensillus, 3 = aspis dorsal, 4 = notogaster lateral, 5 = anoad anal plates



Figs 6–10. *Hoplophthiracarus fatidicus* NIEDBALA, 1982. 6 = aspis lateral, 7 = aspis dorsal, 8 = sensillus, 9 = notogaster lateral, 10 = anoanal plates

LOHMANNIIDAE

Lohmannia javana CSISZÁR, 1961

Fiji, Viti Levu, Nasinu, under Ficus trees, from soil, 31. VIII. 1966. Leg.: G. BORNEMISSZA; 1 ex.

Belong to the *Lohmannia lanceolata* GRANDJEAN, 1950 species-group. The species included here are very similar to one another.

Javacarus granulatus CSISZÁR, 1961

Fiji, Viti Levu, Nakulau I. (coral), leaf mould, 11. IX. 1966. Leg.: G. BORNEMISSZA; 2 ex.

Javacarus khuenelti BALOGH, 1961

Fiji, Viti Levu, Nakulai I. (coral), leaf mould, 11. IX. 1966. Leg.: G. BORNEMISSZA; 7 ex.

Meristacarus heterotrichus CSISZÁR, 1961

Fiji, Viti Levu, Wainandoi, rain forest, in moss on rocks, 17. VII. 1966. Leg.: G. BORNEMISSZA; 8 ex.

Austracarus tahitiensis (HAMMER, 1972)

Western Samoa, near Wailima, Mt. Vaea 426 m, secondary forest, litter. 18. X. 1969. Leg.: J. BALOGH; 5 ex.

HOLONOTHRIDAE

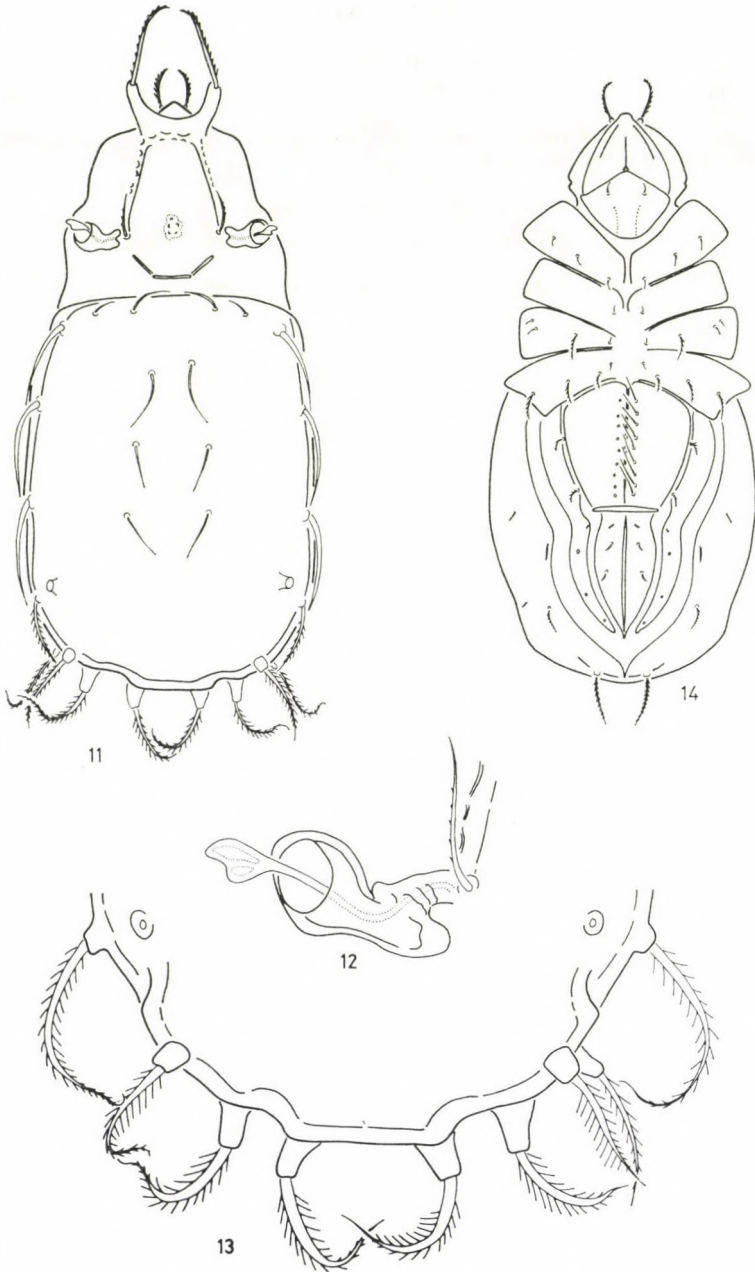
Holonothrus papua sp. n. (Figs 11—14)

Length: 500—558 μm ; width: 238—254 μm .

Prodorsum: Sensillus with long thin, stalk and with short, asymmetrically bipartite head. Bothridium long, tubular, covering the most part of stalk. Setae in originating near to bothridium, medium long, directed forward; setae *le* on diverging apophyses; long, slightly convergent, finely ciliate, setae *ro* short, ciliate. Rostrum not incised. There are two lamellar lines connecting the interlamellar setae and lamellar apophyses. Five small, bright spots at the centrum of prodorsum at level with setae *in*. On the posterior part of prodorsum there is an arched line.

Notogaster: Surface of notogaster flat. 15 pairs of notogastral setae (were unable to discover one pair of setae *p*). Setae c_2 the shortest, c_1 about twice longer; setae c_3 , cp and e_2 marginal, long, curved. Setae d_1 , d_2 and e_1 in two almost parallel, longitudinal rows; setae e_1 at level with e_2 ; these medial setae much shorter than marginal ones. Setae f_1 , f_2 , h_1 , h_2 and h_3 in posteromarginal position; h_2 and h_3 on longer, f_1 and h_1 on shorter apophyses; f_2 has only a small basal tubercle. The five setae of *f* and *h* rows ciliate, the remaining setae of *c*, *cp*, *d* and *e* rows smooth. The two observable pairs of row *p* originating ventrally, near to ventral margin.

Ventral side: Epimeral setal formula 3—1—4—4. Epimeral setae short, sparsely ciliate. Genital plates broad, trapezoid, posteriorly narrowing. 2 pairs of aggenital setae; 2 pairs of anal, 3 pairs of adanal setae. 5 pairs of lyrifissures (*ian*, *iad*, *ih*, *ips*, *ip*) present.



Figs 11–14. *Holonothrus papua* sp. n. 11 = dorsal, 12 = sensillus, 13 = posteromarginal region of notogaster, 14 = ventral

Remarks: There are 3 described species of *Holonothus*: *H. foliatus* WALLWORK, 1963 from Macquaria Island; *H. concavus* WALLWORK, 1966 from Campbell Island and *H. pulcher* HAMMER, 1966 from New Zealand North Island. After WALLWORK (1966) the genus *Holonothus* is not uncommon on the other islands of the New Zealand group, but this material (MICHAL's collection) has not yet been identified. *Holonothus papua* sp. n. is a unique species with long, curved setae c_3 , cp , e_2 in marginal position; with long, thin stalk sensillus of and with prominent, asymmetrically bipartite head. Also the position of setae f_1 , f_2 , h_1 , h_2 and h_3 is considerably different.

Material examined: Papua New Guinea, Wau, Mt. Kaindi cca 2350 m, 25. VIII. 1968, moss forest, litter; holotype, and paratypes 4 ex.

TRHYPOCHTHONIIDAE

Afronothrus sulcatus HAMMER, 1972

US Samoa, Mt. Avala, cca 487 m, primary rain forest, thick, wet litter, 20. X. 1969. Leg.: J. BALOGH; 2 ex.

Allonothrus shuilingi HAMMER, 1959

Fiji, Viti Levu, Nakulau I. (coral), leaf mould, 11. IX. 1966. Leg.: G. BORNEMISSZA; 2 ex.

Archegozetes magnus (SELLNICH, 1925)

US Samoa, Mt. Avala, cca 487 m, primary rain forest, thick, wet litter, 20. X. 1969. Leg.: J. BALOGH; 1 ex.

Mucronothrus rostratus TRÄGARDH, 1931

Papua New Guinea, Wau, Mt. Kaindi, cca 2350 m, moss forest, litter, 25. VIII. 1968. Leg.: J. BALOGH; 1 ex.

NANHERMANNIIDAE

Cyrthermannia luminosa HAMMER, 1971

Fiji, Viti Levu, Nasimu, under Ficus trees, from soil, 31. VIII. 1966. Leg.: G. BORNEMISSZA; 1 ex.

Masthermannia mamillaris (BERLESE, 1904)

Western Samoa, Mt. Vaea, near Wailima, secondary forest, litter, 18. X. 1969. Leg.: J. BALOGH; 1 ex.

EUTEGAEIDAE

Compactozetes hastatus HAMMER, 1973 (Figs 15–17)

Our specimen is very probably identical with this species. For comparative purposes we give some figures from our very dark specimen. Length: 668 μm ; width: 537 μm .

Fiji, Viti Levu, Wainandoi, leaf mould-mixture, 17. VII. 1966. Leg.: G. BORNEMISSZA; 1 ex.

Dudichella membranigera BALOGH, 1970

Fiji, Viti Levu, Wainandoi, leaf mould-mixture, 17. VII. 1966. Leg.: G. BORNEMISSZA; 1 ex.

Described from Sri Lanka (Ceylon); Fiji is the second place of occurrence.

DAMAEOLIDAE

Gressittolus marginatus BALOGH, 1970

Western Samoa, Mt. Vaea, near Wailima, secondary forest, litter, 18. X. 1969. Leg.: J. BALOGH; 1 ex.

AMERIDAE

Andesamerus novaezealandiae sp. n. (Figs 18—19)

Length: 1000—1033 μm ; width: 608—640 μm .

Prodorsum: Sensillus setiform, directed outward, smooth. Setae *in* very short, curved, inserved asymmetrically. Setae *le* and *ro* long, inward curved, smooth. Prodorsum without costulae. Pedotecta II large.

Notogaster: Dorsosejugal suture absent; dorsosejugal region flattened. 10 pairs of notogastral setae: 7 pairs arranged in two longitudinal rows, 3 pairs in posteromarginal position. Setae *ta* originating not far from bothridia, short; setae *te* and *ti* more than twice longer than setae *ta*; setae r_1 , r_2 and r_3 originating in the second half of notogaster. Distance *ti*—*ms* about thrice longer than *te*—*ti*. All notogastral setae fine.

Ventral side: Epimeral setal formula: 3—2—3—3; setae *lb*, *lc* and *2b* (?) very long. 6 pairs of genital, 5 pairs of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Aggenital setae asymmetrically arranged. Anal setae near to margin of anal plates.

Remarks: Only one *Andesamarus* species has been known: *A. peculiaris* HAMMER, 1962 from Chile (Puerto Montt. Petrohué). The differences are as follow:

	<i>peculiaris</i> HAMMER	<i>novaezealandiae</i> sp. n.
1. Number of setae <i>ag</i>	12—14	5
2. Distance <i>ta</i> — <i>te</i>	as long as <i>te</i> — <i>ti</i>	twice longer than <i>te</i> — <i>ti</i>
3. Setae <i>ta</i>	as long as <i>te</i> and <i>ti</i>	twice shorter than <i>te</i> and <i>ti</i>
4. Distance r_3 — r_3	much longer than <i>ms</i> — <i>ms</i>	much shorter than <i>ms</i> — <i>ms</i>
5. Distance r_1 — r_1	as long as r_2 — r_2	shorter than r_2 — r_2

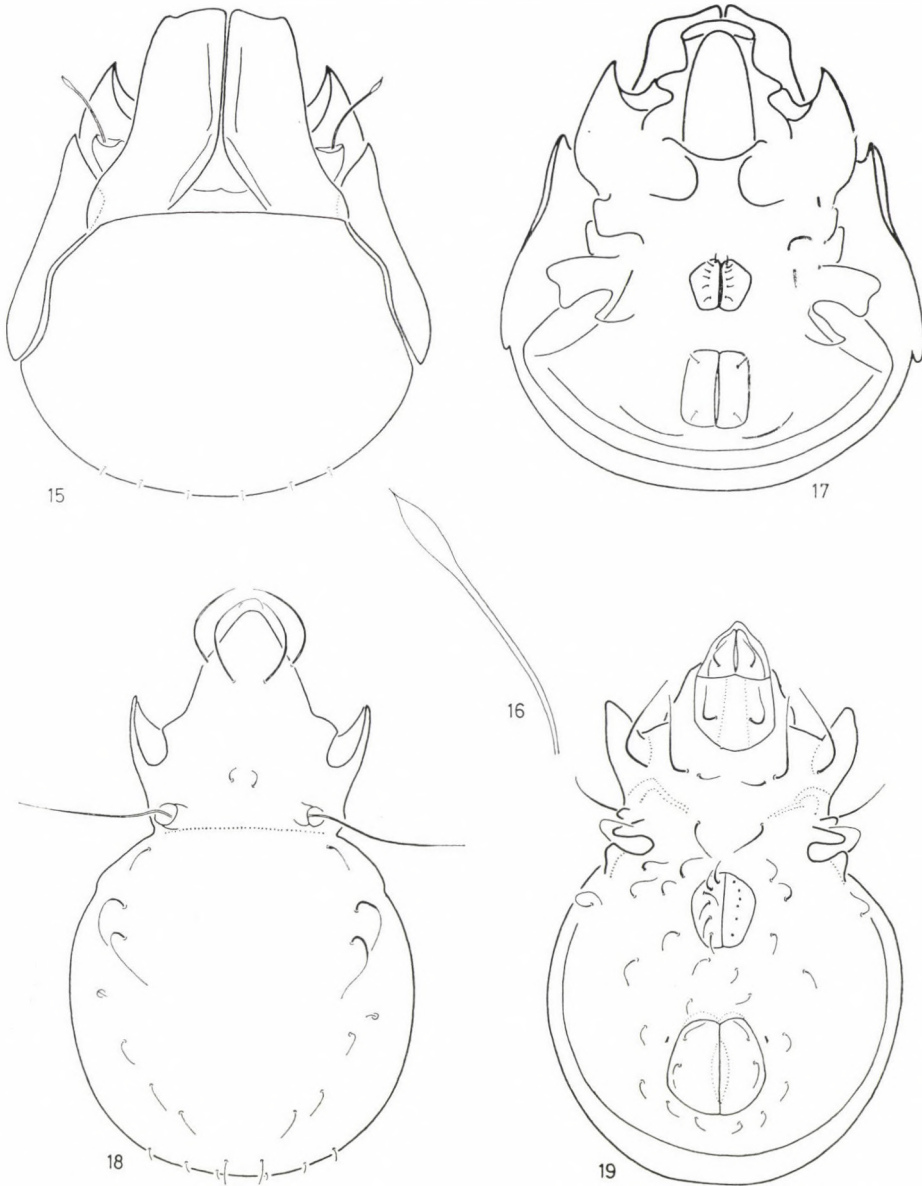
Material examined: New Zealand, Waipoua Forest, litter, 6. I. 1967. Leg.: R. R. FORSTER; holotype, and paratype 1 ex.

CARABODIDAE

Carabodes samoensis sp. n. (Figs 20—25)

Length: 410 μm ; width: 221 μm .

Prodorsum: Sensillus medium long, directed outward, with dilated, apically incompletely divided head, smooth. Setae in similar to notogastral ones, originating on the surface of interlamellar region. Setae *le* originating at



Figs 15–19. 15–17: *Compactozetes hastatus* HAMMER, 1973. 15 = dorsal, 16 = sensillus, 17 = ventral. — 18–19: *Andesamerus novaezealandia* sp. n. 18 = dorsal, 19 = ventral



Figs 20—28. 20—25: *Carabodes samoensis* sp. n. 20 = dorsal, 21 = sensillus, 22 = lamellar cuspis, 23 = ventral, 24 = seta r_1 lateral, 25 = seta ms dorsal. — 26—28: *Dolicheremaeus heterotrichus* sp. n. 26 = dorsal, 27 = sensillus, 28 = ventral

the end of lamellae; curved inward, smooth, setiform; setae *ro* similar to setae *le*. Lamellae marginal, with obliquely truncate end. Surface of interlamellar region with round, scattered tubercles. Rostral region with a semicircular slit.

Notogaster: 10 pairs of short, dilated notogastral setae. Notogastral setae viewed from above symmetrical; with a longitudinal shaft and apically with 8–10 radially arranged branches; the branching part underneath protected with a dilated membrane (Fig. 25). In lateral view (Fig. 24) the notogastral setae asymmetrical. Dorsosejugal suture straight. Notogaster with irregularly arranged tubercles.

Ventral side: Number of observable epimeral setae: *1-1-3-2*, all very fine and short. Mentum and epimeres with scattered foveolae. Distance between genital and anal plates shorter than the length of genital plates. Genital and anal plates with smaller, scattered, ventral plate with larger and more dense foveolae. 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Setae *ad*₁ and *ad*₂ with dilated head; the rest of ventral setae short and fine.

Remarks: The new species differs from all known *Carabodes* in the combination of characters as follows:

1. Notogastral setae dilated; 2. Setae in dilated, setae *ad*₁ and *ad*₂ dilated, *ad*₃ and *ag* setiform; 3. Structure of notogastral setae peculiar (see figures 24–25).

Material examined: Western Samoa, Mt. Vaea, 426 m, near Wilima, secondary forest litter, 18. X. 1969. Leg.: J. BALOGH; holotype.

Gibbicepheus novus HAMMER, 1973

Fiji, Viti Levu, Nakulau I. (coral), leaf mould, 11. IX. 1966. Leg.: G. BORNEMISSZA; 7 ex.; Londoni, under shrubs near Sandry Beach, 14. IX. 1966. Leg.: G. BORNEMISSZA; 4 ex.

OTOCEPHEIDAE

Dolicheremaeus heterotrichus sp. n. (Figs 26–28)

Length: 431–476 μm ; width: 197–226 μm .

Prodorsum: Sensillus long with long, straight, smooth very slightly thickened apical part. Setae *in* originating near to each other, long, smooth, setiform. Setae *ex* short, ciliate; setae *le* and *ro* near to each other in the rostral region. Costulae near to each other, almost parallel. Dorsosejugal suture straight with 4 pairs of enantiophyses.

Notogaster: Relatively broad; ratio of length : width = 1 : 2.1. The 10 pairs of notogastral setae. Setae *ta*, *te* and *ti* longer than rest of notogastral setae; *ta* and *te* apically very finely ciliate, setae *ti* smooth. Setae *ms* a little longer than the 4 posteromarginal setae: *p*₁, *p*₂, *p*₃ and *r*₃; setae *r*₁ and *r*₂ curved shorter than the posteromarginal setae; the other notogastral setae straight. All notogastral setae except setae *ta* and *te*, smooth. Notogaster without sculpture.

Ventral side: Epimeral setal formula: 3-1-3-3. 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Lyrifissures *iad* near to anal plates (i.e. in adanal position), short. All ventral setae short and smooth. Setae ad_3 in preanal position. Distance $ag-ag$ as long as or only a little shorter than distance ad_3-ad_3 ; distance ad_2-ad_2 longer than ad_3-ad_3 .

Remarks: This species belongs to the *Dolicheremaeus wilhelmicola* species-group, but differs from all the known species in the following combination of characters:

1. Setae ad_3 in preanal position; 2. Distance $ag-ag$ as long or almost as long as ad_3-ad_3 ; 3. Setae r_1 and r_2 curved and the shorter, the other notogaster longer and straight; 4. Setae *ta*, *te* and *ti* longer than *ms*, r_3 , p_1 , p_2 and p_3 ; 5. Setae *ta* and *te* apically very finely ciliate.

Material examined: Papua New Guinea, Wau, Mt. Kaindi, cca 2350 m, moss forest, litter, 25. VIII. 1968. Leg.: J. BALOGH; holotype, and paratype 1 ex.

OPPIIDAE

Arcoppia biflagellata sp. n. (Figs 29-31)

Length: 377-385 μm ; width: 205 μm .

Prodorsum: Sensillus extremely long; longer than prodorsum; almost as long as the length of notogaster. The dilated part of sensillus, typical in the genus *Arcoppia*: about the half length of the sensillus, bearing two long, flagellate branches. Prodorsal setae short. Lamellar and translamellar costula absent, as typical for many *Arcoppia*-species. Rostrum with two incisions (characteristic for the genus *Arcoppia*); median tooth of rostrum longer than lateral teeth.

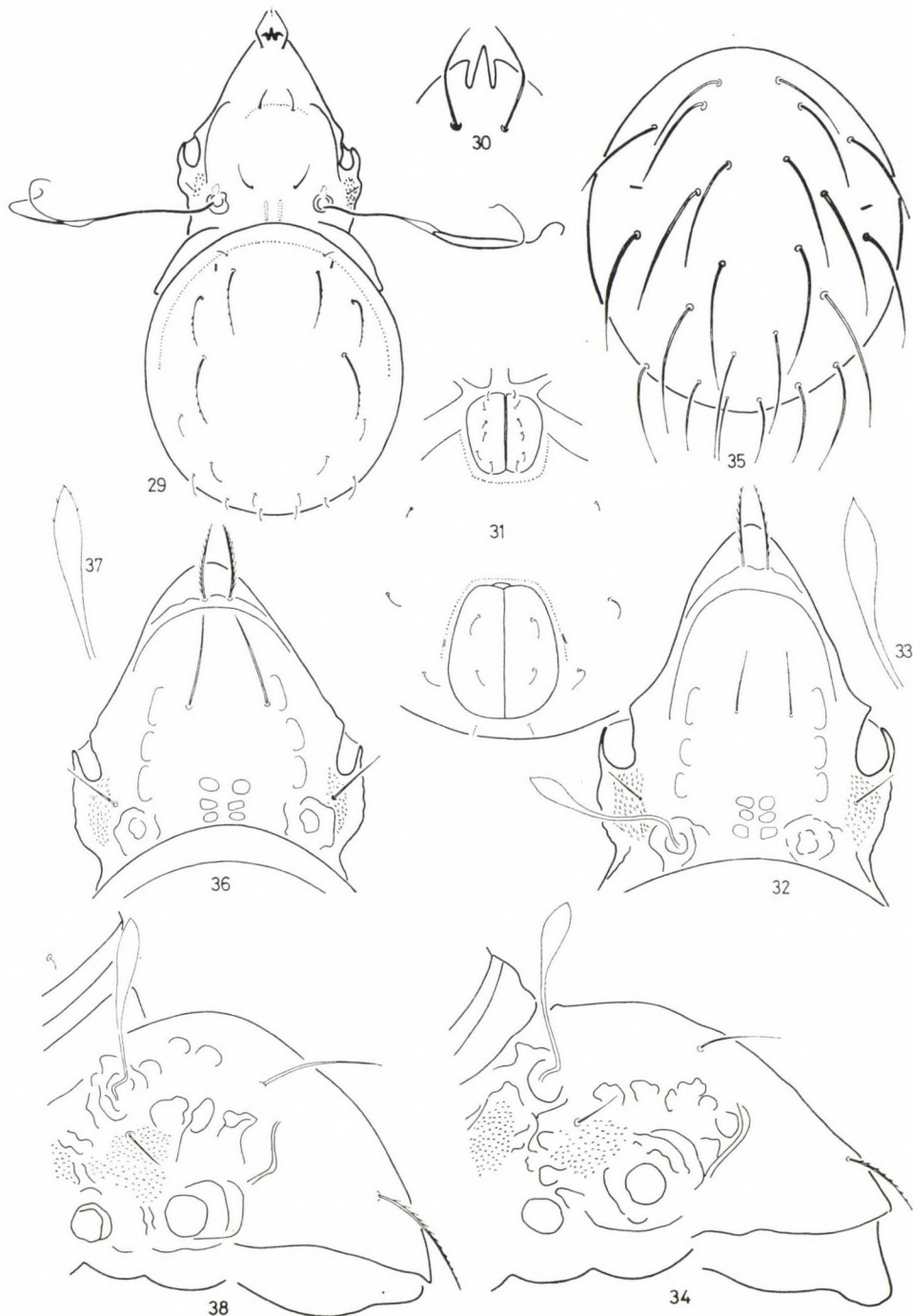
Notogaster: 10 pairs of notogastral setae. Setae *ta* short; *te*, *ti* and *ms* long, sparsely ciliate; setae of rows *r* and *p* very short; setae *ms* at least thrice longer than setae r_1 . Notogaster almost circular; in dorsal view ratio of length : width = 1 : 1.4.

Ventral side: Generally similar to the other species. 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. All ventral setae small and thin. Setae ad_3 at level with the anterior margin of anal plates. Distance ad_3-ad_3 a little longer than distance $ag-ag$.

Remarks: The genus *Arcoppia* is very rich in species (most of them yet undescribed). The new species differs from all known species in the following combination of characters:

1. Lamellar and translamellar costulae absent; 2. Sensillus extremely long, with two long, flagellate branches; 3. 3 pairs of notogastral setae: *te*, *ti* and *ms* long, sparsely ciliate, thrice longer than the rest of smooth notogastral setae.

Material examined: Fiji, Viti Levu, Wainandoi, leaf mould-mixture, 17. VII. 1966. Leg.: J. BALOGH; holotype, and paratype 3 ex.



Figs 29–38. 29–31: *Arcoppia biflagellata* sp. n. 29 = dorsal, 30 = rostrum, 31 = genital-anal region. — 32–35: *Erioppia problematica pacifica* ssp. n. 32 = prodorsum, 33 = sensillus, 34 = prodorsum lateral, 35 = notogaster. — 36–38: *Erioppia problematica problematica* (BALOGH, 1966). 36 = prodorsum, 37 = sensillus, 38 = prodorsum lateral

***Erioppia problematica pacifica* ssp. (Figs 32—35)**

Length: 394—402 μm ; width: 226 μm .

The 3 exemplars collected in Western Samoa are very similar to the Eastern African ones (Figs 36—38). The differences are as follows:

1. Setae *ta* absent (E. Afr. exemplar: *ta* present); 2. Setae *le* and *ro* long: much longer than half distance between *le* and *ro* (in lateral view) (E. Afr. exemplar: setae *le* and *ro* short) shorter than half distance between *le* and *ro*.

There are some differences in the lateral structure of the prodorsum (Fig. 34 and Fig. 38). We believe that the Western Samoan exemplars belong to the same species, but these small differences are sufficient for separating it as new geographical subspecies.

Material examined: US Samoa, Mt. Avala, cca 487 m, primary rain forest, very wet and thick litter, 20. X. 1969. Leg.: J. BALOGH; holotype, and paratype 2 ex.

Multioppia wilsoni AOKI, 1966 (Figs 39—40)

Fiji, Viti Levu, Londoni, under shrubs near Sandy Beach, 14. IX. 1966. Leg.: G. BORNEMISSZA; 3 ex.

Ramusella puertomontensis HAMMER, 1962 (Figs 41—42)

Fiji, Viti Levu, Nasinu, under Ficus trees, from soil, 31. VIII. 1966. Leg.: G. BORNEMISSZA; 1 ex.

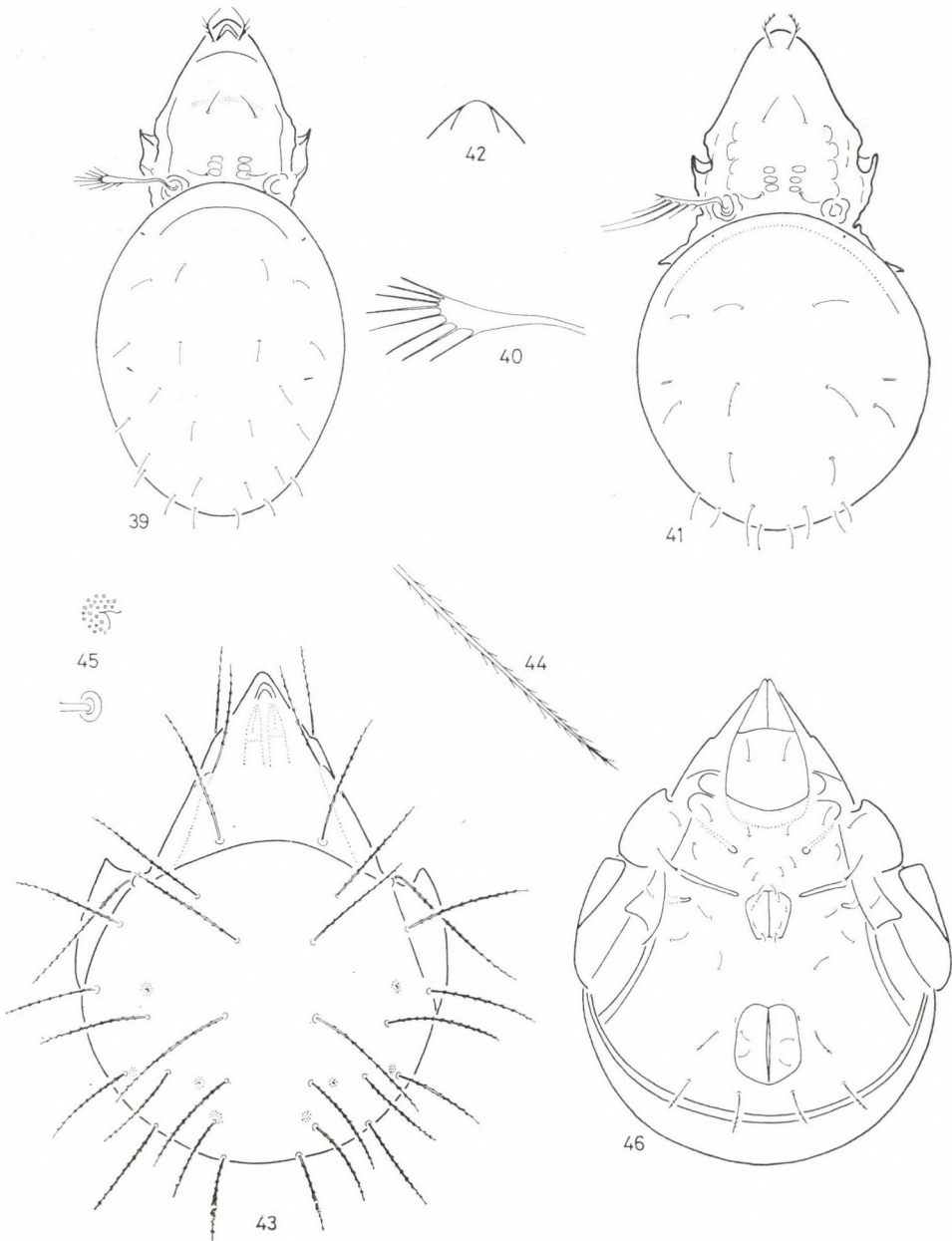
HAPLOZETIDAE

***Acutozetes bornemisszai* sp. n. (Figs 43—46)**

Length: 886 μm ; width: 607 μm .

Prodorsum: Sensillus setiform, ciliate, directed outward and backward; long as setae *in*. Setae *in* originating near to dorsosejugal suture, setiform, ciliate, long: as long as lamellae. Setae *le* shorter than setae *in*; setae *ro* shorter than setae *le*, originating far behind on the margin of prodorsum. Lamellae marginal, short. Prodorsum triangular with long, attenuating rostrum; the tip of latter round. Chelicerae very small, suctorial.

Notogaster: Pteromorphae movable. Dorsosejugal suture arched. 12 pairs of long, setiform, ciliate, rigid notogastral setae present. Octotaxic organ very peculiar: small cone with a bristle on its top, surrounded with scattered, evanescent pori. The first pair, in the place of *Sa*, is removed at some distance from setae *la*; the second pair, in the place of S_1 , near to the insertion point of setae p_3 , the third pair, in the place of S_2 , at some distance from setae *dp*, the fourth pair, in the place of S_3 , near to the insertion point of setae h_1 .



Figs 39–46. 39–40: *Multioppia wilsoni* AOKI, 1966. 39 = dorsal, 40 = sensillus. — 41–42: *Ramusella puertomonttensis* HAMMER, 1962. 41 = dorsal, 42 = rostrum. — 43–46: *Acutozetes bornemisszai* sp. n. 43 = dorsal, 44 = sensillus (apical part), 45 = sacculus Sa and the basal part of seta lm, 46 = ventral

Ventral side: 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Anal setae near to outer margin of anal plates. Setae ad_1 and ad_2 in postanal position; longer than setae ad_3 originating in adanal position.

Remarks: All the known *Acutozetes* species have dilated sensillar head and typical sacculi on the notogaster.

Material examined: Fiji, Viti Levu, Wainandot, leaf mould-mixture, 17. VII. 1966. Leg.: G. BORNEMISSZA; holotype, and paratype 1 ex.

ORIBATULIDAE

Tuberemaeus bellissimus HAMMER, 1971

Fiji, Viti Levu, Wainandoi, rain forest, in moss on rocks, 17. VII. 1966. Leg.: G. BORNEMISSZA; 1 ex.

EINE NEUE ENCHYTRAEIDEN ART
(OLIGOCHAETA: ENCHYTRAEIDAE)
AUS DEM PILIS-GEBIRGE, UNGARN

K. DÓZSA-FARKAS

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

(Eingegangen am: 21. Oktober 1985)

In the framework of MAB-Programme researches were carried out in Pilis Biosphere Reserve in order to establish the antropogen impact on the Enchytraeid fauna of intensively beaten hiking tracks and paths. Description of a new Enchytraeid species (*Fridericia conculcata* sp. n.) is given, which seems to prefer compressed soils.

Im Rahmen des MAB-Programmes sind seit einigen Jahren in Ungarn koordinierte Untersuchungen hinsichtlich des anthropogenen Einflusses auf Flora und Fauna des Pilis-Gebirges eingeleitet worden. Es wurden vorwiegend die dem anthropogenen Einfluß stark ausgesetzten Wege und Pfade in Nähe von Parkplätzen, wo durch ständiges Betreten die Bodenverdichtungen am größten sind, u. a. auch in Bezug auf die Enchytraeiden-Fauna untersucht. Im Laufe der strukturzönologischen Aufnahmen wurde eine Art entdeckt, die die durch Betreten verursachten Bodenverdichtungen bevorzugte, außerdem sich auch als neu für die Wissenschaft erwies. Diese extreme Eigenschaft soll auch mit dem Namen der neuen Art: *Fridericia conculcata* sp. n. zum Ausdruck gebracht werden. Ferner wurde auch eine für die Fauna Ungarns neue Art: *Fridericia kalffi* NURMINEN, 1973 entdeckt.

***Fridericia conculcata* sp. n. (Abb. 1a–h)**

Mittelgroße Art. Holotypus. Länge lebend 18,6 mm, Breite 0,49 mm, Segmentzahl 45. Bei den Paratypen Länge lebend 10–19,7 mm, Breite 0,25–0,56 mm, Segmentzahl (39)–42–44–(45). Kopfporus bei O/I, Dorsalporen im VI. Segment beginnend. Farbe weißlich. Borsten gerade mit einem schwach entwickelten entalen Haken: 3,4–0,2,1 : 2,(3),4–2,(1). Dorsale Borsten fehlen hinter dem Clitellum, einschließlich des XII–XXVII. Segmentes veränderlich, am häufigsten sind sie bis zum XXIV. und XXVI. Segment nicht vorhanden. Beim Holotypus vom XII.–XXV. Segment. Länge der Borsten am Vorderkörper, die äußeren längsten 60–70 μ , hinter dem Clitellum 30–50 μ , am Ende des Körpers erreichen sie wieder eine Länge von 70 μ . Haut-

drüsen in 2—3 Reihen, schwach entwickelt. Clitellum vom XII.—1/2 XIII. Segment. Drüsen in Querreihen geordnet, schwach entwickelt.

Gehirn 2—2 1/2mal größer als breit (Abb. 1a). Peptonephridium (Abb. 1c) kurz, unverzweigt oder mit ein—zwei kurzen Ästen am Ende des V. Segmentes. Lymphozyten, entsprechend der Gattung zweierartig (Abb. 1b): viele große, über Kerne verfügende, in den Møller a Typ gehörende Zellen und wenige, kleine Hialine, kernlose Körperchen. Die Septaldrüsen (3 primäre und 3 sekundäre) sowie der ventral ausführende, am Hinterende terminal liegende Ductus der Nephridien sind kennzeichnend für die Gattung *Fridericia*. Die Coelomflüssigkeit enthält keine abgestoßenen Borsten. Rückengefäß entspringt im XVI.—XVII. Segment. Blut farblos. Chloragogenzellen sind vom VI. Segment beginnend vorhanden, bräunliche Zellen.

Vesicula seminalis vorhanden, im X.—XI. Segment, bräunlich. Samen-trichter (Abb. 1h) 1 1/2—2mal länger als breit, beträgt 1/2 oder 2/3 des Körperdurchmessers, kann sich stark zusammenziehen. Kragen gut zu erkennen, aber schmaler als die Körperbreite des Trichters. Samenleiter mäßig lang, schmal, im X. und XI. Segment etwas gewunden. Penialbulbus klein und kompakt.

Spermatheken bestehen aus einer runden Ampulle (Abb. 1d, f), die mit einem ziemlich langen entalen Ductus voneinander separiert in den Oesophagus einmünden. Die Ampullen besitzen zwei unregelmäßige, gut entwickelte, gestreckte Divertikel, die nach unten gerichtet, selten etwas gewunden sind (Abb. 1e, g). Ektaler Ausführungsgang mittelgroß, bei der Öffnung mit einer sessilen Drüse. Gleichzeitig nur ein reifes Ei vorhanden.

Zahl der untersuchten Individuen: 38.

Fundort: F 7: Holotypus, Pilis-Gebirge, Parkplatz unter dem Fekete-Berg, auf dem Touristen-Weg. 11. XI. 1985. leg. DÓZSA-FARKAS; Paratypen P 10: 27 Ex. Fundort wie beim Holotypus. P. 11: 10 Ex. 22. X. 1984 leg. DÓZSA-FARKAS, Fundort wie beim Holotypus.

Das Typenmaterial ist in Bouen fixiert und wird in 70% Alkohol in der Sammlung des Lehrstuhles für Tiersystematik und Ökologie der Universität, Budapest aufbewahrt.

Die neue Art gehört zu der *Fridericia*-Gruppe, deren Spermatheken über 2 Divertikel verfügen. Die unregelmäßige Form und Anordnung der Divertikeln unterscheidet *F. conculcata* sp. n. von allen bisher beschriebenen Arten dieser Gattung. Außerdem ist das Fehlen der dorsalen Borsten von Clitellum bis zum XXVII. Segment ebenfalls sehr kennzeichnend. In Hinsicht der Richtung der Divertikeln steht sie *F. sylvaticus* HEALY, 1979 am nächsten, unterscheidet sich jedoch von dieser dadurch, daß die Divertikeln nicht symmetrisch stehen, im Vorhandensein der Vesicula seminalis, in der Länge der Samentrichter und im Entspringungspunkt des Rückengefäßes. Von *F. galba* mit Spermatheken, die 2 Divertikel besitzen, unterscheidet sie sich dadurch, daß *F. galba* eine höhere Segmentzahl (50—60), höhere Borstenzahl

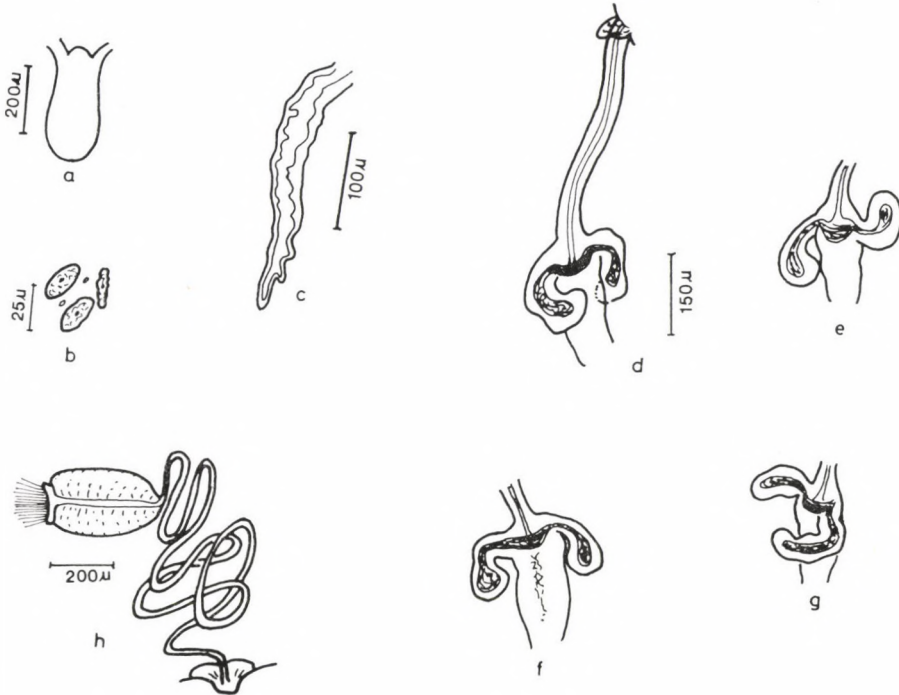


Abb. 1a—h. *Fridericia conculcata* n. sp., a = Gehirn; b = Lymphozyten; c = Peptonephridium; d, e, f, g = Variationen der Spermateken; h = Samentrichter mit Samenleiter und Penialbulbus

(6—8) besitzt und dadurch, daß der efferentale Ductus der Spermatheke und der Samentrichter länger ist.

SCHRIFTTUM

- NIELSEN, C. O. & CHRISTENSEN, B. (1959): The Enchytraeidae. Critical revision and taxonomy of European species (Studies on Enchytraeidae VII.). — *Nature Jütland*, **8—9**: 1—160.
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DIE MISOLAMPINEN AUS NEUGUINEA (COLEOPTERA: TENEBRIONIDAE)

Z. KASZAB

*Ungarisches Naturwissenschaftliches Museum,
H-1088 Budapest, Baross utca 13, Ungarn*

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The description of four new genera (*Papuanisolampus* gen. n., *Irianobates* gen. n., *Bradysphaerotus* gen. n. and *Apterobrachys* gen. n.) and six new species from Mt. Wilhelmina of East Irian (*Papuanisolampus toxopeusi* sp. n., *Irianobates krikkeni* sp. n., *Bradysphaerotus papuanus* sp. n., *Apterobrachys montanus* sp. n., *A. wilhelminae* sp. n. and *A. paniaiensis* sp. n.) are presented. The holotypes are the property of the Rijksmuseum van Natuurlijke Historie Leyden. Synonymy: *Osdara nigriceps* ARDOIN, 1976 is a junior synonym of *Hyboproctus nigroperlatus* KULZER, 1950.

Die Misolampinen zeichnen sich nach GEBIEN (1928) eindeutig aufgrund ihrer Flügellosigkeit aus, was die Verkürzung der Hinterbrust und das Verschwinden der Schulterbeulen bedingt. In demselben Sinne habe ich auch die indomalayisch-orientalischen Misolampinen bearbeitet (KASZAB, 1941, 1960) und beschrieb auch später noch hierher gezählte Gattungen (z. B. KASZAB, 1979).

KULZER (1950) beschäftigte sich eingehend mit dieser Gruppe und stellte fest, daß die früher unter den Triben Entelini-Nodotelini beschriebenen Gattungen zu den Misolampinen einzubeziehen und die Untersuchungsmerkmale, welche LACORDAIRE in seiner *Histoire Naturelle des Insectes, Genera des Coleoptères* Band 5, 1859 angegeben hat, nicht mehr brauchbar sind.

Die systematische Lage und der Inhalt der Beschreibungen der Misolampinen müssen jedenfalls neu ausgewertet werden, weil die Flügellosigkeit kein ausreichendes Merkmal ist, eine Tribus zu charakterisieren; umso mehr als flügellose Gattungen in vielen Gruppen der Unterfamilie Tenebrioninae (sensu GEBIEN) vorhanden sind. Momentan ist die im Sinne GEBIEN und KULZER und auch von mir selbst gebrauchte Tribus Misolampini eine Mischgruppe verschiedener Typen, welche wegen der Flügellosigkeit ähnlich aussehende Formen aufweisen, d. h. sie haben ein kurzes Metasternum und fehlende Schulterbeulen. Ein Teil der hierher beschriebenen, bzw. gestellten Gattungen können leicht aus den vollgeflügelten Formen anderer Tribus abgeleitet werden. So habe ich vor kurzem die ungeflügelten Gattungen aus Neukaledonien *Isopus* MONTROUZIER, 1860, *Episopus* BATES, 1873, *Chlorocamma* BATES, 1873 sowie die Gattung *Metisopus* BATES, 1873 aus Norfolk I., welche bis jetzt der Tribus Misolampini zugeordnet waren, in die Tribus Cnodalonini gestellt (KASZAB, 1982).

Aus Neuguinea kennt GEBIEN (1920) keine Vertreter der Misolampini, dagegen ist eine Gattung der Eutelini, namentlich *Tabarus* GEBIEN, 1920 beschrieben. Diese Gattung ist außer der Flügellosigkeit aufgrund der dreigliedrigen Fühlerkeule, von der die zwei letzten Glieder eng verwachsen sind, sehr charakteristisch und hat, ausgenommen einer Gattung aus Madagaskar, *Asididius* FAIRMAIRE, 1869 keine Verwandten. Weil ich von der Gattung *Tabarus* GEBIEN, 1920 schon eine Revision geschrieben habe (KASZAB, 1976), lasse ich sie hier aus.

Man muß aber eine von mir beschriebenen neuguinischen Misolampini, *Osdara biroi* KASZAB, 1939 kurz erörtern. Sie wurde aufgrund eines männlichen Einzelstückes aus dem ehemaligen Deutsch-Neuguinea: Friedrich-Wilhelmshafen an der Nordostküste am Astrolabe Bay von L. BIRÓ gesammelt. Ob dieser Fundort richtig ist, bezweifle ich jetzt sehr, umso mehr als alle Arten der Gattung *Osdara* WALKER, 1858 ausschließlich in Sri Lanka vorhanden sind. Die Arten dieser Gattung anderer Gebiete, wie *Osdara brevipes* FAIRMAIRE, 1802 und *O. hovana* FAIRMAIRE, 1802 aus Madagaskar gehören zur Gattung *Sphaerocaulus* FAIRMAIRE, 1869, welche eine Schwestergruppe von *Osdara* darstellt. Die *Osdara nigriceps* ARDOIN, 1976 aus Uluguru (Ostafrika) ist ebenfalls keine *Osdara*, sondern synonym mit *Hyboproctus nigroperlatus* KULZER, 1950. Weil in Neuguinea in keinem neuen und alten Material ein weiteres *Osdara*-Exemplar gefunden worden ist, weiters mit *Osdara biroi* vollkommen ähnliche, aber nicht artidentische Arten nur in Sri Lanka vorhanden sind, denke ich, daß der Fundortzettel bei diesem Tier verwechselt worden ist und sie in Wirklichkeit aus Sri Lanka stammt. L. BIRÓ weilte bei der Rückkehr von seiner Neuguinea-Expedition eine kurze Zeit auch in Sri Lanka und die Etiketten wurden später leider vertauscht. Es kommen also im Sinne GEBIEN gebrauchte Misolampini bis heute in Neuguinea nicht vor.

Nun bekam ich die Tenebrioniden aus der 3. Archbold-Expedition aus dem Rijksmuseum Leiden zur Bearbeitung, unter denen ich eine Serie verschiedener Misolampini entdeckt habe, welche sich alle als neue Gattungen und Arten erwiesen haben. Das Material hat Dr. L. J. ΤΟΧΟΡΕΥΣ, als Teilnehmer der Niederländisch-Amerikanischen 3. Archbold-Expedition in dem ehemaligen Niederländischen Neuguinea während der zum Mt. Wilhelmina (4750 m) geleiteten Expedition, gesammelt.

Das besuchte Gebiet gehört zu den montanen und hochmontanen Regenwäldern Neuguineas, und die Misolampinen sind in den Höhen zwischen 1500—3250 m gesammelt worden. Es ist eine bekannte Erscheinung, daß die montanen Mooswälder zu ungeflügelten hochspezialisierten Tenebrioniden-Formen führen, wo die Arten meist sehr geringe Areale haben und die einzelnen Gebirgsgruppen durch verschiedene Barrieren voneinander getrennt sind. Man darf sich deshalb nicht wundern, daß die hierher gehörenden Formen so stark in verschiedene, jedoch nahe verwandte Gattungen und Arten zersplittert sind.

Die genauen Fundorte, wo TOXOPEUS sein Material sammelte, wurden in seiner kleinen Publikation angegeben und durch eine Karte vervollständigt. Der Ausgangspunkt der Expedition war Bernhard Camp am Idenburg River (etwa 200 km Luftlinie SW von Hollandia der Humboldt Bay) und von hier ausgehend führte die Expedition im allgemeinen in südlicher Richtung bis Lake Habbema, am nördlichen Fuß von Mt. Wilhelmina, welcher als höchster Punkt der neuguinischen Hochgebirge allgemein bekannt und in jeder Karte aufzufinden ist. Die Fundorte, von wo die hier beschriebenen Arten stammen, wurde von TOXOPEUS folgenderweise charakterisiert (TOXOPEUS, 1940):

Lake Habbema, ±15 km N. of Mt. Wilhelmina. Moorland, ferns and sparse coniferous forest, furthermore the highest outposts of the high mountain moss forest. Altitudes: surface of Lake at ±3225 m, surrounding hills to 3400 m; most of materials gathered at 3250 m. Time: dry season, June 29—July 29, 1938, some specimens in the beginning of the rain season, chiefly by native collectors (mantri's) during September.

Moss Forest Camp, in high jungle at good 5 km N. E. from Lake Habbema. High mountain moss forest, of mainly *Sycopsis* (?) trees, few Conifers, thick undergrowth of Orchids and Ferns. At a hundred meters lower down local change into richer vegetation without thick moss, due to sheltered position. Altitude: 2800 m. Some further collecting was done at 3000 m, at a small plateau with bogs and Conifers, recalling the Lake Habbema surroundings; at 2700 m in the rich rainy forest, and at 2600 m in a deep ravine with much insect life owing to its open condition. Time: Preliminary excursion Aug. 22—24, 1938, in the dry season; afterwards a stay from Oct. 8—Nov. 6, 1938, in the rains.

Mist Camp, on the mountains ridge S. of Bernhard Camp on the Idenburg R. Dense, very damp forest in a saddle. Altitude: 1800 m. Time: Dec. 25, 1938—Jan. 6, 1939 by the assistant and mantris, then till Jan. 19 by all collectors. Rainy season, nearly no sunshine but constantly fog and rain.

Top Camp, an outpost of Mist Camp, situated on a sparsely overgrown summit, less cloudy. Altitude: amply 2100 m. Time: Jan. 20—25, 1939, thereafter the mantris to Febr. 10.

Lower Mist Camp, below the fog zone in a sheltered ravine, which came out into the head-waters of the Sahuweri R. Altitude: 1560 m, but collections were made from 1400—1700 m. Time: Jan. 26—Febr. 2, 1939.

Sigi Camp, situated in the swampy Sigi River Valley, more open and more exposed to the sun than Rattan Camp. Altitude: 1500 m, but collecting was done between 1300—1600 m. Time: Febr. 15—28, 1939.

Aus dieser Beschreibung der Fundorte geht eindeutig hervor, daß die Misolampinen in den Regenwäldern der montanen Mooszone, vorwiegend in Koniferenwäldern gesammelt wurden. An welche Pflanzenassoziation sie gebunden sind, ist nicht bekannt.

Im Folgenden beschreibe ich 4 neue Gattungen und 6 neue Arten und zur leichteren Orientierung gebe ich eine Bestimmungstabelle der hierher beschriebenen Arten.

Danksagung. Es sei auch an dieser Stelle Herrn J. KRIKKEN (Leiden) gedankt, daß er mir das wertvolle und einzigartige Material zur Verfügung gestellt hat.

BESTIMMUNGSTABELLE DER IN DEN ZENTRALEN HOCHGEBIRGEN NEUGUINEAS VORHANDENEN MISOLAMPINEN

- 1 (2) Alle Schienen sind am Außenrand durchwegs scharf und tief gefurcht, in der Furche mit einem äußerst feinen Längskiel. Schenkel glatt, nur am Ende seitlich dicht punktiert, Schienen, ausgenommen die Furche, grob punktiert, Propleuren punktiert längsgerunzelt, Prosternum grob punktiert. Halsschild flach, Seitenrand mit 5 stump-

fen Winkeln wellenförmig, Vorderrand tief ausgerandet, Vorderecken scharf vorgezogen, Hinterrand doppelbuchtig. Flügeldecken oval, mit groben Reihenpunkten und gewölbten Zwischenräumen, 3., 4. und 5. am Ende mehr gewölbt, glatt. Abdomen glatt, das Analsegment auch am Ende nicht punktiert. — Länge: 12–13 mm

Papumisolampus toxopeusi sp. n.

- 2 (1) Alle Schienen sind drehrund, resp. im Querschnitt oval, Außenrand ohne breite Furche.
- 3 (4) Alle Beine sind glatt. Vorder- und Hinterschenkel beim ♂ unbehaart. Prosternum erloschen punktiert, Propleuren glatt, Abdomen glatt. Halsschild ziemlich flach, Vorderecken scharfwinklig vorgezogen, Seitenrand vor der Basis ausgeschweift, Basalrand doppelbuchtig. Flügeldecken hochgewölbt, mit groben Punktreihen, die Zwischenräume gewölbt, glatt. — Länge: 12,6–15 mm
- Irianobates krikkeni sp. n.**
- 4 (3) Alle Beine sind sehr grob gerunzelt oder einzeln punktiert. Prosternum und Propleuren äußerst grob punktiert, Abdomen mehr oder weniger punktiert, wenigstens aber das Ende des Analsegments dicht punktiert. Halsschild in beiden Richtungen gewölbt, Seitenrand vor den Hinterecken ausgeschweift.
- 5 (6) Vorder- und Hinterschenkel unten beim ♂ unbehaart. Hinterschenkel am Ende innen beim ♂ mit einem Zähnnchen, welches länger ist als der Enddorn. Flügeldecken kurz, hochgewölbt, kaum länger als die größte Breite (40 : 38), die Zwischenräume sind scharf wellenartig erhaben, die Punkte sind breit und flach, der Grund der Punkte etwas gekörnelt, zwischen den Punkten mit flachen Quererhabenheiten. Halsschild anderthalbmal so breit wie in der Mitte lang, Seitenrand leicht gewellt. Abdomen glatt, nur das Analsegment am Ende und das 1. Segment zwischen den Hinterhüften punktiert. — Länge: 10 mm
- Bradysphaerotus papuanus sp. n.**
- 6 (5) Vorderschenkel unten beim ♂ abstechend behaart, Hinterschenkel unten mit einem anliegenden Haarstreifen. Hinterschienen am Ende innen beim ♂ ohne Zahn. Flügeldecken oval, 1,28–1,36mal so lang wie die Breite. Halsschild schmal, 1,2–1,3mal so breit wie die Länge in der Mitte. Abdomen meist grob punktiert.
- 7 (8) Die Schläfen sind hinter den kleinen Augen kurz parallel, und nachher verschmälern sie sich in einem Bogen zum Hals. Flügeldecken mit groben Punktreihen, die Punkte sind voneinander separiert die Zwischenräume sind breit und gewölbt, glatt. Hinterschienen gerade. Halsschild mit leicht abgeflachten Seiten. — Länge: 11,5–12,3 mm
- Apterobrachys montanus sp. n.**
- 8 (7) Die Schläfen sind gleich hinter den großen gewölbten Augen gerade zum Hals verjüngt. Hinterschienen des ♂ mehr oder weniger aufwärts gebogen.
- 9 (10) Flügeldecken mit groben, flachen Reihenpunkten, welche am Grund mit erloschenen feinen Mikrokörnchen besetzt sind, und der Grund ungleich; die Zwischenräume sind schmal, gewölbt und glatt. Halsschildseiten an der Basis stark eingeschnürt, die Scheibe ist weniger hoch gewölbt. Hinterschienen des ♂ kaum gebogen. — Länge: 9–12 mm
- Apterobrachys wilhelminae sp. n.**
- 10 (9) Flügeldeckenzwischenräume schmal dachförmig scharf erhaben, dazwischen ist der Grund breit, ungleich gerunzelt und gekörnt, ohne separiert erkennbare Reihenpunkte. Hinterschienen des ♂ stark gebogen. — Länge: 11,5 mm
- Apterobrachys paniaiensis sp. n.**

Papumisolampus gen. n.

Ungeflügelt. Kopf mit vorstehenden, gewölbten Augen, Wangen mit dem Clypeus gemeinsam nach vorn verengt, Clypeus bildet mit der breiten Stirn eine gleichmäßige Fläche, vorn gerade abgestutzt, beiderseits abgebogen. Schläfen gleich hinter den Augen bis zum Hals gerade verengt, Augenfurche hinten tief und läuft schräg nach außen. Sehr dicht punktiert. Zwischen Oberlippe und Clypeus keine Gelenkhaut sichtbar. Mentum trapezförmig, die Vorderecken sowie die Scheibe beiderseits der Mitte eingedrückt, die Mitte gekielt, die Eindrücke sind seitlich scharf kielförmig begrenzt. Fühler vom 6. Glied an leicht verdickt, das 3. Glied lang, die 6 Endglieder sind lose gegliedert.

Halschild scheibenförmig, nach vorn und hinten verengt, Vorderrand bogenförmig, Hinterrand doppelbuchtig. Sehr dicht punktiert. **Schildchen** klein, dreieckig. **Flügeldecken** hochgewölbt, kurzoval, Seiten nieder gebogen, von oben her nur die 6 inneren Punktreihen sichtbar, die 3 seitlichen geneigt. Die Punktreihen sind grob, Zwischenräume gewölbt. Epipleuren der Flügeldecken schmal, an den Schultern nur wenig erweitert, innen ungerandet. **Prosternum** und **Propleuren** stark punktiert, zwischen den Hüften flach, beiderseits gerandet, hinten gerade und spitzwinklig vorgezogen. **Mittelbrust** in der Mitte leicht V-förmig eingedrückt, bei seitlicher Ansicht mit stumpfen Ecken. **Hinterbrust** sehr kurz, Hinterrand der Mittelhüften und Vorderrand der Hinterhüften tief gerandet. 1. **Abdominalsegment** zwischen den Hinterhüften vorn breit gebogen, vorgezogen, scharf gerandet. **Beine** dünn, Schenkel glatt, alle Schenkel vor dem Knie etwas eingeschnürt, kahl. Alle Schienen am Oberrand mit beiderseits scharf begrenzter Furche, welche je einen feinen Mittelkiel hat, sonst sind sie grob punktiert und dünn, gerade; die Enddorne sind sehr klein. Tarsen einfach, Unterseite gelb, schräg abstehend behaart.

Gattungstypus: *Papuamisolampus toxopeusi* sp. n.

Diese neue Gattung ist vor allem durch die Beinform sehr charakteristisch, und aufgrund dieses Merkmals kann sie leicht von den Verwandten unterschieden werden, die Schienen sind bei allen übrigen papuanischen Arten am Außenrand nicht gefurcht.

Das Gattungsmerkmal, namentlich die gefurchten Schienen am Außenrand, kommt bei mehreren orientalischen Gattungen vor: *Cryptostenophanes* KASZAB, 1941, *Phymaeus* PASCOE, 1883, *Euphloeus* PASCOE, 1887 und *Spheneuphloeus* KASZAB, 1941. Unter diesen steht die neue Gattung noch *Phymaeus* PASC. am nächsten, welche Gattung aber mehrere hochgewölbte Tuberkel an den Flügeldecken hat, und die Furche der Schienen ohne feinen Mittelkiel.

***Papuamisolampus toxopeusi* sp. n. (Abb. 1)**

Körper schwarz, Flügeldecken mit sehr schwachem metallischen Schimmer, Fühler gegen das Ende bräunlich, die Behaarung der Tarsen gelb. Kopf äußerst dicht, etwas längsgerunzelt punktiert. Augen hochgewölbt, aus der Wölbung des Kopfes vorragend, von oben gesehen quer, Augenfurchen gegen den Vorderrand der Augen verschwunden, nach hinten tief und schräg nach außen gerichtet. Stirn und Clypeus flach, Clypealfurche erloschen, nur der Quere nach leicht eingedrückt. Hals, die Breite an den Augen, an der Basis der Wangen und Stirn verhalten sich wie 63 : 75 : 66 : 44. Fühler hintergelegt die Mitte des Halsschildes weit überragend, vom 6. Glied an breiter, die Keule nur schwach abgesetzt. Die Länge der Glieder 2—11 verhält sich

wie 17 : 39 : 27 : 25 : 22 : 23 : 23 : 24 : 37 und die Breite wie 15 : 14 : 16 : 16 : 19 : 24 : 26 : 26 : 26 : 29; das Endglied 1,27mal so lang wie breit, ziemlich parallel, das Ende leicht abgerundet, die Glieder 6—11 lose gegliedert. Hals schild 1,34mal so breit wie die Länge in der Mitte. Seitenrand nach vorn und hinten verengt, der Rand mit 5 stumpfen Ecken, deshalb erscheint die Seite wellenartig, vor den scharf spitzwinkligen Hinterecken ausgeschweift. Vorderrand im Bogen ausgerandet, die Vorderecken sind spitzwinklig vorgezogen. Hinterrand doppelbuchtig. Oberseite sehr dicht, etwas gröber als der Kopf punktiert, die Scheibe vor der Basis spärlicher, die abgeflachten Seiten dichter und runzelig punktiert, der Grund glatt. Die Breite an der Basis, in der Mitte und an den Vorderecken sowie die Länge in der Mitte verhalten sich wie 28 : 33 : 24 : 24. Schildchen sehr klein, breit dreieckig. Flügeldecken 1,32mal so lang wie die gemeinsame Breite weit vor der Mitte; an den Schulterecken kaum breiter als die Halsschildbasis, an der breitesten Stelle 1,3mal breiter als die Halsschildmitte (43 : 33). Eiförmig, mit 9 groben Punktreihen und neben dem Schildchen mit ganz kurzen Skutellarstreifen. Die Punktreihen sind voneinander separiert, die Zwischenräume gewölbt und glatt. Bei Seitenansicht sind die Flügeldecken hoch gebogen, der höchste Punkt liegt etwa den Hinterhüften gegenüber. Die seitlichen Zwischenräume sind geneigt und heruntergebogen, von oben nur das etwas ausgezogene Ende sichtbar. Prosternum zwischen den Hüften gerade nach hinten vorgezogen, lang spitzwinklig ausgezogen, beiderseits dick gerandet, am Vorderrand der Hüften der Quere nach etwas eingedrückt, vor den Hüften breit und flach, grob runzelig punktiert. Propleuren an der Basis längsgerunzelt, vorn erloschener, länglich punktiert und gerunzelt. Mittelbrust in der Mitte eingedrückt, die Epimeren sind grob einzeln punktiert. Hinterbrust zwischen den Mittel- und Hinterhüften sehr kurz, vorn und hinten, ausgenommen die Mitte, sehr scharf gerandet, seitlich gerunzelt, Epipleuren fein und dicht punktiert. Abdomen glänzend, das 1. Segment vorn scharf gerandet, die Randung in der Mitte zwischen den Hüften erloschen. Das 1. Segment vorn erloschen längsgerunzelt, die übrigen Segmente äußerst spärlich und fein punktiert, auch das Analsegment glatt. Beine gerade, Schenkel nur kaum gekeult, vor dem Ende sind sie eingeschnürt und seitlich dicht punktiert, sonst glatt. Alle Schenkel unten kahl, mit vom Ende an ziehender, allmählich flacherer Furche. Schienen gerade, Außenrand aller Schienen scharf doppelt gefurcht, d. h. zwischen den beiden Furchen zieht sich ein sehr feiner Kiel, sonst sind die Seiten- und Unterseite runzelig punktiert. Tarsen einfach, alle Krallenglieder sind lang, Unterseite beim ♂ dicht gelb behaart, beim ♀ kürzer. Die Länge der Glieder 1—4 der Hintertarsen verhält sich wie 20 : 11 : 11 : 38. — Länge : 12—13 mm.

Holotypus ♀: "Neth. Ind. — American/New Guinea Exped. Top /Camp 2100 m/ 19. I. 1939 L. J. TOXOPEUS". Paratypus: id., 28. I. 1939 L. J. TOXOPEUS (1 ♀).

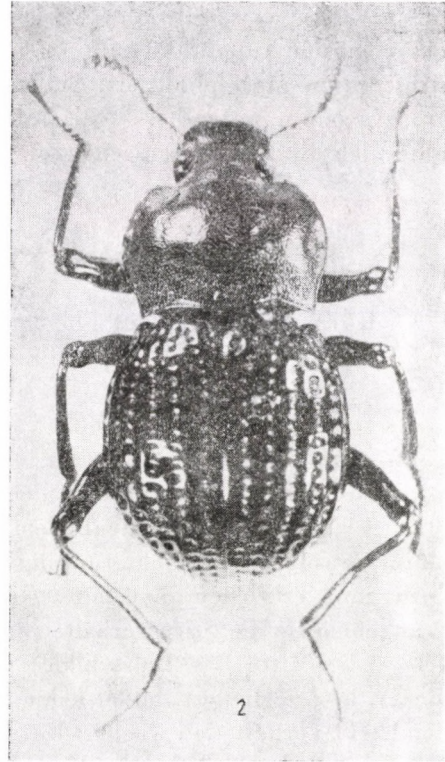
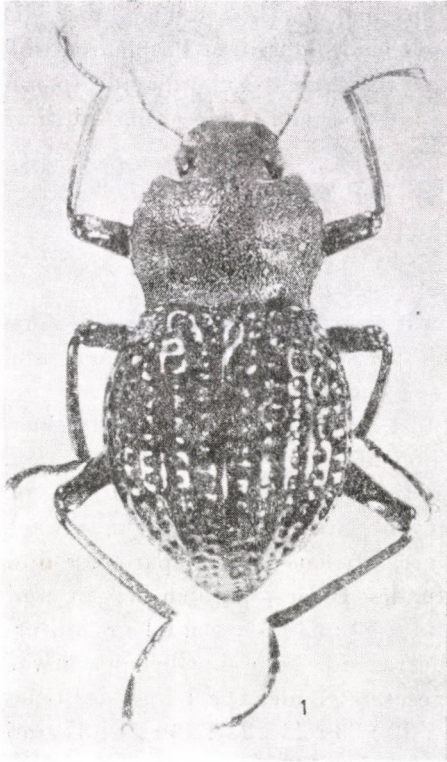


Abb. 1. *Papuamisolampus toxopeusi* gen. n., sp. n. ♀ — Abb. 2. *Irianobates krikkeni* gen. n., sp. n. ♂ (Photo: G. HORVÁTH & A. KEVE)

Die neue Art benenne ich zu Ehren ihres Entdeckers, Herrn Dr. L. J. TOXOPEUS, der als Entomologe an der Archbold-Expedition teilnahm.

Irianobates gen. n.

Ungeflügelt. Kopf, Fühler, Halsschild und Flügeldecken sowie Mittel- und Hinterbrust mit der Gattung *Papuamisolampus* gen. n. identisch. Prosternum vor den Hüften kaum und erloschen punktiert, zwischen den Hüften gerandet, das Ende spitzwinklig gerade ausgezogen, ohne grobe Skulptur; Propleuren ganz glatt. Beine lang und glatt, Schenkel etwas gekault, vor dem Ende eingeschnürt, Unterseite der Vorderschenkel glatt, unbehaart, Hinterschenkel ebenfalls unbehaart. Alle Schienen sind dünn und im Querschnitt rundlich, der Außenrand glatt, die Unterseite aller Schienen leicht gefurcht und fein skulptiert, Tarsen dünn.

Gattungstypus: *Irianobates krikkeni* sp. n., bis jetzt monotypisch.

Nächstverwandt mit *Papuamisolampus* gen. n., bei welcher aber die Schienen am Außenrand gefurcht und gekielt sind, außerdem Propleuren und Prosternum grob punktiert. Sie steht *Bradysphaerotus* gen. n., und *Aptero-brachys* gen. n. nahe, bei diesen Gattungen sind aber alle Beine grob skulptiert und auch die Propleuren sehr grob punktiert.

***Irianobates krikkeni* sp. n. (Abb. 2)**

Körper schwarz, die Flügeldecken mit sehr schwachem metallischem Schimmer, Fühler und Palpen braun, Schenkel schwarzbraun, Schienen und Tarsen heller braun. Kopf mit großen, aus der Wölbung des Kopfes wenig vortretenden Augen, bei Ansicht von oben fast rundlich. Schläfen an der Basis kaum schmaler als die Augen, nach hinten bogenförmig verengt. Augenfurchen vorn und innen schmal, hinter den Augen tief und schräg nach außen zum Hals reichend, den Schläfenbalken begrenzend. Stirn breit, der Quere nach kaum gewölbt, sehr dicht runzelig punktiert, Clypeus feiner, spärlicher und vorn ganz erloschen punktiert. Die Breite des Halses, an den Augen und Wangen sowie die Stirn verhalten sich wie 60 : 69 : 63 : 42. Fühler hintergelegt die Mitte des Halsschildes weit überragend, vom 6. Glied an etwas dicker, lose gegliedert, bildet keine gut abgesetzte Keule. Die Länge der Glieder 1—11 verhält sich wie 30 : 15 : 35 : 25 : 22 : 23 : 23 : 23 : 23 : 24 : 37 und die Breite wie 22 : 15 : 16 : 17 : 17 : 20 : 23 : 27 : 28 : 30 : 30; das Endglied nur wenig länger als breit, das Ende angerundet. Halsschild 1,32mal so breit wie lang, in der Mitte am breitesten, nach vorn und hinten verengt, vor den Hinterecken ausgeschweift, Hinterrand doppelbuchtig, die Hinterecken scharf rechtwinklig, Vorderrand ausgerandet, die Vorderecken spitzwinklig. Die Breite an der Basis, in der Mitte und an den Vorderecken sowie die Länge in der Mitte verhalten sich wie 30 : 37 : 24 : 28. Oberseite in beiden Richtungen bis zu den Rändern gewölbt, neben dem Seitenrand nur schmal und leicht verflacht. Die Punktierung ist gröber als die des Kopfes, aber die Abstände der Punkte etwa so breit wie die Punkte selbst, die Punkte sind rundlich. Schildchen sehr klein, breit dreieckig. Flügeldecken eiförmig, sehr hoch gewölbt, 1,27mal so lang wie die größte Breite und bei seitlicher Ansicht 1,64mal so hoch wie die Länge; die höchste Biegung befindet sich etwa dem 1. Abdominalsegment gegenüber. Mit 9 groben Punktreihen, von welchen die drei seitlichen niedergebogen und in Ansicht von oben nicht sichtbar sind. Die Zwischenräume sind gewölbt, glatt. Prosternum zwischen den Hüften gerade, spitzwinklig ausgezogen, beiderseits mit tiefer Furche und dazwischen in der Mitte mit einem stumpfen Kiel, welcher bis zum Quereindruck zwischen den Hüften ausläuft; Vorderrand der Hüften tief gerandet, vor den Hüften spärlich und grob punktiert. Propleuren vollkommen glatt.

Mittelbrust in der Mitte tief eingedrückt, bei seitlicher Ansicht gibt es keine Ecke. Epimeren erloschen grob punktiert. Mittelbrust sehr kurz, vorn und hinten scharf und breit gerandet, die Randung endet innen am Innenrand der Hüften in je einer tiefen Grube. Epipleuren glatt. Abdomen glatt, beim ♂ ist die Mitte des 2. Segments sehr spärlich und äußerst fein mit einigen Körnchen besetzt; Analsegment unpunktiert. B e i n e ziemlich dünn; Schenkel etwas gekeult, glatt, vor dem Ende eingeschnürt, und an der Außenseite mit je einem kleinen Eindruck. Alle Schenkel sind bei ♂ nackt. Schienen dünn und gerade, Außenrand aller Schienen glatt, seitlich und innen sehr spärlich erloschen punktiert, Unterseite aller Schienen flach, sogar etwas gefurcht. Innen- und Außenrand der Hinterschienen unten beim ♂ mit schmalen Haarstreifen. Tarsen dünn, das Krallenglied aller Tarsen lang, die Länge der Glieder der Hintertarsen 1—4 verhält sich wie 60 : 28 : 29 : 100. — L ä n g e : 12,6—15 mm.

Holotypus ♂: "Neth. Ind. — American/New Guinea Exped. /Mist Camp 1800 m/ I. 1939 L. J. TOXOPEUS". — Paratypen wie Holotypus ♂ (1 ♂ 1 ♀), id., 12. I. 1939, L. J. TOXOPEUS (1 ♂); Sigi Camp 1500 m, II. 1939, L. J. TOXOPEUS (1 ♀); Lower Mist Camp, 1550 m, 3. I. 1939, L. J. TOXOPEUS (1 ♂).

Die neue Art sei meinem Kollegen, Herrn J. KRIKKEN (Leiden), dem anerkannten Spezialisten der Cetoninae gewidmet, der meine Studien mit Untersuchungsmaterial förderte.

Bradysphaerotus gen. n.

Ungeflügelt. K o p f grob skulptiert, Augen vorstehend, nierenförmig, stark gewölbt, Augenfurchen sehr tief, schräg nach außen gerichtet und die Innenseite der Schläfen zum Scheitel begrenzt. Clypeus, Mentum und Fühler wie bei *Papuanisolampus gen. n.* H a l s s c h i l d anderthalbmal so breit wie die Länge in der Mitte, die Scheibe sehr grob und dicht punktiert, Seitenrand scharf, nach vorn und hinten verengt, vor der Basis ausgeschweift, Hinterrand doppelbuchtig, Vorderrand fast gerade. S c h i l d c h e n sehr klein. F l ü g e l d e c k e n kaum merklich länger als die gemeinsame Breite, sehr hoch gewölbt, die seitlichen Zwischenräume geneigt, von oben nicht sichtbar. Die Zwischenräume sind schmal und leicht wellenförmig scharf vortretend, die Reihenpunkte sind sehr groß und ganz flach, der Grund erloschen, fein gekörnelt. P r o s t e r n u m und Propleuren sehr grob punktiert, Prosternum hinter den Hüften mit einer kurzen, stumpfen, aufrecht stehenden Ecke. Mittelbrust in der Mitte nicht scharf begrenzt eingedrückt. Hinterbrust äußerst kurz, der Rand hinter den Mittelhüften sehr fein, vor den Hinterhüften dagegen breit und tief. Abdominalsegmente glatt, ausgenommen das

Ende des Analsegments und den Fortsatz des 1. Segments zwischen den Hinterhüften. *Beine* dünn, grob skulptiert. Vorder- und Hinterschenkel beim ♂ unten nackt. Schienen dünn und im Querschnitt rundlich. Hinterschienen am Ende innen beim ♂ mit einer scharfen Ecke, welche länger ist als die Enddorne. Tarsen dünn und einfach.

Gattungstypus: *Bradysphaerotus papuanus* sp. n.

Nächstverwandt mit der neuen Gattung *Apterobrachys* gen. n.; bei *Bradysphaerotus* sind aber die Schenkel beim ♂ unbehaart, außerdem die Hinterschienen innen am Ende mit einem scharfen Zähnchen versehen und die Flügeldecken fast rundlich. Demgegenüber besitzt *Apterobrachys* eine einfache Hinterschiene des ♂, außerdem die Vorderschenkel unten abstehend und die Hinterschenkel unten anliegend streifenartig behaart und die Flügeldecken oval. Die verwandte Gattung *Papuanisolampus* gen. n. ist aufgrund der gefurchten Schienen und die Gattung *Irianobates* gen. n. durch die glatten Beine und Propleuren leicht zu unterscheiden.

***Bradysphaerotus papuanus* sp. n. (Abb. 3)**

Ungeflügelt. Körper schwarz, Flügeldecken wenig glänzend, Fühler und Palpen sowie die Tarsen braun. *Kopf* sehr dicht, gerunzelt punktiert, Stirn flach und breit, Clypeus leicht der Länge nach gewölbt und die Punktierung etwas spärlicher. Augen hochgewölbt, ragen aus der Wölbung des Kopfes heraus. Augenfurchen sehr tief und breit, schräg nach außen zum Hals verlaufend. Schläfen kurz, gerade stark verengt. Die Breite am Hals, an den Augen und Wangen sowie die Stirn verhalten sich wie 53 : 65 : 55 : 40. *Fühler* hintergelegt die Mitte des Halsschildes weit überragend, vom 6. Glied an dicker, diese 6 Glieder sind lose gegliedert. Die Länge der Glieder 1—11 verhält sich wie 25 : 13 : 34 : 25 : 24 : 23 : 23 : 23 : 23 : 23 : 38 und die Breite wie 17 : 13,5 : 14 : 14 : 15 : 19 : 21 : 23 : 23 : 23 : 25; das Endglied oval, anderthalbmal so lang wie die Breite. *Halsschild* 1,6mal so breit wie lang, in der Mitte am breitesten, nach vorn und hinten gebogen stark verengt, Seiten vor den Hinterecken leicht ausgeschweift, Hinterrand doppelbuchtig, Vorderrand fast gerade, die Scheibe vor der Basis der Quere nach leicht eingedrückt, Seitenrand ebenfalls etwas verflacht, sonst in beiden Richtungen einfach gewölbt, äußerst grob runzelig punktiert, die Ränder der Punkte sind glatt. Die Breite an der Basis, in der Mitte, an den Vorderecken und die Länge in der Mitte verhalten sich wie 23 : 30 : 18 : 19. *Schildchen* sehr klein, dreieckig. *Flügeldecken* kaum länger als die gemeinsame Breite (44 : 38), sehr hoch aufgeblasen, bei seitlicher Ansicht verhält sich die Länge der Flügeldecken und die Breite des Hinterkörpers mit Brust und Abdomen wie 44 : 31, die Nahtlinie bei Seitenansicht sehr stark gebogen. Mit einem kurzen

Skutellareindruck und 9 sehr groben Punktreihen, welche sehr flach und breit sind, ungleich fein glänzend gekörnt und der Grund erloschen chagriniert. Die Zwischenräume schmal dachförmig gewellt. Die seitlichen 3 Zwischenräume sind nach unten geneigt und bei Ansicht von oben nicht sichtbar. Prosternum und Propleuren sehr grob und dicht, einzeln punktiert; Prosternum zwischen den Hüften flach, etwas geneigt, das Ende ausgezogen und mit einer kurzen, aufrecht stehenden Spitze, am Vorderrand der Hüften kurz und seicht gerandet, Mittelbrust in der Mitte vertieft, seitlich ohne Ecke, die Epimeren mit wenigen groben Punkten, Hinterbrust sehr kurz, vor den Hinterhüften breit und tief, hinter den Mittelhüften schmal und feiner gerandet, die Mitte weder vorn noch hinten gerandet, seitlich erloschen punktiert, Epipleuren fast glatt. Abdomen glatt, nur das Analsegment und der Fortsatz des 1. Segments zwischen den Hinterhüften punktiert. Beine dünn, grob punktiert. Schenkel nicht gekeult, Unterseite der Vorder- und Hinterschenkel nackt. Vorder-schienen dünn, merklich gebogen, außen nicht gefurcht, im Querschnitt rundlich, das Ende innen endet beim ♂ in einer kurzen Spitze, welche deutlich kürzer ist als die Enddorne. Hinterschienen dünn und gerade, das Ende innen mit einem längeren, am Ende abgestutzten Zähnchen, welches länger ist als die Enddorne. Alle Schienen sind unten leicht abgeflacht, resp. wenig gefurcht. Die Tarsen sind dünn, unten gelb behaart, die Länge der Glieder 1—4 der Hintertarsen verhält sich wie 50 : 24 : 25 : 75. — Länge : 10 mm.

Holotypus ♂: "Neth. Ind. — American/New Guinea Exped. /Mist Camp 1800 m/ 12. I. 1939, L. J. TOXOPEUS".

Aptero-brachys gen. n.

Ungeflügelt. Kopf, Mentum und Fühler wie bei *Bradysphaerotus* gen. n. Halsschild in der Mitte am breitesten, nach vorn und hinten verengt, vor der Basis ausgeschweift, Scheibe gewölbt; Vorderkörper sehr dicht und grob punktiert. Schildchen klein, dreieckig. Flügeldecken oval, mit Längsrippen oder gewölbten Zwischenräumen. Prosternum und Propleuren sehr grob punktiert, Prosternum hinter den Hüften mit einer kleinen, aufrecht stehenden Ecke. Mittelbrust in der Mitte nicht scharf eingedrückt, bei seitlicher Ansicht ohne Ecke. Hinterbrust sehr kurz, vorn hinter den Mittelhüften und hinten vor den Hinterhüften scharf gerandet. Abdomen grob punktiert, 1. Segment vorn zwischen den Hinterhüften breit abgerundet vorgezogen. Beine einfach, Schenkel nicht gekeult, grob punktiert, Vorder-schenkel des ♂ unten abstehend behaart, Hinterschenkel unten mit einem schmalen Haarstreifen; Schienen dünn und im Querschnitt rundlich oder oval, grob punktiert, Außenrand ohne Furche. Hinterschienen des ♂ am Ende innen ohne Ecke. Tarsen einfach.

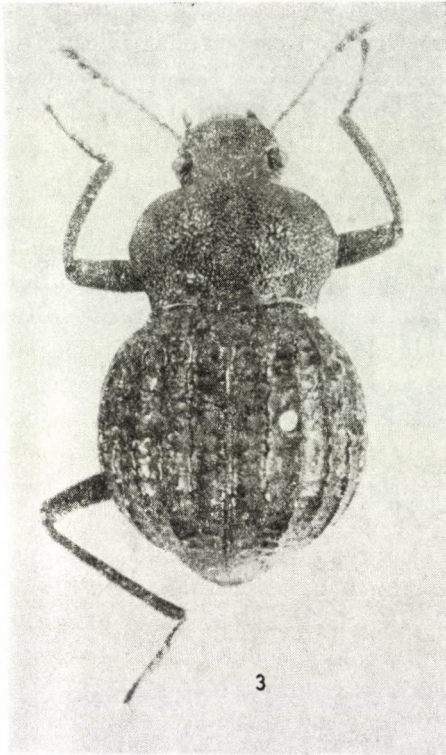


Abb. 3. *Bradysphaerotus papuanus* gen. n., sp. n. ♂ — Abb. 4. *Apterobrachys montanus* gen. n., sp. n. ♂ (Photo: G. HORVÁTH & A. KEVE)

Gattungstypus: *Apterobrachys wilhelminae* sp. n.

Die Gattung ist außer der groben Skulptur der Unterseite und Beine durch die beim ♂ unten behaarten Vorder- und Hinterschenkel sowie die einfachen Hinterschienen und die ovalen Flügeldecken ausgezeichnet. Die nächstverwandte Gattung *Bradysphaerotus* gen. n. besitzt rundliche und nicht ovale Flügeldecken sowie beim ♂ eine Ecke innen an den Hinterschienen. Die Gattung *Irianobates* gen. n. hat glatte Beine, wenigstens alle Schienen am Außenrand glatt. Schließlich ist *Papuamisolampus* gen. n. durch die scharf gefurchte Außenseite der Schienen gekennzeichnet.

Es gehören hierher drei Arten.

Apterobrachys montanus sp. n. (Abb. 4)

Ungeflügelt, glänzend schwarz. Kopf mit kleinen, quergestellten, gewölbten Augen. Schläfen hinter den Augen nicht schmaler, kurz parallel und zum Hals in einem breiten Bogen verengt. Wangen schmaler als die Augen,

nach vorn gerade verengt, Clypealsutur kaum eingeschnitten. Oberseite sehr grob und dicht, eng aneinanderstoßend, stellenweise runzelig punktiert. Stirn breit, der Quere nach gewölbt. Augenfurchen tief. Die Breite am Hals, an den Augen und Wangen sowie die Stirn verhalten sich wie 62 : 68 : 51 : 48. Fühler hintergelegt die Mitte des Halsschildes weit überragend, vom 6. Glied an dicker, jedoch ohne abgesetzte Keule. Die Länge der Glieder 1—11 verhält sich wie 25 : 16 : 32 : 26 : 20 : 22 : 23 : 23 : 23 : 23 : 32 und die Breite wie 20 : 15 : 15 : 15 : 16 : 20 : 25 : 29 : 18,5 : 29 : 32; das Endglied rundlich. Halsschild 1,4mal so breit wie lang, in der Mitte am breitesten, Seiten breit gebogen, vor den scharf rechtwinkligen Hinterecken leicht ausgeschweift, Hinterrand doppelbuchtig. Vorderrand ebenfalls doppelbuchtig, die Vorderecken sind rechtwinklig vorgezogen. Scheibe vor der Basis leicht quer eingedrückt, die Seite ziemlich breit, aber seicht abgeflacht, die Scheibe in beiden Richtungen gewölbt. Sehr dicht und grob punktiert, die Punkte stoßen eng aneinander, die Ränder der Punkte glatt. Die Breite an der Basis, in der Mitte und an den Vorderecken sowie die Länge in der Mitte verhalten sich wie 26 : 33 : 22 : 24. Schildchen klein, breit dreieckig. Flügeldecken 1,4mal so lang wie die gemeinsame Breite in der Mitte, oval, an der Basis so breit wie die Halsschildbasis, in der Mitte aber deutlich breiter als der Halsschild (wie 38 : 33). Oberseite mit 9 sehr groben Punktreihen und eine kürzere Reihe neben dem Schildchen. Die Punkte der Reihen voneinander separiert, die Zwischenräume gewölbt, glatt, die 3 äußeren Zwischenräume heruntergeneigt, von oben nicht sichtbar. Prosternum gerunzelt punktiert, zwischen den Hüften flach, nach hinten leicht geneigt, die Mitte hinter den Hüften eingedrückt, das Ende kurz ausgezogen und mit einer kleinen, aufwärts stehenden Ecke. Propleuren äußerst grob punktiert, die Punkte stoßen eng aneinander. Epipleuren mit einigen groben Punkten. Hinterbrust sehr kurz, vorn hinter den Mittel Hüften und hinten vor den Hinter Hüften gefurcht, sie enden innen in je einer Grube, dazwischen dicht, wie die Epipleuren punktiert. Abdomen punktiert, das 2. und 3. Segment aber sehr spärlich und fein, die Basis des Analsegments glatt. Beine normal, Schenkel wenig gekault, vor dem Ende kaum eingeschnürt, grob punktiert, Mittel- und Hinterschenkel basal fast glatt. Vorderschenkel beim ♂ innen abstehend fein (schwer erkennbar) behaart, Hinterschienen unten beim ♂ mit feinen Haarstreifen. Schienen grob punktiert, im Querschnitt rundlich oder oval, Innenrand der Schienen fein behaart, Hinterschienen an der Unterseite innen mit einem Haarstreifen. Hinterschienen gerade. Tarsen ohne besondere Kennzeichen. Die Länge der Glieder 1—4 der Hintertarsen verhält sich wie 35 : 21 : 21 : 80. — Länge : 11,5—12,3 mm.

Holotypus ♂: "Neth. Ind. — American/New Guinea Exped. /Mist Camp 1800 m/ I. 1939 L. J. TOXOPEUS". — Paratypen wie Holotypus ♂ (1 ♂ 3 ♀), id., 12. I. 1939, L. J. TOXOPEUS (1 ♀).

Von den nächstverwandten beiden Arten *A. wilhelminae* sp. n. und *A. paniaiensis* sp. n. durch die Skulptur der Flügeldecken verschieden (siehe Tabelle).

***Apterobrachys wilhelminae* sp. n. (Abb. 5)**

Ungeflügelt. Körper schwarz, Fühler und Palpen braun, Beine oft schwarzbraun und die Tarsen heller. Kopf mit hoch aufgewölbten Augen, welche aus der Wölbung des Kopfes vorragen, Schläfen hinter den Augen schmal, gerade stark verengt, Augenfurchen tief, hinten am Hals sind sie nicht scharf begrenzt. Wangen schmaler als die Augen, gebogen verengt. Clypealfurche der Quere nach leicht eingedrückt. Stirn breit, etwas gewölbt. Oberseite sehr grob und dicht aneinanderstoßend punktiert, die Ränder der Punkte sind glatt. Die Breite am Hals, an den Augen und Wangen sowie die Stirn verhalten sich wie 49 : 59 : 53 : 40. Fühler hintergelegt die Mitte des Halsschildes weit überragend, vom 6. Glied an dicker, ohne abgesetzte Keule. Die Länge der Glieder 1—11 verhält sich wie 20 : 14 : 25 : 20 : 18 : 18 : 18 : 18 : 20 : 20 : 29 und die Breite wie 15 : 13 : 13 : 13 : 13 : 15 : 18 : 20 : 21 : 22 : 24; das Endglied oval. Halsschild 1,2mal so breit wie lang, in der Mitte am breitesten, Seiten gebogen, vor den scharf rechtwinkligen Hinterecken ausgeschweift, vorn gerade verengt, manchmal vor den Vorderecken sehr leicht eingeschnürt. Hinterrand doppelbuchtig, Vorderrand in fast Halsbreite gerade und beiderseits die scharf rechtwinkligen Vorderecken wenig vorgezogen. Oberseite äußerst dicht, etwas runzelig und seitlich auch gekörnt-punktiert, glatt, die Basis beiderseits vor der größten Ausbuchtung und in der Mitte leicht verflacht, sonst in beiden Richtungen gewölbt. Die Breite an der Basis, in der Mitte und an den Vorderecken sowie die Länge in der Mitte verhalten sich wie 21 : 25 : 17 : 21. Schildchen klein und breit dreieckig. Flügeldecken 1,4mal so lang wie die gemeinsame Breite in der Mitte, oval, an der Basis so breit wie die Halsschildbasis, in der Mitte bedeutend breiter als die Mitte des Halsschildes (wie 30 : 35). Oberseite mit groben, queren, flachen Reihenpunkten, welche breiter sind als die gewölbten Zwischenräume, die Punkte sind voneinander durch quere Leisten getrennt, der Grund der Punkte ungleich punktiert und erloschen gekörnt. Prosternum und Propleuren äußerst grob und dicht einzeln punktiert. Prosternum hinter den Hüften leicht geneigt, kurz ausgerandet und abgerundet, das Ende mit einer ganz stumpfen aufwärts stehenden Ecke. Mittelbrust in der Mitte leicht eingedrückt, Epipleuren der Mittel- und Hinterbrust sowie die Seiten der Hinterbrust grob und dicht punktiert, Hinterbrust sehr kurz, vorn schmal, hinten furchenartig quer gerandet, die hintere Randung endet innen in einer kleinen Grube. Abdomen sehr grob punktiert, glänzend. Beine normal, Schenkel und Schienen grob punktiert, Schenkel kaum gekault, vor dem Ende wenig

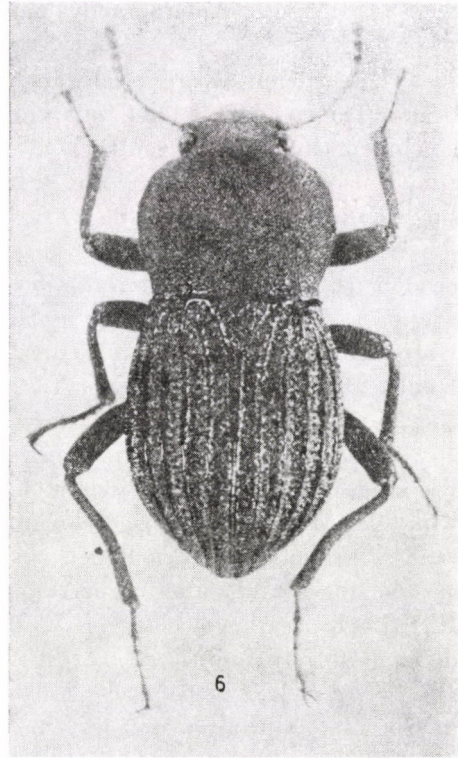
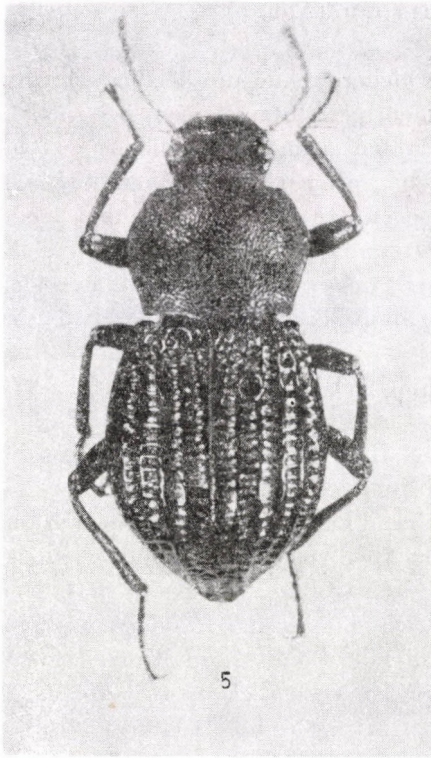


Abb. 5. *Apterobrachys wilhelminae* gen. n., sp. n. ♂ — Abb. 6. *A. paniaiensis* gen. n., sp. n. ♂
(Photo: G. HORVÁTH & A. KEVE)

verschmälert. Unterseite der Vorderschenkel beim ♂ abstehend gelb behaart, Unterseite der Hinterschenkel beim ♂ mit einem feinen Haarstreifen. Schienen im Querschnitt oval, Hinterschienen des ♂ etwas aufwärts gebogen. Innenseite der Schienen an der Endhälfte fein gelb behaart. Tarsen ohne besondere Kennzeichen. Die Länge der Glieder der Hintertarsen 1—4 verhält sich wie 42 : 21 : 21 : 65. — L ä n g e : 9—12 mm.

Holotypus ♂: "Neth. Ind. — Amer./New Guinea Exp. 1938 Lake /Habbema, 3250—3300 m/ Ult. VII—ult. VIII/L. J. TOXOPEUS leg.". — Paratypen: wie Holotypus ♂ (16 ♂, 6 ♀), id., 3300 m, 1938, L. J. TOXOPEUS (1 ♂, 2 ♀); Moss Forest Camp, 2600—2800 m, 9. X.—5. XI. 1938, L. J. TOXOPEUS (1 ♂); Camp E of Mt. Wilhelmina, 3600 m, IX. 1938, L. J. TOXOPEUS (2 ♀).

Eine durch die Skulptur und Form ausgezeichnete Art. Flügeldecken der *A. montanus* sp. n. mehr bauchig, besitzt grobe und gleichmäßige Reihenpunkte, breite, gewölbte Zwischenräume. *A. paniaiensis* sp. n. hat mehr ovale Flügeldecken, welche mit scharfen, geraden Kielen versehen sind, außerdem der Halsschild im Vergleich zu den Flügeldecken breiter, stark gewölbt.

***Apterobrachys paniaiensis* sp. n. (Abb. 6)**

Ungeflügelt, Körper schwarz, Fühler heller, Beine dunkel bis schwarzbraun, Tarsen hell. Kopf mit vorstehenden, gewölbten Augen, bei Ansicht von oben rundlich; Augenfurchen tief, Schläfen schmaler als die Augen, bis zum Hals gerade verengt, Wangen leicht gebogen nach vorn verengt. Clypealsutur kaum angedeutet, Stirn vorn flach, gegen den Scheitel allmählich leicht gewölbt. Äußerst dicht und grob gerunzelt punktiert. Die Breite am Hals, an den Augen und an der Basis der Wangen, weiters die Stirn verhalten sich wie 65 : 75 : 67 : 54. Fühler ziemlich dünn, hintergelegt die Mitte des Halsschildes weit überragend, vom 6. Glied an dicker, jedoch ohne abgesetzte Keule. Die Länge der Glieder 1—11 verhält sich wie 30 : 16 : 35 : 27 : 27 : 25 : 25 : 25 : 25 : 24 : 34 und die Breite wie 20 : 16 : 15 : 16 : 18 : 22 : 25 : 26 : 26 : 26 : 27; das Endglied lang eiförmig. Halsschild 1,2mal so breit wie lang, in der Mitte am breitesten, Seiten breit gebogen, vor den kurz spitzwinkligen Hinterecken ausgeschweift, Basalrand kaum doppelbuchtig, Vorderrand in einem schwachen Bogen ausgerandet (bei Ansicht von oben scheint er gerade abgestutzt), die Vorderecken sind rechtwinklig. Oberseite in beiden Richtungen stark gewölbt, die Wölbung reicht bis zu den Rändern. Äußerst dicht gerunzelt-punktiert-gekörnt, die Ränder der Punkte und Runzeln glatt. Die Breite an der Basis, in der Mitte und an den Vorderecken sowie die Länge in der Mitte verhalten sich wie 28 : 33 : 21 : 27. Schildchen klein, dreieckig flach, erloschen punktiert. Flügeldecken 1,3mal so lang wie die gemeinsame Breite, langoval, an der Basis seitlich mit scharfen Schulterecken und so breit wie die Halsschildbasis. Alle Zwischenräume mit je einem schmalen, dachförmig erhabenen glänzenden Kiel, die dazwischen liegenden breiten Räume ungleich gekörnt und der Grund chagriniert, die Spuren der Reihenpunkte kaum erkennbar. Prosternum gekörnt, grob skulptiert, zwischen den Hüften gerade, hinten stumpf ausgezogen und das Ende mit einer ganz kleinen, aufrecht stehenden Ecke. Propleuren äußerst grob und dicht, einzeln punktiert, glatt. Mittelbrust in der Mitte eingedrückt, aber ohne Ecken, die Pleuren der Mittel- und Hinterbrust grob und dicht punktiert. Hinterbrust schmal, gekörnt-gerunzelt, vorn und hinten gerandet, die hintere Randung endet innen in einer kleinen Grube. Abdomen glänzend, 1. Segment in der Mitte und Analsegment, ausgenommen die Basis, dicht punktiert, die Seiten der Segmente 2—4 allmählich breiter mit Punkten versehen, die Mitte der Segmente 2—3 und die Basis des 4 glatt. Beine normal, grob punktiert. Schenkel nicht gekault, Vorderschenkel unten absteigend gelb behaart, Hinterschenkel unten mit einem Haarstreifen. Schienen im Querschnitt oval, Hinterschienen ziemlich stark aufwärts gebogen. Tarsen ohne besondere Kennzeichen, die Länge der Glieder 1—4 der Hintertarsen verhält sich wie 60 : 22 : 21 : 90. — Länge : 11,5 mm.

Holotypus ♂: "Museum Leyden/Nieuw Guinea Exp./K.N.A.G. 1939 /Paniai/ 2. 9. 39."

Sie ist von allen bekannten Arten durch die gekielten Flügeldecken verschieden.

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DASYTINAE FROM MONGOLIA
(COLEOPTERA: MELYRIDAE)*

K. MAYER

*University of Agriculture, Faculty of Forestry,
66266 Brno, Zamedelská 3, CSSR*

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The following new taxa are described, illustrated and discussed: *Piechockia ingens* gen. et sp. n.; *Apovates impeditus* gen. et sp. n.; *Trichoceble laeta* and *mediocris* spp. n.; *Dasytes nimbosus* and *eximius* spp. n.

Thanks to the kindness of Dr. Z. KASZAB, Hungarian Natural History Museum, Budapest (NHMB), I received a very interesting material collected by himself in Mongolia, together with some specimens collected there by Dr. R. PIECHOCKI. Most of the species examined is new for science. As regards the Mongolian Dasytine fauna, no species have ever been recorded within this area. This fact enabled me to contribute to the knowledge of the Dasytinae.

Abbreviations used:

- AL* = total of the lengths of all antennal segments,
- DE* = maximal diameter of eye,
- EL* = length of elytra (from humeral line to apex),
- EW* = maximal width of elytra (mostly equalling to body width),
- HW* = maximal distance between outer edges of eyes,
- IOW* = minimal distance between inner edges of eyes,
- Length = distance from edge of clypeus to apex of elytra,
- PL* = maximal length of pronotum,
- PW* = maximal width of pronotum,
- Width = maximal body width.

***Trichoceble laeta* sp. n. (Figs 1, 2, 5, 7, 9)**

It differs from all related species by different combination of body colouring and pubescence; different structure of antennal segments and terminalia.

Medium-sized, relatively broad and convex species. Colouration pitchy black to brown, elytra mostly only feebly paler than head and pronotum, rarely distinctly paler (light brown) and body therefore appearing bicolorous; first two or four antennal joints (chiefly scape) paler than following ones. Pronotum at least feebly reddish translucent at sides. Legs light brown,

* Ergebnisse der zoologischen Forschungen von DR. Z. KASZAB in der Mongolei. Nr. 495. Ergebnisse der Mongolisch-Deutschen Biologischen Expeditionen seit 1962, Nr. 178.

femora darkened. Integument densely and finely punctate, pubescence pale (whitish to yellowish).

Head as finely punctate as pronotum, punctures very fine and shallow, intervals among them nearly glabrous, twice or thrice broader than punctures. Eyes small, finely faceted. Antennae distinctly serrate.

Pronotum transverse, narrowly and sharply bordered on its perimeter, finely crenate at side margins, pronotal base subarcuate and feebly emarginate at sides, pronotum broadly rounded on sides; the broadest spot of pronotum situated near middle; pronotal apex as arcuate as base but not emarginate laterally. Pronotal puncturation nearly as in head but somewhat less dense, punctures rarely with raised margins, interspaces among punctures nearly glabrous, sometimes irregular.

Elytra densely and deeply punctate, punctures as broad as interspaces among them, these with inconspicuous microstructure, therefore little lustrous. When the elytra are dark (blackish), then their lateral margins are paler (brownish).

♂. Body slenderer, less convex. Antenna (Fig. 7) strongly serrate from joint 4, apical antennal segment nearly 3.5 times longer than wide. Pronotum feebly emarginate on sides near base, hind angles pronounced. Pygidium broadly crescent, nearly as long as wide. Sternum VII truncate at apex, very inconspicuously emarginate. Sternum VIII nearly crescent, medial process narrow (Fig. 9). Spicular fork and tegmen without particular specific characters. Phallus dorsally (Fig. 1) left-curved at apex; laterally (Fig. 2) with long, conical dorsal lever.

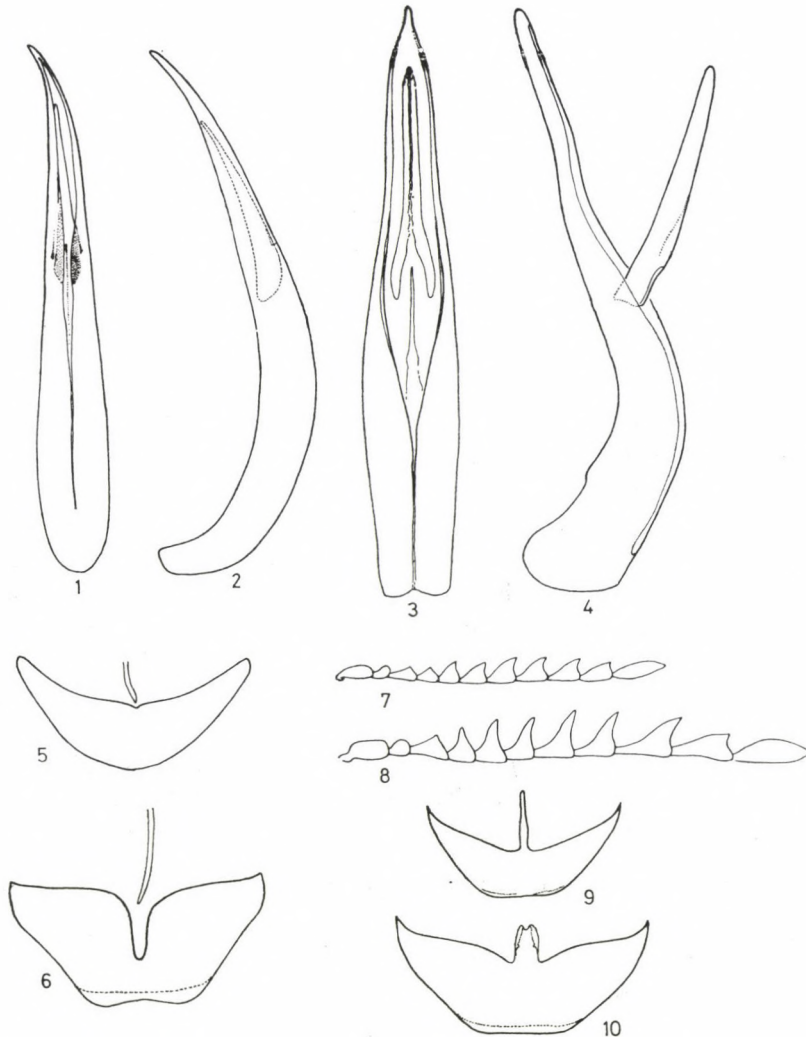
Measurements: Length/AL = 2.08–2.31; AL/PL = 2.05–2.40; IOW/DE = 1.38–1.58; PW/HW = 1.24–1.41; PW/PL = 1.36–1.71; EL/PL = 3.25–3.50; EW/PW = 1.40–1.50; EL/EW = 1.65–1.78; Length = 3.41–4.50 mm; Width = 1.45–1.82 mm.

♀. Body broader, strongly convex. Antennae not very strongly serrate from joint 5, apical segment about 2.5 times longer than wide. Pronotum with base not emarginate at sides, hind angles broadly rounded. Pygidium nearly as in male but somewhat broader. Sternum VII truncate apically, sternum VII crescent (Fig. 5). Ovipositor with no distinct specific characters.

Measurements: Length/AL = 2.87–3.32; AL/PL = 1.52–1.85; IOW/DE = 1.54–1.71; PW/HW = 1.45–1.54; PW/PL = 1.44–1.45; EL/PL = 3.27–3.50; EW/PW = 1.38–1.46; EL/EW = 1.58–1.73; Length = 4.54–5.54 mm; Width = 1.82–2.36 mm.

Material examined: totals 27 ex. (NHMB), 2 ♂ and 2 ♀ in the author's collection. Holotype ♂, allotype ♀, 12 ♂ and 11 ♀ paratypes labelled: "Mongolia, Chovd aimak, Mongol Altaj Gebirge, Uljasutajn gol, 45 km NNO von Somon Bulgan, 1400 m, Exp. Dr. Z. KASZAB, 1966; Nr. 637, 6. VII. 1966". 2 ♀ paratypes labelled: "Mongolia, Chovd aimak, Mongol Altaj Gebirge, cca 35 km N von Somon Uenč, 1750 m, Exp. Dr. Z. KASZAB; Nr. 646, 8. VII. 1966".

Remarks. This species is closely related to *Trichoceble schilskyi* REITTER, 1902 or *T. heydeni* SCHILSKY, 1897, but the relations among them cannot be fully established until a revision of the genus *Trichoceble*.



Figs 1, 2, 5, 7, 9: *Trichoceble laeta* sp. n. (1, 2, 7, 9 — holotype ♂, 5 — allotype ♀); 3, 4, 6, 8, 10: *Trichoceble mediocris* sp. n. (3, 4, 8, 10 — holotype ♂, 6 — allotype ♀). 1, 3 — phallus, dorsal view; 2, 4 — phallus, side view; 5, 6 — female sternum VIII; 7, 8 — male right antenna; 9, 10 — male sternum VIII. Scale = 1 mm. (On the Figs 5, 6, 9, 10 all setae omitted)

Trichocele mediocris sp. n. (Figs 3, 4, 6, 8, 10)

Its entirely black body, whitish pubescence and pectinate antenna are remarkable.

Sizable, elongated species. Body black, lustrous, pubescence whitish. Integument densely and regularly punctate.

Head glossy, punctures fine, intervals among them about thrice broader than punctures. Eyes slightly prominent, very finely faceted.

Pronotum strongly transverse, broadest at basal third, basal as well as apical angles broadly rounded; sides roundly angular, side margins nearly smooth. Pronotal puncturation somewhat coarser than that on head.

Elytra densely and coarsely punctate, intervals among punctures smaller than punctures which partially form transverse wrinkles.

Holotype ♂. Body slender. Antennae (Fig. 8) with joint 8 serrate, joints 3—9 nearly pectinate; apical joint 4.5 times longer than wide. Pronotal base and apex subarcuate. Pygidium slightly tapered apically. Sternum VII nearly straight at apex. Sternum VIII with short and broad medial process (Fig. 10). Spicular fork and tegmen with no specific characters. Phallus dorsally (Fig. 3) with a rounded tip; body sinuate in side view (Fig. 4), dorsal lever with blunt apex.

Measurements: Length/AL = 2.08; AL/PL = 2.57; IOW/DE = 1.25; PW/HW = 1.42; PW/PL = 1.51; EL/PL = 3.64; EW/PW = 1.37; EL/EW = 1.82; Length = 5.18 mm; Width = 1.95 mm.

Allotype ♀. Body somewhat broader. Antennae serrate from joint 5, apical joint thrice longer than wide. Pronotal base and apex strongly arcuate. Pygidium as long as wide, its base nearly straight, basal corners not distinctly developed, only dentate; pygidium regularly rounded from base to apex. Sternum VII straight at apex. Sternum VIII notched in the middle of base, shallowly emarginate at apex (Fig. 6). Ovipositor with no distinct specific characters.

Measurements: Length/AL = 2.92; AL/PL = 1.41; IOW/DE = 1.39; PW/HW = 1.54; PW/PL = 1.37; EL/PL = 3.46; EW/PW = 1.62; EL/EW = 1.62; Length = 5.32 mm; Width = 2.72 mm.

Material examined: 1 ♂, 1 ♀ (NHMB). Holotype ♂ labelled: "Mongolia, Central aimak, Ulan-Baator, Nucht im Bogdo ul, 1880 m, Exp. Dr. Z. KASZAB, 1966; Nr. 507, 9. VI. 1966". Allotype ♀ labelled: "Mongolia, Chovd aimak, Dr. R. PIECHOCKI; 20 km N. Chovd, Chovd gol; Orgozijn, Ulaan uul, 13. VI. 1975".

Remarks. The species resembles *T. ramicornis* SCHILSKY, 1900 but its virtual systematic position cannot be yet evaluated.

Microjulistus fulvus REITTER, 1888

19 ex. from Gobi Altai aimak and Baianchongor aimak were determined and recorded by KASZAB (1977).

Danacaeina bicolor REITTER, 1887

13 ex. from Chovd aimak and southern Gobi aimak were determined and recorded by KASZAB (1977).

Piechockia gen. n.

Type-species: *Piechockia ingens* sp. n. (present designation). Gender: feminine. The genus is dedicated to Dr. R. PIECHOCKI, the collector of this species.

Differential diagnosis in comparison with the genus *Danacaeomimus* CHAMPION, 1932:

Head enlarged, strongly convex, eyes small, not prominent and of the same outline like the contour of head. Terminal segment of maxillary palpi long, oval and not pointed. All sternites nearly equal in length. Visible sternum 6 (= sternum VIII) entirely sunken into visible sternum 5 and therefore invisible in a dry-mounted specimen (in both sexes?). Elytra with epipleura sharply developed up to apex. Metathoracic wings with vein RM well developed, R_c shorter and more rounded, remigial part of wing membrane less extent. Middle and posterior tarsomeres nearly as long as wide. Base of phallus more extent. Internal sac with spines being very tiny and hard to see (even at a magnification of $\times 200$).

Piechockia ingens sp. n. (Figs 11—20)

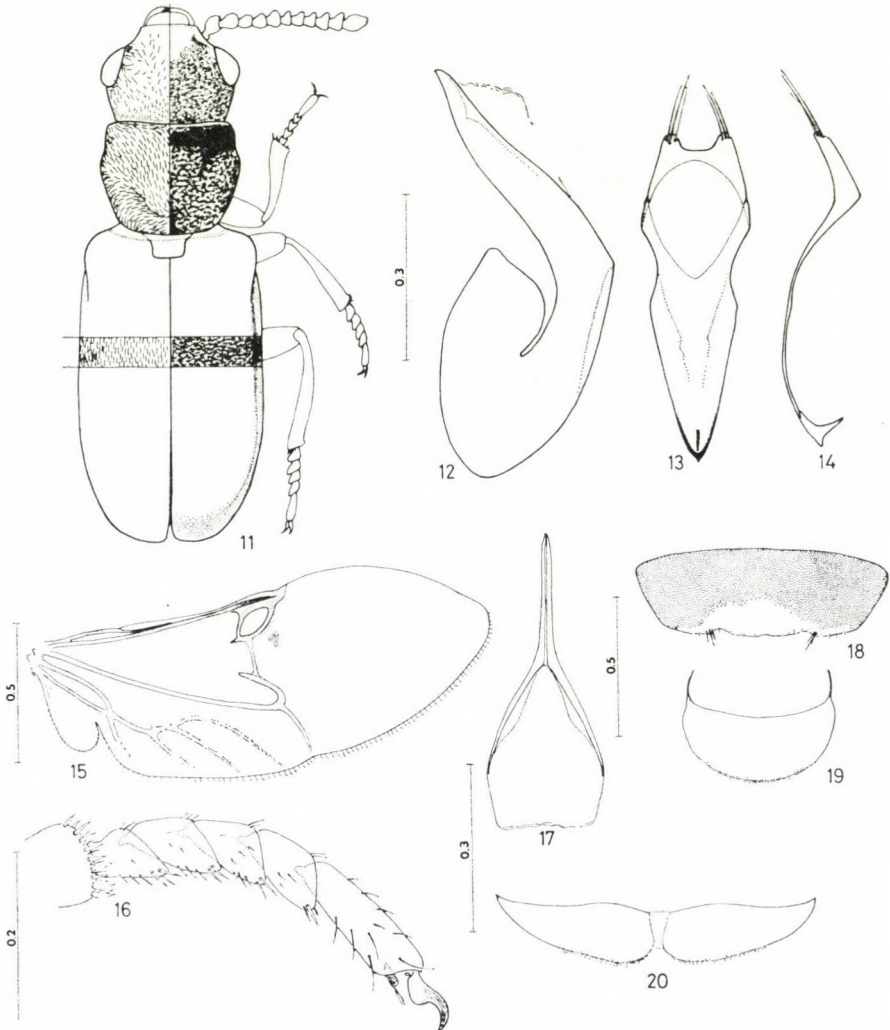
It is a remarkable species, especially by the combination of a single, whitish, scale-shaped pubescence; black head, thorax and sternites; the apex of sternum VII and extremities brownish or yellowish.

♂. Robust, parallel, strongly convex species. Elytra and the apex of sternum VII brown-yellow; antennae, mouthparts, tibiae and tarsi brownish, femora darkened (pitchy-brown), the rest of body entirely black. Integument very densely, flatly and irregularly punctate and wrinkled, nearly dull and covered by single, tiny, scale-shaped, entirely recumbent, hairs (Fig. 11).

Head enlarged, strongly convex, with small, little prominent eyes, antennae with penultimate joints nearly transverse (Fig. 11).

Pronotum not bordered, strongly convex with a transverse, shallow sub-apical depression; pronotal pubescence occupies also the whole surface of hypomeres. Scutellum transverse, oblong. Elytra slightly flattened at sides; puncturation very flat, only indicated. For metathoracic wings see Fig. 15. Legs relatively short, robust, tibiae of all pairs at least slightly arched; tarsomeres approximately as long as wide, 2—4 of equal length; claws short, strongly curved and strongly dilated on inner side (see Figs 11 and 16).

Pygidium strongly convex, semicircular, its basal corners filiform (Fig. 19). Sternites III—VI (i.e. 1st—4th visible sternites) equal. Sternum VII particularly lightened, emarginate and ciliate at apex (Fig. 18). Sternum VIII (in dry-mounted specimens entirely sunken into sternum VII and therefore invisible) without medial process; interrupted by a membranule medially (Fig. 20). Spicular fork (Fig. 17) of a common Dasytine-type. Tegmen (Figs 13, 14) with pointed phallobase, constricted near middle; with well-developed, short



Figs 11—20: *Piechockia ingens* sp. n., holotype ♂. 11 — general view, semi-schematic picture; 12 — phallus, side view; 13 — tegmen, ventral view; 14 — tegmen, side view; 15 — right wing; 16 — front tarsus; 17 — spicular fork; 18 — sternum VII; 19 — pygidium; 20 — sternum VIII. Scale = 1 mm

lateral lobes at apex, each of them bearing three setae. Phallus with differentiated base, body of phallus slightly sinuate in side view (Fig. 12). Internal sac with short, thorn-shaped spines having circular bases, the spines are very (tiny and hard to see (even at a magnification of about $\times 200$)).

Length = 2.93—3.00 mm; Width = 0.90—0.96 mm.

Material examined: 2 ♂ (deposited in NHMB). Holotype ♂ and paratype ♀ labelled: "Mongolia, Chovd aimak, Dr. R. PIECHOCKI; Darschwaržel, Bulgan gol, 25. V. 1974; Porphy massiv".

Apovates gen. n.

Type-species: *Apovates impeditus* sp. n. (present designation). Gender: masculine.

Differential diagnosis: from among all Dasytine genera, known to me, this genus is very distant by the following combination of characters:

(a) bilobate aedeagus, (b) non-functional phallus transformed into spines being firmly attached to the apex of aedeagus, (c) pincers-shaped spicular fork with a remnant of sternum IX (?), (d) double vestiture of body surface, (e) lateral ribs on pronotum, (f) tarsomeres unequal in size, (g) sternum VIII without medial process, (h) complete anal area in metathoracic wings (vein 1A—4A present).

Apovates impeditus sp. n. (Figs 21—27)

Pronotum with double vestiture and narrow lateral ribs, terminalia as figured (Figs 22, 23, 26, 27).

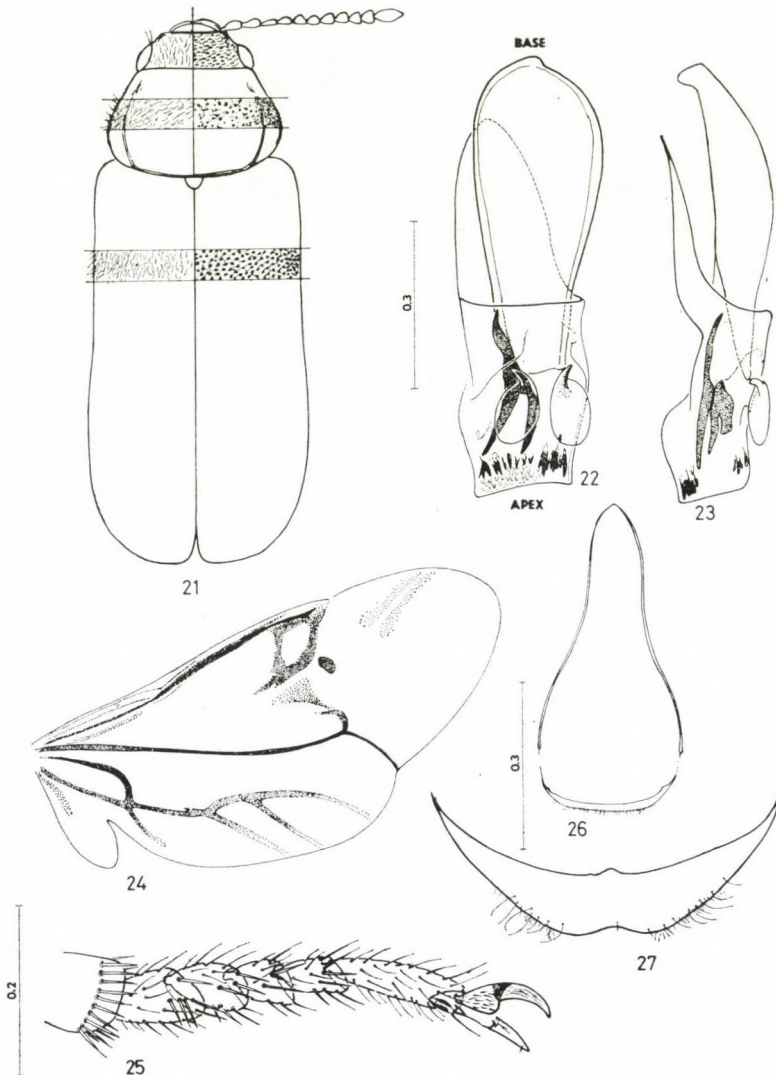
Small, parallel, strongly convex species. Colouring brown-black, upper body surface with feeble green-plumbeous lustre; pedicel, tibiae, and tarsi (tarsomeres 3, 4, 5 darkened) ochraceous. Integument a little glossy, very densely and flatly punctate to transversely wrinkled; basal pubescence almost suberect; in addition, erect short setae present on pronotum (Fig. 21).

Head transverse, sunken into pronotum to the posterior eye margins (natural condition?), finely wrinkled and pubescent. Terminal segments of maxillary palpi and those of labial palpi spindle-shaped with blunt apices. Antennal segments 6—10 submoniliform, the apical one long, oval with an indicated tip (Fig. 21).

Pronotum transverse (its broadest spot at base) tapered forwards; base subarcuate; apex not bordered, nearly straight, side margins not bordered and very finely and inconspicuously denticulate; pronotal disc irregularly punctate and wrinkled, lateral ribs narrow, lateral areas with coriaceous structure (Fig. 21). Scutellum small, wrinkled.

Elytra parallel, humerus little prominent. Epipleura short, narrow elytral apices obliquely truncate and rounded. Structure of elytra formed by dense, small punctures, intervals among them subconvex, nearly as broad as punctures, partially forming transverse wrinkles (Fig. 21). Wings as figured (Fig. 24). Tarsomeres unequal in size (Fig. 25).

Pygidium perfectly trapezoidal, basal corners rather indicated, only dentate. Sternites III—VI of equal lengths, nearly glabrous, sternum VII



Figs 21—27: *Apovates impeditus* sp. n., holotype ♂. 21 — general view, semi-schematic picture; 22 — aedeagus, ventral view; 23 — aedeagus, side view; 24 — right wing; 25 — front tarsus; 26 — spicular fork; 27 — sternum VIII. Scale = 1 mm

straight at apex (Fig. 27). Sternum VIII crescent, very narrow and hard to see on dry specimen: thus abdomen as if five-segmented. Spicular fork filiform, pincers-shaped, with ribbon-like, semimembranous, ciliate formation (sternum IX ?) at base (Fig. 26). Aedeagus of a very particular structure, as far as I know, without any analogy within Coleoptera (Figs 22, 23): Tegmen consisting of four parts: (1) tongue-shaped basally and tube-shaped apically — fundamental portion, (2) flat, tongue-shaped and bordered formation, (3, 4) paired conchiform formations. Phallus is reduced into irregular, spine-shaped formations, firmly attached to the inners side of apex of tegmen.

Length = 3.14 mm; Width = 1.14 mm.

Material examined: holotype ♂ (NHMB) labelled: "Mongolia, Chovd aimak, Mongol Altaj Gebirge, cca 35 km N von Somon, Uenč, 1750 m, Exp. Dr. Z. KASZAB, 1966; Nr. 646, 8. VII. 1966".

Remarks. This genus may belong to the alliance of the genus *Dasytiscus* KIESW. owing to the transverse vein in the anal wing area and unequal tarsomeres. On the other hand, the complete set of anal veins 1A—4A indicates an isolated position within this genus. A special query is the unusual structure of the aedeagus. The phallus, transformed into reduced spines being firmly attached to the apex of tegmen, appears to be non-functional. Thus, the copulation is hardly imaginable although a functional substitution of the phallus by the tegmen cannot be excluded. Discovery of a female specimen would be a very important matter, supposing the occurrence of a complicated bursa copulatrix provided with laminae dentatae as in the species *Dasytiscus gracilitarsis* REITTER, 1902. Both species, *Apovates impeditus* and *Dasytiscus gracilitarsis* have similar structure of genital tube in males, in the latter species females have laminae dentatae in bursa copulatrix.

Enicopus hirtus (LINNAEUS, 1767)

This species was determined and recorded from Mongolia (Chovd aimak) by KASZAB (1977). A query of the evaluation of its subspecies and infrasubspecific units remains open henceforth. The species is distributed probably throughout the whole Palaearctic Region eastwards to Korea (Soul).

Dasytes (Dasytes) niger (LINNAEUS, 1761)

Single female specimen was determined and recorded by KASZAB (1977), Mongolia (Central aimak) being its easternmost known locality. The species was also reported from Yenisei region (HORION, 1953).

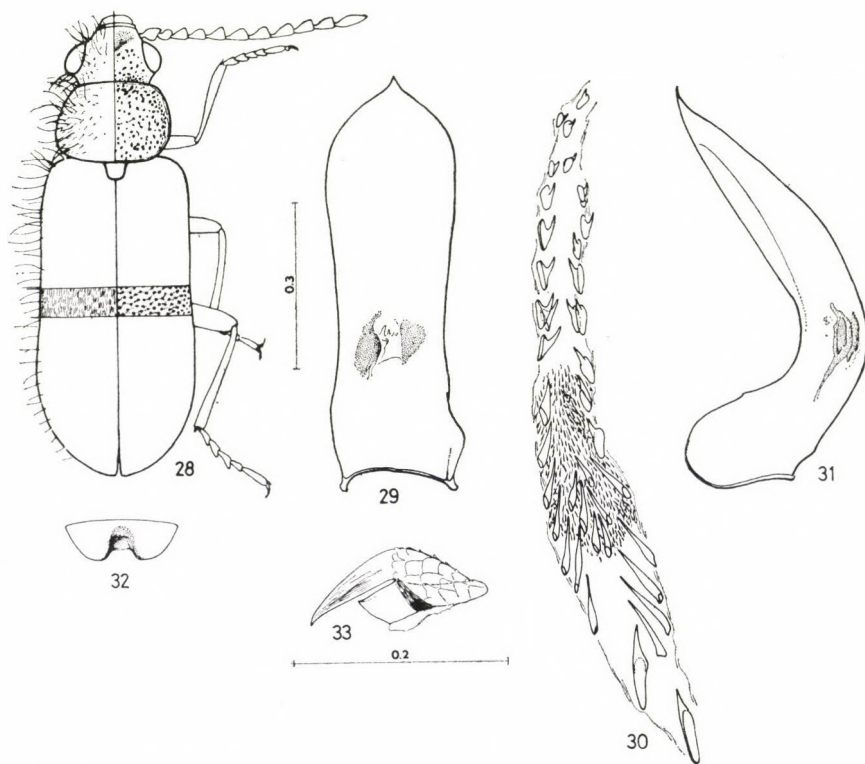
Dasytes nimbosus sp. n. (Figs 28—33)

The species is related to *Dasytes obscurus* GYLL. but the elytral suture is not bordered. Elytral structure and vestiture somewhat resemble those in *Dasytes subaeneus* SCHÖNH.

Medium-sized, dilated posteriorly. Black, shining, lustre with imperceptible green-plumbeous hue; pedicel deep brown or rufescent. Integument finely punctate with double vestiture: (a) basal, reclinate, fine and whitish; (b) erect, coarse, black.

Head with not very prominent eyes, with a feeble interocular depression in both sexes. Pronotum transverse, distinctly bordered on perimeter; with an indistinct preapical transverse depression; base and apex subarcuate; sides strongly rounded; the broadest spot situated at basal third; puncturation irregular, fine to nearly coarse; lateral ribs absent; lateral areas nearly as punctate as pronotal disc (Fig. 28). Elytra at least slightly dilated posteriorly, suture not bordered, puncturation resembles that in *D. subaeneus* SCHÖNH. but the glabrous spots not very prominent, flatter, the cloudy basal pubescence less distinct (Fig. 28). Claws symmetrical in both sexes.

♂. More parallel, antennae longer and joints more elongated, extremities stouter. Claws shorter and stouter (Fig. 33). Pygidium nearly semicircular



Figs 28—33: *Dasytes nimbosus* sp. n., holotype ♂. 28 — general view, semi-schematic picture; 29 — phallus, dorsal view; 30 — internal sac; 31 — phallus, side view; 32 — sternum VII; 33 — front tarsal claw, side view. Scale = 1 mm

with truncate apex. Stermites III—VI without particular depressions, sternum VII (Fig. 32) deeply excavate and emarginate. Sternum VIII with two emarginations at apex. Spicular fork and tegment without specific characters. Phallus posteriorly rounded with a pointed apex in dorsal view (Fig. 29), with a longitudinal edge ventrally in side view (Fig. 31), a complex structure being a basal portion of internal sac, is distinct in both views. Internal sac (Fig. 30) of the type of *Dasytes obscurus* GYLL. and allied species.

Measurements: Length/AL = 2.09—2.10; AL/PL = 2.62—2.80; IOW/DE = 1.30—1.38; PW/HW = 1.15—1.32; PW/PL = 1.51—1.67; EL/PL = 3.88—3.94; EW/PW = 1.37—1.39; EL/EW = 1.28—1.33; Length = 3.83—3.91 mm; Width = 1.30—1.39 mm.

♀. Less parallel, strongly convex, elytra dilated posteriorly. Antennae shorter, their segments serrate, at most as long as wide, inner angles more or less rounded. Extremities slenderer and shorter. Claws slender, not conspicuously dilated (i.e. without denticles) ventrally. Pygidium nearly straight at base, basal corners short. Body of pygidium strongly tapered posteriorly, with truncate and slightly emarginate apex. Sternites III—VII straight, sternum VIII resembles pygidium. Ovipositor with no distinct specific characters, apices of coxites distinctly darkened.

Measurements: Length/AL = 3.40—3.50; AL/PL = 1.53; IOW/DE = 1.44—1.45; PW/HW = 1.45—1.53; EL/PL = 3.57—3.68; EW/PW = 1.40—1.52; EL/EW = 1.59—1.74; Length = 4.35—4.43 mm; Width = 1.83—1.91 mm.

Material examined: 2 ♂, 2 ♀. Holotype ♂, 2 ♀ paratypes deposited in NHMB, 1 ♂ in the author's collection. All specimens bear locality data: "Mongolia Chovd aimak, Dr. R. PIECHOCKI; Daschwarzal Bulgan gol, 25. V. 1974, Porphyrmassiv".

Dasytes fuscus (ILLIGER, 1801)

Material examined: totals 3 ♂, 11 ♀. "Mongolia, Central aimak, 50 km von Somon Bajanzogt, 1600 m; Exp. Dr. Z. KASZAB, 1966; Nr. 519, 11. VI. 1966", 1 ♂, 6 ♀. Idem, 1964, Nr. 264, 4. VII. 1964, 1 ♂, 1 ♀. Idem, 11 km ESE Somon Bajanzogt, 1600 m, Nr. 948, 13. VI. 1968, 1 ♂. Idem, 126 km N Ulan-Baator, 1100 m, Nr. 278, 7. VII. 1964, 1 ♀. Idem, Tosgori ovoos, 10 km N Ulan-Baator, 1700—1900 m, Nr. 926a, 23—24. VII. 1967, 3 ♀. The material is deposited in NHMB, 1 ♂ and 1 ♀ in the author's collection.

Remarks. This species is distributed in Europe, Caucasus, Siberia (Yenisei, Tuvin-skaya ASSR, near the Mongolian boundary) and Dzhungaria (Eastern Kazakhstan, Chinese boundary) (HORION, 1953). Its occurrence in Mongolia is the easternmost known distribution of this species. The genital characters, viz. the shape of spines in internal sac of phallus, fully agree with those in Central-European specimens.

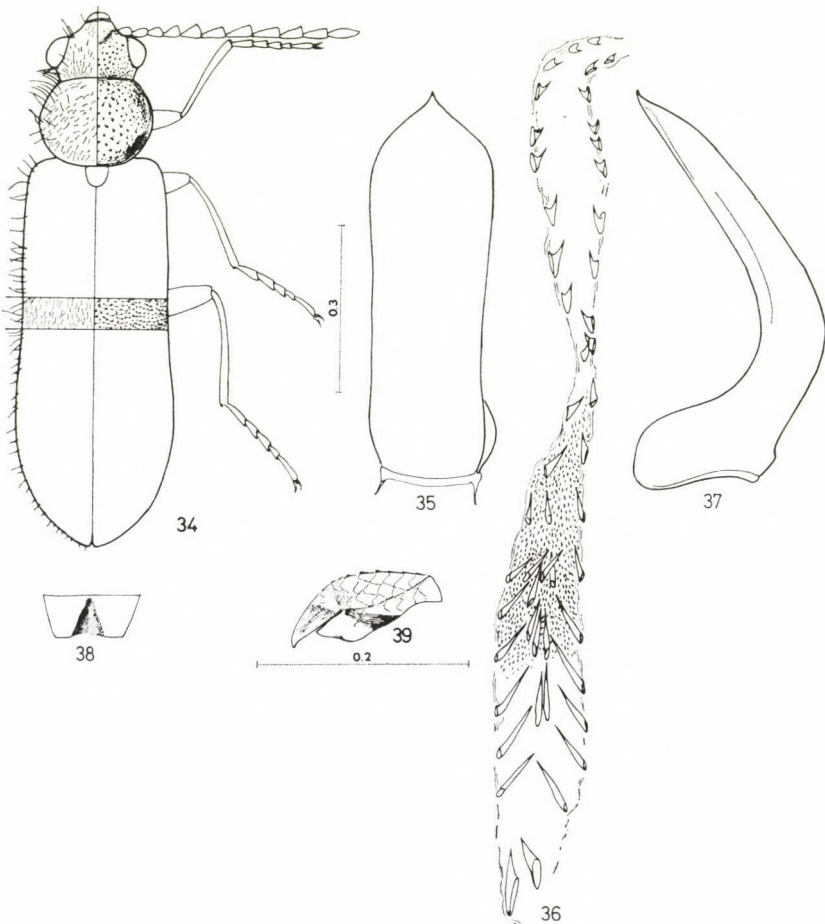
Psilothrix (Dolichomorphus) femoralis (MORAWITZ, 1861)

30 specimens were determined and reported by KASZAB (1977) (Chovd aimak, Southern Gobi aimak, Uvs aimak). It is the easternmost known distribution of this species, which has been known also from Kirghizia (Frunze env.).

***Dasytes eximius* sp. n. (Figs 34—39)**

It resembles *Dasytes alpigradus* KIESW. by its body shape and orange pedicel, but elytra have no bordered suture. The species is undoubtedly closely related to *Dasytes altaicus* SCHILSKY, 1900.

Relatively large, elongated, subparallel. Black, feebly lustrous; pedicel orange in contrast with remaining antennal joints. Integument densely and finely punctate with double pubescence: (a) basal, not entirely recumbent, rather suberect, relatively long, pale (yellowish); (b) reclinate, not very rich and not very long, dark (Fig. 34).



Figs 34—39: *Dasytes eximius* sp. n., holotype ♂. 34 — general view, semi-schematic picture; 35 — phallus, dorsal view; 36 — internal sac; 37 — phallus, side view; 38 — sternum VII; 39 — front tarsal claw, side view. Scale = 1 mm

♂. Eyes slightly prominent, interocular depression distinct. Antennae serrate. Pronotum slightly transverse, perimeter distinctly bordered, base and apex nearly straight, sides strongly arcuate; pronotal disc regularly and scarcely punctate, lateral pronotal areas finely wrinkled with no trace of lateral pronotal ribs. Elytral suture not bordered, puncturation dense and partially forming transverse wrinkles. Claws (Fig. 39) very short and stout, symmetrical in all pairs of legs.

Pygidium elongated, nearly semicircular, its base sinuate, basal corners denticulate, apex shortly and shallowly emarginate. Sternites III—VI without depressions. Sternum VII with deep, deltoid excavation (Fig. 38). Sternum VIII nearly crescent with deltoid incision covered with membranule; darker longitudinal line is present in the middle of the incision. Spicular fork and tegmen with no specific characters. Phallus dorsally (Fig. 35) with a tapering and pointed apex; in side view slender; with short, longitudinal edge ventrally. Internal sac (Fig. 36) of the type of *Dasytes alpigradus* KIESW.

Measurements: Length/AL = 2.14—2.18; AL/PL = 2.76—2.94; IOW/DE = 1.24—1.26; PW/HW = 1.06—1.18; PW/PL = 1.34—1.39; EL/PL = 4.21—4.39; EW/PW = 1.29—1.33; EL/EW = 2.48—2.55; Length = 4.25—4.56 mm; Width = 1.30—1.35 mm.

Material examined: totals 3 ♂. Holotype ♂ and 1 ♂ paratype deposited in NHMB, 1 ♂ paratype in the author's collection. All specimens labelled: "Mongolia: Uva aimak, 4 km OSO vom Pass Ulaan davaa zw. See Örög nuur und Ulaangom, 1700 m; Exp. Dr. Z. KASZAB, 1968; Nr. 1072, 6. VII. 1968".

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REVISION OF THE GENUS
HEMICEROPALES PRIESNER, 1969
(HYMENOPTERA: CEROPALIDAE)

L. MÓCZÁR

H-1114 Budapest, Szabolcska M. utca 1, Hungary

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This revisionary study treats the 13 species and 3 subspecies of the *Hemiceropales* PRIESNER occurring in the Palearctic, Ethiopian regions and in South America of the Neogaea. *Hemiceropales cribrata maculipes* ssp. n. from Zambia, *H. wahisi* sp. n. from Brazil, as well the female of *H. maroccana* (BEAUMONT), the same of *H. bolivari* (BANKS) and the male of *H. basirufus* (ROHWER) are described. Names are synonymized on the basis of the original material: *H. maroccana* (BEAUMONT) = *Ceropales lunatus* HAUPT jun. syn., *H. c. cribrata* (COSTA) = *C. versicolor* GUSSAKOVSKIJ jun. syn., *H. tricolor* (LYNCH ARRIBÁLZAGA) = *C. varipes* BURMEISTER nomen in collection. Neotype of *H. tricolor* (LYNCH ARRIBÁLZAGA) (♀), lecto- and paralectotypes are designated for most of the species.

This paper is a continuation of the previous revisionary study of the *fulvipes*-, *ruficornis*- and *variegata*-groups of the large genus *Ceropales* s. l. (MÓCZÁR, Acta biol. Szeged. 1986, in print). In the last century a rather large material was collected (see the listed museums below) and only a few papers proved to be sufficient for the identification of the species, except the European ones. This was due to the extreme variability and the unusually extensive spreading of some species. This study treats 13 species and 3 subspecies, two of them: *H. cribrata maculipes*, *H. wahisi*, being new to science. New are also the female of *H. maroccana* (BEAUMONT) and of *H. bolivari* (BANKS), and the male of *H. basirufus* (ROHWER), these are described for the first time. The species occur in the Palearctic and the Ethiopian regions and also in the Neotropical Region. On the basis of the original materials for nearly all species it was possible to designate the lecto- and paralectotypes. I also designated a neotype for *H. tricolor* (LYNCH ARRIBÁLZAGA) and synonymized some names: *H. maroccana* (BEAUMONT) = *Ceropales lunatus* HAUPT jun. syn., *H. cribrata cribrata* (COSTA) = *C. versicolor* GUSSAKOVSKIJ jun. syn., *H. tricolor* (LYNCH ARRIBÁLZAGA) = *C. varipes* BURMEISTER nomen in collection. To facilitate the correct recognition of the type specimens in the future, I give between quotation marks the exact data of the different labels of the studied types. Instead of the usual length I detailed descriptions and the short keys of the previous authors, I summarize the most typical characteristics in the key for an unambiguous recognition of the species, and I am going into details concerning

the variability of the species after the enumeration of the locality of the examined specimens.

The 732 specimens investigated are deposited in the following museums (the city names on the locality labels referred to in the text are within parentheses): I am much indebted to the following conservators and private persons for the loan of material used in this revision: Amsterdam = by R. WAHIS; Berlin = Zoologisches Museum an der Humboldt-Universität zu Berlin, DDR, DR. F. KOCH; Bruxelles = Inst. Roy. Sci. Nat. Belgique, DR. P. DESSART; Budapest = Hungarian Natural History Museum, Budapest, Hungary, DR. J. PAPP; Buenos-Aires = Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" Buenos-Aires, Brazil, DR. A. ROIG ALSINA; Cambridge = Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA, DR. J. CARPENTER; Cape Town = South African Museum, Cape Town, Republic of South Africa, DR. V. B. WHITEHEAD; Genova = Museo Civico di Storia Naturale "Giacomo Doria", Italia, DR. R. POGGI; Coll. Gusenleitner = DR. J. GUSENLEITNER, Linz, Österreich; Halle = M. Luther Universität Sektion Biowissenschaften, Halle/Saale, DDR, DR. J. O. HÜSING and DR. M. DORN; Helsinki = Zoological Museum, Division of Entomology, Helsinki, Finland, DR. A. JANSSON; Lausanne = Musée Zoologique, Lausanne, Suisse, DR. J. AUBERT; Leiden = Rijksmuseum van Natuurlijke Historie, Leiden, Nederland, DR. I. T. WIEBES and DR. C. v. ACHTERBERG; Leningrad = Zoological Institute of the Academy of Sciences URSS, Leningrad, URSS, DR. V. TOBIAS; London = British Museum (Natural History), London, England, DR. M. C. DAY; Madrid = Consejo Superior de Investigaciones Científicas Instituto Español de Entomología, Madrid, España, DR. E. MINGO PEREZ; Coll. Mochi = DR. A. MOCHI, Roma, Italia; New York = American Museum of Natural History, New York, USA, DR. J. G. ROZEN; Ottawa = Biosystematics Research Institute, Research Branch, Ottawa, Canada, DR. L. MASNER; Paris = by DR. R. WAHIS; Pretoria = Transvaal Museum, Department of Entomology, Pretoria, DR. S. ENDRÖDY-YOUNGA; Coll. Schwarz = M. SCHWARZ, Linz, Österreich; Stockholm = Naturhistoriska Riksmuseet Sektionen för entomologi, Stockholm, Sverige, DR. P. I. PERSSON; Tel-Aviv = Tel-Aviv University Zoological Museum, Tel-Aviv, Israel, DR. A. FREIDBERG; Tervuren = Koninklijk Museum voor Midden-Africa, Tervuren, Belgium, DR. E. DE CONINCK; Coll. Townes = DR. H. TOWNES, Gainesville, Florida, USA; Tucuman = Fundacion Miguel Lillo, Instituto de Zoologia, Tucuman, Argentina, DR. A. WILLINK; Coll. Wahis = DR. R. WAHIS, Chaudfontaine, Belgium; Coll. Wasbauer = Coll. DR. M. S. WASBAUER; Sacramento, California, USA; Washington = National Museum of Natural History - Smithsonian Institution, Washington, USA, DR. A. MENKE; Wien = Naturhistorisches Museum Wien, 2. Zoologische Abteilung, Österreich, DR. M. FISCHER.

Hemiceropales PRIESNER, 1969 stat. n.

Hemiceropales (subgen.) WOLF, 1965, Nachr. naturw. Mus. Aschaffenburg. **72**: 38 ♀♂ (orig. design. of type-species: *Ceropales c. cribratus* COSTA, 1881; monotypic; without descript.)

Hemiceropales (subg.): 1969, PRIESNER, Naturkundliches J. Stadt Linz: 115, 119 ♀♂ (characters)

Hemiceropales (subg.): 1972, WOLF, Ins. Helv. Fauna 5 Hym. 168 ♀♂

Hemiceropales (subg.): 1986, WAHIS, Notes faun. Gembloux **12**: 35, 44

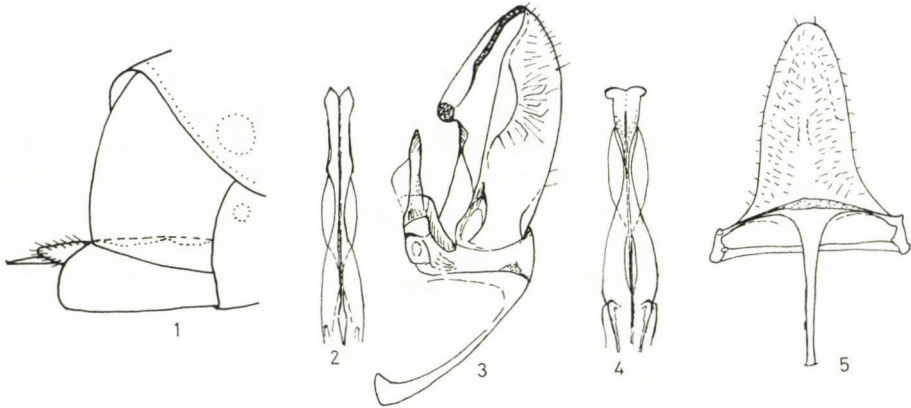
Hemiceropales as subgenus was erected by WOLF (1965), however, it was later characterized by PRIESNER (1969) as follows: "Kopf und Thorax grob punktiert und viel weniger dicht (als Bifidoceropales), mit großen Zwischenräumen zwischen den Punkten. Fühler kurz und dick." This short diagnosis can be supplemented as follows: Frons and pronotum deeply and densely, often closely or very densely punctured; on some American species frons only with scattered punctures, pronotum mostly deeply and densely punctured (Fig. 36) at least on disc also between the humps and the posterior margin. Propodeum mat basally, usually coarsely sculptured, rugose, at least basally

and often with deep punctures mostly laterally, sometimes only rugulose or coarsely punctured; surface flat or moderately convex only basally in lateral view. On some species from America surface granulated, hardly shining and rugulose beginning only with declivous part (Fig. 37). Frons convex between fore ocellus and antennae in lateral view. Eyes strongly divergent towards vertex, inner eye margins moderately concave above. Labrum large, conspicuously exposed. Antennae slender only on species from America. Mesonotum with deep and partly dense, close punctures. Last abdominal segments (♀) strongly compressed and gradually pointed, partly truncate apically. Fore (♀) or fore and middle tarsi (♂) shortened on some American species. Both claws of fore (♀) and middle (♀♂) tarsi bifid, with a long, apressed, obliquely truncate subapical tooth; inner claw of fore tarsus on the male very deeply split owing to the unusual large, not truncate inner tooth basally. Inner side of the last tarsal joint of fore leg deeply emarginated. Both claws of hind tarsus at least rectangularly bent.

Type-species: *Ceropales cribratus cribratus* (COSTA, 1881) ♀♂

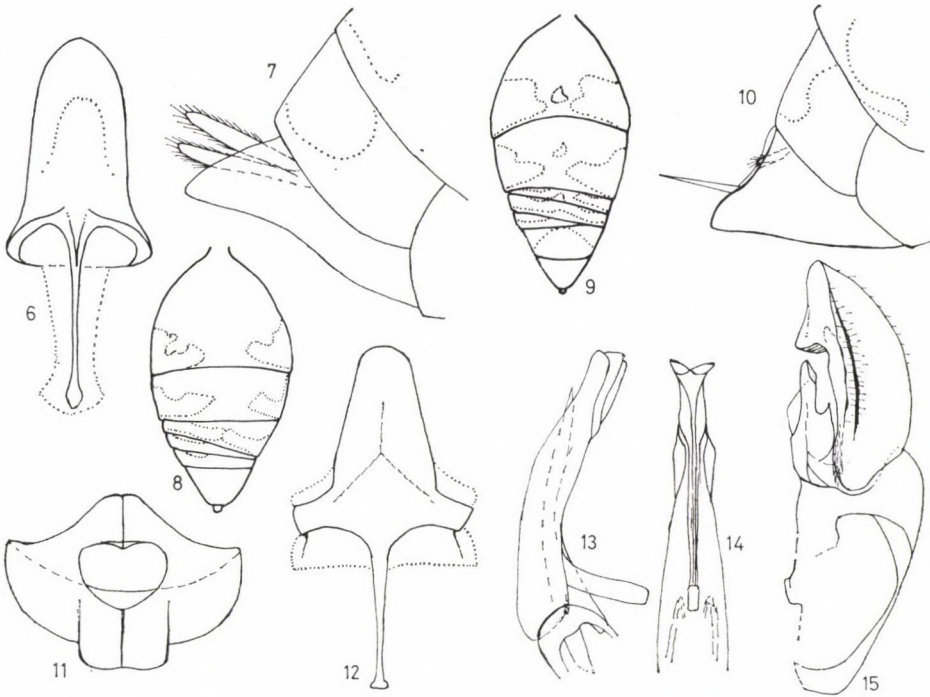
KEY OF SPECIES

- 1 Frons with a transversal crest and deeply, partly densely punctured, or rarely without crest and punctures shallow, in the latter case body largely yellow, partly ferruginous 2
- Frons usually densely and deeply punctured, without crest, sometimes punctures not so deep and covered by silvery pubescence 3
- 2 Frons with a remarkable sharply raised and undulating crest transversally. Frons just below crest, pronotum, mesonotum in its three longitudinal hollows, basis and lateral margin of propodeum deeply and densely punctured. Thorax (= mesosoma) nearly entirely red, propleuron, pronotum in front, lateral corners partly (♀), postnotum laterally (♀♂) and medial part of propodeum longitudinally black (♀♂). Legs largely red, head, abdomen (= metasoma) black, labrum, clypeus, supraclypeal area, ocular sinus, outer eye margin, large and nearly triangular spots of tergites 1–5 laterally, also streaks of tergites 4–5 medially and tergites 6(7) entirely white. Lower margins of sternite 6 (♀) straight in lateral view, tip rather truncate (Fig. 1). 4.2–5.2 mm **carinitifrons** (WAHIS)
- Frons not raised, uniformly convex and coriaceous with dense and shallow punctures. Pronotum rather finely, mesonotum in its two lateral shallow hollow with scattered and deeper punctures, interspaces larger than punctures. Lower face yellow, head elsewhere darker, ferruginous, also antenna, except the black upper side of the last two joints, pronotum-postscutellum and legs, largely ferruginous. A curved line or only three spots covering ocellar area, lateral side of thorax, as well as propodeum, except brownish lateral corners, black. Abdomen ferruginous, base of tergites 3–4(5) black. Outer orbit without a distinct groove. 5–7.8 mm **scobinifera** (ARNOLD)
- 3 Spiracle of propodeum remarkably short, circular or nearly circular. Propodeum flat in lateral view. Last sternites acute apically (♀) 4
- Spiracle elongate. Propodeum distinctly convex anteriorly, flat only posteriorly. Last sternites of abdomen truncate or partly rounded apically (♀) 9
- 4 Abdomen largely black, at most tergites 1–2 sometimes more or less red or rarely hind tergites with light spots, but then punctures very coarse and close 5
- At least tergites 1–3(5–6) with light lateral streaks or bands, or abdomen, sometimes also head, largely ferruginous 6
- 5 Dorsum of pronotum, margins of propleurae and tegulae ferruginous, scutellum and postscutellum with orange yellow spot (♀♂). Tergites 1–2 red, sometimes only partly reddish translucent or black, 6(7) tergite (♂) with yellowish spot. Groove of outer orbit yellow, broad and short, not reaching the middle of orbit. Median sulcus strongly clath-



Figs 1–5. 1 = *Hemiceropales carinifrons* (WAHIS), last abdominal segments of ♀. — Figs 2–3. *H. punctulata punctulata* (CAMERON) ♂, 2 = penis, 3 = right half of genitalia (digitus, cuspis, paramere and basal ring), ventral view. — Figs 4–5. *H. punctulata cereris* (ARNOLD) ♂, 4 = penis, 5 = sternite 9, ventral view

- rate, short, not extending to the middle of propodeum. Propodeum more finely and arcuately rugulose posteriorly. Antenna ferruginous, last joints black above, mandible, labrum, clypeus, lower face lemon yellow, excepting black spot above and below antennal sockets (♀). Coxae yellow, black and ferruginous. Last sternites (♀) pointed apically. ♀ 5.5–9, ♂ 7–8.2 mm **punctulata punctulata** (CAMERON)
- Pronotum black, excepting the ivory white posterior margin, sometimes also scutellum and postscutellum with white spot. Tergites black, 1–2 sometimes also with lunate maculae laterally. Groove of outer orbit black, remarkably deep and broad, longer, reaching to the middle of eye length. Medial sulcus of propodeum longer, extending beyond the basal third. Head and thorax much deeper, closer and with larger punctures than in the nominate species, interspaces smaller than punctures; posterior part of propodeum slightly concave, reticulate-rugose, on the lateral margins with punctures between reticulations. Antenna blackish (♀♂) above, pale ferruginous below. Basis of mandible (♀♂), labrum (♀) black or (♂) yellowish brown. Clypeus, excepting a lower brownish spot (♀), supraclypeal area, excepting a large (♀) or a narrow (♂) black spot and inner eye margin, white. Coxae ferruginous and black, yellow spots on middle and on hind coxae very small. Sternite 9 (apparently 7 from outside) gradually pointed apically (Fig. 5). ♀ 5.6, ♂ 7 mm **punctulata cereris** (ARNOLD)
- 6 Colour largely red and yellow. Mostly on larger specimens, mesonotum with a rectangular yellow macula (♀♂). Abdomen at least on tergite 1 anteriorly ferruginous (then rarely lateral streaks of tergites lemon yellow), or tergites usually with yellow streaks or bands. Antennae and legs nearly entirely ferruginous, usually coxae, femora with yellow spots. Vertex, occiput often pale ferruginous only rarely black, a broad band extending from eye to eye, black. Pronotum largely, scutellum, postscutellum, posterior corners of propodeum orange or yellow, rarely largely black. Declivous part of propodeum concave. Frons, vertex coarsely but not closely punctured. Median clathrate groove extends usually over basal three-fourths of propodeum. Interocular distance on vertex more than twice as long as the least distance between eyes below antennae. Lower margin of last segments (♀) concave (Fig. 7). Sides of sternite 9 gradually narrowing towards the tip (Fig. 6). 4–11 mm **punctulata bulawayoensis** (BISCHOFF)
- Colour largely black and yellow or white. Tergites black, at most (especially 1) brownish red translucent laterally. Mesonotum black. Lateral streaks of abdomen usually yellow or white. Antennae, legs at most partly ferruginous 7
- 7 Light colour of body yellow (♂) or lemon yellow (♀), rarely whitish, then hind femur red with long yellow streak below. Spots of tergites (rarely bands) 1–2(3) large and remarkably broadened laterally (Figs 8–9). Mesonotum usually with a light spot medially. Outer side of all femora usually nearly entirely yellow, often fore and middle femora

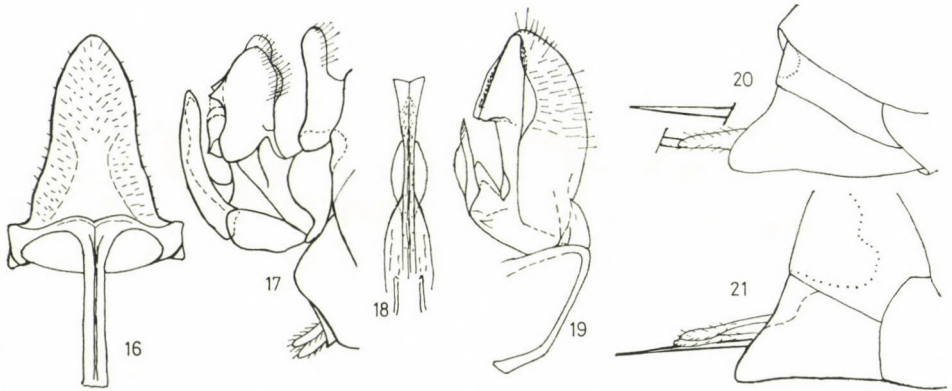


Figs 6–15. 6–7. *Hemiceropaes punctulata bulawayoensis* (BISCHOFF), 6 = sternite 9 of ♂, 7 = last abdominal segments of ♀. — Figs 8–15. *H. maroccana* (BEAUMONT), 8 = abdomen of paratype *lunata* HAUPT, ♂, 9 = abdomen of lectotype, ♂, 10 = last segments, ♀, 11 = basal ring, 12 = sternite 9, 13–14 = penis in lateral and ventral view, 15 = genitalia

diagonally brownish red or upper edge (♀) or only upper margin and inside of middle and hind femora often ferruginous, partly brownish (♂); hind femur rarely partly brown, ferruginous and red (Turkey, Lebanon) or yellow only on lower margin (Turkmen SSR, Lebanon). Hind tibia and tarsi sometimes infuscated. Upper side of last antennal joints more or less infuscated. Mandible, inner and outer eye margins, lower face entirely yellow or rarely yellowish white (♂) or white (♀) up to semilunar bands between eyes, interrupted exceptionally in the middle by a black spot around antennal socket (♀). Last segments elongate, granulated in basal half and with scattered punctures laterally (Fig. 10). Sternite 9 (♂) with straight and convergent sides (Fig. 12). 4.2–7.2 mm

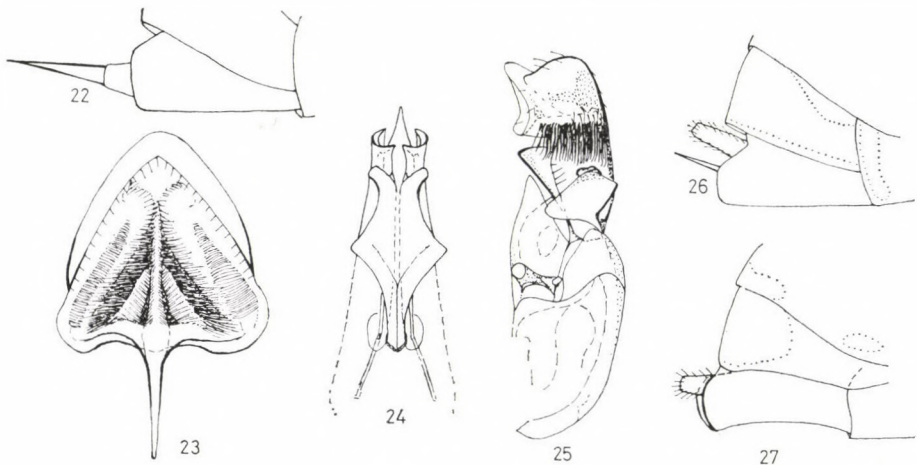
..... *maroccana* (BEAUMONT)
 — Light colour of abdomen white or yellowish white. Spots of tergites 1–2 narrow, not or hardly broadened laterally, then legs black and white. Mesonotum black 8

8 Outer sides of femora usually yellowish red, fore (in Europe) and hind femora (Balkan, Turkey, Arabia) partly brownish or all lighter yellowish red (Africa), legs often with yellowish spots or streaks. Propodeum with stronger rugae, especially basally, medial groove longer and deeper, reaching the middle of propodeum. Basis of mandible often with black spot (Europe), supraclapeal area with a large (♀, Europe often) or a small (♀, Africa) black spot. Antenna yellowish white or ferruginous, upper side fuscous, partly black. Inner and outer orbits with continuous yellow streak. Yellow band between eyes mostly continuous (Spain, Africa) rarely interrupted (Europe). Tergites 1–4 usually with white lateral streaks, (5)6–7 with large medial spots. Posterior margin of pronotum with narrow (Europe) or broad (Africa) white streak. Last tibia and tarsi often, exceptionally (Arabia) legs largely fuscous. Last segments perceptibly concave on lower margin (♀) (Fig. 20). Lateral margins of sternite 9 undulate (♂) (Fig. 16). 3–6.5 (exceptionally 8) mm *cribrata cribrata* (A. COSTA)



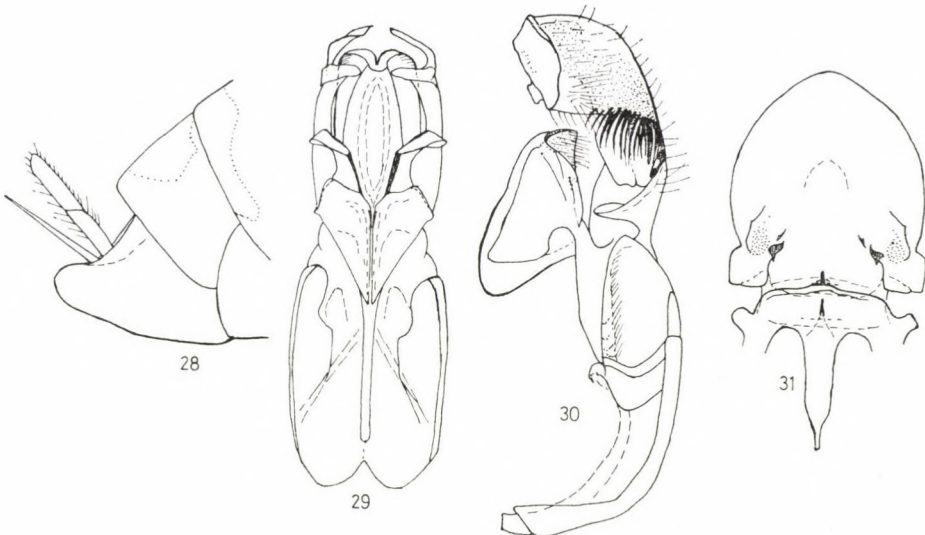
Figs 16–21. 16–20. *Hemiceropales cribrata cribrata* (COSTA), 16 = sternite 9, ♂, 17 = last abdominal segments with genitalia, in lateral view, ♂, 18 = penis, 19 = genitalia, 20 = last segments, ♀. — Fig. 21. *H. cribrata maculipes* ssp. n., last segments, ♀

- Femora largely black with white parts, fore femur inside and middle one partly above pale yellowish red. Sculpture of propodeum finer, at most uniformly rugulose, medial groove shorter and shallower, not reaching the middle of propodeum. Mandible, supra-clypeal area nearly entirely black. Antenna black, lower side of flagellum pale yellowish red. White streaks on inner and outer orbit and narrow white band of frons between eyes interrupted. Tergites 1–5 with white lateral spots, on 1–2 moderately broadened laterally, tergite 6 with large white spot. Lower margin of last segments (♀) hardly concave (Fig. 21). 4.7 mm ***cribrata maculipes* ssp. n.**
- 9 All tergites largely black, at most with lateral light bands. Last abdominal segments truncate apically (Figs 22, 26, 27) 10
- Tergites partly black, partly or largely ferruginous, with or without light bands. Last abdominal segments mostly rounded apically (Figs 28, 38) 12
- 10 Body nearly entirely black, rarely a narrow line on tergite 2 and on pronotum (often more interrupted or only three spots), as well as the same on inner eye margin (rarely



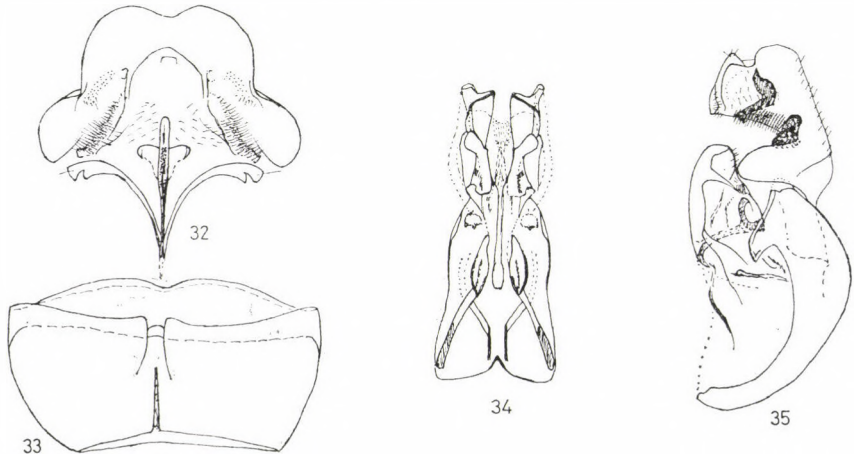
Figs 22–27. 22 = *Hemiceropales chilensis* (SPINOLA), last abdominal segments, ♀. — Figs 23–26. *H. taschenbergi* (DALLA TORRE), 23 = sternite 9, ♂, 24 = penis, 25 = genitalia, 26 = last segments, ♀. — Fig. 27. *H. elsida* (BANKS), last segments, ♀

- broader on ♂), a short line on outer eye margin before vertex, exceptionally lower half of clypeus, white. Hind femur, tibia, tarsi red. Head, pronotum, mesonotum rather densely (rarely very densely) punctured. Last abdominal segments sharply truncate (♀) (Fig. 22). 6–10 mm **chilensis** (SPINOLA)
- Body with yellowish spots and bands. Tergite 1 with broad, 2–6(7) with mostly narrower yellowish bands. Pronotum rarely red. Labrum, clypeus entirely or partly, inner eye margin broadly yellowish. Hind femur often black 11
- 11 Pronotum black, only posterior margin and basal humps yellow. Surface of propodeum coarsely rugulose. Labrum, clypeus, lower face and up to orbits yellow (♂) or with an medial continuous or interrupted broad black line (♀). Pterostigma lighter yellowish brown. Legs largely brownish black or partly (especially fore tibia) more (♂) or less (♀) ferruginous and only with small yellow spot. Face with denser and deeper punctures. Antenna largely black, lower side of basal joints 6–7 brownish (♀) or partly yellowish red (♂). Abdominal band broader. Lower margin of last abdominal segments (♀) straight (Fig. 26). 5–10.9 mm **taschenbergi** (DALLA TORRE)
- Pronotum entirely or posterior and lateral margins red, basal humps often yellow. Surface of propodeum finely granulate and often with punctures. Labrum, clypeus, lower face and up to orbits as usual whitish yellow. Pterostigma darker (♀) or lighter yellowish brown. Fore femur-tarsi reddish brown (♀), basal part of femur usually above darkened, mid and hind femora and tibiae dark brown to black, femora with a yellow streak on lower side. Face finer and only with scattered punctures (♀). Antenna brown above, yellowish red below, except near tip. Abdominal bands narrower. Lower margin of last segments (♀) concave (Fig. 27). 4.5–8 mm **elsida** (BANKS)
- 12 All coxae black with small yellowish white spots backwards, legs elsewhere largely ferruginous. Propodeum coarsely rugose both basally and on declivous part. Abdominal tergites 3–6 rarely more or less also 1–2, sternites 4–5 black, only first segments ferruginous, tergites 2–6 or rarely more or less also 1–2 with white bands, 7 with spot medially. Pronotum closely punctured. Frons granulate, with deep and rather scattered punctures, vertex reticulate, only weakly shining, punctures nearly as large as on frons. Frontal sulcus usually distinct only just below fore ocellus. Head distinctly broader than long (excluding labrum) (62 : 58). Mesonotum more densely punctured, carina lacking. Last segments (♀) rounded apically and slightly concave before apex (Fig. 28). Larger species, ♀ 8.1–14, ♂ 6–11 mm **tricolor** (LYNCH ARRIBÁLZAGA)

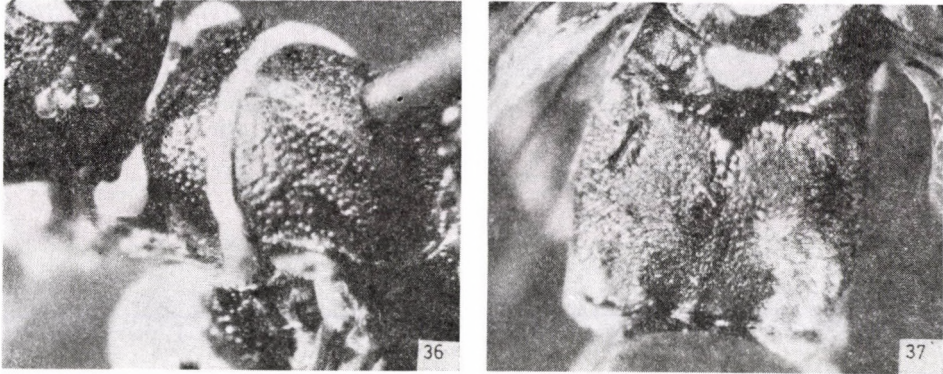


Figs 28–31. 28 = *Hemiceropaes tricolor* (LYNCH ARRIBÁLZAGA), last abdominal segments, ♀.
 — Figs 29–31. *H. brethesi* (BANKS) ♂, 29 = penis, 30 = genitalia, 31 = sternite 9

- Coxae only partly, at most fore and middle black, with light spots. Abdomen nearly entirely ferruginous or at most last tergites partly reddish brown or brownish black. Propodeum mat, granulated basally and mostly wrinkled or rugulose only on declivous part 13
- 13 Fore coxae largely ferruginous, only outside with a small black spot, yellowish white in front; mid coxae white outside, hind one only with 1–2 white spots posteriorly. Flagellum black (♀) or only underside pale yellow, excepting the black last few joints (♂). Episternum and propodeum with much silvery white, rarely golden tomentum. Abdomen with narrow yellowish or white bands on all segments, excepting the first, that on the last segment the broadest, last tergites rarely or 1–2 exceptionally partly blackish. Usually dark spot on labrum (♀), lower face yellowish or white. Propodeum mat, finely transversely rugulose beginning with declivous part. Frons granulate, deeply and rather densely punctate, with deep sulcus, vertex smooth, more finely punctured. Head broader than long (60 : 50, without labrum). Sternite 9 (♂) semicircularly rounded (Fig. 31) or sometimes more pointed apically. ♀ 7–12.3, ♂ 6.6–12 mm **brethesi** (BANKS)
- Fore coxae largely black, yellowish white in front; middle and hind ones largely ferruginous, middle usually hardly black basally with smaller yellowish spot, hind coxa only with a small, apical white spot. Flagellum black above and often yellowish red beneath (♀♂), except the black last few joints (♀♂). Propodeum with some undulate wrinkles on declivous part basally. Frons with longitudinal fovea 14
- 14 Larger species, 12 mm. Abdomen entirely (also tergite 6) darker reddish ferruginous. Labrum entirely yellow. Fore and middle tibia beneath (latter more reddish), metatarsi entirely yellow. POL : OOL = 7 : 12. Frons, pronotum and mesonotum densely punctured (Fig. 36), propodeum coarsely sculptured (Fig. 37). Sternite 9 (♂) stumpy, deeply emarginate apically and laterally and only with short bristles laterally (Fig. 32). Light colour of head yellow, on thorax yellowish white **wahisi** sp. n. ♂
- Smaller species 5.8–9.2 mm. Tergites with distinct yellow bands, or at least tergite 6 with larger white spot. Labrum with a narrow or with larger black medial streak. Fore tibia and metatarsus beneath more or less yellowish white. Anterior ocellus larger than lateral ones 15
- 15 Basal segments of abdomen and venter pale (♀) or more or less (♂) rufous, tergites 3(4)–6 black before posterior bands, 2–6 with rather broad yellow (♂) or white (♀) band posteriorly, 7 with large spot. POL : OOL = 8 : 10 (♀) 11 (♂). Fore and middle coxae black, middle tibia ferruginous, but with yellow spots basally and apically. Frons with strong distinct punctures on a granular surface. Sternite 9 (♂) triangularly pointed apically and with distinct brush, like bristle (Fig. 39). Pronotum, mesonotum with denser punctures. Tomentum of propodeum and episternum silvery. Last segments ♀ hardly concave before apex and convex before penultimate sternite. 5.8–7.2 mm **basirufus** (ROHWER)

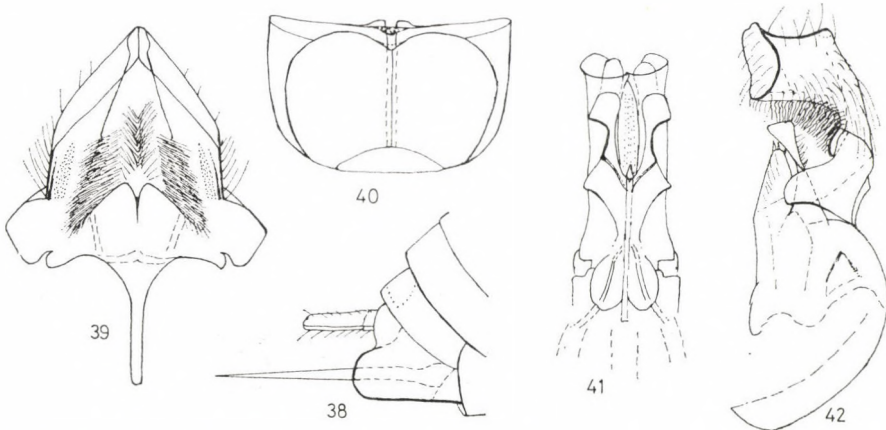


Figs 32–35. *Hemiceropales wahisi* sp. n. ♂, 32 = sternite 9, 33 = basal ring, 34 = penis, 35 = genitalia



Figs 36–37. *Hemiceropales wahisi* sp. n. ♂, 36 = frons-pronotum-mesonotum, 37 = post-scutellum-postnotum-propodeum

– Abdomen entirely ferruginous only tergite 6 with white spot (♀) or tergite 4 with narrow lateral streaks, 5–6 with narrow posterior bands (♂). POL : OOL = 8 : 11 ♀ or 9 : 10 ♂. Legs largely, also middle tibia ferruginous, whole middle metatarsus (♂) yellowish white. Frons rather finely (♂) or (♀) deeply, pronotum densely, mesonotum deeply, sporadically punctured. Propodeum mat, granulated basally, with some punctures basally, transversely wrinkled in declivous part. Lower part of last segments (♀) straight in lateral view (Fig. 38). 9–9.2 mm **bolivari** (BANKS)



Figs 38–42. 38 = *Hemiceropales bolivari* (BANKS) ♀, last segments. — Figs 39–42. *H. basirufus* (ROHWER) ♂, 39 = sternite 9, 40 = basal ring, dorsal view, 41 = penis, 42 = genitalia

Hemiceropales carinitifrons (WAHIS) comb. n.

Ceropales (*Hemiceropales*) *carinitifrons* WAHIS, 1986 in print

Specimens examined: 1 ♀, 1 ♂. Madagascar: “Museum Paris, Madagascar, Coll. J. DE GAULLE 1919”, “R. WAHIS dt. 77 Paratype ♂ *Ceropales carinitifrons mihi*”, 1 ♂ paratype (Hym. Typ. No. 3709 Hungarian Nat. Hist. Museum, Budapest); “Madagascar Behara”, “Museum Paris, XI. 38 A. SEYRIC”, “R. WAHIS dt. 77 Paratype *Ceropales carinitifrons mihi*”, 1 ♀ paratype (Hym. Typ. No. 3710 Budapest).

Distribution: Madagascar (WAHIS, 1986).

Hemiceropales scobinifera (ARNOLD) comb. n.

Ceropales scobiniferus ARNOLD, 1937, Ann. Transv. Mus. 19: 82, 86 Figs 55 ♀♂

Specimens examined: 2 ♀, 13 ♂. Mozambique: "Mt. Mlanje, Nyasaland, 21. I. 1912 S. A. NEAVE", "Nyasaland S. A. NEAVE 1914-425", "British Museum", "*Ceropales scobiniferus* ARNOLD ♂ det. G. ARNOLD" the abdomen on separate pin between microscopical glass sheet with two labels: "Type ♂ *Ceropales scobiniferus* G. ARNOLD", "B. M. Type Hym. 19.780a", 1 ♂ lectotype (London); with the same two locality labels and "Type ♀ *Ceropales scobiniferus* G. ARNOLD" red label, "B. M. Type Hym. 19.780b" (without a head), 1 ♀ paralectotype (London). — Rep. S. Afr.: "Mfongosi Zulu L. W. E. JOHNES Mch 1917 3 ♂ (1 ♂ without head) and 1 ♂ Jan. 1917", paralectotypes (Cape Town); "Mfongosi, Zululand: Jan. 1923 Misses JOHNES", all with "*Ceropales scobiniferus* ARN. ♂ det G. ARNOLD", 1 ♂ paralectotype (Cape Town); Transvaal 12, 13, 17 Jan 1971 H. and M. TOWNES, 3 ♂ (Coll. TOWNES) and 1 ♂ (Budapest). — Nigeria: Ile-Ife Jul 1973 J. T. MEDLER, 2 ♂ (Coll. TOWNES and Budapest). — Zaire: Urundi, Gihanga 850 m 29 Nov 1951 F. J. FRANCOIS, 1 ♂ (Tervuren) and 1 ♀ (Budapest).

M. DAY found one male in the British Museum with the same locality label given by ARNOLD as the holotype of this species ("Lufira R, Katanga 17. 8. 07, 3500 ft", "Neave Coll. 1907-230", "*Ceropales* ♂ n. sp. — (♀ wanted) det. ARNOLD"), but it proved to be a darker coloured *Ceropales variolosa* ARNOLD, 1937 on the basis of the claws, the sculpture and also the genitalia. I designate therefore the ♂ specimen (Mt. Mlanje) as lectotype and the further specimens as paralectotypes from the original material housed in London and Cape Town.

Distribution: Mozambique, Zaire and Rep. of South Africa (ARNOLD, 1937). Nigeria.

Hemiceropales punctulata punctulata (CAMERON) comb. n.

Ceropales punctulata CAMERON, 1904 Rec. Albany Mus. 1: 138 ♂

Ceropales punctulatus: 1937, ARNOLD, Ann. Transv. Mus. 19: 82, 83 ♀♂

Specimens examined: 9 ♀, 7 ♂. Rep. S. Afr.: "*Ceropales punctulata* CAM-type Dunbrody S. Afr. J. A. ONEIL", 1 ♂ holotype (Stockholm); Capland, Krebs, 1 ♂ (Berlin); George 1899 M. WILMAN, 1 ♀ (Cape Town); Cape Province Worcester Jan 1929 R. E. TURNER, 1 ♀ (Budapest); Cape Province Katberg 15–30 Jan 1933 R. E. TURNER, 1 ♀ (London) and the same locality, year and collector, 1 ♂ (Cape Town); Zululand M'fongosi Dez. Feb 1935 W. E. JONES, 1 ♂ (Budapest); Grahamstown 19 Oct 1970 H. and M. TOWNES, 1 ♀ (Coll. Townes); Schoemanshoek 23 Feb 1971 V. WHITEHEAD, 1 ♂ (Coll. TOWNES); Wellington Rooshok Jan 1960 P. M. F. VERHOEFF, 1 ♂ (Zürich) and 1 ♀ (Budapest), Dec 1973 P. M. F. VERHOEFF, 1 ♂ (Leiden). — Rep. Botswana: Mamathes, Basutoland 30 Nov 1947 on *Calpurnia intrusa* C. JACOT-GUILLARMOD 2 ♀, Nieuveld Escarpment, Rietvlei, 1 ♀ (Cape Town) and Papiessforstein, 1 ♀ (Budapest).

According to CAMERON's diagnosis and to the label with the designation "type" this single male specimen represents the holotype. ARNOLD (1937) wrote, that the type was no longer in Albany Museum and was lost, notwithstanding, his redescription of male corresponds to the holotype. One male from Wellington differs from the holotype as follows: by tergites 1–2 black, not ferruginous, by only the posterior margins being dark reddish translucent,

by the stronger rugae of propodeum, distinctly visible also posteriorly. One male (from Schoemanshoek) differs by the punctures of the frons being not so dense as on the holotype and by the slightly finer sculpture of propodeum. The female (from Cape Prov. Worcester) agrees with well ARNOLD's description, except POL : OOL = 6 : 11 not 6 : 9, tergites 1—2 black, not red as in holotype. The general size of the male genitalia (Figs 2—3) is rather similar to *cribrata cribrata* and *maroccana*, but differs from them in some detail. The main characters of this species, the deep and close punctuation of the frons and the very strong rugae at the basis of propodeum indicate the unity of the species-group, simultaneously, the variability, especially in colour, makes it possible to delimit the subspecies *cereris* and *bulawayoensis* from each other.

Distribution: Rep. of South Africa (CAMERON, 1904). Botswana.

Hemiceropales punctulata cereris (ARNOLD) comb., stat. n.

Ceropales punctulatus var. *cereris* ARNOLD, 1937, Ann. Transv. Mus. 19: 82, 84 ♀♂

Specimens examined: 1 ♀, 3 ♂. Rep. S. Afr.: "Ceres, Cape Province. Nov. 1920", "S. Africa, R. E. TURNER. Brit. Mus. 1920-497", "Type ♂ *Ceropales punctulatus* CAM. v. *cereris* G. ARNOLD" red label with ARNOLD's writing, "B. M. Type Hym. 19.782a", 1 ♂ lectotype (London) and with the same locality, date and the type Nr. 19.782b, as well as with a brown label with "British Museum", 1 ♀ paralectotype (London); Aus. Jan. 1930 R. E. TURNER, 1 ♂ (Budapest). — Botswana: Mamathes, Basutoland 17 Dec 1949 C. JACOT-GUIL-LARMOD, 1 ♂ (Cape Town).

ARNOLD (1937) neither separated nor labelled the holotype, consequently, I designate the male specimen as lectotype and the female as paralectotype from the syntypes of the original material deposited in London.

The two males differ from the lectotype as follows. Punctures of mesonotum, episternum more scattered, on frons hardly so close (but still denser than on *punctulata*); in colour: the yellowish white spots larger, on pronotum extending over the disc and over the whole postscutellum, as well as the lateral corners of the outer sides of propodeum, on abdomen the lunate, ivory-white streaks laterally remarkably broadened on tergite 1, gradually narrowed to 4 and on tergites 5—7 (or 6—7 on ♂ from Mamathes) large semicircular spots present; not only the coxae dark and hind legs fuscous, but coxae largely black excepting the yellowish white lower side of fore coxa, a large spot of middle coxa posteriorly and a V-shaped streak on the outer side of hind coxa. Legs otherwise brownish black, excepting the yellowish red inner side of fore femur, as well as the dark red fore and middle tarsi, middle tibia, hind tibia and metatarsus inside (Aus.). Legs of the other male (Mamathes) largely ferruginous, only coxa black, yellowish white and ferruginous to different extents, as well as the upper side of hind tibia and tarsi more darkly infuscated. The male genitalia and sternite 9 (Fig. 5) of the specimen "Aus." do not differ

from those of the nominate species, only the poorly chitinized penis (Fig. 4) seems to be differing to a small degree.

Distribution: Rep. S. Africa (ARNOLD, 1937). Botswana.

Hemiceropales punctulata bulawayoensis (BISCHOFF) comb. n.

Ceropales bulawayoensis BISCHOFF, 1913, Arch. Naturges. 79: 63 ♂

Ceropales punctulatus race *bulawayoensis*: 1937, ARNOLD, Ann. Transv. Mus. 19: 82, 84 Figs 53, 54 ♀♀

? *Ceropales bifasciatus* RADOSZKOVSKI, 1881 sensu ARNOLD, 1937 Ann. Transv. Mus. 19: 84 ♀

Specimens examined: 36 ♀, 72 ♂. Rep. S. Afr.: Cape Prov.: Katberg 1–10 Feb. 1933 R. E. TURNER, 1 ♂ (London); Capland, Sunday river 5 Apr 1897 DR. BRAUNS, 1 ♂ (Cape Town); Natal: Durban 13 Aug 1906 J. ZEIGL (*C. punctulatus* race *bulawayoensis* BISCH. det. ARNOLD), 1 ♂ (Pretoria), Weenen Feb. 1925 H. P. THOMASSET, 1 ♂ (London) and Mkurze Oct 1977 Londt, 2 ♂ (London and Budapest); Zululand M'fongosi Apr–May 1934 W. E. JONES, 1 ♀, 1 ♂ (Budapest); Transvaal: Kosmos, Rustenburg 4200 ft 16 Feb 1969 R. T. SIMON THOMAS, 1 ♀ (Amsterdam) and KRUGER N. P. PAFURI Feb. 1982 L. BRAACK, 12 ♂ (London) and 1 ♂ (Budapest). — Botswana: Basutoland: Mamathes 15 Nov 1947 and 6 Jan 1953 C. JACOT-GUILLARMOUD, 2 ♂ (Cape Town); Redbank 12 Sep 1926 R. H. R. STEVENSON, 2 ♀, 3 ♂ (Cape Town); Nata River 16 Apr 1976 P. GINN, 2 ♂ (Coll. TOWNES and Budapest). — Zimbabwe: Bulawayo 3 Jul 1919, 1 ♂, 9 Dec 1919, 1 ♀ G. ARNOLD (Cape Town) and Bulawayo Umguza River 24 May 1923, 29 Oct 1929 R. STEVENSON, 1 ♀, 2 ♂ (Cape Town); Chishiwasha nr. Salisbury 1978–9 A. WATSHAM, 3 ♂ (London); Turk Mine S. Rhodesia 2 Nov 1958, 1 ♀ (Budapest); Upper Luangwa R. 27 Jul–13 Aug 1910 S. A. NEAVE, 1 ♂ (Budapest). — Angola: Andrada Jun 1949 M. DE PETSHKOWSKY, 1 ♀ (Tervuren); Bruco 26 Feb–2 Mar 1972, 1 ♂ (London). — Zaire: Congo Belge PNG 17 Apr 1950 H. DE SAEGER, 1 ♀ (Coll. WAHIS); Elisabethville 2 May 1930 M. BEQUAERT, 1 ♂ and Bolobo 27 Jul 1912 Mouchet, 1 ♂ (Tervuren); Lualaba R. 30 May 1907 2500–4000 ft, 1 ♀ (London); Katanga 4000 ft 13 Dec 1907, 1 ♀ (London); Lulua Kapanga Oct 1932 F. G. OVERLAET, 1 ♂ (Budapest). — Tanzania: Ilala Maramas Dist. Umugas 18–21 June 1911, 1 ♀ (Budapest); Rabai May 1928 v. SOMEREN, 1 ♂ (London). — Uganda: Kadunguru 29 Dec 1913 R. E. TURNER, 1 ♂ (London). — Nigeria: Buruku Farm 5 Jun 1974 J. L. MUSS, 1 ♂ (London); Fashola nr. Oyo Nov. 1974, 2 ♂, Ikenne Sept 1974, 1 ♀, Ile-Ife May 1973, 1 ♂ and Sep 1974 3 ♀, and Ilora Aug 1974, 4 ♂ all J. T. MEDLER (London); Nr. Funtua, Mairowa Dam. 25 Mar 1973 L. V. KNUTSON, 1 ♂ (Washington); Liboré, Canton de Niamey 2 Dec 1982 J. HAMON, 1 ♀ (Coll. WAHIS). — Togo: Kete 18 Feb 1917 J. J. SIMPSON, 1 ♂ (London); Sokodé Dec 1983 A. PAULY, 1 ♀, 2 ♂ (Coll. WAHIS). — Gold Coast: Accra Aug–Sep 1941 K. H. GUICHARD (*C. variolosus* ARNOLD ♀ det. ARNOLD!), 1 ♂ (Cape Town). — Mali: Bamako 15 Jan 1976 S. POPOV, 1 ♂ (Budapest). — Upper Volta: Banfora 23–26 Mar 1984 M. MATTHEWS, 1 ♀, 2 ♂ (London) and 1 ♀, 1 ♂ (Budapest); Dori 29 Dec 1967 J. HAMON Orstom 1 ♂ (Coll. WAHIS). — Sierra Leone: Freetown Aug–Sep 1967 D. F. OWEN, 2 ♀ (Coll. TOWNES). — Gambia: Keneba Sep–Oct 1975 M. L. D. SPEIGHT, 1 ♂ (London) and 1 ♀, 1 ♂ (Budapest). — Senegal: Dakar Sinigai 7–13 Apr 1981 B. SIGWAI, 1 ♀ (Paris); Kedougou 1–7 Jul 1981 Mal. trap 1 ♀ (Budapest); Parc Nat. bas Casamance 15–20 Mar 1981 (Coll. WAHIS); Ziguinchor PAULY, 2 ♀ (Coll. WAHIS) and 1 ♀ (Budapest).

This subspecies is very variably especially in colour. Concerning the colour of the abdomen we can distinguish two main groups among the specimens: 1. Abdomen nearly entirely ferruginous, tergites 3–4(5) mostly black basally and with yellow lines apically, or the latter mostly broadly interrupted medially especially on tergites 1–2(3). 2. Abdomen largely black, tergite 1(2) more or less ferruginous, darker rufous and all tergites with yellowish white lateral streaks or spots. The majority of the specimens and the

females belong to the first group. Head and thorax with partly ferruginous colour occur on one-third of the females and only one-fifth of the males. The yellow, long streak of the hind femora proved to be present on three-fourths of the females and on one-third of the males. Entirely ferruginous femur or only with minute yellow spot was found on the remainder of specimens. All females and only one-third of the males had a large yellow or white spot on the lateral corners of the propodeum. In any case, it is characteristic that the differently coloured specimens occur often in one and the same locality, even when they were captured in the same time, probably from the same population.

Distribution: Zimbabwe, Bulawayo (BISCHOFF, 1913). Togo, "West Africa, British Congo", Zaire, Uganda, Rep. of South Africa (ARNOLD, 1937). Botswana, Tanzania, Angola, Uganda, Nigeria, Ghana, Gold Coast, Mali, Upper Volta, Sierra Leone, Gambia and Senegal.

Hemiceropaes maroccana (BEAUMONT) comb., stat. and ♂ n.

Ceropales cribratus maroccana BEAUMONT, 1947, Mitt. schweiz. ent. Ges. 20: 508 ♂

Ceropales lunatus HAUPT, 1962, Bull. Res. Coun. Israel 11B: 33 ♂ syn.n.

Ceropales lunatus: 1966, PRIESNER, Israel J. Ent. 1: 151 ♂

Ceropales cribratus lunatus: 1969, PRIESNER, Naturkundliches J. Stadt Linz: 117 syn.n.

Ceropales cribratus maroccanus: 1969, PRIESNER, Naturkundliches J. Stadt Linz: 117 syn.n.

Ceropales ischnokrotapha KOHL, nom. in collection (Wien).

Specimens examined: 23 ♀, 38 ♂. Morocco: "Cotypos", "Azrou, Moyen Atlas, Maroc, 23. VIII. 1935 Collect. NAEF.", "*cribratus* COSTA ♂ ssp. *maroccana* B. J. DE BEAUMONT det. Cotype 1947" with BEAUMONT's writing, 1 ♂ lectotype (Lausanne); 30 km e. Marrakech Roadside verge 26 Mar 1983, 1 ♂ (London). — Senegal: M'bour 27 Oct 1979, 1 ♀ (Paris) and 15–29 Oct 1981, 2 ♀ (Coll. WAHIS and Budapest); Niokolu Badi 30 May–3 Jun 1981 Mal. trap 1 ♂ (Coll. WAHIS); Parc. nat. Basse Casamance 8 Sep 1980 Malaise trap, 1 ♂ (Coll. WAHIS); Zinguinchor 11–12 Aug 1979 A. PAULY, Malaise trap, 1 ♀, 1 ♂ (Coll. WAHIS). — Gambia: Keneba, Malaise Sep–Oct 1975 M. C. D. SPEIGHT, 5 ♀, 4 ♂ (London), 1 ♀ (Budapest). — Upper Volta: Soumoussa c. Bobo-Dioulasso 9 Oct 1969 J. HAMON Orstom 1 ♂ (Coll. WAHIS). — Ivory Coast: Zamto 15 Sep 1965 GRILLON, 1 ♂ (Paris). — Ghana: Kumasi Kwadaso Mar 1977 CIB SCHEIBELRETI, 1 ♂ (London). — Nigeria: Akure Oct 1974 J. T. MEDLER, 1 ♀ and nr. Oyo Nov 1974, 2 ♀, 2 ♂ (London); Fashola Nov. 1973, 1 ♀, 1 ♂ J. T. MEDLER (London); Ilora Aug 1974 J. T. MEDLER, 1 ♂ (Budapest). — Zaire: Equateur, Boketa P. M. 10, 13 Sep. 1983 Liongo, 2 ♀ (Coll. WAHIS); Utukuru 28 Dec 1950 J. V. VERSCHUREN, 1 ♀, 4, 12 Apr 1951 H. DE SAEGER, 1 ♂, 4, 8 May, 27 Oct 1951 H. DE SAEGER, 1 ♂ (all Coll. WAHIS) and 1 ♀ (Budapest), 3, 7 May 1951 H. DE SAEGER, 1 ♂ (Budapest) and 4, 22 Jul 1952 H. DE SAEGER, 1 ♀ (Coll. WAHIS); Rutsuru 3 Jul 1937, 1 ♀ (Tervuren). — Zimbabwe: Salisbury Chishawasha 11 Apr 1980 A. WATSHAM, 1 ♂ (Budapest). — Israel–Palestine: "Jerusalem, Palestine 17. 8. 1946 leg. BYTINSKI-SALZ", "holotypus" and "Typus" red labels, "*Ceropales lunatus* HPT. ♂ HAUPT det. 1952" with HAUPT's writing, 1 ♂ holotype (Tel Aviv); "Jerusalem Palestine 17. 8. 1946 leg. BYTINSKI-SALZ", "Paratypus" red label, "*Ceropales lunatus* HPT. ♂ HAUPT det. 1952" with HAUPT's writing, 1 ♂ paratype (Tel Aviv); "Tiberias, Palestine 12. VII. 1945 BYTINSKI-SALZ", "*Ceropales lunatus* HPT. ♂ HAUPT det. 1952" with HAUPT's writing, 1 ♂ paratype (Hym. Typ. No. 3711 Budapest); "Palestine Jerusalem 8. V. leg. BYTINSKI-SALZ", "*Ceropales lunatus* HPT, det. H. BYTINSKI-SALZ", 1 ♂ paratype (Tel Aviv); the same locality, data but det. PRIESNER, 1 ♂ paratype (Wien); Jerusalem Israel 16 Jun 1950 J. WAHRMAN, 1 ♂ (Tel Aviv); Sparafaud, Palestine 28 Apr BYTINSKI-SALZ, 1 ♂ (Tel Aviv). — Lebanon: Kadisha 24 Jun 1960 MAVROMOUSTAKIS, 1 ♂ (Leiden); Mrach Backdch, Bekaa 14 Aug 1952 A. MOCHI, 1 ♀, 1 ♂ (Budapest) and 14 Jun 1953, 1 ♀, 1 ♂ (Coll. MOCHI). — Syria: Damascus, Hattite 2–18 May 1960 J. DE BEAUMONT, 1 ♂ (Lausanne); Mezzé, 1 ♂ (Budapest). — Turkey: Urfa 1 Jun 1968 J. GUSENLEITNER, 1 ♂ (Coll. GUSENLEITNER). — Russian SSR: Transkaukasus, Helenendorf 1886 "*ischnokrotapha* det KOHL", 3 ♂ (Wien); Caucasus Arexestal Leder "*ischnokrotapha* ? KOHL" by *Anthrenus* damaged, 1 ♂ (Wien). — Turkmen SSR: Kara-kala 14 Jun 1952 KRIZANOVSKIJ, 1 ♂ and Dzafarhal, 1 ♀ (Budapest).

DE BEAUMONT published this species on the basis of two males collected in the same locality in Morocco. According his description: "Chez l'un des individus, tous les tergites portent des bandes jaunes apicales continues; chez l'autre les 3 premières bandes sont interrompues". This difference being less than those between *cribrata* COSTA and *maroccana* BEAUMONT, the latter being widely distributed also in Africa, thus, I regard it to be a separate species. Since I had the opportunity to examine only one specimen of the BEAUMONT's original material, I designate the above-cited male as the lectotype (Fig. 9) having interrupted bands on tergites 1–3 and the other as paralectotype.

Because the data of the locality and of collecting time listed before from Jerusalem and Tiberias (Fig. 8) were given also in HAUPT's diagnosis the specimens were determined as *C. lunatus* HAUPT and labelled mainly by HAUPT, partly by BYTINSKI-SALZ and by PRIESNER all corresponding to HAUPT's diagnosis, all can be regarded as paratypes, in spite of the fact that only one specimen deposited in Tel Aviv was designated as paratype. This species agrees with *maroccana* BEAUMONT both in sculpture and in colour, therefore it is the junior synonym of *maroccana*.

C. ischnokrotapha KOHL is an unpublished name occurring in collection.

Lateral margin of sternite 9 (♂) straight (Fig. 12). Genitalia with the general size of *cribrata*, but remarkably differ in details (Figs 11, 13–15).

♀. — 4.2–5.6 mm. Similar to the male, but differs as follows. Outer orbit, lower face white, black only below or round the antennal socket narrowly. Semilunar band rather broad on lower frons between eyes. Upper side of antenna darker, at least the last joints black. Disc of pronotum, margins of propleura, pronotal tubercle (humps), scutellum, postscutellum, lateral corners of propodeum white or yellowish white. Lateral streaks of tergites 1–4 smaller than on female, lemon-yellow, and only on tergite 5 continuous, 6 with a large medial spot. Hind margins of sternites 1–5 usually with small and narrow yellowish-lemon lateral streaks. Lower side of coxae, outer side of femora nearly entirely yellowish white, upper edge of fore femur sometimes brownish, trochanters, tibiae, tarsi pale ferruginous. Frons more deeply and densely punctured than on paratype (♂, Tiberias). The wedge-shaped groove not reaching beyond the middle of propodeum, striate transversally as in the male. Last sternites compressed laterally and pointed apically (Fig. 10), elongate granulate over basal half and partly with scattered punctures.

The variety of the sculpture on males is limited to the frons, where the interspaces are mostly as large and partly larger than punctures (Tiberias). When the punctures are much denser, the interspaces become smaller (Jerusalem, males from Africa, similarly to females from Africa). In this case, mesonotum black without a yellow spot (Africa). The yellow spot on the abdomen is only pale lemon on male originating from South East Turkey (Urfa), that seems to be a transitional form.

The variety of the colours on the females is limited to the breadth of the yellow spot and the darkness of the hind femur inside, i.e. from hardly infuscated to black. Interestingly enough there are three specimens from Senegal (M'bour) with different colouration: 1 female, collected in 1979 represents the typical colour, 2 females, collected in 1981, have much lighter colour; all being remarkably paler, the white is partly transparent on the tergites, moreover, lower face with lightly cyanide-reddish tint. It is due to the killing method, probably. On the other hand, the yellow colour of the body varies greatly on the femora. Usually the outer sides of all femora are nearly entirely yellow, inside largely ferruginous, exceptionally both insides and the outside ferruginous (Turkmen SSR). The yellow spots and streaks are usually larger on the males and more vivid yellow than on the females. Upper edge of all femora often being ferruginous and partly with gradually broadened brown streak towards the basis of fore femora (lectotype of *maroccana*, specimens from North Africa, Gambia, Nigeria, Zimbabwe, Zaire), scarcely brownish infuscated (lectotype of *lunata*, specimens from Senegal) or brown (Lebanon). Upper half of hind femora ferruginous on the outer side, basis of middle and hind femora ferruginous or partly brownish on specimens from Syria Transcaucasia and W. Asia. Only lower margin of hind tibia yellow, largely dark brown medially and more or less ferruginous on the upper part in front (Lebanon and Caucasus). A narrow brownish streak of the hind femora medially occurs also on one female from Nigeria and on one male from Zimbabwe, too. Rarely (Rutsuru, ♀) hind femur tricoloured: with brownish black streak above, ferruginous on upper edge and largely yellow below; inside brown, inner side of femora usually partly yellow, partly ferruginous (West Africa and Middle Africa); hind femur medially often brownish infuscated, slightly darker on *lunata*. Middle femur partly darker (Lebanon, Syria, Transcaucasia, S. W. Asia and partly in Africa) or dark brown (Lebanon, Caucasus) and an interestingly nearly entirely black on two specimens from Zimbabwe (Salisbury, Chishawasha ♀) and 1 ♀ from Zaire (Boketa). These and the further smaller colour varieties (i.g. the semilunar yellow streak across the frons broader or narrower and rarely interrupted) do not occur on specimens with well-delimited territories, besides, there are transitional forms among them, consequently, they have no zoogeographical significance of any kind.

Distribution: Morocco (BEAUMONT, 1947). Israel (HAUPT, 1962). Senegal, Gambia, Upper Volta, Ivory Coast, Ghana, Nigeria, Zaire, Zimbabwe, Lebanon, Syria, Turkey, Russian SSR: Caucasus and Turkmen SSR.

Hemiceropales cribrata cribrata (A. COSTA) comb. n.

Ceropales cribrata A. COSTA, 1881, Fauna Regno Napoli: 43 T. 8b Fig. 3

Ceropales intermedia MAGRETTI, 1886, Boll. Soc. ent. ital: 402 ♀

Ceropales cribrata: 1887, A. COSTA, Prosp. Imen. Ital. 2: 49 ♀♂

- Ceropales cribrata*: 1887, MAGRETTI, Boll. Soc. ent. ital. **19**: 213 ♀
Ceropales intermedia: 1887, A. COSTA, Prosp. Imen. Ital. **2**: 49 syn. by COSTA
Ceropales cribrata: 1889, TOURNIER, Ent. genèv. **1**: 38
Ceropales cribrata: 1892, FOX, Trans. Am. ent. Soc. **19**: 61
Ceropales cribrata: 1895, DALLA TORRE, Wien. ent. Ztg. **14**: 91
Ceropales cribratus: 1897, DALLA TORRE, Cat. Hym. **8** Fossor.: 341 ♀♂
Ceropales cribrata: 1897, FERTON, Act. Soc. linn. Bordeaux **52**: 128
Ceropales cribrata: 1925, BERLAND, Faune Fr. **10** Hym. vespif. **I**: 220 Fig. 444 ♀♂ (*C. histrio* FERTON, 1894 nec FABRICIUS, 1804)
Ceropales versicolor GUSSAKOVSKIJ, 1926, Ent. Oboz. **20**: 250 ♀♂
Ceropales cribratus: 1927, HAUPT, Dt. ent. Z. Beih.: 296, 300 ♀♂
Ceropales versicolor: 1931, GUSSAKOVSKIJ, Ezheg. zool. Mus. **32**: 2, 8 ♀♂
Ceropales cribrata: 1936, BERHARD, Bull. Soc. ent. France **41**: 286
Ceropales cribratus: 1943, GUIGLIA, Mem. Soc. ent. ital. **22**: 68
Ceropales cribratus: 1944, GUIGLIA, Annali Mus. civ. Stor. nat. Giacomo Doria **62**: 144 ♂
Ceropales cribratus: 1945, GINER MARI, Eos Madr. **21**: 243 Fig. 10c
Ceropales cribratus: 1947, BEAUMONT, Mitt. schweiz ent. Ges. **20**: 506 ♀♂ Figs 1, 12
Ceropales versicolor: 1947, BEAUMONT, Mitt. schweiz. ent. Ges. **20**: 506, 509 syn. n.
Ceropales cribrarius (= *cribratus*): 1954, MÓCZÁR, Folia ent. hung. **7**: 148 (on *Euphorbia gerardiana*)
Ceropales cribratus: 1956, MÓCZÁR, Fauna Hung. **13**(5): 75 ♀♂
Ceropales cribratus: 1963, WAHIS, Bull. Anlns. Soc. r. ent. Belg. **99**: 85 ♀
Ceropales (Hemicer.) cribratus: 1965, WOLF, Nachr. naturw. Mus. Aschaffenh. **472**: 38 ♀♂
Ceropales cribratus: 1965, PRIESNER, Sber. I. **174**: 78 ♂
Ceropales cribratus: 1967, WOLF, Beitr. Ent. **17**: 527 ♀
Ceropales (Hemiceropales) cribratus cribratus: 1969, PRIESNER, Naturkundliches J. Stadt Linz: 115, 117–119 ♀♂
Ceropales cribratus cribratus: 1971, WOLF, Acta faun. ent. Mus. natn. Prague **14** (Suppl. 3): 60 (on *Falcaria*)
Ceropales (Hemiceropales) cribratus: 1972, WOLF, Ins. Helv.: 166, 168 Figs 479, 480 ♀♂
Ceropales cribratus: 1981, WOLF, Linzer biol. Beitr. **13**: 33 (design. of lectotype ♀)
Ceropales (Hemiceropales) cribrata: 1986, WAHIS, Notes faun. Gembloux **12**: 35
Ceropales distinguenda GUSSAKOVSKIJ nom. in collection (Leningrad).

Specimens examined 50 ♀, 71 ♂. Spain: 1 ♀ (Budapest); Catalonia 1 ♂ (Berlin); Escorial, 1 ♀, 1 ♂ (Madrid); Sierra Morena 12 Jun 1927 A. SEYRIC, 1 ♂ (Budapest). — France: Cavalaire S. M. Provence 28 Aug 1936 NAEF and CALLIAN Jul 1956, 2 ♀ (Lausanne); Gallia, 1 ♂ (Budapest); Marseille 1883 KOHL, 1 ♂ (Wien). — Czechoslovakia: Kovačov 15 Jul 1938 J. SNOFLÁK, 1 ♀ (Budapest). — Hungary (MÓCZÁR, 1954): Simon-tornya 6 Jul 1933 F. PILICH, 2 ♂ (Leningrad) and 2, 30 Aug 1934, 1936 on *Euphorbia F. PILICH*, 3 ♂ (Budapest). — Romania: Agigea 5 Aug 1967 on *Reseda lutea* NAGY, 1 ♂ (Budapest). — Yugoslavia: Cirkvenica Jun 1908 Z. SZILÁDY, 1 ♀ (Budapest); Hvar, Dalmacia, 13 Jun 1962 J. GUSENLEITNER, 1 ♂ (Coll. GUSENLEITNER); Insel Krk Mader, 1 ♀, 2 ♂ (Wien); Novi 14 Jul 1899, 15 Jul 1901 HORVÁTH, 1 ♀, 1 ♂ (Budapest). — Greece: Alt Korinth, Peloponnes 5 Jun 1963 M. SCHWARZ, 1 ♂ (Coll. SCHWARZ); Corfou 23 Aug 1954 P. M. VERHOEFF, 1 ♀ (Washington); Ost Kreta: Knossos, on *Foeniculum vulg. piper.* 1 ♂ (Berlin). — Turkey: Anatolia Antakya 1–7 Jun 1965 J. GUSENLEITNER, 1 ♂ (Coll. GUSENLEITNER); Konya 10–12 Jun 1966 F. SCHMIDT, 1 ♂ (Budapest); Urfa 2 Jun 1968 J. GUSENLEITNER, 1 ♂ (Coll. GUSENLEITNER). — Cyprus: 1 ♂ (Budapest). — Russian SSR: “Sarepta Bekker 68”, “7224”, “*Ceropales versicolor* s. sp. V. GUSSAKOVSKIJ” with the author’s writing and a small round and gold coloured label, 1 ♀ lectotype (Leningrad); Sarepta 16–20 Aug 1928 SHESTAKOV, 1 ♂ (Leningrad); Tschita 29 Jan 1924 GUSSAKOVSKIJ, 1 ♀ (Leningrad); Platus 14 Jun 1934, 1 ♀ (Leningrad); Pera-Radi Jun 1937, 1 ♂ (Budapest). — Ukraine SSR: Krim pr. Karadag 23 Jul 1927 C. KOSTYLEV, 1 ♂ (Leningrad). — Georgian SSR: Tifgiaz 30–31 Jul 1904 KUKUEVA, 1 ♀ (Budapest). — Uzbek SSR: Kitab 31 Mai 1932 GUSSAKOVSKIJ, 1 ♂ (Leningrad); Guzar 28 Jun 1929 GUSSAKOVSKIJ, 1 ♀ (Leningrad). — Tadzhik SSR: Stalinabad (= Dusambe) 5 Jun 1938 V. GUSSAKOVSKIJ, *Ceropales versicolor* m. det. GUSSAKOVSKIJ, 1 ♂ (Budapest). — Kazakh SSR: “16. VIII. 25. Krasn. vobopal. Task. u. V. GUSSAKOVSKIJ”, “*Ceropales versicolor* n. sp. ♂ V. GUSSAKOVSKIJ” with author’s writing, “k. Gussakovskovo”, 1 ♂ paralectotype (Hym. Typ. No. 3712 Budapest), with the same dates but “9. VIII. 25” and “*Ceropales distinguenda* n. sp. (typus)”, gold coloured label, 1 ♂ paralectotype (Leningrad); Mergenyev 13 Jul 1951 Steinberg on *Unbelliferae*, 1 ♀ (Leningrad). — Saudi Arabia: Jayfa 500 m 31 Jan 1883 KMG 2 ♂, 1 ♀ (London) and 1 ♂ (Budapest). — Senegal: Kedougou 12 Sep 1979 A. PAULY, 1 ♂

(Budapest) and 17–31 Jul 1981 Mal. trap 1 ♀ (Coll. WAHIS); Parc Nat. Casamance 12–20 Mar 1981 1 ♀, 8 Apr–8 May 1 ♀, 9–21 May 1 ♂ (Coll. WAHIS) and 1 ♀ (Budapest); Park Niokolo-Koba 28 Dec 1979 B. SIGWALT, 1 ♂ (Paris). — Upper Volta: Riv. Volta Rouge 15 km W. Kokhologo 22 Oct 1979 A. PAULY, Malaise trap, 1 ♀ (Coll. WAHIS); Bobo Dioulasso La Guignette 27–30 Mar 1984 M. MATTHEWS, 4 ♂ (London), 1 ♂ (Budapest). — Ivory Coast: Gagnoa Antonihio 2–5 Mar 1984 M. MATTHEWS, 1 ♀ (Budapest); Korhogo, Komborodongou 18–21 Mar 1984 M. MATTHEWS, 1 ♀ (London); Sassandra 26 Feb–1 Mar 1984 M. MATTHEWS, 1 ♀ (London). — Togo: Sokodé Dec 1982 A. PAULY on Euphorbiae, 1 ♂ (Coll. WAHIS). — Nigeria: Ibadan 10 Jul 1962, 3 Jan 1963 Malaise trap D. C. EIDT, 2 ♂ (Ottawa); Ghinda, 1 ♂ (Helsinki); Ile-Ife, May 1973 F. T. MEDLER, 7 ♂ (Coll. TOWNES) and 2 ♂ (Budapest) and July 1973, 3 ♀, 3 ♂ (Coll. TOWNES), 1 ♀, 1 ♂ (Budapest) and Oct. 1973, 1 ♀, 1 ♂ (Coll. TOWNES). — Angola: Bruco 26 Feb–2 Mar 1972, 1 ♂ (Budapest). — Zaire: Bagunda 17 Jan 1951 J. VERSCHUREN 1 ♀ (Coll. WAHIS), and 6 Sep, 9 Jun, 27 Oct 1951, 28 Jan, 15 Feb, 30 Aug 1952 P. SCHOEMAKER, 4 ♀, 1 ♂ (Coll. WAHIS), 1 ♀ (Budapest); Congo Belge P.N.G. 31 Jan 1951 H. DE SAEGER, 1 ♀ (Coll. WAHIS); Congo da Lemba May 1912 R. MAYNÉ, 1 ♀ (Tervuren); Eala Mar 1932 H. J. BRÉDO, 1 ♂ (Tervuren); Elisabethville 28 May 1931 DE LOOSE, 1 ♂ (Tervuren); Equateur, Boketa 6 Sep 1983 Liongo, 1 ♂ (Coll. WAHIS); Kivu env. Fizi 3 Jan 1955 H. BOMANS, 1 ♂ (Budapest); Riv. Mukandwe, Sect. Nord 1140 m sur Gingibenacées 20 May 1957 P. VANSCHUYTBROECK, 1 ♀ (Tervuren); Musosa Oct 1939 H. J. BRÉDO, 1 ♀ (Budapest); Ruanda Gatsibu 1800 m terr. Biumba 6 Feb 1953 P. BASILEWSKY, 1 ♀ (Tervuren); Rutsukuru 15 May 1936 L. LIPPENS, 1 ♂ (Budapest); Yangambi 17 Jun 1948 P. L. G. BENOIT, 1 ♂ (Tervuren). — Zambia: 15 km E. Lusaka 13–22 Nov 1979 R. A. BEAVER, 1 ♂ (London). — Tanzania: Tzaneen 16 Jan 1971 H. and M. TOWNES, 1 ♀ (Coll. TOWNES). — Zimbabwe: Bulawayo 1924 R. H. R. STEVENSON, 1 ♂ (Cape Town); Victoria Falls 3–6 Apr 1968 P. SPANGLER, 1 ♀ (Washington). — Namibia: Okahandja 17–23 Feb 1928, 1 ♂ (London). — Botswana: Mamathes, Basutoland 4 Dec 1949 C. JACOT-GUILLARMOD, 1 ♀ (Cape Town); Serowe 13–30 Mar, 12, 15, 17 Apr, 2, 29 Mai, 9–11 Jul 1983 Per FORCHHAMMER, 2 ♀, 3 ♂ (London) and 1 ♀, 1 ♂ (Budapest). — Rep. of South Africa: Beakon Ranch, N. GRAVELOTTÉ Nov 1978 Brothers, 1 ♀ (Cape Town); Natal, Mtubatuba 24–25 1968 P. J. SPANGLER, 1 ♀ (Washington). — Pretoria 3, 9 Jan 1971 TOWNES, 2 ♀ (Coll. TOWNES), 1 ♂ (Budapest).

BEAUMONT (1947) synonymized *C. versicolor* GUSSAKOVSKIJ with *C. cribratus* COSTA on the basis of the description. I confirm his establishment after having examined the lectotype and the paralectotypes. The pale yellow spot extending to the inner orbit on the lectotype, therefore, makes them richer coloured specimens in this respect, however, tergite 5 is black, and is without a lighter band, which is characteristic for the darker specimens. Both paralectotypes belong to the more richly coloured specimens with the large pale yellow spots, as well as with the coloured tergites 1–5. These specimens labelled as *C. versicolor* n. sp. correspond to the original description having a gold-coloured label symbolizing his new taxa. Since there is no indication concerning the holotype, I designate the female as lectotype (deposited in Leningrad) and the 2 males as paralectotypes (Leningrad and Budapest, Hym. Type No. 3712). The name *Ceropaes distinguenda* is after all a nomen in collection.

H. cribrata cribrata is rather variably in colour, partly also in sculpture. Lower face yellowish white or ivory white in proportion 12: 24 (♂) and 15: 31 (♀), but it is to be noted, that there are also specimens with yellowish white character among the specimens collected in recent years (1973), not only among the old ones. Lateral streaks of tergites ivory-white on all males, but occurred on 7 females in contradiction to 39 females with yellowish white spots. Femora usually nearly entirely yellowish red, middle, sometimes also

fore femora with a small yellow spot outside. The narrow yellow spot or streak is limited at most to the half, rarely to the two-thirds length of the lower edge of hind femora. The ferruginous hind femur in proportion to the same with longer yellow streak below 32: 4 (♂) and 39: 7 (♀). Among the 15 males collected in a single population with Malaise trap there are 12 ♂ without and 3 with yellow spots on the hind femur. Supraclypeal area largely light on 43 females and nearly entirely black on 3 females. The variability of the sculpture appears mostly in the punctures of the frons. There are only 7 among the 46 females on which the punctures are distinctly denser, and the interspaces mostly narrower than the punctures. Lateral margins of sternite 9 undulate, not straight (Fig. 16), genitalia strongly convex (Fig. 17) as usual in lateral view. Male genitalia (Figs 18–19), as well as sternite 9 rather similar to those of *punctulata punctulata* (CAMERON), but they differ in detail. Lower margin of last sternite (Fig. 20) distinctly concave, surface moderately granulate basally and with scattered punctures.

Distribution: Italy (COSTA, 1881). France (BERLAND, 1925) et médit. litt. (BERNARD, 1936). South Europe to Bozen (HAUPT, 1927). Albania, Cyprus (GUIGLIA, 1943, 1944). Caucasia, Turkestan (BEAUMONT, 1947). Greece (WAHIS, 1963). Switzerland, South and East Europe to Middle Asia, North Africa (WOLF, 1972). Middle and South Europe, Turkey, S. Arabia, S. Russia, Ukraine, Georgian, Uzbek, Tadzhik, and Kazakh SSR, Senegal, Upper Volta, Ivory Coast, Togo, Nigeria, Angola, Zaire, Zambia, Tanzania, Zimbabwe, Namibia, Botswana and Rep. of South Africa.

Hemiceropaes cribrata maculipes ssp. n.

Specimen examined: "Zambia 15 km E. Lusaka 14–29. XII 1979 R. A. BEAVER", 1 ♀ holotype (British Museum, London).

♀. — Length 4.7 mm. Black, palpi of mouth parts, a small spot on mandible basally, labrum and clypeus entirely, inner eye margin, except besides antennae, a spot on lower end of the broad basal groove of outer eye margin and a narrow streak apically on the same place, a medial interrupted, narrow and transversal band on frons between eyes, a spot on lower side of scape and pedicel, posterior band and humps on pronotum, tegula, a spot on postscutellum, lateral corners of propodeum posteriorly, lateral streaks on tergites 1–5, 1–2 moderately broadened laterally, a large spot on tergite 6, large spot on fore coxa below, outer and posterior margins of middle and hind coxae, apical half of fore femur on outer side, at least lower half of middle and hind femora, white; lower side of flagellum, fore legs between femur-tibia, whole fore tarsus, lower side of middle tibia-tarsus pale yellowish red, upper side of middle tibia-tarsus, as well as hind tibia-tarsus, brownish. Wings only weakly infuscated, veins brown, pterostigma yellowish brown. Head and thorax covered with very fine silky toment, frons, vertex, pronotum, propodeum partly with longer white hairs.

Frons moderately convex between fore ocellus and antennae, viewed from the side, surface nearly mat, finely granulated with deep and denser punctures, interspaces mostly narrower than punctures. Vertex with scattered punctures, interspaces as large as punctures. Ocelli in an acute, nearly in rectangle. POL : OOL = 9 : 19. Antenna rather short, joints 1 + 2 hardly shorter than 3—4, latter slightly longer than broad. Pronotum, mesonotum with rather dense and deep, scutellum, episternum with scattered punctures. Propodeum flat, sculpture finer, distinct and at most uniformly rugulose, medial groove shorter and shallower, not reaching the middle of propodeum, lateral part of disc punctured, lateral side finely granulated. Abdomen silky shining with brownish toment, last sternites strongly compressed laterally, broadly granulate basally only with some punctures, triangularly acute posteriorly, lower margin hardly concave (Fig. 21) in lateral view. Claws bifid, hind claws rectangularly bent.

Hemiceropaes chilensis (SPINOLA) comb. n.

Ceropaes chilensis SPINOLA, 1851, Hist. Chile, Zool. 6: 391 ♀♂

Ceropaes chilensis: 1855, SMITH, Cat. Hym. Brit. Mus. 3: 179

Ceropaes chilensis: 1892, FOX, Trans. Am. ent. Soc. 19: 60

Ceropaes chilensis: 1895, DALLA TORRE, Wien. ent. Ztg 14: 90

Ceropaes chilensis: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 341 ♀♂

Specimens examined: 20 ♀, 14 ♂. Chile: "Chili DR. GRAY Cⁿ DE SAUSSURE" 1 ♀ lectotype (Geneva) and 2 ♂ paralectotypes with the same data and "*Ceropaes chilensis* SPIN", 1 ♂ partly damaged, as well as 1 ♀ with the same data, paralectotype (all Geneva); Chili A. FAZ, 1 ♀, 1 ♂ (Coll. WAHIS); Chillata, Cerda, 1 ♀ (Tucuman); Concepcion 1904, 3 ♀ (Wien) and 25 Feb 1907 P. HERBST, 2 ♂ (Budapest), 1 ♂ (Berlin); Cauquenes 1 ♀ (Budapest); Contulmo and Rajacagua 3 ♀ (Berlin); Curico Los Queñes 15 Jan 1984 A. ROIG, 2 ♀, 2 ♂ (Buenos Aires and Budapest); FAIRM. 1890, 1 ♀ (Wien); Huintil, Illapel 1 ♀ 3 ♂ (Coll. WASBAUER), 1 ♂ (Budapest); Limache, Chili cent. Feb 1923 A. FAZ, 1 ♀ (Halle); Novara Exp., 1 ♀ (Wien); Puelma 1 ♀ (Berlin); Prov. Cocalan 1 ♀ (Bruxelles); Santiago, 1 ♀ (Budapest); Villa Italia Porter Chili, 1 ♂ (Buenos Aires).

This species was described on the basis of five specimens from Chile. These were deposited in Geneva without type or cotype labels. I designate the less damaged female as lectotype and the other 1 ♀ as well as 3 ♂ as paralectotypes from this original material; they all correspond to the description.

Addition to the original diagnosis: Frons, pronotum, mesonotum with scattered and deep, episternum with denser punctures, interspaces between punctures partly narrower and smaller, partly distinctly larger than punctures. Propodeum with rough surface (lectotype) or sometimes slightly finer and also with some traces of transverse rugosity (one female of the original material and interestingly only one of the two females, as well as two males from Curico Los Queñes, respectively from Concepcion). The propodeum of one male of the original material only transversally rugulose, similarly to a female from Santiago. Last abdominal segments truncate apically (Fig. 22). The

white streak is rather broader on the lower inner orbit (one paralectotype), even also lower half of clypeus white in one male (Villa Italia).

Distribution: Chile (SPINOLA, 1851).

Hemiceropales taschenbergi (DALLA TORRE) comb. n.

Ceropales nigripes TASCHENBERG, 1869, Z. ges. naturw. Halle **34**: 74 ♀♂

Ceropales nigripes: 1872, BURMEISTER, Stettin. ent. Ztg **33**: 238

Ceropales nigripes: 1878, LYNCH ARRIBÁLZAGA, Naturalista argent. **1**: 323 ♂ (on *Ammiviznaga*, *Apium petroselinum*, *Daucus carota* and other Umbelliferae)

Ceropales nigripes: 1892, FOX, Trans. Am. ent. Soc. **19**: 62

Ceropales Taschenbergii DALLA TORRE, 1895, Wien. ent. Ztg **14**: 91, 92 nom. nov. of *nigripes* TASCHENBERG, 1869

Ceropales taschenbergii: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 345 ♀♂

Ceratopales taschenbergi: 1947, BANKS, Bull. Mus. comp. Zool. Harv. **99**: 475, 477

Specimens examined: 124 ♀, 120 ♂. Argentina: "Nov. Friburg", ♀ lectotype and "Mendoza" green labels, 1 ♀ paralectotype (Budapest); Buenos Aires: Campo de Mayo 9 Nov 1902 J. BRETHER, Dec 1919 M. P. GOMEZ, 2 ♂ (Buenos Aires), Sa. de la Ventana 1 ♀ 2 ♂ (Coll. WASBAUER), 3 ♂ (Budapest) and S. Pedro A. FRES, 3 ♀, 7 ♂ (Buenos Aires) and 2 ♀ (Budapest); Cacheuta, 5 ♀, 3 ♂ (Buenos Aires), 1 ♂ (Budapest); Catamarca: Andalgalá 3 ♀ (Coll. WASBAUER), Los Nacimientos de Abajo Jan 1969 Malaise t. WILLINK-TERÁN-STANGE, 7 ♀ (Tucuman) 1 ♀ (Budapest), Pirquitas 13 Feb 1958 R. GOLBACH, 1 ♂ (Tucuman), El Radeo 28 Jan 1958 R. GOLBACH, 1 ♂ (Tucuman) and 2 km N of Santa Maria, 1800 m 21 Mar 1974 Malaise t. C. R. VARDY, 2 ♀ (London and Budapest); Chaco Resistencia 6-8 Dec 1950 MONRÓS—WILLINK, 1 ♀ (Budapest); Cordoba: 2 ♂ (Coll. WASBAUER), Agua de Oro 3 Feb 1976 A. WILLINK, 1 ♀, Bialto Massé, 1 ♀, 13 Jan 1927 MUHN, 1 ♂, A. WILLINK (Tucuman) Cordoba E. Giacomelli, 2 ♀ (Buenos Aires), 1 ♀, 1 ♂ (Coll. WOLF) and D^o PUNILLA—V. HERMOSO Feb 1943, 2 ♀, 1 ♂ (Buenos Aires); Iguazu 30 Jan-13 Mar 1945 HAYWARD—WILLINK—GOLBACH, 1 ♀ (Tucuman); Jujuy: 12 Jun 1960 WILLINK, 1 ♀ and Titicaca 2400-2700 m 20 Mar 1967 STANGE—WILLINK, 1 ♀ (Tucuman); La Rioja: 4 ♂ (Buenos Aires), Chilecito 18 Apr 1972 C. PORTER, 3 ♂ (Tucuman), 2-5 Feb 1977 A. WILLINK, 2 ♀ (Tucuman and Budapest), Famatina 11 Feb 1966 WILLINK—STANGE, 1 ♂ Malligasta 2 Feb 1977 WILLINK, 1 ♂, Guanchin 15 Dec 1971 PORTER—STANGE, 3 ♂, Villa Castelli 1280 m 27 Nov 1977, 1 ♀ and Villa Union 22 Apr 1972 C. PORTER, 2 ♀ (all Tucuman); Mar del Plata H. H. MARISTAS, 1 ♀ (Buenos Aires); Mendoza: 1000 m 7-8 Dec 1979 C. and M. VARDY, 2 ♀, 2 ♂ (London), El Chellao 10 Mar 1981 A. WILLINK, 1 ♀ (Budapest), Sta Rosa 12, 14 Jan 1905, 1 ♂ (Halle) and 1 ♂ (Wien); Miramar Jan 1973 A. ROIG, 5 ♂ (Buenos Aires); Montevideo Paras Lab 6 Mar 1944 BERRY, 1 ♀ (Washington); Partido de Puán 1 ♀ (Coll. WASBAUER) Patagones DACUERRE, 1 ♀ (Budapest); Piquete 22 Dec 1927, 1 ♀, 1 ♂, Dec 1929, 1 ♂, 9 Jan 1928, 1 ♂ and Bridarolli Jan 1932, 2 ♀ (all Tucuman); Pronunciamento Entre Rios Dec 1965, 1 ♂ (Ottawa); Prov. de Santa Fé, 1 ♀ (Buenos Aires); Rio Negro: El Bolson 18 Feb A. ANDREA, 1 ♂ (Washington); Pomona 3 ♂ (Coll. WASBAUER), 1 ♂ (Budapest); Rio Colorado 1 ♀ (Coll. WASBAUER) (Tucuman); N San Antonio Oeste 28 Feb 1980 WILLINK—FIDALGO—CLAPS—DOMINGUEZ, 1 ♂ (Tucuman); Salta: Alemanfa 27 Apr 1970 L. STANGE—C. PORTER, 2 ♂ (Tucuman and Budapest), Campamento Jakulica 22 km O Aguas Blancas Jan 1969 Malaise t. C. PORTER, 1 ♀ (Tucuman) 1 ♂ (Budapest) and 20 Sep 1971 Malaise t., 1 ♂ (Budapest), Lafayate 1650 m 10 Feb 1964 HAYWARD, 1 ♀ and Oran Abra Grande 10 Jan 1967 R. GOLBACH, 1 ♀, (Tucuman), Rosario de Lerma ♀ 6 ♂ (Coll. WASBAUER) and 2 ♀ 1 ♂ (Budapest); Tacuile 7 Dec 1968 WILLINK—STANGE, 6 ♀, Yacochuya, Cafayate 1950 m 16-30 Sep 1968, Malaise t. and 16-28 Sep 1969 WILLINK—TERÁN—STANGE, 2 ♀ (all Tucuman) and 1 ♀ (Budapest); San Blas, 2 ♀, 1 ♂ and coll. DACUERRE, 2 ♂ (Buenos Aires); San Clements del Tuyu Feb-Mar 1951 N. KORMILEV, 1 ♀ (Buenos Aires); San Ignacio 15 Mar 1 ♂ (Coll. WOLF); San Juan Villa Nueva Rio Castaño 21 Jan 1982 A. ROIG, 1 ♂ (Buenos Aires); San Luis Alto Pencoso Dec 1974 A. ROIG, 1 ♂ (Buenos Aires); San. d. Estero: Colonia Dora, 8 ♀, 11 ♂ (London) 2 ♀, 1 ♂ (Budapest) and 1 ♂ (Coll. WAHIS), 61 k. n. e. Los Telares 22-25 Nov 1979 C. and M. VARDY, 1 ♂ (Budapest), Los Tigres 11-16 Jan 1970, 12 ♀, 3 ♂ (Tucuman) and 1 ♀, 1 ♂ (Budapest); Santiago del Estero, Termas de Rio Rondo Dique Frontal: 3, 13, 25 May 1972 C. PORTER—WILLINK, 5 ♀, 2 ♂ (Tucuman) 1 ♂ (Budapest), 17 Jan, 2 ♂, 18-19 Apr 1970, 1 ♀, 2 ♂, L. STANGE—C. PORTER (Tucuman); Tucuman: Girard,

1 ♂ (Buenos Aires), Amaicha del Valle 9 Jan 1965 WILLINK, 1 ♀ (Tucuman), Las Criollas 22 Apr 1951 HAYWARD, 1 ♀ (Tucuman), Quilmes 7 Mar, 6 Dec 1968, 10 Mar 1972 A. WILLINK, 1 ♀, 1 ♂ (Tucuman), San Pedro de Colalao Oct 1947 J. M. ARNAU, 1 ♀ (Tucuman), Tafi del Valle 2500 m 6—8 Jan 1970 VARDY and ARGUINDEGUY, 1 ♀, 1 ♂ (Budapest), Trancas-Tacanas Jan 1948 J. M. ARNAU, 1 ♂, 5—30 Jan and 1—30 Nov 1968 L. STANGE, 2 ♀ (Tucuman) and 1 ♀ (Coll. WAHIS); Zelaya Jan 1953 N. BEMAL, 1 ♀ (Washington). — Brazil: Chaco, 1 ♀ (Buenos Aires); Guaruya Ilha Santo Amaro 15 Apr 1912 G. E. BRYANT, 1 ♀ (London); La Plata, 1 ♂ (Halle); Nova Teutonia F. PLAUMANN, 1 ♂ (Budapest) 1 ♀ 2 ♂ (Bruxelles), 3 ♀ 5 ♂ (Coll. WASBAUER); Rolandia Parana Oct 1948, 1 ♂ (Budapest). — Bolivia: Cochabamba and Tarija 2 ♂ (Coll. WASBAUER). — Paraguay: Dpto. San Pedro Carumbé 1 Feb—8 Mar 1966 GOLBACH, 1 ♂ (Tucuman). — Uruguay: Rio Negro Arroyo Negro 15 km S. Paysandu 27—31 Dec 1962 R. G. VAN DELDER, 1 ♂ (New York).

TASCHENBERG published in his original description 2 ♀ and 1 ♂ specimens from Nov. Friburg, Mendoza, consequently, the above listed 2 females represent the original material. I designate the first female as lectotype and the second one as paralectotype (Budapest Hym. Typ. No. 3713—3714). The description can be supplemented as follows: Face with deep and dense, vertex above, also between eye and ocellus with scattered punctures, scutellum, episternum below with coarser punctures. Propodeum with rough surface, similar to *chinensis* Spinola, on some males sculpture finer, also with a deep triangular groove basally in the middle. Last abdominal segments (♀) sharply truncate apically (Fig. 26), sternite 9 (♂) triangular (Fig. 23) with remarkable rows of brush like bristles. Genitalia (Figs 24—25) resemble *brethesi* (Figs 29—30) or *basirufus* (Figs 41—42), but differ from the in essential details. Wings uniformly infuscated, apex hardly darker.

The colour of the examined 244 specimens varies usually as follows. On lectotype: legs nearly entirely black with small yellow spots, and only tibiae below, hind femur inside and tarsi partly brownish red. Mostly fore, middle femur and tarsi more or less yellowish red. Longitudinal black band from clypeus towards vertex only rarely continuous (lectotype), mostly broadly or narrowly interrupted with yellow streak, at least on lower margin, and often also above clypeus. Scape black with yellow streak below (lectotype), often more or less red. Labrum black with a very narrow yellow lower margin (lectotype) or more or less brownish, rarely yellow.

Some specimens with unusual colour:

- 1 femur-tarsi 3 yellowish red (genitalia similar to the other)
- 2 femur 3 black
- 3 femora 1—2 largely black with yellow spots
- 4 legs 1—2 partly brown, partly yellowish brown
- 5 legs 1—2 brownish red
- 6 tergites usually with yellow bands
- 7 tergites with paler yellow bands
- 8 tergite 1 with band, 2 with lateral spots, 3—6 black
- 9 tergites 1—2 with band, 3 (♀) or 3—4 (♂) with lateral streaks
- 10 tergite 1 laterally broadly and medially hardly interrupted
 - „ 2 with continuous band
 - „ 3 with or without lateral streaks

	1	2	3	4	5	6	7	8	9	10
Tucuman Tafi d. Valle ♂	+		+			+				
Miramar 2 ♂	+			+			+			
Miramar ♂	+			+					+	
Miramar ♂		+			+				+	
Miramar ♂		+		+			+			
Patagones ♀	+			+				+		
Mar del Plata ♀	+			+				+		
Miramar ♀	+			+				+		
San Blas ♀ ♂	+		+						+	
S. Clements ♀		+			+			+		
Cacheuta ♂		+	+				+			+
Rio N. E. Bolson ♂	+									+
Bol.: Tarija 2 ♂									+	+
R. Negro: Pomona ♂		+			+					+
Rosario ♀	+			+			+			
Rosario ♂							+			

The dissimilarity of the usual and unusual colouring of the enumerated specimens (among them Miramar with the same collecting date), prove the great variability of this species.

Distribution: Argentina (TASCHENBERG, 1869). Brazil, Paraguay, Uruguay.

Hemiceropales elsida (BANKS) comb. n.

Ceratopales elsida BANKS, 1947, Bull. Mus. comp. Zool. Harv. 99: 475, 478 ♀♂

Specimens examined: 12 ♀, 10 ♂. "Bolivia: Santa Cruz. J. STEINBACH.", "M. C. Z. Type 26596" red label, "*Ceratopales elsida* Bks. type", 1 ♀ holotype. — Brazil: "Vista Alegre Rio Branco Amazonas 6. IX. 27", "Coll. Bequaert", "M. C. Z. Paratype 26596" 1 ♂ paratype (Cambridge, Mass.); Nova Teutonia 27° 11' B. 52° 23' L. 193 FR. PLAUMANN, 1 ♀, 1 ♂ (with the label *C. varipes* SHUCK. ♂ det HAUPT 1937) (Budapest), 1 ♂ (Ottawa), 2 ♂ (Bruxelles and Budapest), 2 ♀ 3 ♂ (Coll. WASBAUER), 1 ♀ 2 ♂ (Budapest). — Argentina: La Rioja Jagüe 9 Mar PORTER and L. STANGE 1 ♀ (Tucuman); Pronunciamento, Entre Rios Sep 1964, 1 ♀ (Ottawa); Santiago del Estero, Thermas de Rio Hondo, Digue Frontal 25 May 1972 C. PORTER, 2 ♀ (Tucuman) and 1 ♀ (Budapest), the same locality 27–28 Nov 1979 C. and M. VARDY, 1 ♀ (London). — Uruguay: Florida Feb 1952 J. M. ARNAU, 1 ♀ (Tucuman).

Banks separated the type (♀) and the paratype (♂) in the type material, consequently, the female represents the holotype.

Additions to BANKS's diagnosis: antennae yellowish red below, pronotum entirely red on female and red only on the posterior and lateral margins (on paratype) or entirely red (Nova Teutonia). Light spots and bands of body yellowish white; femora-tarsi of fore legs more reddish brown than yellowish (♀); femur beneath, tibia above on male more brown with yellow streaks.

Pterostigma darker (♀) or lighter (♂) brown. Frons with scattered punctures, on female with some larger punctures below fore ocellus. Pronotum distinctly more deeply, but not densely punctured. Punctures of mesonotum very dense and more deep. Propodeum mat, with some punctures (♀) or finely rugulose on declivous part (♂). Lower margin of last abdominal segments concave (Fig. 27).

Distribution: Brazil, Bolivia (BANKS, 1947). Bolivia, Argentina, Uruguay.

Hemiceropales tricolor (LYNCH ARRIBÁLZAGA) comb. n.

Ceropales tricolor LYNCH ARRIBÁLZAGA, 1878, Naturalista argent. 1: 322

Ceropales tricolor: 1892, FOX, Trans. Am. ent. Soc. 19: 62

Ceropales tricolor: 1895, DALLA TORRE, Wien. ent. Ztg 14: 92

Ceropales tricolor: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 345

Ceropales varipes BURMEISTER, name in collection.

Specimens examined: 13 ♀, 9 ♂. Argentina: "Buenos Aires" green label, 1 ♀ neotype (Buenos Aires); "795, 212, *Ceropales varipes* BURM.", 1 ♀ (Buenos Aires); Asul 2 ♀ (Coll. WASBAUER and Budapest), Catamarca 8 Dec 1970 PORTER and STANGE, 2 ♂ (Tucuman); Felipe Sola, Buenos Aires 6 Jan 1951 MARTINEZ, 1 ♀ (Tucuman); and 1 ♀ (Coll. WASBAUER); La Rioja Queb. La Aguadita 13 Nov 1969 WILLINK, STANGE and TERÁN, 1 ♂ (Tucuman) and 2 Dec 1977 WILLINK and FIDALGO, 1 ♂ (Budapest); Mendoza: P. del Aghua 11 Mar 1907, 1 ♀, Chacras decoria 22 Feb 1966 STANGE, 1 ♀ (Budapest), 10 km E Potrerillos Las Vegas 20 Feb 1966 L. STANGE, 1 ♀ (Tucuman), Uspallata Feb 1973 A. ROIG, 1 ♀ (Budapest); Montevideo Paras Lab 9 Feb 1943 BERRY, 2 ♂ (Washington and Budapest); Rosas F. C. Sud Prov. B. Aires J. B. DAGUERRE, 1 ♀ (Buenos Aires); Tucuman: Tafi del Valle 1 Mar 1948 F. MONROS, 1 ♀ and 8—14 Dec 1967 WILLINK, 1 ♂ (Tucuman), 22 Feb 1964, 1 ♀ (Budapest), 9 Apr 1983 WILLINK, 1 ♀ (Tucuman) and 6—8 Jan 1970 VARDY and ARGUINDEGUY, 1 ♂ (London).

The author published neither the exact locality of the new species, nor designated the type in his description. Only the conclusion can be drawn from the introduction of LYNCH ARRIBÁLZAGA's paper (1878), that the locality of the original material is the environs of Buenos Aires ("Partidos septentrionales de Buenos Aires, situados sobre la costa del Rio Paraná"). According to Arturo Roig Alsina the original material together with the LYNCH ARRIBÁLZAGA's collection was lost. But a female originating also from Prov. Buenos Aires that corresponds to the diagnosis is now designated as neotype from Burmeister's collection (deposited in Buenos Aires; Museo Argentino de Ciencias Naturales "Bernardino Rivadavia").

Distribution: Env. of Buenos Aires (LYNCH ARRIBÁLZAGA, 1878). Uruguay (DALLA TORRE, 1897). Argentina.

Hemiceropales brethesi (BANKS) comb. n.

Ceratopales brethesi BANKS, 1947, Bull. Mus. comp. Zool. Harv. 99: 475 ♀♂

Specimens examined: 41 ♀, 32 ♂. Bolivia: Santiago Nov 1959 J. FOERSTER, 1 ♂ (Budapest). — Paraguay: Dpto San Pedro Calumbé R. GOLBACH, 1 ♀ (Tucuman). — Argentina: 16 ♀ 5 ♂ (Coll. WASBAUER); Catamarca 1969 Malaise t. WILLINK—TERÁN—STANGE, 1 ♀ (Budapest); Concepción Feb 1928 M. GÓMEZ, 1 ♀ (Budapest); Córdoba E. Giacomelli, 2 ♀, 4 ♂ (Buenos Aires) and 2 ♂ (Budapest); Corrientes 3 Nov 1971 C. PORTER 1 ♂ (Coll. WAHIS); Jujuy, 2 ♀ (Buenos Aires), Ciudad 27 Jan 1948 WILLINK, 1 ♀ (Tucuman); La Rioja, 1 ♂ (Buenos Aires); Salta: Aguas Blancas Mar 1953, 1 ♂ (Coll. WAHIS). Prov. Anguinen 16—30 Nov, 1 ♂ (Buenos Aires); Santiago del Estero: Colonia Dora 15—26, 2 ♀, 4 ♂ (London) and 2 ♀ (Budapest), Dique Frontal 28 May 1972 C. PORTER, 3 ♀, 2 ♂ (Tucuman) and 3 ♀, 1 ♂ (Budapest), Los Telares, 1 ♀ (London), Thermas de Rio Hondo 30 Dec 1935 L. STANGE, 2 ♂ (Tucuman and Budapest), 27—28 Nov 1979, 2 ♀, 2 ♂ (London) and Santiago Presa Riv. Hondo 24 Apr 1971 FIDALGO, 1 ♀ (Coll. WOLF); Tucuman: 16 Nov 1950 HAYWARD, 1 ♂ (Tucuman), Cadillal 6 Jan 1921, 1 ♂ (Tucuman), Corrientes Manantiales, 1 ♂ (Col. WAHIS), 1 ♂ (Tucuman), Famaila San Ramon Nov 1947 R. L. GARCIA, 1 ♂ (Tucuman), Horco Mrelle San Javier 8 Jun 1968 STANGE, 1 ♀ (Tucuman), Los Piestos 8 Apr 1967 TIRÁN—WILLINK, 1 ♀ (Tucuman), Trancas Feb. 1947 R. GOLBACH, 1 ♀ and Trancas Tacanas 1—30 Nov 1968 STANGE, 1 ♀ (Tucuman).

The original description can be supplemented as follows: The light colour is usually white on the fresh specimens, collected in 1979 and usually yellow or yellowish on the older ones, collected in 1928; the red is ferruginous or pale ferruginous, especially on males, not red. Mandible partly yellow (δ). Hind tarsi dark basally not apically (δ). Propodeum sometimes more or less reddish (δ). Tergite 1 often with a small pale translucent yellow apical margin, lateral spots of tergite 2 sometimes longer, hardly or not interrupted medially (rarely each in ♀ and ♂ from Cordoba and ♂ from Salta A. Blancas), lateral side of pronotum and metapleuron partly dark reddish, rarely propodeum only basally black, rest red (Santiago del Estero-Termas R. Hondo ♂) or only laterally reddish (Salta A. Blancas). Toment and mesepisternum less silvery, distinct golden (♀), partly on ♂ and cover up the distinct transverse wrinkles on the declivous part of the propodeum basally. Frons with deep and rather scattered punctures. Fore and middle claws bifid. Sternite 9 (♂) usually (Fig. 31) semicircularly rounded posteriorly, lateral edge raised and concave ventrally or sometimes pointed apically, without brush like bristles. Male genitalia (Figs 29—30) of the specimens with different sternite 9 are the same.

Distribution: Brazil, Paraguay, Argentina (BANKS, 1947). Bolivia.

Hemiceropales wahisi sp. n.

Specimen examined: "Brazil: Nova Teutonia 27° 11' B. 52° 23' L. 8. i. 1938 FRITZ PLAUMANN B. M. 1938. — 459" 1 ♂ holotype (London, British Museum).

♂ . — Length 12 mm. Black, palpi of mouth parts, labrum, clypeus, supraclypeal area, inner eye margin to the acute spot of ocular sinus, a very small and only hardly interrupted streak of outer eye margin, lower side of scape and pedicel, fore tibia and all tarsi in front, and tarsi behind partly, yellow; lower side of antenna, excepting the two apical joints, rest of legs, except fore and middle coxae partly, whole abdomen, yellowish red, latter darker reddish ferruginous (at most tergite 1 with trace of a very narrow lateral and 7 medial yellowish streak); posterior margin and humps of pronotum, a spot on scutellum, postscutellum, lateral corners of propodeum posteriorly, large spot on lower side of fore coxae, small spot on middle and hind coxae, narrow streak on trochanters apically, yellowish white; fore coxa, except below and middle coxa basally also black. Wings slightly brownish infuscated, veins brown, pterostigma light yellowish brown. Propodeum and episternum covered with silky toment.

Head distinctly broader than long (32 : 30), gradually narrowing behind eyes. Frons finely granulate, mat with a frontal sulcus and a small deepening medially, deeply and densely punctured below fore ocellus and between the lateral yellow spots, interspaces mostly narrower than punctures, vertex dis-

tinctly with finer and scattered punctures, surface alutaceous, moderately shining; ocelli in a hardly acute, nearly in a rectangle, POL : OOL = 7 : 12; antenna slender, scape hardly shorter than joint 3 or 4, pedicel as long as broad, joint 3 more than three times longer than pedicel. Pronotal disc deeply and densely punctured also between humps and posterior margin, mesonotum granulate basally densely and deeply punctured, here interspaces often larger than punctures (Fig. 36), with an impunctate line medially. Episternum largely granulate, only with few scattered punctures. Postnotum with a deep, triangular, smooth and shining area medially (Fig. 37) with diagonal wrinkles laterally. Propodeum convex in lateral view, strongly bending before medial part, sulcus deep, ending before this part, surface coarse coriaceous mat, irregularly rugulose, wrinkles distinct laterally, behind the long spiracles. Fore and middle tarsal joints shortened, 2—4 about as long as broad, 5 distinctly longer than broad. Claws bifid, hind claws rectangularly bent. Sternite 9 stumpy, short, deeply emarginate medially and laterally (Fig. 32), with a row of short bristles laterally. Genitalia (Figs 33—35) resembling those of *basirufus* (ROHWER) or *brethesi* (BANKS), but differ especially in the penis in essential details.

Hemiceropales bolivari (BANKS) comb. n., ♀ n.

Ceratopales bolivari BANKS, 1945, Boln Ent. venez. 4: 111 ♂

Ceratopales bolivari: 1947, BANKS, Bull. Mus. comp. Zool. Harv. 99: 475, 476 ♂

Specimens examined: 1 ♀, 1 ♂. Colombia: "Puerto Colombia", "Colombia 1936 J. Bequaert Collector", "M. C. Z. Type 26595" (Slide no. M.C.Z.R.R.D., not examined), 1 ♂ holotype (Cambridge, Mass.). — Venezuela: Aragua, Ocumare De La Costa 12 Jun 1976 A. S. MENKE and D. VINCENT, 1 ♀ (Budapest).

The single male was designated as type by the author, since it is the holotype. BANKS's description can be supplemented as follows: 9.2 mm, tergite 1 medially and posteriorly, 2 irregularly dark reddish and blackish translucent, 1—3 with a trace of a very narrow yellowish band, apical margin of tergite 4 laterally with narrow white streaks, fore coxae largely black except the large white spot below. Frons finely coriaceous and with silvery toment above antennae among punctures. Vertex remarkably more finely punctured. Pronotum very densely (denser than on mesonotum) punctured, and not finely (BANKS, 1945: 112), on sides only scarcely punctate, with very fine wrinkles below humps. Propodeum mat, granulate basally with some, before declivous parts more punctures, latter finely, transversely wrinkled, medial sulcus basally deep and triangular, shining and ending before declivous part. Claws of fore and middle legs bifid.

♀. — 9.2 mm. Very similar to male, but it differs as follows. The pale brownish spot of labrum is large and brownish black. Abdomen entirely ferruginous, without even traces of darker spots, only tergite 6 with a white

spot medially, coxae, legs as on male, but fore femur entirely ferruginous, middle femur only with a minute spot apically, same on middle tibia placed basally, middle basitarsus ferruginous, white only basally. Face covered with silvery toment above antennae and mat. POL : OOL = 8 : 11. Punctures of face coarser, of pronotum and mesonotum hardly finer, on the other hand, propodeum is rather more coarsely punctured than on male. Last sternites compressed laterally, rounded, nearly truncate apically (Fig. 38).

Distribution: Colombia (BANKS, 1945), Venezuela.

Hemiceropales basirufus (ROHWER) comb. n.

Ceropales basirufus ROHWER, 1960, Proc. U. S. natn. Mus. 44: 443 ♀

Specimens examined: 2 ♀, 4 ♂. Peru: "Santa Ana 3000 ft. 3 August, 1911 Yale Peruv Exp", "♀ Type No. 15110 U.S.N.M." red label, "*Ceropales basirufus* ROH. Type ♀", 1 ♀ holotype and the same locality and red labels, but only with "paratype", 1 ♂ paratype (Washington); Chanchamayo Jul 10 1948 J. M. SCHUNKE, 1 ♂ (Budapest). — Guayana: Seashore 4 mi E Georgetown Sep 30 1918 H. MORRISON, 1 ♂ (Budapest). — Brazil: Amazonas, Obidos Jan 1906 DUCKE, 1 ♂ (Wien) and 13 Jan 1936 ADAM 1 ♀ (Bruxelles).

According to ROHWER "two females collected" comprise the original material, in fact they are 1 ♀ and 1 ♂; the female bears the type labels, probably with the author's writing, therefore, it can be regarded as holotype and the male as paratype. Addition to the description:

♂. — Length 5.8–6.5 mm. Similar to female, differs from it as follows. Light colour of head, thorax and abdomen yellow not yellowish white; narrow basal margin of metanotum black; middle tibia beneath yellow only basally and apically; rufous colour extending over tergites 1–2 and basis of 3. POL : OOL = 8 : 11; antenna slender, thickening apically, propodeum rugulose partly also in anterior part. Sternite 9 with parallel sides anteriorly and triangularly pointed apically (Fig. 39), with distinct two brush-like bristles laterally, also one medially. Genitalia (Figs 40–42) resembling *brethesi* (BANKS) (Figs 29–30) and *taschenbergi* (DALLA TORRE) (Figs 23–25), but differ from them in essential details (Paratype: 6.5 mm).

♀. — 7.2 mm (holotype). Last abdominal segments truncated apically, with slightly rounded corners, hardly concave before apex and convex before penultimate sternite. It is difficult to separate it from *brethesi* ♀.

Distribution: Peru (ROHWER, 1960). Guayana and Brazil.

THREE NEW ACANTHORMIUS ASHMEAD
SPECIES FROM INDIA
(HYMENOPTERA, BRACONIDAE: EXOTHECINAE)

J. PAPP

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

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Three new species of *Acanthormius* ASHMEAD, 1906 are described from India completed with their specific differences (*A. alius* sp. n., *A. balanus* sp. n., *A. obstitus* sp. n.). New distributional datum is given for *A. bakeri* WATANABE. The type-material of the new species is deposited in the Hungarian Natural History Museum, Budapest. A list of the *Acanthormius* species is compiled. With 12 figures.

ACANTHORMIUS ASHMEAD, 1906 SPECIES AND THEIR DISTRIBUTION

Indo-Australian Region

- alius** sp. n.: India
- bakeri** WATANABE, 1968: Philippines, India
- balanus** sp. n.: India
- dubitatus** BRUES, 1918: Solomon Islands
- iriomotensis** WATANABE, 1968: Ryukyu Islands
- japonicus** ASHMEAD, 1906: Ryukyu Islands (and Japan)
- malayensis** WATANABE, 1968: Malaysia
- obstitus** sp. n.: India
- philippinensis** WATANABE, 1968: Philippines
- rugosus** WATANABE, 1968: Ryukyu Islands

Ethiopian Region

- capensis** (HEDQVIST, 1963): South Africa
- dentatus** GRANGER, 1949: Malgasy

Palaeartic Region

- japonicus** ASHMEAD, 1906: Japan (and Ryukyu Islands)
- rossicus** TOBIAS et BELOKOBYSKIJ, 1981: USSR (Far East Maritime Territory)
- takadai** WATANABE, 1968: Japan

Altogether 14 *Acanthormius* species were described from the regions indicated. The majority of the species is distributed in the Indo-Australian Region (9 species), 2 species each occur in the Ethiopian as well as in the Eastern Palaeartic Region, and 1 species (*A. japonicus*) falls into the border-zone of the Palaeartic and Indo-Australian Region.

Further zoogeographic as well as taxonomic characterization of the *Acanthormius* species see in WATANABE's paper (1968) and SHENEFELT's catalogue (1975).

Acanthormius bakeri WATANABE, 1968

New locality. — 1 ♀: India, Tamil Nadu, Anaiamalai Hills, Waterfalls, Estate, 1230 m, 31 III 1980, leg. TOPÁL.

Hitherto the species was reported from the Philippines. New to the fauna of India. The new locality datum suggests its wide distribution in the Indo-Australian Region.

My female specimen agrees well with the description except "antennae brown, the basal segments yellowish". Last eight joints of antenna of my single female are whitish, otherwise flagellum brown to light brown basally.

DESCRIPTION OF NEW SPECIES

Acanthormius alius sp. n. (Figs 1—4)

♀. Body 2.1 mm long. Head in dorsal view subcubic, 1.6 times broader than long, eye twice longer than temple, latter rounded constricted (Fig. 3). Ocelli small, distance between ocelli distinctly longer than greatest diameter of an ocellus. OOL nearly twice as long as POL. Eye in lateral view 1.5 times higher than wide, temple ventrally broadening, malar space one-third as long as height of eye. Clypeus semicircular, twice wider below than high medially. Head polished. Antenna one-quarter longer than body, with 21 joints. First flagellar joint five times longer than broad, further joints gradually shortening so that penultimate joint thrice longer than broad.

Mesosoma in lateral view almost 1.5 times as long as high, mesonotum between tegulae somewhat less broad than head. Notaulix evenly deep. Mesonotum, scutellum and mesopleuron polished, pronotum rugulose. Propodeum almost smooth, shiny, completely areolated. Hind femur five times as long as broad, hind tibia one-quarter longer than femur, hind tibia and tarsus equal in length.

Fore wing distinctly one-quarter longer than body. Pterostigma (Fig. 1) distinctly five times as long as wide, issuing radial vein from its middle; *r1* just longer than width of pterostigma, *r2* 2.4 times as long as *r1* and almost as long as *cuqul*, *cuqu2* as long as *r1*, *r3* 2.5 times as long as *r2* and reaching tip of wing. *N. rec.* distinctly postfurcal.

Metasoma as long as mesosoma. First tergite (Fig. 2) distinctly broadening posteriorly, somewhat wider behind than long medially. Second tergite as long as first tergite, one-quarter wider behind than long medially; third tergite shorter than second tergite, its latero-distal pair of tubercles moderately diverging and one-third as long as length of third tergite, in lateral view margin below tubercle not serrate (Fig. 4). Hind margin of third tergite (between tubercles) almost truncate. Tergites 1—3 shiny and with longitudinal striation, striation of first tergite stronger than that of tergites 2—3, interspaces with transverse and rather dense rugulosity (Fig. 2). Ovipositor sheath long, in lateral view as long as metasoma.

Body blackish brown. Antenna basally yellowish brown, flagellum from

joints 2—3 brown to dark brown without whitish ring apically. Clypeus brownish yellow, mandible yellow and apically dark, palpi and oral organs pale yellow. Legs also pale yellow, tibiae and tarsi with darkening infuscation. Sternites yellow to infuscate yellowish. Tegulae yellow. Wings hyaline, pterostigma proximo-distally yellow to darkening, veins greyish yellowish.

♂ and host unknown.

Locality — Holotype ♀: "India, Tamil Nadu, Ootacamund, Nilgiri, Dodabetta, 2500 m" (first label); "No. 280, 21 III 1980, leg. TOPÁL" (second label). — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7070.

The new species, *A. alius* sp. n., is distinct from all other Indo-Australian species by its long ovipositor sheath, otherwise related to *A. iriomotensis* WATANABE, 1968 (Ryukyu Islands), from which it differs by the following features:

A. iriomotensis WAT.

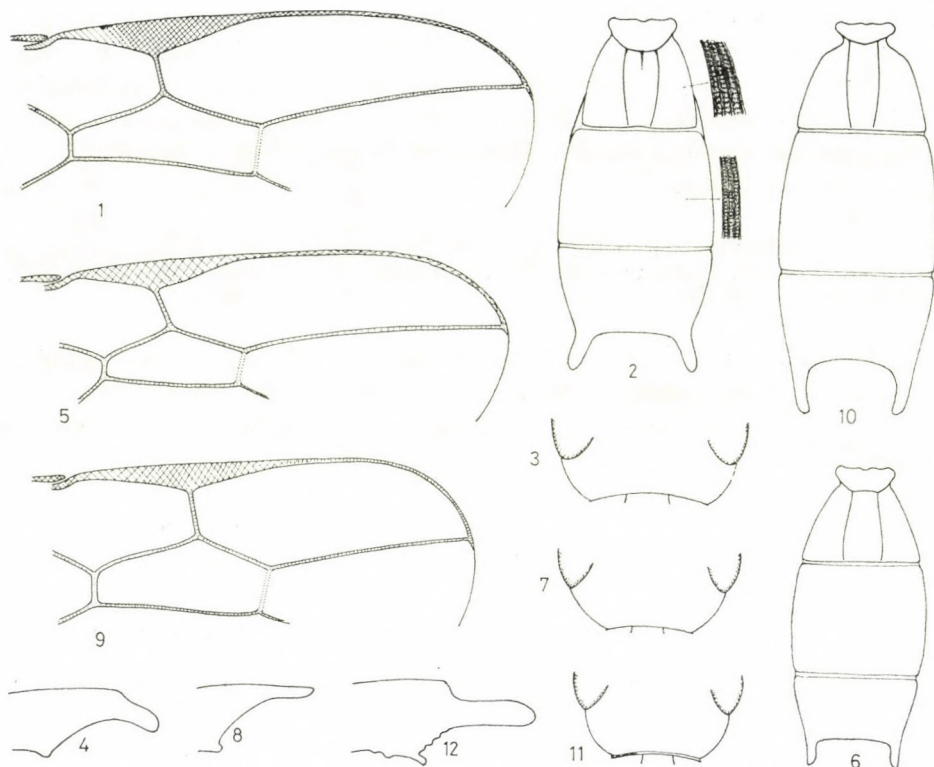
1. Ocelli large, distance between posterior ocelli as long as greatest diameter of an ocellus.
2. Malar space half as long as height of eye.
3. Antenna with 20 joints and yellowish brown, flagellar joints 13—16 yellowish white.
4. Second tergite longer than first tergite, latero-distal pair of tubercles of third tergite rather converging and nearly half as long as median length of third tergite (Fig. 13 in WATANABE 1968).
5. Pterostigma relatively short and wide, four times as long as its width; r_2 about twice longer than r_1 (Fig. 6 l.c.).
6. In lateral view ovipositor sheath as long as tergites 2—3 together.

A. alius sp. n.

1. Ocelli small, distance between posterior ocelli distinctly longer than greatest diameter of an ocellus.
2. Malar space one-third as long as height of eye.
3. Antenna with 21 joints and brown to dark brown entirely.
4. Second tergite as long as first tergite, latero-distal pair of tubercles of third tergite rather diverging and one-third as long as median length of third tergite (Fig. 2).
5. Pterostigma relatively long and less wide, five times as long as its width; r_2 2.6 times longer than r_1 (Fig. 1).
6. In lateral view ovipositor sheath as long as metasoma.

Acanthormius balanus sp. n. ♀ (Figs 5—8)

♀. Body 1.9 mm long. Head in dorsal view 1.8 times broader than long, eye 1.7 times longer than temple, latter rounded constricted (Fig. 7). Ocelli small, distance between ocelli about twice as long as greatest diameter of an ocellus. OOL distinctly twice as long as POL. Eye in lateral view 1.4 times higher than wide, temple ventrally broadening, malar space nearly as long as height of eye. Clypeus thrice wider below than high medially. Head polished. Antenna one-fifth longer than body, with 19 joints. First flagellar joint seven times longer than broad, further joints gradually shortening so that penultimate joint four times longer than broad.



Figs 1–12. 1–4. *Acanthormius alius* sp. n.: 1 = distal part of right fore wing, 2 = tergites 1–3, 3 = hind half of head in dorsal view, 4 = third tergite in lateral view. — Figs 5–8. *A. balanus* sp. n.: 5 = distal part of right fore wing, 6 = tergites 1–3, 7 = hind half of head in dorsal view, 8 = third tergite in lateral view. — Figs 9–12. *A. obstitus* sp. n.: 9 = distal part of right fore wing, 10 = tergites 1–3, 11 = hind half of head in dorsal view, 12 = third tergite in lateral view

Mesosoma in lateral view distinctly 1.5 times as long as high, mesonotum between tegulae one-third less broad than head. Notaulix distinct though less deep. Mesonotum and scutellum uneven to smooth, shiny, mesopleuron polished. Propodeum almost smooth, shiny, completely areolated. Hind femur six times as long as broad, hind tibia one-quarter longer than femur, hind tibia and tarsus equal in length.

Fore wing about as long as body. Pterostigma (Fig. 5) six times as long as wide, issuing radial vein from its middle; *r1* slightly longer than width of pterostigma, *r2* almost twice as long as *r1* and as long as *cuq1*, *cuq2* minutely shorter than *r1*, *r3* 3.3 times as long as *r2* and reaching tip of wing. *N. rec.* postfurcal.

Metasoma somewhat longer than mesosoma though shorter than head + mesosoma together. First tergite (Fig. 6) 1.3 times wider behind than long medially; second tergite 1.3 times wider behind than long medially, and 1.7 times longer than third tergite, i.e. latter tergite more transverse. Hind margin of third tergite almost truncate, its latero-distal pair of tubercles just shorter than half length of tergite itself; in lateral view margin below tubercle not serrate or dentate (Fig. 8). Tergites 1—3 shiny and with longitudinal striation, interspaces with transverse rugulosity. Pair of keels of first tergite rather diverging and reaching its distal end. Ovipositor sheath in lateral view somewhat longer than half length of metasoma or about as long as hind femur.

Body brownish yellow. Scape, pedicellus and first flagellar joint brownish yellow, flagellum dark brown. Palpi and oral organs pale yellow. Legs yellow, coxae + trochanters rather pale; last tarsal joints dark. Tegulae yellow. Wings subhyaline, pterostigma and veins greyish yellow.

♂ and host unknown.

Locality — Holotype ♀: "India, W Bengal, Darjeeling Distr., Sevoke, 1700 m" (first label); "No. 473, 6. VI. 1980, leg. TOPÁL" (second label). — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7071.

The new species, *A. balanus* sp. n., runs to *A. iriomotensis* WATANABE, 1968 (Ryukyu Islands) with WATANABE's key (1968), their distinction is given below:

***A. iriomotensis* WAT.**

1. Malar space short, about half as long as height of eye.
2. Antenna with 20 joints, brown to dark brown, its 15—18th joints yellowish white.
3. Pterostigma four times as long as wide, *r1* slightly shorter than width of pterostigma (Fig. 6 in WATANABE 1968).
4. Second tergite only 1.2 times longer than third tergite, i.e. latter less transverse.

***A. balanus* sp. n.**

1. Malar space long, nearly as long as height of eye.
2. Antenna with 19 joints, flagellum entirely dark brown.
3. Pterostigma six times as long as wide, *r1* slightly longer than width of pterostigma (Fig. 5).
4. Second tergite 1.7 times longer than third tergite, i.e. latter tergite more transverse (Fig. 6).

***Acanthormius obstitus* sp. n. ♀ (Figs 9—12)**

♀. Body 2.5 mm long. Head in dorsal view subcubic, 1.6 times broader than long, eye distinctly 1.7 times longer than temple, latter rounded constricted, margin of occiput unusually strong and finely crenulated (Fig. 11). Ocelli large, distance between ocelli half as long as diameter of an ocellus. OOL 5 times as long as POL. Eye in lateral view relatively less high, only 1.2 times higher than wide, temple ventrally broadening, malar space three-fourths as long as height of eye. Clypeus almost semicircular, 2.1—2.2 times

wider below than high medially. Face transversely striato-rugulose, medially above clypeus uneven to smooth; malar space and temple smooth and shiny, vertex rugose, frons rather broadly and radially strigose. Antenna somewhat longer than body, with 20 joints. First flagellar joint 3.5 times longer than broad, further joints gradually shortening and attenuating so that penultimate joint thrice as long as broad.

Mesosoma in lateral view nearly twice as long as high, mesonotum between tegulae less broad than head. Notaulix distinct, though less deep. Pronotum rugose, mesonotum granulate, scutellum uneven and weakly shiny. Mesopleuron polished. Propodeum rugose-scabrose and completely areolated. Hind femur six times as long as broad, hind tibia about one-third longer than femur, hind tibia somewhat longer than tarsus.

Fore wing somewhat shorter than body. Pterostigma (Fig. 9) seven times as long as wide, issuing radial vein clearly distally from its middle. $r1$ about one-third longer than width of pterostigma, $r2$ 1.6 times longer than $r1$ and about one-third shorter than $cuq1$; $cuq2$ and $r1$ equal in length; $r3$ thrice as long as $r2$ and reaching tip of wing.

Metasoma as long as head and mesosoma together. First tergite (Fig. 10) 1.2 times wider behind than long medially; second tergite one-fourth longer than first tergite, somewhat wider behind than long medially, and 1.6 times longer than third tergite. Hind margin of third tergite slightly arched, its latero-distal pair of tubercles about half as long as length of tergite itself; in lateral view margin below tubercle serrate-dentate (Fig. 12). Tergites 1–3 less shiny, longitudinally striated, interspaces with transverse rugulosity. Pair of keels of first tergite rather converging and reaching its hind end. Ovipositor sheath in lateral view about as long as hind tibia and distinctly longer than half length of metasoma.

Ground colour of body brown. Head light brown to brown; cheek, temple, face laterally, clypeus and mandible brownish yellow to yellow. Palpi pale. Antenna proximo-distally brownish yellow to yellow, without whitish ring. Mesosoma brown, propodeum, meso- and metapleuron dark brown. Tergites 1–3 dark brown. Legs light yellow. Tegulae yellow. Wings subhyaline, pterostigma and veins greyish yellowish.

♂ and host unknown.

Locality — Holotype ♀: "India, W Bengal, Darjeeling, below North Point, 900 m" (first label); "No. 836, 15. X. 1967, leg. TOPÁL" (second label). — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7072.

The new species, *A. obstitus* sp. n., is closely related to *A. rugosus* WATANABE, 1968 (Ryukyu Islands) by their rugose vertex, however, readily distinguished from it by the following features:

O. rugosus WAT.

1. Malar space two-thirds as long as height of eye.
2. Antenna with 17—19 joints.
3. Pterostigma five times as long as wide, *r1* somewhat shorter than width of pterostigma and a little shorter than half of *r2*, *r2* and *cuqul* about equal in length (Fig. 7 in WATANABE 1968).
4. Second tergite medially 1.3 times longer than third tergite (Fig. 11 l.c.).

O. obstitus sp. n.

1. Malar space three-fourths as long as height of eye.
2. Antenna with 20 joints.
3. Pterostigma seven times as long as wide, *r1* distinctly longer than width of pterostigma and a little longer than half of *r2*, *r2* distinctly shorter than *cuqul* (Fig. 9).
4. Second tergite medially 1.6 times longer than third tergite (Fig. 10).

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TAXONOMIC STUDIES
ON THE PALAEARCTIC CUCULLIAE
PART I. DESCRIPTION OF FOUR NEW SPECIES

L. RONKAY and G. RONKAY

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

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Description of *Cucullia subgrisea* (Kazakhstan), *papoka* (Mongolia), *opacographa* (Afghanistan) and *armena* (Armenia) spp. n.

The genus *Cucullia* SCHRANK, 1802 sensu lato is one of the largest triline genera of Noctuidae with more than 170 known species inhabiting the World except Australia and the southern part of Asia; more than half of the described species occurs in the Palearctic Region. Some groups of *Cucullia* are very problematic from taxonomic point of view the differences between the related species being very slight or overlapping; the taxonomic relegation of some taxa even with the knowledge of the larvae is dubious.

A huge amount of species was described in the last century and in the first large catalogues (STAUDINGER and REBEL, 1901; HAMPSON, 1906; WARREN in SEITZ, 1910) more than fifty Palearctic species were listed. In the subsequent years several new taxa were described and distribution data were published, the most important works appearing in this period were the monograph of the Chinese Cuculliae (BOURSIN, 1941) and the papers of WILTSHIRE on the Middle East Cuculliae with the description of a series of unknown *Cucullia* larvae.

The aim of our studies was to make the revision of the Palearctic species of the genus. The present paper contains the first results of this work.

Cucullia subgrisea sp. n.

H o l o t y p e : ♂, "Zap. Kazakhstan, Urda, na svet, 16. V. 952, LEVIN" (in Russian) (= W Kazakhstan, Urda, at light), slide No. 1643 L. RONKAY; deposited in coll. Zoological Institute, Leningrad.

D e s c r i p t i o n : alar expanse 40 mm, length of fore wing 21.5 mm. Head and thorax grey, tegulae striolate with darker grey and white, basal line blackish. Ground colour of fore wing pale violaceous grey with slight brownish

tinge, mostly above cell, and fine silvery grey shade at margins; wing nearly unicolorous, only costal part darker. Transversal lines absent, only peaks of angles of antemedial line can be slightly observed as pale spots. Black streak of submedian fold long and fine, basal field from costa to submedian streak with fine whitish irroration. Orbicular and reniform spots very indistinct, whitish without darker outlines. Terminal area with very fine silvery white and brownish striae. Terminal line whitish, cilia grey with fine brownish line at base. Hind wing brownish white, marginal field with more or less strong brown suffusion, veins covered with brown, cellular lunule obsolescent. Cilia whitish with very pale darker line. Underside greyish white, fore wing strongly covered with brownish grey, outer part of cell with ochreous white irroration; hind wing lighter, veins covered with brown, cellular lunule diffuse.

Male genitalia (Figs 5—6): uncus moderately long and wide, hooked like a bill, tegumen high, fultura inferior elongate, narrow, basal plate of it triangular. Vinculum strong, V-shaped with a slight incision at ventral third. Valvae elongate, narrow, margins parallel, cucullus only slightly pointed. Clavus long, digitiform, sacculus strong and rounded. Harpe narrow and slender, ribbon-like, strongly curved and apically reclinate. Ampulla a short, double-peaked stick. Aedoeagus elongate, more or less curved, vesica consists of a large, long and wide sac and two basal diverticles, one of them with a long, pointed cornutus.

Early stages: unknown.

Specific differences and taxonomic position: this species, both in external and genital characters, is similar to *C. biornata* FISCHER DE WALDHEIM, 1840, *balsamitae* BOISDUVAL, 1840, *lampra* (PÜNGELER, 1908) and *sabulosa* STAUDINGER, 1879. The differences of these species by their wing pattern and colouration are as follows: *subgrisea* has nearly unicolorous fore wing without yellowish irroration in cell (and in tornus), orbicular and reniform spots without dark outlines, transversal lines nearly totally absent. *Balsamitae*, *biornata* and *lampra* have light yellowish irroration in cell (in case of *biornata* at tornus, too), lower part of reniform always defined by some blackish spots or a fine line and orbicular usually also marked with some dark spots; some parts of transversal lines more or less visible. The latter two species are significantly larger than *subgrisea*. The fourth related species, *sabulosa* has different ground colour of fore wing, namely ochreous white with some light brownish shade.

The configuration of male genitalia of *subgrisea* is similar to those of *sabulosa* (Figs 3—4) and *balsamitae* (Figs 1—2); *biornata* and *lampra* from this point of view are much similar to *umbratica* (LINNAEUS, 1758). The differential characters between the former three species are well discernible. The new species has only one cornutus in vesica while the other two have two cornuti being regular in this group. Shape of valvae also very characteristic: *subgrisea*



Figs 1—12. 1—2 = *Cucullia balsamitae* BOISDUVAL, Hungary, Peszér; 3—4 = *C. sabulosa* STAUDINGER, Emba; 5—6 = *C. subgrisea* sp. n., holotype, W Kazakhstan, Urda; 7—8 = *C. campanulae* FREYER, Regensburg, Austria; 9—10 = *C. papoka* sp. n., paratype, Mongolia; 11—12 = *C. han nemanni* VARGA, paratype, Mongolia

has narrow, elongate valvae with parallel margins, apex of it only slightly pointed. Valvae of *balsamitae* longer and slender, apex elongate and strongly pointed; in case of *sabulosa* valvae much wider, costal margin strongly concave, shape of cucullus shows an intermediate form between the two species mentioned above.

In summary, the new species represents a transitional stage between *balsamitae* and *sabulosa*. Its distribution is also interesting because it seems to be sympatric with all of the closely related species, *balsamitae*, *sabulosa* and *biornata*.

Cucullia papoka sp. n.

H o l o t y p e : ♂, Mongolia, Gobi Altaj, Mts. Gurvan Saihan, valley Yulin-am, 2350 m, 24. VII. 1986. leg. Exp. Lep. Hung., coll. HNHM Budapest. Paratypes: 35 ♂♂, 18 ♀♀ from different localities of Mongolia as follows: Ulan-Baatar, Bdgo-ul; Mts. Hangai, Harhorin; the vicinity of Chovd; Manchan, 20 km OS, valley Chenchergol; Bulgan Sum and its vicinity, Mongolian Altaj, Nevinjich; 8 km N of Somon Burenchaan; 130 km ESE of Somon Bajanleg; 6 km SW of Somon Baruunturuun; collected by Z. KASZAB, P. GYULAI, Z. VARGA, GY. FÁBIÁN, M. HREBLAY, L. PEREGOVITS and G. RONKAY; specimens are deposited in coll. HNHM and the collectors; 1 ♂, Sibirien, Sajan, in coll. PÜNGELER, Zoologisches Museum, Humboldt Universität Berlin. Slides Nos 1859, 1860 (♂♂), 1864 (♀) L. RONKAY.

D e s c r i p t i o n : alar expanse 42—47 mm, length of fore wing 19—21 mm. Head and thorax steel-grey with dark grey-brown hairs, tegulae brownish at base with fine black line above it, upper part more or less strongly striolate with whitish and dark grey lines. Ground colour of fore wing steel-grey with more or less intensive bluish-grey irroration; veins finely covered with dark brown. Subbasal line pale or absent, black streak of submedian fold long and strong. Antemedial line double but inner line much paler, dark greyish brown filled with light grey, highly angled. Orbicular and reniform spots encircled by black, former round, filled with grey, sometimes with darker spots inside, latter with greyish annulus and dark centre. Medial line an indistinct, diffuse greyish shade, upper part of postmedial line obsolescent, more prominent under reniform, strongly sinuous. Subterminal line absent, terminal area with two blackish streaks above vein m_2 and below cu_2 ; and with fine whitish lines defined by shorter dark lines and spots. Terminal line represented by black spots, cilia light grey with two dark lines. Hind wing greyish white suffused by brown, marginal field darker brown, cellular lunule very pale; veins covered by brown. Cilia whitish with a brown line consisting of spots, terminal line dark brown. Underside of fore wing dark greyish brownish with light grey irroration at costa, apex and outer margin, hind wing whitish with darker terminal area, cellular lunule a diffuse spot.

Colouration of the female somewhat darker than in case of the males.

Male genitalia (Figs 13—16): uncus moderately long, thick, hooked like a bill, tegumen high. Fultura inferior long, its basal plate triangular. Valvae elongate, cucullus only slightly pointed. Sacculus strong, clavus well-developed, long and plicate, harpe thin, apically spatulated, ampulla very small. Vinculum V-shaped, strong. Aedoeagus long, slightly curved, vesica consists of a large sac and two short basal diverticles. One of the basal diverticles with a large, pointed cornutus, the other with one or two smaller cornuti.

Female genitalia (Figs 9—10): ovipositor short and wide, distal gonapophyses relatively long, proximal ones very short and curved. Ostium bursae short, membranous, with a large V-shaped appendage on ostial plate. Ductus bursae strongly sclerotized, with long crests on dorsal surface. Bursa copulatrix large, more or less elliptical, apex bursae high, rounded.

Early stages: unknown.

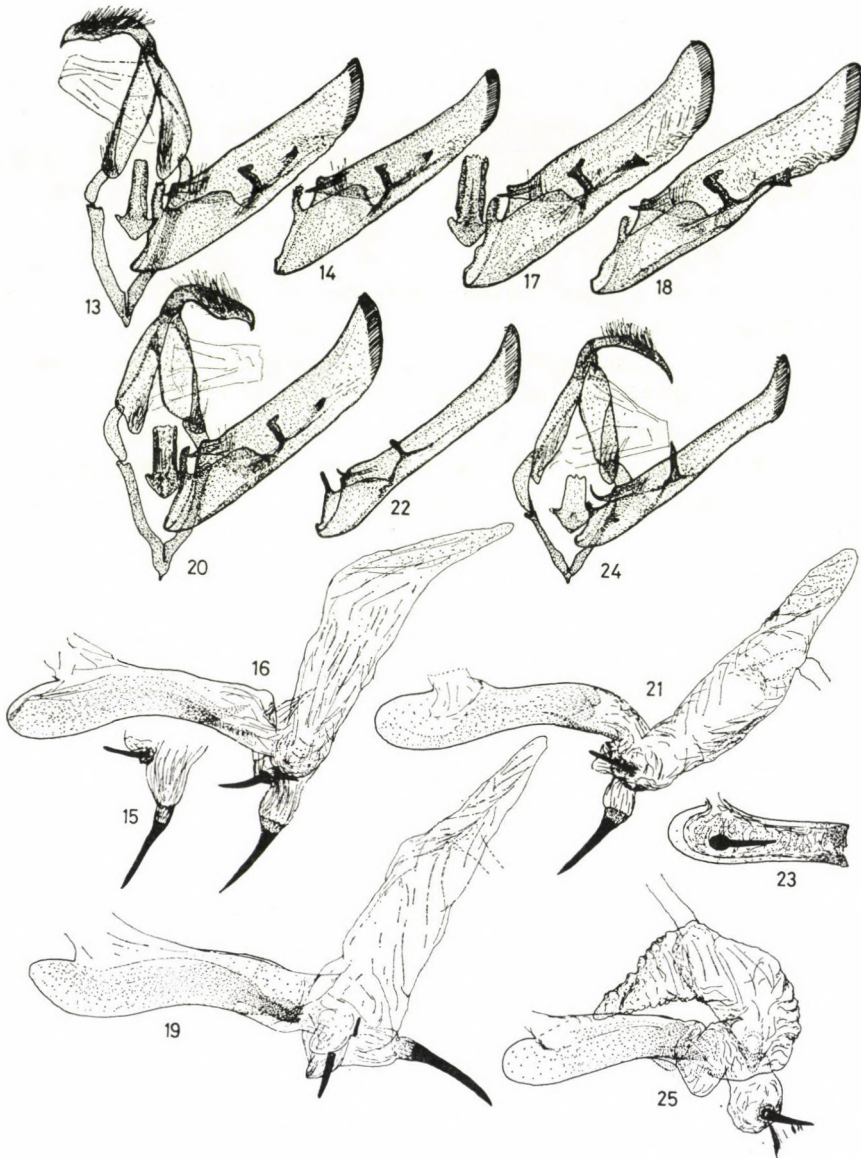
S p e c i f i c d i f f e r e n c e s a n d t a x o n o m i c p o s i t i o n : the new species belongs to the *umbratica* group, closely related to *campanulae* FREYER, 1828 and *hannemanni* VARGA, 1976. It differs from *campanulae* with its much darker ground colour, more intensive whitish-blackish striolation in subterminal area, less strong transversal lines and fully encircled orbicular spot. The other related species, *hannemanni*, has much darker median area orbicular and reniform spots characteristically filled with light yellowish grey, subterminal area nearly unicolorous bluish-grey.

The configuration of genitalia of both sexes also shows characteristic differences. Male genitalia of *papoka* differs from *campanulae* (Figs 17—19) with its shorter and narrower valvae, larger and plicate clavus, more gracile harpe, much smaller ampulla and less robust cornuti of vesica, shape of basal plate of fultura inferior also differs slightly. The other related species, *hannemanni* (Figs 20—21) has characteristic, elongate and pointed cucullus, short and thick uncus.

The configuration of female genitalia of these three species also differ from each other, the differences are smaller than in case of the male genitalia, but significant. Ostial appendage of the new species are much larger than in case of *campanulae* (Figs 7—8) and *hannemanni* (Figs 11—12), ductus bursae is more heavily sclerotized, its dorsal surface fully covered with crests. The *hannemanni* has a rounded smooth plate of ductus bursae, absent in *campanulae*.

The specimens of this interesting species were misidentified both in the material of the Mongolian expeditions of Dr. Z. KASZAB (as *C. tristis* BOURSIN, 1935 and *C. defecta* STAUDINGER, 1897) and in the collection of PÜNGELER (as *defecta*). The first species, *tristis* belongs correctly to the *santonici-duplicata* group, while *defecta* is related to *cineracea* (the male genitalia of these two latter species can be seen on Figs 22—23 and 24—25).

The distribution of *campanulae* is western Palearctic, its easternmost



Figs 13–25. 13–16 = *Cucullia papoka* sp. n., 13, 15 = paratype, slide No. 1859, Mongolia, 14, 16 = paratype, slide No. 1860, Mongolia; 17–19 = *C. campanulae* FREYER, Hungary; 20–21 = *C. hannemanni* VARGA, paratype, Mongolia; 22–23 = *C. defecta* STAUDINGER, paralectotype, Apfelgebirge, slide No. MB 175 BOURSIN; 24–25 = *C. cineracea infuscata* TSHETVERIKOV, Mongolia

locality is Spask (SE Ural) while the other two occur in Central Asia representing a sympatric pair of species with overlapped area in Mongolian and in Gobi Altaj.

Cucullia opacographa sp. n.

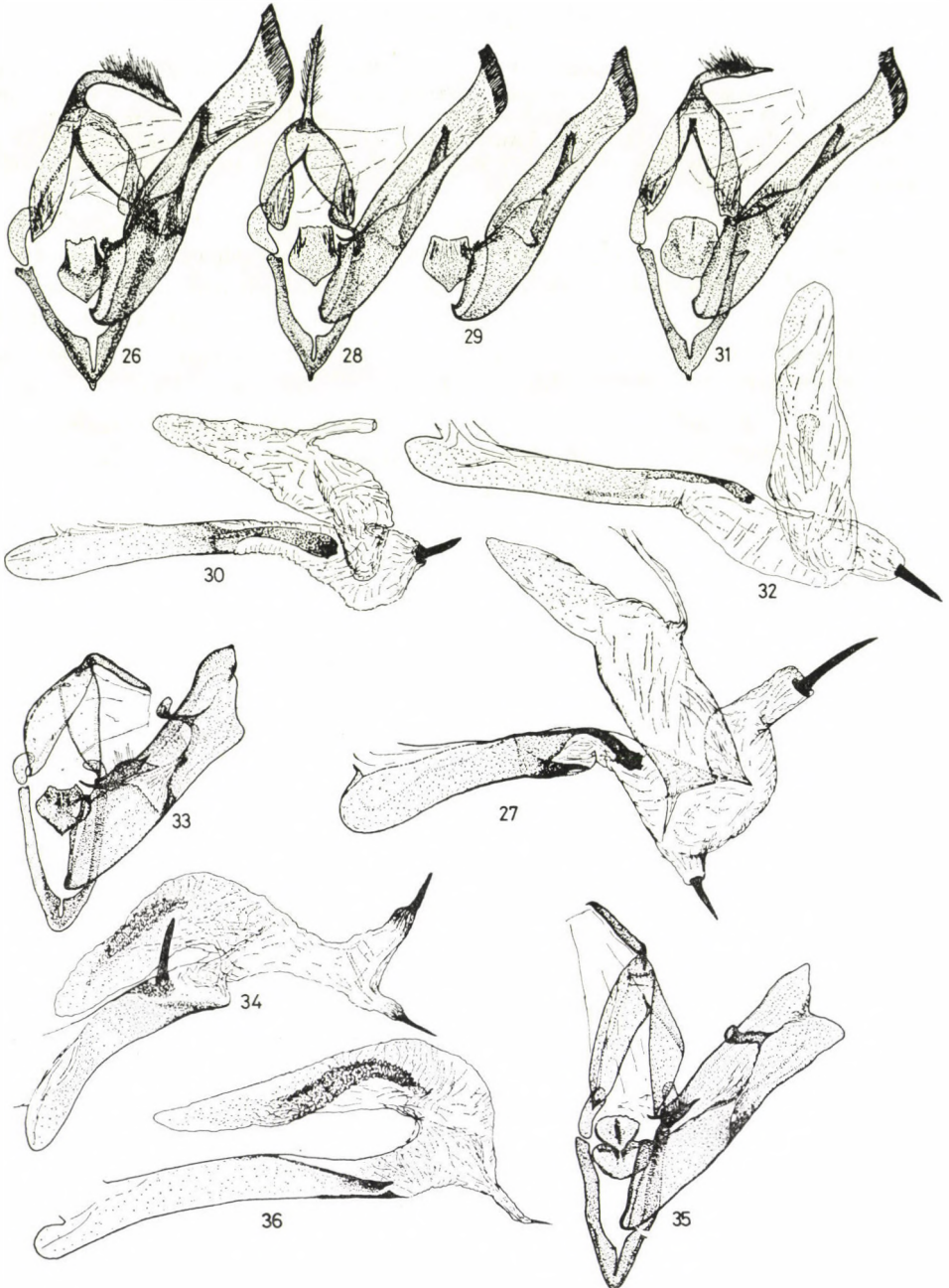
H o l o t y p e : ♂, "Afghanistan, Paghman, 30 km NW v Kabul, 2500 m, 3 u 5 VI. 1965, KASY et VARTIAN" (deposited in coll. VARTIAN, Wien. Paratypes: 2 ♂, 1 ♀, O Afghanistan, s. v. Khinjan, 2100 m, Salang Pass, N-Seite, 9. VII. 1969, leg. VARTIAN, slide No. 2482 Z. VARGA; 1 ♂, 13. VI. 1971, leg. VARTIAN; 1 ♂, Afghanistan, Paghman, 30 km NW v Kabul, 2500 m, 15 u 18. VII. 1965, KASY et VARTIAN, slide No. 1651 L. RONKAY, in coll. VARTIAN, Wien.

D e s c r i p t i o n : alar expanse 41—45 mm, length of fore wing 17—19 mm. Head and thorax light violaceous grey with dark brown hairs, antennae brown with some pale grey scales. Tegulae brownish at base with fine blackish line and some darker brown stripes above, metathoracic tuft and middle of thorax dark greyish brown. Abdomen brownish grey, dorsal crest blackish brown. Fore wing pale bluish-grey with some light brownish irroration and whitish grey shade, elements of pattern indistinct, opaque, except dark brown stripes of subterminal area. Subbasal line absent, streak of submedian fold fine, long, brownish, antemedial highly angled, some parts of well visible, darker with lighter shadow, others obsolescent. Upper parts of orbicular and reniform spots deleted, lower parts defined by diffuse brownish-grey lines, their fillings somewhat lighter than ground colour of wing. Postmedial line very indistinct, except below vein cu_2 , subterminal line absent, terminal area with a strong dark brown stripe below vein cu_2 and a more or less strong stripe between veins m_2 and m_3 . Inner margin with a usually well-discernible dark fascia, veins with darker tinge, mostly in terminal area. Terminal line fine, brownish, cilia white with two grey-brown lines. Hind wing whitish with extensive greyish suffusion and darker terminal area; veins covered with brown, cellular lunule rather diffuse. Cilia whitish with a brown line. Underside of fore wing pale brownish grey, margins with fine whitish grey irroration cilia white with dark spots. Hind wing somewhat lighter, basal field whitish grey, terminal area darker, veins covered with brown.

Male genitalia (Figs 28—30): uncus moderately long, slender, tegumen high and wide, vinculum V-shaped, fultura inferior subtriangular, upper part wider. Valvae elongate, slender, slightly arcuate, cucullus elongate and pointed. Clavus very small, sacculus long and strong, ampulla absent, harpe wide-based, cuneate, slightly curved at apex. Aedoeagus long, distal appendage long and strong with two-four large teeth. Vesica consists of a large sac turning backward and a wide and rounded basal diverticle with one thick and pointed cornutus.

Early stages: unknown.

S p e c i f i c d i f f e r e n c e s a n d t a x o n o m i c p o s i t i o n : the new species is similar in its appearance to *eugrapha* BOURSIN, 1941 but the wing pattern of *opacographa* is much more diffuse and indistinct, ground colour of fore wing much paler. *Opacographa* slightly resembles also to *santonici*



Figs 26–36. 26–27 = *Cucullia khorassana* BRANDT, USSR, Uzbekistan; 28–30 = *C. opacographa* sp. n., 28, 30 = paratype, Afghanistan, slide No. 1651, 29 = paratype, Afghanistan, slide No. 2482 VARGA; 31–32 = *C. elongata* BUTLER, Mongolia; 33–34 = *C. prenanthis* BOISDUVAL, Hungary; 35–36 = *C. armena* sp. n., holotype, Armenia

HÜBNER, 1813 but the colouration of the former is more unicolorous, elements of pattern are more indistinct and hind wing pale greyish, not whitish with darker terminal field, as in the case of *santonici*.

The configuration of male genitalia of the new species is similar to the *asteris-khorassana-elongata* group, mostly to *elongata* BUTLER, 1880 (Figs 31—32) which has also only one cornutus in the vesica. Shape of valvae similar to *elongata* and *khorassana* BRANDT, 1941 (Figs 26—27) but valvae of *opacographa* are less elongate and arcuate, harpe shorter and thicker, apically only very slightly curved. Fultura inferior of *opacographa* subtriangular, teeth on distal appendage of aedoeagus are larger than in the case of *elongata*.

On the basis of the characteristics of male genitalia the new species should be placed into the *asteris-elongata* group beside to *elongata*, while in its appearance it shows a connection between the *asteris* group and the *dracunculi-virgaureae* group.

Cucullia armena sp. n.

H o l o t y p e : ♂, "Martiros, 29. VI. 935" Armenia (in Russian), coll. RYABOV, in coll. the Zoological Institute, Leningrad; slide No. 1631 L. RONKAY. Paratypes: 1 ♂ from same locality and data, in coll. ZIN Leningrad, gen. prep. No. 5916 RYABOV; *C. daralagoesica* sp. n. in litt.; 1 ♂, Inakliu, VII. 1935, coll. RYABOV, in coll. Zoological Institute, Yerevan.

D e s c r i p t i o n : alar expanse 38—39 mm, length of fore wing 17.5—18 mm. Head brown with whitish hairs and dark grey spot at base of antenna, palpi brown with dark brown-whitish grey pattern. Tegulae light greyish with black line at base and fine brown-whitish striolation on upper part; top of it chocolate brown. Thorax greyish-brown, metathoracic hairs dark brown. Abdomen brown with greyish hairs, dorsal tufts large, dark chocolate brown. Fore wing whitish grey with fine bronze shade, strongly irrorated with chocolate brown scales, mostly at costal margin. Basal line absent, antemedial line very pale, obsolescent, strongly waved. Medial line reduced to a dark brown spot on costa, upper part of postmedial line deleted, represented by some blackish spots on veins, lower part blackish brown defined by white on outer side, strongly sinuous. Orbicular and reniform spots absent, latter slightly discernible as a pale brown lunule at cell. Inner margin and tornus with dark brown fascia, tornus with some minute white lines. Subterminal line reduced to some dark brown spots and whitish lines, costa at apex with small whitish spots at radial veins. Hind wing dark, greyish brown, only inner part of basal field lighter. Cellular lunule more or less visible, transversal line diffuse, sinuous. Underside dark brown, inner margin of fore wing lighter. Transversal lines indistinct except at inner margin of fore wing, cellular lunules more or less discernible.

Male genitalia (Figs 35—36): uncus moderately long and slender, tegu-

men high, vinculum strong, V-shaped. Fultura inferior consists of a funnel-like upper part and a rounded quadrangular basal plate. Valvae long, margins more or less parallel, apical part bifurcate. Clavus small, rounded, pulvillus large and heavily sclerotized. Harpe oblique, plicate, top of it characteristically cylindrical. Aedoeagus very long and slender, distal end with a small cornutus. Vesica consists of a large and long sac turning backward with a long, rugulose sclerotized field and a short, narrow diverticle with a very fine, short cornutus.

Early stages: unknown.

Specific differences and taxonomic position: the new species is closely related to *prenanthis* BOISDUVAL, 1840, but differs from it by the following characters: tegulae much lighter with a strong black streak at base, silvery grey irroration of submedian area stronger, terminal two angles of postmedial line whitish, transversal line of hind wing much more visible, anal field of hind wing whitish.

The differences between this species-pair are even more spectacular in the configuration of their male genitalia. Apical part of valvae bifurcate in the case of *armena*, shape of fultura inferior is very different, pulvillus much smaller than that of *prenanthis* (Figs 33—34), harpe thicker, tegumen higher. Aedoeagus is much longer, cornutus of distal end is much smaller. The new species has only one fine cornutus in vesica, rugulose field larger.

The distribution of this species-pair is nearly sympatric: *prenanthis* occurs from W Europe to the NE part of the Caucasus, while *armena* is known from SE Caucasus.

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A SURVEY OF NEOTROPICAL STRONGYLOPSALINAE (DERMAPTERA: LABIIDAE)

H. STEINMANN

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

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A generic and specific revision of Strongylopsalinae (Labiidae), based on a consistent grouping of the external characters and male genitalia is given in a key suitable for identifying Neotropical genera and species. *Strongyloolabis secunda* gen. et sp. n., *Strongylopsalis eberhardi* sp. n., *S. puella* sp. n., and *haitica* sp. n. are described.

A very distinct and characteristic group of the Neotropical Dermaptera. Generally dark yellowish-brown to dark reddish-brown species. Head normal, or a little elongate, tumid, smooth. Cuticle of head, pronotum and tegmina finely punctured. Very similar in external characters to African Vandicinae, but the number of antennal joints only 12-15. Postfrontal and coronal sutures either absent or distinct. Tegmina abbreviated, shortened and squamiform or well developed, and slightly longer than pronotum; with fine or well-marked lateral longitudinal keels; posterior margin of tegmina transversally or obliquely truncate. Forceps comparatively short, apically more strongly inclinate; more or less trigonal basally, and cylindrical apically.

All species endemic for America.

IDENTIFICATION KEY TO GENERA

- 1 (2) Distal antennal joints strongly narrowed at base, often strongly moniliform, basal joints sometimes conical. Tegmina abbreviated, comparatively short, wings absent
Strongylopsalis BURR, 1900
- 2 (1) Distal antennal joints cylindrical, or almost so. Tegmina well developed, slightly longer than pronotum; wings perfect, fully developed
Strongyloolabis gen.n.

Strongylopsalis BURR, 1900

Strongylopsalis BURR, Ann. Mag. nat. Hist. (7) 6: 80. Species typica: *Labia cheliduroides* DE BORMANS, 1880.

The genus *Strongylopsalis* differs from the genus *Marava* (Spongiphoriinae) mainly in the presence of elytral ridges. Cuticle of head, pronotum and tegmina finely coriaceous or punctured. Tegmina abbreviated, comparatively short, wings absent. Male forceps various, short, symmetrical; inner margins

with or without tooth or teeth. Pygidium hidden or small, sometimes large and long. Female forceps simple. Male genitalia with comparatively long external parameres.

Distribution: Central and South America.

IDENTIFICATION KEY TO SPECIES

- 1 (10) Pronotum strongly transverse, ratio of length to width 7 : 9; branches of male forceps shorter and usually much more strongly curved; smaller species, body length 4–7 mm.
- 2 (5) Tegmina much shorter than pronotum, measured along lateral margins.
- 3 (4) Comparatively larger, body length 5 mm; abdominal tergites almost impunctate; male pygidium not or scarcely visible, male forceps with smaller inner tooth basally (Fig. 1); female forceps similar to male's, as in Fig. 2
cheliuroides (DE BORMANS, 1880)
- 4 (3) Comparatively smaller species, body length 4 mm; abdominal tergites strongly punctured; male pygidium rounded, male forceps with larger inner tooth basally (Fig. 3)
dimidiata BRINDLE, 1977
- 5 (2) Tegmina as long as pronotum.
- 6 (7) Male forceps with branches more strongly curved distally, each branch with two inner teeth (Fig. 4), or with the more basal tooth absent; pygidium rounded distally, posterior margin with a small excision medially
tarsata HEBARD, 1924
- 7 (6) Male forceps less strongly curved distally, each branch with one inner tooth, pygidium with or without projections on posterior margin.
- 8 (9) Male pygidium with projections on posterior margin (Fig. 5); body shining black; branches of male forceps with conspicuous inner tooth apically
bidentata BRINDLE, 1971
- 9 (8) Male pygidium without projections on posterior margin (Fig. 7); body shining brown; branches of male forceps without inner tooth apically, but with an obtuse tooth basally
mathurini RIBEIRO, 1931
- 10 (1) Pronotum less transverse, ratio of length to width 7 : 8; branches of male forceps longer, branches weakly curved or almost straight; larger species, body length 7–10 mm.
- 11 (14) Pronotum parallel-sided.
- 12 (13) Yellow species; male pygidium prominent, longer than broad, posterior margin with conspicuous incision (Fig. 8); branches of male forceps strongly trigonal in cross-section basally and medially
flava STEINMANN, 1986
- 13 (12) Dark brown or blackish species, but lateral margins of pronotum yellowish; female pygidium small, simple, branches of female forceps cylindrical, normal, as in Fig. 10
dubia MOREIRA, 1932
- 14 (11) Pronotum widened or expanded posteriorly.
- 15 (16) Male pygidium characteristic, very large, flat, and very deeply excised posteriorly, so forming two lateral arms (Fig. 11); branches of male forceps simple, inner margins with smaller tubercles
excavata BRINDLE, 1971
- 16 (15) Male pygidium otherwise, smaller or larger, but not forming two large lateral arms.
- 17 (22) Male pygidium short, slightly wider than long.
- 18 (19) Tegmina relatively short, posterior margin oblique; male forceps with branches straight, inner margin of each branch sinuate (Fig. 12); pygidium excised posteriorly
boliviana (DE BORMANS, 1903)
- 19 (18) Tegmina longer, posterior margin almost straight; male forceps with branches weakly arcuate, wider basally and evenly narrowed distally.
- 20 (21) Femora unicolour, yellowish or brown; eyes very small; male pygidium broad at base, narrowed distally, posterior margin concave (Fig. 13); male forceps curved, inner margins irregularly dentate on basal half
koepekei BRINDLE, 1968
- 21 (20) Femora bicolour, brownish-black basally, and yellowish apically; eyes larger; male pygidium characteristic, as in Fig. 15; male forceps arcuate, inner margins without dentation, but branches trigonal in cross-section
eberhardi sp. n.
- 22 (17) Male pygidium longer, more or less as long as wide, or longer than broad.
- 23 (24) Male pygidium oval, postero-lateral margin ornamented with small tubercles (Fig. 17); branches of male forceps with two very small teeth at inner margins
puella sp. n.

- 24 (23) Male pygidium not oval, with well-marked postero-lateral angles; inner margins of male forceps with two or one inner tooth.
- 25 (26) Male pygidium characteristic, longer than broad, but not elongated; posterior margin of pygidium with small tubercles, and pygidium with well-developed dorsal and ventral parts, as in Fig. 19; inner margins of male forceps with two sharp teeth
haitica sp. n.
- 26 (25) Male pygidium elongated, slender, and flat; posterior margin concave.
- 27 (28) Tegmina relatively short, posterior margin weakly oblique; each branch of male forceps with a small ventro-median tooth towards apex (Fig. 21), and with some small inner teeth basally; penultimate sternite of male with a deeper apical excision
laminata BRINDLE, 1973
- 28 (27) Tegmina longer, posterior margin very strongly oblique; each branch of male forceps with a larger median tooth beyond mid-point (Fig. 22); penultimate sternite of male with a small apical excision
iheringi REHN, 1917

Strongylopsalis cheliduroides (DE BORMANS, 1880)

Labia cheliduroides DE BORMANS, Anns Soc. esp. Hist. nat. 9: 509. — *Strongylopsalis cheliduroides* (DE BORMANS), BURR, Ann. Mag. nat. Hist. 1900, (7) 6: 80. — *Strongylopsalis inca* BURR, Ann. Mag. nat. Hist. 1900, (7) 6: 81. — *Strongylopsalis inca* BURR, Ann. Mag. nat. Hist. 1908, (8) 1: 50 (proposed synonymy with *cheliduroides* DE BORMANS, 1880).

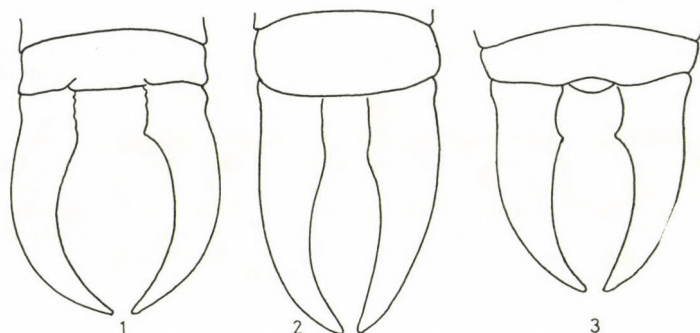
Male shining dark brown, antennae and legs lighter in colour; lateral margins of pronotum and tegmina yellow. Head rounded, comparatively short, postfrontal and coronal sutures very fine. Eyes small, slightly shorter than the length of head behind eyes. First antennal joint slender, a little shorter than distance between antennal bases; second transverse, third longer than fourth. Pronotum strongly transverse, all margins straight, but lateral margins expanded posteriorly; median longitudinal furrow fine. Tegmina much shorter than the length of pronotum; lateral longitudinal keel prominent. Wings absent. Abdomen slender, a little expanded medially, all tergites depressed dorso-ventrally. Ultimate tergite broad, posterior margin trisinate; pygidium not or scarcely visible. Forceps (Fig. 1) well separated at base, branches strongly curved, widened basally, and cylindrical apically. — Female very similar to male, but branches of forceps more or less straight, broad at base, narrowed distally; inner margins of branches irregularly dentate on basal half (Fig. 2). — Length of body with forceps in both sexes: 6–7 mm.

Distribution: Peru.

Strongylopsalis dimidiata BRINDLE, 1977

Strongylopsalis dimidiata BRINDLE, Rev. Fac. Agron. (Maracay) 9 (3): 115.

Male general colour blackish-brown, antennae dark brown, legs dark yellow, forceps yellowish-brown. Cuticle of body rather shining; head sparsely pubescent, pronotum and tegmina glabrous and impunctate; abdomen strongly



Figs 1—3. 1 = Male ultimate tergite with forceps of *Strongylopsalis cheliduroides* (DE BORMANS, 1880), and 2 = ditto, female. — 3 = Male ultimate tergite with forceps of *S. dimidiata* BRINDLE, 1977

punctured and pubescent. Head very broad, a little transverse, frons tumid; postfrontal and coronal sutures indistinct. Eyes comparatively large, but shorter than the length of head behind eyes. First antennal joint a little shorter than the length of eye, and shorter than distance between antennal bases. Pronotum transverse, lateral margins more or less parallel-sided, posterior margin rounded. Tegmina very short, much shorter than pronotum; lateral longitudinal keels prominent. Wings absent. Abdomen short, broad, a little oval, expanded medially. Ultimate tergite broad, posterior margin trisinate. Pygidium rounded, small. Forceps (Fig. 3) with branches simple, inner margin with a small ventro-median tooth near base; branches well separated at base. — Female unknown. — Length of body with forceps: 5 mm.

Distribution: Venezuela.

Strongylopsalis tarsata HEBARD, 1924

Strongylopsalis tarsata HEBARD, Proc. Acad. nat. Sci. Philad. 76: 115.

Male shining black, legs lighter in colour distally. Head short, interocular area feebly tumid. Eyes small, slightly shorter than the length of head behind eyes. Antennae with joints distinctly moniliform; first joint a little shorter than distance between antennal bases. Pronotum strongly transverse, lateral margins nearly parallel showing very faint divergence caudad, posterior margin convex. Tegmina very short, decidedly reduced; surface smooth except for a sharp though delicate lateral keel; posterior margin obliquely truncate. Wings absent. Abdomen comparatively short, with rounded lateral margins; lateral fold in tergite 3—4 distinct. Ultimate tergite transverse, posterior margin trisinate. Pygidium short, broad at base, narrowed at apex, the apex binodose. Forceps similar to those of *cheliduroides* (DE BORMANS) in shape, but

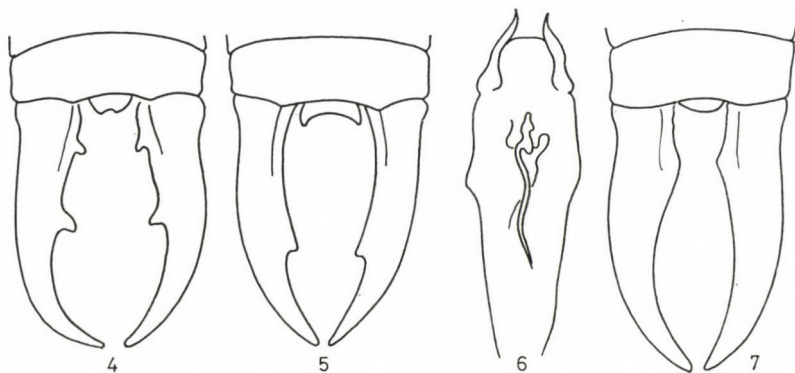
without the basal widened part and with two or one inner tooth (Fig. 4). Penultimate sternite broad, surface weakly convex toward bases of branches of forceps. — Female similar to male, but forceps long, slender, broad at base, inner margins recessed at base to accommodate the prominent pygidium. This is as broad as long, with the lateral margins strongly concave. — Length of body with forceps: male: 5.5–6.5, female: 6–7 mm.

Distribution: Ecuador.

Strongylopsalis bidentata BRINDLE, 1971

Strongylopsalis bidentata BRINDLE, J. nat. Hist. 5: 565.

Male shining black, antennae dark brown, paler on one or more distal joints; legs dark brown; tarsi yellowish-brown, and forceps dark reddish-brown. Head transverse with rounded genae and posterior margin; tumid, postfrontal and coronal sutures indistinct. Eyes comparatively small, slightly shorter than the length of head behind eyes. First antennal joint shorter than distance between antennal bases. Pronotum transverse, slightly widened posteriorly, caudal margin convex. Tegmina very short, more or less as long as pronotum; measured along lateral margins, each tegmen with a well-marked lateral longitudinal keel. Abdomen moderately long, a little expanded medially; tergites 3–4 with distinct glandular folds. Ultimate tergite transverse, depressed between bases of forceps. Pygidium transverse, rather large, with a fusiform projection at each postero-lateral angle (Fig. 5). Forceps trigonal basally, and cylindrical apically; with a large tooth arising from the ventro-medial surface at about two-thirds from base. Genitalia (Fig. 6) characteristic; central parameral plate wide apically, and narrowed basally, virga within



Figs 4–7. 4 = Male ultimate tergite with forceps of *Strongylopsalis tarsata* HEBARD, 1924. — 5 = Male ultimate tergite with forceps of *S. bidentata* BRINDLE, 1971, and 6 = male genitalia. — 7 = Male ultimate tergite with forceps of *S. mathurinii* RIBEIRO, 1931

genital lobe comparatively short, with well-marked sclerotized plate; external parameres moderately short, not of *Strongylopsalis*-type, narrow, pointed. — Female similar to male, but ultimate tergite narrower, forceps shorter, each branch slender, straight except at apices, branches contiguous; pygidium small, rounded. — Length of body with forceps in both sexes: 6—6.5 mm.

Distribution: Colombia.

Strongylopsalis mathurinii RIBERIO, 1931

Strongylopsalis mathurinii RIBERIO, Boln Mus. nat. Rio de Janeiro 1931: 290.

Male general colour shining blackish-brown, tegmina partly lighter, margins of abdominal segments blackish, antennae and legs yellowish-brown. Head rounded, broad; postfrontal and coronal sutures finely visible. Eyes comparatively small, slightly shorter than the length of head behind eyes. First antennal joint typical, shorter than distance between antennal bases. Pronotum rather narrower than head, lateral margins slightly sinuate, posterior margin weakly convex; median longitudinal furrow very fine, indistinct. Tegmina more or less as long as pronotum, posterior margin truncate, each tegmen with a well-marked lateral longitudinal ridge. Wings entirely absent. Abdomen fusiform, a little widened medially; ultimate tergite transverse, simple. Pygidium small, rounded, without projections on posterior margin. Forceps (Fig. 7) a little similar to *cheliduroides* (DE BORMANS), simple, with a small tooth on the inner margin of each branch towards to apex. — Female very similar to male, but forceps narrower, tapering, contiguous. — Length of body with forceps: male: 8—9 mm, female: 8.5—10 mm.

Distribution: Brazil.

Strongylopsalis flava STEINMANN, 1986

Strongylopsalis flava STEINMANN, in Faune subterranea de Venezuela, Bucuresti, in print.

Male general colour yellow to light yellowish-red. Head rounded, a little longer than broad; postfrontal and coronal suture indistinct. Eyes small, shorter than the length of head behind eyes. Antennae 14-jointed; first joint small, shorter than distance between antennal bases; second transverse, third-joint comparatively long, slightly longer than fourth. Pronotum less transverse, median longitudinal furrow distinct; lateral margins straight, and parallel. Tegmina well developed, lateral longitudinal ridge well marked, prominent; posterior margin obliquely truncate. Wings absent. Abdomen slender, more or less parallel-sided; posterior margin of ultimate tergite trisinate.

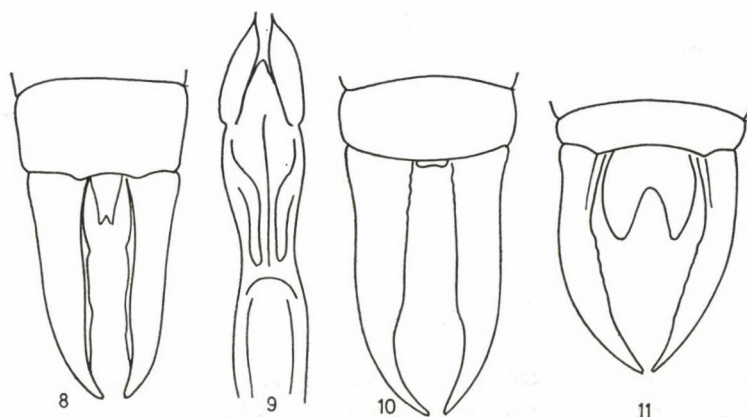
Pygidium large, much longer than broad, elongate, posterior margin with specific incision, as in Fig. 8. Forceps strongly trigonal in cross-section basally and medially; inner margins of forceps with smaller tubercles ventrally. Genitalia (Fig. 9) characteristic; central parameral plate comparatively narrow, but basal, and apical portions expanded; virga within genital lobe slender and short; external parameres with apices acute. — Female very similar to male, but forceps simple, branches with straight median portion, and curved apically, tapering, contiguous. — Length of body with forceps in both sexes: 5.5–6 mm.

Distribution: Venezuela.

Strongylopsalis dubia MOREIRA, 1932

Strongylopsalis dubia MOREIRA, Revta Ent., Rio de Janeiro 2: 282.

Female general colour black or blackish, shining; pronotum yellow laterally, abdomen partly reddish on tergites 5–6; legs yellow, femora darker basally, tibiae partly dark. Head rounded, frons tumid, postfrontal and coronal sutures indistinct; eyes normal, slightly shorter than the length of head behind eyes. First antennal joint typical, shorter than distance between antennal bases. Pronotum rectangular, lateral margins parallel, posterior margin strongly convex; median longitudinal furrow present. Tegmina more or less as long as pronotum, lateral longitudinal ridge well marked, posterior margin truncate. Wings entirely absent. Abdomen fusiform, a little expanded medially; ultimate tergite broad, simple, smooth; posterior margin simple, without trisinate emarginations. Forceps (Fig. 10) comparatively short, broad at base, gently



Figs 8–11. 8 = Male ultimate tergite with forceps of *Strongylopsalis flava* STEINMANN, and 9 = male genitalia. — 10 = Female ultimate tergite with forceps of *S. dubia* MOREIRA, 1932. — 11 = Male ultimate tergite with forceps of *S. excavata* BRINDLE, 1973

curved, narrowed distally. Pygidium small, transverse. Only the single holotype (female) is known, in the Museu de Zoologia, Universidade de São Paulo (MOREIRA also recorded *iheringi* in the same paper, so that the present species is certainly distinct from *iheringi* and it also seems distinct from *mathurinii*). — Male unknown. — Length of body with forceps: 7 mm.

Distribution: Brazil.

Strongylopsalis excavata BRINDLE, 1973

Strongylopsalis boliviana BRINDLE (nec DE BORMANS, 1903), 1971. Ent. Tidskr. **92**: 11. Type male: Naturhistoriska Riksmuseet, Stockholm; type locality: Bolivia. — *Strongylopsalis excavata* BRINDLE (new name for *Strongylopsalis boliviana* BRINDLE, 1971), 1973, J. Ent. (B) **42**: 14.

Male colour reddish to yellowish-brown, antennae, legs and margins of pronotum yellow. Head transverse, tumid; postfrontal and coronal sutures scarcely visible; eyes very small, shorter than the length of head behind eyes. First antennal joint shorter than distance between antennal bases. Pronotum slightly transverse, widened posteriorly, all margins straight, posterior one rounded. Tegmina short, nearly equal in length to pronotum, lateral longitudinal keels well developed. Legs relatively short, femora broad, tibiae less broad than femora, but equal in length to femora. Abdomen broad, depressed; glandular folds on third tergite scarcely visible, those on fourth larger but represented only by a swelling of the cuticle. Ultimate tergite smooth, but irregularly punctured near posterior margin, and punctured on a median and two latero-median longitudinal bands. Each branch of forceps (Fig. 11) trigonal basally, cylindrical medially and apically, evenly curved, ventral edges of branches with small isolated teeth directed medially. Pygidium characteristic, not of *Strongylopsalis*-type, dorsal surface small and sloping into the very large ventral surface which is deeply excised medially; forming two large triangular lobes. — Female similar to male, but smaller, the abdomen slenderer; pronotum and tegmina without depressions, smooth and shining. Forceps short, branches contiguous. — Length of body with forceps in both sexes: 8–9 mm.

Distribution: Bolivia.

Strongylopsalis boliviana (DE BORMANS, 1903)

Carcinophora boliviana DE BORMANS, in BURR, Ann. Mag. nat. Hist. (7) **11**: 233. — *Strongylopsalis boliviana* (DE BORMANS) BURR, Genera Insectorum, 1911, **122**: 48.

Male colour dark reddish-brown, antennae brown, first, second and base of third joints yellow; pronotum narrowly yellow laterally; legs yellow, forceps dark red. Cuticle smooth, impunctate, glabrous except for tergites 6–7 which are strongly striato-rugose, with striations longitudinally. Ultimate tergite

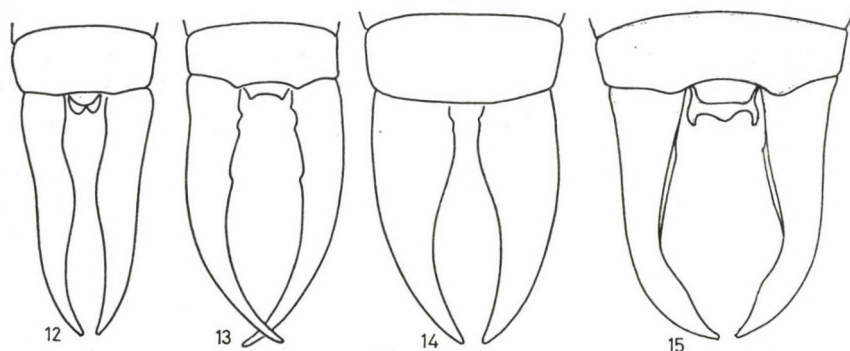
sparsely and irregularly punctured. Head transverse, tumid; postfrontal and coronal sutures absent. Eyes small, slightly shorter than the length of head behind eyes. First antennal joint very small, much shorter than distance between antennal bases. Pronotum transverse, widened posteriorly, posterior margin weakly convex. Tegmina short, each tegmen with a well-marked lateral longitudinal explanate margin or rim; wings totally absent. Abdomen broad, a little depressed, glandular folds prominent. Pygidium small, declivent, dorsal part rounded with small blackened tubercles around margin, ventral part bifurcate, posterior margin irregular and blackish. Each branch of forceps (Fig. 12) mainly elliptical in cross-section, but with a short rounded dorso-median longitudinal ridge near base, wider at base, thence almost parallel-sided, but sharply narrowed towards apex. — Female unknown. — Length of body with forceps: 12–13 mm.

Distribution: Bolivia.

Strongylopsalis koepcke BRINDLE, 1968

Strongylopsalis koepcke BRINDLE, J. nat. Hist. 2: 279.

Male general colour dark reddish-brown or brown, shining; legs yellow or yellowish-brown; antennae yellow basally, darker distally; mouthparts yellow. Head broad, rounded, tumid; postfrontal and coronal sutures very fine. Eyes comparatively small, slightly shorter than the length of head behind eyes. Antennae 12-jointed; first joint very short, second small, quadrate third equal in length to first but narrower, fourth joint one and half times as long as broad, shorter than first, and fifth twice as long as wide. Pronotum slightly transverse, widening posteriorly, lateral margins rather broadly yellow; median longitudinal furrow finely marked. Tegmina almost equal in length to pronotum, wide, meeting along entire sutures, posterior margin truncate; lateral



Figs 12–15. 12 = Male ultimate tergite with forceps of *Strongylopsalis boliviana* (DE BORMANS, 1903). — 13 = Male ultimate tergite with forceps of *S. koepcke* BRINDLE, 1968, and 14 = ditto, female. — 15 = Male ultimate tergite with forceps of *S. eberhardi* sp. n.

longitudinal keels prominent. Abdomen fusiform, impunctate basally, weakly punctured on fourth tergite, more strongly punctured on segments 5–8. Ultimate tergite very broad, posterior margin trisinate. Pygidium dark red, black along margins which are serrated; broad at base, narrowed distally, concave dorsally and on posterior margin. Forceps (Fig. 13) long, only slightly curved, inner margins of each branch irregularly dentate on basal quarter, and with a small tooth near the mid-point. — Female similar to male, but with forceps (Fig. 14) shorter, broad basally, narrowed distally, almost straight; pygidium short, broad or hidden. — Length of body with forceps in both sexes: 8–9.5 mm.

Distribution: Peru.

Strongylopsalis eberhardi sp. n.

Male general colour dark brownish-black; antennae dark brown, legs yellowish-brown except femora brownish-black basally; forceps dark red. Cuticle smooth, but tegmina finely punctured, and abdominal tergites strongly punctated. Head elliptical, rounded posteriorly. Antennae 12-jointed; first joint typical, a little shorter than the length of head behind eyes, second transverse, third a little longer than fourth. Pronotum transverse, slightly expanded posteriorly, all angles rounded, median longitudinal furrow finely visible. Tegmina a little longer than pronotum, lateral longitudinal keels indistinct. Wings absent. Abdomen a little depressed and expanded medially, glandular folds very small. Ultimate tergite transverse, posterior margin trisinate. Pygidium characteristic, broad, well developed, with dorsal and ventral parts; ventral part with median and lateral projections, as in Fig. 15. Each branch of forceps arcuate, trigonal in cross-section basally and medially, inner margins without serration or dentation. Genitalia (Fig. 16) specific; central parameral plate strongly narrowed basally; virga within genital lobe very short with complicated sclerotized plate, as in Fig. 16. External parameres characteristic, broad, strongly sclerotized laterally, and with a conspicuous cloak-like outer marginal flange [similar to *Canarilabis maxima* (BRULLÉ, 1838), in family Carcinophoridae]. — Female unknown. — Length of body with forceps 6 mm.

Holotype male: Costa Rica, Aserri, San Jos, 7. 5. 1984, legit: WILLIAM G. EBERHARD, gen. prep. No. 975, det. DR. H. STEINMANN (deposited in the Universidad de Costa Rica).

Strongylopsalis puella sp. n.

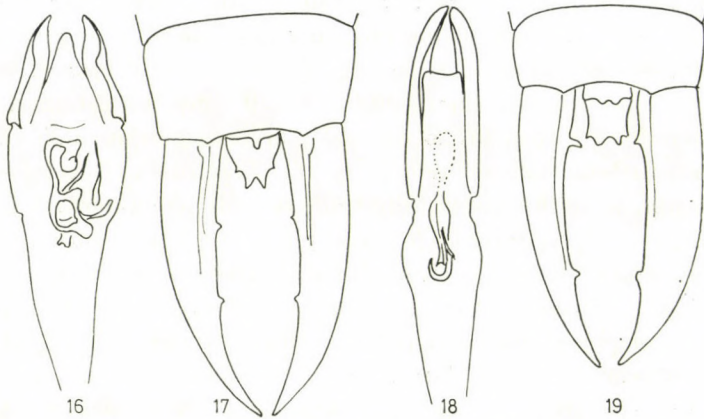
Male general colour dark reddish-brown, antennae dark brown, femora light brown, tibiae brownish, but a little yellowish apically, tarsi yellow; forceps light red. Head rounded, tumid, smooth; postfrontal sutures and coronal

suture fine. Eyes comparatively large, but a little shorter than the length of head behind eyes. Antennae 13-jointed; first joint small, strongly shorter than distance between antennal bases, second quadrate, third longer, more or less as long as first, and fourth small, one and half times longer than wide. Pronotum a little longer than broad, lateral margins straight, and widened posteriorly; median longitudinal furrow present. Tegmina well developed, longer than pronotum, smooth, lateral longitudinal keels prominent. Wings absent. Abdomen fusiform, glandular folds on tergite 3 small, and on tergite 4 larger. Ultimate tergite very broad, simple, cuticle with two irregular, longitudinally punctured bands. Pygidium large, dorsal part of pygidium small, broad, posterior margin of dorsal part with one small tubercle medially; ventral part of pygidium lobiform, with two lateral smaller, and posterior larger tubercles (Fig. 17). Forceps straight, strongly trigonal in cross-section basally, and cylindrical apically; inner margins with two pairs of smaller teeth. Genitalia (Fig. 18) characteristic; central parameral plate very narrow, but a little expanded apically, virga within genital lobe short, with well-developed sclerotized section; external parameres specific, very long and narrow, as in Fig. 18. — Female unknown. — Length of body with forceps: 14–14.5 mm.

Holotype male: Main Range, Blue Mts., 5-7388 ft., Aug. 17. 19., gen. prep. No. 837, det. DR. H. STEINMANN [deposited in the Museum of Comparative Zoology, Cambridge (Mass.)]. — Paratype male, ditto, gen. prep. No. 838, det. DR. H. STEINMANN (deposited in the Hungarian Natural History Museum, Budapest).

Strongylopsalis haitica sp. n.

Male general colour light reddish-brown, legs yellowish-brown, unicolour, a little lighter than forceps. Head large, smooth, postfrontal and coronal sutures indistinct. Eyes very small, slightly shorter than the length of head behind eyes. Antennae 14-jointed; first joint normal, shorter than distance between antennal bases, second quadrate, third more or less as long as first, and fourth short, a little longer than broad. Pronotum quadrate, lateral margins straight, but expanded posteriorly, posterior margin rounded; median longitudinal furrow present at prozona. Tegmina smooth, a little longer than pronotum in length; lateral longitudinal ridge well marked, posterior margin obliquely truncate. Wings absent. Abdomen fusiform, tergites 1–4 more or less smooth, glabrous, tergites 5–7 conspicuous, striato-rugose, and tergites 8–9 impunctate, smooth. Ultimate tergite broad, simple, posterior margin trisinate. Pygidium characteristic (Fig. 19), dorsal part of pygidium with two obtuse tubercles at dorsal surface; ventral part lobiform, posterior margin of ventral part with two smaller, and two larger tubercles. Forceps similar to *puella* sp. n., but inner teeth larger, and first pair directed to posterior angles



Figs 16—19. 16 = Holotype genital armature of *Strongylopsalis eberhardi* sp. n. — 17 = Male ultimate tergite with forceps of *S. puella* sp. n., and 18 = ditto, holotype genitalia. — 19 = Male ultimate tergite with forceps of *S. haitica* sp. n.

of pygidium. Genitalia (Fig. 20) specific; central parameral plate comparatively short, apical part of paramere a little broader, genital lobe (erected in Fig. 20) well developed, virga within genital lobe with smaller sclerotized plate. External parameres narrow and long. — Female very similar to male, but forceps very simple, straight, tapering, contiguous. — Length of body with forceps: male: 14 mm, female: 9—10.5 mm.

Holotype male: Haiti, 1934, Darlington, La Visite vic. La Selle Range, 5-7000 ft., Sept. 16—23, gen. prep. No. 839, det. DR. H. STEINMANN [deposited in the Museum of Comparative Zoology, Cambridge (Mass.)]. — Paratypes 5 females: ditto, 1 female, and Mt. La Hotte, 5-7800 ft., Oct. 16—17, 2 females [deposited in the Museum of Comparative Zoology, Cambridge (Mass.)]. — Haiti, Des Barriere, Mt. La Hotte, nr. 400 ft., Oct. 12—14, 2 females (deposited in the Hungarian Natural History Museum, Budapest).

Strongylopsalis laminata BRINDLE, 1973

Strongylopsalis laminata BRINDLE, J. Ent. (B) 42: 11.

Male dark yellowish-brown to dark reddish-brown; antennae brown, basal two joints and base of third joint yellowish; legs yellowish or with femora vaguely darkened; forceps and pygidium reddish. Cuticle of head, pronotum and tegmina coriaceous, impunctate; abdominal tergites 1—3 sparsely and shallowly, that of tergite 4 stronger, tergites 5—9 strongly punctured; ultimate tergite smooth medially on a triangular area with the base of triangle along anterior margin, and also smooth laterally. Head transverse, tumid, lateral margins rounded. Eyes comparatively small, slightly shorter than the length of head behind eyes. First antennal joint shorter than

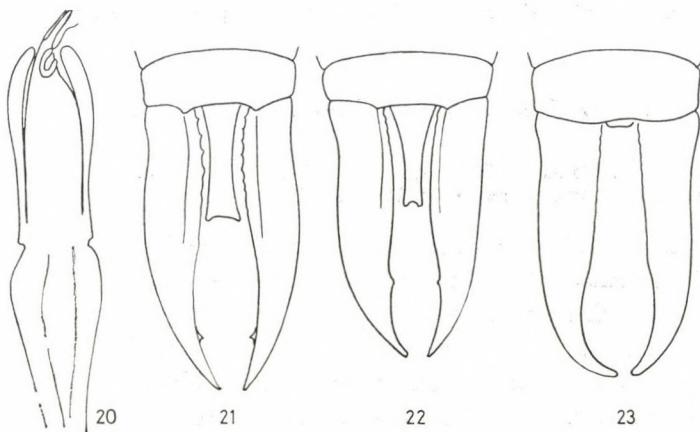
distance between antennal bases; second transverse, hind joint elongate, nearly two and half times longer than broad. Pronotum large, widened posteriorly, transverse; posterior margin convex. Tegmina short, lateral longitudinal keels prominent. Abdomen fusiform, a little expanded medially; ultimate tergite broad, posterior margin trisinate. Pygidium very long, declivent at base, and narrowed apically; lateral margins with crenulations, and with a larger blunt ventro-median tooth towards apex. Forceps (Fig. 21) broad for basal half and with a rounded dorso-median longitudinal ridge towards inner margin. — Female similar to male, but abdomen relatively short, abdominal tergites less strongly punctured, and each branch of forceps almost elliptical in cross-section near base, with a faintly marked dorsomedian longitudinal ridge. — Length of body with forceps in both sexes: 11–12.5 mm.

Distribution: Bolivia.

Strongylopsalis iheringi REHN, 1917

Strongylopsalis iheringi REHN, Trans. Am. ent. Soc. 44: 183. — *Labia castanea* MOREIRA, Boln Inst. biol. Def. agr. Rio de Janeiro 1930: 22. — *Labia castanea* MOREIRA, Rev. Ent. 1931, 1: 263 (proposed synonymy with *iheringi* REHN, 1917).

Male colour dark brown, shining; antennae and legs lighter in colour. Head rather longer than broad, rounded; postfrontal and coronal sutures finely visible. Eyes typical, shorter than the length of head behind eyes. First antennal joint shorter than distance between antennal bases, second transverse, third longer than fourth. Pronotum less transverse and with lateral margins diverging posteriorly; median longitudinal furrow present at prozona.



Figs 20–23. 20 = Holotype genital armature of *Strongylopsalis haitica* sp. n. — 21 = Male ultimate tergite with forceps of *S. laminata* BRINDLE, 1973. — 22 = Male ultimate tergite with forceps of *S. iheringi* REHN, 1917, and 23 = ditto, female

Tegmina more or less as long as pronotum, or a little longer; lateral longitudinal keels well marked; posterior margin obliquely truncate. Wings entirely absent. Abdomen fusiform, a little expanded medially. Ultimate tergite transverse, simple, smooth. Pygidium very long, similar to *laminata* BRINDLE, directed ventro-posteriorly, so that the apex lies below the level of the forceps. Forceps (Fig. 22) long, broad, almost straight, but with apices curved mesad, each branch with an inner sinuate and dentate basal margin ending in a tooth, apical third cylindrical and smooth. — Female similar to male, but forceps (Fig. 23) broad at base, narrowed distally, inner margin of each branch dentate on basal half; pygidium short, small, truncate, apical margin concave. — Length of body with forceps: male: 9–10 mm, female: 10–10.5 mm.

Distribution: Brazil.

Strongylolabis gen. n.

Body of medium size; general colour more or less brownish with some reddish or yellowish parts. Tegmina well or fully developed, with lateral longitudinal keels; normal in length, slightly longer than the length of pronotum. Wings well developed. Antennae with joints of *Vostox*-type, joints cylindrical, and lateral margins of joints more or less parallel-sided.

Type-species: *Spongovostox berlandi* HEBARD, 1920.

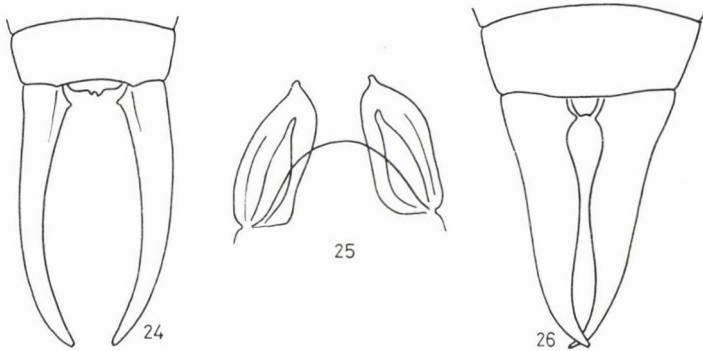
IDENTIFICATION KEY TO SPECIES

- 1 (2) Pronotum very slightly longer than caudal width; tegmina with fine lateral keels; posterior margin transversely truncate. Head showing a moderate depression from eyes to median point of caudal margin. Guatemalan species *berlandi* (HEBAR, 1920)
- 2 (1) Pronotum as long as caudal width; tegmina with well-marked lateral keels; posterior margin obliquely truncate. Head without depression. Panamanian species *secunda* sp. n.

Strongylolabis berlandi (HEBAR, 1920) comb. n.

Spongovostox berlandi HEBARD, Proc. Acad. nat. Sci. Philad. 1920: 343. — *Vostox berlandi* (HEBAR), BRINDLE, J. nat. Hist. 1971, 5: 536.

Male head and pronotum dark brown, tegmina and wings reddish-brown, wings yellow at base; antennae and legs yellow to brown, abdomen reddish to blackish-brown. Head rounded, showing a moderate depression from eyes to median point of posterior margin, occipital lobes prominent, so that cheeks are longer than eyes and caudal margin of occiput broadly angulate-emarginate. Postfrontal and coronal sutures obsolete. Eyes comparatively small, slightly shorter than the length of head behind eyes. First antennal joint large, but shorter than distance between antennal bases, second quadrate,



Figs 24–26. 24 = Male ultimate tergite with forceps of *Strongylolabis berlandi* (HEBARD, 1920), and 25 = ditto, external parameres of male genitalia. — 26 = Female ultimate tergite with forceps of *S. secunda* sp. n.

third joint nearly as long as first, but much more slender. Pronotum very slightly longer than caudal width, smooth, median longitudinal furrow present. Tegmina smooth, with a very fine but distinct and percurrent keel along the external margin of the dorsal surface, transverse truncate caudad. Wings fully developed. Abdomen with dorsal surface polished, fourth and fifth tergites showing lateral a weak rounded carina. Ultimate tergite very weakly depressed meso-caudad, posterior margin almost evenly transverse. Pygidium very strongly declivent (Fig. 24), with surface in a broad triangular dorsal area deplanate, thence convex; lateral margins fitting forceps tightly, latero-caudal margins very strongly convergent, almost transverse to a broad, weakly produced median portion. Forceps elongate, showing a very feeble curvature, branches almost straight, with one inner tooth on each. Genitalia moderately small, central paramere a little broader apically, narrower basally; external paramere (Fig. 25) lemon-shaped, with apices pointed, as in Fig. 25. — Female unknown. — Length of body with forceps: 11–13.5 mm.

Distribution: Guatemala.

Strongylolabis secunda sp. n.

Female general colour dark reddish-brown, antennae brown, legs light brown, forceps orange. Body shining, smooth. Head comparatively large, a little broader than pronotum; postfrontal and coronal sutures indistinct. Eyes moderately large, more or less as long as the length of head behind eyes. Antennae 11-jointed; first joint normal, a little shorter than distance between antennal bases; second quadrate, third joint slender, shorter than first, but longer than fourth, rest of joints cylindrical. Pronotum as long as caudal width, a little transverse, lateral margins straight, a little expanded caudad;

median longitudinal furrow fine, posterior margin rounded. Tegmina fully developed, protuberant; lateral longitudinal keel well marked, prominent. Wings fully developed, recurving to tergite 9. Abdomen very short and broad, oval; ultimate tergite transverse, smooth, median longitudinal sulcus absent, but dorsal surface with a well-marked yellowish band medially. Pygidium small, more or less as long as broad, a little narrowed apically, posterior margin concave. Forceps (Fig. 26) simple, broad at base, branches more or less straight, except apices, curved. Each branch of forceps depressed dorso-ventrally, and strongly elliptical in cross-section. Inner margins of forceps with one small tooth basally, and with a small semicircular emargination at basal half. — Male unknown. — Length of body with forceps: 7.5 mm.

Holotype female: Panama, Hawthorn, Vic. 12, 4, 50., legit: W. L. BROWN (deposited in the Hungarian Natural History Museum, Budapest).

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THE PRETARSUS IN ARADIDAE (HETEROPTERA)

T. VÁSÁRHELYI

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

(Received 23 October, 1985)

The pretarsus of representative aradid material was investigated, the basic type and modifications of different structures are described. No arolium was found, empodium, parempodium and pulvillus may be absent. The pulvillus is lamellate in Calisiinae and Isoderminae. Reduction of pulvillus was followed in some subfamilies and within Mezirinae. Aradinae stands apart on the basis of unique appearance of three structures. With 27 figures.

Pretarsal structures have often been used in the taxonomy of Heteroptera as well as in the identification of different taxa. There is, however, a considerable lack of information on the general morphology and varieties in several of the families.

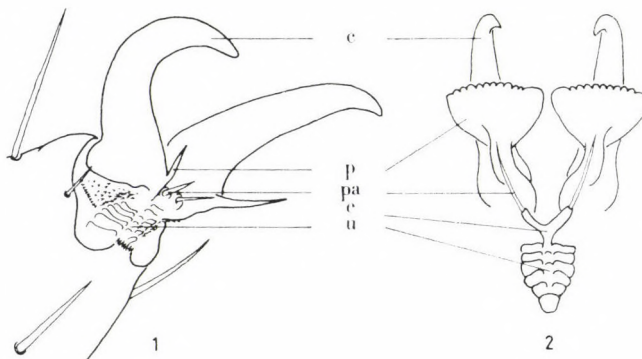
SCHUH (1976) investigated the pretarsal structures on a large material in Miridae, gave a short evaluation of earlier papers, and worked out a unified terminology. USINGER and MATSUDA (1959) paid attention to the pretarsus, probably as it is seen under the binocular, and gave a short summary using the old terminology (i.e. pulvillus is called arolium and parempodium is called a pair of bristles). According to them, using the terminology of SCHUH (1976), the pulvillus is lacking in Aradinae and in certain groups of *Mezira* (and e.g. in *Mezira membranacea* FABRICIUS, 1803). It is lobe-like in *Ctenoneurus* and *Chinamyersia*, and occurs in most subfamilies and in a majority of the genera of the world. They found cases in which a pair of bristles, i.e. parempodia are conspicuous between the pulvilli, and *Kormilevia* as an extreme case with a very long, curved seta. This, according to COBBEN (1978), may be a real arolium if it is situated medially and dorsally to the claws. GOEL and SCHAEFER (1970) investigated and used the pulvillus for taxonomic purposes, describing basi- and distipulvillus but not finding it on the one aradid species (*Glochocoris* sp.) that he studied. The pulvillus of a second aradid species was investigated by COBBEN (1978) with the same result. The need for investigating the aradid pretarsus was suggested by a number of authors. Pretarsal structures are figured by VÁSÁRHELYI (1982) and HEISS (1983). In this study an overall picture is given on the aradid pretarsus, with a short evaluation of its significance in the classification of the family.

MATERIAL

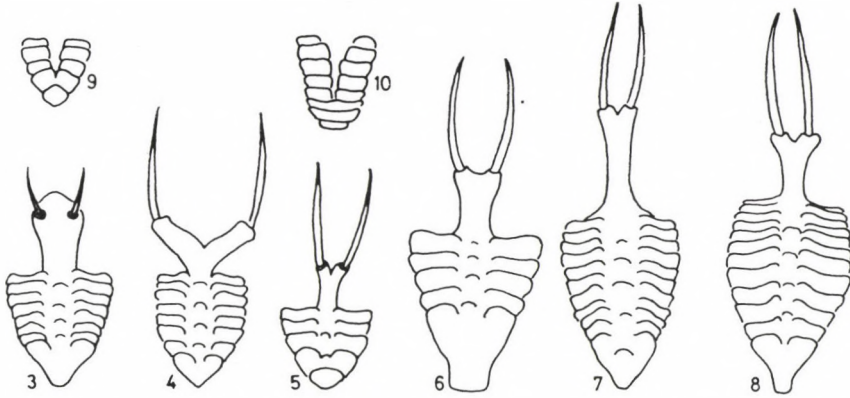
The pretarsus of 222 species was investigated with binocular, of 32 species with SEM and/or transmission light microscope. The following genera were represented: Aneurinae: *Aneurus* (11 species), Aradinae: *Aradus* (24 species), undescribed apterous aradine species (1); Calisiinae: *Calisius* (9); Carventinae: *Biroana* (4), *Caecicoris* (1), *Carventus* (6), *Euricoris* (3), *Proxius* (1), *Veronaptera* (1), *Zimmermannia* (1); Chinamyersiinae: *Chinamyersia* (1), *Tretocoris* (1); Isoderminae: *Isodermus* (1); Mezirinae: *Acoryphocoris* (3), *Aphlebo-derrhis* (1), *Arictus* (12), *Artabanus* (5), *Artagerus* (3), *Barcinus* (2), *Chelonocoris* (2), *Chinessa* (2), *Cinyphus* (5), *Clavicornia* (1), *Crimia* (1), *Ctenoneurus* (4), *Daulocoris* (4), *Dysodiellus* (2), *Dysodius* (4), *Drakiessa* (2), *Glochocoris* (2), *Hesus* (4), *Kormilevia* (1), *Mancinia* (1), *Mastigocoris* (1), *Mezira* (s. str.) (28), *Mezira* (*Zemira*) (18), *Miorrhynchus* (2), *Neophloeobia* (1), *Neuroctenus* (29), *Notapictinus* (1), *Odontonotus* (2), *Oroessa* (1), *Phyllotingis* (1), *Pictinus* (4), *Rossius* (1), *Stelgidocoris* (1), *Strigocoris* (1), *Usingeria* (2), *Usingerida* (1); Pro-sympiestinae: *Neadenocoris* (1), *Prosympiestus* (1). Figs 2–10 were made free-hand from KOH cleared preparations.

MORPHOLOGY AND TERMINOLOGY

The tarsus is two-jointed in each developmental stadium in Aradidae, and in the investigated species (in the genera *Aneurus*, *Aradus*, *Arictus*, *Mezira* and *Neuroctenus*) no significant change in the shape or relative size was observed (Figs 12–15). There is an insinuation apically on the pretarsus, the ventral margin of which may be arched or may have a short lobe directed apically. The distal (inner) part of this lobe is covered with small sensilla. Dorsally to this lobe is the unguitractor (Figs 1–10). Its basal part is trilobate normally. The apical part, i.e. the empodium, is in all but one subfamily



Figs 1–2. Pretarsal structures. 1 = *Mezira* (*Zemira*) sp., L₅, 2 = *Calisius australis* KORMILEV, c = claw, p = pulvillus, pa = parempodium, e = empodium, u = unguitractor plate



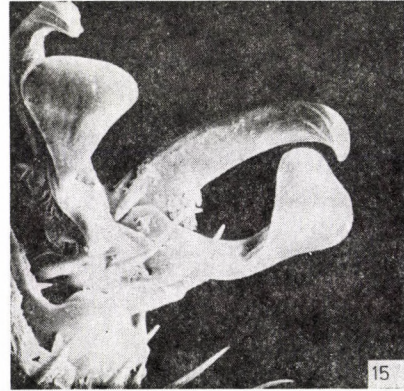
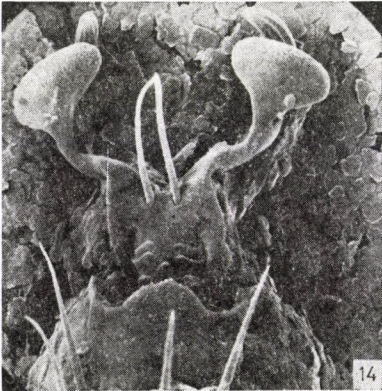
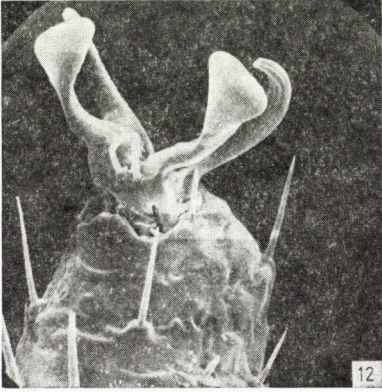
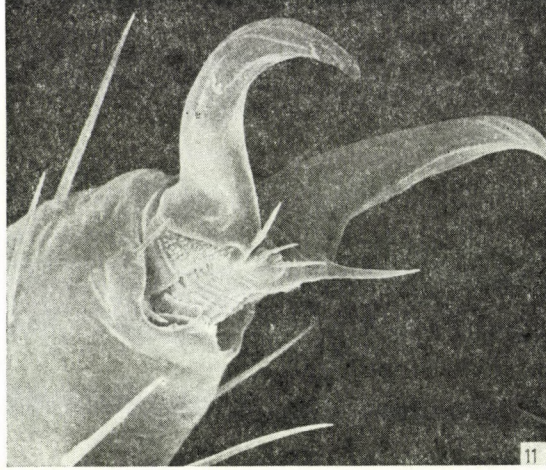
Figs 3—10. Unguitractor plate and parempodia. 3 = *Aradus cinnamomeus* PANZER, L₃, 4 = *Isodermus gayi* SPINOLA, 5 = *Aneurys laevis* FABRICIUS, 6 = *Veronaptera concinna* VÁSÁRHELYI, 7 = *Arictus* sp., L₅, 8 = *Dysodius lunatus* FABRICIUS, 9 and 10 = *Glochocoris* spp.

investigated Y-shaped. The two branches of this Y are bearing the two hair-like parempodia. On both sides of the empodium are the claws. Basally on the claws, on the inner surface, is the pulvillus. No real arolium was ascertained. The varieties of these structures will be discussed below.

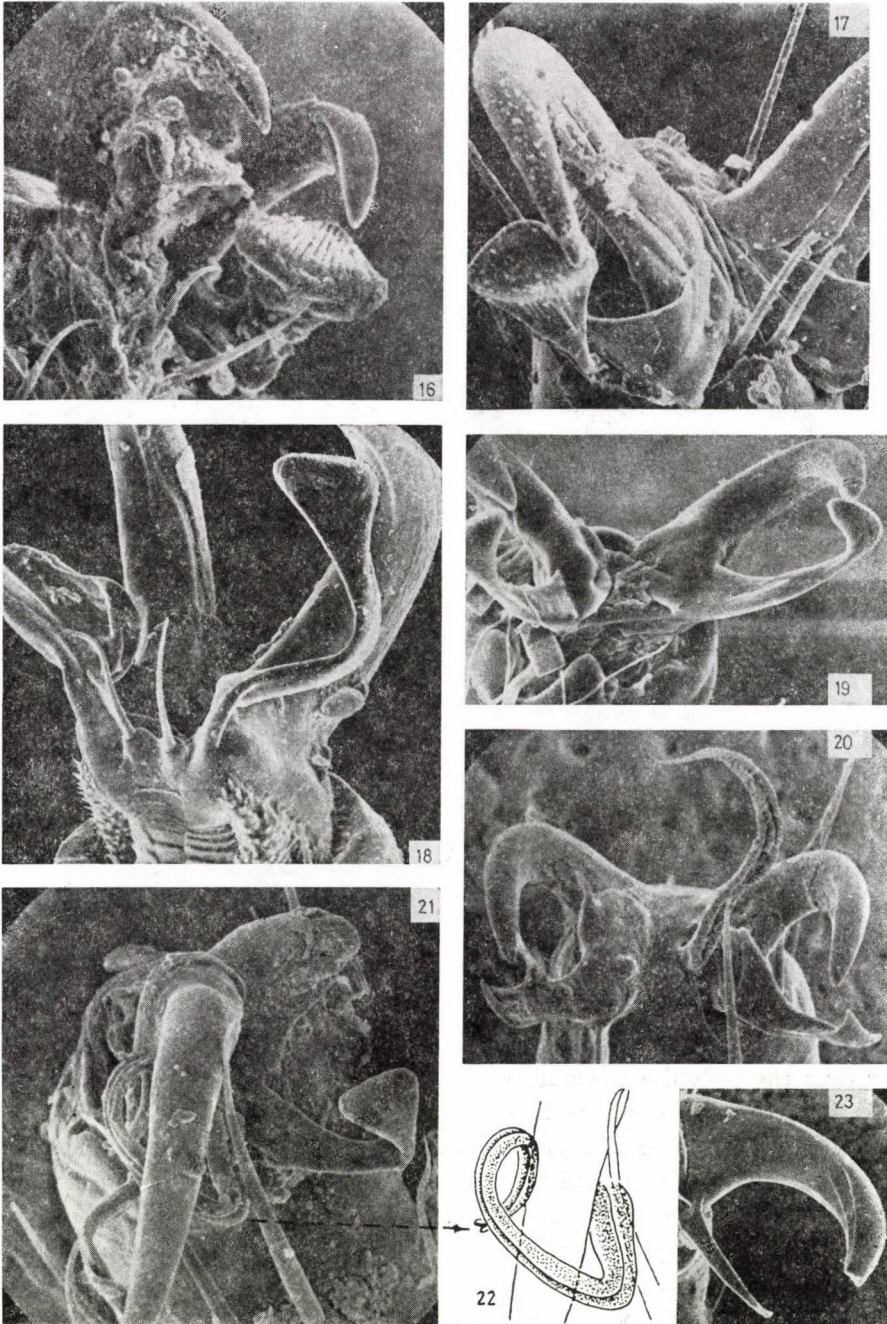
The unguitraction plate is, according to DASHMAN (1953) shaped like an arrowhead. The same was found in the recent study, but with some varieties. In each case the unguitraction plate was trilobate (i.e. with three rows of squamiform processes), with the exception of two *Glochocoris* species, where — probably not due to their smaller size — the median section and the empodium are missing as well as the parempodia (Figs 9—10). In Aradinae the empodium is not Y-shaped but pentangular (Fig. 3).

The parempodia are typical mechanical sensory setae slightly curved inwards, and not continuation of the branches of the Y-shaped empodium as figured by DASHMAN (loc. cit.). No helically striated seta was found. The parempodia were similar in most species. They are missing in *Glochocoris* (Fig. 19), while in *Aradus* they are relatively short (Fig. 27). Parempodia of *Clavicornia* are long, apically flattened and widened. In *Kormilevia* and *Neadenocoris* (as well as probably in *Adenocoris*) they are very long, and adherently helically curved appearing together as a single median curled seta (Figs 20—22).

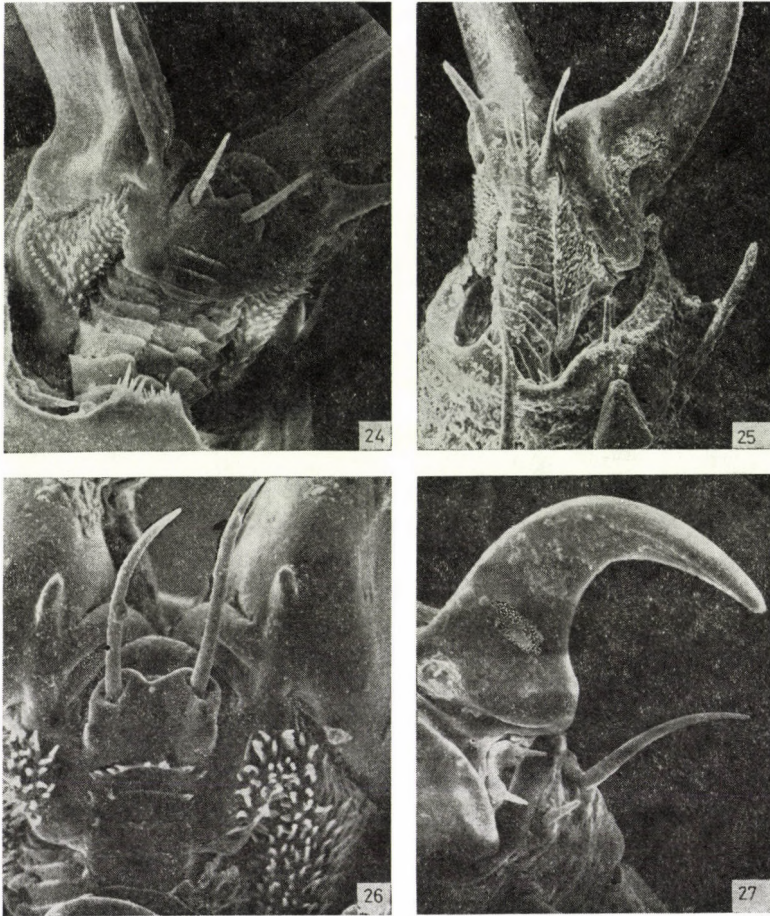
The greatest variability was found in the size and shape of the pulvillus, but without significant change of relative size to claws during postembrional development (Figs 12—15). According to GOEL and SCHAEFER (1970) in Pentatomomorpha the most general form of pulvillus is with a narrower basipulvillus and a broadened, laminate distipulvillus. Such a form was found only in Calisiinae (Figs 2, 16 and Fig. 6 in HEISS, 1983, respectively) and in Isoderminae (Fig. 17) the distipulvillus being slightly laminate subapically. In all



Figs 11–15. SEM photos of pretarsus. 11 = *Mezira (Zemira)* sp., L₅, 12–15 = different larval instars of *Aneurus laevis* FABRICIUS: 12 = L₁, 13 = L₃, 14 = L₄, 15 = L₅



Figs 16—23. SEM photos of pretarsus. 16 = *Calisius* sp., 17 = *Isodermus gayi* SPINOLA, 18 = *Neuroctenus taiwanicus* KORMILEV (teratologically asymmetric), 19 = *Glochocoris* sp., 20 = *Neadenocoris spinicornis* USINGER et MATSUDA, 21 = *Kormilevia plaumanni* KORMILEV, 22 = same, configuration of parandria, 23 = *Artabanus bilobiceps* LETHIERRY



Figs 24–27. SEM photos of pretarsus. 24 = *Mezira (Zemira)* sp., L₅, 25 = *Arictus lobuliventris* KORMILEV, 26 = *Mezira (Zemira) rugosa* SIGNORET, 27 = *Aradus cinnamomeus* PANZER, L₃

other taxa the pulvillus is smaller, mostly with distinct basi- and distipulvillus. It is often “lobe-like” with strong, curved basal and small apical part, latter widened transversally to the claws (Figs 11–15, 18, 20). In *Mezirinae* a further reduction of the pulvillus can be observed. It appears to be a hair-like structure, capitate, with small, rounded head (Fig. 23) or without it, and is gradually becoming shorter (Figs 23–25) and finally it appears as a small peg on the basal inner part of the claw (Fig. 26). The lack of pulvillus was not observed in other species than those belonging to *Aradinae* (*Aradus* spp. and a fifth instar larva of an undescribed, apterous aradine species), this refers also to *Mezira (Zemira) membranacea* FABR. (c.f. USINGER and MATSUDA, 1959).

BEARING ON CLASSIFICATION

Three parts of the pretarsus was found to show significant morphological varieties. The empodium of *Aradus* (Aradinae) is pentangular, that of the other taxa Y-shaped. The empodium and parempodium is missing in *Glochocoris* (Mezirinae), the latter is long, flattened and widened apically in *Clavicornia* (Mezirinae) and is relatively short in *Aradus* (Aradinae). Parempodia of *Kormilevia* (Mezirinae) and *Neadenocoris* (Prosypniestinae) are adherently curled. The pulvillus is lacking in Aradinae, is laminate in Calisiinae and Isoderminae, is "lobe-like" in most of the taxa investigated (Aneurinae, Carventinae, Chinamyersiinae, Prosypniestinae and partly Mezirinae) and is reduced to a hair-like structure and eventually shortened to become a peg in several genera of Mezirinae, and also within the genus *Mezira*, in the subgenus *Zemira* and a few species of *Mezira* s. str.

The lack of empodium and parempodium is surely an apomorphic character as well as the long, apically flattened and widened, or long, adherently curled parempodia. The reduction of pulvillus is also an apomorphic phenomenon. All these are found in Mezirinae (the curled parempodia is found in Prosypniestinae too), this subfamily thus shows most of the apomorphic characters. Laminate distipulvillus seems to be a plesiomorphic character of Calisiinae and Isoderminae. The consideration of the aradine pretarsus is doubtful. The complete lack of pulvillus can be a final stage of reduction. The presence of pulvillus is general among Pentatomomorpha, however, Aradinae has a unique place in some other respects within the group too, thus, the absence of pulvillus may also be plesiomorphic. The pentangular empodium and the shorter parempodium with the lacking pulvillus, as far as the pretarsus is concerned, certainly isolate the Aradinae within the family.

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WEITERE ANGABEN ZUR REGENWURMFUNA
DES KONGO-GEBIETES
(OLIGOCHAETA: EUDRILIDAE
UND GLOSSOSCOLECIDAE)

A. ZICSI und Cs. CSUZDI

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

(Eingegangen am: 22. November 1985)

From different genera of the family Eudrilidae some new species and a new subspecies are described (*Eminoscolex pauliani* sp. n., *Buettneriodrilus sulcatus* sp. n., *B. pseudosulcatus* sp. n., *B. sexpunctatus* sp. n., *B. bicaliculatus sibirianus* ssp. n.). Upon new occurrence data of some other species (*B. aequatorialis* MICHAELSEN, 1935, *Malodrilus kamerunensis* (MICHAELSEN, 1902) and *M. buarensis* (MICHAELSEN, 1937) complementary descriptions are given. Based on a rich material of *Hyperiodrilus africanus* (BEDDARD, 1891) the significance of the porophores developed on the male pores is evaluated.

In einer vorausgehenden Arbeit (ZICSI u. CSUZDI, 1986) wurden innerhalb der Familie Eudrilidae vorwiegend nur Arten der Gattung *Eminoscolex* aus dem Kongo-Gebiet bekanntgegeben. In gleicher Arbeit wurde ferner noch angedeutet, daß die Bearbeitung der von der Ungarischen Bodenzologischen Expedition (Teilnehmer: Prof. DR. J. BALOGH, DR. A. ZICSI und DR. S. ENDRÖDY-YOUNGA) in der Volksrepublik Kongo gesammelten Regenwürmer fortlaufend erfolgen soll. In vorliegender Arbeit befassen wir uns auch weiterhin mit der Bekanntmachung von Vertretern der Familie Eudrilidae sowie mit der Anführung einer Art der Familie Glossoscolecidae.

Die in der Zeit vom 16. X. 1963 und 21. I. 1964 im Kongo-Gebiet mit Unterstützung der UNESCO und dem Office de la Recherche Scientifique et Technique Outre-Mer Paris und Brazzaville (ORSTOM) gesammelten Regenwürmer stammen hauptsächlich aus folgenden Gebieten:

1. Meya, in der Umgebung von Kindamba, W-NW von Brazzaville (S. 3°50'19" — Ö. 14°30'08") vom 29. X.—14. XI. 1963.

2. Sibiti, 5 km entfernt von der Stadt in der Umgebung des Institute de Recherches pour les Huites et Oleagineux (IRHO) und beim Bouenza Wasserfall und dessen Umgebung (S. 3°40'22" — Ö. 13°20'23") vom 23. XI.—3. XII. 1963.

3. Loudima, landwirtschaftlich bebaute Flächen, Plantagen (S. 4°10'00" — Ö. 13°00'39") vom 4. XII.—15. XII. 1963.

4. Reservat Mt. Fouori, an der Grenze von Gabon (S. 2°38'00" — Ö. 11°34'04") vom 12. XII.—14. XII. 1963.

5. (Reservat Lefini) (S. 2°30'00" — Ö. 15°29'00") vom 5. I.—14. I. 1964.

6. Brazzaville und Umgebung (S. 4°10'38" — Ö. 15°10'28") vom 16. X.—28. X. 1963; vom 15. XI.—22. XI. 1963; vom 15. XII. 1963.—4. I. 1964 und vom 15. I.—21. I. 1964.

Nähere Fundortsangaben werden bei der Bekanntmachung der Arten angeführt. Im weiteren wird auf die von BALOGH—ZICSI—ENDRÖDY-YOUNGA (1965) zusammengestellte Fundortsliste verwiesen.

An dieser Stelle werden noch einige von Herrn DR. P. LAVELLE, Paris, in Kongo Mayombe, Station Dimonika gesammelte Regenwürmer angeführt. Für die Überlaßung des Materials sprechen wir ihm auch an dieser Stelle unseren besten Dank aus.

Familie EUDRILIDAE CLAUS, 1880

Gattung *Eminoscolex* MICHAELSEN, 1896

Da wir uns in der vorausgehenden Arbeit (ZICSI und CSUZDI, 1968) mit der Diagnose dieser Gattung eingehend befaßt und sie z. T. auch ergänzt haben, weisen wir an dieser Stelle auf das in der unlängst erschienenen Arbeit Ausgesagte hin. Bei der ersten Durchsicht des untersuchten Materials wurden nicht sämtliche Arten dieser Gattung erkannt, so daß wir jetzt auf diese zurückgreifen werden, um die Beschreibungen, bzw. die nicht angeführten Fundorte noch hinzufügen.

Eminoscolex japomanus MICHAELSEN, 1915

Von dieser bisher nur aus Kamerun bekannten Art, die aufgrund eines Exemplares beschrieben wurde und deren Beschreibung 1937 von MICHAELSEN ebenfalls aus Kamerun anhand mehrerer Exemplare ergänzt wird, liegt uns ein gut erhaltenes praeadultes Tier vor.

Da unser Exemplar im wesentlichen mit den Beschreibungen von MICHAELSEN übereinstimmt, gehen wir auf die Abweichungen, bzw. auf die Anführung solcher Organe ein, die von MICHAELSEN nicht mit Sicherheit erkannt wurden.

Kopf nicht tanylobisch, sondern epilobisch 1/2 offen. Stark verdickte Dissepimente sind vom 6/7—11/12 erkannt worden. Die Samenmagazine sind zwar gewunden, aber nicht zu einem kompakten, unregelmäßig ellipsoiden Körper zusammengesetzt. Beim weiblichen Geschlechtsapparat konnte die Ovarial-Eitrichterblase genau erkannt werden, u. zw. in Form einer Hautröhre, die jederseits im Umkreis der Samentaschenporen an der Leibeswand entspringt und den Oesophagus sowie die lappenförmigen Samentaschen umfaßt. Die lappenförmigen Samentaschenampullen erinnern an die von E. steindachneri franzi Zicsi u. Csuzdi, 1968.

Fundort: AF/177. 1 Ex. Kongo-Mayombe, Station Dimonika, 1984. leg. P. LAVELLE.

Eminoscolex pauliani sp. n.

Äußeres: Holotypus: Länge 80 mm, Breite 4 mm, Segmentzahl 210. Bei den übrigen Exemplaren: Länge 70–80 mm, Breite 3,5–4,5 mm, Segmentzahl 204–208.

Farbe: grau.

Kopf epilobisch 1/2 offen. Nephridialporen im 3. Segment beginnend, zwischen der Borstenlinie *c* und *d* etwas oberhalb von *c*. Vorne Borsten ventral weitgepaart, lateral enger gepaart, hinter dem Gürtel nähert sich die Borstenlinie *b* der Borstenlinie *c* und *d*, die Borstenlinien verlaufen gleichweit voneinander. Borstendistanz wie:

am 13. Segment $aa : ab : bc : cd = 3 : 2,6 : 2,4 : 1,4$
 am 30. Segment $4 : 3 : 1,4 : 1,4$
 Gürtel vom 14.—17. Segment.

Männliche Poren paarig, ventral auf Intersegmentalfurche 17/18, zwischen Borstenlinie *a* und *b*. Borsten des 17. Segments fehlen. Bei den meisten Tieren ist die Kopulationstasche kragenförmig ausgestülpt, aus dieser ragt ein mächtiger, hakenförmiger Penis hervor (Abb. 1a). Akzessorische braune Flecken umgeben auf dem 18. und 19. Segment die Borsten *aa*.

Samentaschenporen auf Intersegmentalfurche 12/13, zwischen der Borstenlinie *c* und *d* auf kleinen Höckern, Farbe in der Umgebung der Samentaschen ausgelöscht, hell.

Weibliche Poren in Intersegmentalfurche 14/15, in Höhe der Nephridialporen, am hinteren Rand des 14. Segmentes ausmündend.

Innere Organisation: Dissepimente 5/6–9/10 sehr dick, trichterförmig ineinandergelegt, die Dissepimente 10/11–12/13 weniger verdickt.

Darm. Ein großer Muskelmagen, im 5. Segment beginnend, reicht bis ins 6. Segment. Unpaarige Chylustaschen im 9., 10. und 11. Segment, stiellos, feingenförmig. Kalkdrüsen im 13. Segment, hornförmig gebogen (Abb. 1b).

Vordere männliche Geschlechtsorgane. Holoandrisch. 2 Paar große Samensäcke ragen vom Dissepiment 10/11 und 11/12 in das Segment 11 und 12. Samenmagazine im 10. und 11. Segment, einfach gewundene Gebilde, nicht zusammengedrückt, stark mit Samenmassen gefüllt (Abb. 1c). Das Ende der sich verdünnenden Samenmagazine durchbohren die entsprechenden Dissepimente und setzen sich in den Samentrichtern fort, die in die Samensäcke eingebettet sind.

Hintere männliche Geschlechtsorgane (Abb. 1d). Große schlauchförmige, V-förmig gebogene, glänzende Euprostatata, sie sind glatt, muskulös. Samenrinnen münden getrennt am Ende in die Euprostatata ein. Am ektalen Ende verdünnen sich die Euprostatata und gehen in die ausstülpbare Kopulationstasche über. Am ektalen Teil der Kopulationstasche liegt eine schlauchförmige mit kugelrundem Kopf versehene, mit der Kopulationstasche verwachsene

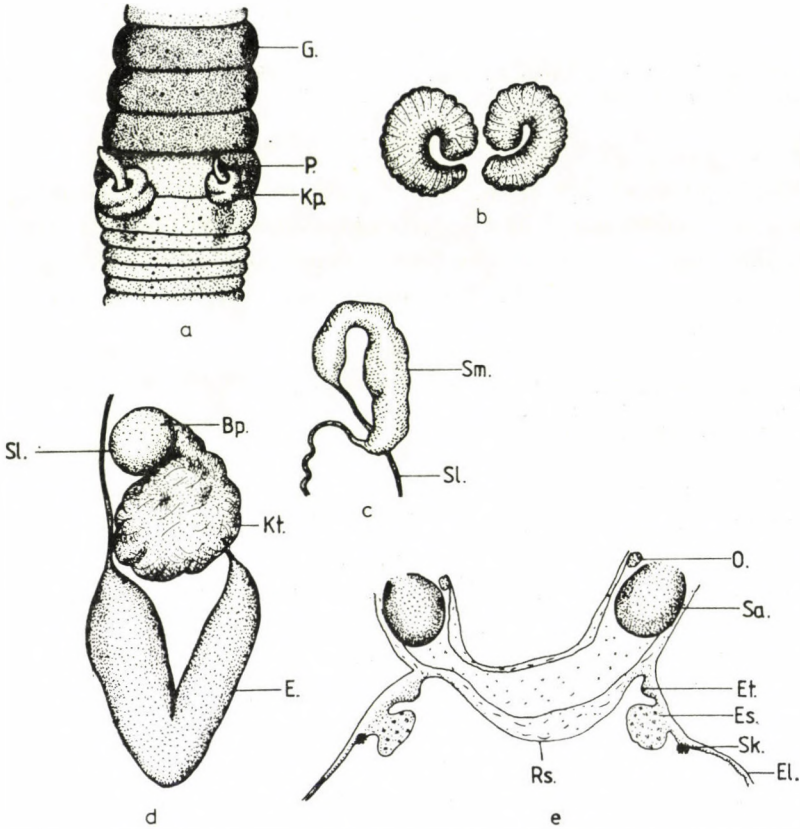


Abb. 1. *Eminoscolex pauliani* sp. n. a = Ventralansicht (*G* = Gürtel, *P* = Penis, *Kp* = ausgestülpte Kopulationstasche); b = Kalkdrüsen; c = Samenmagazin (*Sl* = Samenleiter, *Sm* = Samenmagazin); d = Hintere männliche Geschlechtsorgane (*Sl* = Samenleiter, *Bp* = Bursa propulsoria, *Kt* = Kopulationstasche, *E* = Euprostate); e = Weibliche Geschlechtsorgane und Samentaschenapparat (*O* = Ovarien, *Sa* = Samentaschenatrium, *Et* = Eitrichter, *Es* = Eiersack, *Sk* = Samenkammerchen, *El* = Eileiter)

Bursa propulsoria. Wenn die Kopulationstasche nicht ausgestülpt ist, so liegt in ihr ein mächtiger eingerollter Penis, dessen Spitze eventuell auch in die Öffnung der Burs propulsoria ragt.

Weibliche Geschlechtsorgane und Samentaschenapparat (Abb. 1e). Die beiden Samentaschenporen führen in kleine muskulöse, kugelförmige Samentaschen. Die Samentaschen sind geschlossen. An der Innenseite des 12/13. Dissepiment, im 13. Segment, dicht neben der Samentaschenmündung kleine Ovarien vorhanden, die von einer Ovarial-Eitrichterblase umgeben sind. Diese Ovarial-Eitrichterblase geht in einen Ringschlauch über, der einen Bogen über dem Oeseophagus bildet. Dieser unpaarige Verbindungsschlauch ist in der Mitte stark ausgebreitet. Durch die weiblichen Poren gelangt man in je

einen gestreckten, geraden Eileiter, der sich in einen eingerollten Eitrichter fortsetzt. Dieser ragt in die Ovarial-Eitrichterblase hinein. Auf der Rückseite des Eitrichters liegt ein mächtiger Eiersack, vor dem ein Samenkammerchen.

Die neue Art steht einerseits *E. seidlæ*, andererseits *E. lamani* am nächsten. Von beiden unterscheidet sie sich eindeutig dadurch, daß sie über einen mächtigen Penis verfügt. Von *E. seidlæ* unterscheidet sie sich noch durch den schlauchförmigen, in der Mitte stark ausgedehnten Ringschlauch, durch die Form der Samentaschen und die der Euprostate. Bei *E. seidlæ* haben wir nie eine kugelförmige Bursa propulsaria antreffen können. Von *E. lamani* unterscheidet sie sich ebenfalls in der Form der Samentaschen sowie in der Ausbildung der hinteren männlichen Geschlechtsorgane.

Die neue Art benennen wir zu Ehren nach Herrn DR. R. M. A. PAULIAN, dem damaligen Direktor des ORSTOM-Institutes, Brazzaville, der die Sammeltätigkeit der Ungarischen Bodenzoologischen Expedition förderte und weitgehend unterstützte.

Fundort: Holotypus AF/178. Kindamba Meya, Louolo Fluß, im Boden eines Galeriewaldes. 2. XI. 1963. leg. ZICSI und BALOGH. Paratypen: AF/43. 5 Ex. Fundort wie beim Holotypus.

Bei einem Exemplar vom gleichen Fundort (AF/56) sind die Samensäcke ungewöhnlich groß und reichen vom 12. bis zum 18. Segment. Die Samentaschen sind in normaler Lage im 12./13. Segment. Ansonsten gleicht sie in allen anderen Merkmalen der eben beschriebenen *E. pauliani* sp. n. Wir betrachten diese Abweichung als eine Anomalie und messen ihr keinen taxonomischen Wert zu.

Eminoscolex steindachneri franzi ZICSI et CSUZDI, 1968

Fundorte: AF/22. 1 Ex. Brazzaville ORSTOM-Park. Wald auf sandigem Boden. 22. X. 1963. leg. BALOGH und ZICSI. — AF/110. 1 Ex. Sibiti, Urwald. 24. XI. 1963. leg. ZICSI und BALOGH. — AF/160. 1 Ex. Sibiti, Urwald unter Baumrinde. 27. XI. 1963. leg. BALOGH und ZICSI.

Eminoscolex seidlæ ZICSI et CSUZDI, 1986

Es ist der erste Wiederfund dieser Art aus einer vollkommen anderen Gegend des Kongo-Gebietes. Es liegen uns 7 praeadulte Tiere vor, die wir, obwohl der Gürtel nur angedeutet ist, mit Sicherheit zur unlängst beschriebenen *E. seidlæ* stellen, da sie in allen wesentlichen Merkmalen mit dieser übereinstimmt.

Fundort: AF/179. 7 Ex. Kongo-Mayombe, Station Dimonika, 1984. leg. P. LAVELLE.

Eminoscolex kisantuanus MICHAELSEN, 1935

Von der Station Dimonika, aus Kongo-Mayombe liegen uns 5 Exemplare vor, von denen jedoch nur eins geschlechtsreif ist. Dies unterscheidet sich vorwiegend in der Größe von der Originalbeschreibung und von unserer Ergänzungsdiagnose, die wir anhand zahlreicher Exemplare in der vorausgehenden Arbeit (ZICSI und CSUZDI, 1986) bekanntgegeben haben.

Größe des vorliegenden Tieres 300 mm, Breite 10 mm, Segmentzahl 355.

Fundort: AF/180. 1 + 4 Juv. Ex. Kongo-Mayombe, Station Dimonika, 1984. leg. P. LAVELLE.

Gattung *Eudrilus* PERRIER, 1871

Die Arten dieser Gattung sind in Westafrika verbreitet. Wir konnten im vorliegenden Material nur die zirkumtropisch verbreitete Art *E. eugeniae* (KINBERG, 1867) nachweisen.

Fundorte: AF/1. 81 Ex., AF/11. 21 Ex., AF/153. 2 Ex. Loudima, Obstplantage, in faulenden Früchten, im Kompost. 6.—11. XII. 1963. leg. BALOGH und ZICSI. AF/100. 3 Ex. Sibiti, im Urwald unter Baumrinde, 29. XI. 1963. — AF/148. Sibiti, Urwald, im Boden. 27. XI. 1963. leg. BALOGH und ZICSI. — AF/145—152. 24 Ex. Brazzaville ORSTOM-Park. 16. X. 1963.—21. I. 1964. leg. BALOGH und ZICSI.

Gattung *Buettneriodrilus* MICHAELSEN, 1897

Nachdem die Diagnose der Gattung *Buettneriodrilus* von MICHAELSEN 1915 eine neue Begrenzung erhielt, gleichzeitig Arten der Gattung *Preussia* bzw. *Preussiella* überprüft und revidiert wurden, sind *P. siphonochaeta* MICH., 1891 und *P. lundaensis* MICH., 1891 der Gattung *Buettneriodrilus* einverleibt worden. Dasselbe geschah auch mit der Typus-Art *Neumaniella siphonochaeta* MICH., 1903, die von MICHAELSEN 1935 unter dem Namen *Buettneriodrilus saganensis* nov. nom. in diese Gattung gestellt wurde, da, wie bereits vorausgehend zu ersehen ist, eine *B. siphonochaeta* bereits existierte.

Wie auch bei anderen *Eudrilinen* Gattungen, so kann auch bei *Buettneriodrilus* eine verschiedene Lage der Samentaschenporen vermerkt werden. Wenn dieser Porus in der Nachbarschaft der männlichen Poren gelegen ist, so wurden die Arten der Gattung *Eutoreutus* MICHAELSEN, 1915 zugestellt, obwohl wie auch MICHAELSEN (1935: p. 74) bemerkt »... im übrigen stimmt *Eutoreutus* durchaus mit *Buettneriodrilus* überein«. Für Arten, deren Samentaschenporus weit hinter den männlichen Poren ausmündet, wurde von SEGUN (1976) die Gattung *Agrotoreutus* aufgestellt. Obwohl sich die Verbreitung der letzteren Arten von Nordwest-Kamerun bis Nordnigeria erstreckt, werden

die beiden Gattungen von SIMS (Vortrag in Bologna 1985, mündliche Mitteilung)* eliminiert und der Gattung *Buettneriodrilus* einverleibt.

Die ursprünglich der Gattung *Buettneriodrilus* angehörenden Arten sind vorwiegend aus Zaire (Belgisch-Kongo) und Angola bekannt geworden. Es sind dies: *B. congicus* MICH., 1897 Typus-Art, *B. mayiliensis* MICH., 1910, *B. haasi* MICH., 1910, *B. aequatorialis* MICH., 1935, *B. a. minor* MICH., 1935, *B. a. angolanus* OMODEO, 1973, *B. ealanus* MICH., 1935, *B. kununguensis* MICH., 1935, *B. caeruleus* MICH., 1935, *B. dikanus* MICH., 1935, *B. wissmanni* MICH., 1935, *B. bicaliculatus* MICH., 1935, *B. dundoensis* OMODEO, 1973, *B. sexcaligulatus* OMODEO, 1973 und *B. macrocystis* OMODEO, 1973.

Mit Ausnahme von *B. mayiliensis* sind sämtliche oben angeführten Arten aufgrund eines einzigen Exemplares beschrieben worden, welche z. T. schlecht erhalten oder auch nicht immer ganz geschlechtsreif waren. Soweit uns bekannt, sind bisher keine neueren Fundangaben der bisher beschriebenen Arten bekannt geworden. Dieser Umstand und der, daß in dem vorliegenden Material von den einzelnen Arten ebenfalls nur wenige Exemplare vorliegen, manchmal nur ein einziges Exemplar, erschwert uns ein sicheres Einreihen unserer Tiere, d. h. bei Aufstellung von neuen Arten die Beurteilung der abweichenden Merkmale.

Allenfalls ist die Tatsache, daß immer nur ein Exemplar zur Beschreibung vorlag und auch von einem Spezialisten nur vereinzelte Exemplare dieser Gattung gesammelt werden konnten, äußerst interessant und läßt vermuten, daß diese Tiere wahrscheinlich nur in der großen Regenperiode voll aktiv sind und deswegen nicht Serien von ihnen gesammelt werden konnten.

Da in unserem Material nur Vertreter mit Samentaschen vor dem Gürtelsegment angetroffen wurden, werden nur die im Sinne von MICHAELSEN zur Gattung *Buettneriodrilus* gehörenden Arten berücksichtigt.

***Buettneriodrilus sulcatus* sp. n.**

Es liegen uns von zwei verschiedenen Fundorten je zwei adulte Tiere vor, die in allen wesentlichen Merkmalen miteinander übereinstimmen.

Äußeres: Holotypus: Länge 90 mm, Breite 5 mm, Segmentzahl 208. Bei den Paratypen: Länge 95–130 mm, Breite 4,5–5,5 mm, Segmentzahl 192–210.

Farbe: dorsal dunkelgrau.

Kopf epilobisch $1/2$ – $2/3$ offen. Borsten ventral weit, dorsal ziemlich eng gepaart. Vor dem Gürtel Borstendistanz: $aa : ab : bc : cd = 4 : 2 : 3 : 1$.

* Für das überlassene Manuskript des in Bologna gehaltenen Vortrages, sprechen wir Herrn Dr. R. W. SIMS auch an dieser Stelle unseren besten Dank aus.

Gürtel beim Holotypus vom 14.—1/2 18. Segment, bei den übrigen Tieren auch vom 1/2 13.—1/2 18. Segment.

Samentaschenporen am 12. Segment, in der Mitte, in Höhe der Borsten, oder etwas oberhalb dieser ein kleiner Schlitz, von einem kleinem länglichen Hof umgeben.

Weibliche Poren in Höhe der Nephridialporen am hinteren Rand des 14. Segmentes. Nephridialporen in Borstenlinie *cd*.

Männliche Poren in Intersegmentalfurche 17/18, in der Mitte, zwischen den Borsten *aa* auf einer kleinen Erhebung, aus der Mitte des Porus ragt ein kleiner Penis hervor.

Akzessorische Pubertätsorgane (Abb. 2a). Eine Längsfurche verläuft vom Anfang des 15. Segmentes oder etwas unterhalb davon bis zum Ende des 18. Segmentes. Die Ränder der Furche sind wallförmig erhoben. Die Farbe des Gürtels ist beiderseits der Furche ausgelöscht. Im Bereich der Intersegmentalfurche 15/16 liegt in der Längsfurche ein kreisrunder Porophor auf einer Erhebung. In der Mitte des Porophor eine winzige Öffnung. Nach innen geht dieser Porophor in ein muskulöses, kugelförmiges Gebilde über. Eine ähnliche Längsfurche wurde bei keiner bisher beschriebenen *Buettneriodrilus*-Art erwähnt.

Borsten auf dem 17. Segment fehlen. In der Mitte des 19., 20. und 21. Segmentes ein brauner Fleck. Diese Flecken erinnern an die von *E. eugeniae*.

Innere Organisation: Dissepimente 5/6—10/11 stark verdickt, 11/12 mäßig. Herzen vom 7.—11. Segment.

Darm. Ein großer Muskelmagen im 5. Segment. Chylustaschen im 9., 10., 11. Segment, stiellose, feigenförmige Gebilde mit sehr breiter Basis. Kalkdrüsen im 13. Segment, einfach nierenförmig.

Vorder männliche Geschlechtsorgane. Zwei Paar Samensäcke im 11. und 12. Segment, es sind kleine Ausbuchtungen der entsprechenden, vorausgehenden Dissepimente. Samenmagazine im 10. und 11. Segment, einfach schlauchförmig. Testikelblasen ebenfalls im 10. und 11. Segment, entspringen im vorderen ventralen Winkelraum ihrer Segmente und gehen gerade nach hinten und schwellen vor dem hinteren Dissepiment zu einer Samentrichterblase an (Abb. 2b).

Hintere männliche Geschlechtsorgane (Abb. 2c). Dicke wurstförmige Euprostatata, eine nach vorne, die andere nach hinten gerichtet. Samenleiter gesondert, münden 1/3 vor dem Ende in die Euprostatata ein. Die vorderen Teile der Euprostatata sind verdünnt und münden in eine kleine Kopulationstasche. 2 Paar Rollröhrenborsten münden ebenfalls in die Kopulationstasche ein und sind seitlich im 23. Segment an die Wand geheftet. Die Rollröhrenborste ist einfach gebogen, am Ende, also zur Spitze zu löffelartig ausgebreitet (Abb. 2d). Im letzten Viertel warzenförmige Ornamentierung vorhanden.

Weiblicher Geschlechtsapparat und Samentaschenapparat (Abb. 2e). Die

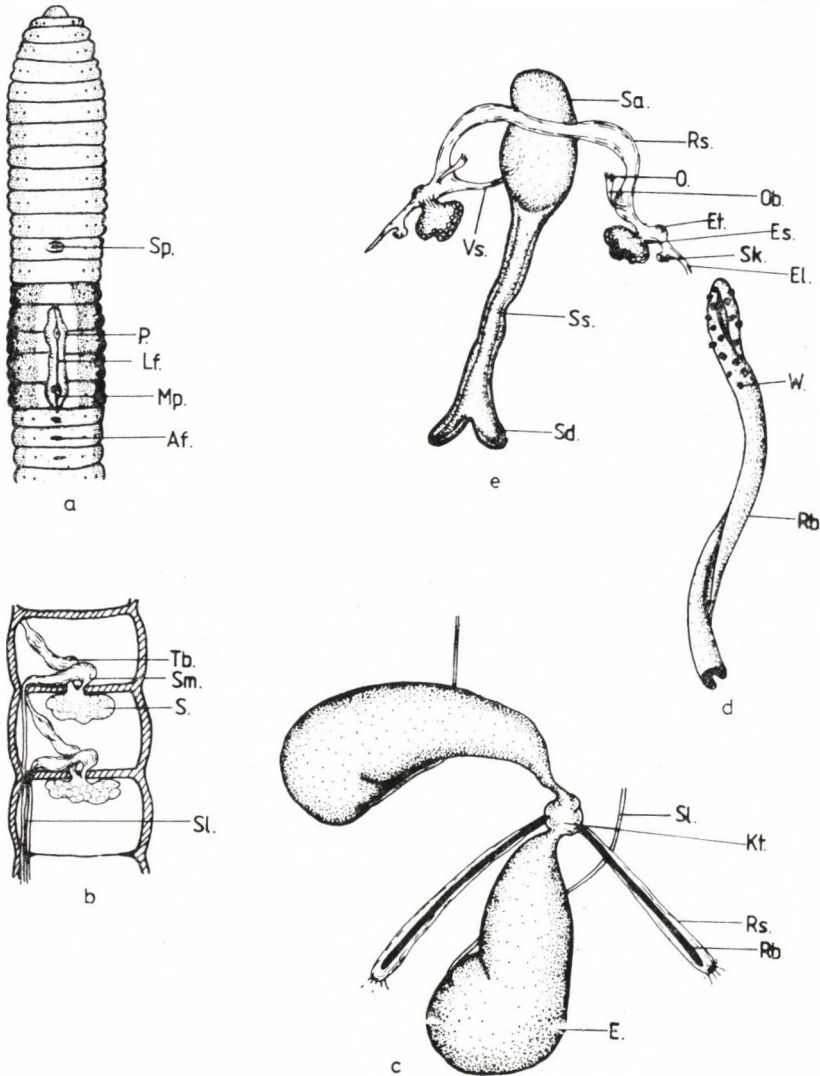


Abb. 2. *Buettneriodrilus sulcatus* sp. n. a = Ventralansicht mit den akzessorischen Pubertätsorganen (*Sp* = Samentaschenporus, *P* = Porophore, *Lf* = Längsfurche, *Mp* = Männlicher Porus, *Af* = Akzessorische Flecke); b = Vordere männliche Geschlechtsorgane (*Tb* = Testikelblase, *Sm* = Samenmagazin, *S* = Samensack, *Sl* = Samenleiter); c = Hintere männliche Geschlechtsorgane (*Sl* = Samenleiter, *Kt* = Kopulationstasche, *Rs* = Rollröhrenborsten-Sack, *Rb* = Rollröhrenborste); d = Rollröhrenborste (*Rb* = Rollröhrenborste, *W* = Warzenförmige Ornamentierung); e = Weibliche Geschlechtsorgane und Samentaschenapparat (*Sa* = Samentaschenatrium, *Rs* = Ringschlauch, *O* = Ovarium, *Ob* = Ovarialblase, *Et* = Eitrichter, *Es* = Eiersack, *Sk* = Samenkammerchen, *El* = Eileiter, *Vs* = Verbindungsschlauch, *Ss* = Samentaschenschlauch, *Sd* = Samentaschendivertikel)

Samentasche besteht aus einem wurstförmigen, geknickten oder kugelförmig angeschwollenen Atrium, das sich in einen muskulösen Samentaschenschlauch fortsetzt und bis zur Euprostata reicht, wo er sich vergabelt. Die Gabelungen sind klein und gleichgroß. Der Samentaschenschlauch ist fest an die Leibeshaut angeschmiegt. Auf Dissepiment 12/13, nahezu in Höhe des Samentaschenatriumausganges befinden sich beiderseits zwei mächtige Ovarien, die von einer Ovarialblase umgeben sind. Die Ovarialblase führt in den Eileiter, der in einen geschlossenen Eitrichter mündet. An der Hinterseite des Eitrichters sitzt ein mäßig großer Eiersack. Der Eileiter ist anschließend sehr kurz und führt durch den weiblichen Porus in Höhe der Nephridialporen hinaus. Aus dem Samentaschenatrium geht auf der linken Seite von der Ventralseite ein Schlauch hervor, der sich in einen Ringschlauch fortsetzt und vor den Kalkdrüsen den Oesophagus umschlingt. Die Eileiter gehen beiderseits in diesen Ringschlauch hinein.

Die neue Art unterscheidet sich von allen bisher beschriebenen Buettneriodrilus-Arten durch die äußeren akzessorischen Pubertätsmerkmale.

Fundort: AF/206. Holotypus Loudima, Zuckerplantage bei Jakob. 7. XII. 1963. leg. ZICSI und BALOGH. Paratypen: AF/128. 1 Ex. Fundort wie beim Holotypus. AF 134. 1 Ex. Kindamba Meya in der Umgebung des Dorfes, nach einem mächtigen Regen. 1. XI. 1963. leg. ZICSI und BALOGH. AF/135. 1 Ex. Kindamba Meya, im Urwald. 11. XI. 1963. leg. ZICSI und BALOGH.

Bemerkung. Das Exemplar vom Fundort AF/134. besitzt nur eine Prostata. Der Samenleiter der rechten Seite mündet direkt in die kleine Kopulationstasche.

Buettneriodrilus pseudosulcatus sp. n.

Äußeres: Holotypus: Länge 80 mm, Breite 4 mm, Segmentzahl 179. Paratypen: Länge 60–80 mm, Breite 3.8–4,2 mm. Segmentzahl 177 und 217.

Farbe: wahrscheinlich grau.

Kopf epilobisch $1/2$ – $2/3$ offen. Borsten ventral weit, dorsal bedeutend enger gepaart. Borsten vor dem Gürtel $aa : ab : bc : cd = 4 : 2 : 3 : 1$.

Gürtel vom 14.—17. Segment, schwach ausgebildet.

Samentaschenporen am 12. Segment zwischen den Borsten *aa*, kleiner Schlitz von einem ovalen Hof in Höhe der Borsten umgeben.

Weibliche Poren in Höhe der Nephridialporen am hinteren Rand des 14. Segmentes. Nephridialporen in Borstenlinie *cd*.

Männlicher Porus am Anfang des 18. Segmentes zwischen den Borsten *aa* auf einer kleinen Erhöhung, in der Mitte ragt ein winziger Penis hervor.

Akzessorische Pubertätsorgane (Abb. 3a). Holotypus. Eine Längsfurche verläuft vom Anfang des 14. Segmentes bis zur Mitte des 18. Segmentes.

Auf Intersegmentalfurche 13/14 scheint ein Porophor mit einer winzigen Öffnung ausgebildet zu sein. Innen konnte kein muskulöses Gebilde erkannt werden.

Borsten auf dem 17. Segment fehlen.

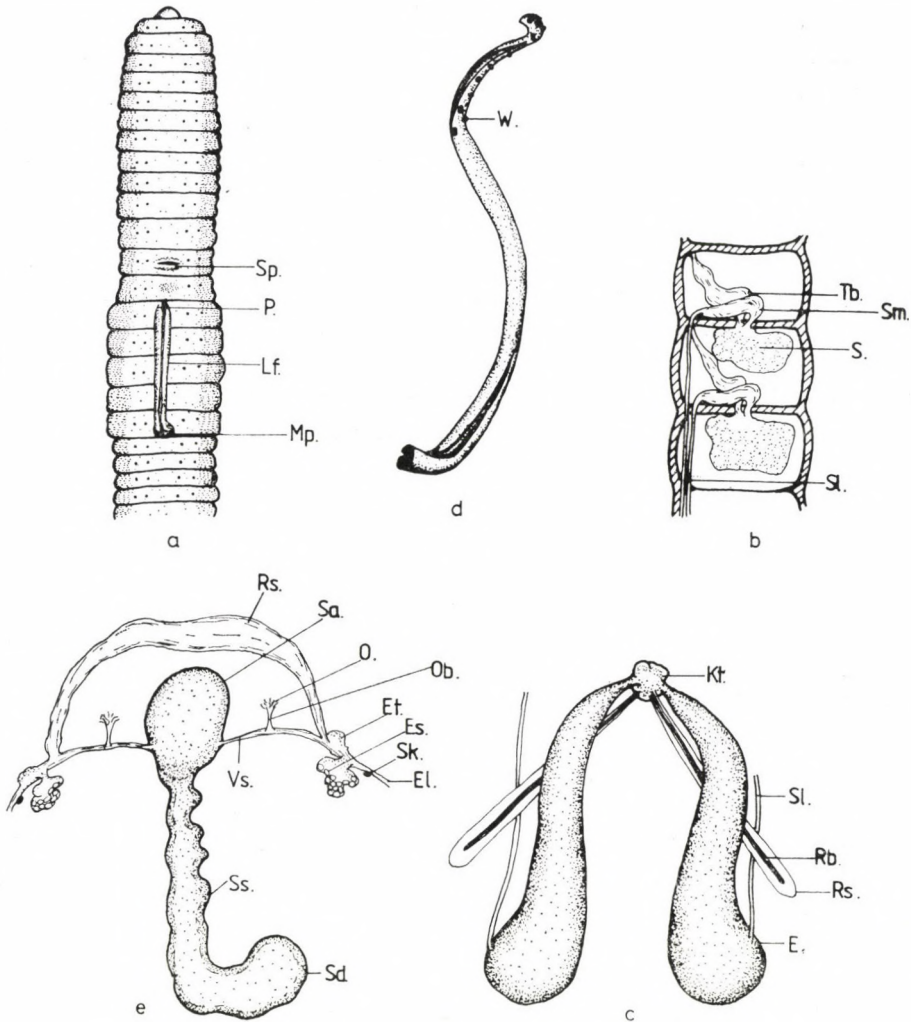


Abb. 3. *Buettneriodrilus pseudosulcatus* sp. n. a = Ventralansicht mit den akzessorischen Pubertätsorganen (Sp = Samentaschenporus, P = Porophore, Lf = Längsfurche, M = Männlicher Porus); b = Vordere männliche Geschlechtsorgane (Tb = Testikelblase, Sm = Samenmagazin, S = Samensack, Sl = Samenleiter); c = Hintere männliche Geschlechtsorgane (Kt = Kopulationstasche, Sl = Samenleiter, Rb = Rollröhrenborste, Rs = Rollröhrenborsten-Sack, E = Euprostata); d = Rollröhrenborste (W = Warzenförmige Ornamentierung); e = Weibliche Geschlechtsorgane und Samentaschenapparat (Rs = Ringschlauch, Sa = Samentaschenatrium, O = Ovarium, Ov = Ovarialblase, Et = Eitrichter, Es = Eiersack, Sk = Samenkammerchen, EL = Eileiter, Vs = Verbindungsschlauch, Ss = Samentaschenschlauch, Sd = Samentaschendivertikel)

Innere Organisation: Keine stark verdickten Dissepimente, die Dissepimente 6/7—9/10 zart verdickt. Herzen vom 7.—11. Segment.

Darm: Mächtiger Muskelmagen im 5. Segment reicht bis ins 7. Segment. Chylustaschen im 9.—11. Segment, die des 9. und 10. feigenförmig abgerundet, sehr platt, im 11. Segment klein, mehr rund. Kalkdrüsen im 13. Segment, nierenförmig.

Vordere männliche Geschlechtsorgane (Abb. 3b). Zwei Paar mächtige Samensäcke im 11. und 12. Segment. Hoden im 10. und 11. Segment, in Testikelblasen eingeschlossen, entspringen im vorderen ventralen Winkelraum der Segmente und gehen von einer Anschwellung begleitet, dicht an die Samenmagazine geschmiegt, nach hinten. Samenmagazine einfach schlauchförmig, nicht gewunden.

Hintere männliche Geschlechtsorgane (Abb. 3c). Glänzende, muskulöse, etwas gewundene Euprostata, beide nach hinten gebogen. Samenleiter münden gesondert im ektalen Teil der Euprostata ein. Vordere Teile der Euprostata verdünnt gebogen und münden in eine kleine Kopulationstasche. 2 Paar Rollröhrenborsten münden ebenfalls in die Kopulationstasche, sind am 19/20 Dissepiment beiderseits befestigt. Rollröhrenborsten im oberen Teil gewunden, Spitze nach vorne gebogen, oberes Drittel mit warzenförmiger Ornamentierung (Abb. 3d).

Weibliche Geschlechtsapparat und Samentaschenapparat (Abb. 3e). Samentasche mit einem angeschwollenen, nahezu runden Kopf. Dieser geht in einen Samentaschenschlauch über, der von den Dissepimenten eingeschnürt ist und am Ende nicht vergabelt in ein gebogenes Divertikulum endet. Das Divertikulum ist in Höhe der Euprostata gebogen. Der Samentaschenschlauch ist fest an die Leibeswand angeschmiegt. Aus dem weiblichen Porus geht ein sehr kurzer Eileiter hervor, an dem gleich ein kleines Samenkammerchen ausgebildet ist. Unweit von diesem liegt ein mächtiger Eiersack. Der Eileiter setzt sich in einem Eitrichter fort. Hinter dem Eitrichter verzweigt sich dieser und geht einerseits in den ringförmigen zöломatischen Verbindungsschlauch über, der hinter den Kalkdrüsen den Oesophagus umgibt. Andererseits setzt sich der Eileiter in Richtung der Samentasche fort, vor der Einmündung in das Atrium der Samentasche kommuniziert er mit der Ovarialblase, die das Ovarium im 13. Segment umhüllt.

Die neue Art steht der vorausgehend beschriebenen *Buettneriodrilus sulcatus* sp. n. am nächsten. Unterscheidet sich von dieser durch die Lage und Form des akzessorischen Pubertätsorgans, in der Ausbildung des vorderen männlichen Geschlechtsapparates, Form der Samensäcke, Samenmagazine und Testikelblasen. Weitere Unterschiede sind in der Ausbildung der Samentasche zu vermerken sowie in der Ausbildung des weiblichen Geschlechtsapparates und der Penialborste.

Fundort: AF/141. Holotypus, Sibiti, Ölplantage, in Blüten und Früchten der Ölpalme. 26. XI. 1963. leg. ZICSI und BALOGH. Paratypen. AF/142. 2 Ex. Fundort wie beim Holotypus.

Bemerkung. Bei den beiden Paratypen liegt die Längsfurche bei einem Exemplar vom 15.—17. Segment, beim anderen vom 18.—20. Segment. Ansonsten stimmen die Tiere in allen anderen Merkmalen mit dem Holotypus überein. SIMS (1971) fand bei den 46 untersuchten Exemplaren seiner neuen Art *Ephyriodrilus afroccidental*s ein starkes Variieren dieses Kennzeichens, welches als Konvergenzerscheinung auch in dieser Gattung in Erscheinung tritt und sicherlich auch Schwankungen unterlegen ist.

Buettneriodrilus sexpunctatus sp. n.

Äußeres: Holotypus: Länge 115 m, Breite 4 mm, Segmentzahl 197.

Farbe: dunkelgrau.

Kopf proepilobisch. Borsten ventral weitgepaart, dorsal enger gepaart. Borsten am Vorderkörper $aa : ab : bc : cd = 3 : 2 : 2,5 : 1$. Nephridialporen zwischen Borstenlinie *c* u. *d*.

Gürtel vom 14.—17. Segment.

Samentaschenporen auf Intersegmentalfurche 12/13 in der Mitte ein augenförmiger kleiner Schlitz. Vor und hinter diesem Schlitz je ein brauner Fleck.

Weibliche Poren auf dem 14. Segment, am hinteren Rand in Höhe der Nephridialporen.

Männliche Poren auf dem 18. Segment, etwas vor den Borsten *aa*, von einem kleinen Hof umgeben. Ein kleiner Penis ragt aus der Mitte hervor.

Akzessorische äußere Pubertätsorgane (Abb. 4a). Drei Paar scharf begrenzte, querovale Pubertätsfeldchen ventral in der Gürtelregion. In jedem Feldchen ein kleines kreisrundes Pubertätsorgan, daß sich durch eine hellere Färbung scharf von der Farbe des Gürtels unterscheidet. Die Pubertätsfeldchen stehen durch helle Querbänder mit dem ventralmedianen gürtellosen Bande in Verbindung. Die Pubertätsfeldchen mit den kreisrunden Pubertätsorganen liegen auf dem 15., 16. und 17. Segment. Hinter dem männlichen Porus auf dem 19. Segment ein querovaler brauner Fleck.

Borsten auf dem 17. Segment fehlen.

Innere Organisation. Verdickte Dissepimente 4/5 sowie 6/7—11/12 mäßig, 5/6 schwach. Herzen vom 8.—11. Segment.

Darm. Mächtiger Muskelmagen im 5. Segment, der bis ins 8. Segment reicht. Chylustaschen im 9. und 10. Segment. Kalkdrüsen schneckenhausförmig eingerollt (Abb. 4b).

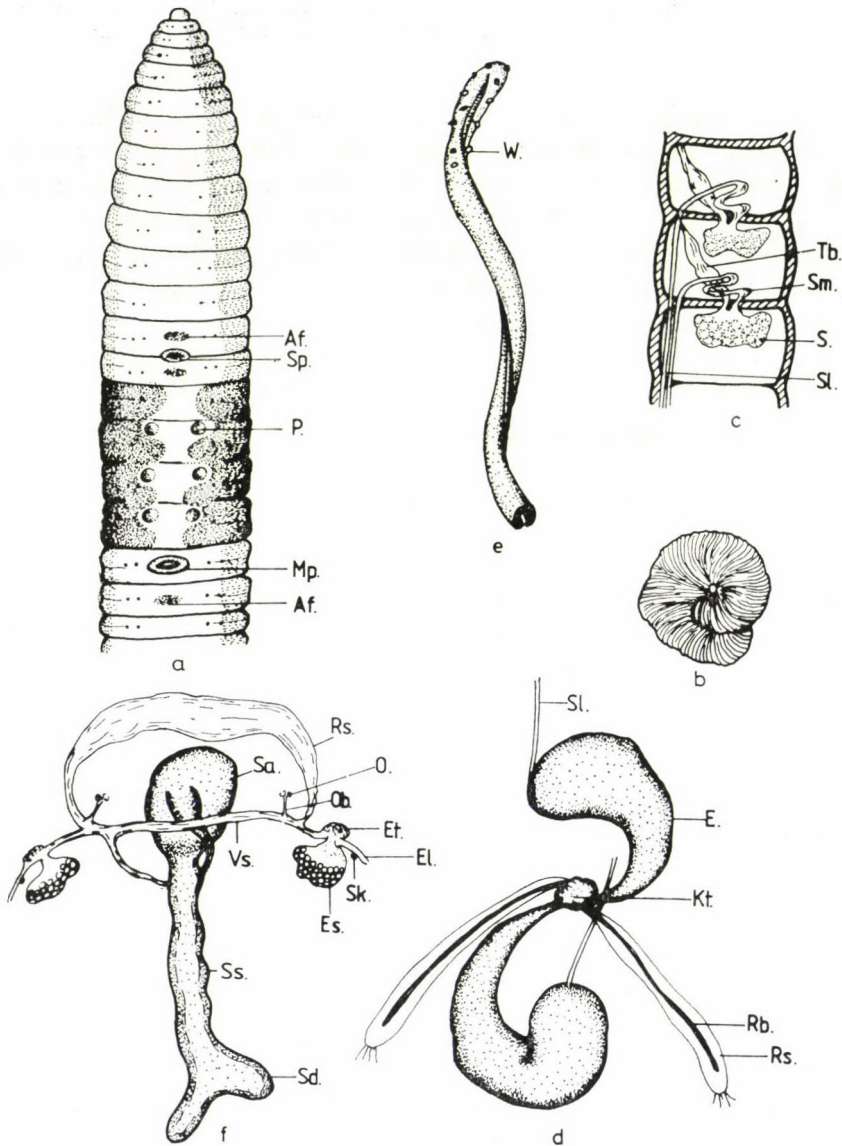


Abb. 4. *Buettneriodrilus sexpunctatus* sp. n. a = Ventralansicht mit den akzessorischen Pubertätsorganen (Af = Akzessorische Flecke, P = Porophore, Sp = Samentaschenporus, Mp = Männlicher Porus); b = Kalkdrüsen; c = Vordere männliche Geschlechtsorgane (Tb = Testikelblase, Sm = Samenmagazin, S = Samensack, Sl = Samenleiter); d = Hintere männliche Geschlechtsorgane (Sl = Samenleiter, E = Euprostata, Kt = Kopulationstasche, Rb = Rollröhrenborste, Rs = Rollröhrenborsten-Sack); e = Rollröhrenborste (W = Warzenförmige Ornamentierung); f = Weibliche Geschlechtsorgane und Samentaschenapparat (Rs = Ring-schlauch, Sa = Samentaschenatrium, O = Ovarium, Ob = Ovarialblase, Et = Eitrichter, El = Eileiter, Sk = Samenkammerchen, Es = Eiersack, Vs = Verbindungsschlauch, Ss = Samentaschenschlauch, Sd = Samentaschendivertikel)

Vordere männliche Geschlechtsorgane (Abb. 4c). Zwei Paar verhältnismäßig kleine Samensäcke im 11. und 12. Segment, es sind kleine Ausbuchtungen an der Dissepimentwand. Hoden im 10. und 11. Segment in Testikelblasen eingeschlossen. Die Testikelblasen schmiegen sich an die schlingenförmigen Samenmagazine an.

Hintere männliche Geschlechtsorgane (Abb. 4d). Die Euprostaten liegen unregelmäßig verbogen, sind etwas gebogene, glänzende, muskulöse Gebilde. Samenleiter mündet am Ende in die Euprostaten ein. Am Vorderteil sind die Euprostaten verjüngt und münden in eine verhältnismäßig große Kopulationstasche. Ebenfalls in diese Kopulationstasche münden ein Paar Rollröhrenborsten, die an der Innenwand des 22. Segmentes angeheftet sind. Die Rollröhrenborsten sind mehrfach gewunden, leicht zerbrechlich, Spitze der Rollröhrenborste kuppelförmig, Ornamentierung: nur sehr vereinzelte Warzen (Abb. 4e).

Weiblicher Geschlechtsapparat und Samentaschenapparat (Abb. 4f). Samentaschenatrium verkehrt birnenförmig, das sich in einen geraden Samentaschenschlauch fortsetzt, der von den Dissepimenten stellenweise eingeschnürt ist. Am Ende vor den Euprostaten vergabelt sich dieser Schlauch asymmetrisch. Der linke Zweig ist länger als der rechte. Der Samentaschenschlauch ist fest an die Leibeswand angeschmiegt. Aus den weiblichen Poren zieht sich ein kurzer Eileiter in Richtung des Samentaschenatriums hin. Gleich hinter den weiblichen Poren ein kleines Samenkammerchen, danach ein eingerollter und eingeschlossener Eitrichter. Gegenüber dem Samentrichter ein ungewöhnlich großer Eiersack. Der Eileiter gabelt sich und geht in einen Ringschlauch über, anderseits in einen unpaarigen Verbindungsschlauch, der über das Atrium der Samentasche verläuft und in den Eileiter der anderen Seite einmündet. Aus dem linken Vorsprung des Samentaschenatriums geht ein dicker Schlauch hervor, der unter der Samentasche verläuft, diese von unten umschlingt und an der rechten Seite in den unpaarigen Verbindungsschlauch mündet. Die Ovarien sind an dem 12/13 Dissepiment befestigt, bilden eine Ovarialblase, die oberhalb des unpaarigen Verbindungsschlauches in den Eileiter einmündet.

Da nur ein Exemplar zur Verfügung steht, alle übrigen Arten aus dem Kongo-Gebiet ebenfalls aufgrund eines Exemplares beschrieben wurden, ist die Bedeutung der abweichenden Merkmale schwer zu beurteilen. Die neue Art unterscheidet sich von *B. sexcaliculatus* durch die Lage der Samentaschenporen, durch die Form der Samentasche. Von *B. ealanus*, wo die äußeren akzessorischen Pubertätsorgane beinahe übereinstimmend sind, unterscheidet sie sich durch die Lage der männlichen Poren, die Form der Samentaschen, die Gestaltung des weiblichen Geschlechtsapparates und die Rollröhrenborsten. Von *B. bule* unterscheidet sie sich in der Lage der Samentaschenporen und der männlichen Poren, ferner in der Form der Samentasche und der Beborstung der Rollröhrenborste. Von allen bisher beschriebenen Arten der Gat-

tung *Buettneriodrilus* unterscheidet sie sich durch das Vorhandensein von nur 2 Chylustaschen, gelegen im 9. und 10. Segment.

F u n d o r t : Holotypus. AF/122. Lefini Reservatum. Am Ufer des Naubouli-Flusses, in einem Galerie-Wald. 11. I. 1964. leg. ZICSI und BALOGH.

Buettneriodrilus bicaliculatus sibirianus ssp. n.

Es liegen uns zwei Exemplare dieser neuen Unterart vor, bei denen der Gürtel angedeutet ist, die Tiere sind im praeadulten Stadium.

Äußeres: Holotypus: Länge 120 mm, Breite 6,7 mm, Segmentzahl 293. Paratypus: Länge 140 mm, Breite 5 mm, Segmentzahl 292.

Farbe: gelblich grau.

Kopf epilobisch $2/3$ offen. In der Borstenzone feine weiße Pünktchen in regelmäßiger Anordnung, aber auch in anderen Teilen der Segmente verstreut weiße Punkte.

Borsten ventral sehr weit, lateral ziemlich eng gepaart, Borstendistanz hinter Gürtel $aa : ab : bc : cd = 3 : 2,5 : 3 : 1$. Nephridialporen in Borstenlinie cd .

Gürtel durch Verfärbung angedeutet 14.—17. Segment.

Samentaschenporen auf dem 13. Segment, vor den Borsten in der Mitte des Segmentes. Die augenförmigen Schlitze sind von einem großen ovalen Hof umgeben.

Weibliche Poren von außen nicht erkannt, liegen in Intersegmentalfurche 14/15.

Männliche Poren ventralmedian, unpaarig im 18. Segment im Höhe der Borsten. Die Umgebung der männlichen Poren etwas angeschwollen, es ragt ein kleiner Penis hervor.

Äußere akzessorische Pubertätsorgane (Abb. 5a). Sehr kennzeichnende Gebilde, die bei *B. bicaliculatus*, und auch bei *B. dundoensis* anzutreffen sind. Es sind dies 1 Paar große Einsenkungen auf dem vorderen Teil des 16. Segmentes. Die von einem Wall eingefassten Einsenkungen erinnern an saugnapfförmige Gebilde, die nach dem Austrocknen ein kreidig-weißes Aussehen bekommen.

Borsten des 17. Segmentes fehlen.

Innere Organisation. Dissepimente 6/7—10/11 sehr stark verdickt, 4/5 und 11/12 mäßig verdickt.

Darm. Ein großer zylindrischer Muskelmagen im 5. Segment. Chylustaschen im 9., 10., 11. Segment, kleine runde Gebilde. Kalkdrüsen im 13. Segment, mächtige nierenförmige Lappen (Abb. 5b).

Vordere männliche Geschlechtsorgane (Abb. 5c). 2 Paar schlauchförmige Testikelblasen im 10. und 11. Segment, die im vorderen ventralen Winkelraum der entsprechenden Segmente entspringen, nach hinten zu schwellen sie zu einer Samentrichterblase an. Diese Samentrichterblase geht in die Samenmagazine über, die die Form eines menschlichen Magens besitzen. Samensäcke groß im 11. und 12. Segment, sie sind mit der Breitseite an das vordere Dissepiment angelegt.

Hintere männliche Geschlechtsorgane (Abb. 5d).

Euprostaten mäßig dick, wurstförmig. Äußerlich glatt, muskulös glänzend. Die eine ragt von der Einmündung nach hinten, die andere nach vorne. Sie sind etwas kreisförmig oval eingebogen. Samenleiter eng aneinandergelegt, nicht verschmolzen, münden unterhalb des entalen Poles in die Euprostaten ein. Vorne verengen sich die Euprostaten und münden dicht nebeneinander in die Hinterseite einer eiförmigen Kopulationstasche ein. Mit jeder Euprostatata mündet auch je ein Penialborstensack aus, in dem Rollröhrenborsten eingebettet sind. Die Säcke sind im 21. Segment an die Leibeswand angeheftet. Die Rollröhrenborsten sind 5 mm lang, etwas gebogen eingerollt. An der Spitze etwas löffelförmig ausgebildet (Abb. 5e). Im letzten Teil ist die Ornamentierung zerstreut vorhanden.

Weiblicher Geschlechtsapparat und Samentaschenapparat (Abb. 5f). Die Samentasche besteht aus einem länglich ovalen, doppelteiligen ektalen Teil, der als spermathekales Atrium bezeichnet werden kann. Ohne sein muskulöses Aussehen gleich zu verlieren, geht es rechtsseitig in einen zylindrischen Schlauch über, der unregelmäßig geschlängelt in Richtung der Euprostaten verläuft. Ohne scharfen Absatz geht dieser Schlauch am Ende in eine dünnwandige angeschwollene Ampulle über, die in Höhe der Euprostaten abgehoben ist und in die Leibeshöhle ragt. Vor den Prostaten und neben der Samentaschenampulle sind die warzenförmigen, kreisrunden Erhebungen der äußeren Saugnapfe deutlich zu erkennen (vergleiche *B. dundoensis* OMODEO, 1973: p. 43. Abb. 13B). Ungefähr in der Mitte des spermathekalen Atriums, auf der linken Seite geht ein unpaariger ziemlich dicker, später dünner werdender Verbindungsschlauch hervor. Er ist eng an das Atrium geschmiegt und zwängt sich unterhalb der Samentasche in enger spiraliger Schlinge durch. Nach Vollendung des Spiralumlafes gabelt sich der Verbindungsschlauch und geht in zwei langen Ästen in den periösophagealen Ringschlauch über. Beiderseits münden in Höhe des 14. Segmentes die kurzen Eileiter in den Ringschlauch ein. Am Eileiter ist der Eitrichter zu erkennen, der in der Eitrichterblase eingeschlossen ist und am hinteren Teil einen kleinen Eiersack führt. Ein Samenkammerchen konnte nicht erkannt werden. Die Ovarien hängen am Dissepiment 12/13 und sind von einer Ovarialblase umgeben. Die Ovarialblase mündet in Höhe des Eitrichters in den Eileiter ein.

Die neue Unterart steht *B. bicaliculatus* und *B. dundoensis* am nächsten.

Da beide Arten bloß aufgrund eines Exemplares beschrieben wurden, kann der systematische Wert der einzelnen Kennzeichen nicht einwandfrei gewertet werden. Von *B. bicaliculatus* weicht die neue Unterart durch die Lage der äußeren Saugnäpfe ab. Auch die Samentaschenporen sind anders gelegen. Von *B. dundoensis* weicht sie ebenfalls in der Lage der Samentaschenporen ab, es fehlen ihr auch die übrigen äußeren akzessorischen Merkmale, die bei *dundoensis* noch angeführt werden. Von beiden Arten weicht sie gewissermaßen auch in der Ausbildung der weiblichen Geschlechtsorgane und in der Ausbildung des Samentaschenatriums, von *dundoensis* auch in der Ausbildung des Samentaschenschlauches ab.

F u n d o r t : Holotypus AF/105. Sibiti, Urwald, 25. XI. 63. leg. ZICSI und BALOGH. Paratypus AF/108. 1 Ex. Sibiti, Urwald, 24. XI. 1963. leg. ZICSI und BALOGH. Unter Inv. Nr. AF/207. und AF/108. sind vom gleichen Fundort 10 Exemplare aufbewahrt, die alle juvenil sind und mit Sicherheit nicht bestimmt werden können, aber dieser Unterart mutmaßlich angehören.

Buettneriodrilus aequatorialis MICHAELSEN, 1935

Es liegt uns ein gut konserviertes, praeadultes Exemplar vor, welches zwar in einigen Kennzeichen von der Originalbeschreibung abweicht, da es jedoch nicht ganz entwickelt ist, soll keine neue Unterart aufgestellt werden. Da bereits zwei Unterarten dieser Stammform existieren, geben wir eine kurze Beschreibung unseres Exemplares an.

Äußeres: Länge 147 mm, Breite 6 mm, Segmentzahl 265.

Samentaschenporen auf dem 13. Segment, vor den Borsten. Weibliche Poren von außen nicht erkannt. Männliche Poren auf dem 18. Segment, auf einer kleinen runden Erhebung.

Akzessorische Pubertätsorgane (Abb. 6a). Zwei Paar saugnapfförmige, von einem Wall umgebene kreisrunde Gebilde, die nach Austrocknung kreidigweißes Aussehen bekommen. Auf dem 19. Segment ein länglich ovaler Fleck.

Hintere männliche Geschlechtsorgane (Abb. 6b). Euprostaten stark verkrümmte, muskulöse, glänzende Gebilde, die mit den Samentaschen-Divertikeln nicht verschlungen waren. Es ist anzunehmen, daß bei unserem Exemplar diese Divertikel bedeutend kürzer sind und beiderseits in die Leibeshöhle ragen. Die Samenleiter laufen separiert und münden am Ende in die Euprostaten. Euprostaten münden verjüngt in eine ovale Kopulationstasche, wohin auch die Penialborstensäcke einmünden. Penialborstensäcke sind an der Leibeswand des 22. Segmentes befestigt.

Weiblicher Geschlechtsapparat und Samentaschenapparat (Abb. 6c). Der von Michaelsen als Nebenkammer des Atriums bezeichnete Teil des Samentaschenatriums wurde erkannt. Aus diesem Nebenkammerchen geht ein unpaariger Schlauch hervor, der nach rechts gebogen unter der Samentasche

verschwindet und in den Eileiter der linken Seite einmündet. Zwischen dem Eileiter und der Samentasche vergabelt sich der Schlauch, der andere Ast führt oberhalb der Samentasche und vereinigt sich mit dem rechtsseitigen Eileiter, d. h. geht in einen ösophagealen Ringschlauch über, der vor den

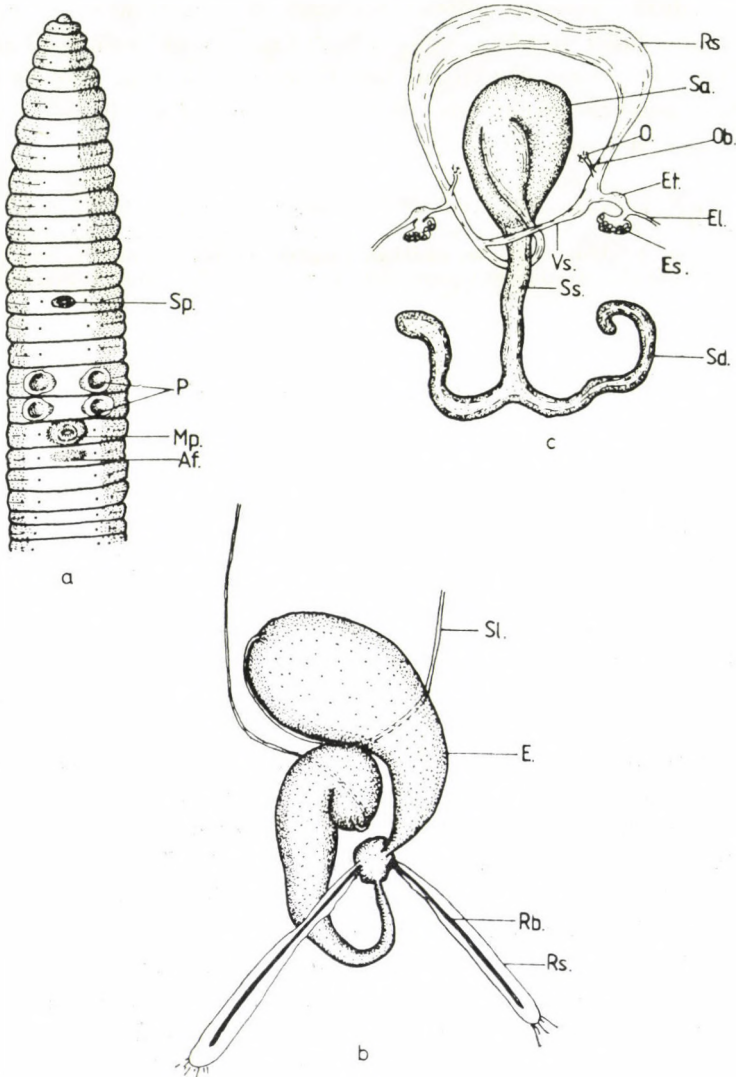


Abb. 6. *Buettneriodrilus aequatorialis* MICHAELSEN, 1935. a = Ventralansicht mit den akzessorischen Pubertätsorganen (*Sp* = Samentaschenporus, *P* = Porophoren, *Mp* = Männlicher Porus, *Af* = Akzessorischer Fleck); b = Hintere männliche Geschlechtsorgane (*Sl* = Samenleiter, *E* = Euprostate, *Rb* = Rollröhrenborste, *Rs* = Rollröhrenborsten-Sack); c = Weibliche Geschlechtsorgane und Samentaschenapparat (*Rs* = Ringschlauch, *Sa* = Samentaschenatrium, *O* = Ovarium, *Ob* = Ovarialblase, *Et* = Eitrichter, *El* = Eileiter, *Es* = Eiersack, *Vs* = Verbindungsschlauch, *Ss* = Samentaschenschlauch, *Sd* = Samentaschendivertikel)

Kalkdrüsen den Oesophagus umrandet. Der Ringschlauch kommuniziert auf der rechten Seite ebenfalls mit dem Eileiter. Ovarien hängen im 12/13 Segment, sind von Ovarialblasen umgeben, die hinter dem Eitrichter in den Eileiter einmünden.

Fundort: AF/140. 1 Ex. Kindamba Meya, Urwald, am Bachrand. 3. XI. 1963. leg. ZICSI und BALOGH.

Gattung *Hyperiodrilus* BEDDARD, 1890

Hyperiodrilus africanus BEDDARD, 1891

Obwohl bereits mehrere Arten dieser Gattung neuerdings beschrieben wurden (SIMS, 1965, CLAUSEN, 1967, SEGUN, 1976), sind wir in der reichen Ausbeute (450 adulte Exemplare aus 2 Ortschaften) nur der Typus-Art *africanus* begegnet. Bei den untersuchten Tieren waren die um den männlichen Porus ausgebildeten Porophoren in vielfältiger Form vertreten. Von den in Loudima und Umgebung gesammelten Tieren (389 Exemplare), die in Obstplantagen, auf Äckern, in Bambuswäldern und an verschiedenen anderen Orten gesammelt wurden, sind die in verschiedener Form in Erscheinung tretenden Porophoren bestimmt und ihr prozentuelles Vorkommen berechnet worden. Die Form der verschiedenen Porophoren und der prozentuelle Anteil der einzelnen Formen wird auf Abb. 7. veranschaulicht.

OMODEO (1955) unterscheidet eben aufgrund dieses Merkmales eine f. *vogelii*. Sämtliche Abweichungen von der Stammform (p. 214 Abb. 1) werden dieser zugestellt. Diesem auch innerhalb einer Population stark variierenden Merkmal können wir keine taxonomische Bedeutung zumessen.

H. africanus ist eine der wenigen Eudrilinen die im Verbreitungsgebiet dieser Gruppe, wahrscheinlich vom Menschen verschleppt, eine weite Verbreitung besitzt. Die Fundorte in der Volksrepublik Kongo, von wo sie jetzt zuerst gemeldet wurde, weisen ebenfalls auf diese Annahme hin.

Fundorte: AF/2–7, 9, 10. 81 Ex. Loudima Umgebung des Bahnhofs in einem Garten. — AF/13. 106 Ex. Loudima SAGRO im Kompost. — AF/123. 23 Ex. Neben Loudima in einem jungen Wald. = AF/125. 4. Ex. Loudima, Garten im Mist. = AF/111. 18 Ex. Zwischen Loudima und Jakob. — AF/113. 19 Ex. 20 km W. von Loudima auf einem Acker. — AF/115–118. 79 Ex. Loudima Obstplantage. — AF/120. 3 Ex. Loudima, Obstplantage im Kompost. — AF/126. 2 Ex. Loudima, 20 km westlich von der Stadt, in einem Galeriewald. — AF/129. 8 Ex. Loudima IRHO, im Garten. — AF/131. 2 Ex. Zuckerrohranpflanzung bei Jakob. — AF/132, AF/136. 37 Ex. Loudima IRHO im Park des Institutes. — AF/138. 2 Ex. Westlich von Loudima in einem Galeriewald. — AF/166. 2 Ex. Loudima Obstplantage. 4. XII.—15. XII. 1963. leg. ZICSI und BALOGH. — AF/139. 2 Ex., AF/162. 17 Ex., AF/163. 12 Ex., AF/164. 24 Ex., AF/165. 3 Ex., AF/167. 1 Ex., AF/170. 1 Ex. Brazzaville ORSTOM Park. In verschiedenen Teilen des inneren und äußeren Parkes, im Mist, Kompost, in der Laubstreu und auf Grasflächen. — AF/169. 1 Ex. Am Ufer des Kongo-Flusses, ungefähr 500 m vom Ufer entfernt. 16. X. 1963.—21. I. 1964. leg. ZICSI und BALOGH.

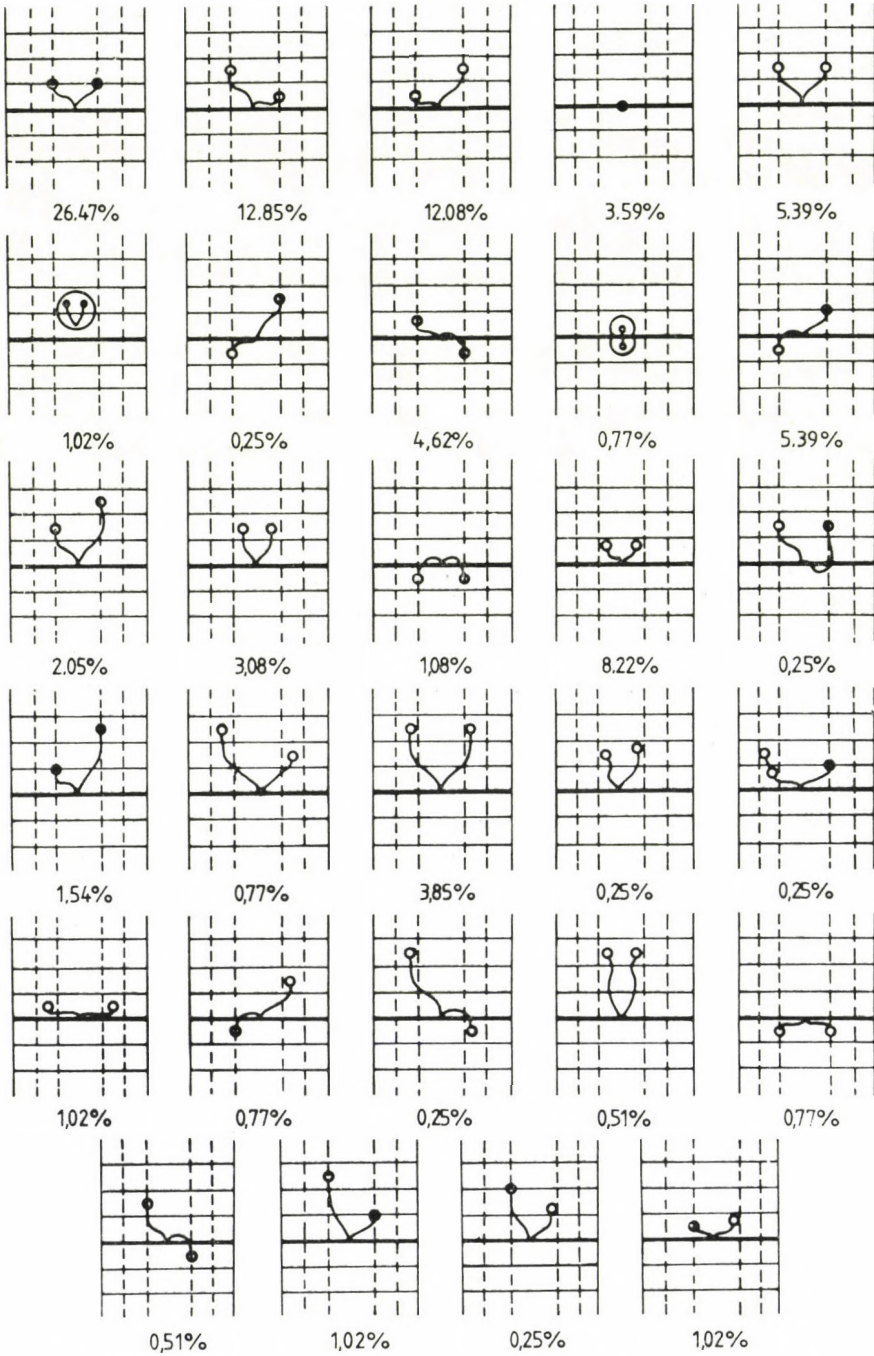


Abb. 7. Verschiedene Gestaltungsformen der Porophoren bei *Hyperiodrilus africanus* BEDDARD und ihre prozentuelle Verteilung an 389 Exemplaren

Gattung *Malodrilus* MICHAELSEN, 1903

Diagnose: 3 Chylustaschen im 9.—11. Segment, Kalkdrüsen im 13. Segment. Weibliche Poren mit den Samentaschenporen verschmolzen. Samentaschenporen weit vor den paarigen männlichen Poren. Weibliche Geschlechtsorgane vollständig getrennt paarig. Holoandrisch. Penialborsten fehlen.

Typus Art: *Malodrilus neumanni* MICHAELSEN, 1903

Zu dieser Gattung wurden noch vier Arten eingereiht, es sind dies: *M. gardullaensis* MICHAELSEN, 1903, *M. sylvaticus* STEPHENSON, 1932, *M. buarensis* MICHAELSEN, 1937 und *Eudrilus kamerunensis* MICHAELSEN, 1902, die nach einer Überprüfung des Typen-Exemplares unter Berücksichtigung der Verwandtschaftsverhältnisse von MICHAELSEN 1915 ebenfalls dieser Gattung zugeordnet wurden. Die Fundorte aus Kamerun weisen darauf hin, daß sich die Verbreitung dieser Gattung nicht nur auf Nordafrika beschränkt, sondern auch in Westafrika zu erwarten ist.

Unsere aus verschiedenen Teilen der Volksrepublik Kongo stammenden Exemplare ähneln hauptsächlich den aus Kamerun beschriebenen Arten.

Bei unseren Tieren kann man mit Sicherheit zwei Formen auseinandertreten, die in gewissen Kennzeichen mit denen aus Kamerun übereinstimmen, in anderen wieder von diesen abweichen. Da die aus Kamerun beschriebenen Arten wieder nur anhand eines Exemplares aufgestellt wurden und wie auch von MICHAELSEN (1937) erwähnt wird, die Beschreibung viel Unsicherheit hinterläßt, stehen wir wieder vor einem Identifikationsproblem. Um die Unsicherheit nicht noch zu vermehren, sehen wir uns gezwungen, die im Kongo gesammelten zwei verschiedenen Formen, den bereits beschriebenen Arten aus Kamerun einzureihen. Wir geben bei beiden Arten eine ausführliche Beschreibung an und weisen auf die Unterschiede hin, in denen unsere Exemplare von der Originalbeschreibung abweichen.

Malodrilus kamerunensis (MICHAELSEN, 1902)

MICHAELSEN lag zur Beschreibung ein vorzüglich konserviertes Exemplar vor. Uns liegen aus Sibiti mehrere gut konservierte Tiere zur Beschreibung und zum Vergleich vor.

Äußeres: Länge 43—75 mm, Breite 3—4 mm, Segmentzahl 81—138. Farbe: dorsal rotviolett bis rotgrau.

Kopf 1/2—3/4 offen. Nephridialporen in Borstenlinie *cd*, in Intersegmentalfurche 2/3 beginnend. Borsten ventral weit gepaart, dorsolateral enger gepaart. Hinter dem Gürtel $aa : ab : bc : cd = 3 : 1,5 : 2 : 1$.

Gürtel vom 14.—17. Segment, ringförmig.

Samentaschenporen mit den weiblichen Poren verschmolzen, in Intersegmentalfurche 14/15, am hinteren Rand des 14. Segmentes von einem deutlichen weißen Hof umgeben. Männliche Poren auf Intersegmentalfurche 17/18, in der Borstenlinie *b*.

Innere Organisation. Dissepimente nicht verdickt. Herzen im 7.—11. Segment. Muskelmagen im 5. Segment, reicht bis ins 6. Segment. Unpaarige Chylustaschen im 9., 10., 11. Segment, kurz gestielt, birnförmig. Kalkdrüsen mit Sicherheit im 13. Segment, nierenförmig. Die Annahme von Michaelsen, daß sie im 12. Segment liegen, ist falsch und ist auch schon von Michaelsen selbst korrigiert worden.

Vordere männliche Geschlechtsorgane. Zwei Paar große Samensäcke im 11. und 12. Segment. Samenmagazine im 10. und 11. Segment, zu einem Knäuel zusammengelegt, mit Samenmassen gefüllt (Abb. 8a).

Hintere männliche Geschlechtsorgane (Abb. 8b). Euprostaten sind kurz und dick, etwa dreimal so lang wie dick. Die Samenleiter treten im Zweidrittel an die Prostaten heran und münden am Ende in diese ein. Am vorderen Teil verengen sich die Euprostaten und gehen in eine Schlinge über, die so lang ist wie die Breite der Prostata. Diese Schlinge mündet in eine ziemlich große Kopulationstasche.

Weibliche Geschlechtsorgane und Samentaschenapparat (Abb. 8c). Weib-

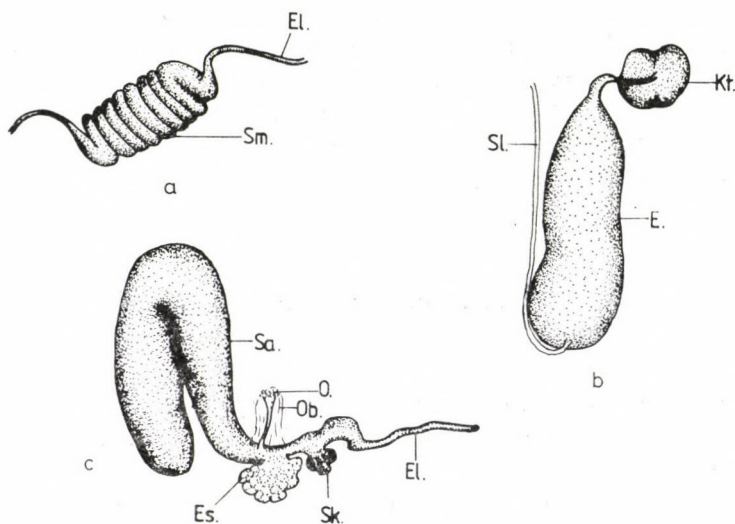


Abb. 8. *Malodrilus kamerunensis* (MICHAELSEN, 1902). a = Samenmagazin (*El* = Samenleiter, *Sm* = Samenmagazin); b = Hintere männliche Geschlechtsorgane (*Kt* = Kopulationstasche, *E* = Euprostate, *Sl* = Samenleiter); c = Weibliche Geschlechtsorgane und Samentaschenapparat (*Sa* = Samentaschenampulle, *O* = Ovarium, *Ob* = Ovarialblase, *Es* = Eiersack, *Sk* = Samenkammerchen, *El* = Eileiter)

licher Geschlechtsapparat mit dem Samentaschenapparat verschmolzen. Der gemeinsame Ausführungsgang ist ein gestrecktes, gewundenes Rohr, dieses führt in einen geschlossenen Eitrichter. Neben diesem befindet sich ein kleines kleeblattförmiges Samenkammerchen. Diesem folgt ein mächtiger Eiersack, der auf einem kurzen, kleinen Stiel sitzt. Der Eileiter geht in eine dickwandige Samentaschenampulle über, die in Höhe der Oesophagus zurückgebogen ist und wieder bis zum Eileiter hinunterreicht. Ovarien hängen am 12/13 Dissepiment und sind von einer Ovarialblase umgeben, die in Höhe des Eiersackes in den Eileiter mündet.

Unsere Exemplare unterscheiden sich von der Originalbeschreibung hauptsächlich in der Ausbildung der Samentaschen.

Fundorte: AF/83. 5 Ex. Sibiti, IRHO. Urwald, unter Baumrinde. 29. XI. 1963. leg. ZICSI und BALOGH. — AF/101. 16 Ex. Fundort wie vorausgehend. — AF/103. 2 Ex. Sibiti, Urwald, mit Formol gesammelt. 25. XI. 1963. leg. ZICSI und BALOGH. — AF/154. 3 Ex. Sibiti, Urwald unter Baumrinde. 27. XI. 1963. leg. ZICSI und BALOGH. — AF/156. 3 Ex. Sibiti im Urwald in faulenden Früchten. 26. XI. 1963. leg. ZICSI und BALOGH.

Malodrilus buarensis MICHAELSEN, 1937

Zur Beschreibung lag MICHAELSEN ein zerbrochenes, innerlich schlecht erhaltenes Exemplar vor. Uns stehen mehrere Exemplare von verschiedenen Fundorten aus der kongolesischen Volksrepublik zur Verfügung.

Äußeres: Länge 45—60 mm, Breite 3—4 mm, Segmentzahl 131—158.

Farbe: rötlich-violett.

Kopf bis tanylobisch, aber auch 2/3 epilobisch.

Nephridialporen vom 2/3 Intersegment beginnend in Borstenlinie *cd*. Borsten ventral weit, dorsolateral bedeutend enger gepaart. Borstendistanz $aa : ab : bc : cd = 3 : 1,5 : 2 : 1,7$.

Gürtel vom 13., 1/2 13.—17., 1/2 18. Segment.

Samentaschenporen mit den weiblichen Poren verschmolzen auf Intersegmentalfurche 14/15 in Höhe der Borstenlinie *bc*, ziemlich großes Gebilde auf der Hinterseite des 14. Segmentes. Auf einem hervorstehenden Fortsatz ein kleines Loch in Richtung des Schwanzes (Abb. 9a). Die Umgebung der Poren weiß, Farbe des Gürtels ausgelöscht, so äußerst deutlich zu erkennen. Männliche Poren auf Intersegmentalfurche 17/18 in Borstenlinie *ab*, etwas näher zu *b*.

Innere Organisation: Dissepimente nicht verdickt. Herzen im 7.—11. Segment. Muskelmagen im 5. Segment. Chylustaschen im 9., 10., 11. Segment, birnförmig. Kalkdrüsen nierenförmig, sind in der Mitte an dem Oesophagus befestigt, liegen im 13. Segment.

Vordere männliche Geschlechtsorgane. Zwei Paar Samenmagazine, im 10. und 11. Segment. Lange gewundene Röhre, die nicht zu einem Knäuel

verschmolzen ist (Abb. 9b), voll mit Samenmassen. Zwei Paar große Samensäcke im 11. und 12. Segment.

Hintere männliche Geschlechtsorgane (Abb. 9c). Einfache etwas gewundene, am Ende ausgebreitete Euprostata. Glänzend, muskulös. Samenleiter treten im hinteren Drittel an die Euprostata heran und münden am Ende in diese ein. Am vorderen Teil verdünnen sich die Euprostaten und gehen in

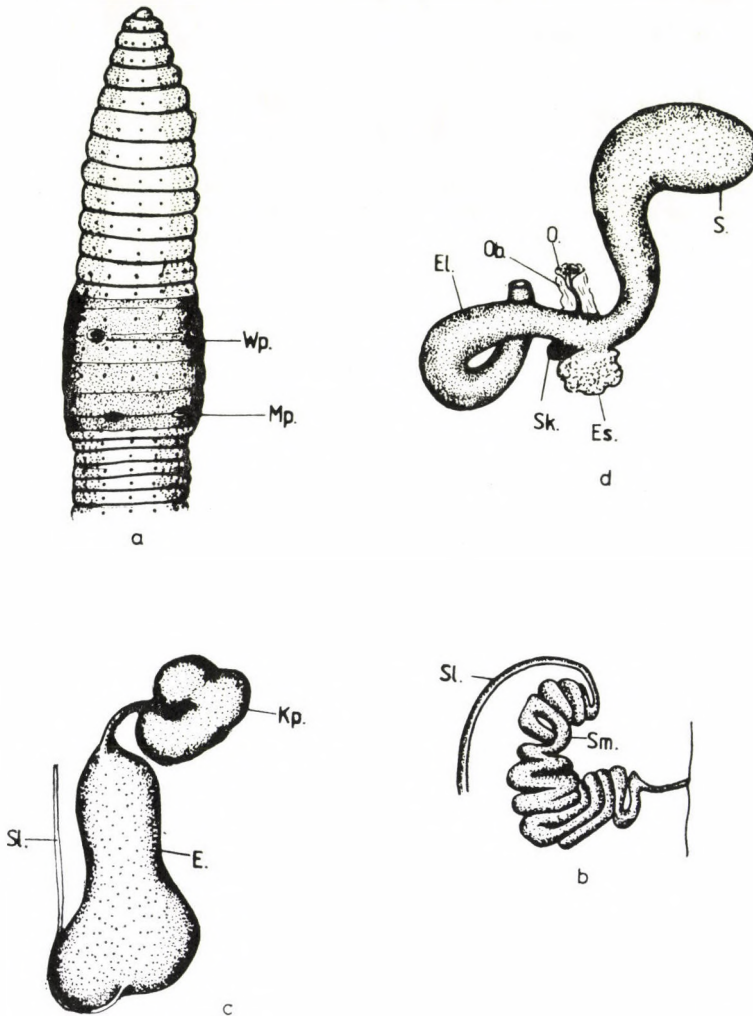


Abb. 9. *Malodrilus buarensis* MICHAELSEN, 1937. a = Ventralansicht (*Wp* = Weibliche Poren, *Mp* = Männliche Poren); b = Samenmagazin (*Sl* = Samenleiter, *Sm* = Samenmagazin); c = Hintere männliche Geschlechtsorgane (*Kp* = Kopulationstasche, *E* = Euprostata, *Sl* = Samenleiter); d = Weibliche Geschlechtsorgane und Samentaschenapparat (*S* = Samentaschenampulle, *O* = Ovarium, *Ov* = Ovarialschlauch, *El* = Eileiter, *Sk* = Samenkammerchen, *Es* = Eiersack)

eine Schlinge über, die glänzend erscheint und gewunden ist. Diese Schlinge geht in eine kreisrunde Kopulationstasche über.

Weibliche Geschlechtsorgane und Samentaschenapparat (Abb. 9d). Ein schlingenförmig gewundener Ausführungsgang, der für beide Geschlechtsorgane gemeinsam ausmündet. Hinter der Schlinge erscheint ein einfaches, einzelliges Samenkammerchen, daneben auf einem kleinen Stiel ein großer Eiersack.

Ovarien hängen am Dissepiment 12/13 und sind von einer großen Ovarialblase umgeben, die einen gewundenen Eitrichter umhüllt. Eitrichter und Ovarialblase münden oberhalb des Eiersackes in den Schlauch der Samentasche. Der Schlauch der Samentasche bildet eine lappenförmige, mächtige Ampulle, die über dem Oesophagus sich mit der von der anderen Seite kommenden Ampulle ohne zu verschmelzen berührt.

Laut Originalbeschreibung unterscheiden sich die beiden Arten in der Ausbildung der Samentaschen und in der Ausbildung der weiblichen Geschlechtsorgane. Ferner unterscheiden sie sich in der Lage des weiblichen Porus und in der Form von diesem. In der Differenzialdiagnose scheint MICHAELSEN bei *M. buarensis*, die ebenfalls aus Kamerun stammende *M. kamerunensis* nicht berücksichtigt zu haben, da kein Zweifel besteht, daß sich diese beiden Arten am nächsten stehen.

Fundorte: AF/54. 1 Ex. Kindamba Meya, im Galeriewald, am Ufer des Louolo-Flusses. 10. XI. 1963. leg. ZICSI und BALOGH. — AF/89. Bouenza Wasserfall, Urwald. 30. XI. 1963. leg. ZICSI und BALOGH. — AF/155. 2 Ex. Brazzaville Park. 21. I. 1964. leg. ZICSI und BALOGH. — AF/157. 12 Ex. Sibiti, Zanzi-Fluß, am Ufer in der Laubstreu. 28. XI. 1963. leg. ZICSI und BALOGH.

Familie GLOSSOSCOLECIDAE MICHAELSEN, 1900

Pontoscolex corethrurus (FR. MÜLL., 1857)

Diese nachweisbar vielfach über die ganze Erde verschleppte Art wurde an mehreren Orten in der Volksrepublik Kongo angetroffen.

Fundorte: AF/181. 2 + 41 juv. Ex. Sibiti, am Ufer eines Wasserreservoirs. 26. XI. 1963. leg. ZICSI und BALOGH. — AF/182. 19 + 15 juv. Ex. Mont Foari-Reservatum, in der Savanne, schwarzer Boden. 13. XII. 1963. leg. ZICSI und BALOGH. — AF/186. 2 + 2 juv. Ex. Mont Foari-Reservatum in der Savanne auf Rotlehm. 14. XII. 1963. leg. ZICSI und BALOGH. — Brazzaville: AF/188. — 1 + 3 juv. Ex. ORSTOM Park. 20. XI. 1963. AF/183—185. 65 Ex. Filou-Bach, am Ufer und im Bett des Baches. 23. X. 1963; AF/187. 5 + 23 juv. Ex. Bakongo am Ufer des Kongo, in schwarzem Boden, 19. X. 1963. leg. ZICSI und BALOGH.

SCHRIFTTUM

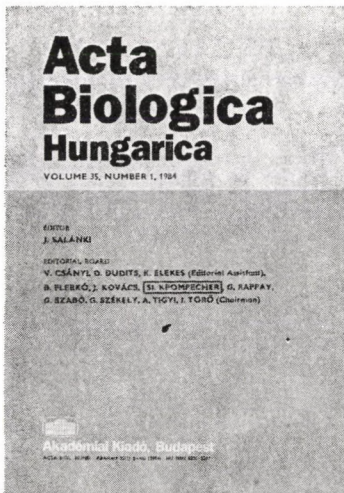
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