FORMERLY ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE

Acta Zoologica Hungarica

VOLUME 30, NUMBERS 1–2, 1984

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Akadémiai Kiadó, Budapest
ACTA ZOOL. HUNG. 30 (1–2) 1–248 (1984) HU ISSN 0001–7264

ACTA ZOOLOGICA HUNGARICA

A QUARTERLY OF THE HUNGARIAN ACADEMY OF SCIENCES

Acta Zoologica is published in yearly volumes of four issues by

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

Subscription information

Orders should be addressed to

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

or to its representatives abroad

Acta Zoologica is indexed in Current Contents

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Volume 30

**Akadémiai Kiadó, Budapest
1984**

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THE GENERA AND SPECIES OF THE FAMILY TYLENCHIDAE ÖRLEY, 1880 (NEMATODA)

THE GENERA CEPHALENCHUS (GOODEY, 1962) GOLDEN, 1971 AND ALLOTYLENCHUS GEN. N.

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(Received 30 March, 1983)

An emended definition of the genus *Cephalenchus* (GOODEY, 1962) GOLDEN, 1971 is given. Ten species are listed, six of them are re-described: *C. cephalodiscus* SULTAN & JAIRAJPURI, 1981, *emarginatus* (COBB, 1893), *megacephalus* (GOODEY, 1962), *leptus* (SIDDIQI, 1963), *limichus* (NESTEROV, 1973) and *hexalineatus* (GERAERT, 1962). A new species is described: *C. illustris* sp. n. *C. hexalineatus* and *megacephalus* hitherto considered to be synonyms of *C. emarginatus* are re-established. Two new combinations are proposed: *C. megacephalus* (GOODEY, 1962) comb. n. and *C. limichus* (NESTEROV, 1973) comb. n. A key and a distinguishing table to species are added.

Moreover, a new genus, *Allotylenchus* gen. n., with the type-species *A. excretorius* sp. n., is established.

The present paper is the fifth part of a set dealing with revision of the genera and species of the nematode family Tylenchidae ÖRLEY, 1880. The four parts already published have discussed the genera *Tylenchus* BASTIAN, 1865, *Aglenchus* (ANDRÁSSY, 1954) MEYL, 1961, *Miculenchus* ANDRÁSSY, 1959, *Polenchus* ANDRÁSSY, 1980, *Malenchus* ANDRÁSSY, 1968 and *Coslenchus* SIDDIQI, 1978.

Including the present article, 74 tylenchid nematode species have been revised: 16 *Tylenchus*, 2 *Aglenchus*, 1 *Miculenchus*, 1 *Polenchus*, 23 *Malenchus*, 20 *Coslenchus*, 10 *Cephalenchus* and 1 *Allotylenchus* species.

Short history. *Cephalenchus* as a subgenus of *Tylenchus* was proposed by GOODEY (1962) and raised to generic rank by GOLDEN (1971) and SIDDIQI (1971). Of the presently recognized species the oldest was described by COBB (1893): *emarginatus*. It was followed by a species each of GOODEY (1962, *megacephalus*), GERAERT (1962, *hexalineatus*) and SIDDIQI (1963, *leptus*). GERAERT and GOODEY (1964) noted in a short paragraph that their species proved to be identical, and they synonymized therefore *megacephalus* — its description appeared some months later — with *hexalineatus*. In the same year, COLBRAN (1964) went on and synonymized both these species with *emarginatus*.

When raising *Cephalenchus* to generic level, GOLDEN (1971) designated *hexalineatus* as type-species. To this fact I should like to add some remarks. When GOODEY proposed *Cephalenchus* as a new subgenus he characterized it by a single species, *Tylenchus* (*Cephalenchus*) *megacephalus*. Thus, the genus was monotypic at that time, and if so, the single species was consequently its type. But since GERAERT and GOODEY (1964) synonymized this species with *T.* (*C.*) *hexalineatus*, GOLDEN handled correctly this latter as type-species. On the base of the recent examinations, however, I am convinced that both *megacephalus* and *hexalineatus* do exist as separate species, and as a consequence, I propose to re-instate the type-species status of *C. megacephalus*.

It was WOOD (1973) who first added a further species to the genus *Cephalenchus*: *tahus*. He was followed by DHANACHAND and JAIRAJPURI (1980) and SULTAN and JAIRAJPURI (1981) who described *C. lobus*, on the one hand, and *C. cephalodiscus* and *C. cylindricus*, on the other hand. To the eight species described to the present two further *Cephalenchus* species are added in this article, viz. *C. limichus* transferred as a new combination from the genus *Tylenchus*, and *C. illustris*, a species new to science.

Besides, some authors must be mentioned as well who have published good contributions to the knowledge of the genus. They are GERAERT (1968), BELLO and GERAERT (1972), KNOBLOCH (1972), MAVLJANOV (1973), HOOPER (1974), MUKHINA (1981) and BAUJARD (1982).

As for the taxonomic position of *Cephalenchus*, both GOODEY (1962) and GERAERT (1962, 1968) regarded it as a subgenus of *Tylenchus*. GOLDEN (1971), SIDDIQI (1971), DECKER (1972), ROMÁN (1978), CORBETT (1978) etc. all recognized it as a good genus close to *Tylenchus*. In my book (1976) I also listed this genus among the representatives of the family Tylenchidae and the subfamily Tylenchinae, respectively. DHANACHAND and JAIRAJPURI (1980) left *Cephalenchus* in the family Tylenchidae but transferred it from the subfamily Tylenchinae to Tylodorinae PARAMONOV, 1967. I maintain my old opinion that the genus does answer very well to the characters of Tylenchinae.

In the present article a revised definition and classification of the genus *Cephalenchus* is given. Ten species are enumerated as valid. Six of them are re-described either on the basis of type specimens, or of new collections. One species is described as new to science. Two species previously considered to be synonym are re-instated. To facilitate recognizing the species a key and a table are annexed.

Besides, a new genus, *Allotylenchus*, is proposed.

Genus **Cephalenchus** (GOODEY, 1962) GOLDEN, 1971

Syn. *Tylenchus* (*Cephalenchus* GOODEY, 1962).

Body straight or slightly arcuate ventrally, 0.40 to 0.76 mm long, slender. Cuticle thin, finely or coarsely striated; annules 1.4 to 2.5 μm wide on mid-body region, disappearing on posterior half of tail. Number of cuticular annules of body excluding tail (from head to anal opening) varying between 190 and 284. Of these annules, 45 to 69 fall on the oesophagus, 163 to 232 on the distance between head and vulva, and 25 to 53 on the distance between vulva and anus. Lateral fields fairly broad and always distinct, each bearing six longitudinal incisures.

Head mostly well separate, sometimes continuous with neck, consisting of some fine, inconspicuous annules. Amphids minute, less visible. Labial framework weak, not cuticularized. Spear thin and long, 14 to 21 μm; metenchium generally somewhat shorter than telenchium. Basal knobs rounded or oval, located in the 8th to 15th annule posterior lip region. Orifice of dorsal oesophageal gland close to spear base. Oesophagus slender, with anterior part (from head to posterior end of medial bulb) occupying less than 50% of its length. Procorpus short, nearly as long as spear, medial bulb with valve, isthmus thin and long. Terminal bulb varying in shape, often slightly lobed on its posterior margin. Excretory pore level with isthmus or basal bulb. Hemizonid quite close to excretory opening, deirids some annules posterior to the latter.

Vulva a transverse slit, with small lateral dikes, lying in 52 to 70% of body length, and in most cases situated somewhat sub-lateral, mostly on the

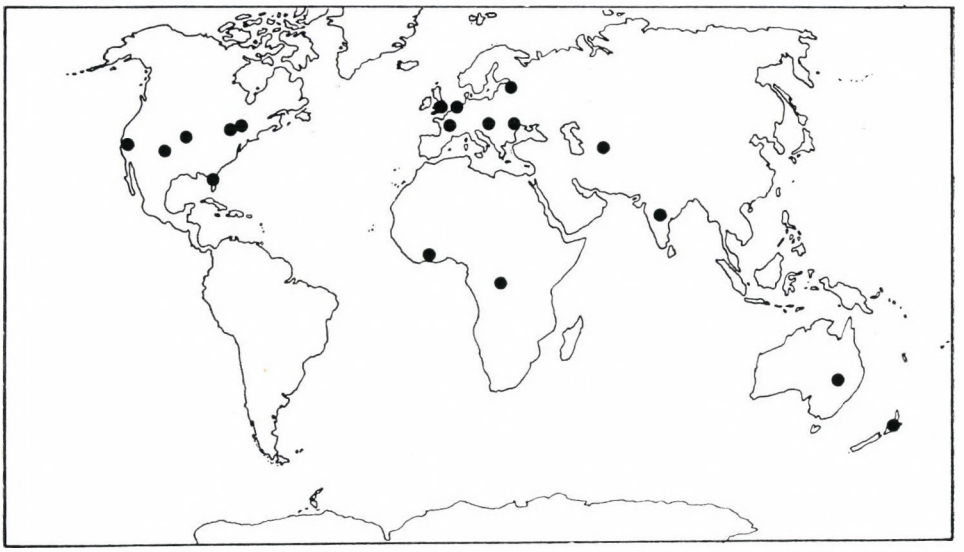

Fig. 1. Distribution of the genus *Cephalenchus*. (Each dot represents a country or state, respectively)

right side. Vagina simple. Female genital organ prodelphic and straight, with oocytes arranged in a single row. Spermatheca present but generally small. Post-vulval sac of uterus rudimentary, only in few cases longer than the corresponding body diameter. Phasmids extremely small, dot-like, hardly visible, dorso-sublateral and prevulval in position.

Tail of both sexes similar, filiform, straight, varying in length between 85 and 236 μm or 8 to 27 anal body diameters, respectively. Always longer (1.4 to 3.5 times) than vulva–anus distance. Tail terminus finely rounded or pointed or setose.

With a single exception, males are known in all species. Bursa adanal, with crenate margin, bursal alae either symmetrical or right ala shorter and ending more abruptly. Spicules 15– 20 μm long, gubernaculum thin, its anterior end somewhat curved dorsally.

The genus is briefly characterized by its slender habit, the generally separate head, the conspicuous lateral fields each showing six incisures, the long and very thin spear, the short precorpus, the absence of lateral vulval membranes, the long tail, the adanal and often asymmetric bursa, and the anteriorly curved gubernaculum. The genus is fairly homogeneous, its species resemble very much one another.

Type-species: *Tylenchus* (*Cephalenchus*) *megacephalus* GOODEY, 1962 = *Cephalenchus megacephalus* (GOODEY, 1962) comb. n.

As for their mode of life, the *Cephalenchus* species are soil inhabiting animals. They occur in various soil types but always near or on roots of plants.

Table

Species	L	a	b	c	V	Annules in μm	Spear in μm
cephalodiscus	0.61—0.73	37—43	6.3—7.0	2.9—3.4	55—58	2—3	19—21
cylindricus	0.62—0.75	41—53	6.2—6.5	3.1—3.5	57—60	2—2.5	20—21
emarginatus	0.67—0.68	28—35	6.2—6.3	4.3—4.5	65—67	2—2.3	19—20
hexalineatus	0.37—0.59	22—35	4.4—6.2	3.9—5.8	60—70	1.8—2.3	15—17
illustris	0.72—0.76	38—42	7.1—7.6	4.0—4.4	67—68	2.1—2.5	19—20
leptus	0.65—0.75	41—53	6.0—7.0	2.8—3.3	54—57	2—2.3	16—18
limichus	0.61—0.74	33—45	5.4—6.3	2.9—3.4	52—59	1.4—1.5	19—21
lobus	0.63—0.71	40—46	7.0—7.7	3—4	59—63	2	15—17
megacephalus	0.44—0.60	27—43	4.4—6.4	3.7—5.5	61—69	1.6—2.3	14—16
tahus	0.56—0.66	33—49	5.7—6.9	3.4—4.6	60—68	2—2.5	14—16

Note: The values in brackets are calculated after the illustrations

They seem to prefer grasslands or the rhizosphere of banana and coniferous species. They live either free in the soil or are ectoparasites causing some disturbance in the moisture household of their host plants.

The genus *Cephalenchus* is distributed over five continents. From Europe 4 species (*illustris*, *leptus*, *limichus*, *megacephalus*), from Asia 5 species (*cephalodiscus*, *cylindricus*, *leptus*, *lobus*, *megacephalus*), from Africa 2 species (*hexalineatus*, *megacephalus*), from North America 5 species (*cephalodiscus*, *emarginatus*, *hexalineatus*, *leptus*, *limichus*) and from Australia 4 species (*emarginatus*, *hexalineatus*, *megacephalus*, *tahus*) have hitherto been recorded. India and the United States are those countries in which *Cephalenchus* species occur in the highest number (India: *cephalodiscus*, *cylindricus*, *leptus*, *lobus*; United States: *cephalodiscus*, *emarginatus*, *leptus*, *limichus*). Three species are known each from the Soviet Union (*leptus*, *limichus*, *megacephalus*) and New Zealand (*hexalineatus*, *megacephalus*, *tahus*).

The most widely distributed species are *C. megacephalus* (Europe, Asia, Africa, Australia), *C. hexalineatus* (Africa, North America, Australia) and *C. leptus* (Europe, Asia, North America). Of them, *C. megacephalus* is the most frequent; it has hitherto been discovered in seven countries.

At present ten species may be enumerated in the genus *Cephalenchus*:

C. cephalodiscus SULTAN & JAIRAJPURI, 1981
C. cylindricus SULTAN & JAIRAJPURI, 1981
C. emarginatus (COBB, 1893) BELLO & GERAERT, 1972
Tylenchus emarginatus COBB, 1893
Tylenchus (*Cephalenchus*) *emarginatus* COBB, 1893 (GERAERT, 1968)
Anguillulina emarginata (COBB, 1893) GOODEY, 1932
C. hexalineatus (GERAERT, 1962) GOLDEN, 1971
Tylenchus hexalineatus GERAERT, 1962
Tylenchus (*Cephalenchus*) *hexalineatus* GERAERT, 1962 (GERAERT & GOODEY, 1964)
Tylenchus (*Aglenchus*) *whitus* EGUNJOBI, 1967
C. illustris sp. n.
C. leptus (SIDDIQI, 1963) KNOBLOCH, 1972
Tylenchus (*Cephalenchus*) *leptus* SIDDIQI, 1963
C. limichus (NESTEROV, 1973) comb. n.
Tylenchus (*Filenchus*) *limichus* NESTEROV, 1973
C. lobus DHANACHAND & JAIRAJPURI, 1980

I

Spear knobs in neck annules	Oesophagus in μm	Tail length in μm	Tail length in anal diameters	Tail length in vulva-anus distances	Annules of oesophageal region	Annules between head and vulva	Annules between vulva and anus	Total body annules without tail
12—13	99—105	198—230	17—22	2.1—2.8	47—49	174—177	42—45	217—222
(10)	(92)	(210)	19—22	(3.5)	(50)	?	?	?
10	106—108	150—152	13—14	1.7—2	48—49	210—212	36	246—248
9—10	91— 99	85—120	8—10	1.4—1.6	53—58	173—176	25—27	198—203
10—11	99—102	166—178	16—20	2.2—2.4	45—51	227—232	35—45	262—277
11—13	98—106	216—236	22—27	2.6—2.8	49—50	175—180	37—41	212—218
13—15	108—114	176—194	18—20	2.7—2.9	65—69	226—231	52—53	278—284
(12—13)	(84)	(166)	17—22	(2.3)	(56)	?	?	?
10—11	83— 97	94—130	9—13	1.5—2.1	48—55	163—179	25—32	190—208
8— 9	105	145—165	20	2	(54)	?	?	?

C. megacephalus (GOODEY, 1962) comb. n.
Tylenchus (*Cephalenchus*) *megacephalus* GOODEY, 1962
Cephalenchus emarginatus apud HOOPER, 1974, et BAUJARD, 1982 (nec COBB, 1893)
C. tahus WOOD, 1973

KEY TO THE SPECIES OF CEPHALENCHUS

1 Spear long, 19 to 21 μm 2
— Spear shorter, 14 to 18 μm 6

2 Vulva far back, in 65—68% of body length; head well separate 3
— Vulva not so back, in 52—60% of body length; head not or hardly separate 4

3 Medial bulb of oesophagus heart-shaped; tail tip finely rounded **illustris** sp. n.
— Medial bulb of oesophagus oval; tail tip pointed **emarginatus** (COBB)

4 Cuticular annules small, 1.4—1.5 μm on mid-body, number of total body annules excluding tail about 280 **limichus** (NESTEROV)
— Cuticular annules wider, 2—3 μm on mid-body; number of total body annules excluding tail about 220 5

5 Tail length 3.5 times vulva-anus distance **cylindricus** SULTAN & JAIRAJPURI
— Tail length 2 to 2.8 times vulva-anus distance **cephalodiscus** SULTAN & JAIRAJPURI

6 Tail very long, 216—236 μm, 24—27 times anal body diameter **leptus** (SIDDIQI)
— Tail much shorter, 94 to 165 μm, 9 to 20 times anal body diameter 7

7 Basal oesophageal bulb very short and distinctly lobed dorsally; excretory duct heavily cuticularized **lobus** DHANACHAND & JAIRAJPURI
— Basal oesophageal bulb not lobed dorsally; excretory duct not cuticularized 8

8 Tail 145—165 μm long, about 20 times anal body diameter; ovary long, almost reaching to oesophagus base **tahus** WOOD
— Tail 85—130 μm long, 8—13 times anal body diameter; ovary shorter 9

9 Basal bulb short, drop-shaped, symmetric, with rounded posterior margin, about half as long as isthmus **megacephalus** (GOODEY)
— Basal bulb elongate, asymmetric, dorsally humped, with slightly lobed posterior margin, about as long as isthmus **hexalineatus** (GERAERT)

Cephalenchus cephalodiscus SULTAN & JAIRAJPURI, 1981 (Figs 2A G)

SULTAN and JAIRAJPURI, 1981: 168—170, Fig. 2A—H (*Cephalenchus cephalodiscus*). ♀: L = 0.61—0.69 mm; a = 41—43; b = 6.3—7.0; c = 2.9—3.2; V = 55—58%; c′ = 19—23; spear = 20—21 μm. ♂: L = 0.59 mm; a = 37; b = 5.9; c = 2.6; spicules =15 μm.

Recent specimens from California, USA. ♀: L = 0.67—0.73 mm; a= 37—40; b = 6.7—6.9; c = 3.1—3.4; V = 55—56%; c′ = 17—22; spear = 19—20 μm.

Body almost straight and very slender, 17—19 μm wide. The recently examined specimens lie either on the ventral or on the dorsal side, never on the lateral side. Cuticle thin, distinctly annulated, annules 2—2.5 μm wide. Number of annules on the oesophageal region 47—49, between head and vulva 174—177, between vulva and anus 42—45. Total body annules excluding tail 217—222. Lateral field more than 1/3 of body width, with six incisures.

Labial region practically not separate, 5—5.5 μm wide at base, without any annulation. Body at posterior end of oesophagus 3—3.3 times as wide as head. Cephalic framework insignificant. Spear very thin, 19—20 μm long, more than 1/6 of oesophagus length (measured from head), and 3.3—3.8 times head diameter, respectively. Basal knobs located in the 12th or 13th annule posterior to head. Oesophagus 99—105 μm long, with anterior portion measuring 43—47% of its length. Medial bulb oval, 9—11 μm, basal bulb comparatively small, drop-shaped, with slightly asymmetrical posterior margin. Excretory pore before terminal bulb, on the 37th to 39th annule from head. Hemizonid one annule before, deirids 2—4 annules behind excretory opening. Cardia small but visible. Rectum as long as anal body diameter.

Distance between proximal end of oesophagus and vulva 2.8 times as long as oesophagus. Vulva transverse, with small lateral dikes; vagina short. Gonad 26—28% of entire body length, or 9—10 times mid-body diameter. Spermatheca oval. Post-vulval uterine sac about as long as corresponding body diameter.

Tail very long, 198—230 μm, 29—32% of body length, and 17—22 times anal diameter, respectively. Terminus exceedingly fine, setose. Tail 2.1—2.8 times as long as vulva–anus distance.

Male after SULTAN and JAIRAJPURI: Tail 22 anal diameters long. Bursa adanal, 28 μm, finely annulated. Spicules 15 μm, Gubernaculum 8 μm long.

Brief characteristics: A long and slender species with narrow head, long spear, drop-shaped basal bulb, vulva lying not far from body center, very long and attenuated tail and a great number of body annules, especially between vulva and anus.

Relationship: Among the *Cephalenchus* species having a long spear and a vulva lying close to 50% of body length, *C. cephalodiscus* resembles *C. cylindricus* SULTAN & JAIRAJPURI, 1981 and *C. limichus* (NESTEROV, 1973) comb. n. It can be distinguished *a)* from *cylindricus* by its shorter tail length compared to the vulva–anus distance (tail 3.5 times as long as that distance

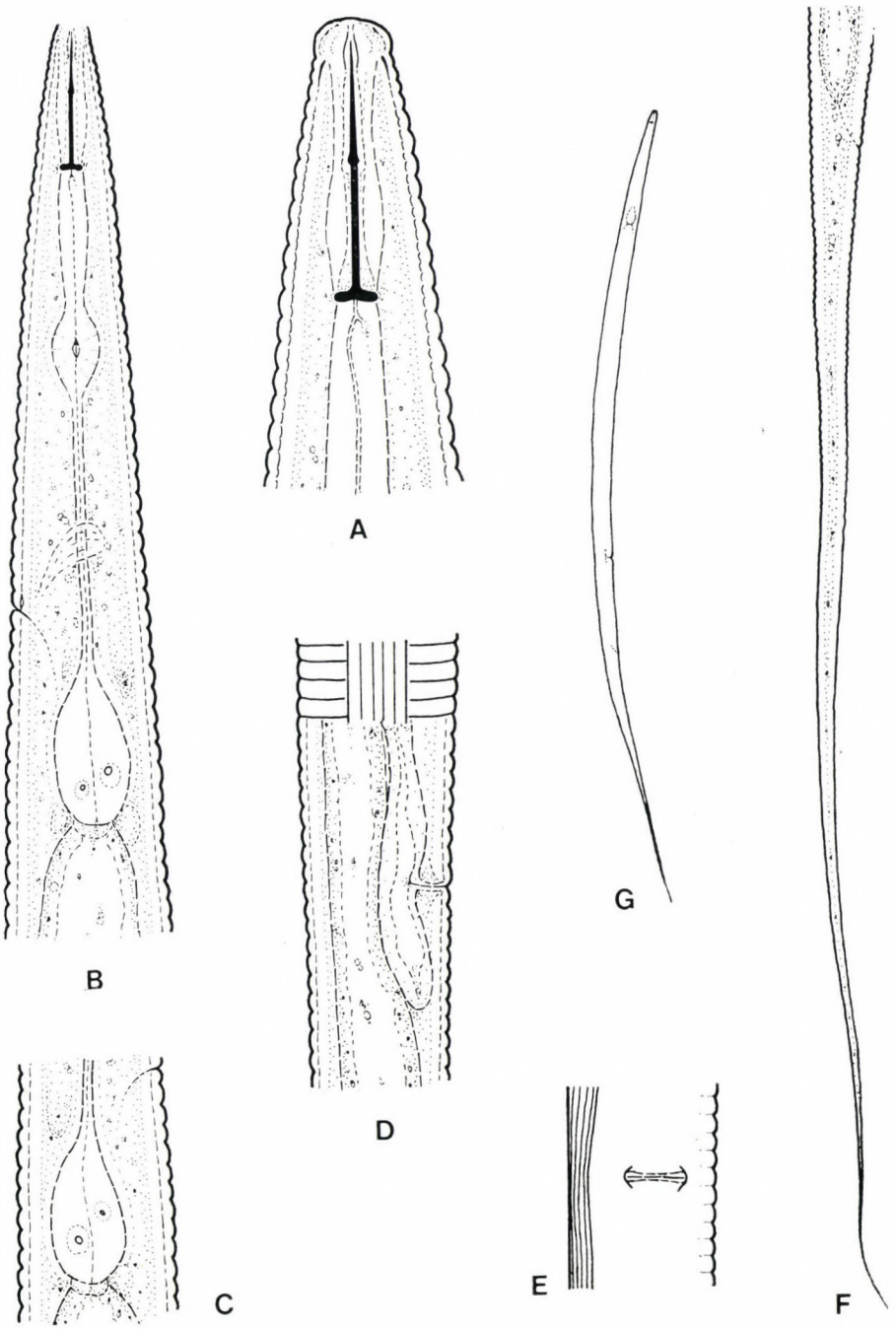

Fig. 2. *Cephalenchus cephalodiscus* SULTAN & JAIRAJPURI, 1981. A = anterior end (×2000); B = oesophageal region (×980); C = posterior bulb (×980); D = vulval region (×980); E = vulva situated somewhat sub-lateral on the right side of body (×980); F = tail (×680); G = female (×160)

in *cylindricus*), and *b)* from *limichus* by the wider body annules (only 1.4—1.5 μm in *limichus*), the longer tail (198—230 μm : 176—194 μm) and the fewer number of total body annules (217—222 : 278—284). The Californian specimens agreed well with the original description.

Distribution: Bhawali, Nainital, India, soil around roots of peach (SULTAN and JAIRAJPURI, 1981). — Recent exemplars: McClures Beach, California, USA, grassy soil. December 1963, leg. D. J. RASKI.

Cephalenchus cylindricus SULTAN & JAIRAJPURI, 1981

SULTAN and JAIRAJPURI, 1981: 166—168, Fig. 1A—G (*Cephalenchus cylindricus*). ♀: L = 0.62—0.75 mm; a = 41—53; b = 6.2—6.5; c = 3.1—3.5; V = 57—60%; c′ = 19—22; spear = 20—21 μm.

Brief characteristics: Body long and very slender, labial region continuous with adjacent body, spear long, basal bulb elongate, vulva lying not far back, tail very long.

This species can be differentiated from all other species of the genus in having the shortest vulva–anus distance compared to tail length: after the original illustration the tail is 3.5 times longer than the mentioned distance.

Distribution: Ranikhet, Almora, India, soil around roots of pear (SULTAN and JAIRAJPURI, 1981).

Cephalenchus emarginatus (COBB, 1893) BELLO & GERAERT, 1972
(Figs 3A—E)

Tylenchus emarginatus COBB, 1893; *Tylenchus* (*Cephalenchus*) *emarginatus* COBB, 1893 (GERAERT, 1968); *Anguillulina emarginata* (COBB, 1893) GOODEY, 1932.

COBB, 1893: 814 (*Tylenchus emarginatus*). ♀: L = 0.68 mm; a = 28; b = 6.2; c = 4.5; V = 65%; spear = 20 μm. ♂: L = 0.60 mm; a = 28; b = 4.8; c = 4.3.

Recent specimens from Florida, USA. ♀: L = 0.67—0.68 mm; a = 33—35; b = 6.2—6.3; c = 4.3—4.5; V = 66—67%; c′ = 13—14; spear = 19 μm.

Body straight after killing by heat, 19—20 μm wide. Cuticle 1—1.3 μm thick, annules low, 2—2.3 μm wide on mid-body. Number of annules on the oesophageal region 48—49, between head and vulva 210—212, between vulva and anus 36; total number of body annules without tail 246—248. Lateral field fairly broad, 1/3 of body diameter or more, with six distinct incisures; the number of incisures reduces to four at level of rectum.

Head separate, 5.5—6 μm wide at base, with three indistinct striae. Cephalic framework not cuticularized. Spear slender, 19 μm long, 3.3 times head diameter, or almost 1/5 of oesophagus length (measured from head), respectively. Metenchium somewhat shorter than telenchium. Spear knobs oval, lying in the 10th annule posterior to head. Oesophagus 106—108 μm long; anterior part 46% of its length. Procorpus about as long as spear, medial bulb strong, oval, 10 μm long, posterior bulb small, with rounded proximal

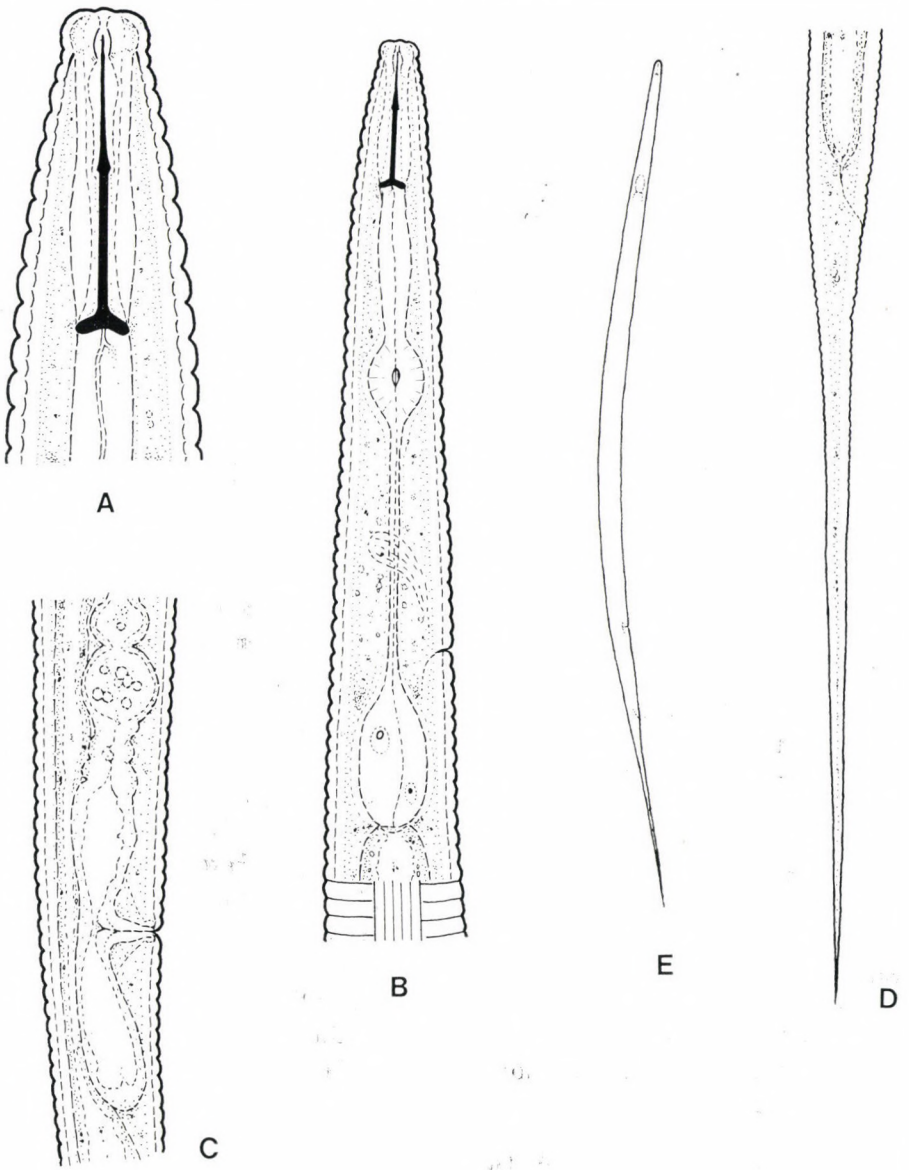

Fig. 3. *Cephalenchus emarginatus* (COBB, 1893) BELLO & GERAERT, 1972. A = anterior end (×2000); B = oesophageal region (×980); C = vulval region (×980); D = tail (×680); E = female (×160)

margin, about half as long as isthmus. Excretory pore 80 μm from head, in 75% of oesophagus, on the 37th annule. Deirids level with excretory opening; hemizonid indistinct. Rectum a little longer than anal body diameter.

Distance between posterior oesophagus end and vulva 3.2 times as long as oesophagus. Vulva located subventral, somewhat displaced to the right

side of body. Lateral vulval dikes very small. Vagina half as long as corresponding body width. Gonad 12 times mid-body diameter, 35% of body length. Spermatheca small, oval. Post-vulval sac of uterus 1.5 times body diameter long, nearly 1/3 of vulva–anus distance.

Tail 150 μm long, 13—14 times anal body diameter, 22% of body length, and 1.9 – 2 times vulva — anus distance, respectively. Tail tip pointed but not hair-like.

Male after COBB: Bursa forming a re-entrant angle with its posterior margin in joining the body. Spicules not mentioned by COBB.

Brief characteristics: Body medium-sized, cuticle well striated, number of body annules high, head set off, spear long, basal oesophageal bulb relatively small, post-vulval uterine sac long, tail of medium length, bursa of characteristic shape.

Relationship: This species was described by COBB from Australia. Although we can several times meet the name "*Cephalenchus emarginatus*" in the literature, the corresponding data refer either to *C. hexalineatus* or *C. megacephalus*. COLBRAN (1964) has namely synonymized both these species with *emarginatus*, and, if one or the other of the subsequent authors mentioned "*emarginatus*" they had meant either *hexalineatus* or *megacephalus*. Owing to the present specimens and after re-valuing the original description, I am, however, of the opinion that COBB's *emarginatus* is a good species which can be easily distinguished from both species. The most important characteristics in separating *emarginatus* from *hexalineatus* and *megacephalus* are as follows: body longer, 0.67— 0.68 mm (*hexalineatus* 0.40—0.59 mm, *megacephalus* 0.44 — 0.60 mm), number of body annules higher, 246—248 (*hexalineatus* 198—203, *megacephalus* 190—208), spear longer, 19—20 μm (*hexalineatus* 15—17 μm, *megacephalus* 14—16 μm), tail longer, 150—152 μm (*hexalineatus* 85—120 μm, *megacephalus* 94—130 μm), post-vulval sac of uterus longer.

The Floridan specimens agreed very well with COBB's description both in morphology and in measurements. As for the tail length in comparison with the vulva–anus distance, COBB said it to be 1.5, but if we calculate this value from the formula we receive 1.7.

Distribution: Harwood, Clarence River, New South Wales, Australia, soil (COBB, 1893). — Recent locality: Lake Placid, Florida, USA, soil around roots of *Pinus* sp., November 1955.

Cephalenchus hexalineatus (GERAERT, 1962) GOLDEN, 1971 (Figs 4A—G)

Tylenchus hexalineatus GERAERT, 1962; *Tylenchus* (*Cephalenchus*) *hexalineatus* GERAERT, 1962 (GERAERT & GOODEY, 1964); *Tylenchus* (*Aglenchus*) *whitus* EGUNJOBI, 1967.

GERAERT, 1962: 35—39, Fig. 11A—F (*Tylenchus hexalineatus*). ♀: L = 0.47—0.59 mm; a = 23—33; b = 5.1—6.2; c = 3.9—4.9; V = 60—70%; c′ = 9—14; spear = 15—17 μm. ♂: L = 0.49—0.61 mm; a = 28—37; b = 5.1—6.4; c = 4.0—5.5; spicules = 16—19 μm.

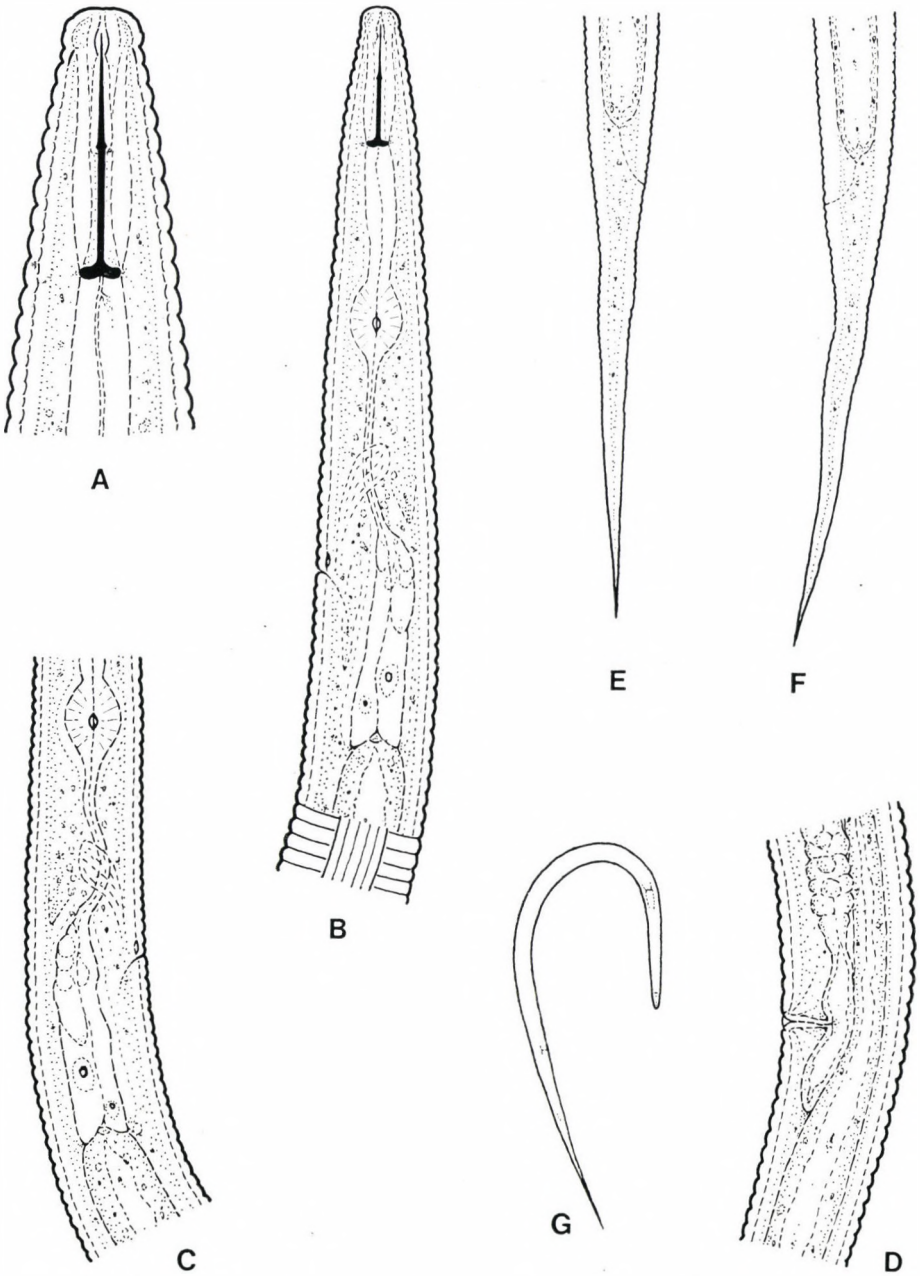

Fig. 4. *Cephalenchus hexalineatus* (GERAERT, 1962) GOLDEN, 1971. A = anterior end (×2000); B = oesophageal region (×980); C = posterior part of oesophagus (×980); D = vulval region (×980); E—F = female tails (×680); G = female (×160)

EGUNJOBI, 1967: 421—422, Fig. 3A—E (*Tylenchus* [*Aglenchus*] *whitus*). ♀: L = 0.40—0.45 mm; a = 26—35; b = 4.4—5.7; c = 4.3—5.0; V = 64—67%; spear = 15—17 μm.

BELLO and GERAERT, 1972: 196—197, Fig. 3 (paratypes of *Tylenchus* [*Aglenchus*] *whitus*, re-measured). ♀: L = 0.37—0.44 mm; a = 22—25; b = 4.5—5.1; c = 4.2—4.9; V = 63—67%; spear = 15—16 μm.

Paratype of *Tylenchus* (*Aglenchus*) *whitus* from New Zealand, newly measured. ♀: L = 0.45 mm; a = 28; b = 4.9; c = 4.9; V = 67%; spear = 15 μm.

Recent specimens from St. Catharines, Canada. ♀: L = 0.47—0.50 mm; a = 25—30; b = 4.8—5.1; c = 5.4—5.8; V = 69—70%; c′ = 8—9; spear = 15—16 μm.

Body arcuate ventrally after killing by heat, 16—19 μm wide. Cuticle thin, about 1 μm, annules well expressed, 2—2.3 μm wide on mid-body. Lateral field 5—5.5 μm wide, 1/3 of body diameter, with six incisures which decrease to four on the 9th to 14th annule posterior to vulva. Number of cuticular annules between head and posterior end of oesophagus 53—58, between head and vulva 173—176, between vulva and anus 25—27. Total number of body annules excluding tail 198—203.

Labial region distinctly set off, 5—5.5 μm wide at base, with two fine annules. Cephalic framework not cuticularized. Body at posterior end of oesophagus 2.6—2.8 times wider than head. Spear thin, 15—16 μm long, 2.7—2.8 times head diameter, about 1/6 of entire length of oesophagus. Basal knobs rounded, in the 9th or 10th neck annule. Oesophagus 91—99 μm long, with anterior portion occupying 43—46% of its length. Procorpus a little longer than spear. Medial bulb fairly well developed, spherical-oval, 9—10 μm long, terminal bulb relatively long, nearly as long as isthmus, slightly humped dorsally, and slightly lobed on its posterior margin. Excretory pore opposite beginning of terminal bulb or somewhat more back, 71—75 μm behind head, in 72—77% of oesophagus length, and on the 40th to 44th annule, respectively. Hemizonid just in front of excretory pore, deirids 2—5 annules posterior to the latter. Rectum rather inconspicuous, one anal diameter long.

Distance between oesophagus end and vulva 2.3—2.5 times as long as oesophagus. Vulva a transverse slit, with small lateral dikes, lying somewhat laterally from the ventromedial line (on the right side). Vagina tubular, generally half as long as corresponding body diameter. Gonad well developed, varying between 37 and 44% of body length. Spermatheca rounded-oval, 7—12 μm long. Post-vulval uterine sac mostly a little shorter than body width at the same level.

Tail 85—91 μm long, 17—20% of body length, 8—9 times anal diameter, and 1.4—1.6 times vulva–anus distance, respectively. Tail tip sharp or very finely rounded.

Male after GERAERT: Of the ten males examined one had symmetric bursal alae, and nine had the right ala posteriorly shorter. Spicules 16—19 μm long, gubernaculum 5.5—7 μm, proximally hook-like.

Brief characteristics: Body relatively short, with few annules, head separate, cuticle coarsely striated, spear comparatively short,

medial bulb with valve located somewhat post-central, posterior bulb long and dorsally humped, vulva far back, tail short.

Relationship: My comments to the synonymization of *Cephalenchus megacephalus* (GOODEY, 1962) comb. n. with *C. hexalineatus* and to that of this latter species with *C. emarginatus* (COBB, 1893) BELLO & GERAERT, 1972 can be found in the discussion of *C. megacephalus*. The differences between *hexalineatus* and *megacephalus* are enumerated there as well.

In the year 1967 EGUNJOBI described *Tylenchus* (*Aglenchus*) *whitus* as a close relative of "*T.* (*Cephalenchus*) *hexalineatus*". BELLO and GERAERT (1972) re-examined EGUNJOBI's paratypes and found an identity between the two species; they synonymized therefore *whitus* with *C. hexalineatus* (= *C. emarginatus*). I could also examine three paratype slides of EGUNJOBI and as a result I can subscribe to the opinion of BELLO and GERAERT.

Distribution: Yangambi, Zaire, roots of *Musa paradisiaca normalis* (GERAERT, 1962). — Palmerston North, New Zealand, soil around roots of apple tree (EGUNJOBI, 1967). — Recent specimens: St. Catharines, Canada, soil around roots of *Taxus cuspidatus*, July 1962. — Maybe that some literature data else refer to this species (e.g. the short-tailed Canadian specimens of GERAERT, 1968) but in vain of the description of the oesophagus — the most important character in recognizing this species — cannot be stated definitely whether these references actually concern *hexalineatus*.

Cephalenchus illustris sp. n. (Figs 5A—J)

♀: L = 0.72—0.76 mm; a = 38—42; b = 7.1—7.6; c = 4.0—4.4; V = 67—68%; c′ = 16—20; spear = 19—20 μm.

♂: L = 0.69—0.71 mm; a = 38—40; b = 8.0—9.4; c = 4.5—4.6; c′ = 13—14; spicules = 20—22 μm.

c

Body fairly large and slender, 15—20 μm wide. Annulation coarse, annules 2.1—2.5 μm wide on mid-body region. Number of annules on the oesophageal region 45—51, between head and vulva 227—232, between vulva and anus 35—45; total number of body annules without tail 262—277. Lateral field narrower than 1/3 body width, with six incisures decreasing to four on the 20th to 28th annule posterior to vulva.

Head set off from neck, with 2 or 3 very fine annules. Body at posterior end of oesophagus 2.6—2.8 times as wide as labial region. Cephalic framework weak. Spear 19—20 μm long, 3—3.3 times head diameter, about 1/5 of entire oesophagus length. Metenchium as long as telenchium. Spear knobs distinct, located in the 10th or 11th annule behind head. Oesophagus 99—102 μm long, with anterior part occupying 47—49% of its length. Procorpus shorter than spear, medial bulb strong, heart-shaped, basal bulb elongate, with slightly lobed posterior margin. Excretory pore situated on the 38th or 39th neck annule and level with anterior end of basal bulb. Rectum distinct, 1.5 times anal diameter.

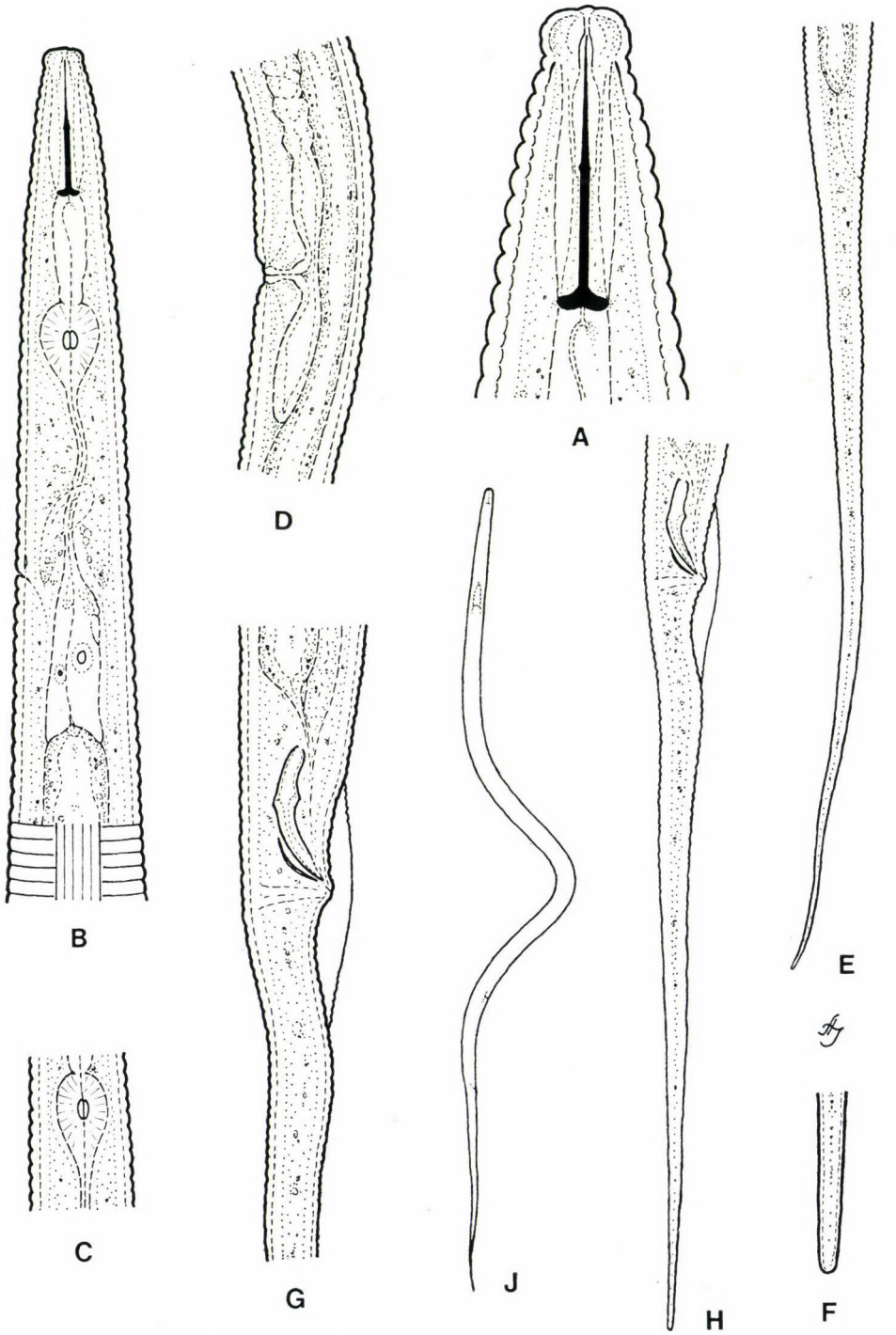

Fig. 5. *Cephalenchus illustris* sp. n. A = anterior end (×2000); B = oesophageal region (×980); C = medial bulb (×980); D = vulval region (×980); E = female tail (×680); F = tip of tail (×2000); G = cloacal region of male (×980); H = male tail (×680); J = female (×160)

Distance between oesophagus end and vulva 3.8—4 times as long as oesophagus. Vulva sunk in body contour; lateral dikes inconspicuous. Gonad 37—44% of body length, 15—17 times body width. Post-vulval sac of uterus 1.2—1.6 times as long as corresponding body width. Phasmids indistinct.

Tail slender, 166—178 μm, 23—25% of body length, 16—20 times anal body diameter, or 2.2—2.4 times vulva–anus distance, respectively. Tail tip finely rounded.

Male in general similar to female but the oesophagus is shorter and the lateral fields are comparatively wider. Bursa adanal, 37—42 μm long, crenate on both ends, with symmetric alae. Spicula 20—22 μm, gubernaculum 8—9 μm long. Tail 152—155 μm long, 13—14 times anal diameter, with rounded tip.

Brief characteristics: Body long and slim, head separate, spear long, medial bulb heart-shaped, vulva sunk and far back, post-vulval sac relatively long, bursal alae of equal shape, tail very long and finely rounded on tip, total number of body annules high.

The new species resembles *Cephalenchus emarginatus* (COBB, 1893) BELLO & GERAERT, 1972, *C. megacephalus* (GOODEY, 1962) comb. n. and *C. hexalineatus* (GERAERT, 1962) GOLDEN, 1971, can be, however, easily separated from them by the longer body, the shape of medial bulb and vulva, and the rounded tail terminus. In the long and slender body as well as in the great number of body annules *Cephalenchus illustris* is similar to *C. limichus* (NESTEROV, 1973) comb. n., but it has broader cuticular annules, a longer post-vulval uterine sac, a rounded tail tip and a vulva situated much further back.

Holotype: ♀ on the slide No. 7/20-Tyl. in the collection of the author.
Type locality: Amsterdam, The Netherlands, grassy soil, June 1968.

Cephalenchus leptus (SIDDIQI, 1963) KNOBLOCH, 1972 (Figs 6A—E)

Tylenchus (*Cephalenchus*) *leptus* SIDDIQI, 1963.

SIDDIQI, 1963: 170—173, Fig. 1—6 (*Tylenchus* [*Cephalenchus*] *leptus*). ♀: 0.65—0.69 mm; a = 41—52; b = 6.0—6.6; c = 2.8—3.2; V = 54—57%; c′ = 27; spear = 16—17 μm.

GERAERT, 1968: 675, Fig. 4D (a paratype of *Tylenchus* [*Cephalenchus*] *leptus*). Measurements equal with SIDDIQI, 1963.

KNOBLOCH, 1972: 202—204, Fig. 1A—E (*Cephalenchus leptus*). ♂: L = 0.68—0.75 mm; a = 39—42; b = 5.6—7.3; c = 2.9—3.7; spear = 17 μm; spicules = 14—16 μm.

MUKHINA, 1981: 56, Fig. 76A—G (*Cephalenchus leptus*). ♀: L = 0.66 mm; a = 35; b = 6.7; c = 3.1; V = 55%; spear = 19 μm. ♂: L = 0.61 mm; a = 63; b = 2.8.

Recent specimens from Rajka, Hungary. ♀: L = 0.69—0.71 mm; a = 49—53; b = 6.5—6.6; c = 3.1—3.3; V = 57%; c′ = 22—25; spear = 17—18 μm.

Recent specimen from Colorado, USA. ♀: L = 0.75 mm; a = 53; b = 7.0; c = 3.2; V = 57%; c′ = 22; spear = 17 μm.

Recent specimen from South Dakota, USA. ♀: L = 0.65 mm; a = 41; b = 6.4; c = 3.3; V = 57%; c′ = 24; spear = 17 μm.

Body almost straight, very slender, 12—14 μm wide on the middle region. Cuticle thin, 1 μm, finely striated, annules low, 2—2.3 μm wide. Number of annules from head to proximal end of oesophagus 49—50, from head to vulva

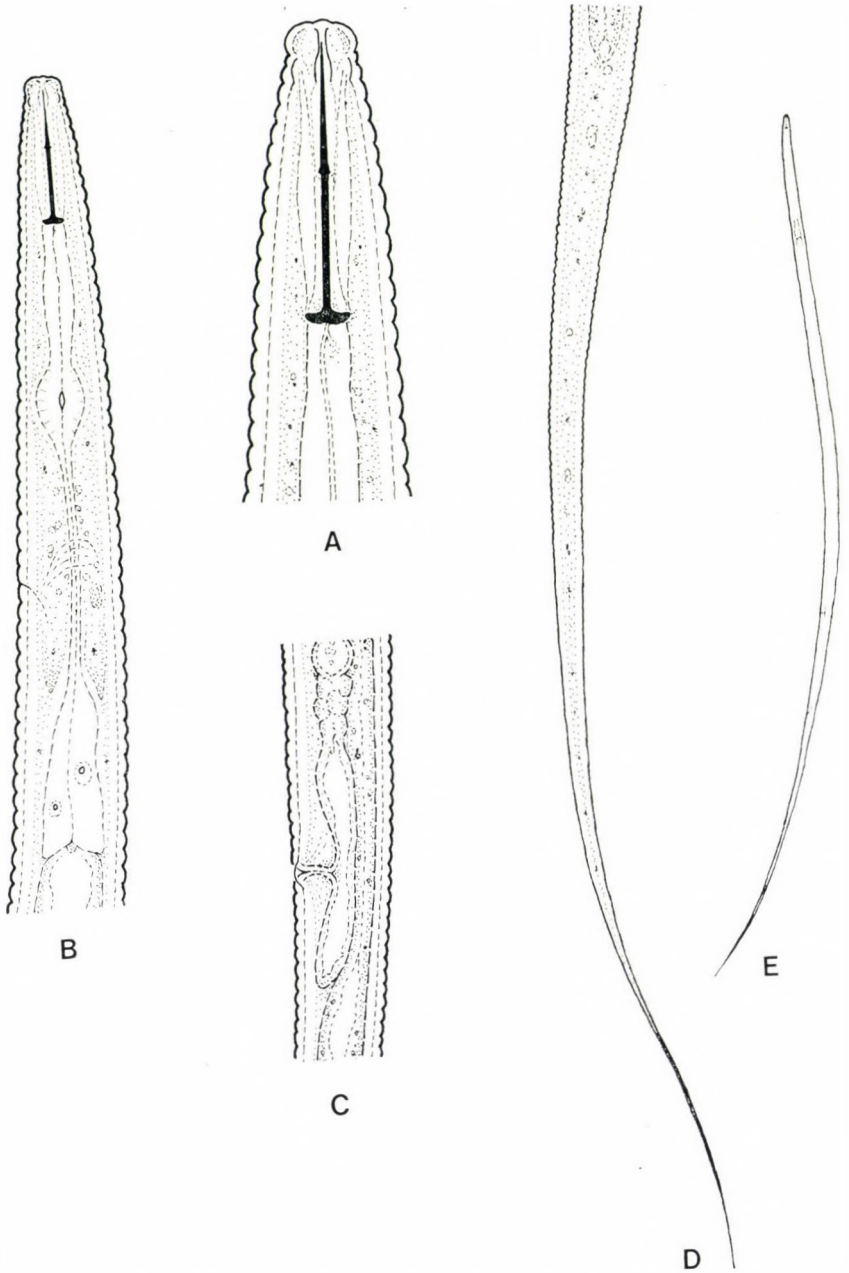

Fig. 6. *Cephalenchus leptus* (SIDDIQI, 1963) KNOBLOCH, 1972. A = Anterior end (×2000); B = oesophagus (×980); C = vulval region (×980); D = tail (×680); E = female (×160)

175—180, from vulva to anus 37—41. Total body annules excluding tail 212—218. Lateral field 1/3 as wide as body, bearing six incisures which reduce to four 10—16 annules posterior to vulva.

Labial region hardly separate, 5 μm wide at base, with two indistinct annules. Labial framework very weak. Body at posterior end of oesophagus 3 times as wide as head. Spear very slender, 17—18 μm long, 3.4—3.6 times head diameter, and 1/5—1/6 of entire oesophagus length, respectively. Metenchium 45% of spear length. Basal knobs oval, located in the 11th to 13th annule behind head. Oesophagus 98—106 μm long, anterior portion 45% of its length. Procorpus as long as spear or somewhat longer. Medial bulb 9 μm long, basal bulb elongate, with slightly lobed posterior margin. Excretory pore 68—70 μm from anterior body end, in 65—66% of oesophagus length, and on the 33rd or 34th annule behind head. Deirids 1—6 annules, hemizonid 1 annule posterior to excretory opening. Rectum hardly visible.

Distance between oesophagus end and vulva 2.8—3 times as long as oesophagus. Vulva with conspicuous lateral dikes, vagina thin, half as long as body diameter. Gonad 28% of body length, 14—16 times body diameter. Spermatheca small. Post-vulval branch of uterus somewhat longer than corresponding body diameter. Phasmids very small, 10—12 annules anterior to vulva.

Tail extremely long and filiform, 216—236 μm, 30—32% of body length, 22—25 times anal body diameter, and 2.6—2.8 times vulva–anus distance, respectively; tapering gradually to its very fine, hair-like tip.

Male after KNOBLOCH: Bursa small, adanal, crenate. Spicules 16 μm, gubernaculum 5 μm long. Tail 15—21 anal body diameters long.

Brief characteristics: Body long and very slim, annulation of cuticle rather weak, number of annules moderate, head slightly set off, spear of middle length, posterior oesophageal bulb elongate, tail very long, more than 20 times anal diameter.

Cephalenchus leptus is the longest-tailed representative of the genus. In this respect only the species *C. limichus* (NESTEROV, 1973) comb. n., *C. cephalodiscus* SULTAN & JAIRAJPURI, 1981 and *C. cylindricus* SULTAN & JAIRAJPURI, 1981 may be compared to it, but *C. leptus* distinguishes from *limichus* by the lower number of body annules, and from *cephalodiscus* and *cylindricus* by the shorter spear.

Distribution: Simla, India, soil around roots of *Cedrus libani*, *Pinus longifolia* and *Picea excelsa* (SIDDIQI, 1963). — Mt. Clemens, Michigan, USA, rose bed in a glasshouse; Maple River, Douglas Lake, Michigan, USA, soil (KNOBLOCH, 1972). — Primorsk District, Russia, USSR, soil around roots of *Echinopanax elatum* (MUKHINA, 1981).

Recent localities: Rajka, Hungary, grass roots, June 1963. — Guanella Pass, Colorado, USA, *Carex* roots, August 1961, leg. D. J. RASKI. — Toronto, South Dakota, USA, grain field, May 1958, leg. F. E. CAVENESS.

Cephalenchus limichus (NESTEROV, 1973) **comb. n.** (Figs 7A—E)

Tylenchus (*Filenchus*) *limichus* NESTEROV, 1973.

NESTEROV, 1973: 241—242, Figs 2A—C (*Tylenchus* [*Filenchus*] *limichus*). ♀: L = 0.65—0.74 mm; a = 41—45; b = 5.8—6.3; c = 2.9—3.2; V = 52—58%; spear = 20.5—21 μm. ♂: L = 0.61 mm; a = 39; b = 5.9; c = 2.9; spicules = 18 μm.

Recent specimens from Colorado, USA. ♀: L = 0.61—0.63 mm; a = 33—36; b = 5.4—5.8; c = 3.2—3.4; V = 58—59%; c′ = 18—20; spear = 19—20 μm.

Body straight, 17—19 μm wide. Cuticle 1 μm thick or so, striation dense but conspicuous, annules 1.4—1.5 μm wide on mid-body region. Number of annules between head and posterior end of oesophagus 65—69, between head and vulva 226—231, between vulva and anus 52—53. Total number of body annules without tail 278—284. Lateral field about 1/3 as wide as body, marked by six incisures which are in general not so expressed as in the other species of the genus.

Head narrow, 4.5— 5 μm wide at base, hardly set off, with two indistinct annules. Labial framework not cuticularized. Body at posterior base of oesophagus 2.2—2.4 times as wide as head. Spear 19—20 μm long, 3.8— 4.3 times head diameter; metenchium as long as telenchium. Basal knobs relatively large, oval, located in the 13th to 15th annule posterior to labial region. Orifice of dorsal oesophageal gland quite near spear base. Oesophagus 108—114 μm long, anterior part 41—42% of its length. Procorpus shorter than spear, medial bulb 9 μm long, oval, rather weak, isthmus long and thin. Excretory pore 66—70 μm behind anterior body end, in 68—71% of oesophagus length, and on the 42nd to 44th annule, respectively. Hemizonid 1—2 annules anterior, deirids 3—4 annules posterior to excretory pore. Rectum hardly discernible.

Distance between oesophagus end and vulva 2.2—2.4 times as long as oesophagus. Vulva slit-like, with small lateral dikes, located ventral-subventral. Gonad 28—30% of body length, 9—10 mid-body diameters long. Oocytes arranged in a single file. Post-vulval uterine sac one body diameter long. Phasmids inconspicuous.

Tail 176—194 μm long, 30—31% of body length, 18—20 times anal body diameter, or 2.7—2.9 times vulva–anus distance, respectively. Terminus finely pointed.

Male after NESTEROV: Bursa adanal, with finely waved margin. Spicules 18 μm long.

B r i e f c h a r a c t e r i s t i c s : Cuticle densely striated, number of body annules very high, almost 300, head hardly separate, spear long, basal knobs relatively far back, vulva not far from body center, tail very long.

R e l a t i o n s h i p : The present specimens fit very well the original description and figures. The species is unique among the representatives of the genus *Cephalenchus* in having narrow and very numerous cuticular annules.

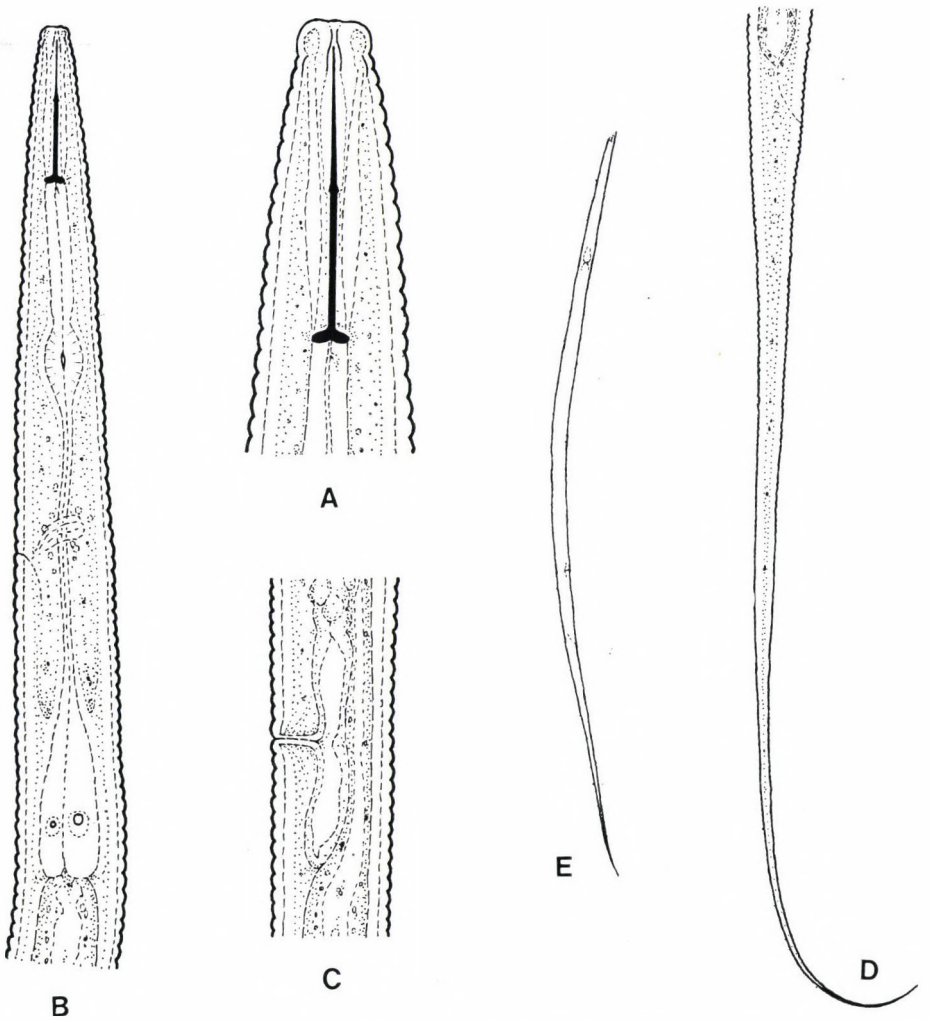

Fig. 7. *Cephalenchus limichus* (NESTEROV, 1973) comb. n. A = anterior end (×2000); B = oesophageal region (×980); C = vulval region (×980); D = tail (×680); E = female (×160)

The number of annules of *C. limichus* is both on the oesophageal region and on the post-vulval body region (between vulva and anus) as well as on the whole body excluding tail the highest within the genus. This dense annulation is well observable also on the figures of NESTEROV. Owing to the dense annules the basal knobs of the spear are located further back than in other species (on the 13th to 15th annule posterior to labial region).

Cephalenchus limichus is a long-tailed species with vulva lying before 60% of body length. In these respects it is similar to *C. leptus* (SIDDIQI, 1963) KNOBLOCH, 1972 and *C. cephalodiscus* SULTAN & JAIRAJPURI, 1981, but can be

distinguished from them by the great number of body annules, and besides, *a)* from *leptus* by the longer spear (19—21 μm : 16—18 μm) and the absolute length of the tail (176—194 μm : 216—220 μm), *b)* from *cephalodiscus* by the absolute length of tail (176—194 μm : 198 - 230 μm).

Distribution: Prut District, Moldavia, USSR, soil around roots of wild plants (NESTEROV, 1973). — Recent specimens: Independence Pass, Colorado, USA, grass roots, August 1961, leg. D. J. RASKI.

Cephalenchus lobus DHANACHAND & JAIRAJPURI, 1980

DHANACHAND and JAIRAJPURI, 1980: 120—123, Figs 2A—M (*Cephalenchus lobus*). ♀: L = 0.63—0.71 mm; a = 40—46; b = 7.0—7.7; c = 3—4; V = 59—63%; c′ = 17—22; spear = 15—17 μm. ♂: L = 0.64—0.70 mm; a = 38—41; b = 7.0—7.5; c = 3—4; spicules = 15 μm.

Brief characteristics: Cuticle finely annulated, head hardly separate, spear of middle length, terminal oesophageal bulb very short and dorsally lobed, excretory canal unusually strong, cuticularized, tail long, finely pointed.

Cephalenchus lobus is standing alone within the genus in showing an overlapping basal bulb and a heavily cuticularized excretory duct.

Distribution: Langthabal Kunja, Imphal, Manipur, India, grass roots (DHANACHAND & JAIRAJPURI, 1980).

Cephalenchus megacephalus (GOODEY, 1962) **comb. n.** (Figs 8A—G)

Tylenchus (*Cephalenchus*) *megacephalus* GOODEY, 1962; *Cephalenchus emarginatus* nec COBB, 1893 apud HOOPER, 1974, et BAUJARD, 1982.

GOODEY, 1962: 331—333, Figs 1A—E (*Tylenchus* [*Cephalenchus*] *megacephalus*). ♀: L = 0.46—0.60 mm; a = 27—40; b = 4.5—6.1; c = 3.7—5.2; V = 62—68%; c′ = 11; spear = 14—15 μm. ♂: L = 0.47—0.60 mm; a = 27—39; b = 5.1—6.6; c = 3.2—4.6; spicules = 17 μm.

MAVLJANOV, 1973: 98—99, Figs 13A—E (*Tylenchus* [*Cephalenchus*] *megacephalus*). ♀: L = 0.44—0.49 mm; a = 33—34; b = 4.4—5.1; c = 3.8—5.4; V = 64—67%; spear = 14.5 μm.

HOOPER, 1974: 1—2, Figs 1A—I (*Cephalenchus emarginatus*). Although HOOPER's drawings represent *C. megacephalus*, the measurements given after GERAERT refer to *C. hexalineatus*.

BAUJARD, 1982: 183—186, Figs 1A—D (*Cephalenchus emarginatus*). ♀: L = 0.46—0.59 mm; a = 27—43; b = 5.4—6.4; c = 3.8—5.5; V = 61—69%; c′ = 10—17; spear = 15.5—17 μm. ♂: L = 0.47—0.57 mm; a = 28—46; b = 5.0—6.6; c = 3.6—4.8; spicules = 17—20 μm.

Paratypes of *Tylenchus* (*Cephalenchus*) *megacephalus* from Adiopodoumé, Ivory Coast, newly examined and measured. ♀: L = 0.46—0.52 mm; a = ? (flattened specimens); b = 5.2—5.3; c = 4.1—4.3; V = 65—66%; spear = 15 μm. ♂: L = 0.53—0.55 mm; a = ?; b = 5.7—6.0; c = 3.7—3.8; spicules = 17—19 μm.

Recent specimens from Kennington, England. ♀: L = 0.47—0.53 mm; a = 27—32; b = 4.8—5.7; c = 5.0—5.4; V = 68—69%; c′ = 9—10; spear = 15.5—16 μm.

Recent specimens from Léopoldville, Zaire. ♀: L = 0.52—0.56 mm; a = 32—37; b = 5.8—6.2; c = 4.2—4.8; V = 63—68%; c′ = 11—13; spear = 15—15.5 μm. ♂: L = 0.48 mm; a = 37; b = 5.8; c = 4.3; spicules = 18 μm.

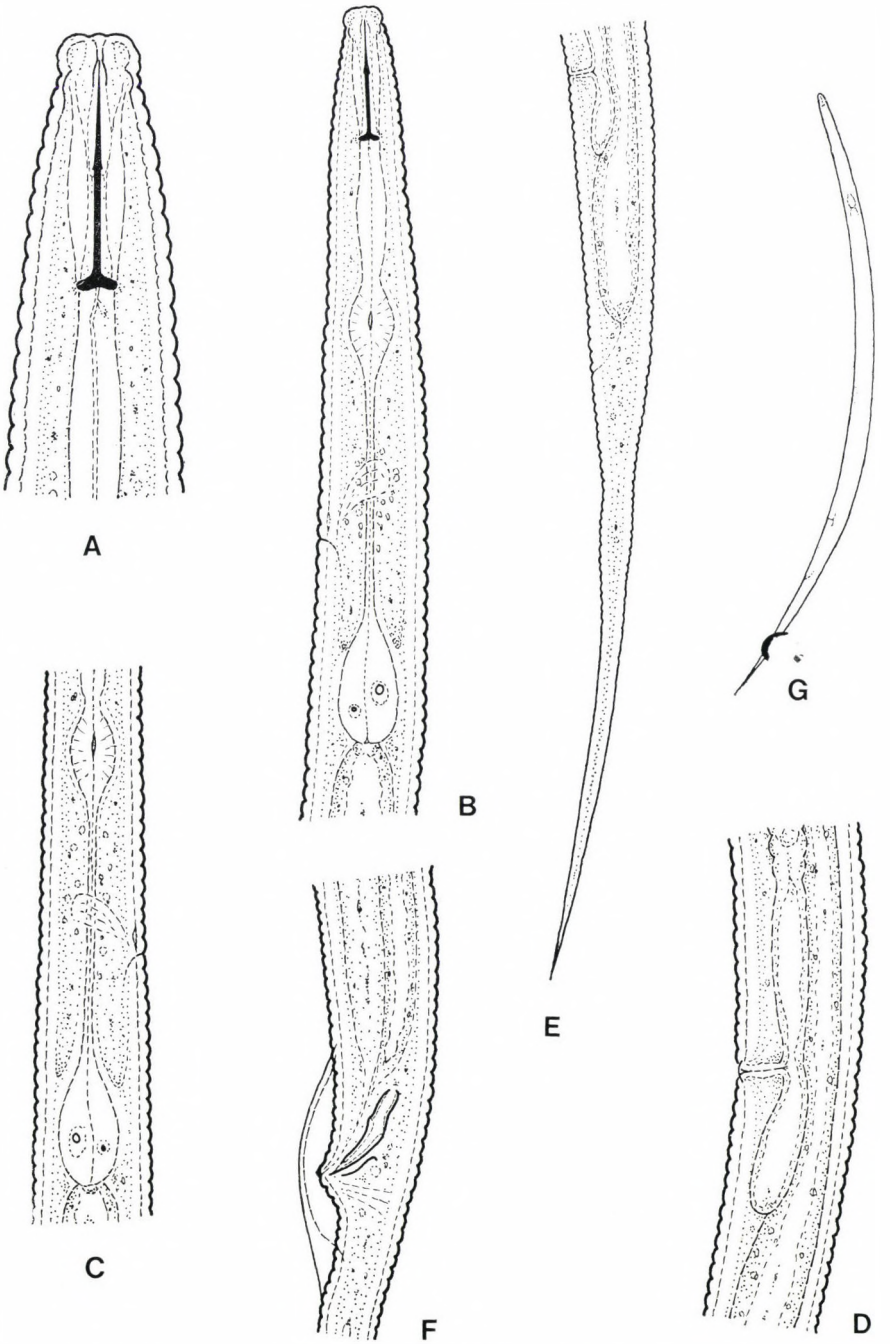

Fig. 8. *Cephalenchus megacephalus* (GOODEY, 1962) comb. n. A = anterior end (×2000); B = oesophageal region (×980); C = posterior part of oesophagus (×980); D = vulval region (×980); E = posterior end of female (×680); F = cloacal region of male (×980); G = female (×160)

Recent specimens from Queensland, Australia. ♀: L = 0.45—0.50 mm; a = 28—36; b = 5.2—5.6; c = 4.8—5.1; V = 67—69%; c′ = 10—11; spear = 16 μm.

Recent specimens from Ngatimoti, New Zealand. ♀: L = 0.48—0.49 mm; a = 29—33; b = 5.1—5.2; c = 4.5—4.7; V = 66—68%; c′ = 10—11; spear = 15—16 μm.

Body straight or slightly arcuate ventrally, 14—17 μm wide. Cuticle thin, 1 μm or less, annules low, 1.7—2.3 μm wide on mid-body. Number of annules on the oesophageal region 48—55, between anterior body end and vulva 163—179, between vulva and anus 25—32; total number of body annules without tail 190—208. Lateral field about 1/3 of body width, with six incisures which decrease to four in the 4th to 15th annule behind vulva.

Head set off from body contour, 5—6 μm wide at base, bearing 2—3 very fine transversal striae. Cephalic framework weak. Body at posterior end of oesophagus 2.6—2.9 times as wide as labial region. Spear very slender, 15—16 μm long, 2.6—3.2 times head diameter, or 1/5—1/6 of entire oesophagus length, respectively. Basal knobs rounded-oval, lying in the 10th or 11th annule behind labial region. Metenchium nearly as long as telenchium. Oesophagus 83—97 μm long, with anterior part occupying 44—48% of its length. Procorpus 1.1—1.2 times longer than spear. Medial bulb oval, 8—10 μm long, with a thin, oval valve located a little anterior to its center. Basal bulb drop-shaped, small, with rounded posterior margin; isthmus very slender, nearly twice as long as basal bulb. Excretory pore 67—75 μm behind labial region, in 69—81% of oesophagus length, on the 37th to 42nd cuticular annule posterior to head. Hemizonid one annule before, deirids 1 to 5 annules behind excretory opening. Rectum indistinct, about as long as anal body diameter.

Vulva a transverse slit, usually somewhat displaced to the right side of body. Lateral vulval dikes small. Gonad varying between 25 and 35% of body length, or between 9 and 11 body width, respectively. Oocytes arranged in a single row. Spermatheca oval, in bisexual populations larger than in populations without males. Vagina thin, slightly oblique, about 1/3 of corresponding body width. Post-vulval uterine sac one body diameter long, or, in bisexual populations, somewhat longer. Phasmids very small, difficult to see, 8—11 annules anterior to vulva.

Distance between oesophagus end and vulva 2.3—3 times as long as oesophagus. Tail 94—123 μm long, 19—24% of entire body length, 9—13 times anal body diameter, and 1.5—2.1 times vulva–anus distance, respectively. Terminus pointed or very finely rounded.

Bursal alae differently shaped: left ala normal, arched, 28—35 μm, right ala shorter and ending more abruptly, 24—28 μm. Quite exceptionally both alae are similar. Spicules 17—19 μm long, with ventrally curved tips; gubernaculum 6—7 μm long, thin, proximally bent ventrally.

Brief characteristics: Body medium-sized, head low and set off, spear comparatively short, medial bulb oval, with thin valve, basal bulb small, drop-shaped, vagina short, vulva situated behind 60% of body

length, bursa with aberrant right ala, tail of moderate length, total body annules about 200.

Relationship and remarks: GOODEY and GERAERT each described a species in the year of 1962, viz. *Tylenchus* (*Cephalenchus*) *megacephalus* GOODEY, 1962 and *Tylenchus hexalineatus* GERAERT, 1962. Two years later (1964), in a common note, they agreed that their descriptions referred to one and the same nematode species, and, in accordance to the law of priority, they synonymized *T. megacephalus* — which were described a few months later — with *T. hexalineatus*. Most subsequent authors accepted this synonymization, GOLDEN (1971) as well, who raising *Cephalenchus* to generic level designated *C. hexalineatus* as type-species. My recent investigations show, however, that within "*hexalineatus-megacephalus*" two although very similar but distinctly separatable species do exist, i.e. both nominal species — *hexalineatus* and *megacephalus* — are valid. When comparing different populations from different countries, I have found that certain constant differences always occur between these species. In a consequence I propose to re-establish the validity of *C. megacephalus* and to regard it as type-species of the genus *Cephalenchus*.

It must be mentioned that after synonymizing *megacephalus* with *hexalineatus*, COLBRAN (1964) went a step farther and synonymized both with a third species, *Tylenchus emarginatus* COBB, 1893. Some authors, e.g. BELLO and GERAERT (1972), HOOPER (1974), BAUJARD (1982) agreed with that and used the name "*emarginatus*" for all the three nominal species. Nevertheless, both *megacephalus* and *hexalineatus* can be easily separated from *emarginatus* (see the discussion of the latter species).

The differences between *Cephalenchus megacephalus* and *C. hexalineatus* are as follows: the basal oesophageal bulb of *megacephalus* is much smaller and drop-shaped, with rounded posterior margin, about half as long as isthmus (the basal bulb of *hexalineatus* is bigger, elongate, somewhat humped dorsally, with slightly lobed posterior margin, about as long as isthmus), the medial bulb of *megacephalus* is rather weak, with thin, somewhat pre-central valve (the medial bulb of *hexalineatus* is more globular, with valve lying a little post-central), the vagina of *megacephalus* is shorter, about 1/3 body diameter (the vagina of *hexalineatus* is longer, nearly 1/2 body diameter). Besides, the head is lower and more strongly set off in *megacephalus*.

Distribution: Adiopodoumé, Ivory Coast, soil around roots of *Musa sinensis* (type locality, GOODEY, 1962). — Verkhnechirchiks District, Uzbekistan, soil from roots of "kenaf" (MAVLJANOV, 1973). — "England" (HOOPER, 1974). — Léon, France, soil around *Pinus pinaster*; Nieky, Ivory Coast, roots of *Musa* sp. (BAUJARD, 1982). — Besides, there can be found other records, too, in the literature regarding "*hexalineatus*" or "*emarginatus*" but in vain of description or illustrations it cannot be definitely stated whether they refer to *megacephalus*.

Recent localities, or, recently examined specimens: Paratypes of *Tylenchus* (*Cephalenchus*) *megacephalus* originated from Adiopodoumé, Ivory Coast, soil around roots of *Musa*

sinensis, collected in July 1959. — Kennington, England, from Sitka spruce soil, February 1969. — Léopoldville, Zaire, around *Musa* "Poyo", without datum. — Queensland, Australia. roots of pear, June 1952, leg. R. COLBRAN. — Ngatimoti, New Zealand, grass + willow, December 1966, leg. W. M. WOUTS. — Heretofore, *Cephalenchus megacephalus* is known from Europe (England, France), Asia (Soviet Union: Uzbekistan), Africa (Ivory Coast, Zaire) and Australia (Queensland, New Zealand).

Cephalenchus tahus WOOD, 1973

WOOD, 1973: 659—673, Figs 1A—G and 2A—D (*Cephalenchus tahus*). ♀: L = 0.56—0.66 mm; a = 33—49; b = 5.7—6.9; c = 3.4—4.6; V = 60—68%; spear = 14—16 μm. ♂: L = 0.54—0.61 mm; a = 32—36; b = 5.8—6.2; c = 4.4—5.2; spicules = 20 μm.

Brief characteristics: Cuticle coarsely annulated, head set off, spear comparatively short, terminal bulb small, vulva located on the right subventral side of body, gonad very long, almost reaching to oesophagus, with great number of oocytes, bursa asymmetric, tail long, finely pointed.

As for the bursa, there is a discrepancy in the original text. On page 673 we can read: "left ala frequently reduced . . .", but some lines further: ". . . the inconsistent form of the right bursal ala . . .". We can suppose that the second sentence is the correct one since in *Cephalenchus* species the right bursal ala may show a reduction.

Cephalenchus tahus resembles *C. megacephalus* (GOODEY, 1962) comb. n., is, however, distinctive because of the longer tail (145—165 μm : 94—130 μm) and the more strongly developed female gonad.

Distribution: Broken River, Southern Alps, New Zealand, soil around roots of *Festuca novaezealandiae* (WOOD, 1973).

Genus **Allotylenchus** gen. n.

Tylenchidae, Tylenchinae (?). Body shorter than 1 mm, very slender. Cuticle smooth, annulation completely lacking. Lateral fields very narrow, simple, without inner incisures.

Labial region separate, high. Amphids longitudinal, slit-like. Spear rather weak, with small basal knobs. Orifice of dorsal oesophageal gland close to spear base. Medial bulb well developed, with distinct valve, terminal bulb dorsally humped. Excretory opening large, circular, excretory duct heavily cuticularized, unusually long and wide, extending behind posterior margin of oesophagus.

Vulva transverse, with lateral flaps. Female gonad prodelphic, straight, post-vulval uterine sac short. Tail filiform.

Bursa adanal, not crenate. Spicules tylenchoid.

Type and single species: *Allotylenchus excretorius* sp. n.

The most striking characteristic of this new genus is the very long and heavily cuticularized excretory canal. In the family Tylenchidae there is an

other genus only, *Aerotylenchus* FOTEDAR & HANDOO, 1979, which possess a similarly developed excretory system. *Allotylenchus* can be separated, however, by several important features from the above mentioned genus; these are: labial region high and separated from adjacent body region (*Aerotylenchus:* labial region low and continuous with neck), cuticle completely smooth (*Aerotylenchus:* cuticle distinctly annulated), lateral fields very narrow and plain (*Aerotylenchus:* lateral fields normally wide and strongly structured), vulva with large lateral flaps (*Aerotylenchus:* vulva without flaps), bursa smooth (*Aerotylenchus:* bursa crenate). These differences — chiefly the structure of head, cuticle and lateral fields — are of generic level and good enough to separate one genus from the other. The strong development of the excretory tract seems to a convergence only. (See also the heavily cuticularized duct of *Cephalenchus lobus* DHANACHAND & JAIRAJPURI, 1980.)

In having a separate head, slender body and filiform tail, *Allotylenchus* is to a certain extent similar to *Cephalenchus* but clearly distinguishes from that by its smooth cuticle, simple lateral fields, much shorter spear and especially by the structure of the excretory organ.

Allotylenchus excretorius sp. n. (Figs 9A—F)

♀: L = 0.70—0.89 mm; a = 48—54; b = 6.7—7.4; c = 3.5—3.7; V = 58—60%; c′ = 18—26.

♂: L = 0.72—0.80 mm; a = 55—57; b = 6.4—7.2; c = 3.5—3.8; c′ = 20—24.

Body very slender and almost straight after killing by heat. Cuticle very thin, only 0.5—0.6 μm, completely smooth, without any striation; only subcuticle may show an exceedingly fine annulation. Lateral fields unusually narrow, 2—2.5 μm wide, 1/7—1/8 body width, plain, without inner incisures or striae. It seems to be characteristic that the animals lie either on the subventral or on the subdorsal side of body.

Labial region high, well set off, 6 μm (in male 6.5 μm) wide at base. Body at posterior end of oesophagus 2.2—2.8 times (♀) or 2 times (♂) as wide as head. Cephalic framework weak. Mouth tube in head cuticularized, amphora-shaped. Amphids visible, slit-like. Spear 12—13 μm long, 2—2.2 times head diameter, 1/9—1/10 of oesophagus length. Metenchium needle-like, about as long as telenchium. Spear knobs oval, moderately cuticularized. Oesophagus 115—123 μm long, with anterior part occupying 48—49% of its length. Procorpus 2.5—3.3 times as long as spear; medial bulb oval, 11—13 μm; terminal bulb elongate, 20—23 μm, dorsally somewhat humped. Rectum 1.5 times as long as anal body diameter.

Excretory pore large, circular, located 91—99 μm behind head and in 76—81% of oesophagus length. Excretory duct unusually strong, 35—40 μm long, 2.5—3 times as long as corresponding body diameter. It begins in front

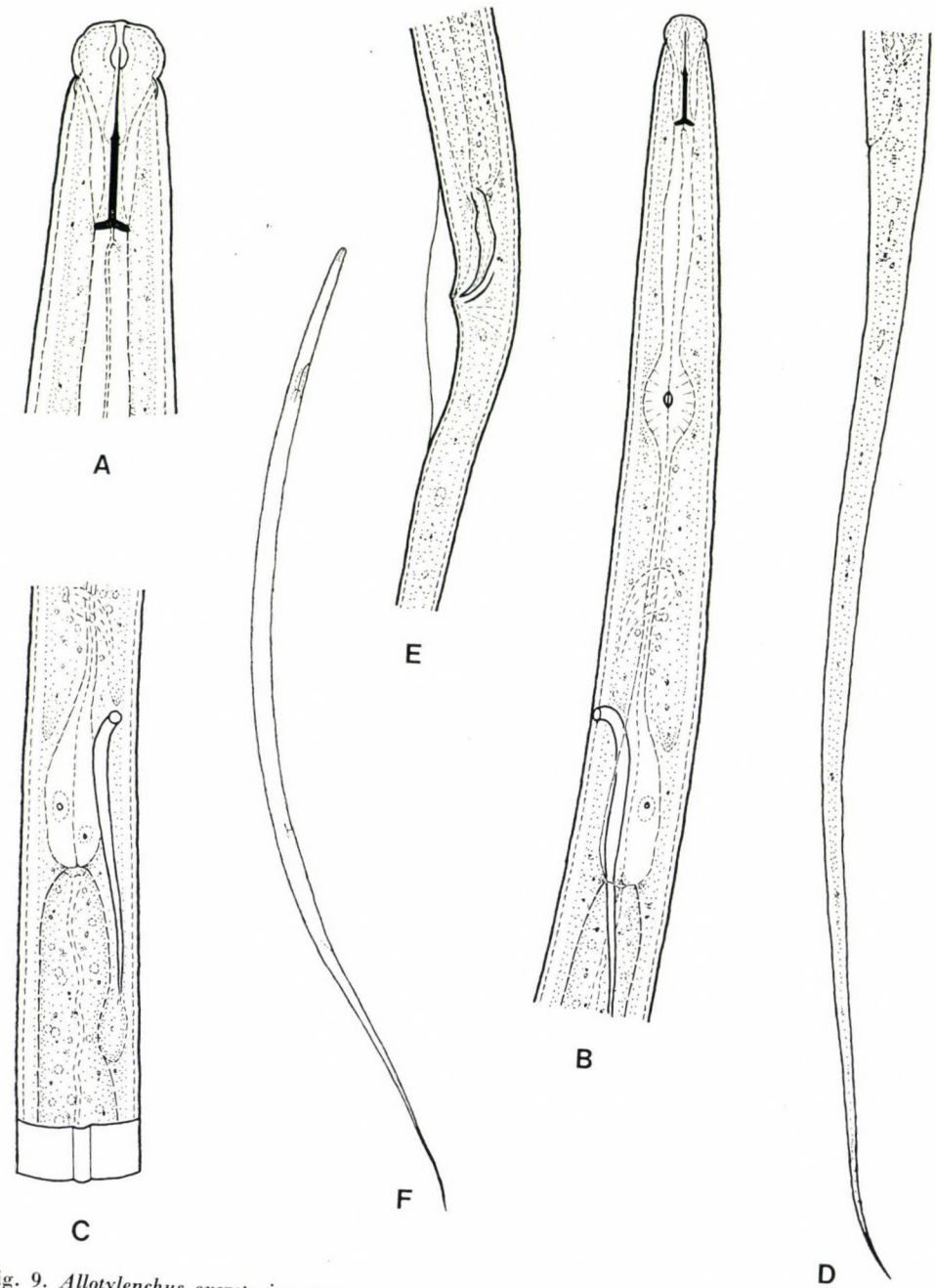

Fig. 9. *Allotylenchus excretorius* gen. n., sp. n. A = anterior end (×2000); B = oesophageal region (×980); C = oesophago-intestinal region (×980); D = female tail (×680); E = cloacal region of male (×980); F = female (×160)

of the posterior bulb, runs backward on the right subventral side of the bulb and ends one to two body diameters behind cardial region. Its anterior portion is about 2 μm wide, then it narrows gradually.

Distance between oesophagus end and vulva 2.8—3.3 times as long as oesophagus. Vulva transverse, with large lateral flaps; vagina thin. Gonad 22—28% of body length. Spermatheca small. Posterior uterine sac short. Phasmids not observed.

Body at anal opening only half as wide as at vulva. Tail filiform, 210—246 μm long, 18—26 anal body diameters, 26—28% of body length, and 1.8—2 times vulva–anus distance, respectively. Tail tip finely pointed.

Bursa adanal, 30—35 μm long, smooth, with symmetric alae. Spicula tylenchoid, 17—19 μm, gubernaculum 6—7 μm long.

Holotype: ♀ on the slide 10/33-Tyl. Holotype and numerous paratypes preserved in the collection of the author.

Type locality: Antibes, France, grass roots, March 1974.

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Acta Zoologica Hungarica 30 (1–2), pp. 29–51 (1984)

ORIBATID MITES FROM COLOMBIA (ACARI)

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(Received 11 April, 1983)

Three new Oribatid genera and thirteen new species from Colombia (South America) are described, along with one redescription.

Prof. DR. H. STURM (Hildesheim, BRD) has sent me a very rich Oribatid material for study purposes. The material comprises the Oribatid samples obtained during his three Colombian expeditions in 1955–56, 1967—69 and 1978, mainly in the region of Páramo. The ecological conditions of the region have been published by him in an excellent, study: "Zur Ökologie der andinen Paramoregion, 1978".

The Oribatid fauna of South America and that of the Andes has become fairly known in the last two decades mainly through the works of M. HAMMER, J. BALOGH, J. BALOGH and J. CSISZÁR, J. BALOGH and S. MAHUNKA and S. MAHUNKA. Colombia has been the single South American country from which, besides some data of A. BERLESE and F. GRANDJEAN, nothing has been known as regards Oribatids. This is why the collecting activity of his work is further commendable since he concentrated his activity to the Páramo region paying special attention to the mesofauna inhabiting the live and dead leaves of various *Espeletia* species. Owing to his meticulous work a highly versatile material very rich in forms has come forward. Surprisingly numerous are the new taxa, including even the genus *Ameroppia* HAMMER, 1961. The so far ascertained number of genera are around 80, that of species, above 100. The full elaboration of the entire material will yet take time. The present contribution reveals some interesting new forms deriving mainly from among the representatives of the Espeletia fauna.

The problems arising in connection with the new taxa have been consulted with DR. J. BALOGH; in identifying the *Aedoplophora* material and making the drawings DR. S. MAHUNKA gave me helping hand; the help of both here is acknowledged.

Aedoplophora glomerata GRANDJEAN, 1932 (Figs 1A—C)

This very interesting species has been described on the basis of three specimens. Two specimens derive from Puerto Caballero (Venezuela), while 1 specimen from Puerto Columbia (Colombia). The two Venezuelan specimens

have been designated as topotypes. The original description fully agree with specimens examined by me. There is one exception: GRANDJEAN (1932, p. 16, Fig. 1E) drew the sensillus with a rounded apex and as denuded while in fact my specimens show the sensillus with a pointed apex and as ciliate (Fig. 1B).

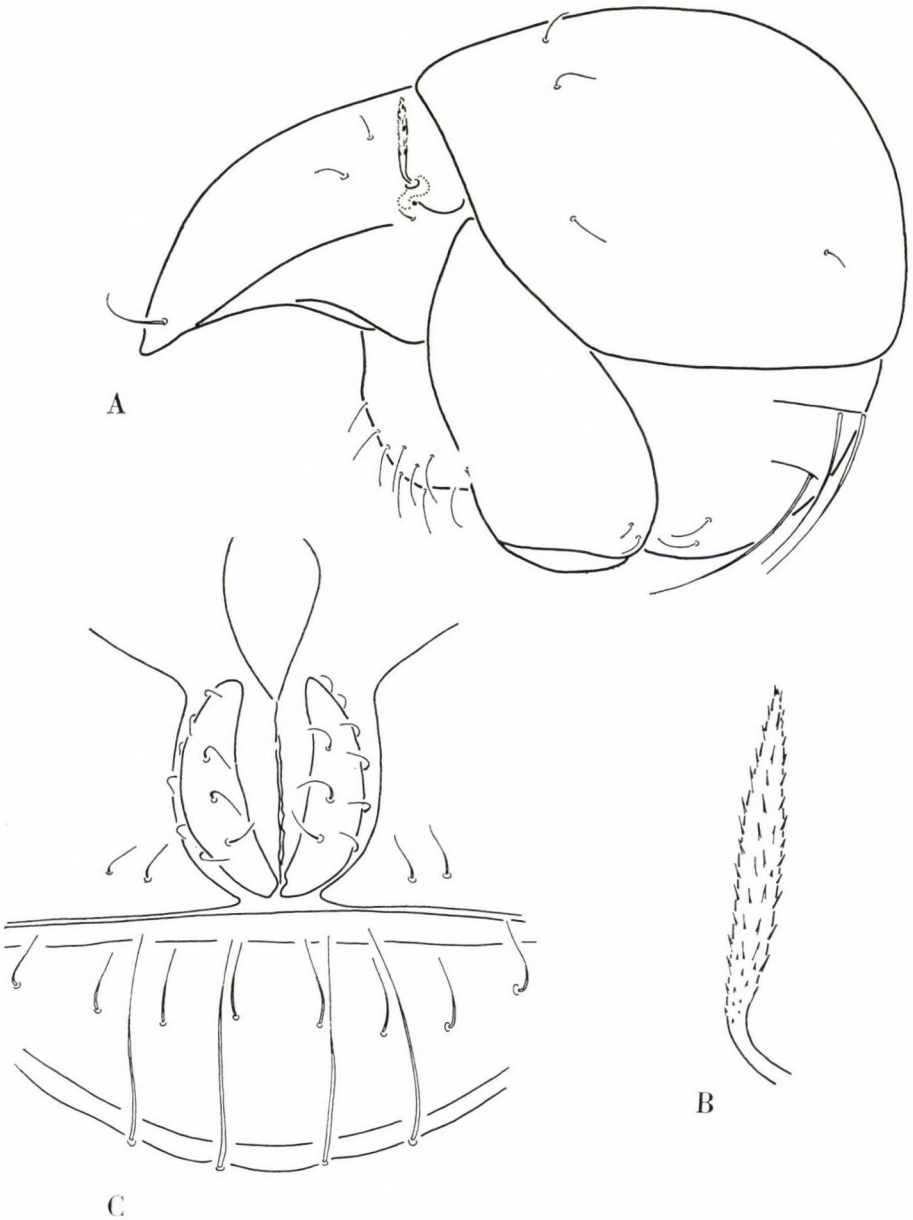

Fig. 1. A—C: *Aedoplophora glomerata* GRANDJEAN, 1932. A = lateral, B = sensillus, C = anal region

GRANDJEAN again treated the species in 1954 in detail. However, here no mention is made of the sensillus, since all of his three specimens lack it. GRANDJEAN supposed that it very easily breaks off (1954, pp. 315—316).

The 15 specimens that have been examined by me all had intact sensillus, consequently I cannot subscribe to GRANDJEAN's opinion. The difference in the shape of the sensillus I consider an observational mistake, for otherwise the sensillus fully conforms in both sets of specimens, thus representing *Ae. glomerata* GRANDJEAN, 1932.

Material examined: Colombia, Icononzo, Puente Natural, 75 km SW from Bogota, remainder of a natural forest; 5. I. 1968.

PHTHIRACARIDAE PERTY, 1841

Phthirarica andina sp. n. (Figs 2A—F)

Length of aspis: 315—349 μm, length of notogaster: 582—754 μm; height of notogaster: 467—480 μm.

Aspis: Rostrum widely rounded. Rostral hairs curved, pro- and inclinate, crossing each other, ciliated, distally. Interbothridial region with two pairs of long erect hairs: inner pair much longer, than outer pair; latter as long as sensillus. Interbothridial hairs ciliated. Sensillus long, distally slightly fusiform and ciliated, with a pointed tip.

Notogaster: 16—17 pairs of median long, erect, slightly proclinate and very finely ciliate notogastral hairs; neotrichy in the *ps*-region.

Ano-adanal region: Six pairs of hairs on ano-adanal plate: 2 pairs of anal, 1 pair of adanal hairs in marginal position; 3 pairs of adanal hairs each in an exterior longitudinal row.

Material examined: Colombia; Páramo de Monserrate, 3200—3300 m, Holotype; paratypes from the same locality.

Remarks: The genus *Phthirarica* MAHUNKA, 1982 had only one species: *P. ridicula* MAHUNKA, 1982 from Costa Rica, Turrialba, 560 m. The new species is bigger, its outer pair of interbothridial hairs much longer; there are 1—2 pairs of neotrichial hairs in *ps*-region; also the position of anal and adanal hairs different.

Sturmacarus gen. n.

Two pairs of anal, 4 pairs of adanal hairs. 15—19 pairs of notogastral hairs. Three pairs of hairs on the aspis setiform, not erect. Sensillus very short, dilated and fusiform.

Type-species: *Sturmacarus espeletiae* sp. n.

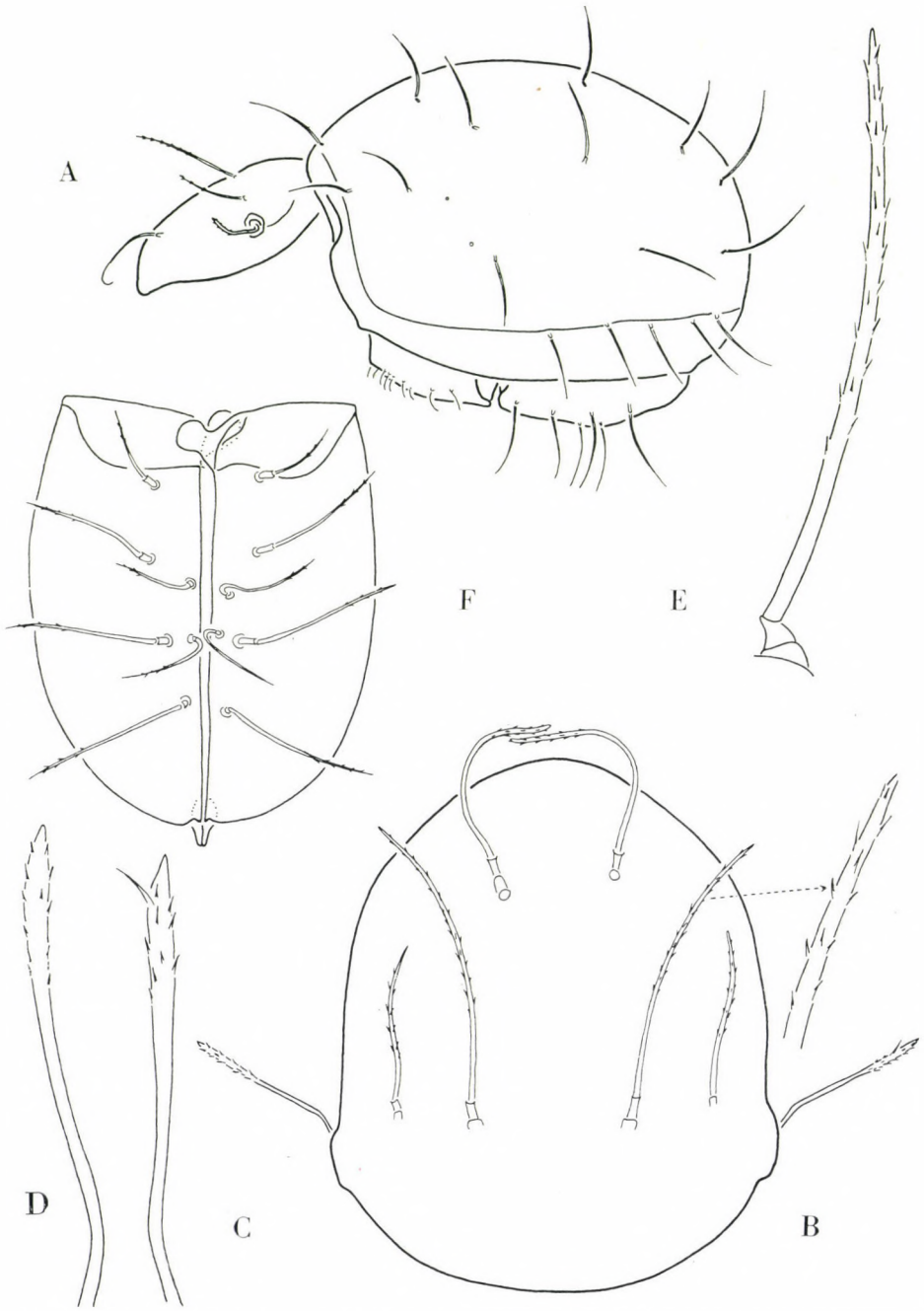

Fig. 2. A—F: *Phthirarica andina* sp. n. A = lateral, B = aspis, dorsal, C, D = sensillus, E = notogastral hair, F = anal plates

R e m a r k s : The new genus comes close to *Phthirarica* having 6 pairs of hairs on the ano-adanal plates. The differences are as follow:

	Phthirarica	**Sturmacarus**
1. Sensillus	long, setiform	short, fusiform
2. Rostral hairs	strongly curved, crossing each other, long, thick, ciliate	never crossing, fine, short, smooth
3. Aspis-hairs	long, erect, partly bacilliform, ciliate	short, adjacent, setiform, smooth

Sturmacarus espeletiae sp. n. (Figs 3A—F)

Length of aspis: 217—291 μm; length of notogaster: 390—533 μm; height of notogaster 295—385 μm.

A s p i s : Rostrum widely rounded. Rostral hairs short, fine, slightly exclinate or parallel; not ciliate. Interbothridial region with two pairs short straight, fine, setiform hairs. Sensillus very short, dilated, fusiform.

N o t o g a s t e r : 18—19 pairs of short, fine, erect, slightly proclinate notogastral hairs. Notogastral hairs with very fine and short cilia. Visible only under greater magnification.

A n o - a d a n a l r e g i o n : Adanal hairs ad_1—ad_4 gradually becoming shorter.

M a t e r i a l e x a m i n e d : Colombia, Páramo de Monserrate, 3200—3300 m, holotype; 17 paratypes from the same locality; Colombia, Laguna de Mucubaji, paramo, Espeletia schultzii, dead leaves; with BERLESE-funnel, 10. XI. 1978, 10 paratypes.

Sturmacarus hirtus sp. n. (Figs 4A—F)

Length of aspis: 349 μm; length of notogaster: 590 μm; height of notogaster: 431 μm.

A s p i s : Rostrum widely rounded. Rostral hairs medium long, fine, not ciliate. Interbothridial region with two pairs of medium long, very fine and smooth hairs. Sensillus with a short stalk and a rounded, capitate head.

N o t o g a s t e r : 15 pairs of notogastral hairs: all long, fine piliform, proclinate. Surface of notogaster with a very fine structure as shown in Fig. 4A.

A n o - a d a n a l r e g i o n : Adanal hairs ad_1—ad_4 gradually becoming shorter. Anal hairs much longer than adanal hairs.

M a t e r i a l e x a m i n e d : Colombia, Páramo de Sumapaz, cca 3700 m, soil from 0—5 cm at Espeletia. Berlese-funnel, 5. X. 1978, Holotype.

R e m a r k s : The new species differs from *Sturmacarus espeletiae* by 1. the form of sensillus; 2. length and form of aspis-hairs, 3. length and form of notogaster hairs, 4. sculpture of notogaster, 5. length and position of ano-adanal hairs (as shown in Figs 3A—F and 4A—F).

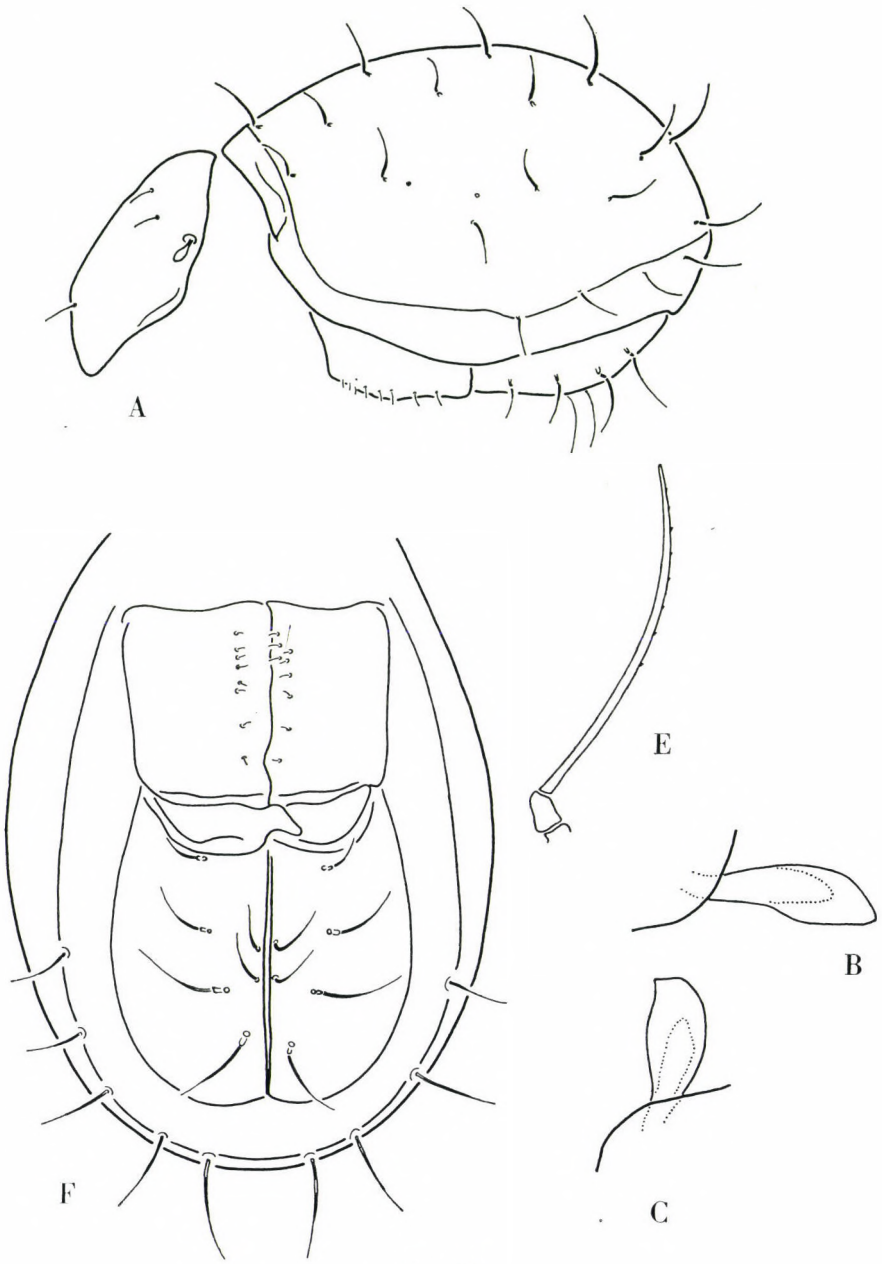

Fig. 3/1

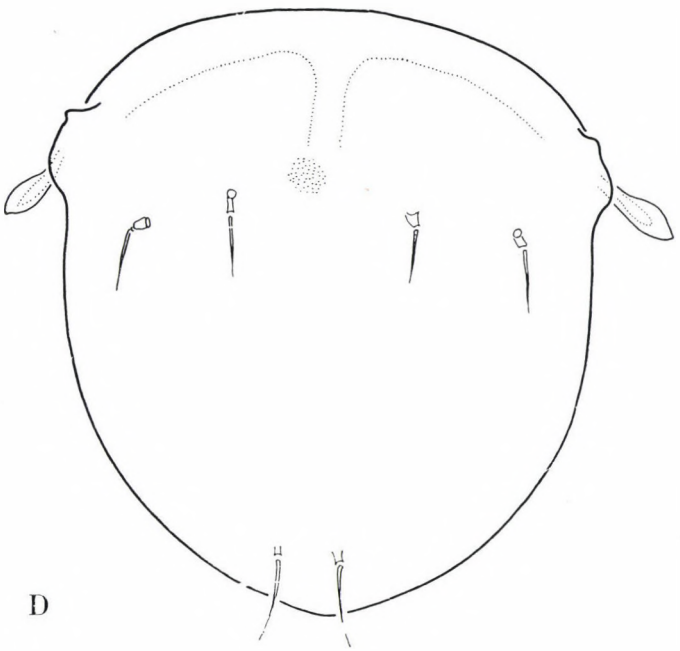

Fig. 3. A—F: *Sturmacarus espeletiae* sp. n. A = lateral, B, C = sensillus, D = aspis, dorsal E = notogastral hair, F = genital-anal region

Xenolohmannia comosa sp. n. (Figs 5A—B)

Length: 931— 988 μm, width: 615— 656 μm.

D o r s a l s i d e : Sensillus pectinate, with 6, gradually shortened braches. The first and second braches fairly long. Prodorsal hairs long, thin, hairs exp shorter than the others.

All notogastral hairs very long, with flagellate end with fine, short scattered cilia (visible only under greater magnification!). Notogastral neotrichy: 19 to 20 pairs notogastral hairs. Transversal ribons or areae porosae hardly discernible, forming 8—9 transversal rows.

V e n t r a l s i d e : Epimeral and genital regions connected with a chitinous bridge. Genital plates with a transversal suture. Central part of posterior genital plates somewhat protuberant. Preanal plate broad. Ano-adanal plate broad, semicircular, bending upwards; bearing 6 hairs arranged in one longitudinal row (Fig. 5D shows a supranumerary hair on the right side!). Ano-adanal hairs long.

M a t e r i a l e x a m i n e d : Colombia, Resina, Eastern Cordilleres, cca. 1600 m, remains of a montane forest, litter, 8. VI. 1956, holotype; 8 paratypes form the same locality.

R e m a r k s : The genus *Xenolohmannia* BALOGH et MAHUNKA, 1969 has 2 species: *X. discrepans* BALOGH et MAHUNKA, 1969 (Brazil, Manaus) is

663×428 μm, having 8—9 braches on the sensillus and short, setiform notogastral hairs; *X. capillata* BALOGH et MAHUNKA, 1978 (Brazil, Manaus) is 680—696×429—440 μm, having 8—10 branches on the sensillus and partly very short, and partly long notogastral hairs.

Pseudotocepheus sturmi sp. n. (Figs 6A—D)

Length: 623 μm, width: 267 μm.

D o r s a l s i d e : Sensillus medium long, with gradually dilated, rounded end. Interlamellar hairs long. Lamellar hairs originating on an abrupt transversal arch, situated near to rostrum. Rostral hairs situated on the same level as the lamellar hairs. Lamellae absent. Several rounded foveolae on the lateral part of prodorsum. One pair of rounded, weak enatiophyses, directed backwards on the median part of posterior margin of prodorsum.

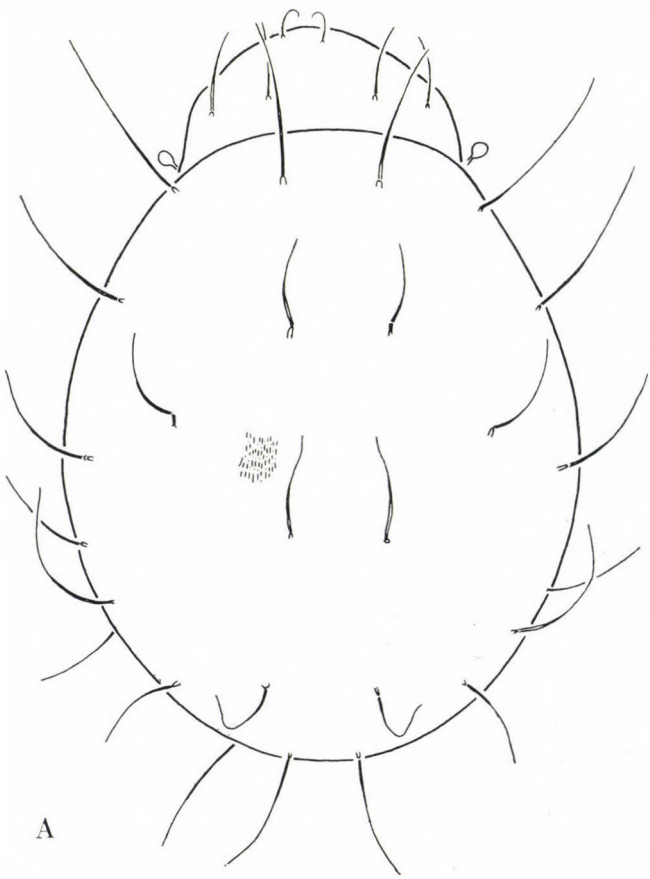

Fig. 4/1



Fig. 4. A—F: *Sturmacarus hirtus* sp. n. A = dorsal, B = lateral, C, D = sensillus, E = aspis, dorsal, F = anal plate

Ten pairs of medium long, fine notogastral hairs. No protuberances or enatiophyses on the anterior margin of notogaster.

Ventral side: Three pairs of genital, one pair of aggenital, two pairs of anal, three pairs of adanal hairs. Hair *ad* in adanal position. Pori *iad* preanal. Ventral plate foveolated.

Material examined: Colombia, Macarena, tropical rainforest, cca. 450—650 m, litter, 22. II. 1956, holotype.

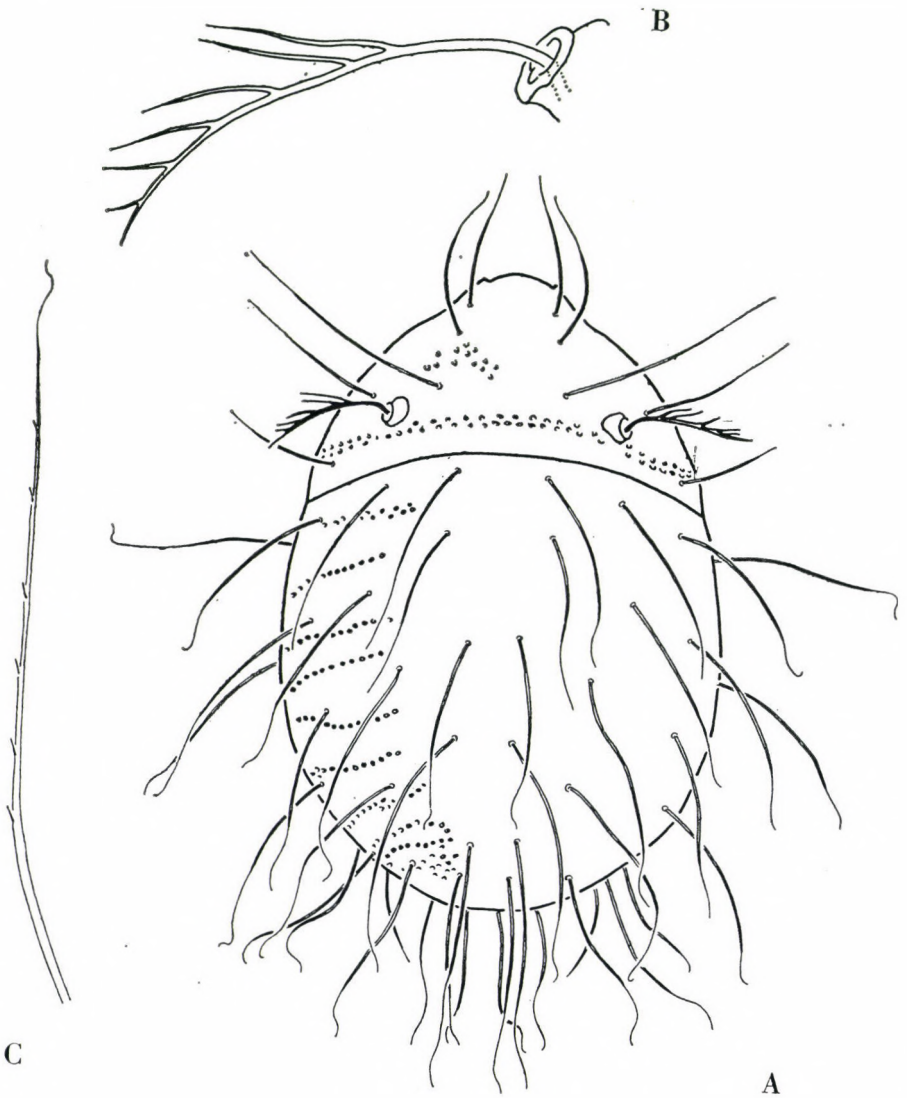

Fig. 5/1



D

Fig. 5. A—D: *Xenolohmannia comosa* sp. n. A = dorsal, B = sensillus, C = notogastral hairs, D = genito-anal region

R e m a r k s : There are 4 species of *Pseudotocepheus* without costula: *P. pauliani* BALOGH, 1960 (Madagascar), *P. pygmaeus* BALOGH, 1962 (Madagascar), *P. septemtuberculatus* BALOGH et MAHUNKA, 1978 (Brazil) and *P. vicarius* BALOGH et MAHUNKA, 1978 (Queensland).

The differences of this species group are as follows:

1 (2) Pori iad between ad_2 and ad_3 in adanal position. Humeral protuberance opposite to the posterior tubercle of bothridium **P. vicarius** BALOGH et MAHUNKA, 1978
2 (1) Pori iad on level with ad_3 or before it, in preanal position.
3 (4) Lamellar hairs originating on level with rostral hairs **P. sturmi** sp. n.
4 (3) Lamellar hairs originating behind rostral hairs.
5 (6) 6—8 rounded tubercles on the posterior margin of prodorsum. Pori *iad* on level with hairs ad_3 **P. septemtuberculatus** BALOGH et MAHUNKA, 1978
6 (5) Two rounded tubercles on the posterior margin of prodorsum or smooth. Pori *iad* before insertion point of ad_3.
7 (8) Two rounded tubercles of posterior margin of prodorsum. Notogaster with short longitudinal wrinkles. Notogastral hairs short. 1134 μm **P. pauliani** BALOGH, 1960
8 (7) Posterior margin of prodorsum without two rounded tubercles. Notogaster with fine punctulation. Notogastral hairs long. 560—567 μm **P. pygmaeus** BALOGH, 1962

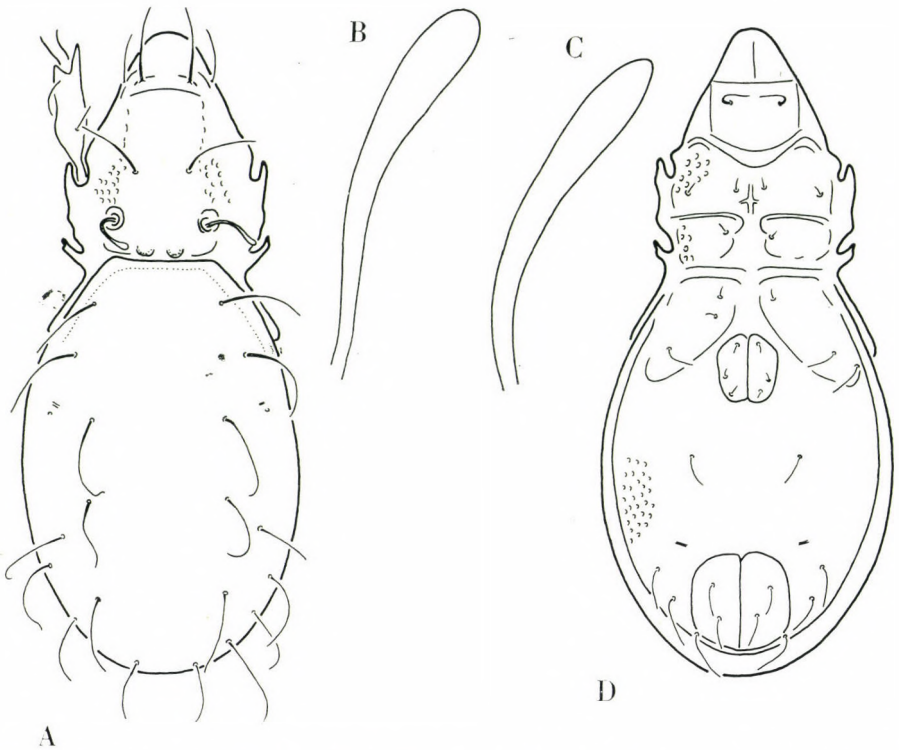

Fig. 6. A—D: *Pseudotocepheus sturmi* sp. n. A = dorsal, B, C = sensillus, D = ventral

Flagellocepheus gen. n.

Fam. Otocepheidae. Three pairs of genital hairs. Thirteen pairs of notogastral hairs. Pori iad in apoanal position. Hairs ad_1 in postanal, ad_2 and ad_3 in adanal position. Costulae present. Dorsosejugal region without enantiophyses.

Type-species: *Flagellocepheus sagittatus* sp. n.

R e m a r k s : There are only 2 genera of the family Otocepheidae having 12—14 pairs of notogastral hairs, 3 pairs of genital hairs and pori iad in apoanal position: *Neotocepheus* HAMMER, 1966 (New Zealand) and *Plenotocepheus* HAMMER, 1966 (New Zealand, Rhodesia), but these have well developed enantiophyses in the dorsosejugal region.

Flagellocepheus sagittatus sp. n. (Figs 7A—D)

Length: 435 μm, width: 221 μm.

D o r s a l s i d e : Sensillus medium long, proclinate and inclinate, with an aciculate, straight end. Interlamellar hairs medium long, flagellata.

Lamellar and rostral hairs in a horizontal row. Posteromarginal part of interlamellar region with a transversal keel.

Notogaster with 13 pairs of medium long, flagellate hairs. Dorsosejugal suture without enantiophyses.

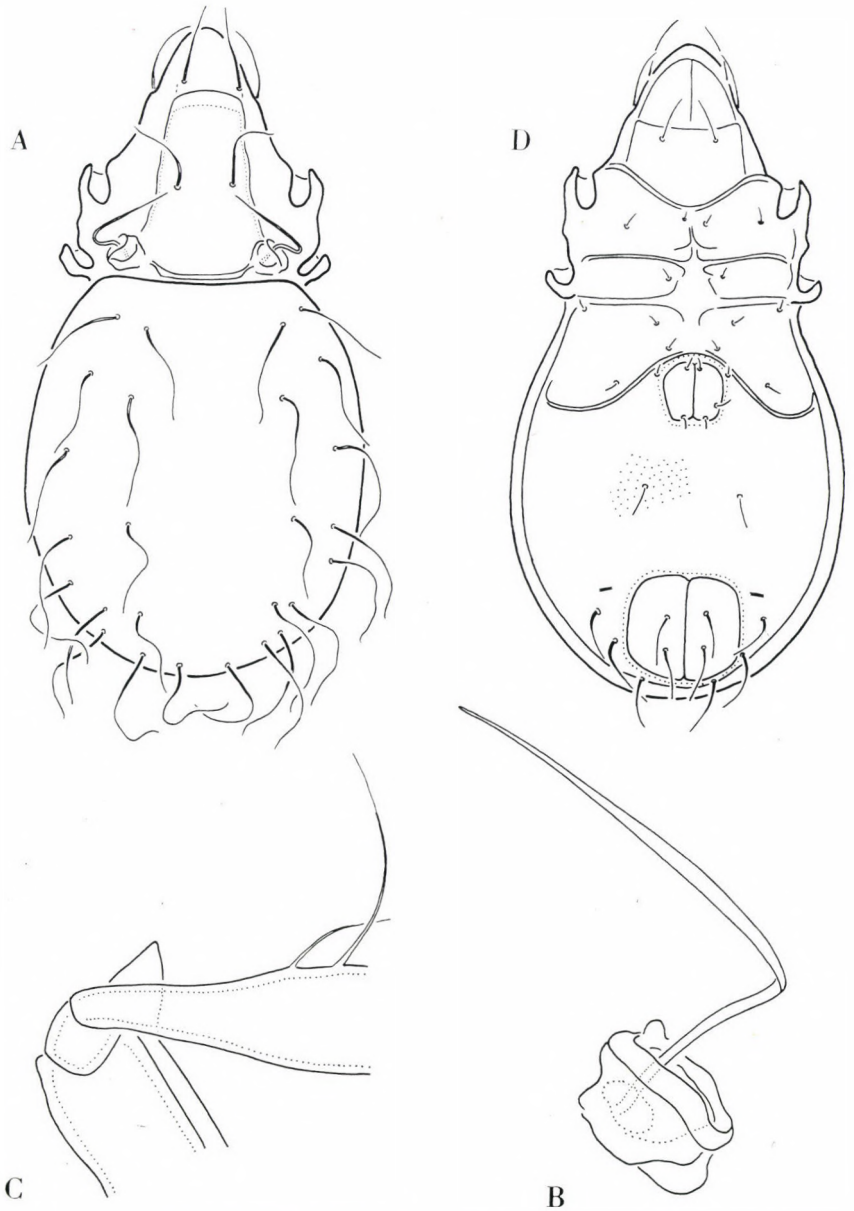

Fig. 7. A—D: *Flagellocepheus sagittatus* sp. m. A = dorsal, B = sensillus, C = femur, genu and tibia I, exteriorad and anteriorad, D = ventral

Ventral side: Three pairs of genital hairs. (On the left genital cover only 2 pairs!). One pair of aggenital, two pairs of anal, three pairs of adanal hairs. Hairs ad_1 in postanal, ad_2 and ad_3 in adanal position. Pori *iad* apoanal, before ad_3, on level with anterior margin of anal plates. Ventral plate with very fine punctulation.

Material examined: Colombia, Resina, Eastern Cordilleres, cca. 1600 m, remains of a montane forest, litter, 8. VI. 1956, holotype.

Chavinia similis sp. n. (Figs 8A—D)

Length: 262—285 μm, width: 148—168 μm.

Dorsal side: Sensillus short, with fusiform, apically pointed head. Lamellar and interlamellar hairs short, fine; lamellar hairs on a triangular chitinous lath. Prodorsum with two bordered hollows laterally and with an other one medially. The bordering of this median hollow in front interrupted. There are six small tubercles on the posterior margin of prodorsum.

Notogaster with 10 pairs of notogastral hairs. Hairs *ta* short and thin, proclinate and exclinate; hairs *te*, *ti*, *ms*, r_1, r_2 and r_3 long; hairs p_1, p_2 and p_3



Fig. 8. A—D: *Chavinia similis* sp. n. A = dorsal, B, C = sensillus, D = ventral

very short and thin. Six pairs of long notogastral hairs much longer than those of *Chavinia paradoxa* HAMMER, 1961 (Peru).

V e n t r a l s i d e : Six pairs of genital, one pair of aggenital, two pairs of anal, three pairs of adanal hairs. Hairs ad_1 in postanal, ad_2 in adnal, ad_3 in preanal position.

M a t e r i a l e x a m i n e d : Colombia, Páramo del Huila, cca. 3700 m. Espeletia hartwegiana, dead lower leaves, BERLESE-funnel, 3. VII. 1978, holotype; 7 paratypes from the same locality.

R e m a r k s : The differences between *C. paradoxa* HAMMER, 1961 and *C. similis* sp. n. are as follows:

	C. paradoxa	C. similis
1. Sensillus apically	rounded	pointed
2. Median prodorsal hollow in front	closed	open
3. Six pairs of notogastral hairs	short	long

Oxyoppia polita sp. n. (Figs 9A—D)

Length: 270—275 μm, width: 144—148 μm.

D o r s a l s i d e : Sensillus long, with a fusiform and completely smooth head. Interlamellar and lamellar hairs short, rostral hairs longer. Costulae

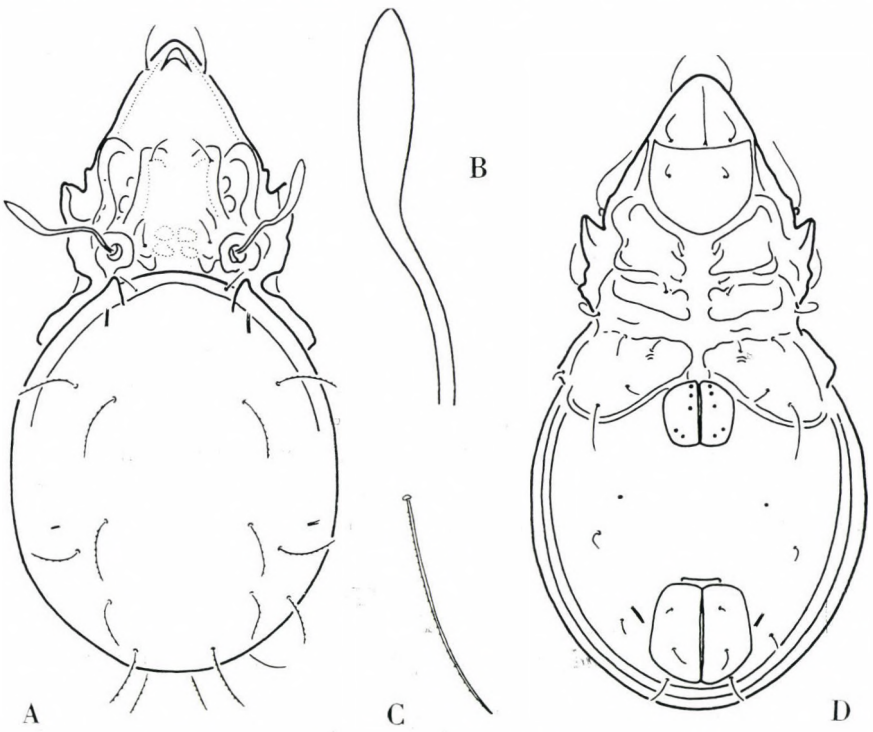

Fig. 9. A—D: *Oxyoppia polita* sp. n. A = dorsal, B = sensillus, C = hair r_1, D = ventral

apically with a transversal translamellar line, interrupted medially. Two tubercles and two pairs of areolae in the interlamellar region.

Notogaster with 10 pairs of notogastral hairs. Hairs *ta* short, proclinate and exclinate, the remaining notogastral setae only a little longer, but bacilliform and ciliated.

V e n t r a l s i d e : Six pairs of very short genital, one pair of aggenital, two pairs of anal, three pairs of adanal hairs. Hairs ad_1 in postanal, ad_2 in adanal, ad_3 in preanal position. Pori *iad* somewhat apoanal and oblique (infrequent in *Oxyoppia*!).

M a t e r i a l e x a m i n e d : Colombia, Páramo de Monserrate, 3200—3300 m, Espeletia grandifolia, dead leaves cca. at 54 cm height on the trunk, Berlese-funnel 3. V. 1968, holotype: 7 paratypes from the same locality.

R e m a r k s : This is the single species of *Oxyoppia* with 1. completely smooth sensillus head and 2. interrupted translamellar ridge.

Reductoppia gen. n.

Fam. Oppiidae, subfam. Arcoppiinae. Six pairs of genital, 10 pairs of notogastral hairs. Hairs *ta* present. Rostrum tripartite. There is a chitinous arch before the lamellar hairs. Pori *iad* in adanal position. Sensillus fusiform, apically pointed and smooth.

Type-species: *Reductoppia espeletiae* sp. n.

R e m a r k s : General characters as in *Arcoppia*, but the branches of sensillus are completely reduced, possibly a result of the special environment.

Reductoppia espeletiae sp. n. (Figs 10A—D)

Length: 298—455 μm, width: 230—262 μm.

D o r s a l s i d e : Sensillus at the end dilated, fusiform with a pointed tip. Interlamellar, lamellar and rostral hairs medium long, smooth. Two pairs of oblique areolae in the interlamellar area. There is a chitinous arch before the lamellar hairs. Rostrum tripartite, incisions with rounded basis.

Ten pairs of notogastral hairs. Hairs *ta* short, fine, exclinate and proclinate. Hairs *te*, *ti*, *ms*, r_2 and r_3 medium long, r_1 and p_3 shorter, p_1 and p_2 short.

V e n t r a l s i d e : Generally of *Arcoppia*-type. Six pairs of short genital hairs, each arranged in one longitudinal row. Ventral hairs very short. Hairs ad_1 in postanal, ad_2 and ad_3 in adanal position. Pori iad in adanal position.

M a t e r i a l e x a m i n e d : Colombia, Páramo del Huila, cca. 3700 m, Espeletia hartwegiana, dead lower leaves, Berlese-funnel, 3. VII. 1978, holotype; 7 paratypes from the same locality.

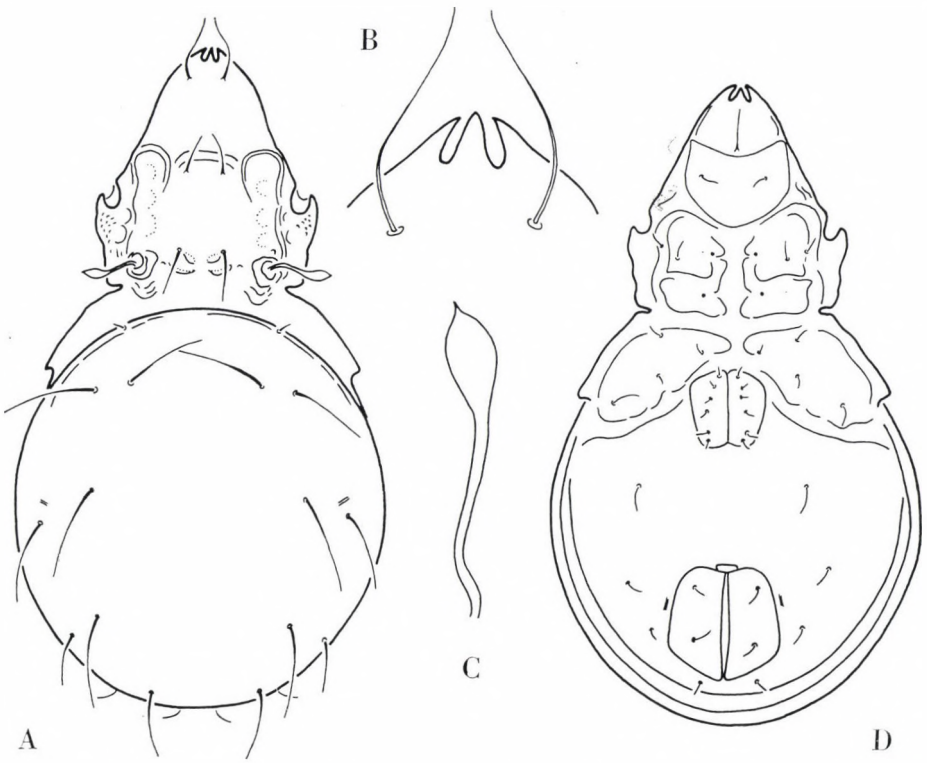

Fig. 10. A—D: *Reductoppia espeletiae* sp. n. A = dorsal, B = rostrum, C = sensillus, D = ventral

Amerioppia senecionis sp. n. (Figs 11A—G)

Length: 357—385 μm, width: 197—217 μm.

D o r s a l s i d e : Sensillus short, with fusiform, apically pointed head, three pairs of small areolae in the interlamellar region. Hairs *te* medium long, hairs *ro* shorter, near to each other, on the apical half ciliated.

Ten pairs of notogastral hairs. Hairs *ta* short, exclinate and proclinate. Hairs *ta*, *ti*, *ms*, r_1, r_2 and r_3 medium long, very finely ciliate; p_1, p_2 and p_3 shorter.

V e n t r a l s i d e : Five pairs of genital, one pair of aggenital, two pairs of anal, three pairs of adanal hairs. Hairs ad_1 in postanal position, near to each other.

M a t e r i a l e x a m i n e d : Colombia, Ruiz, Superparamo, living parts of Senecio species, 4640 m. 7. X. 1978, holotype; 6 paratypes, from the same locality.

R e m a r k s : This is the first *Amerioppia* species with a short, fusiform and pointed head.

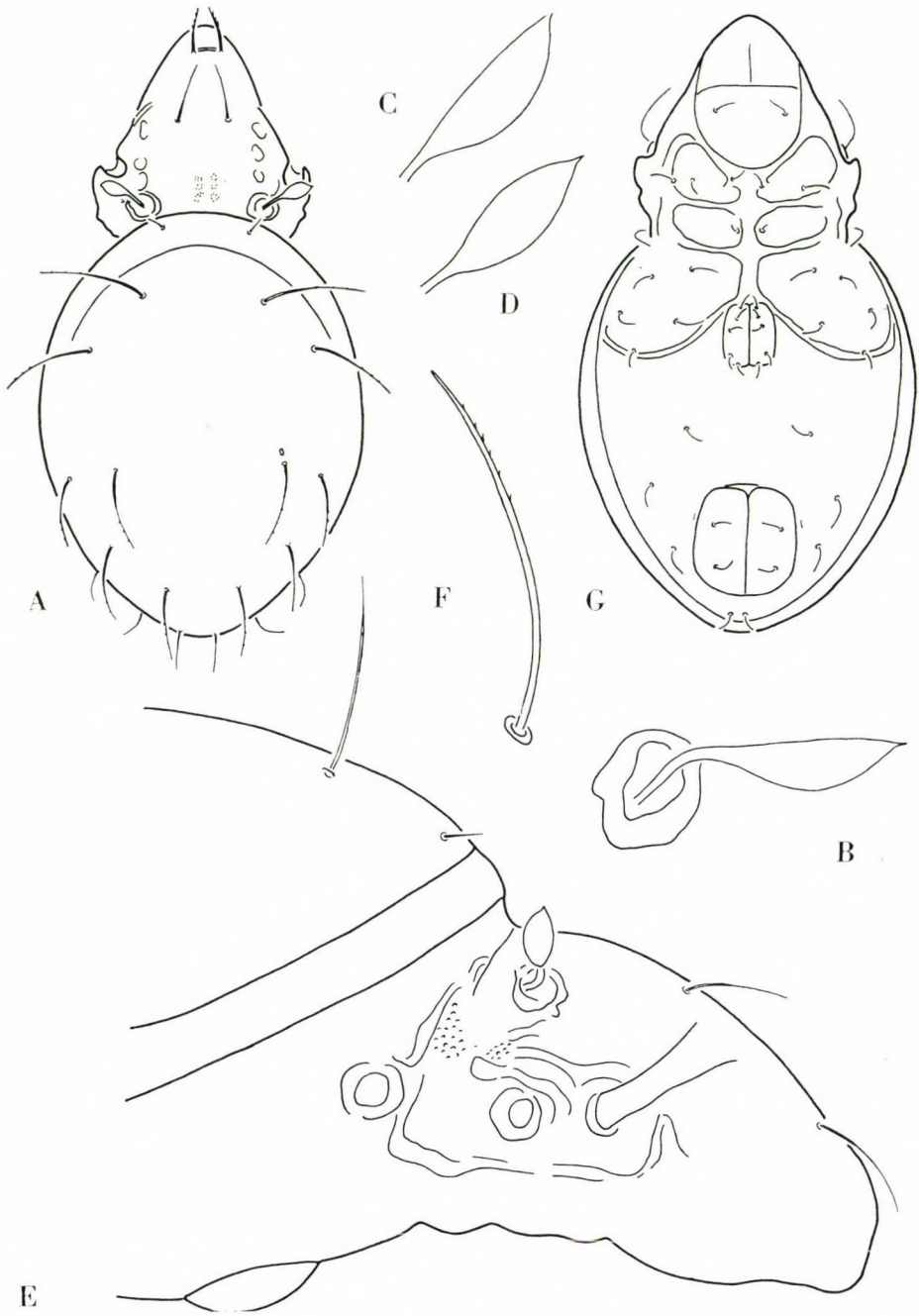

Fig. 11. A—G: *Amerioppia senecionis* sp. n. A = dorsal, B, C, D = sensillus, E = prodorsum, lateral, F = notogastral hair, G = ventral

Amerioppia espeletiarum sp. n. (Figs 12A—D)

Length: 328—414 μm, width: 189—230 μm.

D o r s a l s i d e : Sensillus with a very short stalk and a globular head. Notogastral hairs short and smooth. Three pairs of areolae in the interlamellar region. Exostigmatal hairs long. Granulation in the sub-bothridial region present.

Notogaster with 10 pairs of notogastral hairs. Hairs *ta* very short, exclinate and proclinate, hairs *te*, *ti*, *ms*, r_1, r_2 and r_3 short, hairs p_1, p_2 and p_3 very short.

V e n t r a l s i d e : Two parallel chitinous lines medially in the epimeral region. Five pairs of genital, one pair of aggenital, three pairs of adanal hairs. Hairs ad_1 in postanal, ad_2 in adanal, ad_3 in preanal position. Pori *iad* adanal.

M a t e r i a l e x a m i n e d : Colombia, Páramo de Sumapaz, cca. 3700 m, soil from 0—5 cm at Espeletia. Berlese-funnel, 5. X. 1978, holotype; 7 paratypes; from the same locality; Páramo el Tablazo at Bogota; 3100—3200 m, dead leaves, sifting and Berlese-funnel, 12. VIII. 1978, 12 paratypes; Páramo de Monserrate, 3200—3300 m, Espeletia grandifolia, dead leaves cca. at 54 cm height on the trunk, Berlese-funnel, 13. V. 1968, 15 paratypes; Páramo de Monserrate, 3230 m, Espeletia grandifolia, dead leaves, 21. VII. 1978, 4 paratypes; Cocuy, Espeletia lopezii, cca. 4000 m, dead leaves, 24. IX. 1978, 11 paratypes.

R e m a r k s : This is the first *Ameriopa*-species in having a sensillus with a very short stalk and a globular head.

Amerioppia cocuyana sp. n. (Figs 13A—E)

Length: 283—299 μm, width: 152—164 μm.

D o r s a l s i d e : Sensillus medium long, with a great fusiform head. Lamellar hairs short. Interlamellar area with two pairs of areolae. Exostigmatal hairs medium long. Rostral hairs very near to each other, ciliate.

Notogaster with pairs of notogastral hairs. Hairs *ta* very short. Hairs *te*, *ti*, *ms*, r_1, r_2 and r_3 medium long, hairs r_1, r_2 and r_3 short.

V e n t r a l s i d e : Five pairs of genital, one pair of aggenital, two pairs of anal, three pairs of adanal hairs, all short. Hairs ad_1 in postanal, ad_2 in adanal, ad_3 a little in preanal position. Pori *iad* adanal.

M a t e r i a l e x a m i n e d : Colombia, Páramo Cocua, cca. 4000 m, Espeletiopsis columbiana, dead leaves, 24. IX. 1978, holotype; 11 paratypes from the same locality.

R e m a r k s : There are only two smaller *Amerioppia* species (260—280 μm length) in the Neotropical Region: *Amerioppia paraguayensis* BALOGH et MAHUNKA, 1981 (Paraguay): this species has a longer and ciliated sensillus; *Amerioppia minima* HAMMER, 1961 (Peru): this species has a finely ciliate sensillus and much longer *te*, *ti*, *ms*, and r_3 hairs on the notogaster.

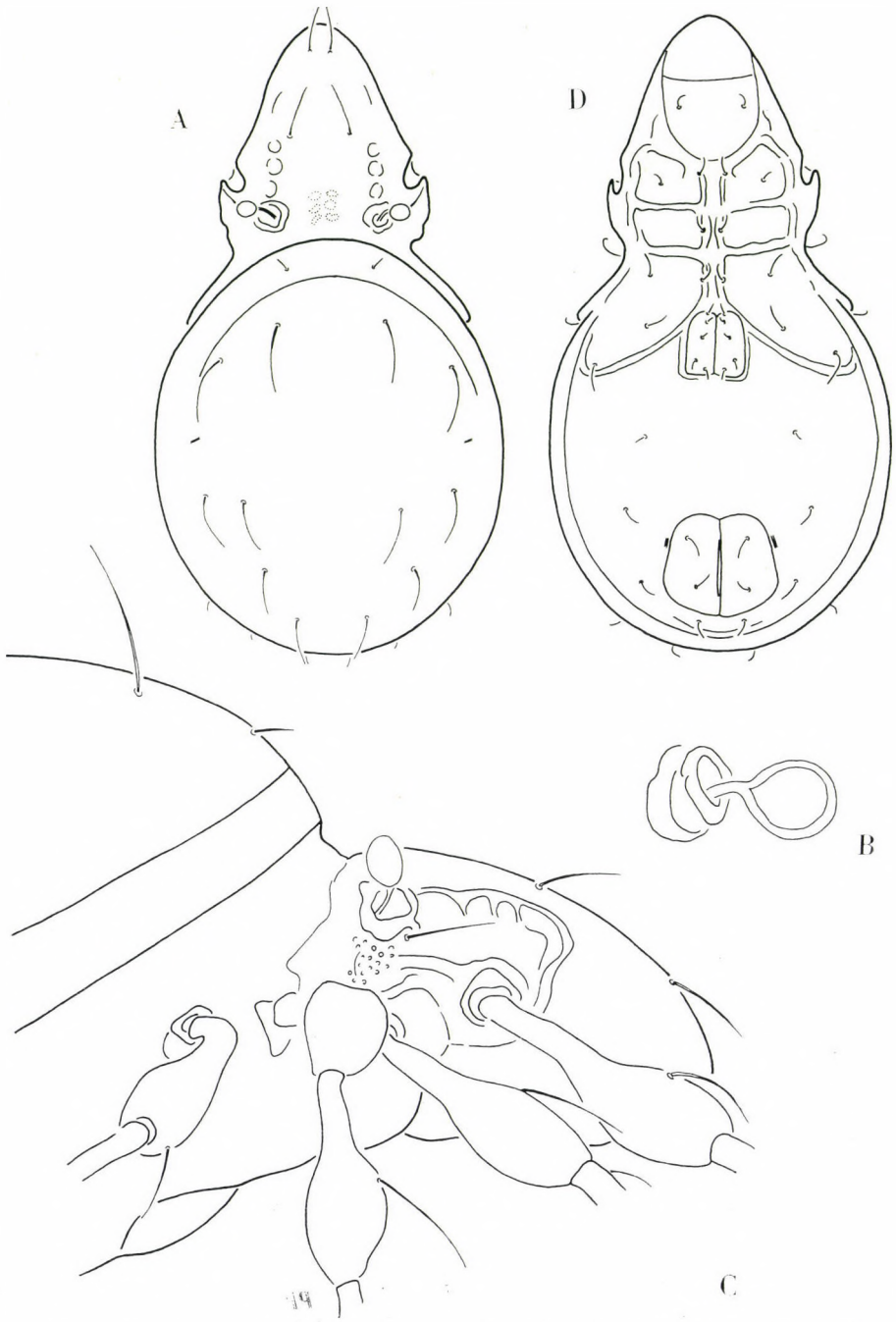

Fig. 12. A—D: *Amerioppia espeletiarum* sp. n. A = dorsal, B = sensillus, C = prodorsum, lateral, D = ventral

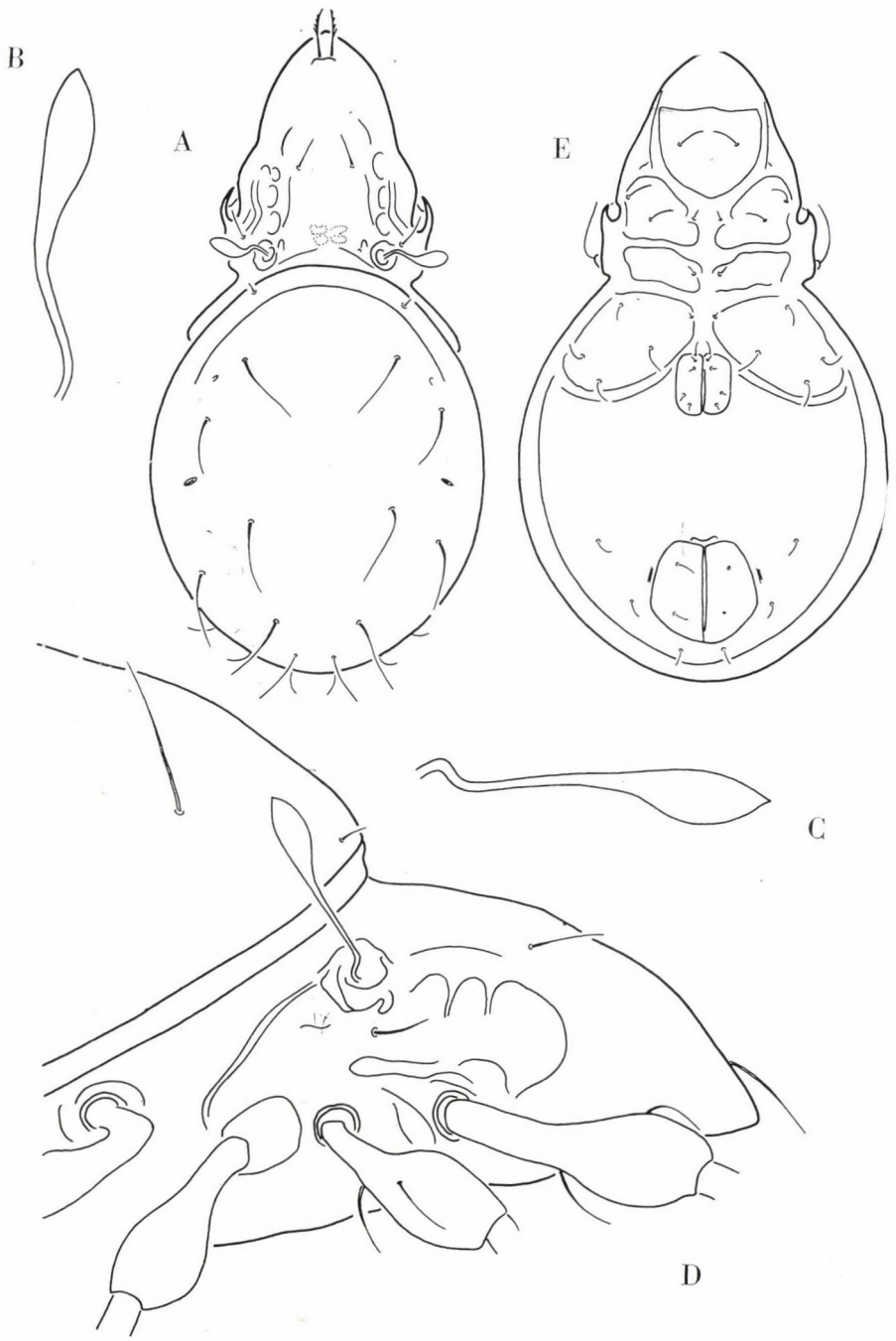

Fig. 13. A—E: *Amerioppia cocuyana* sp. n. A = dorsal, B, C = sensillus, D = prodorsum, lateral, E = ventral

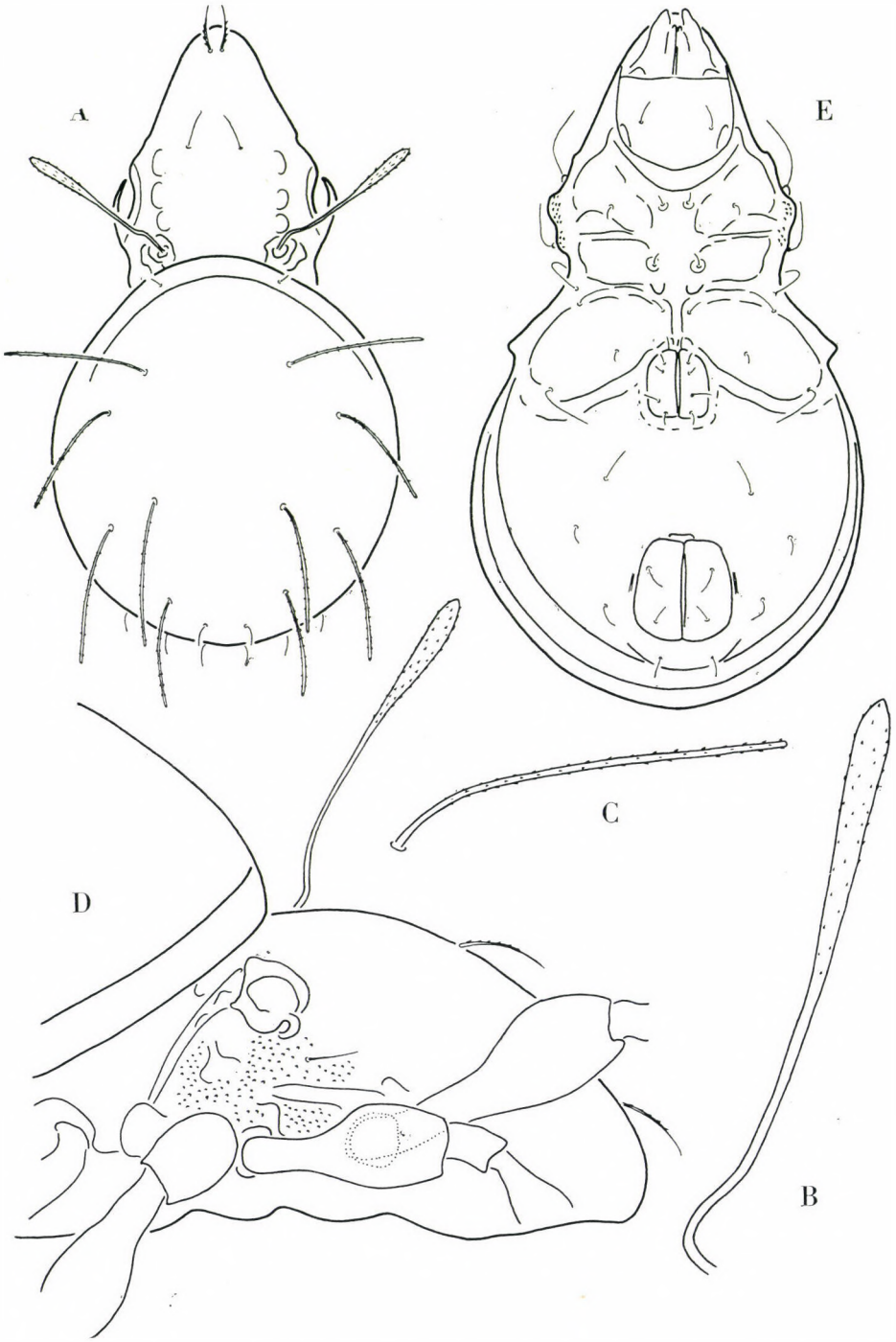

Fig. 14. A—E: *Amerioppia sturmi* sp. n. A = dorsal, B = sensillus, C = notogastral hair *te*, D = prodorsum, lateral, E = ventral

Amerioppia sturmi sp. n. (Figs 14A—E)

Length: 246 μm, width: 139 μm.

D o r s a l s i d e : Sensillus long, exclinate and proclinate, gradually becoming fusiform with a blunt tip, and with very small, scattered aciculi. Hairs of prodorsum short; lamellar hairs fine and smooth, rostral hairs near to each other and finely ciliate.

Notogaster with 10 hairs. Hairs *ta* tiny, exclinate and proclinate, hairs *te*, *ti*, *ms*, r_3 and r_2 long, somewhat bacilliform, with short, scattered aciculi and a blunt tip. Hairs r_3, p_1, p_2 and p_3 short, thin, smooth.

V e n t r a l s i d e : With characteristic, small chitinous tubercles, each one on the apodemata sejugal, near to the median axis and at the anterior margin of the genital plates. Five pairs of genital, 1 pair of aggenital, 2 pairs of anal, three pairs of adanal hairs. Hairs ad_1 in postanal, ad_2 in adanal, hairs ad_3 a little in preanal position.

M a t e r i a e x a m i n e d : Colombia, Bogota, 14. II. 1969, holotype.

R e m a r k s : There are two South American small species, which resemble the new species: *Amerioppia lanceolata* (HAMMER, 1958) and *Amerioppia minima* HAMMER, 1961. Both species have 6 long notogastral hairs and a medium long or long sensillus with an apically pointed tip. *Amerioppia sturmi* sp. n. has only 5 pairs of long notogastral hairs, hairs r_1, p_1, p_2 and p_3 are equally short and fine; the sensillus has a blunt tip.

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Acta Zoologica Hungarica 30 (1—2), pp. 53—77 (1984)

CONTRIBUTIONS TO THE MILLIPEDE FAUNA OF VIETNAM (DIPLOPODA) II

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(Received 2 November, 1982)

In extensive materials of the Diplopoda from Vietnam kept in the Hungarian Natural History Museum, Budapest, among the 12 discovered species of the family Paradoxosomatidae (Polydesmida) nine species and one genus proved to be new to science: *Vietnamorpha spiralis* gen. n., sp. n., *Szechuanella grandis*, *Tylopus hilaroides*. *T. magicus*, *T. maculatus*, *T. crassipes*, *T. procurvus*, *T. topali*, and *T. granulatus* spp. n. Remarks are given on the tribal position of the genera *Gonobelus Att.* and *Vietnamorpha* gen. n., and on the comparative anatomy of the gonopods of *Tylopus*. Two new chordeumoid diplopods described: *Metopidiothrix melanocephala* sp. n. and *Vieteuma topali* gen. n., sp. n. (Vieteumatidae fam. n.).

I. PARADOXOSOMATIDAE

The diplopod family Paradoxosomatidae (Polydesmida) is known to form a very considerable part of the Indochinese millipede fauna (ATTEMS, 1938, 1953). Therefore it was not at all surprising that the majority of the extensive collections of the Diplopoda made in 1966 by DR. G. TOPÁL and in 1971 by DRS G. TOPÁL and I. MATSKÁSI in North Vietnam and now kept in the Hungarian Natural History Museum, Budapest, were represented by paradoxosomatids. Moreover, among 12 identifiable species of this family nine species and one genus have proved to be new to science. Except for a few paratypes retained in the author's collection for a subsequent deposition in the Zoological Institute of the USSR Academy of Sciences, Leningrad, all the materials, including all the holotypes, have been returned to the Budapest Museum.

I am most grateful to DRS Z. KASZAB and S. MAHUNKA (Budapest) for the opportunity to study these materials under their care. DR. G. TOPÁL of the Budapest Museum is also thanked for providing full information on the localities and habitats of the specimens. Besides, I wish to thank particularly Prof. DR. R. L. HOFFMAN, Radford University, Virginia, USA, for valuable comments on the status of my new genus described below. My further deep gratitude concerns DR. J. GRUBER, Naturhistorisches Museum, Vienna, for making available for restudy the type-specimens and slides of *Gonobelus sinensis* ATT., *Anoplodesmus hilaris* ATT., *A. mutilatus* ATT., *Sundanina sigma* ATT. and *Agnesia nodulipes* ATT. of the ATTEMS collection kept in the Vienna Museum.

Oxidus gracilis (C. L. KOCH, 1847)

Locality: Vietnam, Prov. Lao cai, Co xan, in and around a cave, 6 ♂♂, 1 ♀, 2 juv. — 27. XI. 1971 (No. 133), leg. TOPÁL and MATSKÁSI. — Material examined: 9 specimens.

Remarks: This species, probably of East Asiatic origin (JEEKEL, 1968), is (sub)-cosmopolitan, widespread throughout tropical and subtropical areas by man; in more temperate or continental regions is encountered only in hothouses.

Orthomorpha coarctata (DE SAUSSURE, 1860)

Localities: Vietnam, Mai lam, NE of Hanoi, sifted from under decaying corn-stems, 1 ♂, 2 ♀♀ — 13. IV. 1966 (No. 28), leg. TOPÁL. — Same locality, from pitfall traps under a bushy fence in village, 5 ♂♂, 2 ♀♀ — 13—16. IV. 1966 (No. 83), leg. TOPÁL. — Same locality, from pitfall traps in corn field, 2 ♂♂ — 13—16. IV. 1966 (No. 84), leg. TOPÁL. — Yen so, SW of Hanoi, beaten from trees in village, 1 ♂, 1 ♀ — 22. IV. 1966 (No. 121), leg. TOPÁL. — Than liet, SW of Hanoi, beaten from trees, 1 ♂ — 23. IV. 1966 (No. 140), leg. TOPÁL. — Material examined: 15 specimens.

Remarks: The species is circum-tropical, easily dispersed through human agency, probably of Oriental origin (JEEKEL, 1968).

Helicorthomorpha holstii (POCOCK, 1895)

Localities: Vietnam, Mai lam, NE of Hanoi, beaten from bushes in village, 8 ♂♂, 6 ♀♀ — 16. IV. 1966 (No. 85), leg. TOPÁL. — Prov. Ninh binh, Cuc phuong, forest on limestone hill, 1 ♂, 1 ♀ — 3. V. 1966 (No. 247), leg. TOPÁL. — Same locality, beaten from bushes near creek, 1 juv. — 7. V. 1966 (No. 268), leg. TOPÁL. — Same locality, 1 ♀ — 12. V. 1966 (No. 348), leg. TOPÁL. — Same locality, beaten from bushes, 2 ♂♂, 1 ♀ — 14. V. 1966 (No. 365), leg. TOPÁL. — Same locality, 1 ♂, 1 ♀ — without date, leg. T. PÓCS. — Thuong linh, near Phu ly, 1 ♂, 1 ♀ — 21. V. 1966 (No. 437), leg. TOPÁL. — Prov. Yen bai, Yen bai, 1 ♀ — 18. XI. 1971 (No. 25), leg. TOPÁL and MATSKÁSI. — Prov. Yen bai, Minh xuan, near Luc yen, 300 m, beaten from bushes, 1 ♂, 1 ♀, 4 juv. — 2. XII. 1971 (No. 189), leg. TOPÁL and MATSKÁSI. — Prov. Yen bai, Luc yen, 300 m, beaten from bushes in forest, 1 ♂, 1 juv. — 5. XII. 1971 (No. 238), leg. TOPÁL and MATSKÁSI. — Prov. Yen bai, Muong son, 300 m, beaten from bushes on bank of River Chay, 1 juv. — 8. XII. 1971 (No. 246), leg. TOPÁL and MATSKÁSI. — Same locality, beaten from bushes on southern slopes, 1 ♂, 1 juv. — 8. XII. 1971 (No. 273), leg. TOPÁL and MATSKÁSI. — Material examined: 31 specimens.

Vietnamorpha gen. n.

Strongylosomoid paradoxosomatid of medium size (about 2 cm long) with long legs. Paranota 2 below collum. Pleural keels present. A rather small trapeziform lamina between male coxae 4. Leg-pair 1 without processes on joints.

Gonopods high, rather simple, with distal parts bent dorsad toward coxites. Coxite quite short, subcylindrical; prefemur setose, set off from acropodite by an oblique suture; femorite long, slender, almost parallel-sided, gently bent toward coxite, mesally carrying seminal groove, set off by a poor oblique cingulum from postfemur; postfemoral portion with a dorsal process, set off by a good cingulum from tibiotarsus. Solenomerite becomes free from distal part of postfemur, rather long, serrate and/or spiny, well spiral together with lamellar and more or less slender tibiotarsus.

Type-species: *Vietnamorpha spiralis* sp. n.

Remarks: *Vietnamorpha* gen. n. is obviously most closely related to the genus *Gonobelus* ATT. erected by ATTEMS (1936, 1937) for the only species, *G. sinensis* ATTEMS, 1936,

from Yunnan, South China. Apart from the same distributional pattern, similarities between the two genera can be observed in the habitus (poor development of paraterga, very long legs, etc.), as well as in the gonopod structure (general outlines, distal parts bent dorsad, a dorsal postfemoral process, serrate and spiny solenomerite, spiral tibiotarsus, etc., which, upon a restudy of the types, have all proved to be correctly described and depicted by ATTEMS). However, both these genera seem well distinguishable by the lack of paraterga, normal male prefemur 1, practically parallel-sided gonofemorite curved dorsad, much shorter gonocoxites and tibiotarsus in *Vietnamorpha* gen. n.

As regards the tribal position of both *Gonobelus* and *Vietnamorpha*, this question is indeed very difficult as the former has hitherto been regarded of incertae sedis (JEEKEL, 1968; HOFFMAN, 1979). Several genera of the Paradoxosomatidae, both Asian and African (HOFFMAN, 1963, 1982), seem to have the gonopods provided not with usually one, but with two cingula (or sulci) demarcating the postfemoral region from both the femorite and tibiotarsus. Perhaps this is also the case with the closely related genera *Kaschmiriosoma* SCHUB. from Kashmir, Pakistan and Afghanistan, *Gonobelus* ATT. from South China, and *Vietnamorpha* gen. n. from North Vietnam. The process(es) arising proximad of the cingulum demarcating the tibiotarsus should be thus considered postfemoral. The three above genera can probably be regarded as disjunct representatives of the mainly Asian tribe Sulciferini still outlined far from perfect (JEEKEL, 1968; HOFFMAN, 1979).

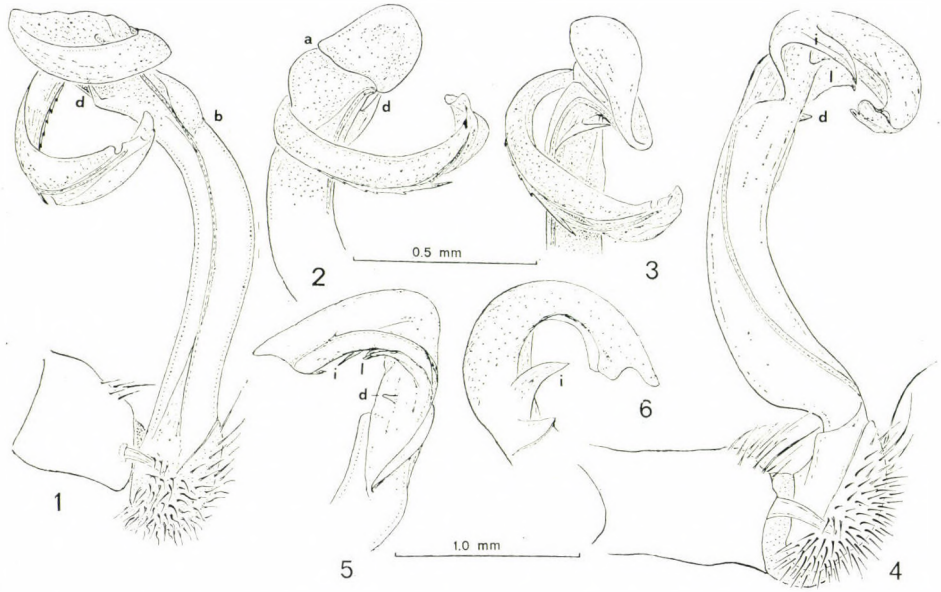
Vietnamorpha spiralis sp. n. (Figs 1—3)

L o c a l i t i e s : Vietnam, Prov. Ninh binh, Cuc phuong, pitfall traps in forest, 9 ♂♂ (including holotype), 4 ♀♀, 2 juv. — 5—18. V. 1966 (No. 385), leg. TOPÁL. — Same locality, pitfalls near a creek, 1 ♂, 3 juv. — 6—18. V. 1966 (No. 387), leg. TOPÁL. — Material examined: 19 specimens.

Holotype male and 16 paratypes deposited in the Hungarian Natural History Museum, Budapest; one male and one female paratypes (No. 385) retained in the author's collection.

D e s c r i p t i o n : Males up to 19 mm long and 1.4 mm wide (holotype), females up to 20 mm long and 1.6—1.7 mm wide. Colouration rather uniform marble brown, testaceous; antennae light brown, only joints 6 to 8 white; legs light brown, tarsi yellowish.

Antennae long and slender, slightly clavate, almost reaching the ozopore of ring 5. Head a little broader than collum, the latter a little broader than segments 2 to 4 and of subequal width with ring 5. Body strongylosomoid, moniliform, parallel-sided till ring 17, onward gradually tapering. Surface shining and quite smooth, with several poor wrinkles only above pleural keels, absolutely without lateral keels or paranota. Rings well constricted, with very poor metazonal lateral swellings a bit better expressed on pore-bearing mid-body rings. Collum with anterior 4 + 4 and medial 2 + 2 very long setae in two transverse rows arched forward. Terga 2 and 3 with 3 + 3, subsequent metazona with 2 + 2, such setae in one transverse row. Dorsal axial suture displayed as a very thin yellowish line, neither sulci nor tubercles. Pleural keels moderately developed, small, reaching segment 16. Epiproct rather long, in lateral view a bit bent down, almost straight, in dorsal view long, subtriangular, roundly bulbous at the apex, without evident apical and/or subapical papillae, but setose. Anal valves margined. Sterna (from 6th in males, from 4th in females) with a pair of small, paramedian, acute spines directed backwards, each surmounted by a long seta and gradually increasing in length to the penultimate leg-pair.



Figs 1—6. 1—3 = *Vietnamorpha spiralis* gen. n., sp. n., ♂ paratype: 1 = left gonopod (medial view); 2—3 = distal part of the gonopod (dorsal and subventral views, respectively); 4—6 = *Szechuanella grandis* sp. n., ♂ holotype: 4 = left gonopod (medial view); 5—6 = distal part of the gonopod (frontal and sublateral views, respectively)

♂. — Legs very long and slender, especially at hind body half. Pair 1 somewhat reduced, without any processes on any joint; beginning from pair 3, tibiae and tarsi subequally long, the latters always without brushes. Sterna 4 and 5 with a pair of large, well separated, acute, paramedian spines directed obliquely forward and a rather small, setose, unpaired, trapeziform lamina, respectively.

Gonopods (Figs 1—3) slender, high, with the distal parts bent dorsad toward coxite; coxae short, subcylindrical, distally setose; prefemur densely setose, well set off from acropodite by an oblique suture; femorite elongate, parallel-sided, regularly and gently bent dorsad, with seminal groove running along its mesal side, apically with a trace (rudiment ?) of cingulum (*b*) obliquely demarcating postfemoral portion; latter with an acute dorsal spine (*d*) and a good cingulum (*a*) demarcating tibiotarsus. Solenomerite becoming free from distal part of postfemur, serrate, distally with a long spine, all attached to tibiotarsus which makes two spiral rounds and is quite slender and lamellate.

Szechuanella grandis sp. n. (Figs 4—6)

Localities: Vietnam, Prov. Ninh binh, Cuc phuong, forest on limestone hill, 1 ♂ (holotype) — 3. V. 1966 (No. 247), leg. TOPÁL. — Same locality, 1 ♀ — 16. V. 1966 (No. 380), leg. TOPÁL. — Material examined: 2 specimens.

Both holotype and paratype in the collection of the Hungarian Natural History Museum, Budapest.

Diagnosis: Well distinguishable from the two hitherto known species of the genus, *S. tenebra* HOFFMAN, 1960, from Szechuan, China, and *S. variata* (ATTEMS, 1953), from North Vietnam (s. HOFFMAN, 1960, 1963), by the considerably larger body size, much longer and comparatively slightly curved gonofemora, significantly shorter tibiotarsus, presence of a small additional postfemoral spine (*d*) in the gonopods of the new form.

Description: Body 58 and 55 mm long and ca. 5.0 and 6.0 mm wide in the ♂ and ♀, respectively. Colouration uniform greyish-brown, prozona dark brown; antennae (except dark joint 7), legs, posterior and ventro-lateral parts of metazona, ventrum, epiproct, and paraterga somewhat lighter, grey-yellowish.

Antennae long and slender, somewhat clavate, reaching mid-length of segment 4. Head a little narrower than collum and subequal to segment 2; body parallel-sided on segments 5 to 17 whereupon gradually tapering posteriad. Tergal surface smooth, more or less dull, hairless. Rings well constricted. Lateral keels poorly developed, on segment 2 well below both collum and 3rd one, especially poorly expressed from metazonite 6 onward where only very small ridges are preserved, a bit better on pore-bearing rings. At hind half of body they all turn into small swellings. Paraterga never exceeding beyond caudal tergal margin and nowhere acute beak-like. Dorsal axial suture invisible; sulcus thin and shallow, far from reaching base of paraterga, begins from segment 5. Pleural keels very moderately developed, comparatively well expressed only till segment 4, up to ring 7 displayed as poor swellings gradually vanishing. Epiproct flattened, subtriangular, in lateral view rather long, slightly bent down, in dorsal view widely truncate, without apical concavity, with a pair of large subapical lateral setiferous knobs. Anal valves margined. Sterna without spines, setose.

♂. — Legs rather long, slender, somewhat enlarged, with tarsal brushes, hardly elongated toward caudal end, with a prominent, large, setose, trapeziform lamina between coxae 4.

Gonopods (Figs 4 – 6) high, rather slender; coxae long, subcylindrical, distally setose; prefemur rather short, densely setose, set off from acropodite by a good oblique suture; femorite long, slender, slightly bent ventrad, with seminal groove running along mesal side, distinctly set off from postfemur by a demarcation cingulum; postfemoral portion with a small sublateral spine (*d*), a large submesal lamina (*l*) (HOFFMAN's *B*), and a large acute inner process (*i*) (HOFFMAN's *A*); tibiotarsus relatively short, moderately curved, completely sheathing solenomerite which becomes free a little distad of the cingulum between femorite and postfemur.

♀. — Legs a little slenderer, without modifications.

Tylopus hilaroides sp. n. (Figs 7–8)

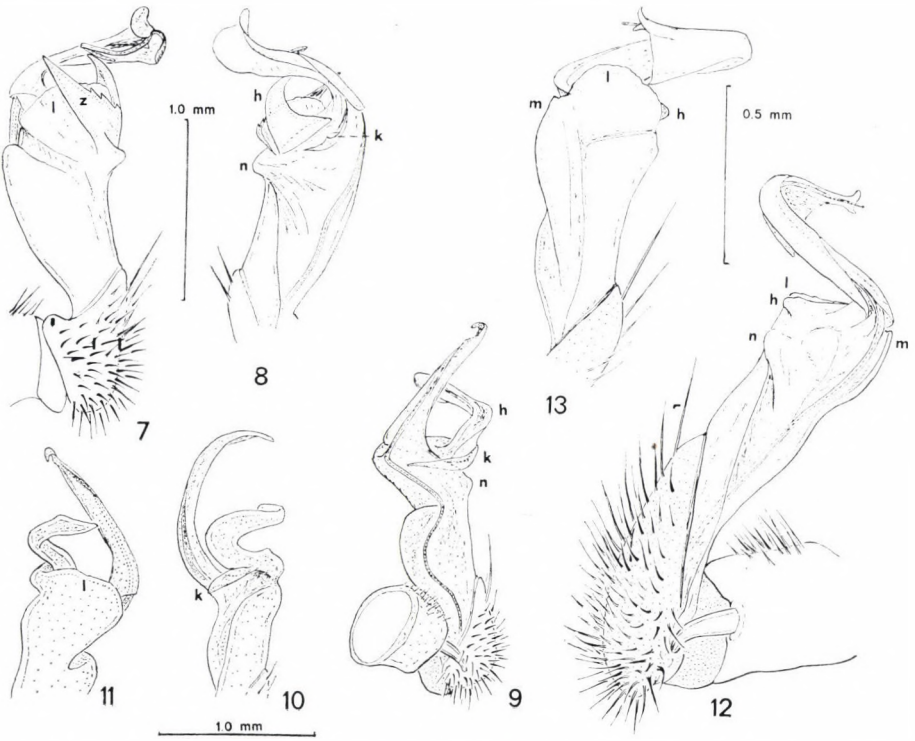
Localities: Vietnam, Prov. Ninh binh, Cuc phuong, 2 ♂♂ (including holotype) — 16. V. 1966 (No. 380), leg. TOPÁL. — Same locality, from pitfall traps in forest, 1 ♂ — 5—18. V. 1966 (No. 385), leg. TOPÁL. — Material examined: 3 specimens.

Holotype with a paratype deposited in the Hungarian Natural History Museum, Budapest; one paratype (No. 385) retained in the author's collection.

Diagnosis: Clearly most closely related to *T. hilaris* (ATTEMS, 1938) from Vietnam as regards both habitus and gonopod structure. A direct comparison with the types of *Anoplodesmus hilaris* ATTEMS of the ATTEMS collection in the Vienna Museum has revealed that both the original description and drawings by ATTEMS (1938) are quite accurate and that differences between the two species compared lie in the presence of one row of setae on tergum 18, of sulcus starting from ring 5, of the dentation along the distal margin of the gonopod process *z*, of membrane *k*, etc., in *T. hilaroides* sp. n.

Description: Body up to 35 mm long and 3.4 and 5.0 mm wide on pro- and metazona, respectively. Colouration yellowish-brown; head brown, region around suture between pro- and metazona dark brown; legs, ventrum, antennae (except darker joint 7), lateral keels, epiproct, and posterior halves of metazona lighter.

Antennae rather short, slender, clavate, reaching ring 3. Head a little narrower than collum and subequally wide with segment 2; body parallel-sided on rings 6 to 17, onwards gradually tapering. Collum, regardless 1 + 1 lateral hairs, with 4 + 4, 2 + 2 rather short acute setae in two transverse rows arched forward. Paraterga moderately developed, settled low (at mid-height of body rings), with thin and distinct rim, with 3 minute indentations on segment 2 and with one poor anterior denticle on paratergum 3. Paraterga beginning from collum, on segment 2 well below collum, but almost at level of beginning 3rd one, up to ring 14 with posterior angles blunt, only from ring 15 onward produced caudad beyond hind tergal contour and on rings 16 to 19 acute beak-like, maximum on segment 18, minimum on ring 19. Tergal surface more or less smooth, a little rugose only at posterior halves of metazona. A transverse row of 2 + 2 short hairs on anterior halves of metazona; only on ring 19 with 2 + 2 and 4 + 4 setae in two transverse rows, posterior of which consisting of especially short hairs and situated right at the hind tergal margin. Prozona shagreened, rings very well constricted, the suture being longitudinally striated. Dorsal axial suture thin; sulcus starting from metazonite 5, rather thin, shallow, reaching base of paraterga. Pleural keels moderately developed, somewhat better expressed up to ring 7 where they are indentated and acute caudally, on rings 8 to 16 much lower, the caudal projection being first very poorly developed to become a poor swelling on ring 17. Epiproct rather large, broad, long, in lateral view straight, in dorsal view subtriangular, at distal half almost parallel-sided, apically with a poor concavity rather broadly dividing a pair of apico-lateral knobs and subapically with a pair of small setiferous lateral tubercles. Anal valves margined. Sterna densely setose, without spines.



Figs 7—13. 7—8 = *Tylopus hilaroides* sp. n., ♂ paratype (No. 380): right gonopod (lateral and medial views, respectively); 9—11 = *Tylopus magicus* sp. n., ♂ paratype: 9 = right gonopod (medial view); 10—11 = distal part of the gonopod (subventral and sublateral views, respectively); 12—13 = *Tylopus maculatus* sp. n., ♂ holotype: 12 = right gonopod (medial view); 13 = distal part of the gonopod (sublateral view)

Legs rather long and distinctly enlarged, especially due to outer parts of prefemora (first of all pregonopodal ones but 1st), clothed with very dense hook-like setae (especially dense mesally), joints with several small submedian inner tubercles one of which is especially well developed on both postfemur and tibia.

Gonopods (Figs 7—8) stout, much enlarged distad; coxites rather long, subcylindrical, setose distally; prefemur densely setose, quite large, distinctly set off from acropodite by an oblique suture; femorite with evidence of torsion, at its apical part bearing a considerable swelling (*n*), a large, acute lateral process (*z*) indentated distally, but not proximally, a large inner hook (*h*), and a large lateral lamina (*l*). At base of process *z* there is a conspicuous membrane (*k*), thin and chitinous. Tibiotarsus sigmoid, lamellate, sheathing solenomerite almost all along its length.

Tylopus magicus sp. n. (Figs 9—11)

L o c a l i t y : Vietnam, Prov. Lao cai, O quy ho, near Sa pa, 1950 m, under bark of trees by a stream, 2 ♂♂ (including holotype), 4 juv. — 25. XI. 1971 (No. 116), leg. TOPÁL & MATSKÁSI. — Material examined: 6 specimens.

Holotype and all paratypes deposited in the Hungarian Natural History Museum, Budapest.

D i a g n o s i s : Perhaps most closely related to *T. hilaris* (ATTEMS, 1938), or *T. hilaroides* sp. n. as regards certain gonopod characters, although very distinct in having the very slender and almost straight tibiotarsus, as well as the very thick and snake-like postfemoral process *h* of the gonopods.

D e s c r i p t i o n : Body 33 – 35 mm long and 3.4 to 3.5 mm wide in adults (para- and holotype, respectively), up to 24 and 2.8 mm in larvae (last instar ♀). Colouration light pink-brown; only antennal joint 7 and region around suture between pro- and metazona dark brown.

Antennae rather long, slender, slightly clavate, reaching segment 4. Head a bit narrower than collum and subequal to segment 2; body parallel-sided on rings 6 to 16, onwards gradually tapering. Collum, regardless 1 + 1 lateral hairs, with 4 + 4, 2 + 2 and 2 + 2 rather long setae in 3 transverse arched forward rows. Lateral keels well developed, beginning from collum, settled low (at mid-height of body rings), without marginal indentation, with thin rim; on ring 2 well below collum, but at level of beginning of 3rd one, acute beak-like caudally on ring 2, but onwards, up to segment 16, a little blunt and almost not projecting beyond hind tergal margin, only on ring 17 acute beak-like and better protruding caudad, whereas on both terga 18 and 19 again a little blunt and poorer developed. Prozona shagreened, rings well constricted; metazona smooth, with 2 + 2 setae of medium size on hind half in a transverse row. Dorsal axial suture thin, poorly expressed; sulcus starting from ring 5, rather thin, shallow, reaching base of paraterga. Pleural keels quite moderately developed, a little better until ring 7 where they are indentated and protruding a bit caudad beak-like, onward to ring 10 very poor to become merely small swellings further on. Epiproct rather short, subtriangular, large, straight, apically with a pair of rather large lateral knobs divided by quite a broad and deep concavity, and with a pair of very small subapical setiferous tubercles.

♂. — Legs rather long and enlarged, gradually elongated toward telson, without tarsal brushes. From pair 8 onward postfemur and tibia each with a small inner parabasal tubercle gradually improving until ring 17 where they abruptly vanish. A large, setose, trapeziform lamina between coxae 4; a pair of small, round, setose, paramedian tubercles between coxae 5.

Gonopods (Figs 9 – 11) with relatively short subcylindrical coxites; prefemur densely setose and well set off from acropodite by an oblique suture; femorite stout, with evidence of torsion, apically with a wanting swelling (*n*), a very large, snake-like postfemoral process (*h*), a wanting lateral lamina (*l*), and a very thin, slender, nonsigmoid (almost straight) tibiotarsus completely

sheathing solenomerite. At base of process *h* there is a thin chitinous membrane (*k*) connecting base of *h* and apex of femorite mesally near seminal groove.

juv. — Completely light, lateral keels poorer developed, all legs slender and thin, rather short, not elongating caudad, without modifications.

Tylopus maculatus sp. n. (Figs 12—13)

Locality: Vietnam, Prov. Lao cai, O quy ho, near Sa pa, 1950 m, beaten from bushes near stream, 1 ♂ (holotype) — 24. XI. 1971 (No. 101), leg. TOPÁL and MATSKÁSI. — Material examined: 1 specimen.

Holotype: The above specimen, deposited in the Hungarian Natural History Museum, Budapest.

Diagnosis: Obviously most closely related to *T. doriae* (POCOCK, 1895), from Burma, judging from the presence of small tubercles on metazona and a poor development of both postfemoral process *h* and lateral lamina (*l*) at gonofemoral apex (s. JEEKEL, 1965). However, the new species is well distinguishable by 3 + 3 tubercles in a row behind the sulcus on metazonites and by certain details of the gonopod structure.

Description: Body ca. 16 mm long and 1.8 and 2.1 mm wide on pro- and metazona, respectively. Colouration light brown, starting from collum till ring 19, dorsum with dark brown paramedian spots: a pair of well separated smaller spots on prozona and a pair of larger spots less apart on anterior half of metazona. Legs, ventrum, head, antennae (except darker joint 7), lateral keels, and epiproct yellowish.

Antennae long and slender, somewhat clavate, almost reaching mid-length of segment 5. Head a bit narrower than collum and subequal to segment 2; body parallel-sided on rings 6 to 17, onward gradually tapering. Collum, disregarding 1 + 1 lateral hairs, with 4 + 4, 2 + 2 and 2 + 2 rather short setae in 3 transverse rows arched forward. Lateral keels moderately developed, beginning from collum, settled low (at mid-height of body rings), with thin rims, on ring 2 well below both collum and 3rd one, up to segment 15 practically within hind tergal contour, on rings 16 to 19 a little protruding beyond hind tergal margin, but only on segment 18 acute beak-like caudally. Surface slightly wrinkled, hind halves of metazona a little better rugose. Each metazonite with small 2 + 2 and 3 + 3 setiferous tubercles in transverse rows, one in front and the other behind the sulcus. To mid-body metazonites the posterior row of tubercles appearing rather like a transverse row of small, low, longitudinal ridges again reduced in size onwards. Sulcus starting from ring 4, shallow, thin, better developed from metazonite 5 onward, reaching base of paraterga always but on segment 4. Prozona shagreened, rings well constricted. Dorsal axial suture thin, shallow. Pleural keels moderately developed, a little better developed, indentated and caudally beak-like till ring 7, onward only in the form of small swellings. Epiproct large, subtriangular, rather short, truncate at the apex, provided with a pair of small apico-lateral knobs rather broadly divided by a very poor concavity, and with a pair of

very small subapico-lateral setiferous tubercles. Anal valves margined. Sterna densely setose, with a pair of small, acute spines directed caudad between posterior leg-pairs of every diplosegment but 17 to 19.

Legs very long, slender, gradually elongating toward telson, without tarsal brushes, rather enlarged, perhaps thicker than in ♀. Prefemora not particularly swelled outwards. Femora 3 each with a very large, onward until segment 16 with a small, parabasal inner spine. A large setiferous trapeziform lamina between coxae 4.

Gonopods (Figs 12 – 13) high, very long; coxite subcylindrical, long, distally setose; prefemur densely setose, distinctly set off from acropodite by an oblique suture; femorite slender, with evidence of torsion, apically with a very poor inner lamina (*m*) and a large swelling (*n*), with a rudimentary lateral lamina (*l*) and a very small postfemoral process (*h*). Tibiotarsus rather simple, sigmoid, almost entirely sheathing solenomerite.

Tylopus crassipes sp. n. (Figs 14—16)

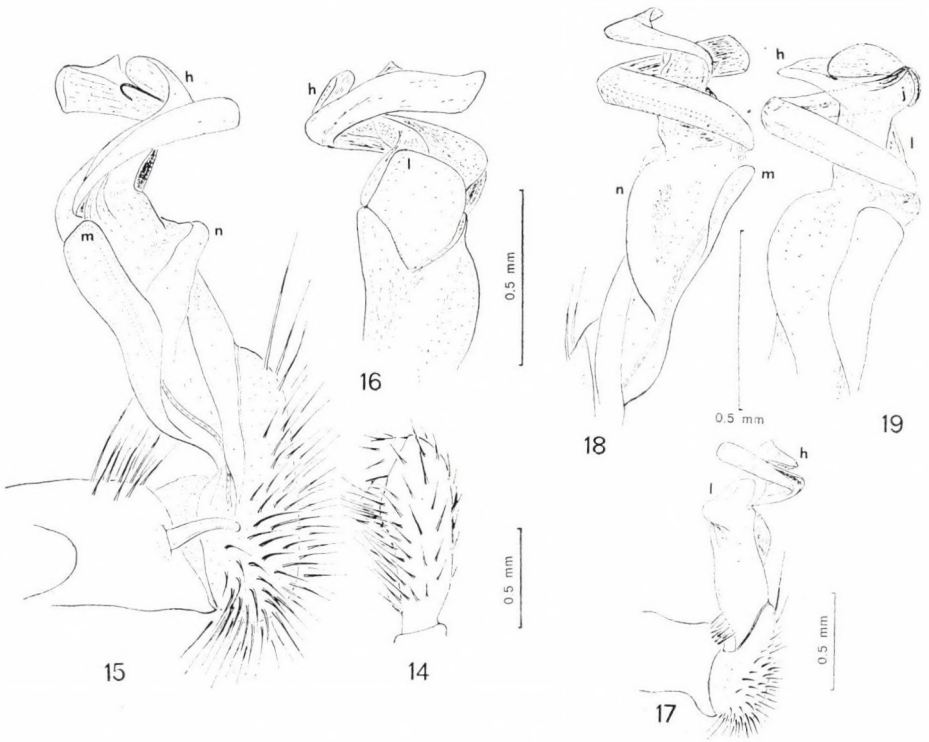
Localities: Vietnam, Prov. Lao cai, O quy ho, near Sa pa, 1900 m, 2 ♂♂, 1 ♀ — 23. XI. 1971 (No. 85), leg. Topál & Matskási. — Same locality, 1950 m, under bark of trees near stream, 1 ♂ (holotype) — 24. XI. 1971 (No. 100), leg. Topál & Matskási. — Material examined: 4 specimens.

Holotype and two paratypes deposited in the Hungarian Natural History Museum, Budapest; one male paratype retained in the author's collection.

Diagnosis: Obviously most closely related to *T. procurvus* sp. n., but well distinguishable by the poorer development of paraterga and absence of a parabasal outgrowth on the gonopod process *h*.

Description: Body up to 26 mm long and 2.7 mm wide in males (paratype), and 24 and 2.8 mm in the female. Holotype 25 mm long and 2.2 and 2.5 mm wide on pro- and metazona, respectively. Colouration from light yellowish (♀) to brown (holotype) or dark brown (♂♂ paratypes), darker at anterior body part; region around suture between pro- and metazona, anterior halves of metazona in front of sulci, antennal joint 7 darker; legs, labrum, ventrum, paraterga and epiproct lighter.

Antennae rather long and slender, slightly clavate, reaching almost mid-length of ring 5. Head a bit narrower than collum and subequal to segment 2; body parallel-sided on rings 6 to 16, onward gradually tapering. Collum, excluding 1 + 1 lateral hairs, with 4 + 4, 2 + 2 and 2 + 2 long setae in 3 transverse rows arched forward. Lateral keels relatively well developed, settled rather low (at mid-height of somites), beginning from collum, on segment 2 well below collum and a little below 3rd one, without marginal indentation, with thin rims, from segment 7 onwards projecting caudad acute beak-like, although until ring 12 only a little protruding beyond hind tergal contour, from ring 12 very acute, directed obliquely dorsad and rather well produced caudally till segment 17 whereupon gradually reducing in size posteriad,



Figs 14—19. 14—16 = *Tylopus crassipes* sp. n., ♂ paratype: 14 = femur 6 (medial view); 15 = left gonopod (medial view); 16 = distal part of the gonopod (sublateral view); 17—19 = *Tylopus procurvus* sp. n., ♂ paratype: 17 = right gonopod (lateral view); 18—19 = distal part of the gonopod (submedial and subventral views, respectively)

though still acute beak-like. Prozona finely shagreened, rings well constricted; metazona smooth, with 2 + 2 long setae in a transverse row on anterior (presulcus) half. Dorsal axial suture thin, visible on metazona only; sulcus starting from ring 4, thin, rather shallow, fully developed from metazonite 5, reaching base of paraterga, medially slightly curved anteriorad. Pleural keels poorly developed, a little better expressed, indentated and caudally beak-like to ring 7, onward till rings 9 or 10 very small, on subsequent several segments being represented by small swellings only. Epiproct rather short, stout, subtriangular, straight, in dorsal view with a pair of small, but distinct apicolateral knobs divided by a relatively deep and even concavity, as well as with a pair of small setiferous subapico-lateral tubercles. Anal valves margined. Sterna setose, without spines.

♂. — Legs enlarged, long, slender, elongated toward telson, with tarsal brushes. From leg-pair 2 onward each femur with a small distal inner outgrowth especially well developed on pregonopodal pairs (Fig. 14) and gradually reducing in size toward mid-body segments. Besides, from pair 6 onward each

postfemur with a disto-medial and each tibia and tarsus with a parabasal inner tubercle gradually somewhat increasing in size toward caudal body end, but abruptly disappearing on hindmost leg-pairs. A large setose trapeziform lamina between coxae 4.

Gonopods (Figs 15—16) rather high; coxae long, subcylindrical, distally setose; prefemur densely setose, set off from acropodite by a distinct oblique suture; femorite high, with evidence of torsion, distally with a large inner lamina (*m*) and a considerable swelling (*n*), with a small lateral lamina (*l*) and a very large and sigmoid postfemoral process (*h*) lacking any secondary outgrowth. Tibiotarsus lamellar, sigmoid, sheathing both process *h* and solenomerite.

♀. — Lateral keels very poorly developed, only on ring 19 a little producing beyond caudal tergal margin, acute beak-like caudally on rings 18 and 19 only. Pleural keels also less expressed, nowhere beak-like, better visible on segments 3 and 4. Legs thin and slender, relatively short, not elongated toward telson, without modifications. Antennae somewhat shorter, only a little exceeding mid-length of segment 3.

Tylopus procurvus sp. n. (Figs 17—19)

Localities: Vietnam, Prov. Lao cai, O quy ho, pass between Prov. Lao cai and Lai chau, 2160 m, singled, 1 ♀ — 22. XI. 1971 (No. 57), leg. TOPÁL & MATSKÁSI. — Prov. Lao cai, O quy ho, near Sa pa, 1950 m, under bark of trees near stream, 4 ♂♂ (including holotype), 4 ♀♀ — 25. X. 1971 (No. 116), leg. TOPÁL & MATSKÁSI. — Material examined: 9 specimens.

Holotype together with 6 paratypes deposited in the Hungarian Natural History Museum, Budapest; one male and one female paratypes (No. 116) retained in the author's collection.

Diagnosis: Obviously most closely related to *T. crassipes* sp. n., but distinguishable by the presence of a distinct anterior outgrowth on the gonopod process *h*, as well as by a better development of paraterga.

Description: Body up to 26 mm long and 2.7 mm wide in males (holotype 25 mm long, 2.2 and 2.6 mm wide on pro- and metazona, respectively), females 27—28 mm long and up to 3.3 mm wide.

Colour brown to dark brown; antennal joint 7, postero-lateral parts of pro- and anterior halves of metazona darker. Each tergite but collum with a light axial sun-clock pattern surrounded by darker background, less dark on pro- and more dark on anterior half of metazonite, extending laterad even to post-sulcus half at base of paraterga. Antennae (except for joint 7) (sometimes darker than legs), legs, ventrum, paraterga and epiproct lighter. Collum with a light median triangle.

Antennae rather long, slender, slightly clavate, reaching end of tergum 4. Head a bit wider than collum and subequal to ring 3, body parallel-sided on rings 6 to 17, onward gradually tapering. Collum, disregarding 1 + 1

lateral hairs, with 4 + 4, 2 + 2 and 2 + 2 long setae in 3 transverse rows arched forward. Lateral keels well developed, settled low (at mid-height of body rings), starting from collum, on ring 2 considerably lower than both collum and 3rd one, without marginal indentation, with thin rim, from segment 7 onward a little extending caudad beyond hind tergal margin, from ring 14 onward acute beak-like and directed a bit obliquely dorsad, developed best on ring 17 whereupon smaller caudad, though still acute beak-like. Prozona finely shagreened, rings well constricted; sulcus starting from segment 4, thin, rather deep, medially a little curved anteriad, poorer developed on ring 4, well expressed and reaching base of paraterga from segment 5 onward. Metazona smooth, with 2 + 2 long setae in a transverse row on pre-sulcus part. Dorsal axial suture thin, visible only on metazona. Pleural keels poorly developed, somewhat better expressed, indentated and beak-like caudad up to segment 7, onwards especially small and turning into small swellings from ring 11. Epiproct rather short, subtriangular, almost parallel-sided on distal half, straight, in dorsal view with an apical pair of small lateral knobs divided by a shallow and rather broad concavity, with a subapical pair of very small tubercles from each side bearing a long seta. Anal valves margined. Sterna densely setose, without spines.

♂. — Legs rather long, enlarged, elongated toward telson, with tarsal brushes. From pair 2 onward each femur with a small inner distal tubercle better expressed from pair 8 onward. Besides, from leg-pair 8 each postfemur with a disto-medial and each tibia and tarsus with a parabasal inner tubercle until ring 16, onwards without the modifications. Coxae 2 with a small inner distal tubercle. A large setose trapeziform lamina between coxae 4.

Gonopods (Figs 17—19) rather high; coxae long, subcylindrical, distally setose; prefemur densely setose, distinctly set off from acropodite by an oblique suture; femorite high, with evidence of torsion, apically with an inner lamina (*m*) and a considerable swelling (*n*), as well as with a good lateral lamina (*l*) and a very high sigmoid thick postfemoral process (*h*) orally provided with a distinct secondary outgrowth (*j*). Tibiotarsus sigmoid, sheathing almost entirely both process *h* and solenomerite.

♀. — Lateral keels much poorer developed, caudal angles of paraterga becoming acute beak-like and especially long from segment 15 or 16 onwards, only a little produced beyond hind tergal margin from ring 13. Pleural keels also poorer expressed, more or less visible only on terga 3 and 4. Legs relatively short, slender, not elongated toward telson, without modifications. Antennae a bit shorter.

Tylopus topali sp. n. (Figs 20—23)

Locality: Vietnam, Prov. Ninh binh, Cuc phuong, from pitfall traps in forest, 2 ♂♂ (including holotype), 2 ♀♀ — 5—18. V. 1966 (No. 385), leg. Topál. — Material examined: 4 specimens.

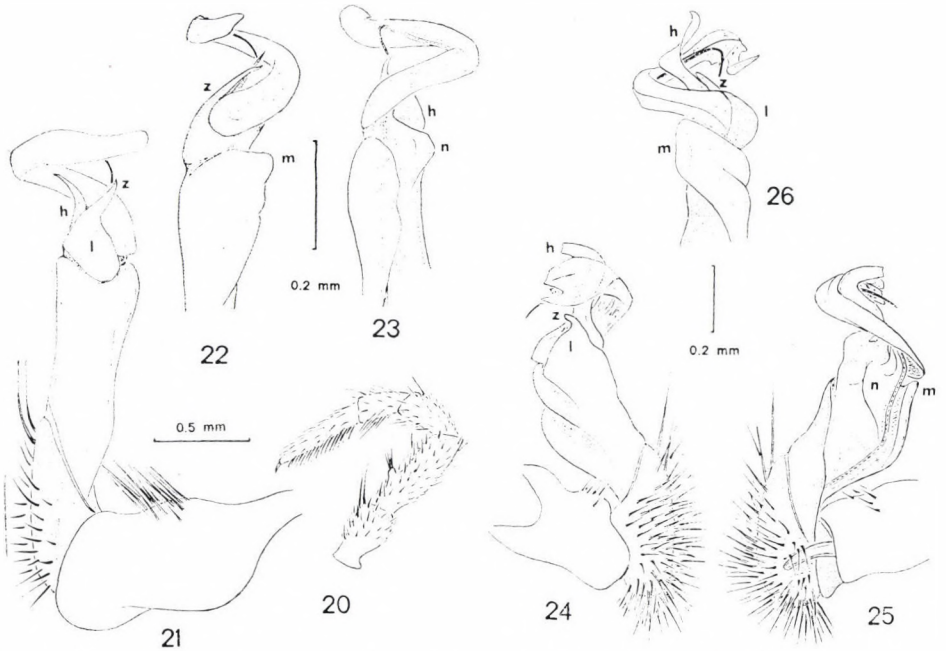
Holotype with all the paratypes deposited in the Hungarian Natural History Museum, Budapest. One male (paratype) incomplete, lacking posterior 6 somites. The species is named after its collector, Dr. Gy. Topál (Budapest).

Diagnosis: Apparently most closely related to *T. granulatus* sp. n. or *T. silvestris* (Pocock, 1895), from Burma, but easily distinguishable from both by the somewhat smaller body, different tuberculation of terga, degree of development of the gonopostfemoral process *h*, etc., in the new species.

Description: Body up to 14 mm long and 1.0 and 1.2 mm wide on pro- and metazona, respectively, in males (holotype), and up to 15 and 1.5 mm in females.

Colour rather uniform brown-yellow; labrum, antennae (except for joint 7), ventrum, legs, paraterga and epiproct lighter; antennal joint 7, region around suture between pro- and metazona, and pre-sulcus halves of metazona darker.

Antennae rather long, slender, slightly clavate, reaching ring 4. Head a little narrower than collum and subequal to segment 2, body parallel-sided on rings 6 to 17, onwards gently tapering. Collum somewhat rugose, disregarding 1 + 1 lateral hairs, with 4 + 4, 2 + 2 and 2 + 2 rather long setae in 3 transverse rows arched forward. Lateral keels well developed, settled low (at mid-height of body rings), with thin rim carrying a setiferous indentation which gradually increases in size toward telson, on ring 2 well below both collum and 3rd one, especially well developed from ring 5 onward, already from ring 4 onwards distinctly protruding acute beak-like beyond hind tergal margin, directed somewhat obliquely dorsad, best developed on ring 17. Prozona finely shagreened, rings well constricted; metazona dorsally with transverse rows of rather small tubercles crowned by a long seta each. Segment 2 with 2 + 2 such setiferous tubercles; segments 3 to 5 with 2 + 2 anterior and 1 + 1 posterior sublateral tubercles in two transverse rows, although on ring 5 the posterior row contains a trace of 1 + 1 paramedian tubercles; from somite 6 onward again 2 + 2 anterior tubercles, but till segment 14 with 3 + 3 ones (due to splitting of lateral tubercles) in posterior (post-sulcus) rows; on metazonite 15 with 4 + 3 (in holotype 4 tubercles on the left side), on rings 16 to 19 with 4 + 4 tubercles in posterior rows. Dorsal axial suture thin; sulcus starting from segment 3, thin, rather deep, reaching base of paraterga already from ring 4 onward. Pleural keels moderately developed, somewhat better expressed till segment 7, caudally acute beak-like and indentated, on somite 8 already very small, though still caudally acute, onwards till segment 15 represented by poor swellings gradually vanishing. Epiproct rather long, in lateral view a little bent ventrad, almost straight, in dorsal view with an apico-lateral pair of rather large knobs divided by a relatively deep and narrow concavity, as well as with a pair of large subapico-lateral tubercles each provided with a long seta. Anal valves margined. Sterna densely setose, without spines.



Figs 20—26. 20—23 = *Tylopus topali* sp. n., ♂ paratype: 20 = telopodite 6; 21 = left gonopod (lateral view); 22—23 = distal part of the gonopod (dorsal and submedial views, respectively); 24—26 = *Tylopus granulatus* sp. n., ♂ paratype: 24—25 = right gonopod (lateral and medial views, respectively); 26 = distal part of the gonopod (dorsal view)

♂. — Legs long, enlarged, elongated toward telson, with tarsal brushes. Pairs 6 and 8 with a good proximal femoral digitoid tubercle bearing a bunch of long hairs (Fig. 20). On pair 9 this tubercle is poorly expressed, and from pair 10 onward already lacking. A large setose trapeziform lamina between coxae 4.

Gonopods (Figs 21—23) rather high; coxae long, subcylindrical, distally setose; prefemur densely setose, distinctly set off from acropodite by an oblique suture; femorite high and slender, with evidence of torsion, apically with an inner lamina (*m*) and a considerable swelling (*n*), as well as with quite a small lateral lamina (*l*) crowned by a spiny process (*z*). Tibiotarsus sigmoid, lamellar, quite simple, sheating solenomerite almost entirely. Postfemoral process *h* spiny.

♀. — Lateral keels expressed much poorer, dorsum more convex, tubercles on metazona developed somewhat worse. Paraterga acute beak-like caudally and distinctly protruding beyond hind tergal margin only on last 4 or 5 pretelson somites. Pleural keels also poorer developed, relatively marked only on segments 3 and 4. Antennae shorter, reaching mid-length of segment 3. Legs also shorter, slender, without modifications.

Tylopus granulatus sp. n. (Figs 24—26)

Locality: Vietnam, Prov. Ninh binh, Cuc phuong, from pitfall traps in forest, 3 ♂♂ (includng holotype) — 5—18. V. 1966 (No. 385), leg. TOPÁL. — Material examined: 3 specimens

Holotype and one paratype deposited in the Hungarian Natural History Museum, Budapest; a paratype retained in the author's collection.

Diagnosis: Perhaps most closely related to *T. silvestris* (POCOCK, 1895), from Burma or *T. topali* sp. n. judging from the tergal tuberculation and gonopod configuration, but clearly distinguishable from the former by a considerably smaller body and a poorer tuberculation of metazona, and from the latter by a relatively larger gonopostfemoral process *h* and a poorer development of the gonopod disto-femoral swelling *n*.

Description: Body up to 18 mm long and 1.3 and 1.8 mm wide on pro- and metazona, respectively (holotype).

Colour from marble dark brown to brown or brown-yellowish; antennae (except for joint 7), ventrum, legs, paraterga, epiproct and sometimes labrum lighter; vertex marble; antennal joint 7, pleuro-lateral parts of somites and partly terga darker. Prozona with two light brown paramedian spots well distinct over light background of both well-developed striated transverse suture between pro- and metazona and well-expressed thin axial suture. Mid-body metazona with lighter sulci and axial suture dividing a pair of darker larger spots reaching base of paraterga on pre-sulcus half and another smaller lighter pair of subtriangular sublateral spots on post-sulcus half.

Antennae rather long, slender, somewhat clavate, reaching ring 4. Head a little narrower than collum and subequal to segment 2, body parallel-sided on rings 6 to 17, onward gradually tapering. Collum, disregarding 1 + 1 long lateral hairs, with 4 + 4, 2 + 2 and 2 + 2 long setae in 3 transverse rows arched forward, as well as with a pair of low, but distinct and large central swellings. Lateral keels very well developed, settled low (at mid-height of body rings), with thin rim which has a small setiferous indentation on segments 1, 3—19, but two such indentations on paraterga 2, all directed caudad somewhat obliquely dorsad, acute beak-like caudally already from collum, on segment 2 well below both collum and 3rd one, slightly projecting beyond hind tergal margin already from segment 3, gradually increasing in length till ring 17 whereupon much shorter posteriad, but still well acute. The lateral marginal indentations situated as far back from the anterior metazonite margin as 1.4 to 1.6 of the total metazonite length, gradually becoming deeper toward telson until ring 17. Prozona finely shagreened, rings very well constricted; metazona dorsally with two transverse rows of good tubercles each crowned by a long seta: 2 + 2 and 3 + 3 on rings 2 to 8, 3 + 3 and 4 + 4 larger ones on rings 9 to 15, 3 + 3 and 5 + 5 ones from ring 16 onward, gradually better expressed until ring 18. Tubercles somewhat poorer developed on tergite 19, rather reminding light small longitudinal carinae in posterior rows at hind body half. Dorsal axial suture thin, quite well developed; sulcus starting from segment 3, thin, rather deep, reaching base of paraterga already

from ring 4 onwards. Pleural keels moderately developed, until ring 7 somewhat better, caudally acute beak-like and indentated, until ring 14 very small to be replaced onward by poor swellings gradually evanescent till ring 17. Epiproct massive, subtriangular, rather short, in lateral view straight, in dorsal view with a pair of small apico-lateral knobs rather broadly divided by a shallow concavity, and with a pair of subapico-lateral setiferous tubercles, rather large and well visible. Anal valves margined. Sterna densely setose, without spines.

Legs rather long, enlarged, perhaps thicker than in ♀, elongated toward telson, with tarsal brushes. From pair 6 onward there is a clear disto-femoral digitoid inner tubercle, from pair 8 onward till segment 17, besides, with a small inner parabasal tubercle on each postfemur, tibia and tarsus. Further on legs especially elongate, slender, but without the tubercles. A large setose trapeziform lamina between coxae 4.

Gonopods (Figs 24—26) rather high, slender; coxae quite long, subcylindrical, distally setose; prefemur large, densely setose, distinctly set off from acropodite by an oblique suture; femorite rather broad, with evidence of torsion, apically with a good inner lamina (*m*), with a poor swelling (*n*), with a low lateral lamina (*l*) surmounted by a small digitoid process (*z*). Process *h* long, lamellate, sigmoid. Tibiotarsus lamellate, sigmoid, curved around process *h* and sheathing solenomerite.

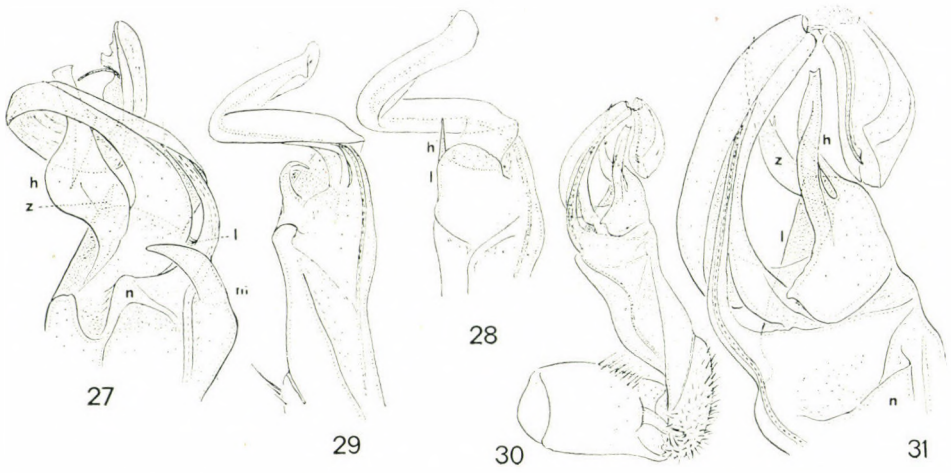
Review of Tylopus species

Until now, the genus *Tylopus* JEEKEL, 1968, has been known to comprise six species, twice arranged in identification keys (JEEKEL, 1965; HOFFMAN, 1973). The species are: *T. doriae* (POCOCK, 1895), and *T. silvestris* (POCOCK, 1895), from Burma, both redescribed by JEEKEL (1965), *T. hilaris* (ATTEMS, 1938), *T. mutilatus* (ATTEMS, 1953), and *T. nodulipes* (ATTEMS, 1953) (type-species), from Indochina, as well as *T. perarmatus* HOFFMAN, 1973, from Thailand. Besides, two further species described as *Sundanina sigma* ATTEMS, 1953, from Indochina and *S. spinipleura* CARL, 1941, from Burma have been suspected, though not formally treated, as belonging in fact to *Tylopus* (JEEKEL, 1965, 1968; HOFFMAN, 1973).

I have been able to restudy the type-specimens and the type gonopod preparations of all the above four species of ATTEMS kept in the Vienna Museum. Of them only *hilaris* has proved to be quite accurately illustrated, whereas the gonopods of *mutilatus*, *nodulipes* and *sigma* should have been redrawn to show the distal outgrowths in further detail (Figs 27—31). As one can see, the gonopods of *sigma* strikingly resemble those of *T. maculatus* sp. n., and therefore the assignment of the former within *Tylopus* seems now highly justified, resulting formally in *T. sigma*, comb. n. As to *spinipleura*, although JEEKEL (1968) sees its closest affinities among the Polydrepanini, I rather share HOFFMAN's (1973) opinion that this species should be a *Tylopus* or something much alike. Indeed, the two gonopostfemoral processes and the sigmoid tibiotarsus, as quite clearly depicted by CARL (1941), strongly suggest those of a *Tylopus*, resulting formally in *T. spinipleurus*, comb. n.

At present, having brought a total of *Tylopus* species to 15, I believe a comparative analysis of them is warranted. However, another tentative key seems still superfluous as e.g. the collection of the Universitetets Zoologiske Museum in Copenhagen contains also further several new *Tylopus* from Thailand (in litt.). Perhaps *Tylopus* will turn out equivalent of South American *Mestosoma* SILV. or African *Eviulisoma* SILV. among Paradoxosomatidae.

The following analysis, though preliminary as it is, should rely first of all on gonopod characters as no obvious correlation seems to exist between the gonopod structure and peripheral features (HOFFMAN, 1973).



Figs 27—31. 27 = *Tylopus nodulipes* (ATTEMS, 1953), ♂ holotype: distal part of right gonopod (medial view, drawn not to scale); 28—29 = *Tylopus sigma* (ATTEMS, 1953), ♂ paratype: distal part of gonopods (lateral and medial views, respectively, not drawn to scale); 30—31 = *Tylopus mutilatus* (ATTEMS, 1953), ♂ holotype: 30 = left gonopod (medial view); 31 = distal part of it enlarged (not drawn to scale). All designations explained in the text

Among the *Tylopus* species several species-groups can be distinguished:

1. *Hilaris*-group, comprising now the species *hilaris*, *hilaroides* and *perarmatus* which all possess a good process (*z*) laterally of the lateral lamina *l*. Besides, the swelling *n* is always considerable, while the inner lamina *m* is always wanting. If *hilaroides*, besides other things, has the peculiar membrane *k*, *hilaris* and *perarmatus* are both provided only with *z*, *l*, *h* and *n* (HOFFMAN's *FP*, *C*, *PFP* and *FL*, respectively), *k* being entirely reduced.

2. *Mutilatus*-group, represented so far by a single species, *mutilatus* (Figs 30—31), which, as the previous group, possesses the richest variety of structures arising at the end of the gonofemorite. It is difficult to interprete the three distinct processes mesad of the high lateral lamina *l*. Perhaps the longest lateral one ought to be referred to as *z*, while the other two seem a two-branched process *h*.

3. *Magicus*-group, comprising but the only species *magicus* which has the membrane *k* and is especially disjunct in having the tibiotarsus almost straight and not sheathing the thick and large process *h*. Both *n* and *m* are wanting.

4. *Nodulipes*-group, seems to contain the rest of the known species, i.e. *nodulipes*, *doriae*, *silvestris*, *spinipleurus*, *sigma*, *crassipes*, *maculatus*, *procurvus*, *topali* and *granulatus*. Perhaps it will turn out to be too collective and need further splitting, but at present this entity seems warranted. The above species almost always (except in *spinipleurus* and *sigma*) have a more or less distinct *m* which is sometimes crowned by a conspicuous spine (*nodulipes*), always lack *k*, often possess both *z* and *l* more or less reduced. The process *z*, when present, is next to or completely coalesced with *l*: in *spinopleurus*, *topali* and *granulatus* *z* surmounts *l*.* in *nodulipes* almost coalesced. However, no *z* laterally of the lateral lamina *l* is here present. The latter also significantly varies in size from relatively high (*doriae*, *silvestris*, *procurvus*) to wanting (*spinipleurus*, *crassipes*, *maculatus*). The postfemoral process *h*, one of the most conspicuous characters of the genus, always lies more or less off (mesad of) *l* and is wanting only in *doriae*, *maculatus* and perhaps *sigma*,** of medium size in *topali* and quite large and massive in the other species, especially in *crassipes*, *procurvus* and *nodulipes*. The swelling *n* is also wanting e.g. in *sigma* or very large e.g. in *crassipes* or *procurvus*.

* Even if to see *z* reduced and not coalesced with *l*, this minor modification would not alter the present treatment significantly enough.

** It is very difficult to judge whether the ventral spiny process of the *sigma* gonopods corresponds indeed to *h* and not to *z*, but the base of this process seems off enough (mesad) from that of the lamina *l*.

In general, *Tylopus* is somewhat difficult to outline as it displays a very considerable degree of variety in almost every character concerned, be it peripheral or gonopodal. However, it always has at least a rudimentary lateral lamina (*l*) and at least one postfemoral process (*h*), sometimes much reduced as well. A better outline of both the genus and species-groups ought to involve, of course, more comparative materials.

II. CHORDEUMATIDA

The millipede order Chordeumatida being quite rarely met with in tropical Asia, it was the more agreeable to be able to study two nice series of chordeumoids from Vietnam which proved to contain two still undescribed forms. Moreover, one of them happened to represent not only a new genus, but a new family of its own. The present paper deals with descriptions of the two new millipedes and with their placement among related forms.

I wish to express my cordial thanks to Drs T. K. Sergeeva and A. J. Druk of the Institute of Evolutionary Animal Morphology and Ecology, USSR Academy of Sciences, Moscow, for donating the series of the first new chordeumoid treated below.

Metopidiothrix melanocephala sp. n. (Figs 32—35)

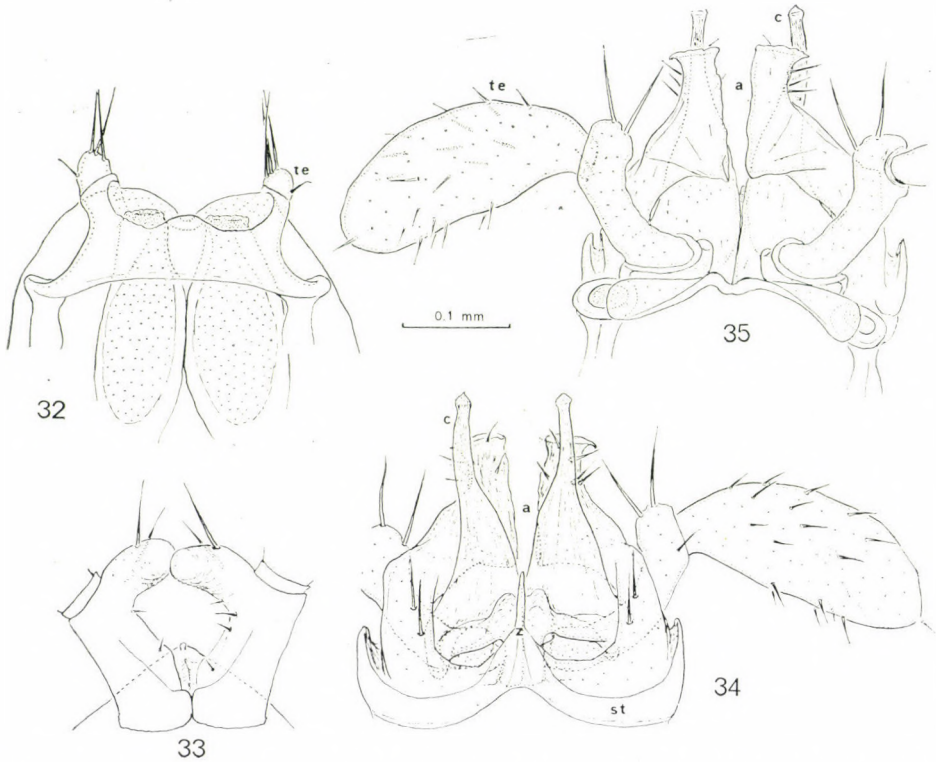
Localities: Vietnam, Prov. Thai Nguyen, Buong luoi, 35 km N An khe, tropical rainforest, litter, 1 ♂, 1 ♀, 4 juv. — 30. XII. 1980, leg. T. K. Sergeeva. — Same locality, 3 ♂♂ (including holotype), 2 ♀♀, 2 juv. — 4. I. 1981, leg. A. J. Druk. — Same locality, 1 ♀ — 9. I. 1981, leg. T. K. Sergeeva. — Material examined: 14 specimens.

Holotype with several paratypes deposited in the Zoological Institute of the USSR Academy of Sciences, Leningrad; several paratypes will be placed in the Zoological Museum of the Moscow State University, Moscow; one male and one female paratypes have been sent to the Hungarian Natural History Museum, Budapest.

Description: Males up to 7.0 mm long and 0.75 mm wide (holotype), females up to 9.0 mm long and 1.1 mm wide. 32 segments. Head, collum, segments 2 and 3 black or black-brown contrasting with uniform light marble yellowish-brown of the rest of the body. Labrum, axial suture and telson whitish. Subventral and ventral body parts paler, anterior body portion following the black part a bit darker than middle or hind segments. Antennae brownish.

Head with scattered hairs of medium size, cheeks very convex. Up to 17 or 18 black convex ocelli in an irregularly triangular eye field from each side of head. Antennae rather long, slender, a little clavate. Gnathochilarium without promentum, usual. Labrum with three usual median marginal teeth.

Body subcylindrical, very gradually tapering caudad. Each segment but telson with 3 + 3 macrochaetae, without lateral keels, but with poor lateral swelling especially poorly expressed at posterior body half. Macrochaetae almost in a transverse row; median one of each side widely separated from its counterpart; both lateral ones each on a minute papilla, separated by a



Figs 32—35. *Metopidiothrix melanocephala* sp. n., ♂ paratype: 32 = leg-pair 10 (frontal view); 33 = coxae 11 (frontal view); 34—35 = gonopodal block (frontal and caudal views, respectively)

distance subequal to length of the longest posterior one; antero-lateral and median chaetae subequal in length, either ca. 1.3—1.5 times shorter than postero-lateral one. Tegument with a very fine polygonal ornamentation.

Legs rather long, slender, very slightly elongate toward telson; claw with a basal setoid a little longer than claw proper.

♂. — Clypeolabrum with a distinct round central tubercle covered with dense short pubescence of yellowish red hairs and situated well in front of antennal sockets and just in front of dark flattened frons. Antennae longer, reaching mid-length of somite 4, without peculiarities. Body slenderer.

Pregonopodal legs subequal in length, none significantly enlarged, without tarsal papillae. Leg-pair 10 (Fig. 32) greatly reduced, telopodite *(te)* setose and 1-jointed, coxae with prominent gland sacks. Leg-pair 11 (Fig. 33) with prominent inner coxal processes, without further pecularities.

Gonopods rather simple, combined in a block (Figs 34—35). Anterior gonopods (*a*) with a very long median spine (*z*) crowning fused coxosternum, distally enlarged, setiferous, attached to and sheathing latero-posteriad high and slender posterior gonopod colpocoxites (*c*). Posterior gonopods with a

plate-like sternum (*st*) provided with tracheal apodemes, telopodite (*te*) massive, 2-jointed, sparsely setose.

♀. — Head regularly and slightly convex, without tubercles or yellowish pubescence. Antennae somewhat shorter, reaching but segment 3. Body thicker. Legs without modifications.

juv. — Dark pigmentation of foremost part of body still striking, though a bit lighter than in adults. Last instar with already much reduced leg-pairs 8 to 10.

Remarks: The family Metopidiothricidae containing but a few Oriental species has recently been revised (MAURIÈS, 1978; SHEAR, 1980). As a result, only one *Metopidiothrix*, namely *M. rhopalophora* ATTEMS, 1907, from Java, and three *Malayothrix*, i.e. *M. lacertosa* (ATTEMS, 1907), from Java, *M. enghoffi* MAURIÈS, 1978, from the Bismarck Archipelago, and *M. papuana* SHEAR, 1980, from Irian, New Guinea, have been recognized as valid. Biogeographically, the discovery of a fifth good species of the family in Vietnam, though considerably extending the known range of the group as far northward as to Indochina, seems far from surprising. Morphologically, the new form is certainly more closely related to *Metopidiothrix rhopalophora* (s. ATTEMS, 1907), than to any of the *Malayothrix* species as reflected in the following key. Besides, further accumulation of data on the components of the family might prove the generic status of *Malayothrix* as being too high, as MAURIÈS (1978) pointed out.

A tentative key to the known species of the Metopidiothricidae

1 (4) Male clypeolabrum with a good median setiferous tubercle anteriorad of antennal sockets; male leg-pair 3 not particularly enlarged 2
2 (3) Head and segments 1 to 3 black contrasting with the paler rest of the body; anterior gonopods with a long median coxosternal spine (*z*); male leg-pair 10 with 1-jointed telopodites **Metopidiothrix melanocephala** sp. n.
3 (2) Body uniform marble yellowish-brown; anterior gonopods without coxosternal spine; male leg-pair 10 with 2-jointed telopodites **Metopidiothrix rhopalophora** ATTEMS
4 (1) Male clypeolabrum without such tubercle, but with a more or less distinct interantennal depression behind a transverse swelling; male leg-pair 3 particularly incrassate 5
5 (6) Male antennal joint 4 with a good subapical tubercle; male leg-pair 11 without coxal processes **Malayothrix lacertosa** (ATTEMS)
6 (5) Male antennal joint 4 without tubercles; male leg-pair 11 with prominent inner coxal processes 7
7 (8) Anterior gonopods distally with two slender processes, one apical and the other hook-like lateral; tip of posterior gonopod colpocoxites stout, with a couple of processes; male leg-pair 11 with a very large hook-like coxal process **Malayothrix papuana** SHEAR
8 (7) Anterior gonopods distally well enlarged, shield-like, without slender processes; tip of posterior gonopod colpocoxites slender, flagelloid; male leg-pair 11 with smaller straight coxal processes **Malayothrix enghoffi** MAURIÈS

VIETEUMATIDAE fam. n.

26 segments. Body small, without good paraterga. Antennae long and slender. Gnathochilarium without promentum. 3 + 3 macrochaetae on each somite but telson.

♂. — At least some pregonopodal legs modified. No tarsal papillae. Leg-pairs 10 and 11 with coxal sacks. Anterior gonopods anteriorly with a large angiocoxite, laterally with simple telopodites, posteriorly with massive

independent coxites provided with a number of setose pseudoflagelloids and hyaline membranes, mesally with a pair of processes. Posterior gonopods simple, independent, with colpocoxites and enlarged 2-jointed telopodites.

♀. — Legs without modifications.

Type-genus: *Vieteuma* gen. n.

Vieteuma gen. n.

26 segments, body small, subcylindrical. Antennae long and slender. Gnathochilarium without promentum. 3 + 3 macrochaetae on each body segment but telson. Legs long and slender.

♂. — At least some pregonopodal legs modified. No tarsal papillae. Leg-pairs 10 and 11 with coxal glands. Anterior gonopods complex, independent, situated on a plate-like sternite, anteriorly provided with angiocoxite platform bearing a medial spine, laterally with simple 1-jointed telopodites, posteriorly with a pair of massive setose coxites distally provided with several setose pseudoflagelloids and hyaline membranes, mesally with a pair of processes. Posterior gonopods simple, independent, with quite simple colpocoxites and 2-jointed enlarged setose telopodites.

Type-species: *Vieteuma topali* sp. n.

Remarks: The new form is undoubtedly most closely related to the genus *Kashmireuma* MAUR. recently described from North India (MAURIÈS, 1982). Indeed, similarities between the two genera are striking, especially in the gonopod structure: large angiocoxite, massive independent coxites bearing laterally a simple telopodite and a number of various outgrowths each, etc. However, *Vieteuma* gen. n. possesses several characters, i.e. absence of promentum, of male tarsal papillae and of reduction of female leg-pair 2, to warrant the establishing of an independent family, Vieteumatidae fam. n., as opposed to Kashmireumatidae Maur. Thus the new family, along with Kashmireumatidae and many other groups, should be placed within the superfamily Cleidogonoidea well reviewed recently by MAURIES (1982).

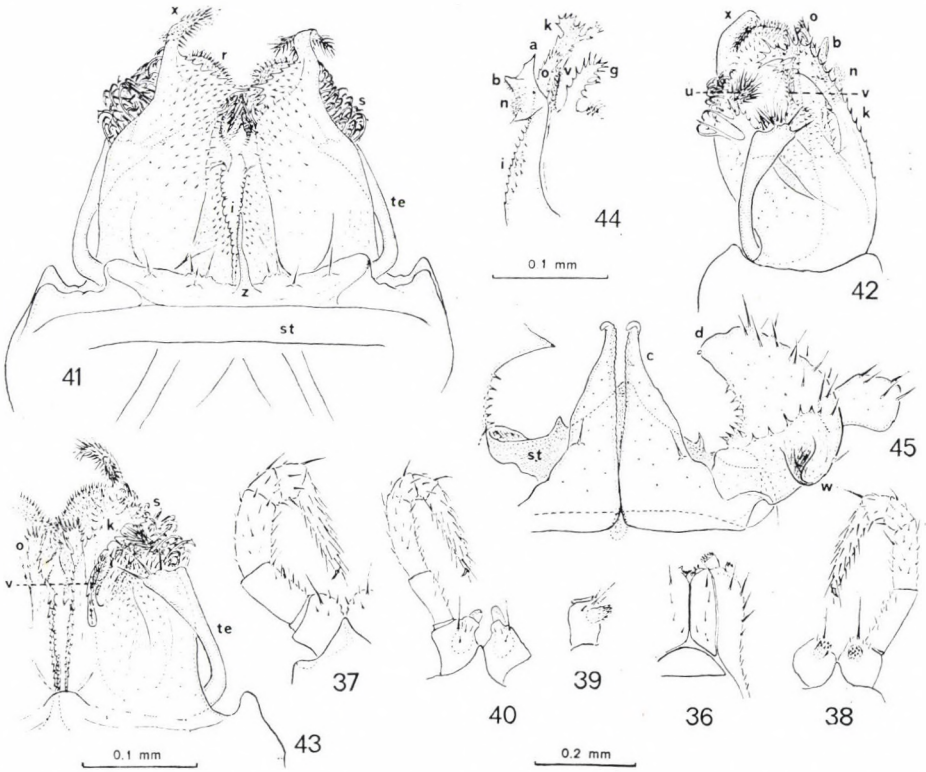
Vieteuma topali sp. n. (Figs 36—45)

Locality: Vietnam, Prov. Lao cai, O quy ho, Sa pa Distr., pass between Lao cai and Lai chau provinces, 2160 m a.s.l., sifted litter, 7 ♂♂ (including holotype), 2 ♀♀ — 22—25. XI. 1971 (No. 117), leg. TOPÁL & MATSKÁSI. — Material examined: 9 specimens.

Holotype together with 7 paratypes deposited in the Hungarian Natural History Museum, Budapest; one male paratype retained in the author's collection for a subsequent placement in the Zoological Institute of the USSR Academy of Sciences, Leningrad.

Derivatio nominis: It is a real pleasure to name the new species after Dr. GY. TOPÁL of the Budapest Museum whose efforts to build up a good collection of very many animal groups in Budapest, millipedes among them, are well-known and much appreciated.

Description: Body up to 5.0 mm long and 0.7 mm wide in males (holotype) and 1.0 mm wide in females. 26 segments. Colour uniform light marble yellowish-brown, better expressed at anterior body part. Labrum, axial suture and telson whitish. Subventral and ventral parts paler. Antennae brownish.



Figs 36—45. *Vieteuma topali* sp. n., ♂♂ paratypes: 36 = gnathochilarium; 37 = leg-pair 6 (frontal view); 38 = leg-pair 7 (caudal view), 39 = coxa 7 (sublateral view); 40 = leg-pair 10 (caudal view); 41—44 = anterior gonopods (frontal, caudo-lateral, caudal and submesal views, respectively); 45 = posterior gonopods (frontal view)

Head with scattered hairs of medium size, cheeks well convex. Up to 13—15 black convex ocelli in an irregularly triangular eye field on each side of head. Antennae rather long and slender, slightly clavate. Gnathochilarium (Fig. 36) usual, without promentum. Labrum with 3 usual medial marginal teeth.

Body subcylindrical, very gradually tapering caudad; each segment with 3 + 3 long macrochaetae, without lateral keels, but with very poor lateral swellings a little better expressed at anterior body half and gradually vanishing at mid-body. Macrochaetae almost in a transverse row; median one of each side widely separated from its counterpart; postero-lateral chaeta a little longer than both antero-lateral and median ones which are subequal, all situated on very poor knobs. Tegument with a very fine polygonal ornamentation.

Legs rather long, slender, very slightly elongate toward telson; claw without long basal setoid; pairs 1 and 2 a little shorter than subsequent ones.

♂. — Antennae somewhat longer, reaching segment 5, without peculiarities. Frons moderately convex, normal, without peculiarities. Leg-pairs 3 to 6 somewhat enlarged (Fig. 37); pair 7 thinner, with a distinct caudal coxal process crowned with minute spines (Figs 38 – 39). Pairs 10 and 11 subequal (Fig. 40), normal, both with coxal sacks. No tarsal papillae. Body slenderer.

Anterior gonopods (Figs 41—44) very complex, situated on a large plate-like sternum (*st*) which has anteriorly an angiocoxite platform crowned with 4 + 4 long setae and a long spiny medial process (*z*). Telopodites long, 1-jointed (*te*), apically enlarged and setiferous, bent latero-caudad. Coxites massive, completely independent, covered with short and dense setae on anterior surface, apically with a setose flagelloid process (*x*) divided into two smaller branches, subapically also well setose on round posterior (*r*) and on serrate anterior hyaline lobes. Lateral surface of coxites densely setose with peculiar branching hook-like macrochaetae (*s*) fields which from each side almost hide a short setiferous pseudoflagelloid (*u*). Each coxite mesally with a large securiform serrate outgrowth (*i*) covered with minute spines, distally bearing a small pubescent hook-like process (*n*), a small subapical (*b*) and a small acute apical (*a*) lobe, and somewhat sheathing a pronounced inner pocket-like cavity in the main body of coxites. Posteriorly the cavity is demarcated by another short setiferous pseudoflagelloid (*v*) and inside bearing an in situ invisible serrate hyaline membrane (*g*) with a group of hairs at base. Hind surface of coxites also shortly and densely setose, provided with a pair of obvious swellings, mesally bearing a pair of large serrate hyaline membranes (*k*) each having a somewhat smaller inner branch (*o*).

Posterior gonopods (Fig. 45) independent, on a large triangular sternite (*st*) with tracheal apodemes. Telopodite 2-jointed, setose, enlarged, especially well owing to joint 1 which has a large inner (*d*) and a smaller antero-lateral (*w*) outgrowth each supplied with a basal row of stout spines. Joint 2 smaller, simple. Colpocoxites (*c*) finger-shaped, slender, distally bearing a caudal inner row of small spines, parabasally with an oral pair of small tubercles each surmounted by a seta.

♀. — Antennae a little shorter, reaching mid-length of segment 3. Body somewhat thicker. Legs normal, without modifications. Vulvae setose, large, subquadrate, bursa massive, operculum with a heavily chitinous, uneven, thick rim at margin.

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Acta Zoologica Hungarica 30 (1–2), pp. 79–85 (1984)

DREI NEUE ASIATISCHE TENEBRIONIDEN (COLETEOPRA)

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(Eingegangen am 24. März 1983)

Description of a new genus and species of Blaptini (Coleoptera, Tenebrionidae) from Turkmenia (*Thaumatoblaps marikovskiji*) living in the underground gallery of an Isopoda species (*Oniscus* sp.); a new species of *Lobodera* (*L. echingolensis*) (Opatrini) from Mongola and a new subspecies of Diaperini (*Basanus tshushimensis kompancevi*) from the far East is given.

Die faunistische Erforschung des paläarktischen Asien bringt auch noch heute manche erwähnenswerte Resultate. Auch bei so gründlich studierten Gebieten, wie Turkmenien und die Mongolei sowie der Ferne Osten, gibt es noch viel zu entdecken. Von Jahr zu Jahr kommen noch weitere neue Arten, resp. Gattungen hervor, besonders wenn man bis jetzt unerforschte Gebiete aufsucht oder neue Sammelmethoden gebraucht. Diesmal beschreiben wir eine neue, auffallende Blaptini-Gattung und -Art, welche unter ganz besonders spezifischen Umständen lebt, außerdem eine neue Art der Gattung *Lobodera* MULSANT and REY, 1859 aus der Wüste Gobi sowie eine neue Unterart einer bis jetzt in Japan heimischen *Basanus tshushimensis* M. CHÛJÔ, 1963 aus dem Fernen Osten.

Thaumatoblaps gen. n.

Sehr gestreckt; Kopf wie bei *Blaps*-Arten, 5 Endglieder der Fühler größer und rundlich. Mentum queroval und ganz flach. Halsschild viel länger als breit, Basis gerade und fein gerandet. Flügeldecken sehr gestreckt, beide Geschlechter mit gut ausgebildetem Mucro; das ♂ mit einem Bürstenfleck zwischen den beiden ersten Abdominalsegmenten. Beine kräftig und lang. Vorderschienen nur mit einem großen, gebogenen Enddorn bei beiden Geschlechtern, Mittel- und Hinterschienen mit den normalen 2 Enddornen. Unterseite der Tarsen auch beim ♂ nicht behaart, nur spärlich kurz beborstet.

Typus der Gattung: *Thaumatoblaps marikovskiji* sp. n.

Dies ist ein rätselhaftes Tier, das in dem System der Blaptini ganz allein steht und von allen bis jetzt bekannten Gattungen und Arten abweicht. Charakteristisch ist die äußerst schmale Gestalt, die nur mit einem großen Enddorn versehenen Vorderschienen, die mit Mucro versehenen Flügeldecken und beim Männchen mit einem Bürstenfleck am Abdomen. Die Arten der Gattung *Blaps* FABRICIUS, 1775 haben immer zwei Enddorne der Vorderschienen, mit oder ohne Bürstenfleck des ♂ am Abdomen, beim ♂ und ♀ meist verschiedene Mucro der Flügeldecken, welche beim ♂ auch in seltenen Fällen fehlen; *Prosodes* ESCHSCHOLTZ, 1829 besitzt keinen Bürstenfleck am Abdomen des ♂, ohne Mucro der Flügeldecken, zwei

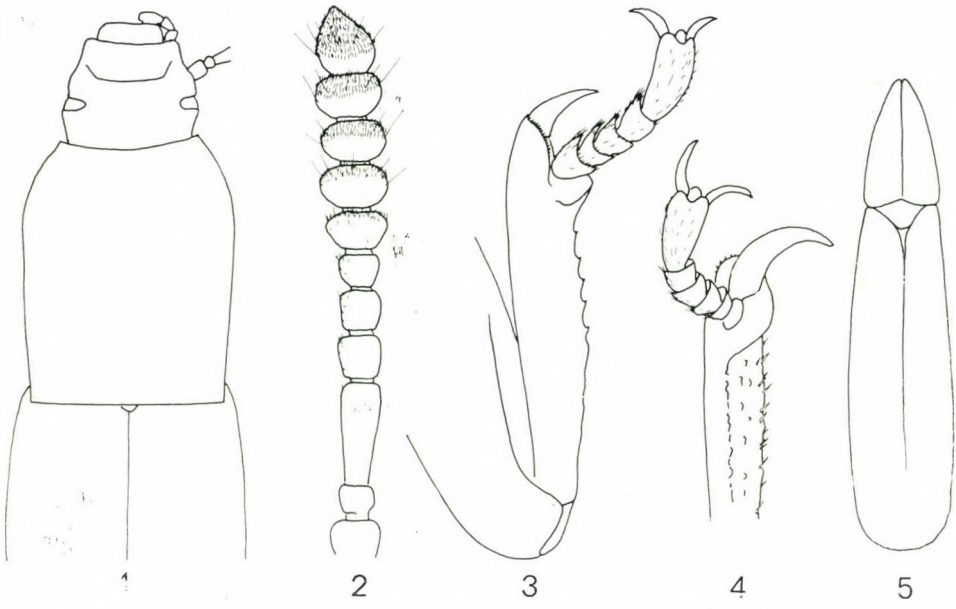

Abb. 1—5. *Thaumatoblaps* (gen. n.) *marikovskiji* sp. n. — 1 = Umriß des Vorderkörpers, 2 = Fühler, 3 = Vorderschiene bei Draufansicht, 4 = Vorderschiene bei Seitenansicht, 5 = Aedoeagus

Enddorne der Vorderschienen und seitlich zusammengedrückte Tarsen. Es gibt einige Untergattungen der Gattung *Prosodes* (z. B. *Prosodestes* REITTER, 1909), wo nur beim ♂ ein einziger Enddorn ausgebildet ist, bei ihnen findet sich aber kein Abdominalbürstenfleck, kein Mucro, und die Tarsen sind seitlich abgeplattet. *Nalepa* REITTER, 1887 und *Ablapsis* REITTER, 1887 sind grundsätzlich *Prosodes* ähnlich. *Agnaptorina* REITTER, 1887 hat zwei Enddorne, ohne Mucro, das ♂ ohne Bürstenfleck, aber Haarflecke der Vorder- und Mitteltarsen. Die Gattungen *Dila* FISCHER VON WALDHEIM, 1844, *Coelocnemodes* F. BATES, 1879, *Caenoblaps* KÖNIG, 1906, *Asidoblaps* FAIRMAIRE, 1886 und *Itagonia* REITTER, 1887 besitzen gezähnten Vorderschenkel, ohne Bürstenfleck des Abdomens des ♂ und ohne Mucro, *Asidoblaps* und *Itagonia* mit Haarflecken der Vorder- und Mitteltarsen des ♂. *Tagonoides* FAIRMAIRE, 1886, *Colasia* C. KOCH, 1965, *Blaptyscellis* C. KOCH in PIERRE, 1961, *Pseudognaptorina* KASZAB, 1976 besitzen zwei Vorderschienenenddorne, keinen Mucro und keinen Bürstenfleck des Abdomens beim ♂, aber Haarflecken an den Vorder- und Mitteltarsen. Einen Enddorn der Vorderschienen besitzen die Gattungen *Gnaptorina* REITTER, 1887, *Gnaptor* BRULLÉ, 1832 und *Tagona* FISCHER VON WALDHEIM, 1822, bei ihnen findet sich aber kein Mucro, kein Bürstenfleck des Abdomens des ♂, und *Gnaptor* besitzt beim ♂ einen undeutlichen zweiten Enddorn der Vorderschienen. Wie aus dieser Zusammenstellung ersichtlich, ergibt sich folgende Kombination der Merkmale: Enddorne der Vorderschienen beider Geschlechter, Mucro der Flügeldecken, der Bürstenfleck des ♂ an Abdomen, die Beborstung resp. Behaarung der Tarsen an der Unterseite, die normalen oder seitlich zusammengedrückten Tarsen, die gezähnten oder einfachen Vorderschenkel beider Geschlechter sind Merkmale, die die Zugehörigkeit oder Unabhängigkeit der Gattungen entscheiden. Die neue Gattung unterscheidet sich in so wichtigen Merkmalen von allen bis jetzt bekannten Formen, daß es gerechtfertigt ist, sie zu beschreiben.

Thaumatoblaps marikovskiji sp. n. (Abb. 6)

Körper einfarbig tiefschwarz, gestreckt, zylindrisch, Vorderkörper fettglänzend, Flügeldecken und Unterseite glänzend. K o p f (Abb. 1) mit schmalen Augen, am Hinterrand der Augen am breitesten, nach vorn verengt, die

Sehfläche nach vorn gerichtet. Wangen schmaler als der Kopf (wie 17 : 18,5), in etwa Augenlänge parallel, nachher gebogen verengt und an dem Clypeus ausgeschweift, Clypeus und Stirn liegen in einer gemeinsamen Fläche, Wangen mit dem Clypealrand etwas aufgewölbt. Clypeus am Voderrand gerade leicht ausgeschnitten, die Seitenecken abgerundet. Stirn fein, Clypeus etwas gröber, erloschen punktiert, der Grund chagriniert. Mentum vollkommen flach, breitoval, vorn abgerundet. Fühler (Abb. 2) hintergelegt das vordere Drittel des Halsschildes nicht erreichend, kürzer als die Halsschildbreite. Das 3. Glied gestreckt, alle übrigen Glieder sind breiter als lang oder höchstens so lang wie breit. Die Länge der Glieder 2—11 verhält sich wie 6 : 18 : 8 : 8 : 7 : 7 : 7,5 : 7,5 : 8 : 12 und die Breite 1—11 wie 9 : 6 : 7 : 8 : 8 : 8 : 11 : 13 : 12 : 12 : 10,5, das Endglied etwas unregelmäßig oval, scharf zugespitzt. Halsschild deutlich länger als breit. Seiten fast parallel, im vorderen Drittel am breitesten, von da an gebogen verengt; die breiteste Stelle vorn, die Basis und die Länge in der Mitte, weiters die Breite an den Augen des Kopfes verhalten sich wie 27,5 : 26 : 33 : 18,5. Die Vorderecken abgerundet, Vorderrand leicht im Bogen ausgerandet, Hinterecken rechtwinklig, Hinterrand ganz gerade, strichförmig fein gerandet, der Quere nach an der Basis fast flach. Oberseite einfach der Quere nach wenig gewölbt, im vorderen Drittel nach vorn leicht geneigt. Die Punktierung ist sehr spärlich, einzeln, der Grund chagriniert. Flügeldecken 2,43mal so lang wie der Halsschild und 2,48mal so lang wie die größte Breite etwa in der Mitte. An der Basis so breit wie der Halsschild, erscheint ziemlich parallel, das Verhältnis zwischen der größten Breite in der Mitte und der Basis wie 32,5 : 27. Ende der Flügeldecken bei beiden Geschlechtern mit gleichgroßem, gut ausgebildetem und abgesetztem Mucro, welcher ungef. 1 mm lang ist. Oberseite der Quere nach gewölbt, der sehr feine Seitenrand aber fast seiner ganzen Länge nach von oben betrachtet übersehbar. Die Punktierung spärlich, erloschen, gegen die Naht etwas feiner als die des Halsschildes, gegen die Seiten noch feiner und erloschener. Der Grund erloschen chagriniert, deshalb glänzender als der Halsschild. Prosternum niedergebogen, mit den Coxen in demselben Bogen gerundet, vor den Coxen mit einer Querfurche, die Mitte zwischen den Hüften der Länge nach leicht eingedrückt. 1. Abdominalsegment des ♂ mit etwa 5 gewölbten, starken Querrunzeln, ohne Höcker, der Bürstenfleck des ♂ ist gut ausgebildet, die Segmente 2—3 wurmartig erloschen gerunzelt, die zwei letzten Segmente punktiert, Analsegment fein und scharf gerandet. Beim ♀ sind die Abdominalsegmente 1—3 einfach der Quere nach gewölbt, erloschen gerunzelt, das 1. Segment in der Mitte ohne Querfalten oder Runzeln. Beine kräftig, die Länge der Schenkel, Schienen und Tarsen 1—3 verhält sich wie 20 : 23 : 44 : 20 : 21 : 33 : 14 : 18 : 20. Vorderschienen bei beiden Geschlechtern nur mit einem großen, stark gewölbten, spitzigen Enddorn (Abb. 3—4). Außenseite der Vorderschienen am Ende etwas ausgerandet. Vorder- und Mittelschienen

am Außenrand mit kurzen Kerbzähnchen und Borsten, Hinterschienen ganz gerade, gegen das Ende leicht verdickt, der Querschnitt oval. Endglied der Vordertarsen etwa so lang wie die gemeinsame Länge der Glieder 2—4, Basalglied der Hintertarsen länger als das Endglied (wie 30 : 25). Unterseite der Tarsenglieder der Länge nach kahl, seitlich spärlich beborstet, unbehaart. Aedoeagus: 3,1 mm (Abb. 5). — Länge: 16—17,2 mm.

Holotypus ♂: UdSSR, Turkmenien, Umgebung Kopa auf Solontchakboden, 16. VIII. 1978, MARIKOVSKIJ. — Paratypen: wie Holotypus, 21. IV. 1978, P. I. MARIKOVSKIJ (1 ♀) und 29. V. 1978, MARIKOVSKIJ (1 ♀). Holotypus ♂ und Paratypus ♀ befindet sich im Zoologischen Institut der Akademie, Leningrad, 1 ♀ auch im Ungarischen Naturwissenschaftlichen Museum in Budapest.

Die Art lebt in steinharten Solontchakboden in den Löchern einer sehr großen Assel (*Oniscus* sp.), dies macht die Seltenheit und die sonderbaren Merkmale dieses Tieres aus.

Das Tier sei von uns zu Ehren ihres Entdeckers, Prof. P. I. MARIKOVSKIJ benannt.

Lobodera (Discotus) echingolensis sp. n. (Abb. 7)

Körperform einer kleinen *L. dilectans* (FALDERMANN, 1836) sehr ähnlich, schwarz, Beine braun, Fühler und Tarsen heller rotbraun. Kopf mit breit gebogenen Wangen, die breiteste Stelle liegt etwas vor dem Vorderrand der Augen. Clypealsutur kaum sichtbar und zwischen Wangen und Clypeus am Seitenrand kein Ausschnitt erkennbar, Clypeus vorn beiderseits stark gebogen, die Mitte kurz, abgerundet V-förmig und breit ausgerandet. Oberseite dicht und fein raspelartig gekörnt, aus den Körnchen entspringen sehr kurze, anliegende, gelbe Härchen, der Grund zwischen den Körnchen matt chagriniert. Mentum oval, flach, vorn abgerundet, die Mitte nicht gekielt. Die breiteste Stelle der Wangen, die Breite an den Augen und die Stirn zwischen den Augen verhalten sich wie 60 : 54 : 37. Fühler hintergelegt die Mitte des Halsschildes nicht erreichend, das 3. Glied gestreckt, vom 7. Glied an merklich breiter, das Endglied eiförmig. Die Länge der Glieder 2—11 verhält sich wie 11 : 25 : 14 : 12 : 10 : 10 : 10 : 10 : 10 : 15 und die Breite wie 10 : 9,8 : 10 : 10 : 11 : 13 : 15 : 15 : 15 : 15. Halsschild 1,8mal so breit wie die Länge, in der Mitte im hinteren Drittel am breitesten, zur Basis nur wenig, nach vorn stärker und gebogen verengt, Vorderrand in einem einfachen Bogen ausgerandet, nicht gerandet, Hinterrand zweibuchtig, die feine Randung in der Mitte unterbrochen, Hinterecken fast rechtwinklig, Vorderecken ein wenig spitzwinklig. Das Verhältnis der Breite zwischen den Vorderecken, der größten Breite und der Basis sowie der Länge in der Mitte ist wie 66 : 103 : 96 : 58. Oberseite sehr dicht erloschen punktiert-gerunzelt, der Rand breit abgesetzt und abgeflacht, der glänzende Rand in der vorderen Hälfte etwas aufgebogen. Die Punktierung der Mitte geht an den Seiten allmählich in kleine raspelartige Körnchen über, dazwischen ist der Grund chagriniert. Flügeldekken 2,75mal so lang wie der Halsschild und 1,4mal so lang wie die größte Breite etwa um die Mitte; der Quere nach gewölbt, Seiten aber nur im hinte-

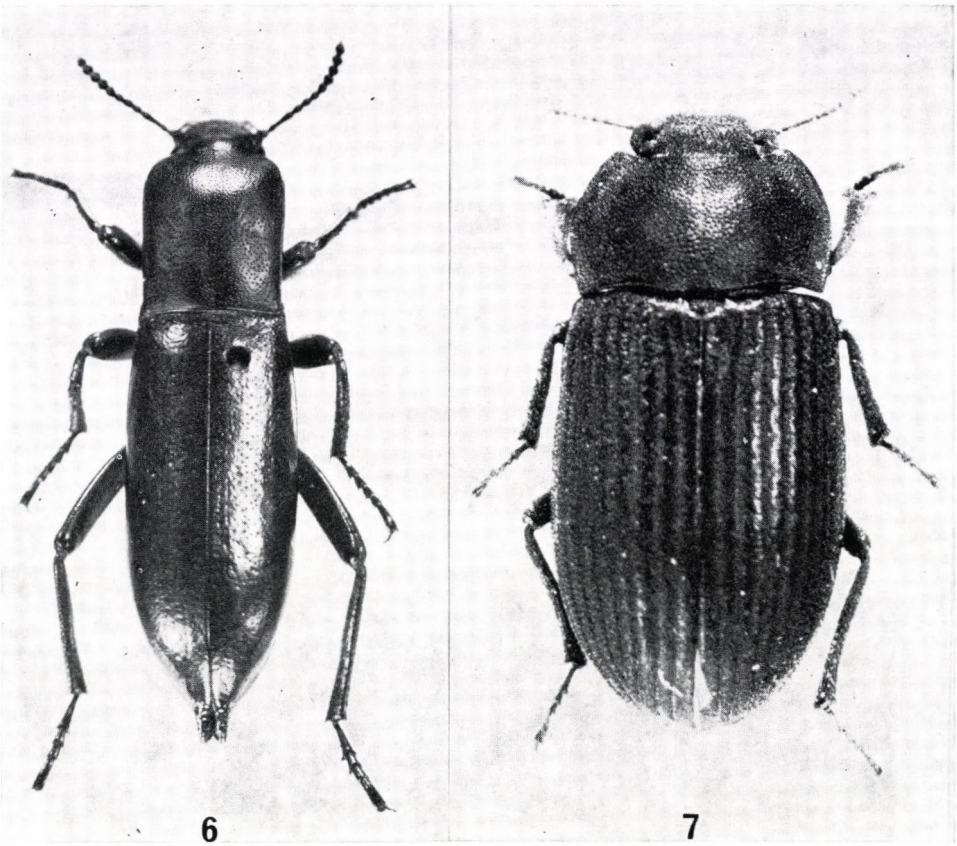

Abb. 6. *Thaumatoblaps* (gen. n.) *marikovskiji* sp. n. — Abb. 7. *Lobodera* (*Discotus*) *echingolensis* sp. n. (Foto: G. HORVÁTH & A. KEVE)

ren Drittel steil abfallend, so daß der fein abgesetzte Seitenrand von oben weit bis über die Mitte sichtbar ist. Innen mit schmalen, den Seiten zu allmählich tieferen und breiteren Streifen, in welchen die feinen Punktreihen kaum erkennbar sind; Oberseite in den inneren Zwischenräumen erloschen, nach außen und am Ende allmählich stärker, aber sehr fein und dicht gekörnt; die Oberfläche ist äußerst fein und kurz mit gelben Härchen spärlich besetzt. Prosternum stumpf, Hinterbrust und Abdomen raspelartig gekörnt, letztere auch etwas längsrunzelig. Analsegment beiderseits an der Basis kurz gerandet. Mitte des Abdomens beim ♂ ziemlich stark der Länge nach vertieft. Beine kurz, Vorderschienen breit, das Ende dreieckig erweitert, breiter als die gemeinsame Länge der 4 ersten Tarsenglieder. Hinterschienen dünn, am Ende leicht verdickt. Die Glieder der Hintertarsen verhalten sich wie 40 : 17 : 14 : 40. Tarsen mit rötlichen Borsten und feinen Haaren. — Länge: 8,5—10 mm.

Holotypus ♂: Mongolei, Bajanchongor aimak, Echin-gol, unter Steinen im trokkenen Flußbett, 26. VI. 1982, A. G. KIREJTSHUK (Zoologisches Institut der Akademie, Leningrad). — Paratypen: wie Holotypus (2 ♂, 2 ♀, davon ein Pärchen im Ungarischen Naturwissenschaftlichen Museum in Budapest).

Die Untergattung *Dicotus* REITTER, 1904 enthält bis jetzt nur 6 Arten: *viberti* REITTER, 1906 aus Nordafrika (Ägypten und Algier), *dilectans* (FALDERMANN, 1836) aus Transkaukasien über Turkmenien und Kasachstan bis zum Balchaschseegebiet und Afghanistan sowie aus Sinkiang, *freyi* SCHUSTER, 1937 aus dem Iran, *kaszabi* SKOPIN, 1960 aus Turkestan (Syr Darja-Gebiet), *semenovi* REICHARDT, 1937 aus Tadshikistan und der Mongolei, schließlich *netuschili* (REITTER, 1904) aus dem chinesischen Turkestan. Ausgenommen *L. kaszabi* SKOPIN, haben alle Arten fein punktierten Halsschild, als nähere Verwandte kommen sie nicht in Frage. Die Größe und Form entsprechen noch der *L. kaszabi* SKOPIN am meisten, bei welcher aber der Halsschild sehr grob rugulos punktiert ist, außerdem sind die Halsschildseiten weniger gebogen, die Längsstreifen an den Flügeldecken breit und die Zwischenräume stärker gewölbt, die Streifen, vor allem seitlich und am Absturz mit groben Reihenpunkten.

Basanus tshushimensis kompancevi sp. n.

Sehr nahe verwandt mit der Stammform *B. tshushimensis tshushimensis* M. CHÛJÔ, 1963, so daß es genügt, die Unterschiede gegenüber zu stellen:

B. tshushimensis s. str.	ssp. **kompancevi** ssp. n.
1. Das 3. Fühlerglied schlank, 1,56mal so lang wie breit, das 1. Glied 1,5mal so breit wie das 3. Glied (Abb. 8).	1. Das 3. Fühlerglied kürzer, 1,11mal so lang wie breit, das 4. Glied nur 1,33mal so breit wie das 3. Glied (Abb. 9).
2. Punktierung der Längsreihen der Flügeldecken vom ersten Viertel an gut erkennbar und sehr dicht, die Zwischenräume überall sehr fein und ziemlich spärlich, die Abstände der Punkte auch am Absturz, wo sie am stärksten sind, bedeutend größer als die Punkte selbst (Abb. 12).	2. Die Punktierung der ganzen Oberfläche deutlich gröber, die Zwischenräume der Flügeldecken mit deutlich stärkerer Punktierung, die Abstände der Punkte kaum schmaler als die Punkte selbst (Abb. 10—11).
3. Länge: 7,5—8,8 mm.	3. Länge: 8,2 mm.
4. Japan: I. Tsushima.	4. UdSSR: Primorje Kraj.

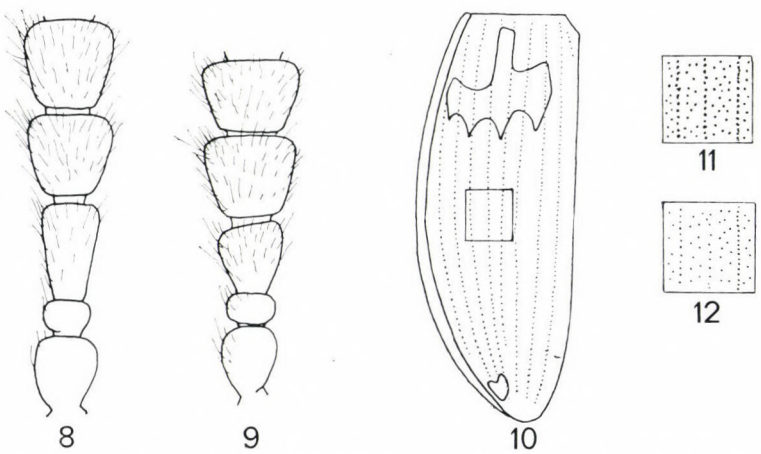

Abb. 8—9. Basalglieder der Fühler von *Basanus tshushimensis tshushimensis* M. CHÛJÔ (8) und *B. thushimensis kompancevi* ssp. n. (9). — Abb. 10—11. Linke Flügeldecke von *B. thushimensis kompancevi* ssp. n. (10) und Oberflächenskulptur der Flügeldecke (11). — Abb. 12. Oberflächenskulptur der Flügeldecke bei *B. thushimensis thushimensis* M. CHÛJÔ

Holotypus ♀: UdSSR, Primorje Kraj, Lazoskij p-n,c. Sokolcij, 28.—29. III. 1979, A. KOMPANCEV (Zoologisches Institut der Akademie, Leningrad). Eine Paratype aus demselben Fundort befindet sich im Ungarischen Naturwissenschaftlichen Museum, Budapest.

Die Art sei nach ihrem Entdecker, A. KOMPANCEV, benannt.

SCHRIFTTUM

CHÛJÔ, M. (1963): A new species of the genus Basanus Lacordaire from Japan and Korea (Coleoptera, Tenebrionidae). — Nipponius, **2** (4): 17—19, Figs 1—2.

REITTER, E. (1904): Tenebrionidae (III. Theil) mit den Abtheilungen: Lachnogyini, Akidini, Pedinini, Opatrini und Trachyscelini. — Verh. nat.-forsch. Ver. Brünn, **42:** 25—189.

SEIDLITZ, G. (1896—1898): Tenebrionidae. — in Erichson, W. F.: Naturgeschichte der Insecten Deutschlands, V (1): 201—877.

Acta Zoologica Hungarica 30 (1–2), pp. 87–136 (1984)

ORIBATIDS OF THE EASTERN PART OF THE ETHIOPIAN REGION (ACARI). V

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(Received 24 March, 1983)

Taxonomic and systematic examinations of the Oribatid fauna from the eastern part of the Ethiopian Region are given. The description of 29 new species, the redescription of 2 species and 9 new genera from Tanzania and Ethiopia are presented.

The present contribution is a continuation of my earlier endeavours to elaborate the Oribatid materials from the eastern part of the Ethiopian Region. This fifth part comprises mainly those species which originate from various heights and different biotopes of the Kilimanjaro, the number of species totals 31, of which 29 are new to science. A further species has already been described from Ethiopian materials.

The materials have been collected by DR. T. PÓCS (Tanzania) and DR. A. DEMETER (Ethiopia) whose efforts are herewith acknowledged.

During the elaboration of the materials, naturally many a species has been identified which had already been described earlier. These species are not referred to herewith, but will be discussed in detail when a survey of all the species known from the region is presented. The same goes for any zoogeographical notes and evaluation.

Any systematical problems presenting themselves in the course of elaboration, besides the rather brief differential diagnoses, will again be elucidated in the series: The Oribatids of the World, in preparation by BALOGH and MAHUNKA. Notwithstanding some small groups are ripe enough for discussing them short keys, as for example the genera of *Beklemishevia* ZACHVATKIN, 1945, *Dampfiella* SELLNICK, 1931, *Pilizetes* SELLNICK, 1937 and *Pergalumna* GRANDJEAN, 1936.

LIST OF LOCALITIES

Afr. 105. Tanzania, Mts. Kilimanjaro, Kibo, 3820 m. 1. August, 1972. leg. T. Pócs. — Extracting the root system of tussocks of grass taken in semi-desert area in a Berlese funnel.

Afr. 106. Tanzania, Mts. Kilimanjaro, Mweka. Base Hut. 2700–2900 m. 2. July, 1972. leg. T. Pócs. — Extracting moss carpet from the mist forest of Erica arborea in a Berlese funnel.

Afr. 108. Tanzania, Mts. Uluguru, 1800 m. 18. May, 1972. leg. T. Pócs. — Extracting sample from humus in a Berlese funnel.

Afr. 109. Tanzania, Mts. Kilimanjaro, Mweka, Base Hut, 2550–2650 m. 2. July, 1972. leg. T. Pócs. — Extracting moss carpet from the mist forest of Erica arborea in a Berlese funnel.

Afr. 119. Tanzania, Mts. Kilimanjaro, Kibo, 3890 m. 1. July, 1972. leg. T. Pócs. — Extracting the root system of tussocks of grass taken in semi-desert area in a Berlese funnel.
Afr. 166. Tanzania, Mts. Kilimanjaro, 2850 m. 19. September, 1972. leg. T. Pócs. — Extracting moss carpet from the mist forest of Erica arborea in a Berlese funnel.
Afr. 175. Tanzania, Mts. Uluguru, 2100 m. 1. January, 1980. leg. T. Pócs. — Berlese sample from litter with humus from stones.
Afr. 178. Tanzania, Mts. Kilimanjaro, 2850 m. 19. September, 1972. leg. T. Pócs. — Berlese sample from Sphagnum of Erica arborea wood, near Umbwe.
Afr. 181. Tanzania, Mts. Uluguru, Rts. Mnyera peak, 211 m. 1. January, 1973. leg. T. Pócs. — Berlese sample from dwarf forest, from epiphytic moss.
Ethiopia 323. Dinshu, Bale N. P. 3200 m, 1. XI. 1980. leg. A. Demeter. — Soil sample from alpine meadow, extracted in Berlese funnel.

APHELACARIDAE Grandjean, 1954

Beklemishevia demeteri sp. n.

Measurements: Length: 360—405 μm, width: 152—171 μm, length of prodorsum: 110 μm, width of prodorsum: 84 μm.

D o r s a l s i d e (Fig. 1A): Anterior margin of prodorsum slightly convex, without sharp rostrum. Rostral and lamellar setae nearly equal in length, both pairs much shorter than the interlamellar one. The latter one (114 μm) longer than the setiform sensillus (96 μm). Anterior exobothridial setae long, simple, posterior ones much shorter, but thickened. Notogastral setae as in the type species of the genus, only the ratio between them slightly different.

V e n t r a l s i d e (Fig. 1D): Mentum and labiogenal region as shown in Fig. 1B. Palpal tarsus (Fig. 1C) with one bifurcated seta. Epimeral setal formula: *4—3—3—5*. All setae thin and simple. The anterior setae of 1st epimere different in lengths. Nine pairs of simple and one (the first) pair modified, thickened (Fig. 1E), transversally situated genital setae. Five pairs of anal and adanal setae present.

L e g s : All legs with three claws. Empodium is much shorter than the two lateral claws. Chaetotaxy a shown in Fig. 1F.

M a t e r i a l e x a m i n e d : Holotypus (819-HO-83): Ethiopia, 323; 2 paratypes from the same sample: 1 paratype: Afr. 108. Holotypus and 2 paratypes (819-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The genus *Beklemishevia* consists so far of three species: *B. galeodula* Zachvatkin, 1945, *B. barbata* (Schubart, 1968) and *B. africana* (Mahunka, 1973). The new species stands nearest to *B. africana*, however, the latter has a rostral apex and its sensillus is much longer than the interlamellar setae.

Key for the Beklemishevia species

1 (2) First leg with two, all other with three claws **galeodula** Zachvatkin, 1945
2 (1) All legs with three claws.

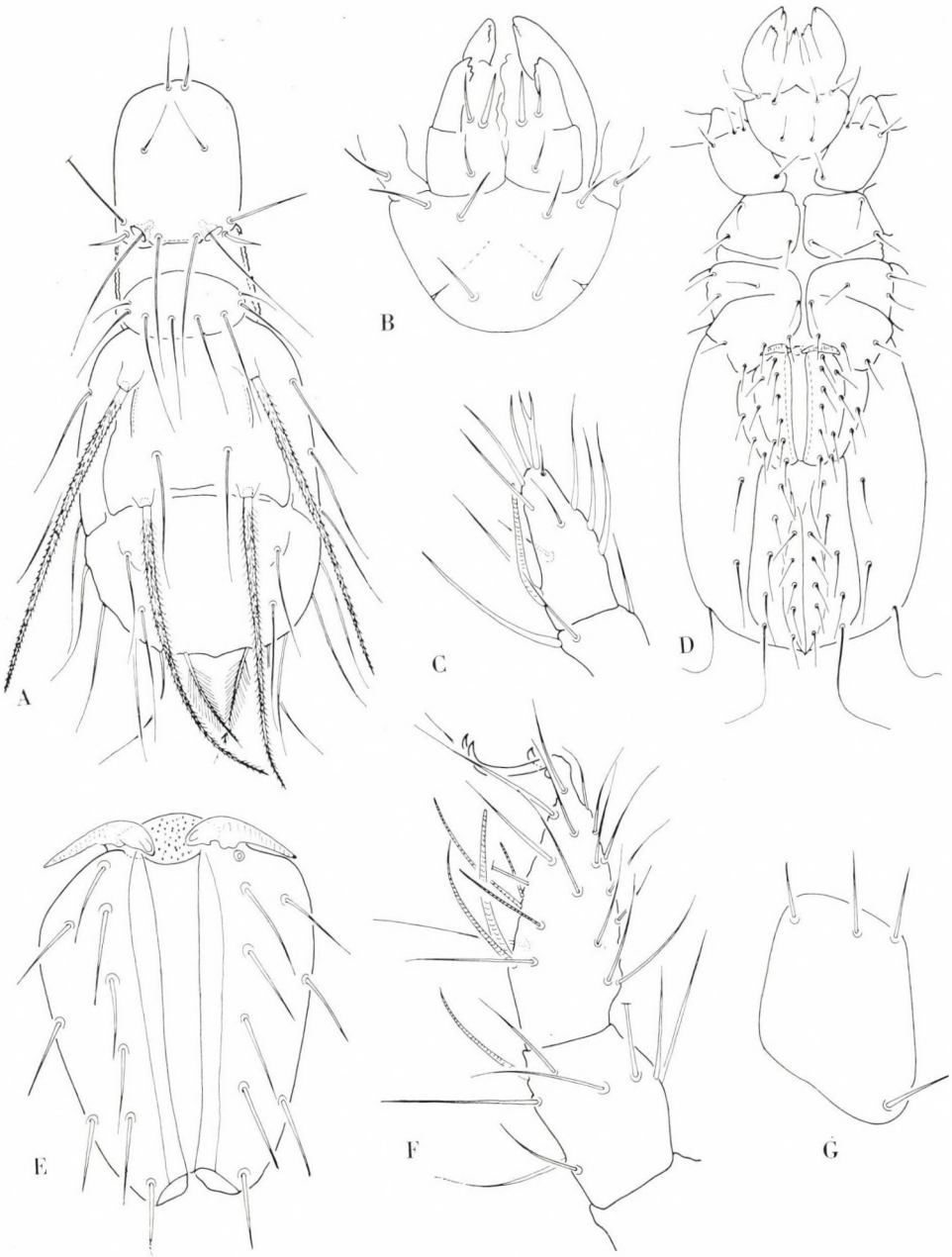

Fig. 1A—G. *Beklemishevia demeteri* sp. n. — A = dorsal side, B = gnathosoma, C = palpal tarsus, D = ventral side, E = genital plate, F = tarsus and tibia of leg I, G = trochanter of leg I

3 (4) Setae c_1 only half as long as c_2. Epimeral setal formula: *4—3—3—4*
barbata (SCHUBART, 1968)
4 (3) Setae c_1 nearly as long as c_2. Epimeral setal formula: *4—3—3—5*.
5 (6) Rostrum with a median apex. Sensillus longer than interlamellar setae
africana (MAHUNKA, 1973)
6 (5) Rostrum rounded, without apex. Sensillus shorter than interlamellar setae
demeteri sp. n.

BRACHYCHTHONIIDAE THOR, 1930

Liochthonius tanzanicus sp. n.

Measurements: Length: 160—190 μm, width: 92—104 μm.

Dorsal side (Fig. 2A): All setae of body phylliform, some pairs serrated marginally. Head of sensillus (Fig. 2B) with two apices and some spines in four or five rows. Spots in the basal part of prodorsum not visible. Setae *c* and *d* slightly shorter than the setae (Fig. 2C) of *F* or *H* segment.

Ventral side: Similar to that of the other species of the genus.

Material examined: Holotypus (820-HO-83): Afr. 105; 5 paratypes: from the same sample; 12 paratypes: Afr. 119. Holotypus and 15 paratypes (820-PO-83) in the Hungarian Natural History Museum, Budapest, and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species stands nearest to *L. penicillus* CHINONE, 1978 from Japan, however, the sensillus of the latter species asymmetrical and their spines much longer.

CAMISIIDAE OUDEMANS, 1900

Heminothrus glaber sp. n.

Measurements: Length: 780—793 μm, width: 420—432 μm.

Dorsal side (Fig. 3A): Rostrum slightly nasiform, rostral setae long, curved, longer than distance between them. Lamellar setae arising on a pair of well-developed tubercles, well spinosed or ciliated. Interlamellar setae very long, reaching nearly to rostrum, not ciliated, but a thin velum on it, serrated marginally (Fig. 3D). Exobothridial setae well visible. Sensillus short, clavate, spinose. Surface of prodorsum well foveolated. Notogastral surface — excepting a pair of convex cristae — smooth. All setae very long, similar in shape (Fig. 3B) to interlamellar setae. Posteromarginal setae originating on small tubercles.

Ventral side (Fig. 3C): Epimeral setal formula: *3—1—3—4*. Epimeres framed with tubercles arranged in parallel lines beside the apodemes. On the first epimere a dentate plate existing marginally. Fourteen pairs of

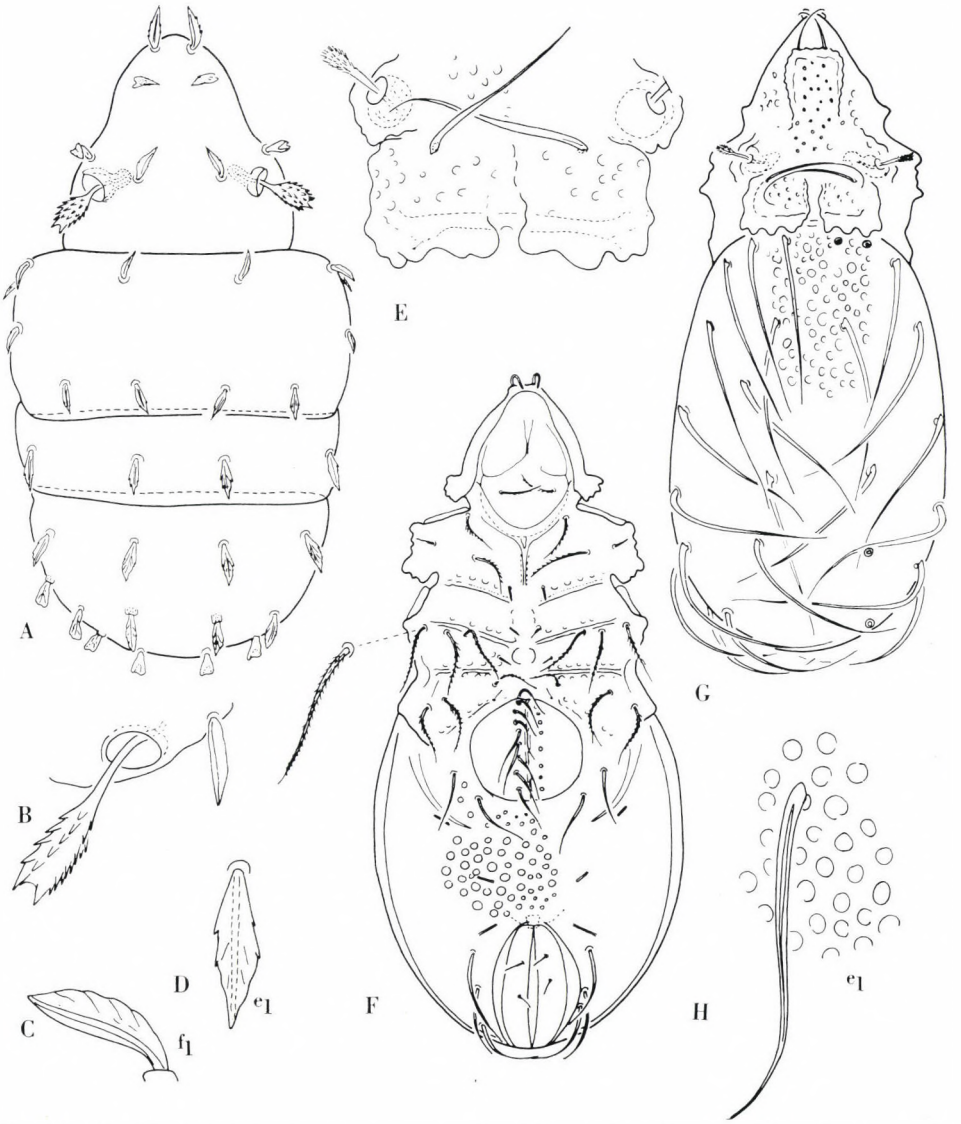

Fig. 2A—D. *Liochthonius tanzanicus* sp. n. — A = dorsal side, B = sensillus, C = setae f_1, D = seta e_1. — E—H. *Nanhermannia pluriseta* sp. n. — E = basal part of prodorsum, F = ventral side, G = dorsal side, H = seta e_1

strong genital setae present (Fig. 3E). Anal and adanal setae resembling epimeral ones, all slightly dilated and serrated marginally.

Material examined: Holotypus (821-HO-83): Afr. 178; 3 paratypes: from the same sample; 5 paratypes: Afr. 109; 4 paratypes: Afr. 166. Holotypus and 10 paratypes (821-HO-82) in the Hungarian Natural History Museum, Budapest and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The new species is well characterized by the very long notogastral setae and the great difference between the sculpture of the prodorsum and the notogaster. On these grounds the new species stands nearest

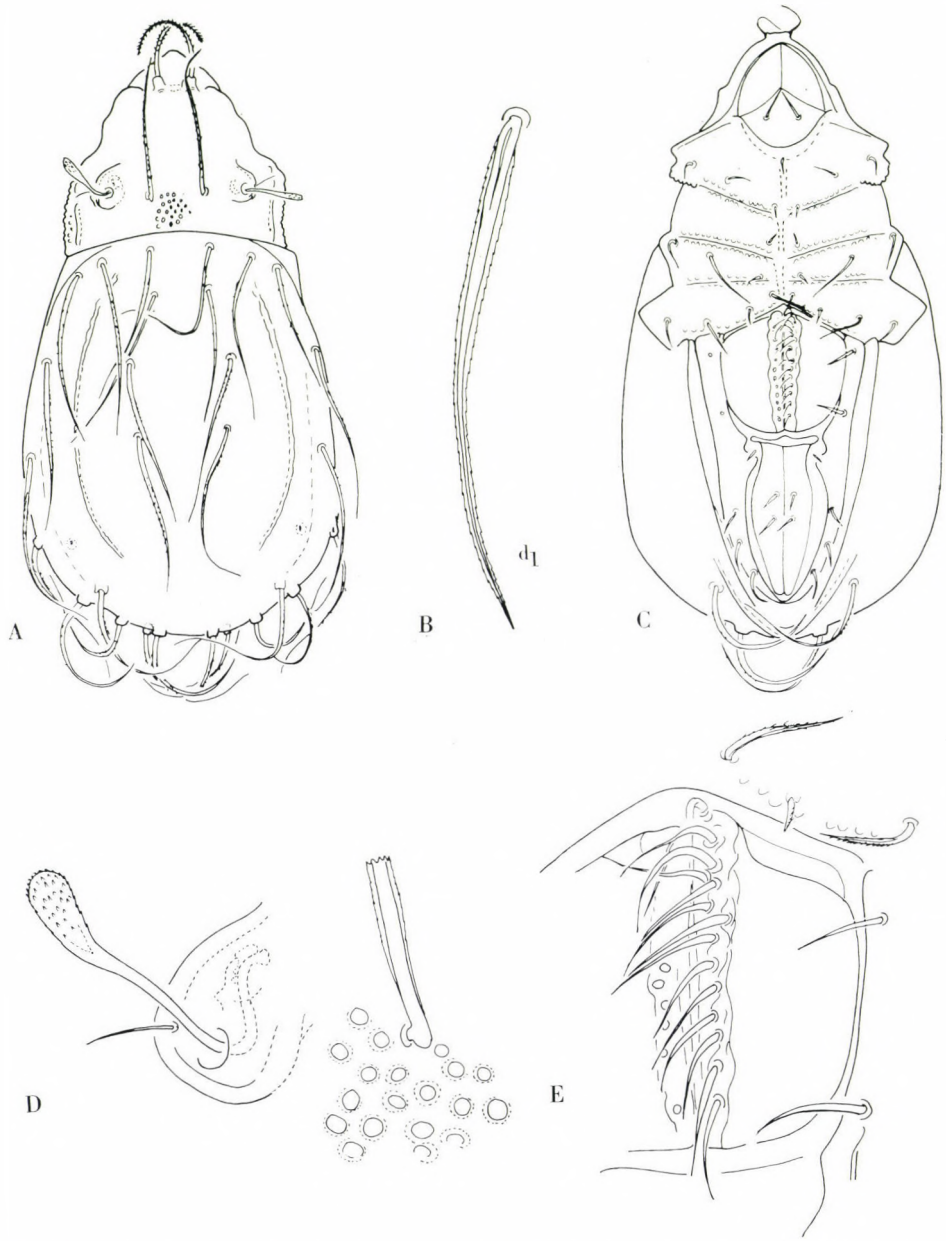

Fig. 3A—E. *Heminothrus glaber* sp. n. — A = dorsal side, B = seta d_1, C = ventral side, D = trichobothrium, E = genital plate

to *H. yamasakii* AOKI, 1958 and *H. exaggeratus* HAMMER, 1980, however the notogaster of the latter species is foveolated, while *yamasakii* has only 12 pairs of genital setae.

NANHERMANNIIDAE SELLNICK, 1928

Nanhermannia pluriseta sp. n.

Measurements: Length: 608—625 μm, width: 264— 280 μm.

D o r s a l s i d e (Fig. 2G): Median part of prodorsum well framed, lamellar setae arising on this margin, reaching out to the rostrum. Median part ornamented by slightly smaller foveolae than on lateral part. Interlamellar setae very long, longer than distance between them. Sensillus short, with a small head and well barbed. Basal teeth of prodorsum well developed, four teeth sitting on each side, this sculpture medially divided (Fig. 2E). All setae of notogaster very long, c_2 reaching far beyond the insertion points of d_2. Sculpture consisting of large foveolae (Fig. 2H).

V e n t r a l s i d e (Fig. 2F): Epimeral setal formula: *4—1—4—4* (often more setae on one side of the epimeres). All setae — excepting *1a*, *1d*, *2a*, *3a* and *4b* — well ciliated. Nine pairs of genital, two pairs of aggenital, two pairs of shorter anal and three pairs of adanal setae present. All smooth, as are notogastral setae.

M a t e r i a l e x a m i n e d : Holotypus (822-HO-83): Afr. 109; 5 paratypes from the same sample. Holotypus and 4 paratypes (822-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The new species is well characterized by the epimeral setal formula, all other species have only three pairs of setae on their 1st epimeres. On the ground of the very long notogastral setae the new species is distinguished from all its congeners. From Africa only one species (*N. quadridentata* BALOGH, 1958) has been known, however, its prodorsal teeth are undivided medially.

GYMMODAMAEIDAE GRANDJEAN, 1954

Trichodamaeus subgen. n.

D i a g n o s i s : Habitus very similar to *Aleurodamaeus* GRANDJEAN, 1954. Genital plates with nine pairs of setae.

Type-species: *Aleurodamaeus* (*Trichodamaeus*) *africanus* sp. n.

R e m a r k s : The new subgenus is distinguished from the nominate genus by the number of the genital setae.

Aleurodamaeus (Trichodamaeus) africanus sp. n.

Measurements: Length: 662—739 μm, width: 397—438 μm.

Dorsal side (Fig. 4A): Prodorsum partly covered with secretion layer, resembling a diadem anteriorly, which is indented marginally, and a median part dilated basally, with a foveolated or wrinkled sculpture. Rostral and lamellar setae arising near to each other, nearly in a transversal line, both pairs simple, flagellate and finely barbed. Interlamellar setae short, spiniform. Exobothridial setae simple, but much shorter than the lamellar one. Bothridium caliciform, rising well above the surface of prodorsum. Sensillus setiform, smooth. Notogastral surface smooth too, but covered with larval and nymphal skins (Fig. 4D). Posterior end of body elongated, with two pairs of long, flagelliform setae, each arising on a tubercle. Two other pairs of setae in posteromarginal position. The nymphal skin with typical sculpture, surface polygonated medially and nearly foveolated laterally. All layers of skin with an elongated protuberance and with two pairs of setae posteriorly (but all setae broken), and two–three pairs of setae anteriorly.

Ventral side (Fig. 4C): Epimeral setae thin, flagellate. Epimeral setae formula: *3—1—3—3*. Nine pairs of genital setae (often 10 setae on a plate). Genital, anal and adanal setae comparatively long, setae ad_2 and ad_3 in paraanal position.

Legs: All legs very long and thin, typical for the genus. Leg 1 as shown in Fig. 4B.

Material examined: Holotypus (823-HO-83): Afr. 109; 2 paratypes from the same sample; 1 paratype: Afr. 106. Holotypus and 2 paratypes (823-PO-83) in the Hungarian Natural History Museum, Budapest, and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is very similar to *Aleurodamaeus setosus* (Berlese, 1883). However, the sculpture of the larval skin is finely polygonated and not completely foveolated as in *setosus*. The new species has nine pairs of genital setae (*setosus* has only seven) and the setae of the tibia stand very near to each other (in *setosus* far from each other).

MICROTEGEIDAE Balogh, 1972

Microtegaeus papillosus sp. n.

Measurements: Length: 365—370 μm, width: 227—248 μm.

Dorsal side (Fig. 5A): Rostrum elongated, with truncate apex. Rostral setae thin. Lamellae well developed, lamellar setae originating on small tubercles, interlamellar setae resembling the preceding ones, both pairs strong and curved. Sensillus (Fig. 5B) long, its head beset with thick papillae.

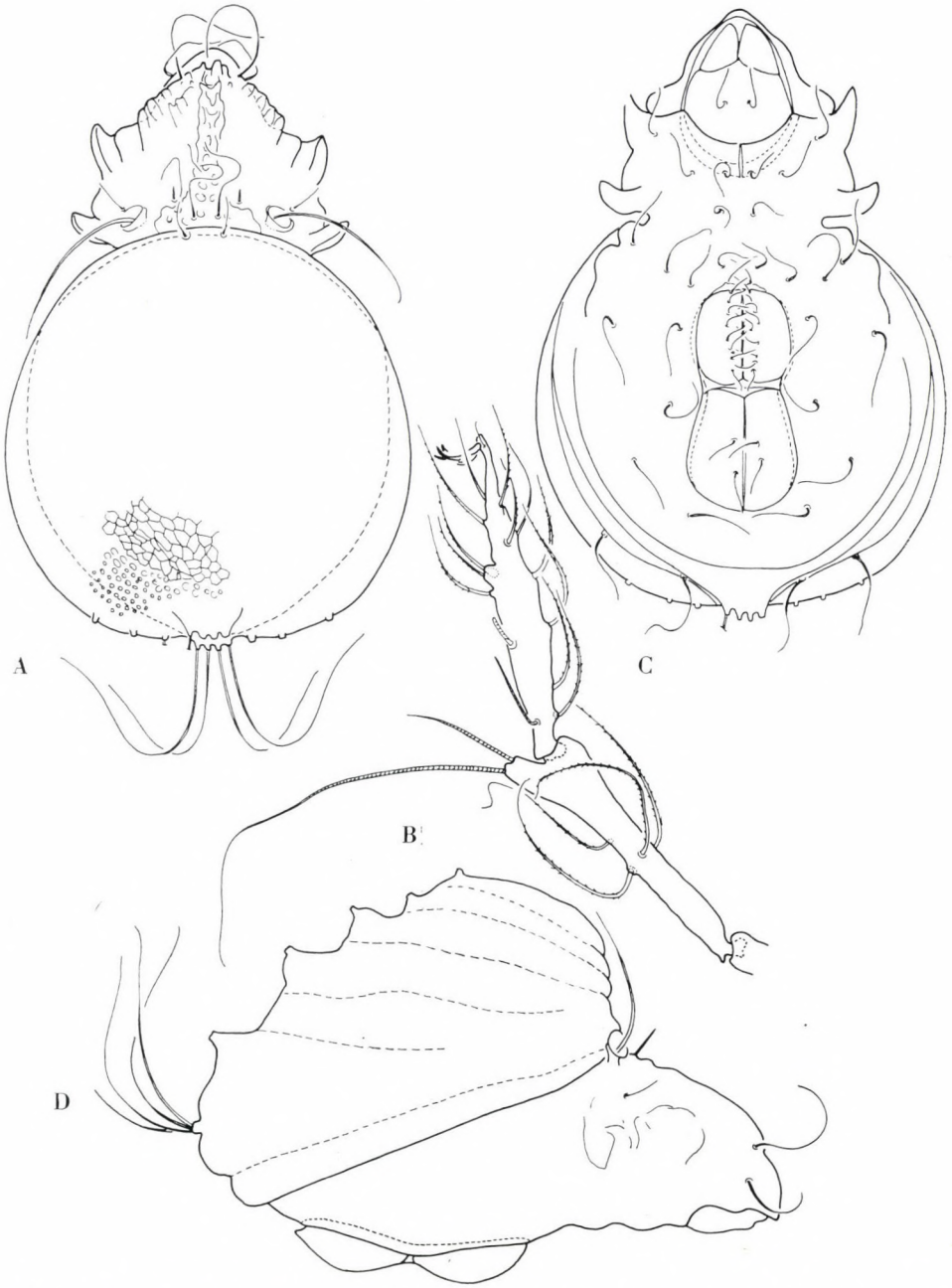

Fig. 4A—D. *Aleurodamaeus* (*Trichodamaeus*) *africanus* sp. n. — A = dorsal side, B = tarsus and tibia of leg I, C = ventral side, D = body from lateral view

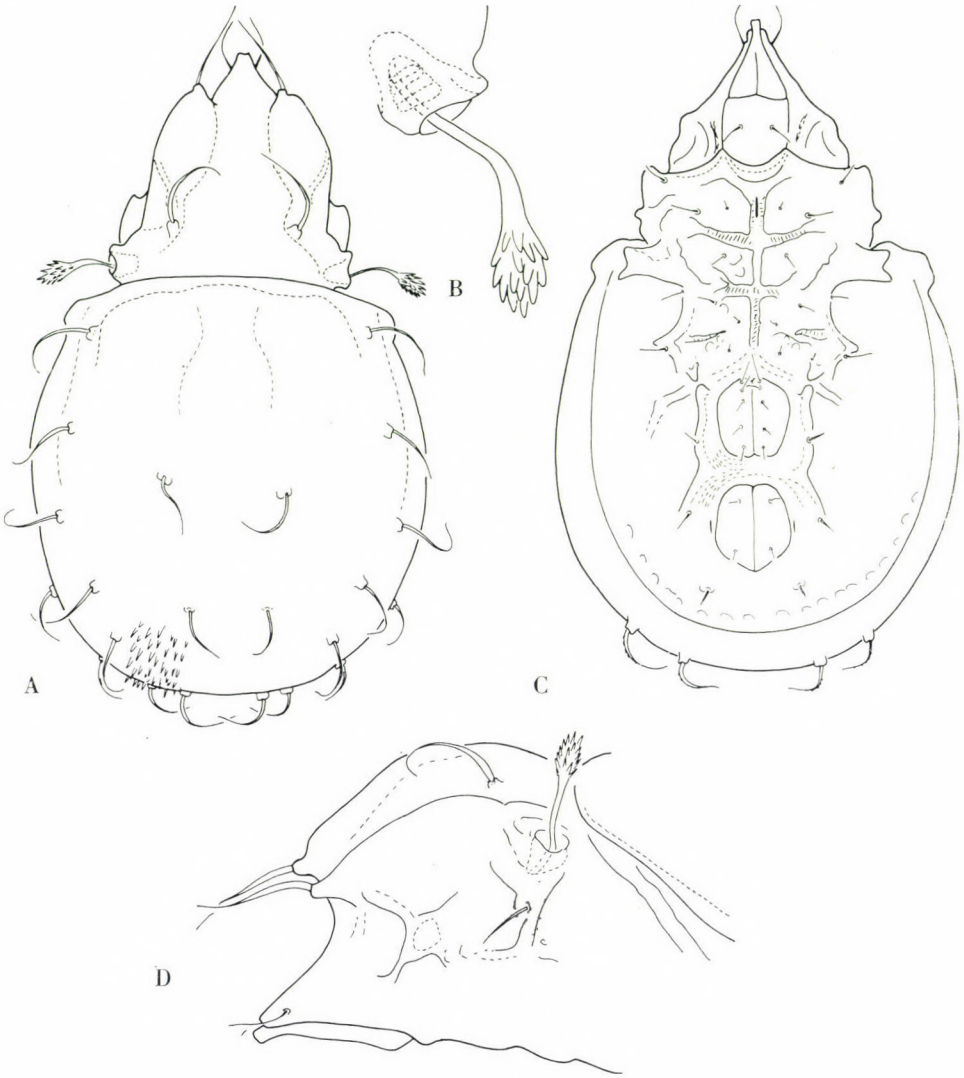

Fig. 5A—D. *Microtegeus papillosus* sp. n. — A = dorsal side, B = sensillus, C = ventral side, D = lateral part of prodorsum

Notogaster completely covered with secretion spinules. Eleven pairs of notogastral setae present, all long, thickened basally. Their basal part with some broad cilia. Notogastral setae arising on small tubercles.

Ventral side (Fig. 5C): Well chitinized. Apodemes and bordures well developed. Surface of epimeres with some rugae. All epimeral setae simple, some (*3c*, *4c*) arising in small tubercles. Five pairs of genital setae present. Anogenital region framed by chitinous laths, inner surface ornamented with short ridges. One pair of aggenital and two pairs of adanal setae present.

Material examined: Holotypus (824-HO-83): Afr. 106; 1 paratype from the same sample. Holotypus deposited in the Hungarian Natural History Museum, Budapest; paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well characterized by its long interlamellar and notogastral setae, the smooth surface of notogaster and the long

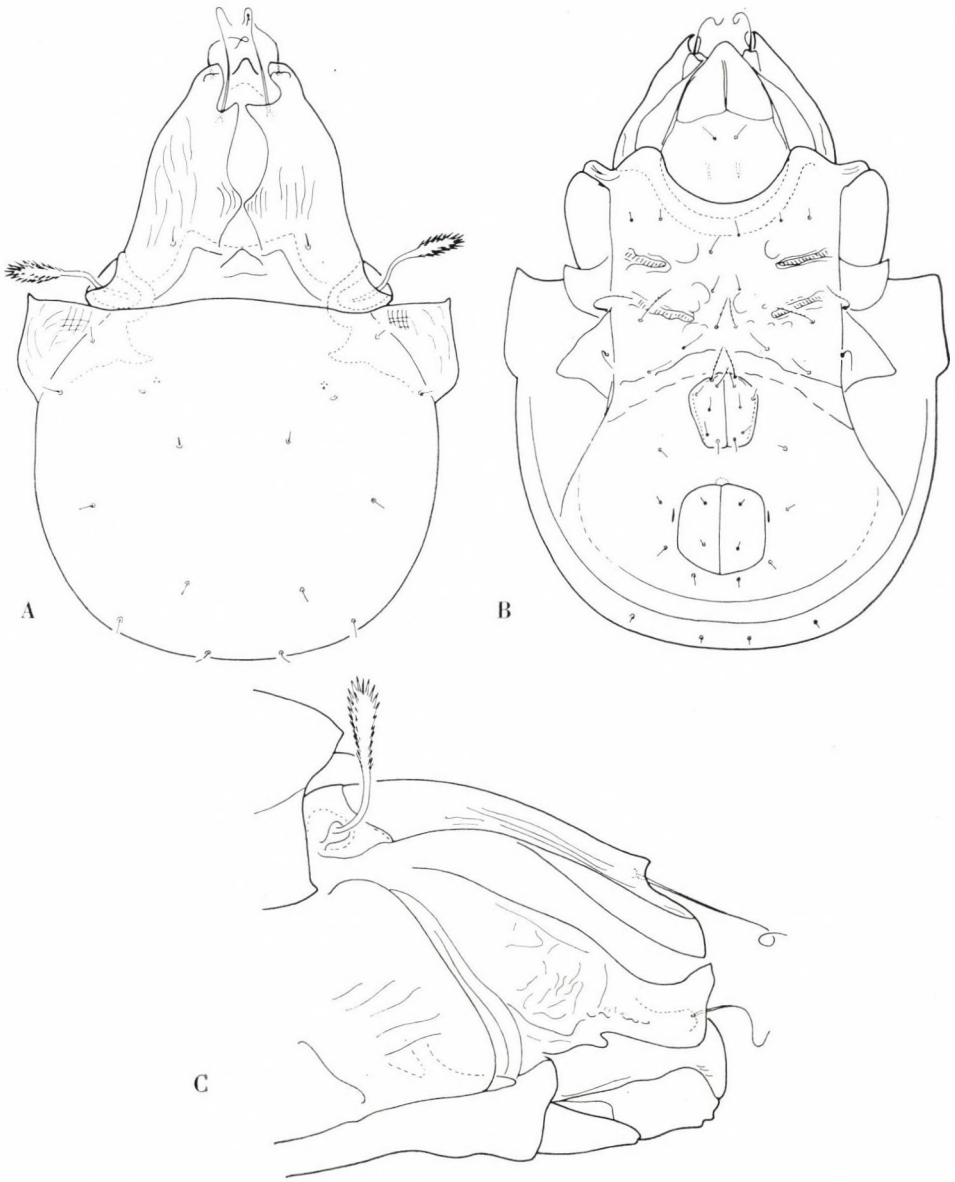

Fig. 6A—C. *Szentivanyiella africana* sp. n. — A = dorsal side, B = ventral side, C = prodorsum from lateral view

peduncle of sensillus. This combination of characters is unknown among the so far described taxa. The straight rostral apex is a general feature being different from all others species.

MICROZETIDAE Grandjean, 1936

Szentivanyiella africana sp. n.

Measurements: Length: 267 μm, width: 186 μm.

Dorsal side (Fig. 6A): Rostrum pointed, rostral setae arising laterally on large tubercles. Lamellae very broad, covering nearly the biggest part of prodorsum, leaving only a part of either rostral or interlamellar region free. Lamellar setae arising near to inner margin of lamellae but their insertion points covered by the lamellae. Tectum very wide with a broad cuspis (Fig. 6C). Interlamellar region with a big apophysis. Rostral and lamellar setae long, flagelliform, interlamellar one short, originating on the surface of lamellae. Surface of lamellae and pteromorphae rugose. Sensillus fusiform, laterally spinose. Nine pairs of short notogastral setae present.

Ventral side (Fig. 6B): Surface of pedotecta rugose, epimeral surface finely granulated. Epimeral setae different in length, *3a* stronger than the others, all finely ciliated. Anterior pairs of genital setae much longer than other five pairs. Anal and adanal setae minute.

Material examined: Holotypus (826-HO-83): Afr. 166, deposited in the Hungarian Natural History Museum, Budapest.

Remarks: The species of the genus *Szentivanyiella* Balogh et Mahunka, 1969 have been known until now only from South America and Java. The new species stands near to the type species *S. latilamellata* Bal. et Mah., 1969, however, it is distinguished from the latter by the median apophysis of prodorsum and the shape of the lamellae.

GUSTAVIIDAE Oudemans, 1900

Gustavia longiseta sp. n.

Measurements: Length: 610 μm, width: 463 μm.

Dorsal side (Fig. 7A): Rostrum with two sharp horns (Fig. 7B). Lamellae with a long cuspis, lamellar setae originating on them. Interlamellar setae very long, slightly ciliated. Sensillus only slightly thickened, its distal part with some short cilia. Notogaster with one pair of long and strong setae.

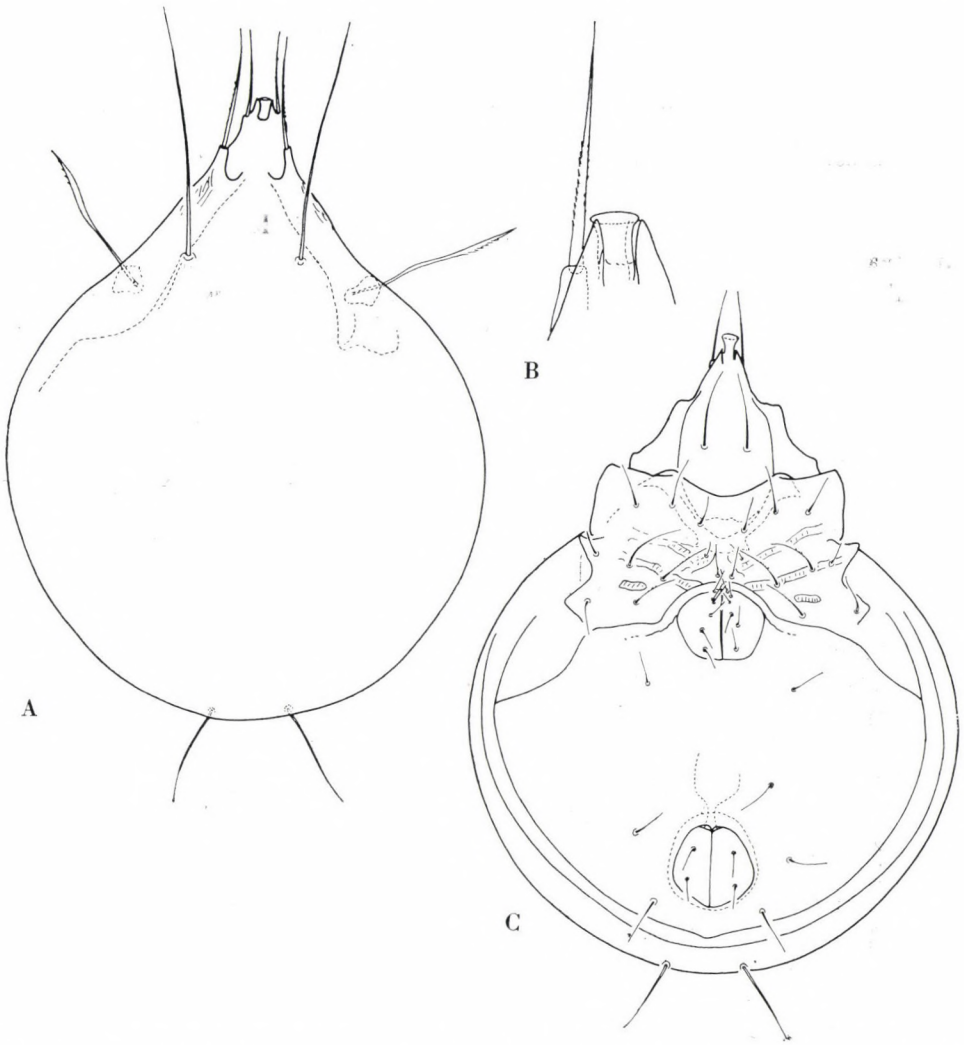

Fig. 7A—C. *Gustavia longiseta* sp. n. — A = dorsal side, B = rostrum, C = ventral side

Ventral side (Fig. 7C): Apodemes well developed, before the genital opening an arched chitinous lath present. All epimeral setae long and thin. Setae *1b* much longer than *1a*, *3a* much shorter than *3b* and *3c*, *4b* longer than *4a* or *4c*. Six pairs of comparatively long genital and one pair of aggenital setae present. Anal and adanal setae long, *iad* pori not visible.

Material examined: Holotypus (827-HO-83): Afr. 166, deposited in the Hungarian Natural History Museum, Budapest.

Remarks: The new species is distinguished from all congeners by the one pair of very long notogastral setae.

CARABODIDAE C. L. Koch, 1837

Congocepheus latilamellatus sp. n.

Measurements: Length: 347—370 μm, width: 190 - 203 μm.

Dorsal side (Fig. 8A): Lamellae very wide, dilated medially, covering a large part of prodorsum. Latter very high in lateral view (Fig. 8C) and nearly right-angled. Interlamellar setae in dorsal view arising below the rostral one. Interlamellar setae very large, broad phylliform, with an elongated end. Rostral setae short, lamellar setae with long spines. Sensillus spindle-shaped, curved, well barbed. Surface of notogaster with strong chitinous laths.

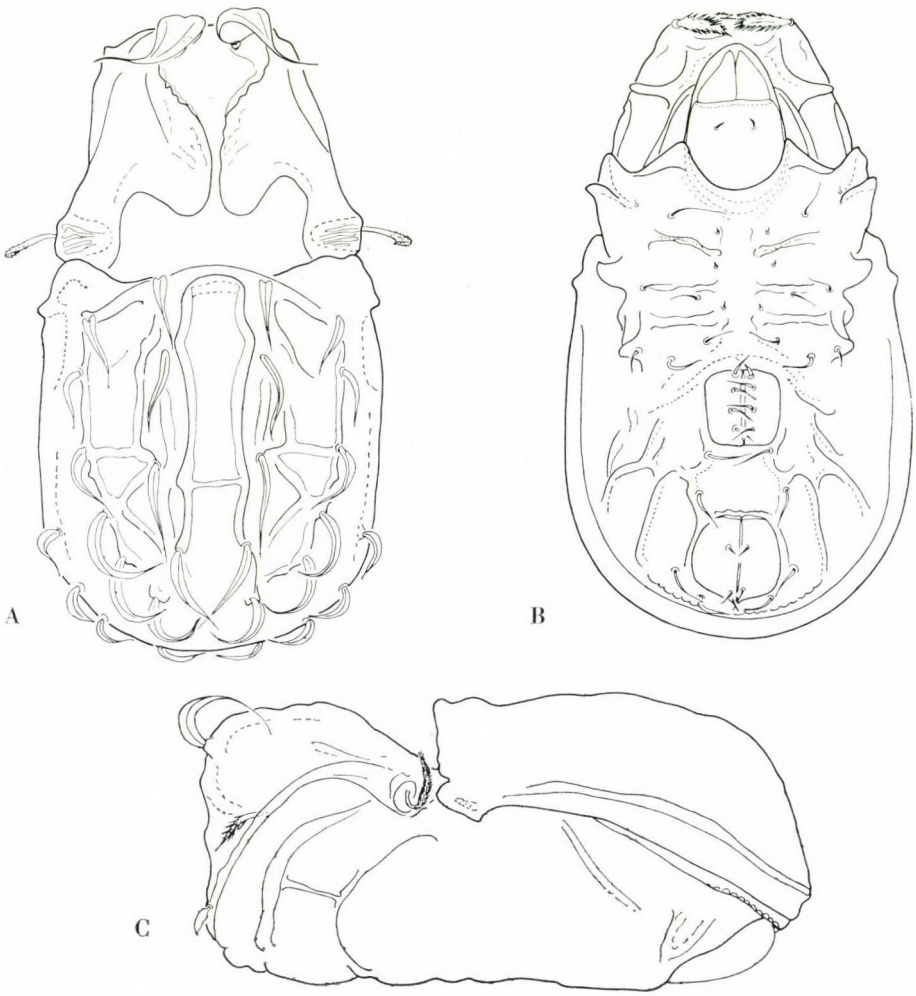

Fig. 8A—C. *Congocepheus latilamellatus* sp. n. — A = dorsal side, B = ventral side, C = body from lateral view

comprising a polygonal reticulation. Fourteen pairs of phylliform notogastral setae present.

Ventral side (Fig. 8B): Pedotecta 1 divided by a transversal crest. Epimeral setal formula: *3—1—3 – 3*. Among the epimeral setae a great differences exists, setae *1b*, *3b*, *3c*, *4a*, *4b* and *4c* much longer than the other ones. Genital, aggenital and adanal setae slightly dilated, phylliform. Posterior margin of the anal plates with long spines medially. Both pairs of anal setae much shorter than the genital or adanal ones.

Material examined: Holotypus (828-HO-83): Afr. 178; 2 paratypes from the same sample. Holotypus and 1 paratype (828-HO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is conditionally ranged to the genus *Congocepheus* BALOGH, 1958, because the shape of notogaster not completely identical. The known *Congocepheus* species display a much larger hollow between the prodorsum and notogaster. The new species stands very near to *C. ornatus* MAHUNKA, 1982, but the lamellae of the latter species are thinner, and the ornamentation of the notogaster and the ventral plate are highly different.

Trichocarabodes costulatus sp. n.

Measurements: Length: 690—751 μm, width: 332—406 μm.

Dorsal side (Fig. 9A): Rostrum wide. Lamellae and translamella well developed. Lamellar seta arising on a small tubercles, which originate on the translamella. A pair of chitinous laths reaching inwards and forwards, interlamellar setae arising on them. Lamellar and interlamellar setae phylliform, finely barbed. Rostral setae (Fig. 9D) with a serrated margin. Sensillus (Fig. 9E) setiform, curved beset with spines. Surface of prodorsum ornamented with tubercles, surface of lamellae with some foveolae. Fourteen pairs of small, spindle-shaped notogastral setae (Fig. 9B), resembling the interlamellar ones. Notogaster tuberculated.

Ventral side (Fig. 9C): Epimeral setal formula: *1—1— 3— 3*. Surface of epimeres with large spots, bordures well discernible. Genital plates with 8—10 pairs of long and thin genital setae in different variations (*8—9*, *9—9*, *9— 10*), mostly 9. Genital and anal region well framed with chitinous laths. Excepting adanal setae all ventral setae thin and simple, adanal setae resembling notogastral ones, slightly thickened and spindle-shaped.

Material examined: Holotypus (829-HO-83): Afr. 109; 11 paratypes from the same sample. Holotypus and 9 paratypes (829-PO-83) deposited in the Hungarian Natural History Museum, Budapest; 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species stands close to *Trichocarabodes celisi* (BALOGH, 1958), however, the setae of this species are normal, thin, and without chitinous laths in the interlamellar region.

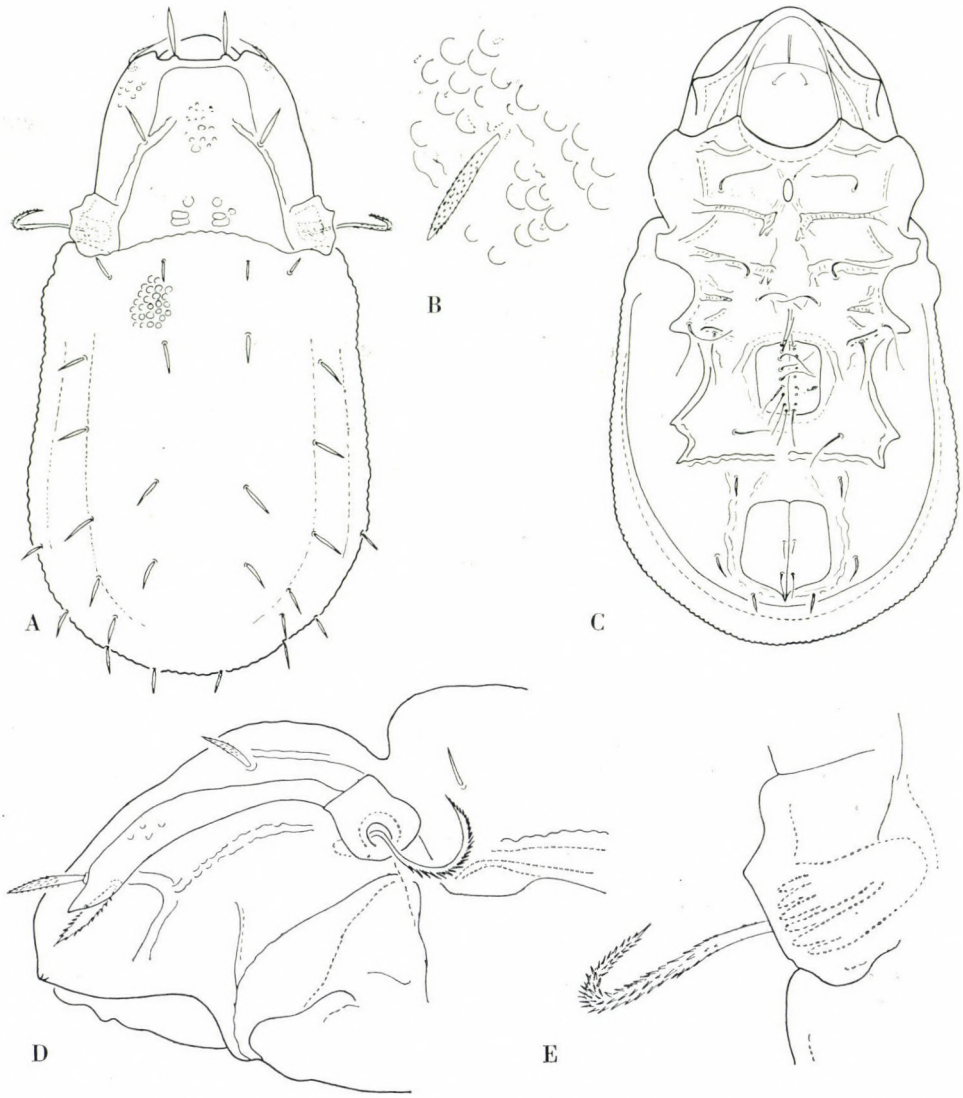

Fig. 9A—E. *Trichocarabodes costulatus* sp. n. — A = dorsal side, B = notogastral seta, C = ventral side, D = prodorsum from lateral view, E = sensillus

TECTOCEPHEIDAE GRANDJEAN, 1954

Tectocepheus spinosus sp. n.

Measurements: Length: 308—329 μm, width: 175—187 μm.

D o r s a l s i d e (Fig. 10A): Rostrum wide, rostral margin undulate, without incisure. Lamellae long, apices elongated, distal end scarcely broader

than basal end of lamellar setae (Fig. 10C). Lamellar and rostral setae distinctly pilose. Surface of lamellae with some longitudinal rugae, some rugae also present before translamella. Interlamellar and all notogastral setae short, spiniform with secretion layer, so seemingly thicker than in effect. Sensillus clavate, its head with squamiform spines.

Ventral side (Fig. 10B): All epimeral setae minute. Surface covered with secretion, 3rd and 4th epimeres with some short rugae longitudinally. Six pairs of short genital setae. Adanal region with some strong rugae lateral margin of ventral plate nearly parallel.

Material examined: Holotypus (830-HO-83): Afr. 119; 17 paratypes from the same sample. Holotypus and 15 paratypes (830-PO-83) deposited in the Hungarian Natural History Museum, Budapest; 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is bigger than any of the other species of the genus. Owing to its lamellar cuspis it stands nearest to *Tectocepheus*

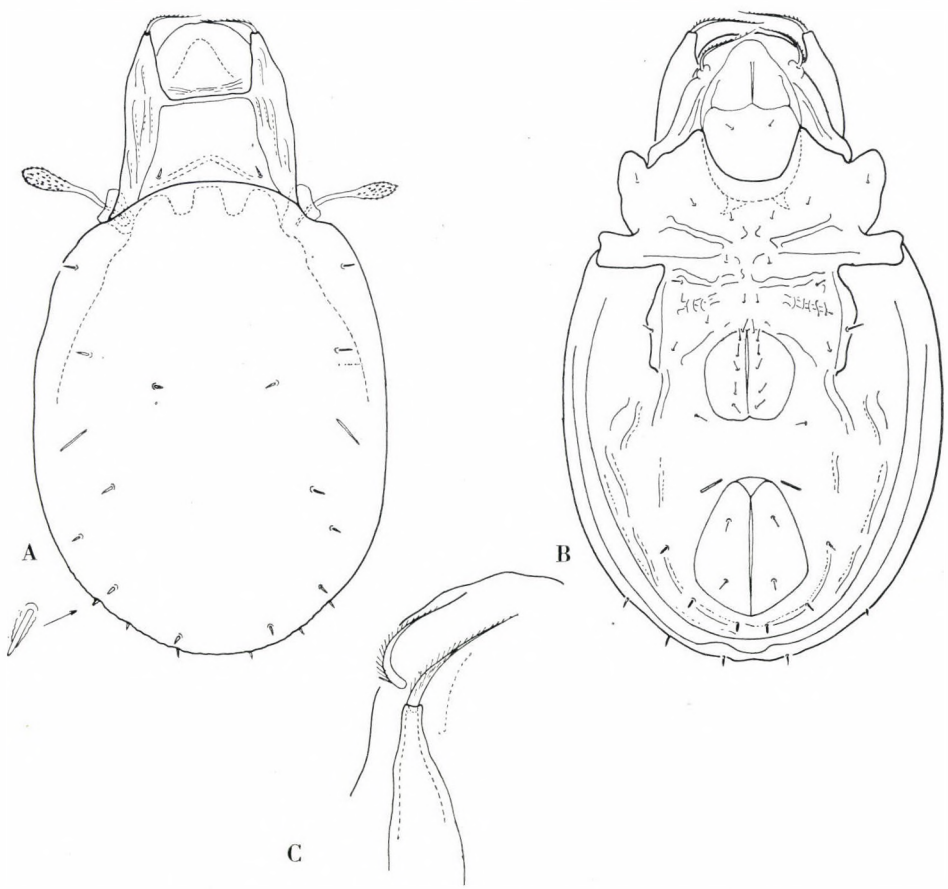

Fig. 10A—C. *Tectocepheus spinosus* sp. n. — A = dorsal side, B = ventral side, C = rostrum

vicarius BALOGH, 1958, however, the new species has no notogastral hollow, its sensillus is much longer and the rugae of the prodorsal and anal region are much stronger.

DAMPFIELLIDAE BALOGH, 1961

Dampfiella setosa sp. n.

Measurements: Length: 600—718 μm, width: 223—268 μm.

D o r s a l s i d e (Fig. 11A): Rostrum wide, rostral and lamellar setae arising near to each other, both pairs long, curved, setiform, well ciliated. Surface of prodorsum — in lateral view — concave medially. Costulae well developed, curving inwards. Prodorsum with some polygonal fields basally and laterally (Fig. 11E). Interlamellar setae short, erect and stick-shaped. In exobothridial region a long, branched, taenidal-tube (see GRANDJEAN, 1964). Sensillus (Fig. 11B) long, its head lanceolate, with minute spines. Surface of pedotecta with small rugae, exobothridial region granulated. Notogastral setae — excepting seta *ta* — long, *ti* (Fig. 11C) much longer than distance between setae *ta* and *ti*. All setae thick, slightly obtuse, with squamiform spines. Ratio of posteromarginal setae: $p_1 < p_2$, $r_3 < p_3$.

V e n t r a l s i d e (Fig. 11D): Epimeral setae of two types, *1a*, *1c*, *2a*, *3c* and *4c* short and obtuse, *1b*, *2b*, *4a* much longer than these and setiform. Apodemes and bordures well visible. Genital plates with four pairs of setae, first pair partly reduced and sometimes represented only by their alveoli. Genital setae thin and simple, all other setae in anogenital region obtuse and stick-shaped. Adanal setae equal in length, but an_1 only half as long as an_2. *Iad* pori in preanal and lateral position.

L e g s : All femora with a deep hollow proximally, on either sides two sharp spurs visible.

M a t e r i a l e x a m i n e d : Holotypus (831-HO-83): Afr. 119; 32 paratypes from the same sample. Holotypus and 30 paratypes (831-PO-83) deposited in the Hungarian Natural History Museum, Budapest; 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The new species stands nearest to *Dampfiella paratina* MAHUNKA, 1983, however, the sensillus of the new species is much shorter, and the notogastral setae much longer and stronger.

The so far known African species of the genus *Dampfiella* agree with the partly reduced genital setae. The first pair sometimes represented by their alveoli in the deeper region, or if the setae are present, then are much shorter than the other genital ones, and neither one is completely reduced.

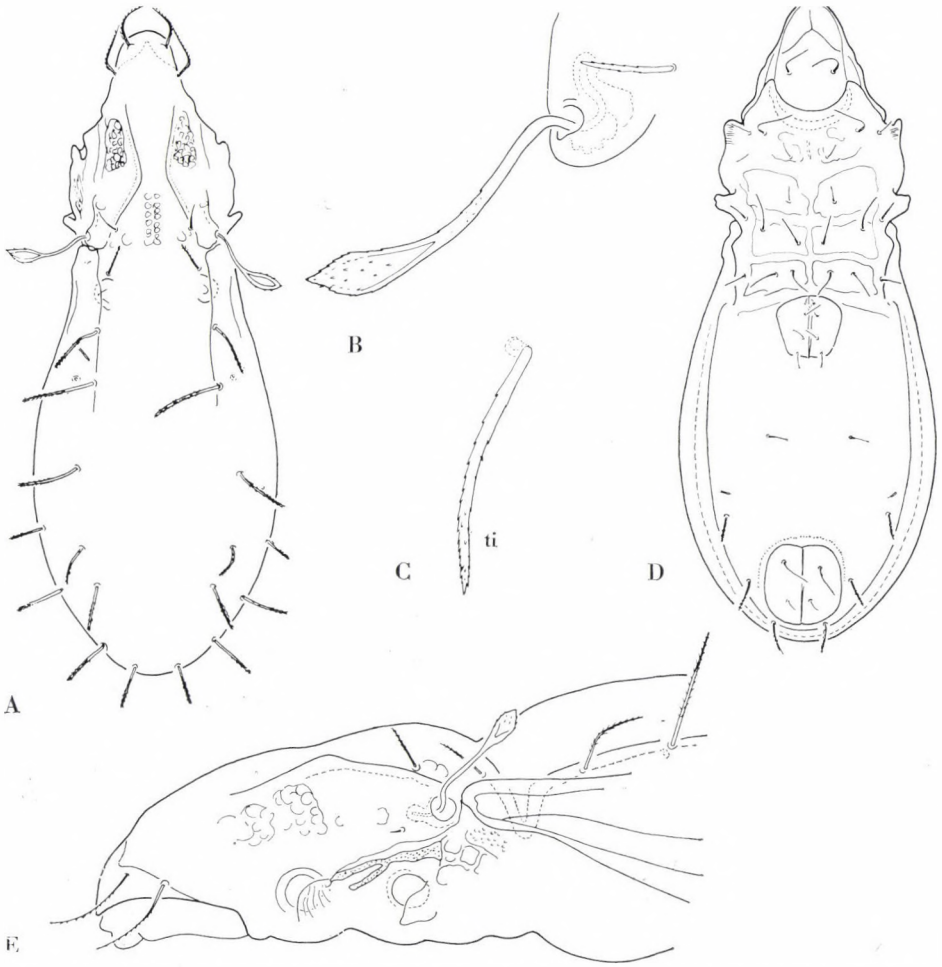

Fig. 11A—E. *Dampfiella setosa* sp. n. — A = dorsal side, B = trichobothrium, C = seta *ti*, D = ventral side, E = lateral part of body

Key for the African species

1 (2) Notogastral setae robust, *te* much longer than distance between setae *te* and *ti*; this distance much shorter than same between setae *ti* and *ms*. Seta p_1 or p_2 longer than distance between them **setosa** sp. n.

2 (1) Notogastral setae partly thin and shorter, seta *te* much shorter than distance between setae *te* and *ti* and distance between setae *te* and *ti* or *ti* and *ms* nearly equal.

3 (4) Eleven pairs of notogastral setae present. Setae r_1 and r_2 originating near to each other, distance between them smaller than length of setae r_2 **africana** BALOGH, 1958

4 (3) Ten pairs of notogastral setae present. Setae r_1 and r_2 originating farther from each other than distance between these setae **paratina** MAHUNKA, 1983

OPPIIDAE GRANDJEAN, 1954

Amerioppia foveolata sp. n.

Measurements: Length: 292—310 μm, width: 158—176 μm.

D o r s a l s i d e (Fig. 12A): Rostral setae arising near to each other, more robust than the other prodorsal setae. Interlamellar setae absent, exobothridial setae shorter than lamellar ones. Costulae absent, but a thin line visible in this place. Prodorsum with some large spots laterally and a very large one basally. Lateral part of prodorsum (Fig. 12E) and also some pedotecta

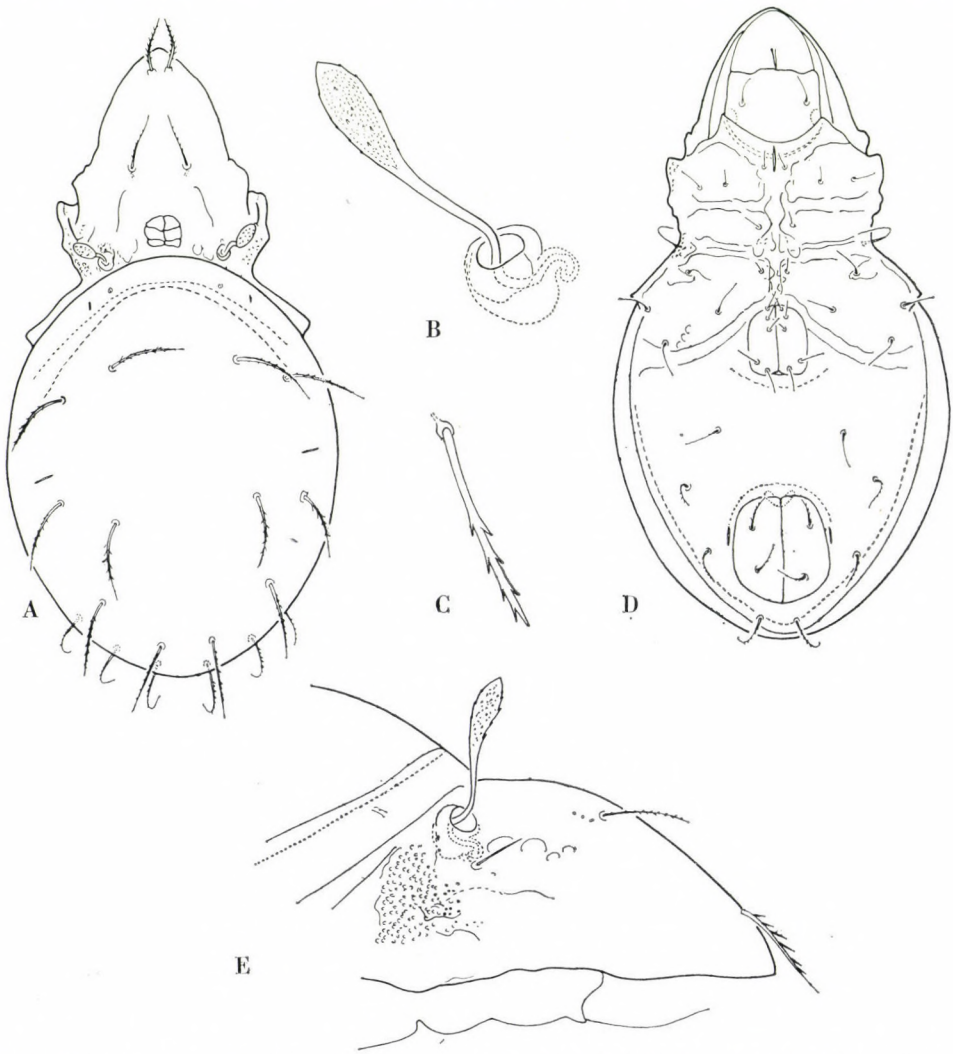

Fig. 12A—F. *Amerioppia foveolata* sp. n. — A = dorsal side, B = sensillus, C = seta r_3, D = ventral side, E = prodorsum from lateral side

granulated. Sensillus (Fig. 12B) long, slightly dentate. Nine pairs of strong notogastral setae (Fig. 12C) present, all well ciliated. Cilia very strong. Setae *ta* absent, only their insertion points visible.

V e n t r a l s i d e (Fig. 12D): Apodemes well developed, some chitinous thickening visible. Surface of epimeres smooth, only some small spots present. Epimeral setae different in lengths, some of those in marginal position comparatively longer than the median ones. Six pairs of simple genital setae; aggenital, anal and adanal setae slightly stronger than preceding ones. Setae ad_3 in preanal position.

M a t e r i a l e x a m i n e d : Holotypus (832-HO-83): Afr. 105; 6 paratypes from the same sample. Holotypus and 5 paratypes (832-PO-83) in the Hungarian Natural History Museum, Budapest, and 1 paratypes in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The new species is well characterizable by the large round spot in the middle of the basal part of prodorsum. In the other species of this genus three or four pairs of spots are present on this place.

Quadroppia crenata sp. n.

Measurements: Length: 176—184 μm, width: 96—104 μm.

D o r s a l s i d e (Fig. 13A): Rostrum widely rounded, rostral setae with some strong cilia. Anterior part of prodorsum with an elliptical chitinous ring, lamellae and translamella well developed, translamella not connected directly with lamellae. Lamellar setae arising on the surface of prodorsum. In the interlamellar region some chitinous laths existing, nearly parallel with lamellae. Sensillus large, with a clavate and barbed head. Surface of prodorsum with a well developed, continuous crest, framing the median part of notogaster. The lateral (marginal) part slightly less higher than the median one. Among the notogastral setae four pair originating on the margin of region. All setae erectile, straight.

V e n t r a l s i d e (Fig. 13B): Apodemes well divided by longitudinal crest. Epimeral setae short and thin. Genital plates with a longitudinal crest. Five pairs of genital setae present, all nearly equal in length. Anal and adanal setae similar to the preceding ones.

M a t e r i a l e x a m i n e d : Holotypus (833-HO-83): Afr. 105; 13 paratypes from the same sample; 7 paratype: Afr. 119. Holotypus and 18 paratypes (833-HO-83) deposited in the Hungarian Natural History Museum, Budapest, and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The new species is well characterizable by the sharp and continuous chitinous crest on the notogaster. On this ground the new species stands nearest to *A. circumita* HAMMER, 1961, however, the chitinous ring on

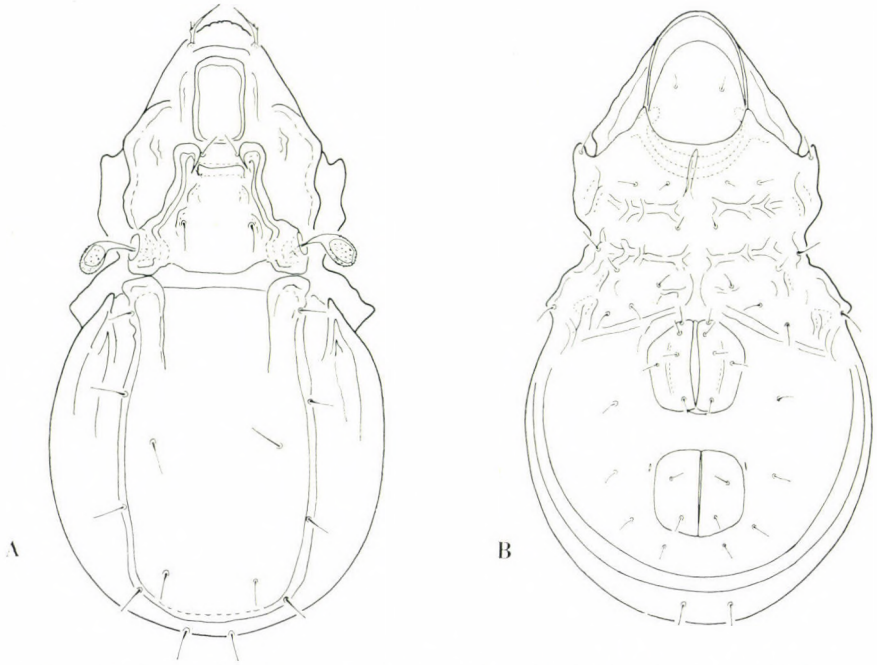

Fig. 13A—B. *Quadroppia crenata* sp. n. — A = dorsal side, B = ventral side

the prodorsum in the latter opens basally, the translamella is connected with the lamellae, the lamellar setae arising on the lamellar cuspis and the notogastral setae are much shorter than in the new species.

SUCTOBELBIDAE Grandjean, 1954

Serratobelba gen. n.

D i a g n o s i s : Family Suctobelbidae. Rostral part of prodorsum elongated, with 4—7 large teeth on each margin. Prodorsum ornamented with 3 larger fenestrate spots, median tubercles reduced. Sensillus with a smooth and clavate head. Dorsosejugal suture with one pair of tooth laterally, between them some rugae and one pair of stronger cristae longitudinally present. Three pairs of small fields, resembling areae porosae. Sternal apodeme developed. Six pairs of genital, one pair of phylliform aggenital, two pairs of anal and three pairs of adanal setae present. *Iad* pori originating far from anal plates in paraanal, setae ad_3 in preanal position.

Type species: *Suctobelbila multidentata* Mahunka, 1983.

R e m a r k s : The family Suctobelbidae is in urgent need of a general revision a part of its supraspecific taxa is rather heterogenous. I plan to do

this work in the near future, but for the present, I describe Suctobelbids species and the newly described (MAHUNKA, 1983) *Suctobelbila* species a ranging of a new genus definitely necessaire. It is distinguished from all congeners by the form of the dorsosejugal structure and by the surface of prodorsum.

Serratobelba rugosa sp. n.

Measurements: Length: 240—250 μm, width: 125—131 μm.

D o r s a l s i d e (Fig. 14A): Rostrum undulate. Rostral setae arising laterally, setiform, normal. Prodorsum with 4—5 pairs of larger, sharp, and 2—3 pairs of smaller, rounded, tubercle-like teeth laterally (Fig. 14B). Pro-

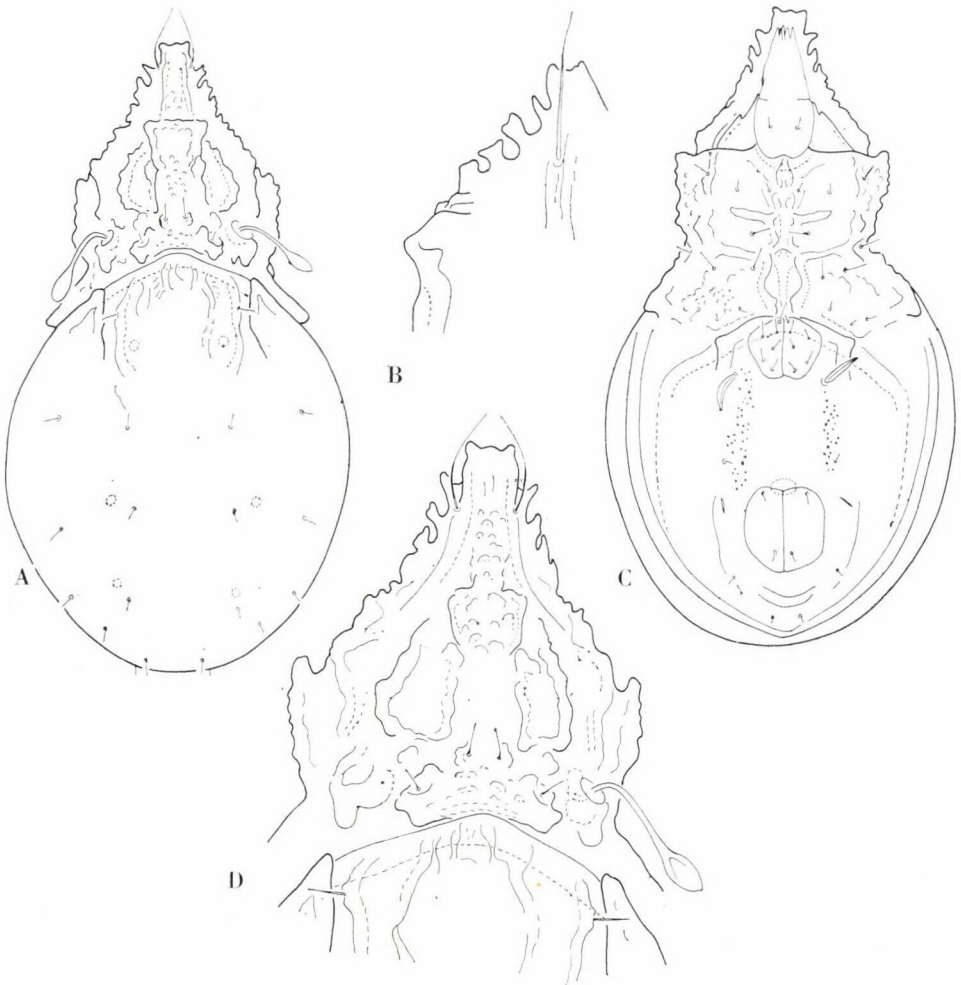

Fig. 14A—D. *Serratobelba rugosa* sp. n. — A = dorsal side, B = rostral teath, C = ventral side, D = prodorsum

dorsal ornamentation rather complicated, surface ornamented with rugae, tubercles and fenestrate spots. Median, unpaired tubercles divided. Sensillus (Fig. 14D) comparatively short, its head clavate and smooth. Dorsosejugal region with one pair of teeth, well-developed crista and some rugae. All notogastral setae short and simple.

Ventral side (Fig. 14c): Apodemes and bordures well developed. Epimeral setae simple. Aggenital setae dilated and phylliform. Anal and adanal setae short and simple.

Material examined: Holotypus (834-HO-83): Afr. 175; 8 paratypes from the same sample. Holotypus and 7 paratypes (834-PO-83) deposited in the Hungarian Natural History Museum, Budapest; 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: This new species is the second one of this new genus. It is distinguished from the type-species by its measurements, the shorter sensillus, the shape of lateral teeth of prodorsum and by the form of the aggenital setae.

LICNEREMAEIDAE Grandjean, 1931

Licneremaeus cristatus sp. n.

Measurements: Length: 196—208 μm, width: 104—112 μm.

Dorsal side (Fig. 15A): Rostrum widely rounded, rostral setae arising on a chitinous lath. Lamellae well developed, angulated anteriorly and connected with a transversal ridge anteriorly and medially. Some secondary laths or rugae also present. Lamellar setae arising on the dorsal surface of prodorsum. Interlamellar setae similar to the lamellar one, all three pairs nearly equal in length. Sensillus flat, in dorsal view clavate, its surface roughened. Notogaster with well framed spots anteriorly and with indistinct ones medially and posteriorly. In the anterior part of notogaster a well discernible chitinous lath longitudinally and medially (Fig. 15C). Notogaster with 13 pairs of setae covered with secretion membrane. The medially three pairs shorter than the others.

Ventral side (Fig. 15B): Surface of epimeres smooth but well divided by apodemes, bordures, and rugae. Epimeral setae simple. In front of genital opening a stronger, bridge-like chitinous formation present, laterally with two opposed teeth. Ventral plate with polygonal reticulation. Two pairs of adanal setae present. *Iad* pori not visible.

Material examined: Holotypus (835-HO-83): Afr. 175; 13 paratypes from the same sample. Holotypus and 11 paratypes (835-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well characterized by the median crista on the notogaster and the well subdivided anterior group of field of the

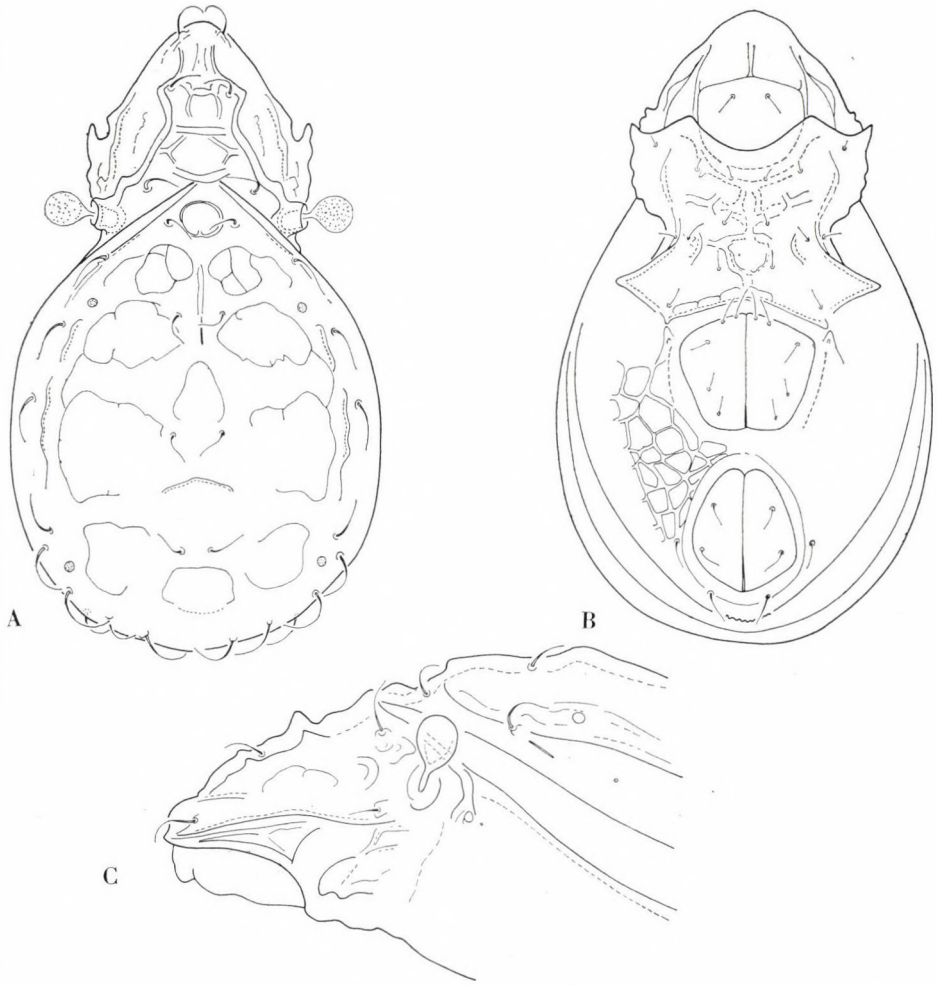

Fig. 15A—C. *Licneremaeus cristatus* sp. n. — A = dorsal side, B = ventral side, C = lateral part of prodorsum

notogaster. Both characters were unknown in the so far known species. On the ground of the sculpture of the prodorsum, the new species stands nearest to *L. semiareolatus* MAHUNKA, 1978, however, the latter species has an unpaired field between the anterio-lateral group of fields.

ORIBATULIDAE THOR, 1929

? Incabates longisacculus sp. n.

Measurements: Length: 284—317 μm, width: 178—191 μm.

D o r s a l s i d e (Fig. 16A): Rostrum slightly elongated, with a small nasiform apex. Rostral half of prodorsal surface with sharply framed, con-

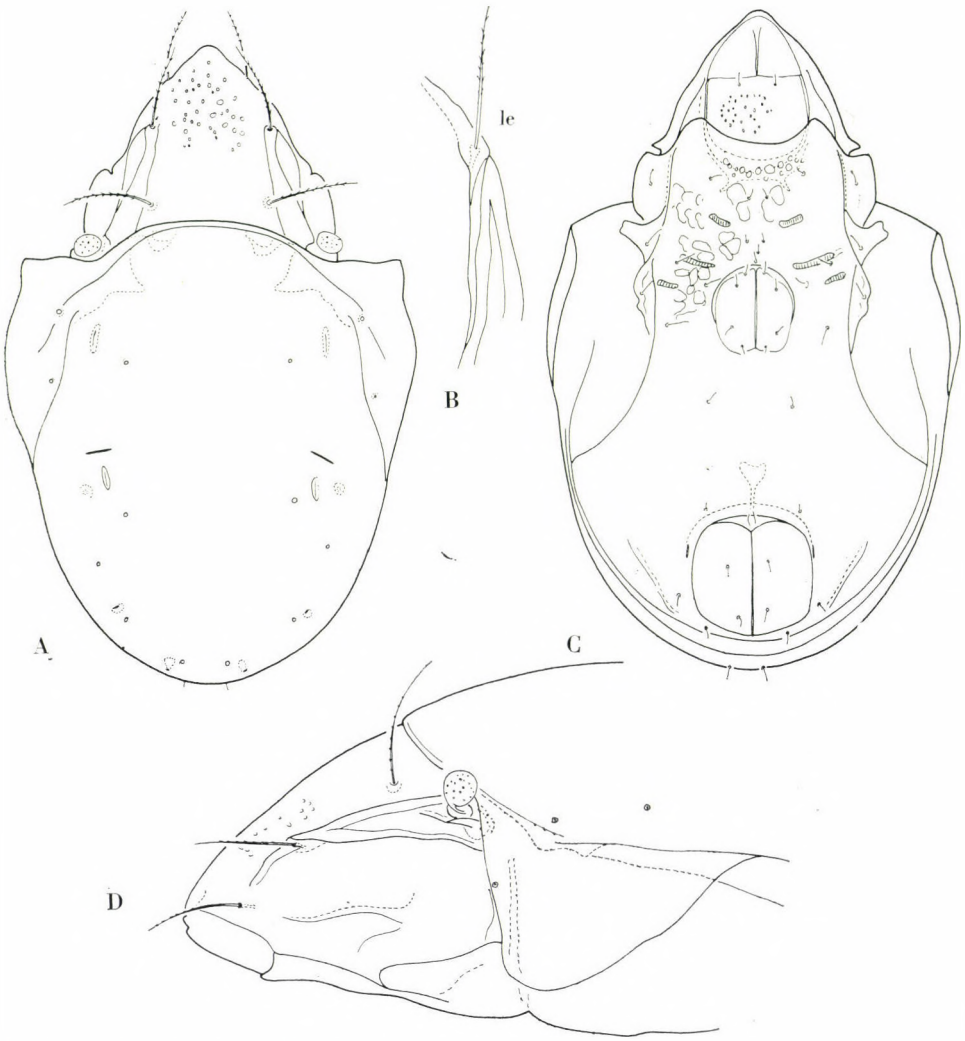

Fig. 16A—D. ? *Incabates longisacculus* sp. n. — A = dorsal side, B = lamella, C = ventral side, D = lateral part of prodorsum

spicuous foveolae. Lamellae well developed continued a short prelamella and without cuspis. Lamellar setae arising on the surface of lamellae (Fig. 16B). Rostral setae arising marginally, but far from end of prelamella (Fig. 16D). All prodorsal setae finely ciliate, their ratio: *ro* < *le* < *in*. Pteromorpha well developed, tongue-shaped. Surface of notogaster smooth, 10 pairs of large setal insertion points well visible. Four pairs of sacculi present, *Sa* and S_1 elongated, slit-like.

V e n t r a l s i d e (Fig. 16C): Mentum foveolated, foveolae similar in shape to prodorsal ones. Epimeral surface with larger irregular spots. Apodemes

short, epimeral setae simple. Pedotecta 4 weakly developed, rounded. Four pairs of genital setae minute, anal and adanal setae similar in shape. Setae ad_3 in preanal position.

Material examined: Holotypus (836-HO-83): Afr. 105; 7 paratypes from the same sample. Holotypus and 5 paratypes (836-PO-83) deposited in the Hungarian Natural History Museum, Budapest, and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well characterized by the ornamentation of the prodorsum and the mentum and by the shape of the elongated sacculi. On this ground it is distinguished from all its congeners.

Nannerlia elongatissima sp. n.

Measurements: Length: 383—406 μm, width: 170—193 μm.

Dorsal side (Fig. 17A): Rostrum rounded, rostral setae arising on separated tubercles. Lamellae well developed, a short prelamella visible. Lamellar setae arising on lamellae. Ratio of the prodorsal setae: *ro* < *in* < *le*. Sensillus clavate, slightly squamose. Dorsosejugal suture strongly convex.

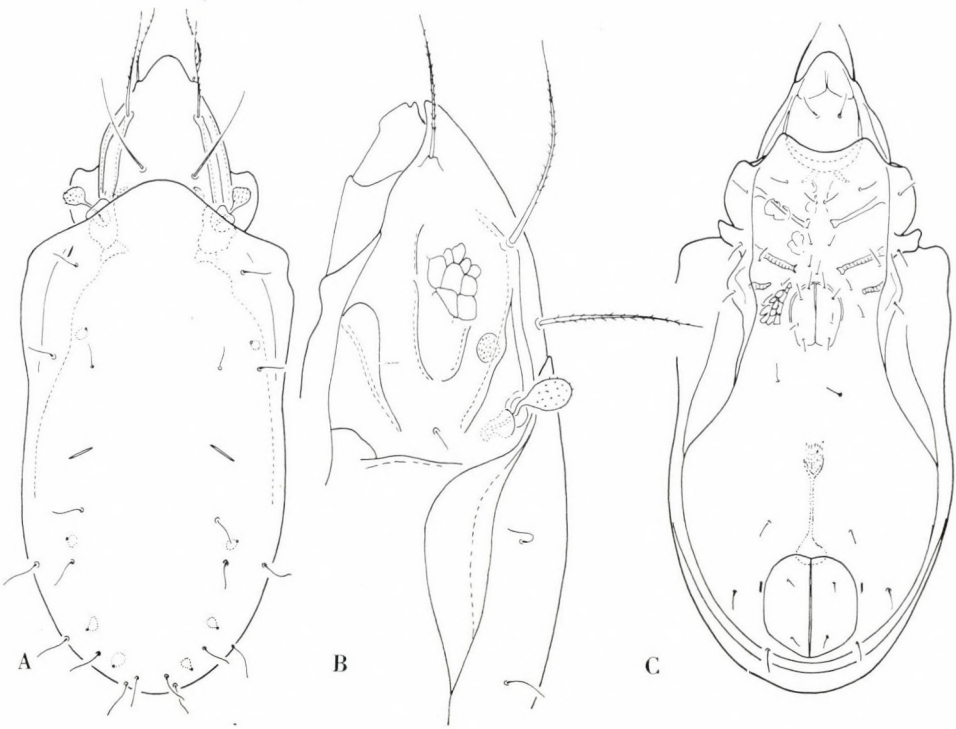

Fig. 17A—C. *Nannerlia elongatissima* sp. n. — A = dorsal side, B = body of lateral view, C = ventral side

Pteromorphae small (Fig. 17B), undulate in dorsal view. Ten pairs of simple, thin notogastral setae and four pairs well visible sacculi present.

Ventral side (Fig. 17C): Surface of epimeres with some large spots. Epimeral setae thin and simple. Four pairs of genital, three pairs of adanal setae present. Setae ad_3 in preanal position.

All legs with three claws. Strong heterodactyly.

Material examined: Holotypus (837-HO-83): Afr. 119; 14 paratypes from the same sample. Holotypus and 12 paratypes (837-PO-83) deposited in the Hungarian Natural History Museum, Budapest; 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species may be ranged in the genus *Nannerlia* COETZER, 1968, but the dorsosejugal suture of the new species is more convex than in the other species of this genus.

Scheloribatella gen. n.

Diagnosis: Family Oribatulidae. Lamellae well developed, lamellar setae arising on their cuspis, prolamella absent. Rostral setae arising marginally. Dorsosejugal suture complete. Ten pairs of comparatively long notogastral setae, frour pairs of small sacculi present. Epimeral setal formula: *3—1—3—3*. Four pairs of genital setae. Seta ad_3 in preanal position. All legs with one claw.

Type species: *Protoribates shiraensis* EVANS, 1953.

Remarks: On the ground of the present diagnosis the new genus is near to *Scheloribates* BERLESE, 1908 and *Fijibates* HAMMER, 1972. However, the former has three claws on all legs, the latter has incomplete dorsosejugal suture furthermore, its rostral setae arising much nearer to each other on the dorsal surface of prodorsum.

Scheloribatella shiraensis (EVANS, 1953) comb. n.

Measurements: Length: 370—381 μm, width: 202—223 μm. The new material is well identifiable by the description and figures of EVANS (p. 267, Figs 6A—D), only the prodorsum is slightly different (Fig. 18D).

Localities: Afr. 105: 12 Ex.

Scheloribates heterotrichus sp. n.

Measurements: Length: 603—625 μm, width: 364—380 μm.

Dorsal side (Fig. 18A): Rostrum wide, rounded. Rostral setae arising laterally on a small tubercle and on the end of prelamellae (Fig. 18C). Ratio of prodorsal setae: $ro < le < in$. Lamellae well developed, prelamellae much thinner than lamellae. Sensillus short, its head clavate, with short

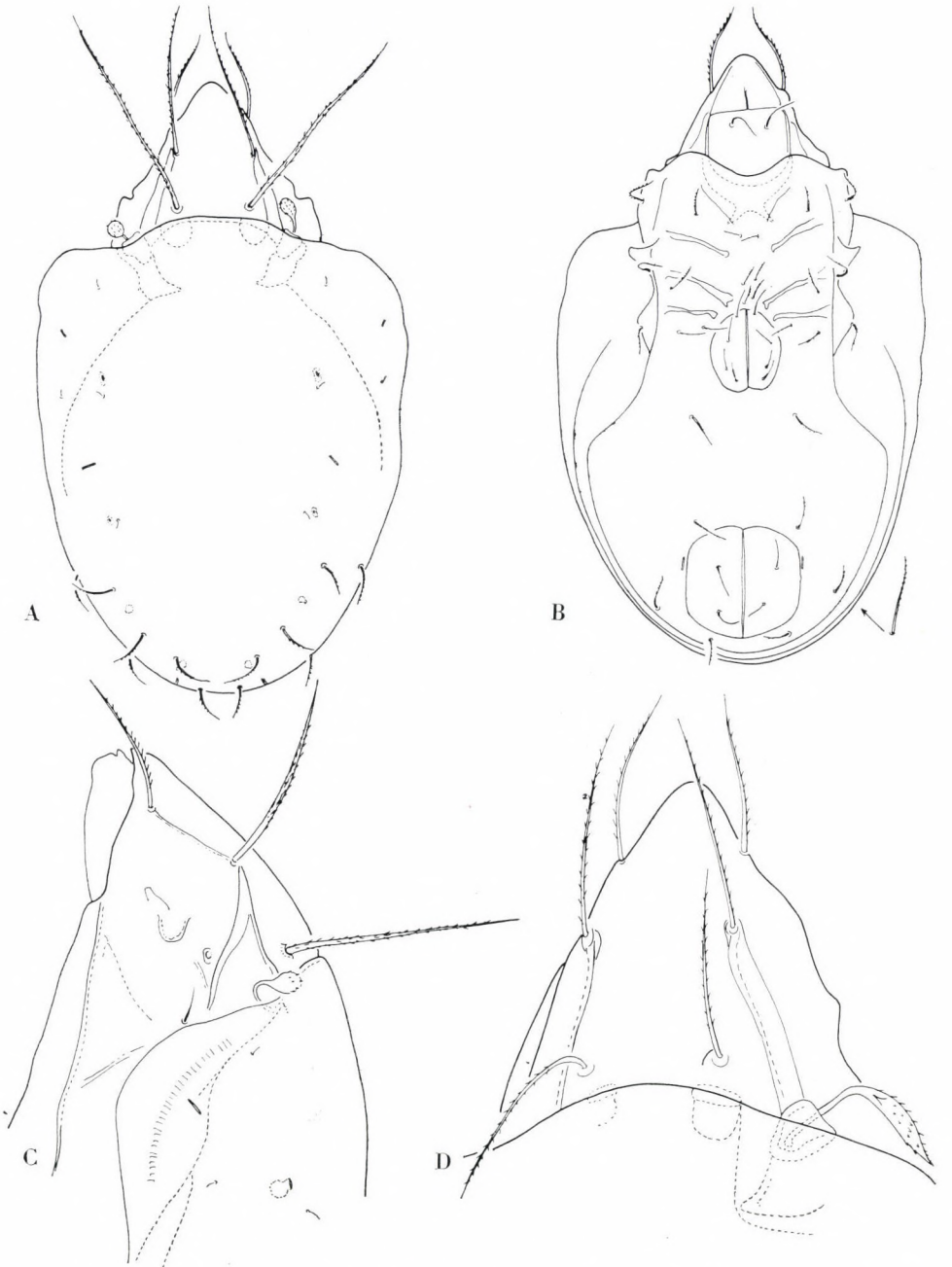

Fig. 18A—C. *Scheloribates heterotrichus* sp. n. — A = dorsal side, B = ventral side, C = lateral part of prodorsum — D = *Scheloribatella shiraensis* (EVANS, 1953)

spines. Setae of notogaster of diverse lengths, setae in the anterior part (*ta*, *te*, *ti*, *ms*) short, minute, others much longer and thicker, finely ciliated.

Ventral side (Fig. 18B): Epimeral surface smooth, some apodemes and bordures well developed, long. Epimeral setae comparatively long, all finely ciliated. Four pairs of genital setae present (one specimen has only three pairs!). Genital, anal and adanal setae comparatively long, ad_3 in preanal position. Setae an_1 shorter than an_2. Adanal setae ciliated.

All legs with three claws.

Material examined: Holotypus (849-HO-83): Afr. 119; 1 paratype from the same sample; 1 paratype: Afr. 105. Holotypus and 2 paratypes (849-PO-83) in the Hungarian Natural History Museum, Budapest, and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is distinguished from all so far known *Scheloribates* BERLESE, 1908 species by the shape of the chaetom of the notogaster.

Scheloribates minutus sp. n.

Measurements: Length: 292– 345 μm, width: 207—236 μm.

Dorsal side (Fig. 19A): Rostrum nasiform, elongated. Rostral setae arising laterally on the cuspis of prelamellae (Fig. 19C). Lamellae well developed, lamellar setae arising on their surface. Ratio of prodorsal setae: $ro < le < in$. Sensillus very long, nearly as long as length of interlamellar setae. Its head asymmetrically spindle-shaped, with 4– 5 cilia on its outer margin. All prodorsal setae ciliated. Notogaster with 10 pairs of minute setae, all thin and simple. Four pairs of sacculi present, all sharply framed. Dorsosejugal suture strongly convex.

Ventral side (Fig. 19B): Epimeral surface with large spots, forming a polygonal sculpture. Pedotecta 4 small, weakly developed. All epimeral setae thin and simple. Four pairs of genital setae short, adanal setae much longer than genital ones.

Material examined: Holotypus (838-HO-83): Afr. 105; 7 paratypes from the same sample. Holotypus and 5 paratypes (838-PO-83) deposited in the Hungarian Natural History Museum, Budapest, and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species in well characterized by the very long sensillus and by the nasiform rostrum. In this ground it is well distinguished from all its congeners.

Setulobates gen. n.

Diagnosis: Family Oribatulidae. Lamellae well developed, prelamellae and translamella absent. Lamellar setae arising on the surface of lamellae. Bothridium not covered by the notogaster. Dorsosejugal suture

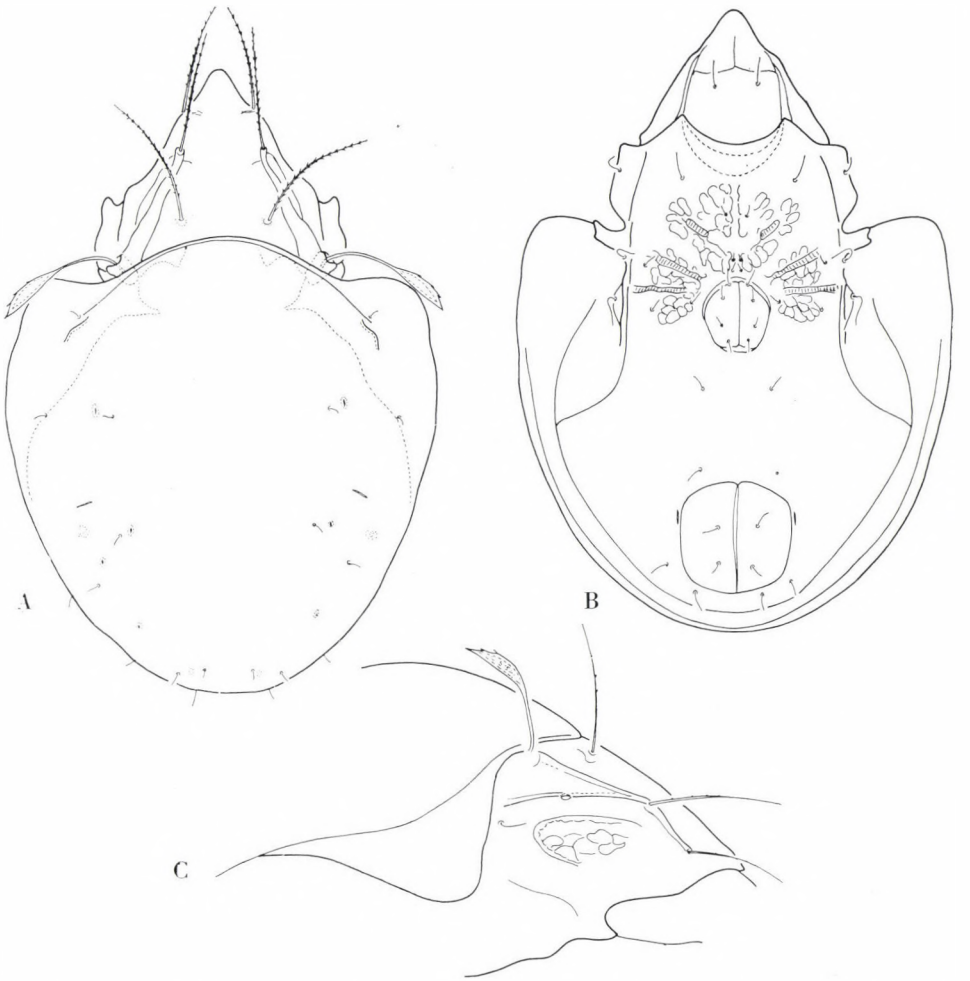

Fig. 19A—C. *Scheloribates minutus* sp. n. — A = dorsal side, B = ventral side, C = prodorsum from lateral view

rounded anteriorly. Fourteen pairs of long, thin notogastral setae, four pairs of minute sacculi present. Epimeral setal formula: *3—1—3—3*. Four pairs of genital, one pair of aggenital, two pairs of anal and three pairs of adanal setae present. Setae ad_3 in preanal position. All legs with one claw.

Type species: *Setulobates heterotrichus* sp. n.

R e m a r k s : The family Oribatulidae so far has not included a genus with one claw and fourteen pairs of notogastral setae.

Setulobates heterotrichus sp. n.

Measurements: Length: 357—411 μm, width: 203—244 μm.

Dorsal side (Fig. 20A): Rostrum slightly narrowed, rostral setae arising marginally. Rostral and lamellar setae thickened basally, with strong spines (Fig. 20D). Interlamellar setae very long, finely ciliated. Lamellae wide, a short part reaching anteriorly, after the insertion points of lamellar setae. Sensillus with a well separated head (Fig. 20C). Notogastral setae very thin and curved. Shoulder part of notogaster with tubercles.

Ventral side (Fig. 20B): All epimeral setae thin and simple.

Material examined: Holotypus (839-HO-83): Afr. 166; 9 paratypes from the same sample; 3 paratypes: Afr. 106. Holotypus and 11 paratypes (839-HO-83) deposited in the Hungarian Natural History Museum, Budapest, and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: Besides the differential diagnosis of the new genus, the new species is well characterized by the tuberculated notogastral shoulder.

CERATOZETIDAE Jacot, 1925

Africoribates ornatus Evans, 1953

Measurements: Length: 429—454 μm, width: 295—324 μm.

The newly collected specimens are well identifiable with the description and figures of Evans (1953). However, Evans did not mention the sculpture (Fig. 22A) of the ventral side (striated longitudinally on the epimeres and rugose on the ventral and anal plates), the variability of the lamellae and translamellae (Figs 22C, E) and the unpaired area porosae postanales (Fig. 22B).

Material examined: Afr. 106: 10 Ex.

Baloghobates africanus sp. n.

Measurements: Length: 754—853 μm, width: 541—547 μm.

Dorsal side (Fig. 21A): Prelamellae well developed, reaching to anterior margin of prodorsum and forming a small tooth on each side of the rounded rostrum (Fig. 21C). Lamellae with a short free cuspis each, lamellar setae arising on them. Rostral setae originating near to the large cuspis of tectum (Fig. 21D), their anterior margin lineated. A weak translamella discernible. Sensillus small and clavate. Pteromorphae large and movable. Notogaster smooth, with 10 pairs of alveoli and 4 pairs of area porosae.

Ventral side (Fig. 21E): Surface of epimeres and the anogenital region smooth. Epimeral setae short but comparatively thick, — excepting

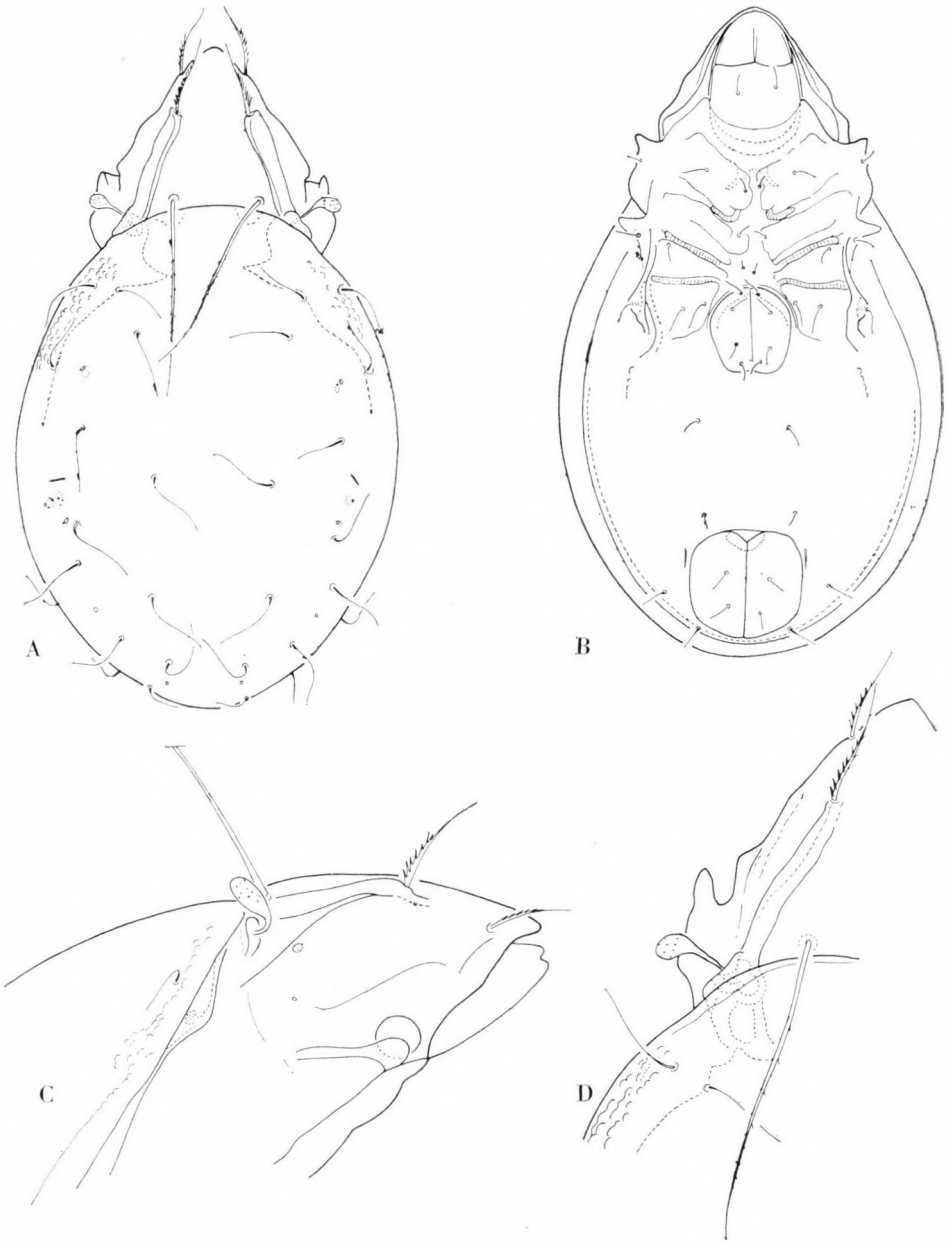

Fig. 20A—D. *Setulobates heterotrichus* sp. n. — A = dorsal side, B = ventral side, C = prodorsum from lateral view, D = lateral part of prodorsum

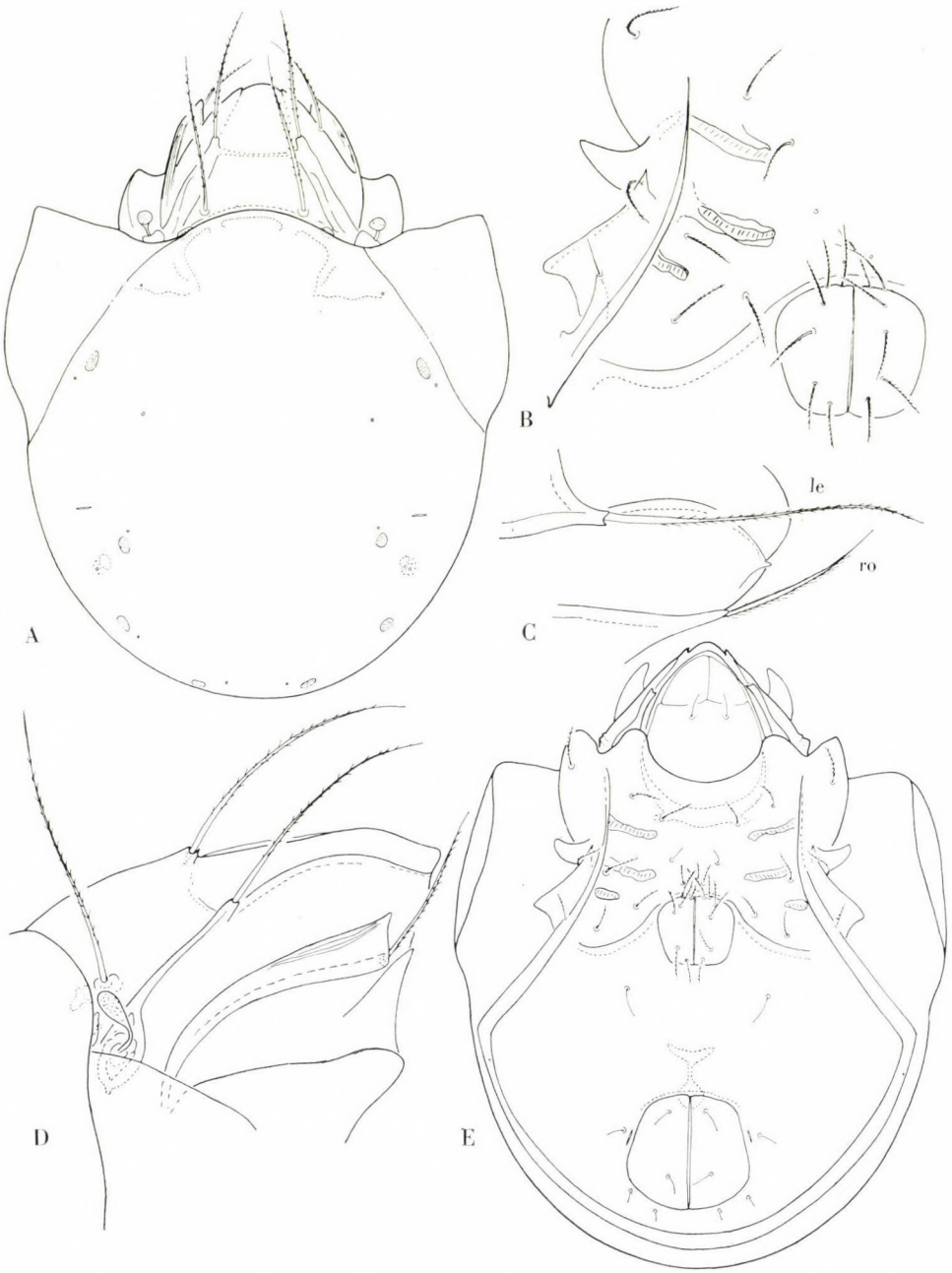

Fig. 21A—E. *Baloghobates africanus* sp. n. — A = dorsal side, B = lateral part of epimeral region, C = rostrum, D = prodorsum from lateral view, E = ventral side

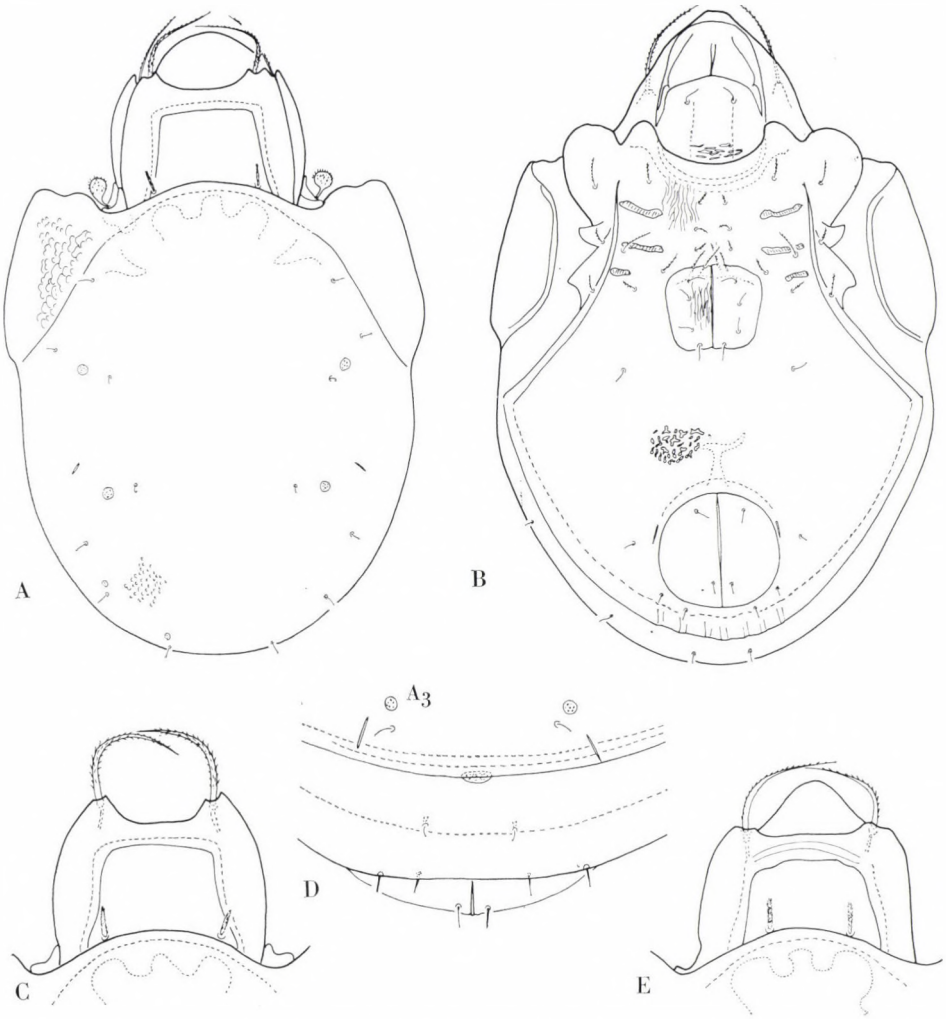

Fig. 22A—E. *Africoribates ornatus* EVANS, 1953 — A = dorsal side, B = ventral side, C = lamellae, D = posterior end of body, E = lamellae of another specimen

4c — conspicuously ciliated. Six pairs of genital setae long, also ciliated. Apodemes short but well visible. Anal and adanal setae much shorter than genital or aggenital ones.

L e g s : All legs tridactylous. Heterodactylia observable. Genu of leg 1 with a sharp spur.

M a t e r i a l e x a m i n e d : Holotypus (840-HO-83): Afr. 181; 7 paratypes: from the same sample. Holotypus and 6 paratypes (840-HO-83) in the Hungarian Natural History Museum. Budapest; 1 paratype in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The new species is the first record in Africa of the genus *Baloghobates* HAMMER, 1967. It is distinguished from the type species by the lack of the bridge between pteromorphae, thus the insertion points of the interlamellar setae are not covered in dorsal view.

Kilimabates gen. n.

D i a g n o s i s : Family Ceratozetidae. Rostrum tripartite, with a nasiform median apex. Tectum large, without teeth. Lamellae without cuspis, translamella well developed. Sensillus small, clavate. Dorsosejugal suture complete. Pteromorphae movable. Four pairs of hardly visible areae porosae, ten pairs of minute alveoli present. Epimeral setal formula: *3—1—3—3*. Six pairs of genital, one pair of aggenital, two pairs of anal and three pairs of adanal setae present. *Iad* pori and setae ad_2 and ad_3 in paraanal position. All legs tridactylous. Genu of leg 1 with a sharp process.

Type species: *Kilimabates processus* sp. n.

R e m a r k s : The new genus may be well ranged in the family Ceratozetidae, however, its relation with the other genera is problematic. On the ground of the shape of rostrum and the lamellae it stands very far from all the heretofore known taxa.

Kilimabates processus sp. n.

Measurements: Length: 446—471 μm, width: 300—313 μm.

D o r s a l s i d e (Fig. 23A): Rostrum divided by two deep incisions (Fig. 23D). Tectum broadened anteriorly, large. Rostral setae ciliated, and originating on the anterior end of tectum. Genal teeth sharp. Lamellae without cuspis, they are contiguous with the translamella. Lamellar setae originating on the lamellae. Ratio of prodorsal setae $ro < le < in$. Setae *in* and *le* slightly barbed. Sensillus small, finely roughened. Pteromorphae very large, in lateral view tongue-shaped. Areae porosae not well framed. All notogastral setae reduced.

V e n t r a l s i d e (Fig. 23C): All epimeral setae barbed and slightly stronger than genital ones. Anal and adanal setae simple. Surface of body smooth.

L e g s : All legs tridactylous. Genu of legs 1 (Fig. 23E) and 2 with sharp a process ventrally. Solenidium φ_1 and φ_2 of leg 1 arising on a well separated tubercle too. Femur of legs 3 and 4 (Fig. 23C) with a sharp process.

M a t e r i a l e x a m i n e d : Holotypus (841-HO-83): Afr. 109; 5 paratypes from the same sample. Holotypus and 4 paratypes (841-PO-83) deposited in the Hungarian Natural History Museum, Budapest, and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The new species stands quite apart from the other species of this family.

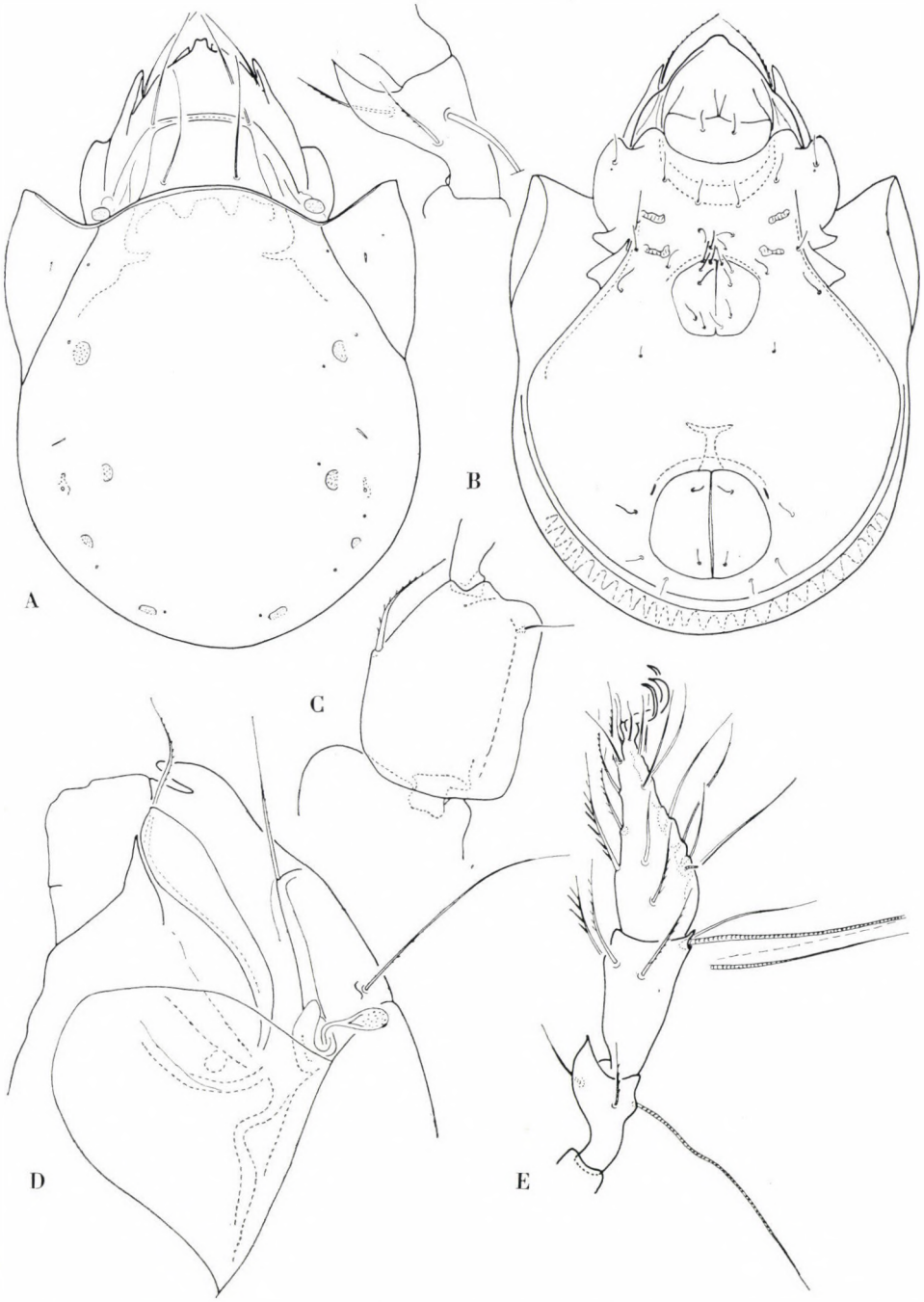

Fig. 23A—E. *Kilimabates processus* sp. n. — A = dorsal side, B = ventral side, C = femur of leg IV, D = prodorsum from lateral view, E = leg I

Sculptozetes gen. n.

Diagnosis: Family Ceratozetidae. Body surface well sculptured. Rostrum rounded, without incision or teeth. Lamellae well developed, with a long free cuspis. Lamellar setae arising on the cuspis. Tectum short, ending far from the rostral setae. Pteromorphae not movable. Notogaster with four pairs of areae porosae and 14 pairs of long notogastral setae. Epimeral setal formula: *3—1—3—3*. Anal opening far removed from the posterior margin of the ventral plate and is conspicuously near to the genital opening. The length of the anal opening is much longer than distance between the genital and anal openings. Six pairs of genital setae. Two pairs of adanal setae in postanal, one pair in paraanal position. All legs with three claws, tarsus short.

Type species: *Sculptozetes longisetosus* sp. n.

Remarks: The family Ceratozetidae includes two genera (*Fuscozetes* SELLNICK, 1928 and *Melanozetes* HULL, 1916) each having 14 pairs of long notogastral setae. Both genera have a translamella and their anal and genital plates are removed far from each other.

Sculptozetes longisetosus sp. n.

Measurements: Length: 738—771 μm, width: 508—533 μm.

Dorsal side (Fig. 24A): Lamellae long, as is free cuspis (Fig. 24C). Lamellar setae curving, slightly squamose, rostral setae pilose. Sensillus (Fig. 24B) clavate, squamose. Tectum (Fig. 24D) short having a triangular cuspis. Interbothridial and notogastral setae pilose, all long and slightly flagellate. Notogastral surface with groups of foveolae (Fig. 24E).

Ventral side (Fig. 24F): Surface foveolated. Epimeral setae different in lengths, inner setae much shorter than outer ones. Six pairs of genital setae present, one pair of aggenital, two pairs of anal setae simple. Adanal setae very long and flagellate.

Material examined: Holotypus (842-HO-83): Afr. 178; 13 paratypes: from the same sample; 3 paratypes: Afr. 166. Holotypus and 14 paratypes (842-PO-83) in the Hungarian Natural History Museum, Budapest, and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: On the ground of the generic diagnosis the new species is far from all its alliance.

Ulugurozetes gen. n.

Diagnosis: Body covered with secretions layer. Rostrum without incision rounded. Tutorium well developed, with dilated but undivided free cuspis. Lamellae originating laterally, with short cuspis, lamellar setae arising

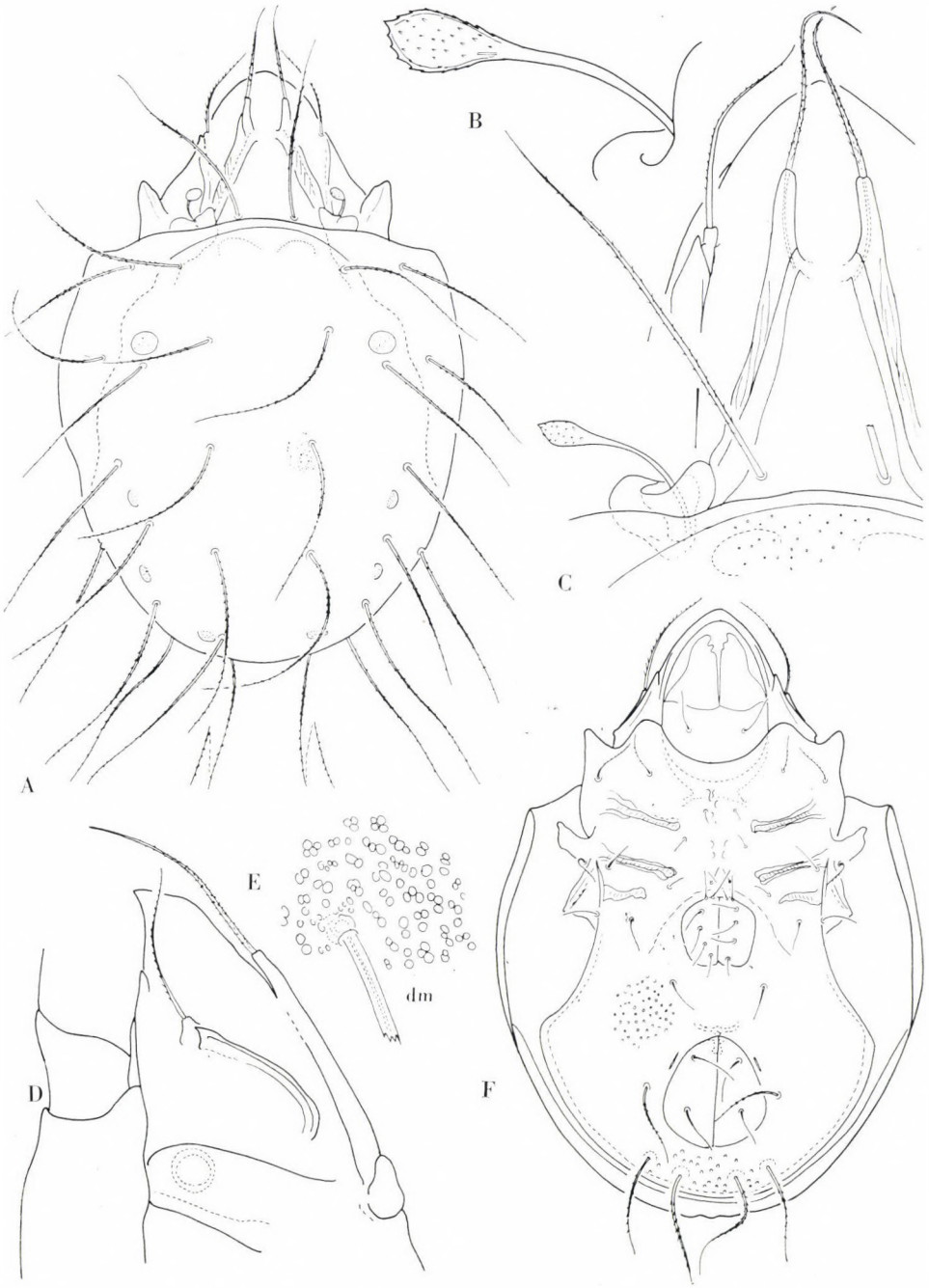

Fig. 24A—F. *Sculptozetes longisetosus* sp. n. — A = dorsal side, B = sensillus, C = prodorsum, D = prodorsum from lateral view, E = sculpture of notogaster, F = ventral side

on them. Sensillus short and small. Pteromorpha movable. Four pairs of minute sacculi and thirteen pairs of well developed notogastral setae present. Epimeral setal formula: *2—1—2—2*. Genal tooth and custodium very small, hardly discernible. Six pairs of genital setae. All legs tridactylous.

Type species: *Ulugurozetes turbulentus* sp. n.

Remarks: The ranging of the new taxon is very problematic, many characters differ from those of the genera of Ceratozetoidea. It stands nearer to the family Mycobatidae, but the reduced custodium, the epimeral setal formula, the number of notogastral setae and the four pairs of minute sacculi support the erection of a new family:

ULUGUROZETIDAE **fam. n.**

Type genus: *Ulugurozetes gen. n.*

Ulugurozetes turbulentus sp. n.

Measurements: Length: 598—681 μm, width: 442—500 μm.

Dorsal side (Fig. 25A): Rostrum widely rounded. Rostral setae arising laterally, or slightly ventrally, under the tutorium, setiform, unilaterally ciliated. Tutorium with a well developed, dilated cuspis. Lamellae and interlamellar setae strong, both pairs with slightly rounded end (Fig. 25H), their surface squamose. Lamellae well developed, without long free cuspis. A short part of translamella visible. Lamellar setae originating on the cuspis. Bothridium large, with long, outward bending anterior spur. Sensillus small, its head densely barbed. Dorsosejugal suture undulate. Pteromorphae movable, their surface sculptured. Thirteen pairs of strong, squamose notogastral setae present (Fig. 25D), a small difference along their lengths observable. Surface with a secretion layer forming a polygonal ornamentation, partly missing here and there.

Ventral side (Fig. 25B): Apodemes short, but well visible. Epimeral surface irregularly granulated, ventral surface foveolated, but the foveolae confluent partly or connected sometimes and forming rugae. Custodium (Fig. 25C) very short, scarcely visible. Epimeral setae short, but slightly thickened, squamose. Six pairs of genital setae (Fig. 25C) much longer and thinner. Anal and adanal setae similar to epimeral ones, ad_1 and ad_2 in postanal, ad_3 in paraanal position.

Material examined: Holotypus (843-HO-83): Afr. 181; 3 paratypes from the same sample. Holotypus and 2 paratypes (843-PO-83) in the Hungarian Natural History Museum, Budapesr; 1 paratype in the Museum d'Histoire Naturelle Geneva.

Remarks: See the remarks after the genus diagnosis.

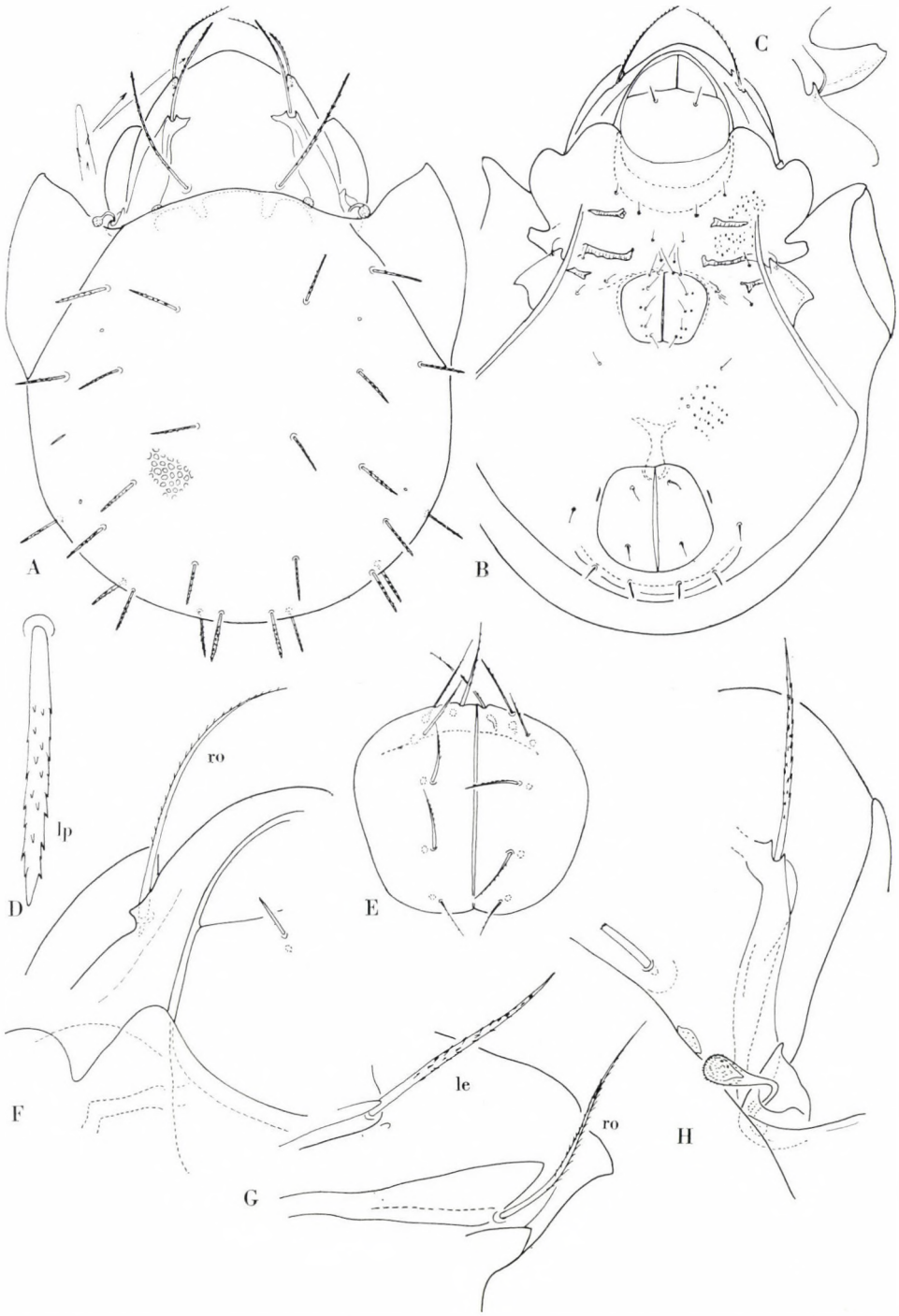

Fig. 25A—H *Ulugurozetes turbulentus* sp. n. — A = dorsal side, B = ventral side, C = pedotecta 2, D = seta *lp*, E = genital plates, F = rostral part of body, G = rostrum from lateral view, H = trichobothrium and lamella

GALUMNIDAE JACOT, 1925

Didymonycha gen. n.

D i a g n o s i s : Family Galumnidae. Lamellar carinae *S* and *L* present, lamellar setae arising between carinae *L*. Dorsosejugal suture missing medially. Interlamellar setae minute. Ten pairs of minute, hardly discernible notogastral setae and four pairs of weakly developed areae porosae and a median area porosa postanalis present. Sensillus with a long peduncle and a clavate head. Six pairs of genital setae. All adanal setae in post- or paraanal position. All legs bidactylous.

Type-species: *Didymonycha hesperis* sp. n.

R e m a r k s : The new genus is well characterizable by the minute notogastral setae and the bidactylous legs. The new taxon is close to *Trachygalumna* BALOGH, 1962 but the latter genus has tridactylous legs.

Didymonycha hesperis sp. n.

Measurements: Length: 422—441 μm, width: 243—267 μm.

D o r s a l s i d e (Fig. 26A): Lamellar and rostral setae normal, simple, thin and comparatively long. Lamellar setae arising near to carinae *L*, but it stands definitely between the inner (*L*) carinae. Interlamellar setae and ten pairs of notogastral setae hardly visible, minute. Head of sensillus with minute squamiform spines. Areae porosae adalares (*Aa*) large, long situated transversally; A_1 round, the two latter pairs small, hardly discernible. Dorsal and ventral surface smooth.

V e n t r a l s i d e (Fig. 26E): Epimeral setae thin and simple. In front of genital opening a well visible transversal band present; genital setae long, all other setae in anogenital region minute. Setae ad_1 and ad_2 in postanal, ad_3 in paraanal position.

L e g s : All legs with two claws (Fig. 26D) of tarsus 1 (Fig. 26C) with a widened distal end. ω_1 characteristically bent.

M a t e r i a l e x a m i n e d : Holotypus (844-HO-83): Afr. 109; 14 paratypes from the same sample. Holotypus and 12 paratypes (844-PO-83) deposited in the Hungarian Natural History Museum, Budapest; 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : On the basis of the generic diagnosis the new species stands far from all so far known Galumnids taxa.

Pergalumna pocsi sp. n.

Measurements: Length: 475—548 μm, width: 345—418 μm.

D o r s a l s i d e (Fig. 27A): Rostrum wide, rounded. Rostral lamellar and interlamellar setae long, well ciliated. Sensillus setiform, slightly longer

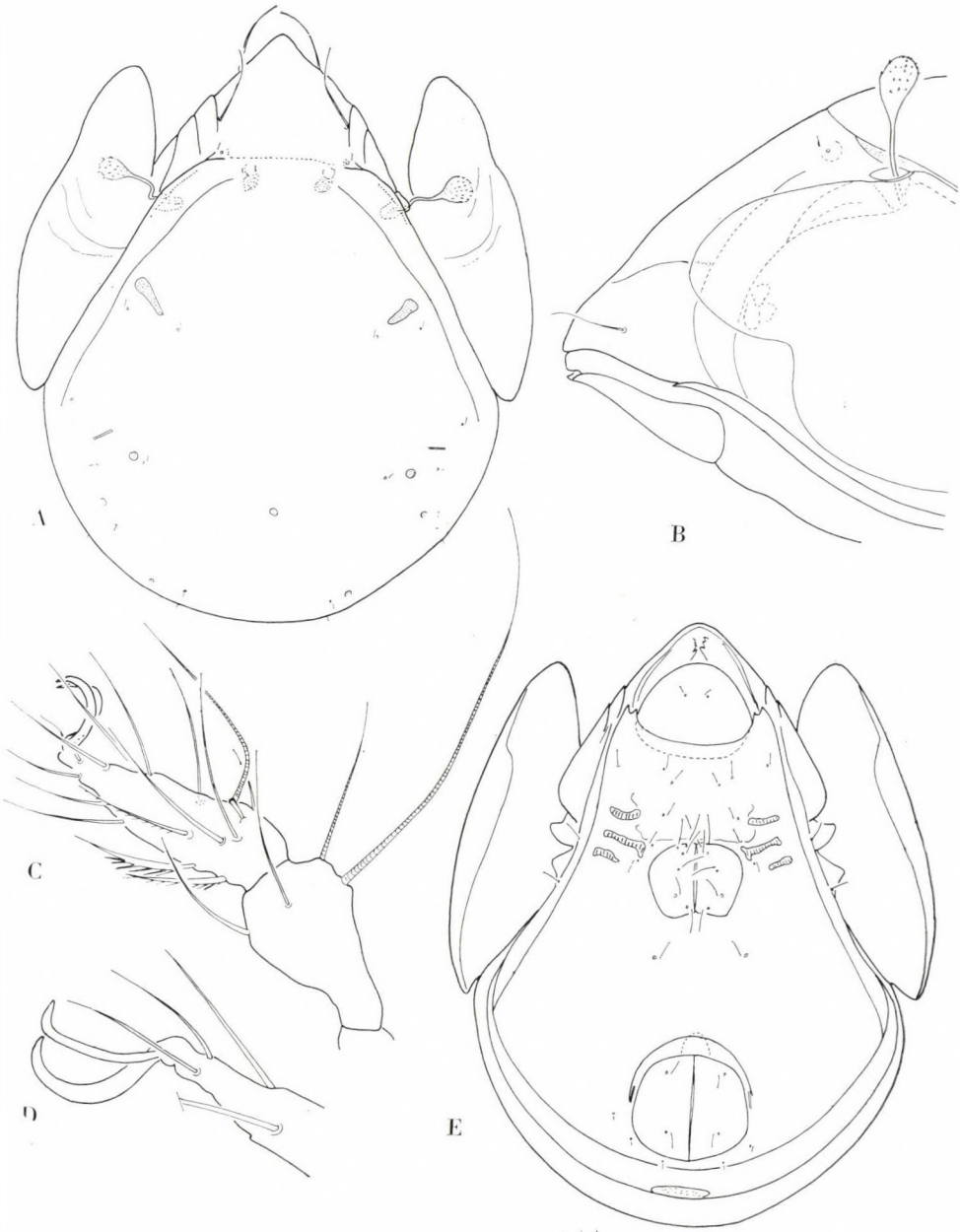

Fig. 26A—E. *Didymonycha hesperis* sp. n. — A = dorsal side, B = prodorsum from lateral view, C = tibia and tarsus of leg I, D = claws of leg IV, E = ventral side



Fig. 27A—C. *Pergalumna pocsi* sp. n. — A = dorsal side, B = ventral side, C = prodorsum from lateral view

than interlamellar setae. Lines *S* and *L* normal, developed (Fig. 27C). Pteromorphae with fine ornamentation. Dorsosejugal suture absent. Notogaster only with 3 pairs of areae porosae, not sharply framed. Alveoli well visible.

V e n t r a l s i d e (Fig. 27B): A part of the epimeral setae completely reduced, however, *1a*, *3a*, *3b*, *3c*, *4b* and *4c* comparatively long. All thin and simple. Apodemes short, *ap. sej.* and *ap. 3.* originating near to each other. Six pairs of comparatively long genital, 1 pair of short aggenital and 3 pairs of anal setae. Among adanal setae ad_1 and ad_2 much longer than ad_3 and anal setae, both pairs in postanal position.

Material examined: Holotypus (845-HO-83): Afr. 175; 2 paratypes: from the same sample; 17 paratypes: Afr. 181. Holotypus and 17 paratypes (845-PO-83) in the Hungarian Natural History Museum, Budapest, and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is characterized by the long interlamellar setae, the setiform sensillus, the lack of dorsosejugal suture and the three pairs of areae porosae on notogaster. On this ground it belongs to the "*longisetosa*" group. The species of this group may be distinguished by the following key:

1 (6) Areae porosae adalares transversally elongated, twice as wide as long.
2 (3) Interlamellar setae very long, reaching to apex of rostrum **longisetosa** BALOGH, 1960
3 (2) Interlamellar setae much shorter.
4 (5) Interlamellar setae much shorter than sensillus **capillaris** AOKI, 1961
5 (4) Interlamellar setae and sensillus nearly equal in length **dubitanda** HAMMER, 1972
6 (1) Areae porosae adalares round.
7 (8) Sensillus shorter than interlamellar setae **foveolata** HAMMER, 1973
8 (7) Sensillus much longer than interlamellar setae.
9 (10) All areae porosae very small. Rostral setae much shorter than lamellar ones **mauritii** MAHUNKA, 1978
10 (9) All areae porosae much larger. Rostral and lamellar setae nearly of equal length and longer than in the preceding species **pocsi** sp. n.

Pergalumna tanzanica sp. n.

Measurements: Length: 416—425 μm, width: 263—272 μm.

Dorsal side (Fig. 28A): Body very high and convex in lateral view. Lamellar carina weakly developed, lamellar setae arising far from carinae (Fig. 28C). All prodorsal setae minute, hardly visible. Sensillus long, setiform, reclinate, with long spines on the outer margin. Dorsosejugal suture well developed. Notogaster with ten pairs of alveoli and three pairs of unframed and very hardly discernible areae porosae. Dorsal and ventral surface well punctulated.

Ventral side (Fig. 28B): Mentum waved anteriorly. Surface of epimeres strewn with large and polygonated spots. Epimeral setae short, hardly visible. Carina circumpediale short, comparatively weak. Setae in the anogenital region — excepting the two anterior pairs of genital setae — minute. All legs tridactylous.

Material examined: Holotypus (846-HO-83): Afr. 109; 6 paratypes from the same sample. Holotypus and 5 paratypes (846-PO-83) deposited in the Hungarian Natural History Museum, Budapest; 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is characterized by the minute prodorsal setae, the well-developed dorsosejugal suture, the shape of the sensillus and the unframed, hardly discernible areae porosae. On this ground it stands nearest to *Pergalumna nuda* BALOGH, 1960, however, the sensillus of the latter species is smooth and the lamellar carinae (*L*) reaching to the bothridium.



Fig. 28A—C. *Pergalumna tanzanica* sp. n. — A = dorsal side, B = ventral side, C = prodorsum from lateral view

Pilizetes brevisetus sp. n.

Measurements: Length: 379—394 μm, width: 268—293 μm.

D o r s a l s i d e (Fig. 29A): Prodorsum very round, rostrum slightly nasiform. Rostral and lamellar setae long, thin and setiform, the latter one flagellate. Both pairs with short cilia. Interlamellar setae spiniform, short, similar in shape to the notogastral ones. Sensillus (Fig. 29D) long, reclinate, with long cilia marginally. Surface of prodorsum and the pteromorphae foveolated, foveolae well framed. Surface of notogaster and the ventral region

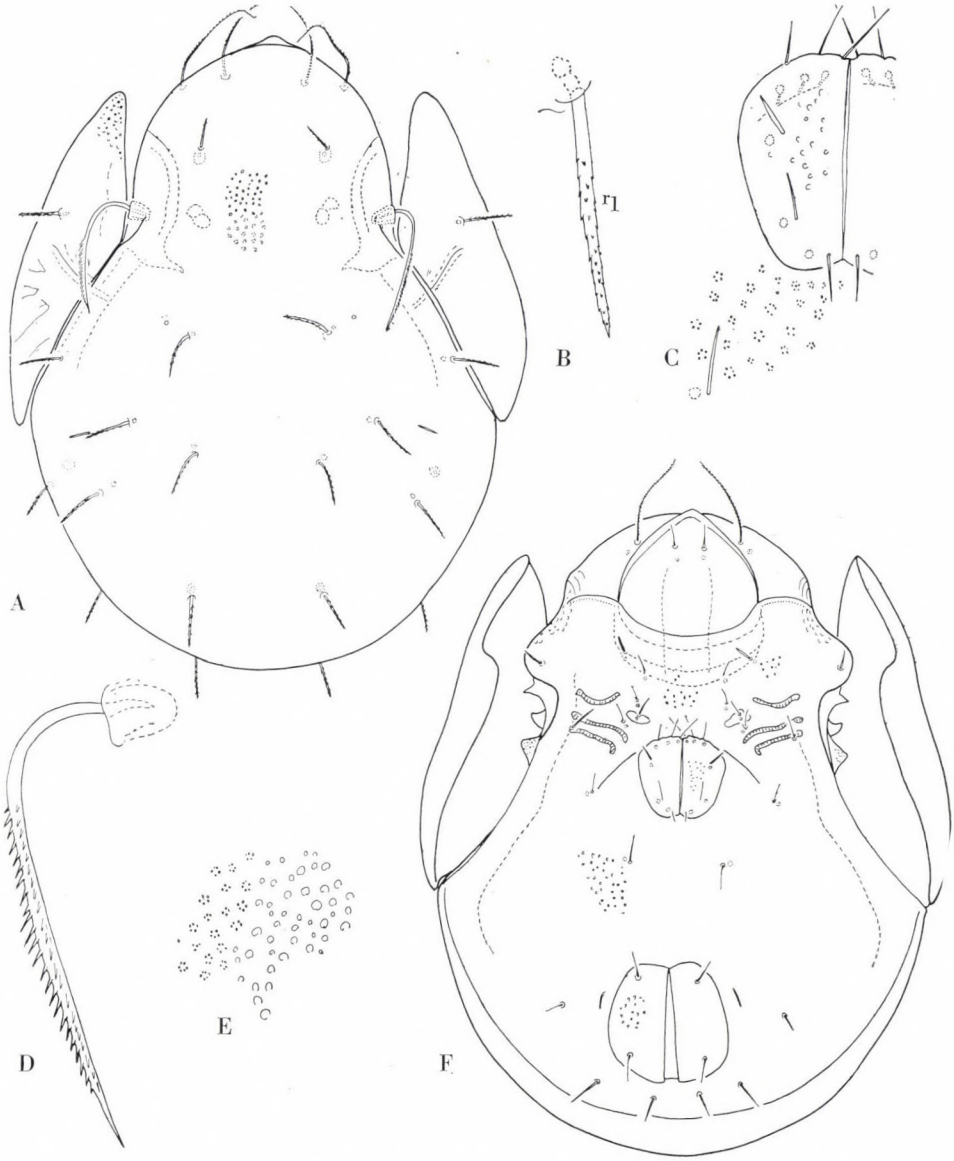

Fig. 29A—F. *Pilizetes brevisetus* sp. n. — A = dorsal side, B = seta r_1, C = genital region, D = sensillus, E = sculptur of the dorsosejugal region, F = ventral view

also foveolated. The foveolae consisting of small punctures (Fig. 29E). All notogastral setae short, spiniform (Fig. 29B) and squamose.

V e n t r a l s i d e (Fig. 29F): Surface with stronger sculpture laterally than medially. Epimeral setae different in length, *1a*, *2a* and *3a* also thinner than *1c*; *3b* the longest. Genital setae in the anterior margin of the plates

(Fig. 29C) thin and long, the other three pairs much thicker, shorter and spiniform. Genital and anal plates well foveolated. Anal setae thinner, but longer than posterior adanal ones. Ad_3 short, originating far from ad_1 and ad_2. A pair of minute pori in paraanal position.

Material examined: Holotypus (847-HO-83): Afr. 181; 1 paratype: from the same sample. Holotypus deposited in the Hungarian Natural History Museum, Budapest; paratypus in the Museum d'Histoire Naturelle, Geneva.

Remarks: Please consult the key for the African *Pilizetes* species.

Pilizetes subsimilis sp. n.

Measurements: Length: 357—382 μm, width: 248—260 μm.

Dorsal side (Fig. 30A): Rostrum widely rounded, rostral and lamellar setae long, thin, setiform and smooth (Fig. 30B). Interlamellar setae short, stick-shaped. Prodorsal surface strongly, notogastral surface more weakly sculptured. Sensillus (Fig. 30C) clavate with a long peduncle. Ten pairs of thick, short and slightly roughened notogastral setae (Fig. 30B).

Ventral side (Fig. 30E): Surface with very different sculpture. Mentum with large foveolae, genital plates with larger, anal plates also with smaller foveolae. All setae short, — excepting genital ones — stout, slightly thickened. Two pairs of adanal setae in postanal, one pair in paraanal position, the latter one (ad_3) standing far laterally.

Material examined: Holotypus (848-HO-83): Afr. 181; 3 paratypes: from the same sample. Holotypus and 2 paratypes (848-PO-83) in the Hungarian Natural History Museum, Budapest, and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

From the Ethiopian region* so far eight *Pilizetes* SELLNICK, 1937 species are known. These are distinguished by the following key:

1 (12) Sensillus setiform, gradually attenuating at its distal end, well visibly ciliated.
2 (3) Prodorsum and notogaster with very rough, nearly polygonae sculpture, notogastral setae shorter than some fields of notogaster **dudichi** BALOGH, 1966
3 (2) Prodorsum and notogaster less sculptured, ornamented only by foveolae or smaller reticulation.
4 (5) Interlamellar setae short, nearly only half as long as notogastral setae. Basal part of sensillus smooth **brevisetus** sp. n.
5 (4) Interlamellar setae as long as or longer than notogastral ones.
6 (9) Setae *ta* on pteromorphae much longer than notogastral setae *ti*.
7 (8) Notogastral setae–excepting *ta*–minute, much shorter than interlamellar ones **curtipilus** BALOGH, 1960
8 (7) Setae of notogaster normal, nearly as long as interlamellar ones **saskai** MAHUNKA, 1969
9 (6) Setae *ta* on pteromorphae and other notogastral setae equal in length.
10 (11) Interlamellar setae twice as long as notogastral ones. Surface of notogaster punctulated **subglaber** BALOGH, 1962
11 (10) Interlamellar setae as long as notogastral ones. Surface with larger foveolae **basilewskyi** BALOGH, 1958

* From the Neotropical region the species *P. neotropicus* BALOGH et MAHUNKA, 1978 does not belong in this genus.



Fig. 30A—E. *Pilizetes subsimilis* sp. n. — A = dorsal side, B = prodorsum from lateral view, C = sensillus, D = seta r_1, E = ventral side

12 (1) Sensillus dilated, clavate, spindle-shaped, smooth or finely roughened, never ciliated.
13 (14) Sensillus clavate, barbed. Interlamellar setae minute **subsimilis** sp. n.
14 (13) Sensillus spindle-shaped. Interlamellar setae not shorter than notogastral ones.
15 (16) Setae *ta* on pteromorpha very long, much longer than the thick notogastral setae **sellnicki** BALOGH, 1958
16 (15) Setae *ta* on pteromorphae not longer than notogastral setae. All setae similar in shape.
17 (18) Head of sensillus distinct, with a long and elongated, spiniform distal end. Setae *te* nearly as long as distance between setae *te* and *ti* **africanus** SELLNICK, 1937
18 (17) Head of sensillus gradually thickened, without a distinct, spiniform distal end. Setae *te* shorter, only half as long as distance between setae *te* and *ti* **australis** BALOGH et MAHUNKA, 1966

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Acta Zoologica Hungarica 30 (1–2), pp. 137–158 (1984)

FIRST SURVEY OF THE TRIASPIDINI SPECIES OF THE INDO-AUSTRALIAN REGION (HYMENOPTERA: BRACONIDAE, CALYPTINAE)

I. THE GENUS TRIASPIS HALIDAY

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(Received 30 March, 1983)

A short historical review of the survey of the Indo-Australian Triaspidini species is given. A key to the species of *Triaspis* HAL. is presented. Ten new *Triaspis* HAL. and three new *Schizoprymnus* FÖRST. species are described. With 71 figures.

From the Indo-Australian zoogeographical region the first two *Triaspis* species were described by SZÉPLIGETI under the names *Sigalphus semiglaber* in 1902 and *S. tripartitus* in 1905 (SZÉPLIGETI, 1902, 1905). The third species was discovered by FULLAWAY, who gave the name *Muiriella concisa* FULLAWAY, 1919. As indicated, SZÉPLIGETI had arranged his two species in the genus *Sigalphus* LATREILLE and FULLAWAY erected a new genus as *Muiriella* for his single new species (SHENEFELT, 1970). Since their time the taxonomical status and interpretation of the genera *Sigalphus* and *Muiriella* had changed, and in our modern conception the generic names *Triaspis* HALIDAY and *Schizoprymnus* FÖRSTER are the accepted ones. Consequently, the valid generic names of the three species in question are as follows: *Triaspis semiglaber* (SZÉPLIGETI, 1902), *T. tripartitus* (SZÉPLIGETI, 1905) and *Schizoprymnus* (*Muiriella*) *concisa* (FULLAWAY, 1919). The first two species are dealt with in the present survey (part I), the third species will be discussed in my elaboration of the Indo-Australian *Schizoprymnus* species (part II).

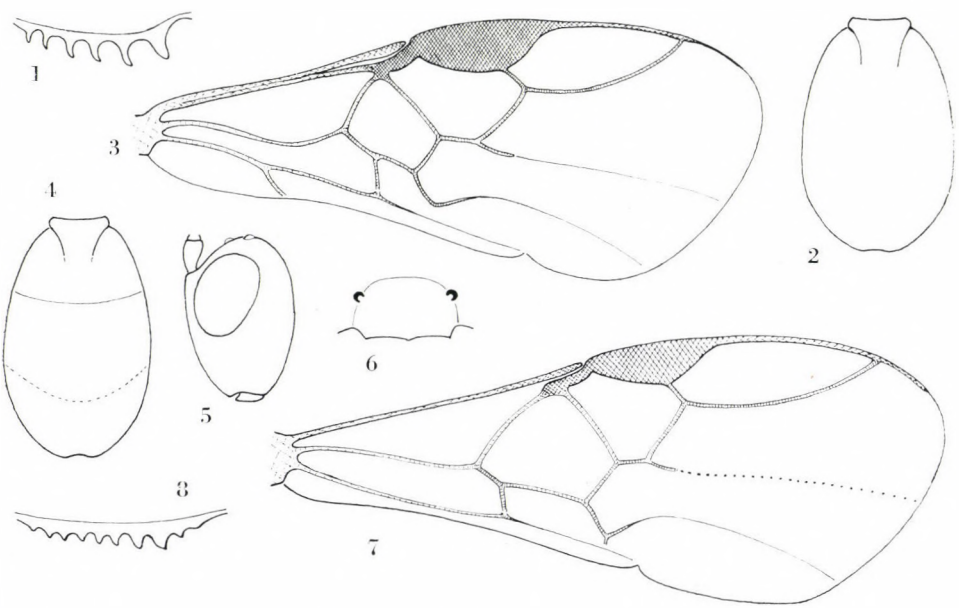
The description of the fourth species, "*Sigalphus* (?) *ichneutipterus* ♂ (?) n. sp.", was published by VACHAL in 1907; however, the species belongs to the genus *Phanerotoma* WESMAEL, quite another genus belonging in the subfamily Cheloninae. The two question-marks in the taxon-name indicate that VACHAL himself was not convinced of the correctness of this taxonomical arrangement. DR. B. SIGWALT (Paris), on my request, was kind enough to examine the type-specimen of VACHAL's species deposited in the Museé National d'Histoire Naturelle (Paris) and informed me in his letter of December 13, 1980, that beyond any doubt it represents a *Phanerotoma* species. The new taxonomical status of this species is as follows: *Phanerotoma ichneutipterus* (VACHAL, 1907) (Cheloninae).

For the elaboration of the Indo-Australian species of the tribe Triaspidini (within the subfamily Calyptinae, Braconidae) a total of 171 specimens had served. The majority of them came to me on loan from the Bishop Museum, Honolulu, and only a few specimens represented the Hungarian Natural History Museum, Budapest. The material is divisible between two genera: *Triaspis* HAL. (57 specimens) and *Schizoprymnus* FÖRST. (114 specimens).

Acknowledgement. I express my sincere thanks Dr. G. M. NISHIDA (Bishop Museum, Honolulu) for his kindness to sort out the Triaspidine specimens from among the Indo-Australian Braconidae and to dispatch them to me on loan for a long period. Without his effective help and intervention this and the subsequent surveys could not have been accomplished.

Key to the Triaspidini genera of the Indo-Australian Region

1 (4) Carapace not fully coalesced, either with two distinct sutures or at most first suture between tergites 1—2 more or less distinct.
2 (3) Transverse sutures between tergites 1—2 and 2—3 distinct, i.e. carapace definitely with three tergites (Figs 13—14) **Triaspis** HALIDAY, 1835
3 (2) At most first transverse suture between tergites 1—2 more or less distinct, second suture between tergites 2—3 effaced, i.e. carapace almost unsegmented (Figs 2, 4) **Schizoprymnus** FÖRSTER, 1862



Figs 1—2. *Schizoprymnus* (*Muiriella*) *concisa* (FULLAWAY): 1 = denticulate rim of carapace behind, in latero-apical view, 2 = carapace in dorsal view. — Fig. 3. *Urosigalphus bruchi* CRAWFORD: right fore wing. — Figs 4—8. *Schizoprymnus* (*Muiriella*) *bucculus* sp. n.: 4 = carapace in dorsal view, 5 = head in lateral view, 6 = clypeus, 7 = right fore wing, 8 = denticulate rim of carapace behind, in latero-apical view

a (b) Rim of carapace behind (or third tergite below) denticulate (Fig. 1). Propodeum with a median and a pair of lateral (a total of 3) spines
subgenus **Muiriella** FULLAWAY, 1919, stat. n.

b (a) Rim of carapace behind (or third tergite below) not denticulate as usually (Fig. 70). Propodeum without spines, at most with tubercules medially or laterally
subgenus **Schizoprymnus** FÖRSTER, 1862

4 (1) Carapace fully coalesced, i.e. without transverse suture.

5 (6) *N. bas.* 1.8—2 times longer than *n. rec.*, i.e. discoidal cell with distally strongly converging *cu1* and *d. N. med.* less clearly sinuate to nearly straight (Fig. 7). Antenna relatively long, about length of body, at least with 18—19 joints. Subgenera see at couplet 3 (2) **Schizoprymnus** FÖRSTER, 1862

6 (5) *N. bas.* 1.3—1.5 times longer than *n. rec.*, i.e. discoidal cell with distally moderately converging *cu1* and *d. N. med.* clearly sinuate or curved (Fig. 3). Antenna relatively short, usually as long as head and mesosoma together, with 14 to 19 joints
Urosigalphus ASHMEAD, 1889

Remark — The fourth Triaspidine genus, *Aliolus* SAY, 1836, seems restricted to the Nearctic America (MARTIN 1956, SHENEFELT 1970).

Triaspis HALIDAY, 1835

Triaspis HALIDAY, 1835, Ent. Mag., 3: 123. — Type-species: *Sigalphus caudatus* NEES, 1814.

A concise characterization of the genus *Triaspis*, specified to the Indo-Australian species, seems reasonable to afford:

Body 1.8—3.5 mm long. Head usually transverse, 1.8—2 times broader than long, its surface smooth to polished with disperse to moderate and small punctation. Inner margin of eyes parallel-subparallel. Compound eye twice to almost twice higher than wide. Ocelli forming an equilateral triangle, distance between two ocelli somewhat longer than or at most as long as diameter of an ocellus. Head behind (temple + occiput) carinated. Mandible bicuspid. Maxillar palp shorter than height of head. Antenna about as long as body, its last 6—8—10 joints cubic or subcubic.

Mesosoma stout. Mesonotum, scutellum and mesopleuron smooth with fine (sub)punctation. Notaulix and prescutellar furrow evenly deep, crenulated. Sternaulix always distinct, either narrow, furrow-shaped and crenulated, or broad and giving an impression of a rugose surface. Propodeum carinated, fields among carinations smooth to rugulose-rugose. Legs without any special feature.

Fore wing about length of body. Radial cell ending far before tip of wing; *r1* more or less shorter than width of stigma, *r2* arched to weakly arched, *cuqu2* absent. *N. bas.* about twice longer than *n. rec.* Nervulus interstitial or somewhat postfurcal. Nervellus joining to *n. med.* about its middle.

Metasoma carapace-shaped: first three tergites distinct though fused and strongly sclerotized, further tergites concealed. Two sutures between tergites 1—2 and 2—3 crenulated. Second suture sometimes weaker than first one. First tergite with a pair of converging keels. Carapace below with a distinct rim, which apically more or less emarginate (to retain ovipositor apparatus). Ovipositor sheath variable in length, from half to twice carapace length.

Colour of body usually dark, black, blackish or brownish black. Antenna black(ish), basally more or less reddish yellow to yellow. Legs usually reddish yellow, sometimes blackish. Wings hyaline or subhyaline, rarely brownish fumous.

Checklist of Triaspis Hal. species of the Indo-Australian Region

bangelus sp. n.
coruscus sp. n.
fumosus sp. n.
nishidai sp. n.
prinops sp. n.
pumilus sp. n.
scotospilus sp. n.
semiglaber (SZÉPLIGETI, 1902)
tadornus sp. n.
transitus sp. n.
tripartitus (SZÉPLIGETI, 1905)
versatus sp. n.

Remark — Three new species of *Schizoprymnus* FÖRSTER were included in the key for the Indo-Australian *Triaspis* species owing to their transitional feature-combinations between the two genera. Therefore I had to describe them in this part of my survey, their description see on p. 155—158; they are as follows:

Schizoprymnus (*Muiriella*) **bucculus** sp. n.
(*Schizoprymnus*) **politus** sp. n.
tortilis sp. n.

Key to the Indo-Australian species of the genus Triaspis Haliday*

1 (4) First suture of carapace distinct, second suture more or less distinct (Figs 4, 69).
2 (3) Apical rim of carapace not denticulate, though with a pair of denticles laterally from apical emargination (Figs 70—71) (subgenus *Schizoprymnus* FÖRSTER) **Schizoprymnus** FÖRSTER, 1862
a (b) Tergites 2—3 polished. Further details see at couplet 8 (9) **Schizoprymnus (S.) politus** sp. n.
b (a) Tergites 2—3 sculptured.
c (d) Apical rim of carapace semicircularly excised (Fig. 71). Sutures eventually distinct in a variable degree (Fig. 69). Antenna with 20—21 joints. Head behind eye strongly rounded (Fig. 67). Radial cell rather short (Fig. 68). ♀: 2.2—2.7 mm. — Vietnam, Laos **Schizoprymnus (S.) tortilis** sp. n.
d (c) Apical rim of carapace weakly to moderately emarginate (Figs 44, 47).
e (f) Body 2.1—2.5 mm long (♂). Carapace in dorsal view rather elongate, 1.7—1.8 times longer than broad at second tergite (Fig. 43). Antenna with 24 joints. Further details see at couplet 20 (21) **Triaspis semiglaber** (SZÉPLIGETI, 1902)
f (e) Body 3—3.2 mm long (♀). Carapace in dorsal view oval, 1.5—1.6 times longer than broad at second suture. Antenna with 18—20 joints. In lateral view ovipositor sheath (1.5—)1.8—2 times longer than carapace. Further details see at couplets 22 (23) and 25 (26) **Triaspis tadornus** sp. n.
3 (2) Apical rim of carapace denticulate (Fig. 8) (subgenus *Muiriella* FULLAWAY, 1919, **stat. n.**). Cheek almost twice as long as basal width of mandible (Fig. 5). Antenna with 28—29 joints. In lateral view ovipositor sheath as long as or somewhat longer than carapace. Body and legs either black or rusty brown. ♀: 3—3.3 mm. — New Guinea, New Britain **Schizoprymnus (Muiriella) bucculus** sp. n.
4 (1) First and second sutures equally distinct, i.e. carapace definitely with three tergites (Figs 13—14, 43, 55).
5 (12) Either third tergite or second + third tergites polished, and at least on their declivous lateral part longitudinally uneven.

* Three *Schizoprymnus* species are also included in the key owing the transitional suture-conditions of their carapace.

6 (7) Third tergite only on its median streak-like fifth to sixth smooth to polished, otherwise sculptured. Further details see at couplets 23 (22), 30 (27) and 32 (31)
Triaspis bangelus sp. n.
T. tripartitus (SZÉPLIGETI, 1905)
T. pumilus sp. n.

7 (6) Third tergite or second + third tergites polished.

8 (9) Tergites 2—3 polished, second tergite medially uneven. First suture crenulated, second suture smooth and less deep than first one. Head in dorsal view behind eye strongly rounded (Fig. 63). Antenna with 25 (right antenna) to 26 joints (left antenna). Stigma shorter than proximal section of metacarp, distal section of metacarp almost half as long as its proximal section (Fig. 64). First tergite uneven to smooth, shiny, medially rugulose-subrugulose. Eye and temple in lateral view equally wide (cf. Fig. 21). In lateral view ovipositor sheath somewhat longer than carapace. Apical rim of carapace feebly emarginate (Fig. 66). ♀: 2.5 mm. — Papua New Guinea
Schizoprymnus (S.) politus sp. n.

9 (8) Only tergite 3 polished, on its lateral declivous part eventually uneven with longitudinal elements.

10 (11) Stigma wide, 2.3—2.6 times longer than wide; radial cell short, proximal section of metacarp shorter than length of stigma (Fig. 26). Hind femur short, 3.5—4 times as long as broad (Fig. 25). Antenna with 19—20 joints. Apical rim of carapace distinctly emarginate (Fig. 27). Black, legs yellow. ♂: 1.8—2 mm. — New Caledonia
T. nishidai sp. n.

11 (10) Stigma less wide, 3—3.5 times longer than wide; radial cell long, proximal section of metacarp equal to length of stigma (Fig. 18). Hind femur long, 5 times as long as broad (Fig. 17). Antenna with 21—22 joints. Apical rim of carapace moderately to feebly emarginate (Fig. 19). Black, legs also blackish or brownish yellow with dark pattern. ♀♂: 2—2.3 mm. — New Hebrides, Papua New Guinea, Philippines
T. coruscus sp. n.

12 (5) All three tergites sculptured usually longitudinally rugose or striato-rugose, at most a middle streak of third tergite smooth to polished.

13 (16) Head in dorsal view relatively less transverse, breadth of head between eyes only slightly greater than that between temples, i.e. temple moderately rounded behind eye (Figs 28, 36).

14 (15) Radial cell long, stigma shorter than proximal section of metacarp (Fig. 31). Mesonotum in its profile arched, i.e. usual in its height above pronotum (Fig. 30↑). Last 11—13 joints of flagellum cubic, antenna with 26 joints. Carapace longitudinally striato-rugose, interspaces (between striato-rugose elements) transversely rugo-rugulose, shiny. Head in frontal view quadrate, i.e. as wide between eyes as high medially (Fig. 29). Carapace in lateral view evenly high (Fig. 32). Apical rim of carapace moderately emarginate (Fig. 33). Ovipositor sheath in lateral view almost one-third longer than carapace. Converging pair of keels of first tergite almost reaching hind margin of tergite. Body and legs black, wings subfumous. ♀: 4 mm. — Papua New Guinea
T. prinops sp. n.

15 (14) Radial cell short, stigma as long as proximal section of metacarp (Fig. 38). Mesonotum in its profile rather angular, i.e. unusual high above pronotum (Fig. 37↑). Every flagellar joint distinctly (e.g. penultimate joint 1.7 times) longer than broad; antenna with 24 joints. Carapace anteriorly rather longitudinally rugose, posteriorly striate elements less expressed, interspaces (between rugose elements) more or less transversely rugulose, shiny. Head in frontal view less quadrate, slightly broader between eyes than high medially. Carapace in lateral view gradually bellied posteriorly (Fig. 39). Apical rim of carapace excised (Fig. 40). Converging pair of keels of first tergite ending far before hind margin of tergite. Body black, legs rusty with dark pattern, scape + pedicel also rusty. ♂: 3.5 mm. — British North Borneo (or Malaysia)
T. scotospilus sp. n.

16 (13) Head in dorsal view transverse, breadth of head between eyes distinctly greater than that between temples, i.e. temple rounded to constricted (Figs 9, 20, 41, 48, 53, 58).

17 (24) Radial cell long, proximal section of metacarp always longer than stigma, distal section of metacarp usually somewhat shorter than half of its proximal section (Figs 12, 23, 42), or at most half of its length.

18 (19) In dorsal view temple behind eye rounded (Fig. 20). In lateral view temple as wide as eye (Fig. 21). Antenna with 29 joints. Tip of third tergite groove-like and dorsoventrally impressed. Apical rim of carapace weakly emarginate. Ovipositor sheath half as long as carapace. Carapace longitudinally striato-rugose. Body black, legs

brownish black. Wings subhyaline, stigma and veins yellowish. ♀: 3.2 mm. — Papua New Guinea **T. fumosus** sp. n.

19 (18) In dorsal view temple behind eye strongly rounded (Fig. 9) to constricted (Figs 41, 58). In lateral view temple less wide than eye (Fig. 10). Antenna with 18—25 joints. Tip of third tergite never groove-like impressed.

20 (21) Body 2.1—2.5 mm (♂). Cheek short, at most as long as basal width of mandible. Carapace in dorsal view rather elongate, 1.7—1.8 times longer than its greatest breadth at second tergite (Fig. 43); in lateral view somewhat higher apically than basally. Tergites less roughly striato-rugose, shiny. Antenna with 24 joints. Black, horizontal surface of tergites 1—2 rusty to testaceous. Legs yellow to rusty, hind tibia infumate. Scape and pedicel yellow(ish). Only male sex known. — Papua New Guinea, British North Borneo (or Malaysia), Philippines, Thailand, Laos **T. semiglaber** (SZÉPLIGETI, 1902)

21 (20) Body 3—3.2 mm long (♀♂). Cheek long, more or less longer than basal width of mandible. Carapace in dorsal view oval, 1.3—1.4 times (♀) and (1.4—)1.6—1.8 times (♂) longer than its greatest breadth at second suture (Figs 13—14).

22 (23) Carapace in lateral view evenly high, i.e. not bellied posteriorly (Fig. 46). Apical rim of carapace, in comparison to next species, rather widely emarginete (Fig. 47). Hind tarsus long, tarsal joints 3—4 in lateral view distinctly longer than broad (Fig. 45). Antenna with 18—20 joints. Ovipositor sheath in lateral view (1.5—)1.8—2 times longer than carapace. Body black, legs yellow or reddish yellow, hind tibia apically and hind tarsus entirely infumate. ♀: 3—3.2 mm. — British North Borneo (or Malaysia) **T. tadornus** sp. n.

23 (22) Carapace in lateral view bellied posteriorly, i.e. distinctly higher apically than basally (Fig. 15). Apical rim of carapace, in comparison to previous species, rather less widely emarginate (Fig. 16). Hind tarsus less long, in lateral view tarsal joint 3 subcubic and joint 4 cubic (Fig. 11). Antenna with 23—25 joints. Ovipositor sheath in lateral view as long as carapace. Body with similar colour to previous species, legs rather reddish yellow. ♀: 3 mm, ♂: (2.8—)3 mm. — Philippines **T. bangelus** sp. n.

24 (17) Radial cell short, proximal section of metacarp about as long as stigma, distal section of metacarp always longer than half of its proximal section (Figs 50, 60).

25 (26) In lateral view ovipositor sheath (1.5—)1.8—2 times longer than carapace. Body strong, 3—3.2 mm long. Radial cell rather long, though incidentally proximal section of metacarp very slightly shorter than stigma, its distal section always shorter than half of proximal section. Further details see at couplet 22 (23) **T. tadornus** sp. n.

26 (25) In lateral view ovipositor sheath short, usually about as long as carapace, at most somewhat longer; if 1.5 times longer than carapace (*T. versatus*) then body less strong, 2.2—2.3 mm long and radial cell shorter than stigma.

27 (30) Carapace bellied, in lateral view high, distinctly convex in its dorsal profile, i.e. only about twice longer than high (Figs 51, 61).

28 (29) In lateral view ovipositor sheath clearly longer (usually 1.2—1.4 times and at most 1.5 times longer) than carapace (Fig. 61). Head in dorsal view behind eye constricted (Fig. 58). Clypeus more transverse, 2.1—2.2 times wider below than high medially (Fig. 59). Antenna with (19—)20—23 joints. Mesosoma reddish to rusty, meso- + metasternum and propodeum with blackish suffusion. Head and carapace black, latter antero-laterally with rusty suffusion. Legs reddish yellow. ♀: 2—2.5 mm, usually 2.2—2.3 mm. — British North Borneo (or Malaysia) **T. versatus** sp. n.

29 (28) In lateral view ovipositor sheath three-fourths to at most as long as carapace. Head in dorsal view behind eye strongly rounded (Fig. 48). Clypeus less transverse, 1.7—1.8 times wider below than high medially (Fig. 49). Antenna with 17—18 joints. Head, mesosoma and carapace black or brownish black. Leg yellow or reddish yellow. ♀: 1.9—2 mm. — British North Borneo (or Malaysia), New Hebrides, New Caledonia **T. transitus** sp. n.

30 (27) Carapace not bellied, in lateral view low, less distinctly convex in its dorsal profile, i.e. about thrice longer than high (Fig. 56).

31 (32) Clypeus more transverse, thrice longer below than high medially, its lower margin very feebly bisinuate (Fig. 54). Antenna with 21—22 joints. Carapace in dorsal view relatively bellied, 1.3—1.35 times longer than its greatest width (Fig. 55), its surface rather longitudinally rugose, less shiny, only tergite 3 with a median polished field. In lateral view ovipositor sheath somewhat longer than carapace. Body brown to black, legs reddish yellow. Stigma and alar venation yellowish to brownish yellow pigmented. ♀: 2.6 mm, ♂: 2.1 mm. — Australia (Sidney), Philippines **T. tripartitus** (SZÉPLIGETI, 1905)

32 (31) Clypeus less transverse, 1.7 times longer below than high medially, its lower margin convex (Fig. 34). Antenna with 16 joints. Carapace in dorsal view not bellied, 1.45 times longer than its greatest width (Fig. 35); its surface rugo-striate, i.e. striate elements unusually strong, shiny, tergites 1—3 with a narrow polished streak. In lateral view ovipositor sheath as long as carapace. Body black, legs yellow. Stigma brownish yellow, alar venation with pale pigmentation. ♀: 1.9 mm. — New Britain
T. pumilus sp. n.

DESCRIPTION OF THE NEW SPECIES

Triaspis bangelus sp. n. ♀♂ (Figs 9—16)

♀. Body 3 mm long. Head in dorsal view (Fig. 9) transverse, 1.8—1.9 times broader between eyes than long, behind eye temple strongly rounded, eye somewhat longer than temple. Face transverse, twice wider than high medially. Clypeus semicircular, twice wider below than high medially, its lower margin indistinctly pointed. In lateral view eye somewhat wider than temple (Fig. 10). Antenna as long as body, with 23 joints.

Mesosoma in lateral view 1.3—1.4 times longer than high. Hind tarsus relatively less long, in lateral view third tarsal joint subcubic (1.4 times longer than high), fourth tarsal joint cubic (Fig. 11).

Fore wing somewhat longer than body. Stigma (Fig. 12) thrice longer than wide, issuing radial vein distal from its middle. Radial cell long, proximal section of metacarp one-fifth to one-sixth longer than stigma, its distal section distinctly shorter than half of proximal section.

Carapace as long as mesosoma, in dorsal view (Fig. 13) 1.4 times longer than broad at second suture, in lateral view (Fig. 15) posteriorly broadening, i.e. distinctly higher apically than basally. Converging pair of keels of first tergite reaching its hind margin. Carapace striato-rugose, shiny. Third tergite medially with a polished, ventrally widening field; its apical rim emarginate (Fig. 16).

Body black. Tegula brownish yellow. Legs reddish yellow. Distal half of hind tibia and hind tarsus entirely blackish fumous. Wings hyaline.

♂. Similar to female. Body (2.8—)3 mm long. Antenna with 23—25 joints. Carapace in dorsal view (Fig. 14) 1.7—1.8 times longer than broad, rather striato-rugose. Polished field of third tergite larger. Carapace medially with rusty to reddish suffusion.

Host unknown.

Locality — Philippines, Mountain Province, Abatan, Buguias, 60 km S of Bontoc, 1800—2000 m, 1 ♀ (holotype) + 1 ♂ (paratype): 15. VI. 1964, 1 ♂ (paratype): 31. V—1. VI. 1964, 1 ♂ (allotype): 11—12. VI. 1964, 1 ♂ (paratype): 19. VI. 1964, leg. H. M. TORREVILLAS.

Holotype, allotype and 1 ♂ paratype are deposited in the Bishop Museum, Honolulu; 2 ♂ paratypes are in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5364—5365.

The new species, *T. bangelus* sp. n., is related to *T. semiglaber* (SZÉPLIGETI) and *T. tadornus* sp. n., their distinction is expounded within the key-couplets 19 (18) to 23 (22).

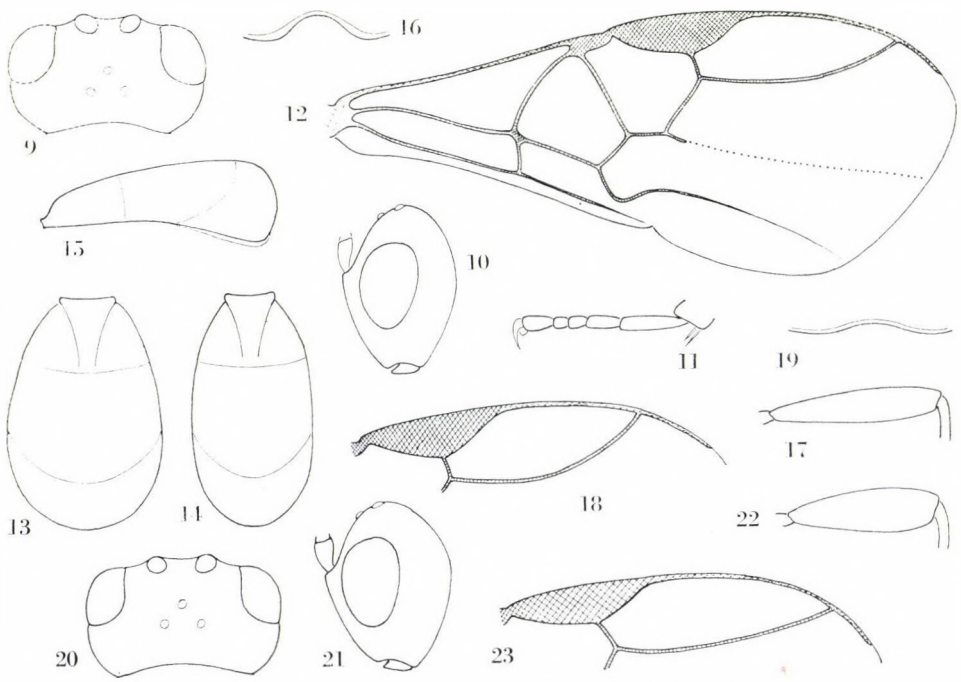
Triaspis coruscus sp. n. ♀♂ (Figs 17—19)

♀. Body 2—2.2 mm long. Head in dorsal view less transverse, 1.7 times broader than long, behind eye temple strongly rounded, eye slightly longer than temple. Face transverse, distinctly twice wider than high medially. Clypeus distinctly twice wider below than high medially, its lower margin truncate. In lateral view eye and temple equal in breadth. Antenna about as long as body, with 21—23 joints.

Mesosoma in lateral view 1.4 times longer than high. Hind femur (Fig. 17) relatively thin, five times as long as broad.

Fore wing about one-third longer than body. Stigma (Fig. 18) 3—3.5 times longer than wide, issuing radial vein from its middle. Radial cell long, proximal section of metacarp as long as stigma, its distal section more than half as long as proximal section.

Carapace as long as mesosoma, in dorsal view 1.5 times longer than broad at base of third tergite, in lateral view its posterior third 1.5—2 times higher than its anterior third, i.e. carapace bellied behind. Converging pair of keels



Figs 9—16. *Triaspis bangelus* sp. n.: 9 = head in dorsal view, 10 = head in lateral view, 11 = hind right tarsus, 12 = right fore wing, 13 = female carapace, 14 = male carapace in dorsal view, 15 = carapace in lateral view, 16 = apical emargination of carapace. — Figs 17—19. *T. coruscus* sp. n.: 17 = hind femur, 18 = distal part of right fore wing, 19 = apical emargination of carapace. — Figs 20—23. *T. fumosus* sp. n.: 20 = head in dorsal view, 21 = head in lateral view, 22 = hind femur in lateral view, 23 = distal part of right fore wing

of first tergite more or less reaching its hind margin. Tergites 1—2 rugoso-striate, tergite 3 polished, its lateral declivous part uneven with longitudinal elements. Apical rim of carapace weakly emarginate (Fig. 19). Ovipositor sheath in lateral view about as long as carapace.

Body black. Tegula yellowish brown to blackish brown. Legs either blackish or yellowish brown with dark (blackish to brown) pattern. Wings subhyaline.

♂. Similar to female. Body 2.1—2.3 mm long. Antenna 23-jointed. Sculpture of carapace somewhat stronger, basal quarter of third tergite also rugoso-striate. Legs either reddish yellow or blackish.

Host unknown.

Localities — 1 ♀ (holotype): Papua New Guinea (NE), Mt. Wilhelm, 3900 m, 13—24. IX. 1968, leg. J. BALOGH. — 1 ♀ (paratype): Papua New Guinea (NE), Morobo, Mt. Kaindi, 2350 m, Malaise trap, 22. III. 1971, leg. J. L. GRESSITT. — 1 ♀ (paratype): New Hebrides, Maewo island, Sounwari, 0—100 m, 15-23-S and 168-07-E, swept from succulente Urticate, 4—5. IX. 1979, leg. W. C. GAGNE. — 1 ♂ (allotype): Philippines, Albay Province, Libon, Caguscos, 200 m, 15. V. 1965, leg. L. M. TORRESVILLAS. — 1 ♂ (paratype): Papua New Guinea (NE), Mt. Wilhelm, Lake Aunde, 3600 m, 2. VII. 1955, leg. J. L. GRESSITT. — 1 ♂ (paratype): Papua New Guinea (NE), Bulldog Road, 2900 m, swept from Rhododendron, 27. VII. 1977, leg. J. L. GRESSITT.

Holotype and 1 ♂ paratype are deposited in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5366 (holotype) and 5367 (paratype); 4 paratypes (2 ♀ + 2 ♂) are in the Bishop Museum, Honolulu.

The new species, *T. coruscus* sp. n., is closely related to *T. nishidai* sp. n. and *T. politus* sp. n. They are separated by the features keyed within the couplets 8 (9) to 11 (10).

Triaspis fumosus sp. n. ♀ (Figs 20—23)

♀. Body 3.2 mm long. Head in dorsal view (Fig. 20) transverse, 1.9 times broader than long, behind eye temple rounded, eye longer than temple. Face transverse, twice wider than high medially. Clypeus semicircular, twice wider below than high medially, its lower margin indistinctly convex. In lateral view eye and temple equal in breadth (Fig. 21). Antenna as long as body, with 29 joints.

Mesosoma in lateral view as long as high. Hind femur 3.5 times longer than broad, broadest at its distal half (Fig. 22). Hind tibia distinctly one-fourth longer than hind tarsus.

Fore wing as long as body. Stigma (Fig. 23) 3.5 times longer than wide, issuing radial vein from its distal half. Radial cell long, proximal section of metacarp somewhat longer than stigma, its distal section short, one-fourth as long as proximal section.

Carapace as long as mesosoma, in dorsal view 1.65 times longer than broad at second tergite, in lateral view evenly convex, i.e. not bellied posteriorly. Converging pair of keels merging into sculpture at middle. Carapace evenly and longitudinally striato-rugose. Ovipositor sheath in lateral view

half as long as carapace. Tip of third tergite groove-shaped or dorso-ventrally strongly impressed. Apical rim of carapace hardly emarginate.

Body black. Tegula brown. Legs blackish. Wings subfumous.

♂ and host unknown.

Locality — 1 ♀ (holotype): Papua New Guinea (NE), Wau, Morobe district, 1200 m, Malaise trap, 4—5. II. 1963, leg. J. SEDLACEK.

Holotype is deposited in the Bishop Museum, Honolulu.

The new species, *T. fumosus* sp. n., runs nearest to *T. semiglaber* (SZÉPLIGETI, 1902), their specific distinctive features are contrasted in the key-couplets 17 (24) to 20 (21).

Triaspis nishidai sp. n. ♂ (Figs 24—27)

♂. Body 1.8—2 mm long. Head in dorsal view transverse, twice as broad as long, behind eye temple restricted (Fig. 24), eye 1.5 times longer than temple. Face 1.8—2 times wider than high medially. Clypeus 2—2.2 times wider below than high medially, its lower margin weakly convex. In lateral view eye 1.4—1.5 times wider than temple. Antenna somewhat shorter than body, with 19—20 joints.

Mesosoma in lateral view 1.4—1.5 times as long as high. Hind femur (Fig. 25) relatively thick, 3.5—4 times longer than broad. Hind tibia one-fifth longer than hind tarsus.

Fore wing somewhat shorter than body. Stigma (Fig. 26) wide, 2.3—2.6 times longer than wide, issuing radial vein slightly distally from its middle. Radial cell short, proximal section of metacarp somewhat shorter than stigma, its distal section longer than half proximal section.

Carapace as long as mesosoma, in dorsal view 1.6 times as long as broad at base of third tergite, in lateral view carapace slightly bellied, i.e. somewhat higher posteriorly than anteriorly. Converging pair of keels merging into sculpture at hind half of first tergite. Tergites 1—2 rather strongly striato-rugose; tergite 3 polished, its lateral declivous part longitudinally rugulose-subrugulose to uneven. Apical rim of carapace distinctly emarginate (Fig. 27).

Body black. Tegula brown or yellowish brown. Legs yellow, distal half of hind tibia and entire hind tarsus infumate. Wings hyaline.

♀ and host unknown.

Locality — 4 ♂ (holotype + 3 paratypes): New Caledonia, Col. d'Amieu (Circ. Moindou), 650 m, 31. III. 1968, leg. J. L. GRESSITT.

Holotype and 2 paratypes are deposited in the Bishop Museum, Honolulu; 1 paratype is in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5368.

The new species is dedicated to DR. G. M. NISHIDA (Bishop Museum, Honolulu), who was kind enough, on my request, to place at my disposal the entire Triaspidini collection of Bishop Museum, implying also the sorting and shipping of it.

The new species, *T. nishidai* sp. n., is closely related to *T. coruscus* sp. n. and *T. politus* sp. n. They are separated by the features keyed within the couplets 8 (9) to 11 (10).

Triaspis prinops sp. n. ♀ (Figs 28—33)

♀. Body 4 mm long. Head in dorsal view (Fig. 28) 1.8 times broader than long, behind eye temple moderately rounded, i.e. head between eyes only slightly broader than between temples; eye indistinctly longer than temple. Face less transverse, 1.45 times wider than high medially; head in frontal view (Fig. 29) quadrate, i.e. as broad between eyes as high medially. Clypeus 1.65 times wider below than high medially, its lower margin convex and faintly pointed at middle. In lateral view eye slightly wider than temple. Antenna shorter than body, with 26 joints.

Mesosoma in lateral view 1.4 times as long as high. Mesonotum in profile arched, not conspicuously high above pronotum as usually (Fig. 30↑). Hind femur 3.8 times longer than broad. Hind tibia longer than hind tarsus.

Fore wing as long as body. Stigma (Fig. 31) thrice as long as wide, issuing radial vein from its middle. Radial cell long, proximal section of metacarp somewhat longer than stigma, its distal section hardly one-third as long as proximal section.

Carapace as long as mesosoma, in dorsal view 1.4 times longer than broad at second tergite, oval in its outline, in lateral view evenly high (Fig. 32). Converging pair of keels of first tergite almost reaching hind margin of it. Carapace longitudinally and rather strongly striato-rugose, interspaces (between striato-rugose elements) transversely rugoso-rugulose, shiny. Apical rim of carapace moderately emarginate (Fig. 33). In lateral view ovipositor sheath almost one-third longer than carapace.

Body and legs black. Tegula blackish brown. Wings brownish subfumous.

♂ and host unknown.

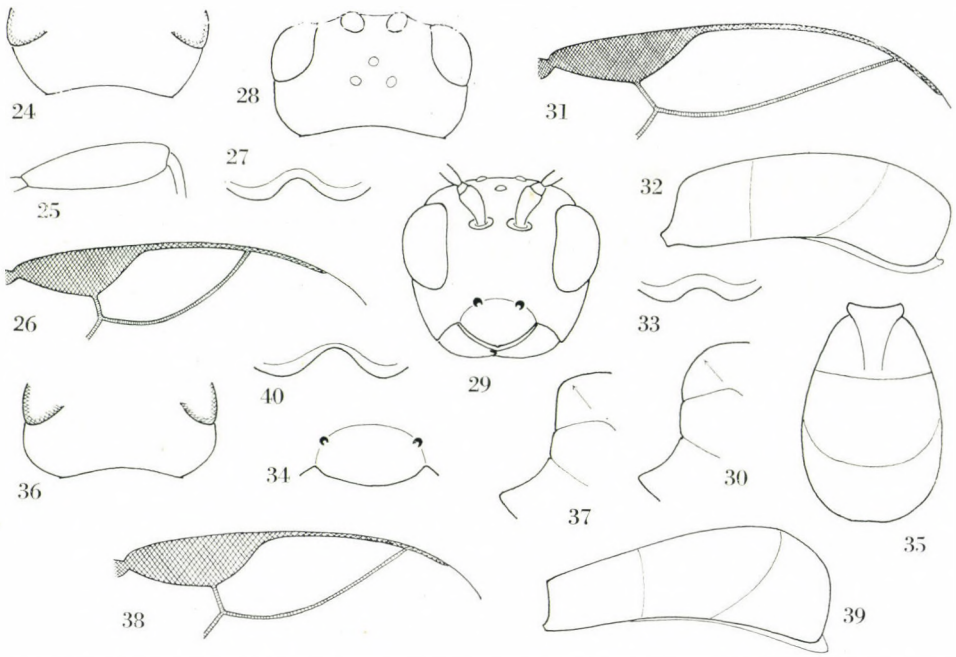
Locality — 1 ♀ (holotype): Papua New Guinea (NE), Wau, 1200 m, MV trap, 17—19. IX. 1964, leg. J. SEDLACEK.

Holotype is deposited in the Bishop Museum, Honolulu.

The new species, *T. prinops* sp. n., stands nearest to *T. scotospilus* sp. n., their specific differences are contrasted within the key-couplets 13 (16) to 15 (14).

Triaspis pumilus sp. n. ♀ (Figs 34—35)

♀. Body 1.9 mm long. Head in dorsal view transverse, twice broader than long, behind eye temple constricted, eye one-third longer than temple. Face less transverse, about 1.6 times wider than high medially; inner margin of eyes slightly though clearly converging towards oral part. Clypeus (Fig. 34) subsemicircular, 1.7 times wider below than high medially, its lower margin convex. In lateral view eye distinctly wider than temple. Antenna shorter than body, with 16 joints.



Figs 24—27. *Triaspis nishidai* sp. n.: 24 = head behind eye, 25 = hind femur, 26 = distal part of right fore wing, 27 = apical emargination of carapace. — Figs 28—33. *T. prinops* sp. n.: 28 = head in dorsal view, 29 = head in frontal view, 30 = fore profile of mesosoma, 31 = distal part of right fore wing, 32 = carapace in lateral view, 33 = apical emargination of carapace. — Figs 34—35. *T. pumilus* sp. n.: 34 = clypeus, 35 = carapace in dorsal view. — Figs 36—40. *T. scotospilus* sp. n.: 36 = head behind eye, 37 = fore profile of mesosoma, 38 = distal part of right fore wing, 39 = carapace in lateral view, 40 = apical emargination of carapace

Mesosoma in lateral view somewhat stout, 1.35 times longer than high. Hind femur 3.3 times longer than broad. Hind tibia slightly longer than hind tarsus.

Fore wing as long as body. Stigma thrice longer than wide, issuing radial vein slightly distally from its middle. Radial cell short, proximal section of metacarp shorter than stigma, its distal section about one-third shorter than proximal section.

Carapace as long as mesosoma, in dorsal view (Fig. 35) 1.45 times longer than broad at second suture; in lateral view evenly high, i.e. not bellied, 3.1 times longer than high. Converging pair of keels of first tergite reaching its hind margin. Carapace rugoso-striate, i.e. striate elements very strong, shiny, tergites 1—3 with a narrow polished streak. Apical rim of carapace nearly semicircularly emarginate. Ovipositor sheath in lateral view as long as carapace.

Body black, tegula brown, legs yellow. Wings hyaline, stigma brownish yellow, venation with pale pigmentation.

♂ and host unknown.

Locality — 1 ♀ (holotype): New Britain, Malmalwan-Yunakanau, Gazella Peninsula, light trap, 5—12. V. 1956, leg. J. L. GRESSITT.

Holotype is deposited in the Bishop Museum, Honolulu.

The new species, *T. pumilus* sp. n., is allied with *T. tripartitus* (SZÉPLIGETI, 1905), the differences of the two species are keyed in the couplets 30 (27) to 32 (31).

Triaspis scotospilus sp. n. ♂ (Figs 36—40)

♂. Body 3.5 mm long. Head in dorsal view less transverse, 1.8 times broader than long, behind eye temple strongly rounded (Fig. 36), i.e. head between eyes only slightly broader than between temples; eye and temple equal in length. Face less transverse, 1.7 times wider than high medially, inner margin of eyes parallel. Clypeus 1.75 times wider below than high medially, its lower margin truncate. In lateral view eye and temple equal in width. Antenna as long as body, with 24 joints; distal joints distinctly longer than broad, penultimate joint 1.75 times as long as broad.

Mesosoma in lateral view somewhat stout, 1.35 times longer than high. Mesonotum rather angular in its profile (Fig. 37 ↑). Hind femur 3.5 times longer than broad. Hind tibia slightly longer than hind tarsus.

Fore wing as long as body. Stigma (Fig. 38) 2.5 times longer than wide, somewhat unusually wide, issuing radial vein distal from its middle. Radial cell short, proximal section of metacarp as long as stigma, its distal section just one-third as long as proximal section.

Carapace just as long as mesosoma, in dorsal view 1.5 times longer than broad at base of third tergite; in lateral view (Fig. 39) gradually bellied posteriorly, i.e. higher behind than basally. Converging pair of keels merging into sculpture at middle of first tergite. Carapace anteriorly striato-rugose, posteriorly rather rugose, interspaces transversely rugulose, shiny. Apical rim of carapace excised (Fig. 40).

Body black. Tegula black. Legs rusty brown with dark pattern. Scape + pedicel rusty, flagellum blackish. Wing subhyaline. Stigma dark brown.

♀ and host unknown.

Locality — Holotype ♂: British North Borneo (or Malaysia), Tenompok, 13. II. 1959, leg. T. C. MAA.

Holotype is deposited in the Bishop Museum, Honolulu.

The new species, *T. scotospilus* sp. n., is related to *T. prinops* sp. n., their specific differences are contrasted within the key-couplets 13 (16) to 15 (14).

Triaspis semiglaber (SZÉPLIGETI) (Figs 41—44)

Sigalphus semiglaber SZÉPLIGETI, 1902, Természetr. Füz., 25: 62, ♂; type-locality: Sattelberg, Huon Golf, Papua New Guinea. — Holotype in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 584.

♂. Body 2.1—2.5 mm long. Head in dorsal view transverse, twice broader than long, behind eye temple constricted (Fig. 41), eye distinctly longer than

temple. Face 1.85—2 times wider than high medially. Clypeus 1.8 times wider below than high medially, rather three-sided in its outline, its lower margin weakly convex. In lateral view eye slightly wider than temple. Antenna about as long as body, with 24 joints.

Mesosoma in lateral view 1.3—1.5 times longer than high. Hind femur 4 times longer than broad. Hind tibia and tarsus equal in length.

Fore wing as long as body. Stigma (Fig. 42) 3—3.3 times longer than wide, issuing radial vein more or less distally from its middle. Radial cell long, proximal section of metacarp somewhat longer than stigma, its distal section one-third as long as proximal section.

Carapace slightly longer than mesosoma, in dorsal view (Fig. 43) relatively elongate, 1.8—1.9 times longer than broad at second tergite; in lateral view weakly bellied behind, i.e. posteriorly somewhat higher than anteriorly. Converging pair of keels of first tergite more or less approaching its hind margin. Carapace striato-rugose to rather finely rugose, shiny. Apical rim of carapace sinuate (Fig. 44). Second suture of carapace sometimes indistinct.

Body black. Tegula brown to brownish yellow. Upper or horizontal surface of tergites 1—2 with rusty to testaceous suffusion. Legs yellow to rusty; distal part of hind tibia infumate. Wings subfumous to subhyaline.

♀ and host unknown.

Localities — Holotype ♂: Thailand, Chingdao, 5—11. IV. 1958, leg. T. C. Maa. — 2 ♂: Laos, Vientiane Province, Ban Van Eue, 29. III: 1 ♂, 30. III. 1966: 1 ♂, leg. ? — 1 ♂: Philippines, Ifugao Province, Jacmal Bunhian, 24 km E Mayoyao, 800—1000 m, 13. V. 1967, leg. Torrevillas. — 1 ♂: British North Borneo (or Malaysia), Tenompok, 10—19. II. 1959, leg. T. C. Maa.

Remark — I desist to associate a female specimen, originating from British North Borneo, with this species owing its conspicuous deviation from the male sex. Carapace in dorsal view somewhat bellied, 1.4 times longer than broad at second tergite. Mesosoma rusty, similar to that of *T. versatus*. Ovipositor sheath in lateral view short, about half as long as carapace.

Triaspis tadornus sp. n. ♀ (Figs 45—47)

♀. Body 3—3.2 mm long. Head in dorsal view less transverse, 1.8 times broader than long, behind eye temple constricted (cf. Fig. 41), eye longer than temple. Face less transverse, 1.55—1.6 times wider than high medially. Clypeus twice wider below than high medially, its lower margin either truncate or very faintly pointed at its middle. In lateral view eye one-fourth wider than temple. Antenna shorter than body, about as long as head, mesosoma and fore half of carapace, with 18—20 joints.

Mesosoma in lateral view 1.4—1.5 times longer than high. Hind femur 4—4.4 times longer than broad. Hind tibia and tarsus equal in length. Tarsal joints 3—4 distinctly longer than broad in lateral view, third joint 3.3 times, fourth joint thrice longer than broad (Fig. 45).

Fore wing as long as or slightly longer than body. Stigma thrice longer than wide, issuing radial vein more or less distally from its middle. Radial cell long, proximal section of metacarp slightly to distinctly longer than stigma, its distal section less than half as long as proximal section.

Carapace as long as mesosoma, in dorsal view 1.5—1.6 times as long as second suture, in lateral view (Fig. 46) not bellied behind, i.e. (almost) evenly high. Converging pair of keels merging into sculpture about middle of first tergite. Carapace more or less longitudinally rugose or eventually striato-rugose. Apical rim of carapace widely emarginate (Fig. 47). Second suture of carapace more or less distinct. In lateral view ovipositor sheath (1.5—)1.8—2 times longer than carapace.

Body black. Tegula brown. Legs reddish yellow, hind coxa blackish (holotype). Hind tibia distally and hind tarsus entirely more or less infumous. Wings hyaline. Stigma brown.

♂ and host unknown.

Locality — Holotype ♀ + 3 ♀ paratypes: British North Borneo (or Malaysia), Tenompok, 10—19. II. 1959: holotype ♀ + 1 ♀ paratype, 13. II. 1959: 1 ♀ paratype, 15. II. 1959: 1 ♀ paratype, leg. T. C. MAA.

Holotype and 2 ♀ paratypes are deposited in the Bishop Museum, Honolulu; 1 ♀ paratype is in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5369.

The new species, *T. tadornus* sp. n., runs to *T. bangelus* sp. n., their distinction is given in the key-couplets 21 (20) to 23 (22). Also related to *T. prinops* sp. n.; the following specific features separate the two species:

T. tadornus sp. n.	**T. prinops** sp. n.
1. Head in dorsal view behind eye constricted (cf. Fig. 41), i.e. head between eyes distinctly broader than between temples.	1. Head in dorsal view (Fig. 28) behind eye moderately (or relatively weakly) rounded, i.e. head between eyes only slightly broader than between temples.
2. Antenna with 18—20 joints.	2. Antenna with 26 joints.
3. Apical rim of carapace widely emarginate (Fig. 47).	3. Apical rim of carapace less widely emarginate (Fig. 33).
4. In lateral view ovipositor sheath (1.5—) 1.8—2 times as long as carapace.	4. In lateral view ovipositor sheath 1.3 times as long as carapace.
5. Legs reddish yellow.	5. Legs black.
6. Body 3—3.2 mm long.	6. Body 4 mm long.

Triaspis transitus sp. n. ♀ (Figs 48—52)

♀. Body 1.9—2 mm long. Head in dorsal view transverse, 2—2.1 times broader than long, behind eye temple strongly rounded (Fig. 48), eye nearly twice longer than temple. Face less transverse, 1.6—1.7 times wider than high medially, inner margin of eye slightly converging ventrally. Clypeus (Fig. 49) hardly semicircular, 1.7—1.8 times wider below than high medially, its lower margin very faintly convex or almost truncate. In lateral view eye

and temple equal in width. Antenna about as long as head and mesosoma together, with 17—18 joints.

Mesosoma in lateral view 1.3—1.35 times longer than high. Hind femur somewhat thick, 2.8 times as long as broad. Hind tibia and tarsus equal in length.

Fore wing as long as body. Stigma (Fig. 50) 2.7—3 times longer than wide, issuing radial vein from its middle. Radial cell short, proximal section of metacarp shorter than stigma, its distal section about one-third shorter than proximal section.

Carapace as long as mesosoma, in dorsal view 1.35—1.4 times longer than broad at its second tergite, in lateral view (Fig. 51) high though not bellied, i.e. convex in its profile and evenly high. Converging pair of keels merging into sculpture of first tergite at middle. Carapace either rather longitudinally rugoso-rugulose or striato-rugulose, shiny. Apical rim of carapace semicircularly emarginate (Fig. 52). In lateral view ovipositor sheath three-fourths to at most as long as carapace.

Body black or brownish black. Tegula brown or yellow. Legs yellow to reddish yellow. Wings hyaline. Stigma light brown to brown.

♂ and host unknown.

Localities — Holotype ♀: New Caledonia, Yahoue, Malaise trap, 20. II. 1963, leg. C. Yoshimota et N. Krauss. — 1 ♀ paratype: British North Borneo (or Malaysia), Tenompok, 10—19. II. 1959, leg. T. C. Maa. — 1 ♀ paratype: New Hebrides, South Abrim island, Malaise trap, 22. VIII—4. IX. 1967, leg. J. et M. Sedlacek.

Holotype and 1 paratype are deposited in the Bishop Museum, Honolulu; 1 paratype is in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5370.

The new species, *T. transitus* sp. n., is closely related to *T. versatus* sp. n., the differentiation of the two species is expounded within the key-couplets 27 (30) to 29 (28).

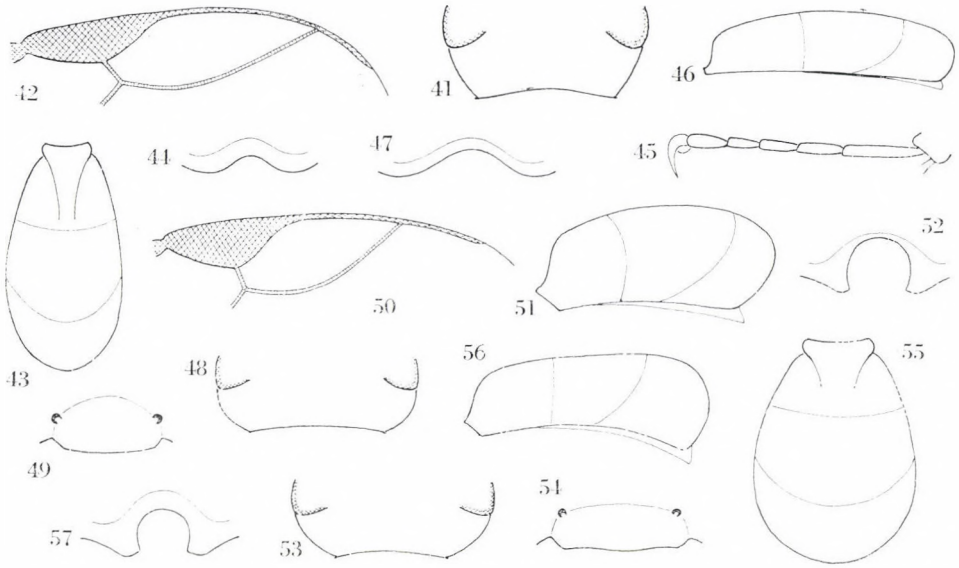
Triaspis tripartitus (Szépligeti) (Figs 53—57)

Sigalphus tripartitus Szépligeti, 1905, Ann. Mus. nat. hung., 3: 43, ♀; type-locality: Sydney (Australia). — Holotype in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 585.

♀. Body 2.6 mm long. Head in dorsal view twice broader than long, behind eye temple constricted (Fig. 53), eye longer than temple. Face distinctly twice wider than high medially. Clypeus (Fig. 54) unusually transverse, thrice wider below than high medially, its lower margin very weakly bisinuate. In lateral view eye wider than temple. Antenna shorter than body, with 22 joints.

Mesosoma in lateral view 1.4 times longer than high. Hind femur somewhat thick, thrice longer than broad. Hind tibia one-fourth longer than hind tarsus.

Fore wing somewhat shorter than body. Stigma 2.7 times longer than wide, issuing radial vein distal from its middle. Radial cell short, proximal



Figs 41—44. *Triaspis semiglaber* (SZÉPLIGETI): 41 = head behind eye, 42 = distal part of right fore wing, 43 = carapace in dorsal view, 44 = apical emargination of carapace. — Figs 45—47. *T. tadornus* sp. n.: 45 = hind right tarsus, 46 = carapace in lateral view, 47 = apical emargination of carapace. — Figs 48—52. *T. transitus* sp. n.: 48 = head behind eye, 49 = clypeus, 50 = distal part of right fore wing, 51 = carapace in lateral view, 52 = apical emargination of carapace. — Figs 53—57. *T. tripartitus* (SZÉPLIGETI): 53 = head behind eye, 54 = clypeus, 55 = carapace in dorsal view, 56 = carapace in lateral view, 57 = apical emargination of carapace

section of metacarp shorter than stigma, its distal section distinctly longer than half proximal section.

Carapace as long as mesosoma, in dorsal view (Fig. 55) somewhat bellied, 1.3—1.35 times longer than its greatest breadth at second suture; in lateral view (Fig. 56) evenly high, i.e. not bellied, thrice longer than high. Converging pair of keels merging into sculpture about middle of first tergite. Carapace rugose with rather longitudinal elements, third tergite with a middle streak-like polished field. Apical rim of carapace semicircularly emarginate (Fig. 57). Ovipositor sheath in lateral view one-fourth longer than carapace.

Body brown to dark brown. Tegula yellow. Legs reddish yellow. Wings hyaline, stigma brown.

♂. Body 2.1 mm long. Carapace in dorsal view not bellied, 1.6 times as long as broad. Body black, tegula dark brown. Legs reddish yellow, distal half of hind tibia and entire tarsus infumate.

Host unknown.

Localities — Holotype ♀: Australia, Sydney. — 1 ♂: Philippines, Mountain Province, Abatan, Buguias, 60 km S of Bontoc, 1800—2000 m, 11—12. VI. 1964, leg. H. M. TORREVILLAS.

Triaspis versatus sp. n. ♀ (Figs 58—62)

♀. Body 2—2.5 mm, usually 2.2—2.3 mm long. Head in dorsal view (Fig. 58) transverse, 2—2.1 times broader than long, behind eye temple constricted, eye one-third longer than temple. Face less transverse, 1.8 times wider than high medially, inner margin of eyes parallel. Clypeus (Fig. 59) transverse, 2.1—2.2 times wider below than high medially, its lower margin weakly convex. In lateral view eye one-third wider than temple. Antenna shorter than body, as long as head, mesosoma and half carapace, with (19—)20—23 joints.

Mesosoma in lateral view somewhat stout, (1.2—)1.25—1.3 times longer than high. Hind femur thrice longer than broad. Hind tibia one-fourth to one-fifth longer than hind tibia.

Fore wing either somewhat shorter than or as long as body. Stigma (Fig. 60) 2.3—2.6 times longer than wide, issuing radial vein more or less distally from its middle. Radial cell short, proximal section of metacarp either somewhat shorter than or as long as stigma, its distal section either more or less longer than or, less usually, as long as half proximal section.

Carapace as long as mesosoma, in lateral view (Fig. 61) bellied, distinctly convex in its dorsal profile, evenly high, i.e. about twice longer than high. Converging pair of keels reaching or approaching hind margin of first tergite. Carapace longitudinally striato-rugose. Apical rim of carapace semicircularly emarginate (Fig. 62). Ovipositor sheath in lateral view (Fig. 61) longer than carapace, usually 1.2—1.4 times, and at most 1.5 times, longer.

Body bicoloured. Head and carapace black, face exceptionally blackish brown, carapace antero-laterally with rusty suffusion. Mesosoma reddish to rusty, meso- + metasternum and propodeum with blackish suffusion. Legs reddish or reddish yellow, hind tibia distally and full hind tarsus less frequently more or less infumate. Wings hyaline, stigma light brown to brown, venation with rather light pigmentation.

♂ and host unknown.

Localities — Holotype ♀ + 12 ♀ paratypes: British North Borneo (or Malaysia), Tenompok, 10—19. II. 1959: holotype + 8 paratypes, 13. II. 1959: 1 paratype, 15. II. 1959: 2 paratypes, 10—14. II. 1959: 1 paratype, leg. T. C. Maa. — 1 ♀ paratype: British North Borneo (or Malaysia), Tenompok, Mt. Kinabulu, 18. X. 1958, leg. T. C. Maa. — 2 ♀ paratypes: Borneo, Sarawak (or Malaysia), Bau District, Bidi, 90—240 m, 2. IX. 1958, leg. T. C. Maa. — 1 ♀ paratype: British North Borneo (or Malaysia), Ranau, 30. IX—5. X. 1958, leg. T. C. Maa. — Total number of type-specimens: holotype ♀ + 16 ♀ paratypes.

Holotype and 11 paratypes are deposited in the Bishop Museum, Honolulu; 5 paratypes are in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5371—5375.

The new species, *T. versatus* sp. n., is closely allied with *T. transitus* sp. n., their specific separation is keyed within the couplets 27 (30) to 29 (28).

Schizoprymnus (Muiriella) bucculus sp. n. ♀ (Figs 4—8)

♀. Body 3—3.3 mm long. Head in dorsal view transverse, 1.9—2 times broader than long, behind eye temple constricted, eye twice as long as temple. Face transverse, twice wider than high medially. Clypeus (Fig. 6) 1.7—1.8 times wider below than high medially, its lower margin truncate and at middle subpointed. In lateral view temple gradually widening ventrally (Fig. 5). Cheek almost twice as long as basal width of mandible (Fig. 5). Antenna about as long as body, with 28—29 joints.

Mesosoma in lateral view 1.2—1.35 times longer than high. Hind femur 3.4—3.5 times longer than broad. Hind tibia one-fourth longer than hind tarsus.

Fore wing about as long as body. Stigma (Fig. 7) 3.4—3.5 times longer than wide, issuing radial vein distal from its middle. Radial cell long, proximal section of metacarp longer than stigma, its distal section shorter than half proximal section.

Carapace somewhat shorter than mesosoma, in dorsal view (Fig. 4) 1.3—1.4 times longer than broad at second tergite, two sutures more or less distinct (second suture usually less distinct than first one), in lateral view less convex in its dorsal profile, evenly high, thrice longer than high. Converging pair of keels merging into sculpture of first tergite. Carapace striato-rugose, shiny, medio-apical field of third tergite polished. Apical rim of carapace denticulate (Fig. 8) (subgeneric feature of *Muiriella* FULLAWAY). In lateral view ovipositor sheath as long as or somewhat longer than carapace.

Body black (holotype ♀ + 1 ♀ paratype from New Guinea) or rusty brown (1 ♀ paratype from New Britain). Tegula brown or brownish yellow. Legs blackish or reddish yellow. Wings subhyaline, stigma and venation with opaque brownish-greyish pigmentation.

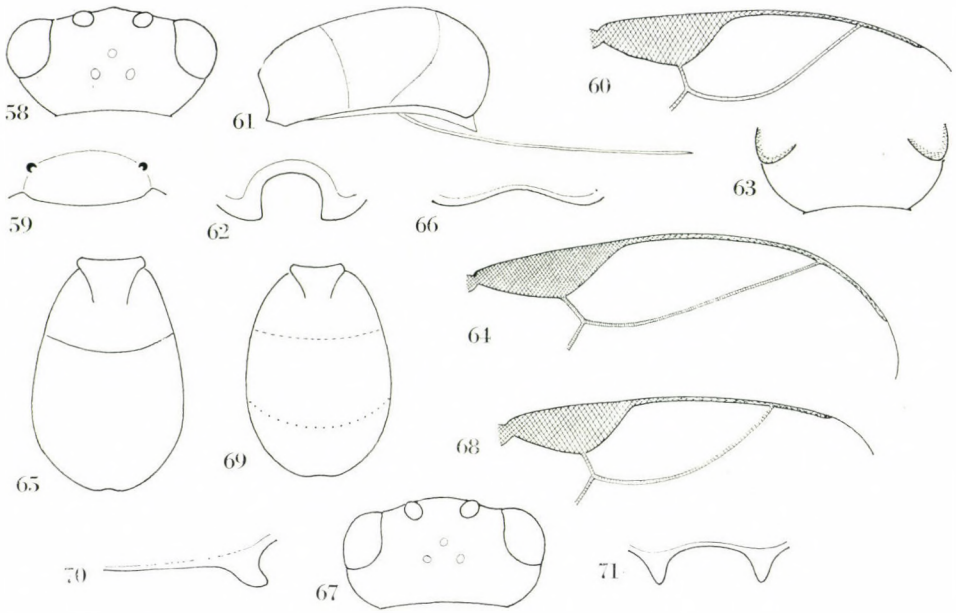
♂ and host unknown.

Localities — Holotype ♀: Papua New Guinea (NE), Wau, Mt. Kaindi, 1230 m, Malaise trap, 5. X. 1964, leg. J. SEDLACEK. — 1 ♀ paratype: West New Guinea, Star Mts. Sibil Val, 1245 m, 18. X—8. XI. 1961, leg. S. QUATE et L. QUATE. — 1 ♀ paratype: New Britain, Gazelle Peninsula, Mt. Sinewit, 900 m, 7—16. XI. 1962, leg. J. SEDLACEK.

Holotype and 1 paratype are deposited in the Bishop Museum, Honolulu; 1 paratype is in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5376.

The new species, *S. bucculus* sp. n., is related to *S. concisa* (FULLAWAY, 1919); the two species can be distinguished by the features tabulated below:

S. bucculus sp. n.	**S. concisa** (FULL.)
1. Cheek unusually long, almost twice longer than basal width of mandible (Fig. 5).	1. Cheek short, as usually about one-fifth longer than basal width of mandible.
2. Antenna with 28—29 joints.	2. Antenna with (19—)20—21 joints.
3. Body 3—3.3 mm long.	3. Body 2.2—2.3 mm long.



Figs 58—62. *Triaspis versatus* sp. n.: 58 = head in dorsal view, 59 = clypeus, 60 = distal part of right fore wing, 61 = carapace in lateral view with ovipositor sheath, 62 = apical emargination of carapace. — Figs 63—66. *Schizoprymnus* (*S.*) *politus* sp. n.: 63 = head behind eye, 64 = distal part of right fore wing, 65 = carapace in dorsal view, 66 = apical emargination of carapace. — Figs 67—71. *S.* (*S.*) *tortilis* sp. n.: 67 = head in dorsal view, 68 = distal part of right fore wing, 69 = carapace in dorsal view, 70 = rim of carapace whole in latero-apical view, 71 = apical emargination of carapace

Schizoprymnus (Schizoprymnus) politus sp. n. ♀ (Figs 63—66)

♀. Body 2.5 mm long. Head in dorsal view transverse, 1.85 times broader than long, behind eye temple strongly rounded (Fig. 63), eye longer than temple. Face 1.8 times wider than high medially, inner margin of eyes indistinctly converging towards oral part. Clypeus almost semicircular, 1.8 times wider below than high medially, its lower margin truncate. In lateral view eye and temple equal in width (cf. Fig. 21). Antenna longer than body, with 25 (right antenna) and 26 (left antenna) joints.

Mesosoma in lateral view relatively stout, 1.3 times as long as high. Hind femur four times longer than broad. Hind tibia indistinctly longer than hind tarsus.

Fore wing longer than body. Stigma (Fig. 64) thrice as long as wide, issuing radial vein from its middle. Radial cell long, proximal section of metacarp somewhat longer than stigma, its distal section slightly less than half as long as proximal one.

Carapace as long as mesosoma, in dorsal view (Fig. 65) 1.4 times as long as broad at second suture, in lateral view slightly higher posteriorly. Converg-

ing pair of keels merging into sculpture at middle of first tergite. First tergite smooth to uneven, medially longitudinally subrugulose-rugulose, shiny. Tergites 2—3 polished, second tergite medially uneven. First suture deep and crenulated, second suture shallow and smooth (transitional character towards *Triaspis*). Apical rim of carapace weakly emarginate (Fig. 66). In lateral view ovipositor sheath one-fifth longer than carapace.

Body black. Tegula yellow. Legs yellow, distal half of hind tibia and entire hind tarsus infumate. Wings brownish fumous.

♂ and host unknown.

Locality — Holotype ♀: Papua New Guinea (NE), Mt. Kaindi, caught with Malaise trap set up in environment of Nothofagus carrii, 3. V. 1973, leg. J. L. GRESSITT.
Holotype is deposited in the Bishop Museum, Honolulu.

Within the genus *Triaspis* HAL. the new species, *S. politus* sp. n., runs to *T. coruscus* sp. n. and *T. nishidai* sp. n.; their specific differences are keyed in couplets 7 (6) to 11 (10). *S. politus* represents a transitional species towards *Triaspis* in view of its shallow and smooth (or uncrenulated) second suture, i.e. second suture weakly present.

Schizoprymnus (Schizoprymnus) tortilis sp. n. ♀ (Figs 67—71)

♀. Body 2.2—2.7 mm long. Head in dorsal view (Fig. 67) transverse, twice broader than long, behind eye temple strongly rounded, eye longer than temple. Face 1.8—2 times wider than high medially, inner margin of eyes parallel. Clypeus 2—2.2 times wider below than high medially, its lower margin more or less convex. In lateral view eye and temple equal in width. Cheek either as long as or somewhat longer than basal width of mandible. Antenna somewhat shorter than body, with 20—21 joints.

Mesosoma in lateral view 1.3—1.35 times longer than high. Hind femur 3.2—3.5 times longer than broad. Hind tibia one-sixth longer than hind tarsus.

Fore wing as long as body. Stigma (Fig. 68) 2.5—2.7 times longer than wide, issuing radial vein minutely distally from its middle. Radial cell rather short, proximal section of metacarp either as long as or somewhat longer than stigma, its distal section more or less shorter than half proximal section.

Carapace as long as mesosoma, in dorsal view (Fig. 69) (1.2—)1.35—1.4 times longer than broad at second tergite, two sutures sometimes more or less distinct (indicating its transitional position towards *Triaspis*); in lateral view convex, rather evenly high, 2.5—3 times longer than high. Converging pair of keels merging into sculpture about middle of first tergite. Carapace either rather longitudinally rugose or striato rugose, shiny. Apical rim of carapace semicircularly excised, and with a pair of denticle (Figs 70—71). In lateral view ovipositor sheath either as long as or somewhat longer than carapace.

Body black. Tegula brown or blackish brown. Scape and pedicel always, flagellar joints 1—2(—3—4) usually, rusty to reddish yellow. Legs reddish yellow, hind tibia distally and tarsus fully variably infuscate to a degree.

Wings hyaline, stigma brownish greyish and venation rather yellowish pigmented.

♂ and host unknown.

Localities — Holotype ♀ + 1 ♀ paratype: Vietnam, DiLinh (Djiring), 1200 m, 22—28. IV. 1960, leg. L. W. QUATE. — 1 ♀: Vietnam, Mt. Lang, Bian, 1500—2000 m, 19. V—8. VI. 1961, leg. N. R. SPENCER. — 1 ♀ paratype: Vietnam, Fyan, 1200 m, 11. VII—9. VIII. 1961, leg. N. R. SPENCER. — 1 ♀ paratype: Vietnam, Dalat, 6 km S, 1400—1500 m, 9. VI—7. VII. 1961, leg. N. R. SPENCER. — 2 ♀ paratypes: Vietnam, Dalat, 1500 m, 29. IV—4. V. 1960, leg. L. W. QUATE. — 1 ♀ paratype: Laos, Savannakhet Province, Savannakhet, 15. IV. 1967, leg. ? — 1 ♀ paratype: Laos, Vientiane Province, Ban Van Eue, 30. VI. 1967, leg. ? — Total number of type-specimens: holotype ♀ + 8 ♀ paratypes.

Holotype and 5 ♀ paratypes are deposited in the Bishop Museum, Honolulu; 3 ♀ paratypes are in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 5377—5379.

The new species, *S. tortilis* sp. n., is related to *S. tantalus* PAPP, 1981 (Palaearctic Region: Hungary, Greece, Turkey); the two species can be differentiated by several features expounded in a tabular form:

S. tortilis sp. n.	**S. tantalus** PAPP
1. Head behind eye strongly rounded (Fig. 67).	1. Head behind eye constricted.
2. Antenna with 17—19 joints.	2. Antenna with 20—21 joints.
3. Carapace in lateral view not bellied, evenly high.	3. Carapace in lateral view bellied behind, gradually higher posteriorly, i.e. one-fifth to one-fourth higher behind than basally.
4. Ovipositor sheath in lateral view either as long as or somewhat longer than carapace.	4. Ovipositor sheath in lateral view always shorter than carapace.
5. Carapace rather longitudinally rugose or striato-rugose, shiny.	5. Carapace rugose, dull.
6. Stigma 2.5—2.7 times longer than wide; proximal section of metacarp either as long as or somewhat longer than stigma (Fig. 68).	6. Stigma 2.4—2.6 times longer than wide; proximal section of metacarp always as long as stigma.

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Acta Zoologica Hungarica 30 (1–2), pp. 159–177 (1984)

LAUXANIIDAE (DIPTERA), NEW PALAEARCTIC SPECIES AND TAXONOMICAL NOTES*

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(Received 31 March, 1983)

Distribution data for 23 lauxaniid species are given incl. new records for Czechoslovakia, Roumania, Hungary, Bulgaria, the USSR, North Korea and Japan. Seven new species and a new subgenus of *Lyciella* are described [*Homoneura koreana* sp. n., *H. lushanica* sp. n., *H. shatalkini* sp. n., *H. stackelbergiana* sp. n., *H. stigmata* sp. n., *L.* (*Shatalkinia* subg. n.) (type-species: *L.* (*S.*) *supraorientalis* sp. n.) and *Calliopum ceianui* sp. n.]; taxonomical status of other two species is clarified [*Lyciella vittata* (WALKER), *Sapromyza sordida* HALIDAY]. The problems of the delimitation of the Palaearctic region from the Oriental are discussed. With 30 figures.

The preparatory works and publication of the new Catalogue of Palaearctic Diptera have facilitated dipterology in Europe in various ways; complete or partial revisions in several families, collecting and critical review of the faunistic records, etc. have been made. In the family Lauxaniidae a complete revision was not possible (PAPP, 1981) but an extensive identification work and a study of types was made on materials of some European collections. The results of this work was partly involved in the manuscript of the lauxaniid part of the catalogue (PAPP, 1984), other parts are published here. Several new species were found, seven new species are described below, mainly from the easternmost parts of the Palaearctic region (in a conservative sense). Study of the lauxaniid fauna of North Korea (partly published here) and that of the Japanese fauna (first part has been published by SASAKAWA and IKEUCHI, 1982), revealed that the traditional "general biogeographical" borders cannot be upheld. The Amur and Ussuri region of the Soviet Far East and the adjacent areas have an endemic fauna coloured by some Palaearctic (Holarctic) species and some Oriental elements. The northern borders of the Oriental region for lauxaniids are as north as North Korea and Japan, i.e. similarly to numerous other groups it was found that no general delimitation is possible even for the major biogeographical regions: every animal group has its own story of evolution which is expressed more or less also in the present distribution of the species, species-groups, etc.

It is my agreeable duty to express my most sincere thanks to the following scientists and institutions for generous loans of type-materials and un-

* Zoological collectings by the Hungarian Natural History Museum in Korea (No. 70)

named materials of Lauxaniidae: to Dr. Brian H. Cogan (British Museum Nat. Hist.) for types of *Sapromyza vittata* Walker, specimens of *Sapromyza sordida* Halid., to Dr. Hubert Schumann (Zoologisches Museum, Museum für Naturkunde, Berlin) for the repeated opportunity to study their rich collection of types, to Dr. Emilia P. Nartshuk (Zoological Institute, Acad. Sci., Leningrad), to Dr. Vladislav Martinek (State Forestry and Game Management Research Institute, Prague) for valuable named and unnamed materials of the European Lauxaniidae, to Prof. Dr. A. A. Shatalkin (Zoological Museum, Moscow State University) for lauxaniid specimens from the Soviet Far East.

HOMONEURINAE

Homoneura brevicornis (Kertész, 1915)

Material studied: North Korea: 3 ♂, 3 ♀: Prov. South Pyongan, Pyongyan, city park, 4. Aug. 1971, No. 137, leg. S. Horvatovich and J. Papp; 23 ♂, 14 ♀: ibid., Nungra do (island), 14. Aug. 1971, No. 175; 1 ♂, 1 ♀: ibid., island in the river Te-dong, 27. May 1970, No. 36, leg. S. Mahunka and H. Steinmann; 2 ♀: Pyongyan, Hotel garden, 4—5. Aug., 12. Aug. 1971, Nos 142, 166, leg. S. Horvatovich and J. Papp; 2 ♀: Lyong-ak san, 25 km W from Pyongyan, 9. Aug. 1971, No. 155. 49 ex. — It seems a widespread species, described from Formosa but recently found in Japan (Ryukyus) (Sasakawa and Ikeuchi, 1982). The above specimens were carefully compared with syntypes in the collection of the HNHM, incl. male genitalia. New for the Palaearctic Region (see introduction) and for the fauna of North Korea.

Homoneura consobrina (Zetterstedt, 1847)

Material studied: Roumania: 1 ♂: Domogled, Jelaran, 9. Aug. 1976, leg. I. Ceianu. — A European species (cf. Papp, 1983), new to Roumania.

Homoneura euaresta (Coquillett, 1898)

Material studied: (Japan): 2 ♂: "Akashi — 3 6", det. G. E. Shewell (HNHM; ? a part of the type-series); USSR: 1 ♂: Юж. Приморье, Кедр. падь, 17. Sept. 1980, leg. A. Шаталкин; 1 ♂: ibid., 27. Aug. 1980 — "n. 1"; North Korea: leg. S. Horvatovich and J. Papp, 1971: 1 ♂, 2 ♀: Kaesong, Mts. Pakyon, 20 km NE from Kaesong, 11. Sept., No. 261; 4 ♂, 2 ♀: ibid., Pakyon popo, 27 km NE from Kaesong, 8. Sept., No. 245; Prov. South Pyongan: 4 ♂, 5 ♀: Za-mo san, 60 km NE from Pyongyan, 2. Sept., No. 231; 1 ♂: Changlyong san, 50 km N of Pyongyan, 13. Aug., No. 169; 2 ♂: De-sang san, 12 km NE from Pyongyan, 7. Aug., No. 145. 23 ex. — New to the Asian continent and for the fauna of North Korea and of the USSR, hitherto known only from Japan (Sasakawa and Ikeuchi, 1982).

Homoneura filiola Czerny, 1932

Material studied: North Korea, leg. S. Horvatovich and J. Papp, 1971: 1 ♂, 1 ♀: Prov. Ryan-gang Plateau, Chann-pay, Sam-zi-yan, 1700 m, 27. Aug., No. 209; 1 ♂: Kaesong, Mts. Pakyon, Pakyon popo, 27 km NE from Kaesong, 10—12. Sept., No. 257. 3 ex. — The female holotype has been studied in the collection of the Zoological Institute, Acad. Sci. Leningrad but it is important to have males for future comparison with the related species. Hitherto known only from the Ussuri region of the Soviet Far East, new to North Korea.

Homoneura kolthoffi Hendel, 1938

Material studied: North Korea: 1 ♀: Kaesong, Mts. Pakyon, Pakyon popo, 27 km NE from Kaesong, 10—12. Sept., No. 257, leg. S. Horvatovich and J. Papp. — It was described in a posthumus paper of Hendel on the base of the single holotype (South China, "Kiangsu"). This record widens its area far north. New to North Korea.

Homoneura lamellata (BECKER, 1895)

Material studied: USSR, Far East: 1 ♀: Амурская обл., г. Зея, 1. Aug. 1981, Л 3, leg. О. Горбунов. — A widespread Holarctic species, known from N Europe (incl. USSR), Austria, Mongolia (SHEWELL, 1971, REMM and ELBERG, 1980) and North America. New to this part of the USSR.

Homoneura limnea (BECKER, 1895)

Material studied: Czechoslovakia: 2 ♂, 1 ♀: Moravia (Křístek), No. 14b, c. — It is a species, which was frequently misidentified by earlier authors; its distribution for the new Palaearctic catalogue was compiled mainly on the base of specimens in the collection of the HNHM.

Homoneura patelliformis (BECKER, 1895)

Material studied: specimens from Hungary, Austria, Yugoslavia, Italy (Trieste), Roumania and ? Bulgaria in the collection of the HNHM; 1 ♀: Roumania, Domogled, Jelaran, 30. Aug. 1976 (137), leg. I. CEIANU (coll. DR. V. MARTINEK). This latter specimen was identified with doubt since females of this species-group are not readily identifiable. I must stress that *H. patella* SHEWELL, 1971 (Mongolia) is *not* conspecific with patelliformis as it was stated by REMM and ELBERG (1980); there are rather distinct differences in the male genitalia of the two species as far as I was able to judge on the base of comparison of the holotype of patella with specimens of *patelliformis* from Hungary.

Homoneura spinicauda SASAKAWA and IKEUCHI, 1982

Material studied: North Korea: 1 ♀: Prov. Kengi, Bagyon san, 7. June 1970, No. 99, leg. S. MAHUNKA and H. STEINMANN; 2 ♂: ibid., Bagyon popo, about 27 km NE from Kaesong, No. 100; 3 ♂: Kaesong, Mts. Pakyon, Pakyon popo, 27 km NE from Kaesong, 8. Sept. 1971, No. 245, leg. S. HORVATOVICH and J. PAPP. 6 ex. — Recently described from Japan (Honshu, Kyushu, Ryukyus); the genitalia of the above specimens agree in details with the drawings on the genitalia of the type-series. New to the Asian continent and to North Korea.

Homoneura thalhammeri L. PAPP, 1978

Material studied: 2 ♂: Roumania, Domogled, Jelaran, 26. July 1978, leg. I. CEIANU. — It is a rare European species (Czechoslovakia, Hungary, Roumania). It is nice to find more specimens out of the type-series.

LAUXANIINAE

Protrigonometopus maculifrons HENDEL, 1938

Material studied: 1 ♂: "Japan, Dr. Matsumura" (HNHM). — Described from China ("Kiangsu"), new to Japan. A species with peculiar head structure and colour.

Sciasminettia dichaetophora (HENDEL, 1907)

Material studied: specimen from Mongolia (SHEWELL, 1971); 1 ♀: USSR, Georgia, Sukhumi, Gumista Valley, 30. May 1975, leg. K. SIN (HNHM). — Hitherto known from the Soviet Far East and Mongolia; new to this part of the USSR.

Minettia austriaca HENNIG, 1951

Material studied: Roumania: 4 ♂: Clg. Mold., V. Caselor, 7. July 1976 (Nos 6—9), leg. I. CEIANU; 1 ♂: Domogled, Jelaran, 20. July 1977, leg. I. CEIANU (in alcohol). — Described from Austria and hitherto known only from Czechoslovakia (MARTINEK, 1977) and Estonia; new to Roumania.

Minettia filia (BECKER, 1895)

Material studied: Czechoslovakia: 2 ♂, 1 ♀: Moravia bor., Nýdek 3 km E, 550 m, 49.09N, 18.46E, BARTÁK leg., 2. Aug. 1981; Roumania: 1 ♂: Domogled, 14. June 1977, leg. I. CEIANU; 1 ♀: Valea Putnei, 11. July 1975, leg. I. CEIANU. — A peculiar species; described as a species of Sapromyza but it was regarded later to be a species of Homoneura

or Sapromyza by authors. Its strong intraalar bristles and the pecularities in the genitalia of both sexes serve as bases for identification. Known only from Yugoslavia, Roumania, the USSR (and ? Poland) (PAPP, 1984), new for the fauna of Czechoslovakia.

Lyciella decempunctata (FALLÉN, 1820)

Material studied: Roumania: 2 ♂: Domogled, V. Jelaran, 16. May 1977, leg. I. CEIANU. — A widespread species (PAPP, 1984) but immature specimens are not readily identifiable, as in the case of the above specimens in alcohol. In such cases the male and female terminalia give us bases for the safe identification.

Lyciella vittata (WALKER, 1849)

Sapromyza vittata WALKER, 1849: List Spec. Dipt. Brit. Mus., 4: 988.

Lectotype female. Its labels: 1. (circular label, diameter of 7.5 mm with green marginal circle and printed) "Type"; 2. "Ent. Club. 44-12"; 3. "One of Walkers series so named 'EAW' " — (on the other side) "*Sapromyza vittata* WALK.". Paralectotype female: with labels 2 and 3.

Two wrinkled, immature specimens. The lectotype female is in a rather poor state of preservation. Both third antennal joints with arista are missing, several cephalic and thoracic bristles are broken or broken off; apical part of scutellum with apical scutellars lost; both wings broken (though only a small apical part of left wing missing); left middle tarsi 2—5, left hind tarsi 3—5, right middle tarsi 4—5 and right hind tarsomere 5 broken off. The specimen was fixed into a square piece of celluloid with a part of its original pin.

Measurements in mm: body length c. 3.14 (lectotype), c. 2.85 (paralectotype); wings 3.86 × 1.43 and 3.63 × 1.43.

Description. Colour very pale (owing to their immature state), greyish yellow, mouth edge with a dark brown spot, frons with 2 diffuse long stripes, palpi brown, mesonotum with 4 wide diffuse brown stripes, legs ochreous with some light brownish hue and with greyish pollen on femora, abdominal terga with pale yellowish brown proximal bands, their marginal bristles on diffuse brown spots. Cephalic chaetotaxy: 2 reclinate *ors*, *oc*, *vte*, *vti*, incurving *pvt*, postoculars and genal bristles thin and only moderately long, hind lower part of genae with 2 ventrally directed bristles. Thoracic chaetotaxy: 1 *h*, 2 *np*, 1 *prst*, 1 *sa*, 2 *pa*, 0 *ia*, 1 + 3 *dc* (prescutellar area are destroyed by pin on both of the specimens), 2 *sc*, 1 *pp* (supracoxal), 1 *mp*, 2 strong *stp* pairs. Mesopleuron with several small thin bristles. Wings light, greyish, veins very pale yellow, no darker spots. Terminal section of median vein 1.78 times as long as intracrossvein section. Halteres whitish yellow. Fore femora with a long row of about 10 sharp black spines anteroventrally on apical half. Preapicals present on each tibia, strong ventroapical on middle tibia. Female sternum 5 big, wide, boat-shaped. Cerci short with numerous moderately long and short hairs.

The lectotype and paralectotype of *Lyciella vittata* (WALKER, 1849) are clearly conspecific with the form hitherto named *Lyciella quadrivittata* (LOEW, 1861), thus *Sapromyza quadrivittata* LOEW, 1861 is a junior synonym of *Sapromyza vittata* WALKER, 1849 (see also PAPP, 1984).

Sapromyza (*Schumannimyia*) *hyalinata* (MEIGEN, 1826)

Material studied: Roumania: 3 ♀: Sazata, 21. June 1978, leg. I. CEIANU. — Known from the northern and central parts of Europe southwards to Hungary and Roumania (incl. European parts of the USSR) and from Mongolia. A careful study of the genitalia is necessary to the identification of any specimen in this subgenus.

Sapromyza (*Schumannimyia*) sp.

Material studied: 1 ♀: "Oesterreich, 3. 5. 78, lgt. BAUER Barbaram" (received from DR. V. MARTINEK for identification). I have seen other two females of this species which is surely distinct from *S. atripes* (MEIGEN, 1838), which is an Asian species (see SHEWELL, 1971). All the specimens of the subgenus of *Schumannimyia* other than *hyalinata* from the Alps and the Carpathians may belong to *multiseriata* CZERNY, 1932 or to a new species but the species depicted by SHEWELL (1971) as atripes, has not been found in Europe.

Sapromyza palpella (RONDANI, 1868)

Material studied: Czechoslovakia: 1 ♂: Slovakia mer., Filakovo, 6 km SE, 48°14′ N, 19°53′ E, 12. May 1981, BARTÁK leg. (No. 12); Hungary: 1 ♂: Hortobágy N. P., Új-

szentmargita, Peucedanumos rét (meadow with Peucedanum), 31. July 1975, leg. T. VÁSÁRHELYI et M. SIMON. Also all females published as *S. intonsa* LOEW, 1847 recorded by PAPP (1981: The fauna of the Hortobágy National Park, 1: 226) are females of *palpella*. This misidentification was made prior to the revision of this species-group (PAPP, 1981). Hitherto known from France, Italy, Yugoslavia and Czechoslovakia (PAPP, 1984, MARTINEK, 1982). New for the fauna of Hungary.

Sapromyza sordida HALIDAY, 1833

HALIDAY, 1833: Ent. Mag., 1: 171.

Material studied: 1 ♂: Worth Matravers, Dorset, June 1960, R. W. CROSSKEY — "*Sapromyza sordida* HAL." det. J. C. DEEMING, 1964; 1 ♂: *Sapromyza sordida* HAL. — Verrall Bequest. 1911-411 — (handwriting on a circle label) "Bourne-mouth 19/7/71".

Description: Body and legs vivid yellow, mesonotum and frons shining; abdomen without black spots. Palpi black, third antennal joint brownish dorsally and apically. Anterior side of fore femora of males with a brown spot in apical third. Arista with dense, short (0.056 mm) rays. 0 + 3 *dc*, thoracic chaetotaxy anyway as in its congeners, *acmi* in 6 rows. Wings clear, light yellowish without any darker spots, veins yellow. Strong thick costal fringe on less than a third of section mg_3. Terminal section of medial vein 1.839 and 1.737 times as long as intracrossvein section, respectively. Male with a brush of black (at least brown) bristles on ventral surface of middle metatarsus, male hind tibia ventroapically with a small brush of short black bristles.

The specimens under this name are not conspecific with, nor closely related to *Sapromyza maculipes* BECK. = *Sapromyza tuberculosa* BECK., as it was admitted by PAPP (1978). *Sapromyza sordida* HAL. is a distinct species closely related to *Sapromyza amabilis* FREY, maybe its vicariant species on the British Isles. It resembles also species of *Calliopum* but its colour is yellow.

Sapromyza opaca BECKER, 1895

Material studied: more than 200 specimens from several countries of Europe; USSR, Asia: 1 ♀: окр. Якутска, Ботанический сад, В. Ковалёв, 14. July 1976; 1 ♂: р. Индигирка, уст. р. Иньяли, В. Ковалёв, 19. June 1976. — It is a widespread Palaearctic species. After studying several hundreds of European specimens, I can say that there are only 3 species of this species group: sexpunctata, opaca and zetterstedti. Specimens with 2 or 3 pairs of abdominal spots may belong to both opaca or zetterstedti. A reliable identification is possible only on the basis of the genitalia. Male genitalia of *S. opaca* are depicted by PAPP (1979), the longer postgonite is long thin and pointed apically.

Sapromyza setiventris ZETTERSTEDT, 1847

Material studied: Roumania: several ♂, ♀: Domogled, Musuroaie, 29. Sept. 1978, 12. Aug. 1978, leg. I. CEIANU; 1 ♂: ibid., Arb. 1, 31. Aug. 1976. — It is a rather polymorphic species; it can be identified as *S. obsoletoides* SCHNABL with the key of CZERNY (1932) (cf. PAPP, 1984).

Sapromyza zetterstedti HENDEL, 1908

Material studied: Czechoslovakia: 7 ♂: Moravia mer., Strážnice Přivoz, env Strážnice, 7, 15. June, 30. May 1973, lgt. V. MARTINEK; Roumania: 5 ♂: Cimpulung Moldovenesc, Sandri, 29. June 1974; 7 ♂, 1 ♀: Domogled, Jelaran, V. Foregari, 20. June, 10. Sept. 1976, 29. May, 3. June 1977, 21. June 1978, leg. I. CEIANU. — A little known European species. Contrarily to males of opaca, the longer postgonite of this species is not thin and pointed but resembles a long shoe-lift with a wide rounded apex; this postgonite partly shields the phallus.

Calliopum elisae (MEIGEN, 1826)

Material studied: Czechoslovakia: Bohemia c., BARTÁK leg., 1981: 1 ♂: Kunice, 49.55 N, 14.40 E, 20. June; 1 ♂: Srbsko 1 km NE, 49.58 N, 14.09 E, 300 m, 29. Aug. — It is an easily identifiable species on the basis of the genitalia in both sexes, but it is highly variable as regards its body size.

Calliopum splendidum L. PAPP, 1978

Material studied: Yugoslavia: 1 ♂: Krivosije, Paganetti; Roumania: 1 ♀: Domogled, Jelaran, leg. I. CEIANU; Czechoslovakia: 2 ♀: Slovakia occ., Res. "Abrod" env.,

Velké Leváre, leg. V. MARTINEK, 6. July 1975; 2 ♀: Bohemia c., near pond Mirosovice, 1 km NW 49.56 N, 14.43 E, 350 m, BARTÁK leg., 26. July 1981; Hungary: 1 ♀: Fót, Somlyó-h., 16. Aug. 1960, leg. MIHÁLYI; 1 ♀: Mátraháza, 19. July 1969, leg. MIHÁLYI; Bulgaria: 1 ♂: Bulgaria mer., Pirin, Popina-eka, 1250 m, 22—27. July 1974, leg. DR. A. HOFFER. This latter specimen may belong to a distinct subspecies on the basis of minor modifications in the male genitalia. I must correct the description of this species: it has 6 and not 4 rows of acrostichals though they are not completely arranged and anteriorly more than 4 rows can be seen. New to Bulgaria, Czechoslovakia and Roumania.

Lauxania cylindricornis (FABRICIUS, 1794)

Material studied: more than 500 specimens from Europe and the material published by SHEWELL (1971) from Mongolia; 1 ♀: окр. Якумска, Ботанический сад, В. Ковалёв, 14. July 1976. This is the only widespread species of the genus (PAPP, 1983); contrarily to its abundance its lifehabits are almost entirely unknown.

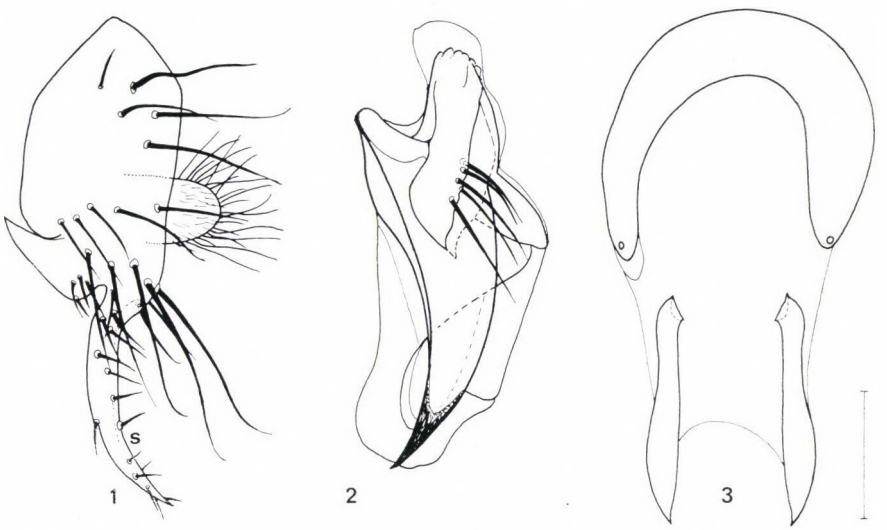
DESCRIPTION OF THE NEW SPECIES

Homoneura koreana sp. n.

Measurements in mm (holotype male): body length 4.23, wings 4.00×1.57, terminal section of medial vein 1.25, intracrossvein section 0.79, ratio 1.585, aristal hairs only 0.022.

Body and legs yellow, wings light brownish with large brown spots, veins light brown, dark brown on spot areas. Dark brown spots on wings: at merger of *sc* and r_1 veins with costa, just distally to this one, which includes a round spot on anterior crossvein, somewhat proximally to apex of r_{2+3} (c. 0.70×0.60 mm), one at apex of wing and an 8-shaped spot on posterior crossvein. No conspicuous pattern on abdominal terga.

Head bristles as usual but ocellars thin and very short (only 0.19 mm), median occipitals up to 0.22 mm. Third antennal joint 0.30 mm long, 0.17 mm wide, ratio 1.76, third joint with 0.02 mm long light hairs. Main characteristic bristles of thorax as in other species of *Homoneura* s. str., 0 + 3 *dc* pairs, *prsc* long (0.40 mm), anterior *stp* comparatively long (0.28 mm); *acmi* in 6 rows, no enlarged acrostichals. Fore femur antero-ventrally with a ctenidium of short sharp thornlets on distal 3/7. Middle tibia with 2 spurs, hind metatarsus (male) without a brush of black bristles, hind tibia with a very short (0.07 mm) curved spur. Marginal bristles on abdominal terga moderately long, at most 0.30 mm. Male 7th tergum U-shaped, ventrally to 7th tergum a pair of free sclerites present, each alike a knife-blade (Fig. 3). Epandrium (periandrium) rather small with few but long bristles, surstyli (Figs 1, 30) very long, curved caudally and bearing bristles along whole length, ventral part of epandrium with extremely long bristles (Fig. 30). Aedeagal complex peculiar: two pairs of strongly sclerotized processes, longer pair adjacent to phallus with sharp apex, shorter ones (postgonites) with long bristles (Fig. 2). Female unknown.



Figs 1—3. *Homoneura koreana* sp. n. holotype male, genitalia. 1 = epandrium with surstylus, 2 = phallic complex, lateral view, 3 = sclerites of the 7th segment (*s*: surstylus). Scale: 0.2 mm

Holotype male: North Korea: Prov. South Pyongan, Chang-lyong san, 50 km N of Pyongyan, 13. Aug. 1971. — No. 169, leg. S. HORVATOVICH et J. PAPP. The abdomen with genitalia is preserved in a plastic microvial with glycerine. The holotype is deposited in the collection of the Zoological Department, HNHM, Budapest.

Homoneura koreana sp. n. has no relative in the Palaearctic species of *Homoneura* s. str. The species group of the Oriental species with similar wing pattern, very short aristal cilia, 0 + 3 *dc* pairs, etc. includes several species, from which this new species differs by the male genitalia (features of pregenital segment, very long surstyli, peculiar aedeagal complex, etc.).

Homoneura lushanica sp. n.

Measurements in mm: 4.18 (holotype), 4.32 (paratype female), wings 4.73 × 1.32 (holotype), 4.75 × 1.89, terminal section of medial vein 1.31, 1.18, intracrossvein section 0.33, 0.84, ratio 1.58 (holotype), 1.40, third antennal joint 0.28, its cilia 0.02.

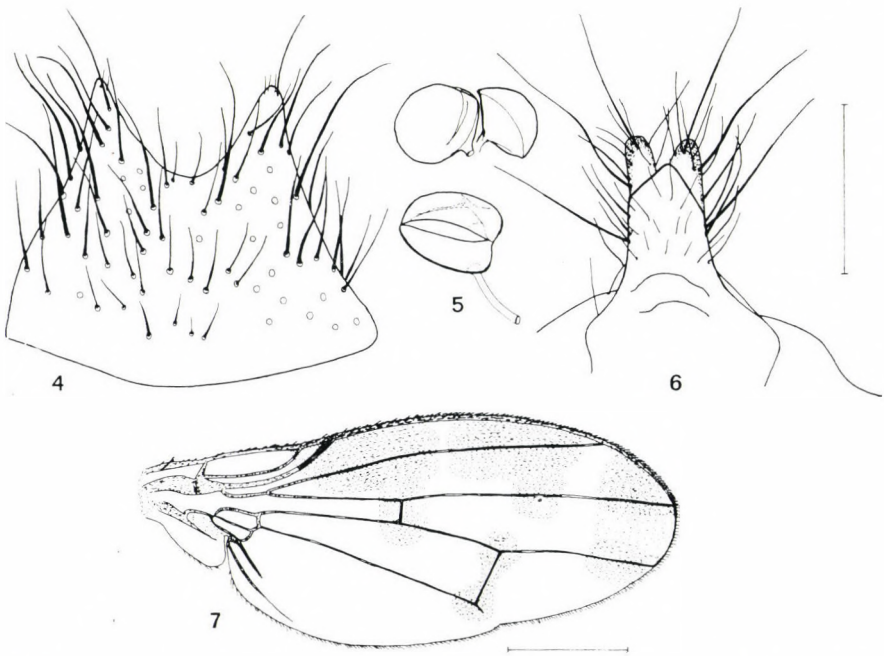
Frons dull, face with greasy shine, antennae, body and legs yellow, mesonotum sagittally with a diffuse greyish stripe between median acrostichal rows, mesonotum subshining. Wings with large dark brown patches, as in Fig. 7. Abdomen flattened with a sagittal, narrow brown stripe on terga 4—7.

Head bristles as usual but postverticals very long (0.45 mm), postoculars in 2—3 rows, upper row of very long (0.20 mm) bristles, parafacial bristles weak but genal bristles long and thick. Arista without dorsal or ventral rays, cilia at most 0.04 mm long. Thoracic chaetotaxy as in other species of *Homoneura* s. str., 0 + 3 *dc* pairs *prsc* long, mesopleura and sternopleura setose,

acrostichals in ±6 rows between *dc* lines, median rows only a little enlarged (longest *acmi* only 0.13 mm). Prosternum with 3—4 pairs of very thin bristles. Fore femora anteroventrally with ctenidium on distal half, anterodorsal and posterodorsal bristles very long. Middle tibia with 2 long spurs (0.27 mm!), middle femora with a row of long anterodorsal bristles on distal 4/7, hind tibial spur very short, only 0.06 mm. Abdomen with long marginal bristles (0.38—0.40 mm). Female sternum 7 with a deep, U-shaped caudal emargination (Fig. 4) and with numerous long bristles. Supraanal plate setose (Fig. 6) cerci short with 2—3 very long bristles each. Spermathecae subspherical (Fig. 5), at least paired ones not globular.

Holotype female: China, Prov. Kiangsi, Lushan-Gebirge — 2—6. IX. 1959. leg. SZÉKESSY and YANG. Paratype female: same data as for the holotype. The wing of the paratype is on slide, its terminalia are preserved in a plastic microvial with glycerine. The type-specimens are deposited in the collection of the Zoological Dept., HNHM, Budapest.

Homoneura lushanica sp. n. is an Oriental species; there is no related species in the Palaearctic. Its wing pattern is very similar to that of the H. (*Tarsohomoneura*) species in North America (see MILLER, 1977). As far as I know there is not any species in the Oriental region with identical wing pattern. Only after discovering male specimens of this species will enable me to better judge its relationships. Its female terminalia are also characteristic.



Figs 4—7. *Homoneura lushanica* sp. n. paratype female. 4 = sternum 7, 5 = spermathecae, 6 = terminalia, dorsal view, 7 = wing. Scales: 0.2 mm for Figs 4—6, 1.0 mm for Fig. 7

Homoneura shatalkini sp. n.

Measurements in mm: body length 3.86 (holotype), 3.15 (paratype), wings 4.18×1.60 (holotype), 3.86×1.54 (paratype), terminal section of medial vein 1.36, 1.19, intracrossvein section 1.00, 0.965, ratio 1.36, 1.23.

Frons greyish, a narrow reddish yellow sagittal stripe present, orbitalia light greyish. Mesonotum yellowish grey with a pair of diffuse brown acro-



Figs. 8—12. *Homoneura shatalkini* sp. n. paratype male, genitalia. 8 = epandrium with surstyli in sublateral view, 9 = phallus and postgonites, lateral view, 10 = right postgonite, 11 = left surstylus and cercus, 12 = left postgonite (*pg*: postgonites). Scales: 0.2 mm

stichal stripes. Clypeus light brown, palpi dark greyish brown or ochreous. Disc of scutellum concolorous with mesonotum, lateral margins yellowish. Pleurae and legs yellowish grey. Large dark brown spots on wings: at merger of costa with r_1 and *sc*, one with diameter of 0.45 mm on anterior crossvein, one of c. 0.6×0.4 mm around posterior crossvein, one spot at c. 0.65 mm to t_a, one spot of c. 0.65×0.30 mm just proximally to merger of r_{2+3} in c, one spot at apex of r_{4+5} and a small one well proximally to apex of *m*. Wings light brownish, veins ochreous to light brown, dark brown on spot areas. Abdomen sagittally with a wide (c. 0.25 mm) dark brown stripe, tergites laterally with a pair of diffuse lighter brown spots.

Head bristles long, e.g. *vti* 0.63 mm from base to tip, *ors* reclinate, occipitals in 2 rows, bristles in the inner row longer, most median bristles up to 0.17 mm. Third antennal joint only 0.27 mm long, 0.15 mm wide. Aristal hairs short, at most 0.03 mm. Thoracic bristles strong, 1 *h*, 2 *np*, 1 *prst*, 1 *sa*, 2 *pa*, 1 + 2 *dc*, 2 *sc*, 1 *mp*, 1 short anterior and 1 long posterior *stp*. Acrostichal microchaetae in 4 ± arranged rows, 6 rows more anteriorly, no enlarged *acmi*, but *prsc* pair long (0.33 mm). Fore femora with ctenidium as usual on distal 2/5 anteroventrally, middle tibia with 2 ventral spurs, ventral spur of female on hind tibia only 0.07 mm, male hind metatarsus with a brush of short black bristles. Squamal fringe yellowish white.

Male epandrium (periandrium) rather large, high and not short (Fig. 8), cerci with long bristles (Fig. 11) surstyli asymmetrical (Figs 8, 11). Gonites much asymmetrical (Figs 9, 12), right gonite widening apically, left gonite resembling a knife with blunt apex. Phallus (Fig. 9) with a pair of apical lamellae. Female cerci dark greyish brown, supraanal plate yellowish.

Holotype female: "Sapporo" Japonia (collected before World War I). Paratypes: 5 ♂, 5 ♀: USSR, South Primorje Region, «Кедр. падъ», 17–30. Aug., 18. Sept. 1980, leg. A. A. SHATALKIN (immature a little wrinkled specimens). The holotype and two male and female paratypes each are deposited in the collection of the Zoological Department, Hungarian Natural History Museum, Budapest, the other paratypes are in the Zoological Museum of the Moscow State University.

I name this new species on the honour of Professor DR. A. A. SHATALKIN (Moscow State University).

H. shatalkini sp. n. belongs to the species-group of *Homoneura* with short aristal hairs, spotted wings and variegate body but it can be specifically characterized by its male genitalia [asymmetrical surstyli and gonites (Figs 9, 12), a pair a subapical lamellae on phallus].

Homoneura stackelbergiana sp. n.

Measurements in mm: body length 4.27 (holotype), 3.73—4.16 (paratypes), wings 4.05×1.51 (holotype), 3.64—4.18×1.43—1.54, 3rd antennal joint 0.21 long, its width 0.15, ratio 1.40, terminal section of medial vein 1.06, intracrossvein section 0.85, ratio 1.24.

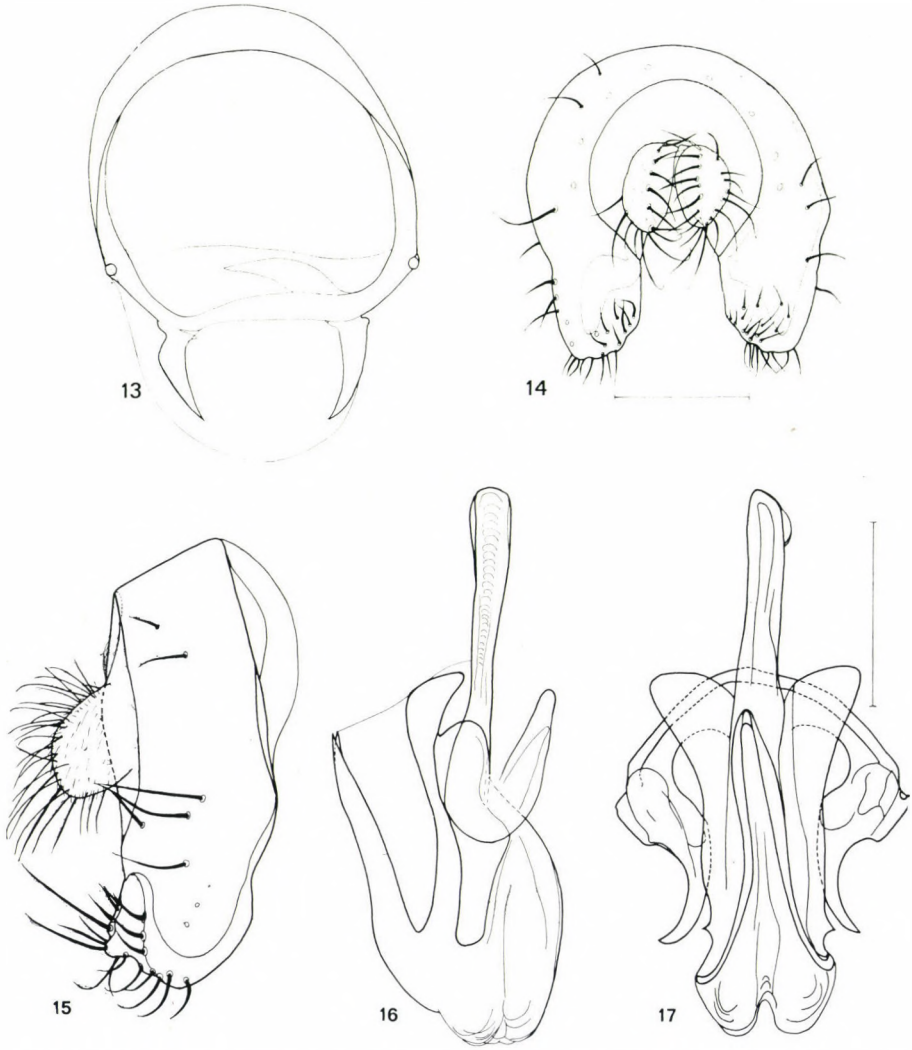
Body and legs ochreous, mesonotum, meso- and sternopleura and femora with a brown hue, abdominal tergites with 0.1 mm wide brown marginal bands. Palpi and halteres ochreous. Squamal cilia white. Basic colour of wings light brownish, veins brown, dark on spot areas. Dark brown spots on wings: on the anterior crossvein (c. 0.20 × 0.18 mm), on upper edge of posterior crossvein (sometimes also on lower edge or the two spots confluent), proximally to apex of r_{2+3} and r_{4+5} each, and at distal 2/5 of medial vein.

Head bristles strong, ocellars extremely long (0.51 mm) from tip to base, *vti* 0.80 mm long, *pvt* pair 0.45 mm. Aristal hairs at most 0.05 mm. Prosternum with some short bristles. Thoracic chaetotaxy similar to that of its congeners; 1 + 2 *dc* pairs, *prsc* very long (0.58 mm). One, two or three pairs of acrostichal macrochaetae at level of the 2nd *dc* and before and behind them; sometimes also presutural enlarged acrostichal present (longest acrostichals 0.50—0.55 mm). Acrostichals in 6 rows, median rows enlarged. Anterior sternopleural 0.39 mm, i.e. comparatively long. Legs rather short and thick, e.g. fore femur only 0.84 mm, fore femora with a ctenidium of about 10 short sharp black thornlets anteroventrally between middle and distal 4/5. Middle tibia with 2 thick spurs, middle metatarsus without black brush. Hind tibia with short (0.15 mm) dorsal preapical, ventral spur 0.09 mm. Middle femora anteriorly with long thick spines (4—5) on distal half. Abdominal tergites with rather long (0.34 mm) marginal bristles. Male 7th tergite and sternite form a ring (synsclerite) (Fig. 13) with a pair of sclerotized ventral processes. Epandrium short (Fig. 14), cerci with long and thick bristles, surstyli united with epandrium (Fig. 15) with numerous apical and medial bristles. Phallic complex (Fig. 16) more or less symmetrical, postgonites rather short, phallapodeme short and thin, phallus with a hairpin-like dorsal process (Fig. 17). Long hairs in female 7th sternite. Female cerci short, dark brown with numerous short hairs.

Holotype male: N. Korea: Prov. South Pyongan, Pyongyan, Nung-ra do (island), 14. Aug. 1971. — No. 175, leg. S. HORVATOVICH et J. PAPP. Paratypes: 1 ♂, 1 ♀: data same as for holotype: 3 ♂, 1 ♀: Prov. South Pyongan, Pyongyan, Hotel garden, 7—8. Aug. 1971, No. 150; 2 ♂, 15 ♀: ibid., 4—5., 11., 12., 14., 18., 20—21., 31. Aug., 1., 2., 4., 9—10. Sept. 1971, Nos 142, 162, 166, 176, 188, 190, 225, 227, 229, 234, 235, 256; 3 ♀: Pyongyan, Lyong-ak san, 25 km W from Pyongyan, 9. Aug. 1971, No. 155, leg. S. HORVATOVICH and J. PAPP. 26 paratypes. The holotype and all the paratypes are deposited in the collection of the Zoological Dept., HNHM, Budapest.

I name this new species on the honour of the late Professor A. A. STACKELBERG, esteemed master of two generations of dipterists.

H. stackelbergiana sp. n. is similar to *H. stackelbergi* CZERNY but contrarily to *stackelbergiana*, *stackelbergi* has 0 + 3 *dc* pairs, veins are yellow on wings, it has spots at merger of costa with *sc* and r_1 veins and the genitalia are much different (cf. SASAKAWA and IKEUCHI, 1982).

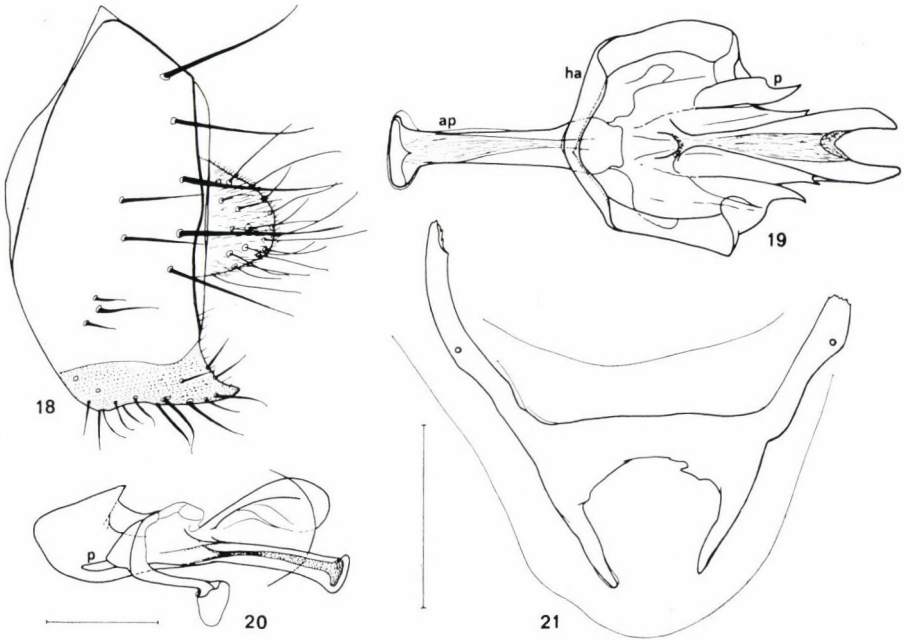


Figs 13—17. *Homoneura stackelbergiana* sp. n. paratype male, genitalia. 13 = 7th synsclerite, 14 = epandium, surstyli and cerci, posterior view, 15 = same, lateral view, 16 = phallic complex, lateral view, 17 = phallic complex, ventral view. Scales: 0.2 mm

Homoneura stigmata sp. n.

Measurements in mm (holotype male): body length 4.57, wings 3.86×1.50, terminal section of medial vein 1.18, intracrossvein section 0.81, ratio 1.46, length of ocellar bristles 0.34, median occipitals 0.19.

Body dark yellowish grey, frons ochreous to light brown, orbitals greyish, facial plate greyish brown, femora yellowish grey, knees, tibiae and tarsi yellow, dark yellowish grey on dorsal side of tibiae. Basic colour of wings



Figs 18—21. *Homoneura stigmata* sp. n. holotype male, genitalia. 18 = epandrium with surstylus, 19 = phallic complex, ventral view, 20 = phallus and phallapodeme, lateral view, 21 = ventral part of the 7th synsclerite with the 7th stigma (*ap*: phallapodeme, *ha*: hypandrium, *p*: postgonite). Scales: 0.2 mm (smaller one only for Fig. 20)

light brownish, veins brown, darker on spot areas. Dark brown spots on wings: on merger of *sc* and r_1 veins with costa, a spot of c. 0.40×0.35 mm proximally to apex of r_{2+3}, another one just proximally to apex of r_{4+5}, a spot of 0.25×0.20 on anterior crossvein, one diffuse spot well proximally to apex of medial vein and another spot on hind crossvein. Squamal cilia whitish. Abdomen dark yellowish grey with narrow brown marginal bands.

Head bristles strong (see above), 3rd antennal joints and arista missing on the holotype. Thoracic chaetotaxy as in related species, $0 + 3$ *dc* pairs, *acmi* in 8 rows, median rows moderately enlarged. Anterior sternopleural 0.31 mm. Fore femora with a ctenidium of sharp short thornlets on distal 3/7 anteroventrally, middle tibia with 2 strong spurs, hind tarsal spur curved thick but only 0.09 mm long. Pregenital sterna not wide, largely transverse quadrate.

Male epandrium rather small with few but long bristles, surstyli coalescent with epandrium (Fig. 18) short and wide with a short caudal apex. Seventh synsclerite (Fig. 21) with robust ventral part and with a pair of ventral sclerotized processes. Phallapodeme (Fig. 20) short, postgonites short with thin sharp apex (not well discernible in lateral view (Fig. 19), apex of phallus

(Fig. 19) bilobate, blunt in lateral view (Fig. 20). Male cerci short with moderately long bristles.

Holotype male: North Korea: Prov. Kengi, Bagyon san, 8. VI. 1970 — Hung. Zool. Exp. I. in Korea, No. 112 — leg. Dr. S. Mahunka et Dr. H. Steinmann. The male abdomen with genitalia is preserved in a plastic microvial with glycerine.

Homoneura stigmata sp. n. has no close relative among the Palaearctic species of *Homoneura*, it is obviously related to some Oriental species of the subgenus *Homoneura* s. str. with dark spotted wings (see e.g. Kertész, 1915); the peculiarities in its male genitalia (short and wide surstyli, bilobed apical part of phallus, shape of 7th synsclerite) serve as a safe base in its identification.

Shatalkinia subg. n. of *Lyciella* Collin, 1948

This new subgenus keys out to *Lyciella* Collin in Stuckenberg's key (1971) for the Old World genera of lauxaniids: small black spines on costa not attaining apex of r_{4+5}, wings not rounded, face not prominently convex and not glossy, orbital bristles normal and reclinate (Fig. 22), third antennal joint not elongate, antennae of rather usual shape, arista with fine short rays dorsally and ventrally, hind tibia with a single ventroapical spur, wing venation as usual (as in many sapromyziform genera), posthumeral/presutural bristle present, no intraalar bristles, 1 + 3 *dc* pairs, anterior part of frons not protruding, 2 pairs of sternopleurals, frontofacial angle about 120°, no anteroventral bristle on hind femora, abdominal marginal bristles long but not erect, neither r_{2+3} or r_{4+5} setose, middle tibia with a single ventroapical spur, male hind leg not modified, no comb of small spines on the distal anteroventral surface of fore femora.

Contrarily to *Lyciella* s. str. species, prosternum not setose, 4—5 pairs of short presutural *acmi*, 1 + 2 pairs of long acrostichals and one additional pair of prescutellar bristles; genitalia unique: comparatively very small (male epandrium + cerci dorsally not longer than 0.2 mm), male cerci rather large and setose (Fig. 23), surstyli (telomeres) very small with a blunt medial apex; surstyli in subcaudal position (Fig. 24). Hypandrium with a pair of large and setose lateral processes, medial part not V-shaped but alike a plate; phallus very short and blunt; aedeagal complex with a pair of curved, caudally directed processes, which are regarded here as modified postgonites. Female sterna quadrangular, cerci with fine hairs. Type-species: *Lyciella* (*Shatalkinia*) *supraorientalis* sp. n.

Lyciella (*Shatalkinia*) **supraorientalis** sp. n.

Measurements in mm: body length 3.95 (holotype), 3.86—4.09 (paratypes); wings 4.55 × 1.83 (holotype), 4.55 × 1.80, 4.60 × 1.86 (paratypes); length of 3rd antennal joint 0.30, of 2nd joint 0.12 mm.

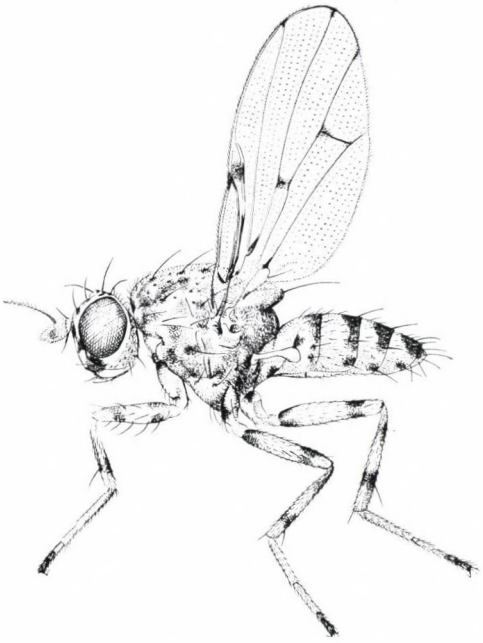


Fig. 22. *Lyciella* (*Shatalkinia*) *supraorientalis* sp. n., paratype male

Basic colour of body light greyish brown but characteristic frontal and thoracic bristles emerge from dark brown spots (Fig. 22), mesonotum with greasy shine, scutellum dorsally greyish, apically with 2 black (dark brown) spots separated by a narrow yellowish stripe, frons and face variegate, sagittal line and margins of eyes yellowish, palpi dark brown, legs greyish brown with a preapical and subbasal dark ring each on tibiae and with dark brown hue at least on ventral surface of femora preapically and basally (probably all these latter are diffuse dark rings), thorax with diffuse brown spots, abdominal terga 3—5 with a pair of dorsal more or less triangular dark brown spots each, more lateral marginal bristles emerge from small brown spots or these latter spots ± confluent.

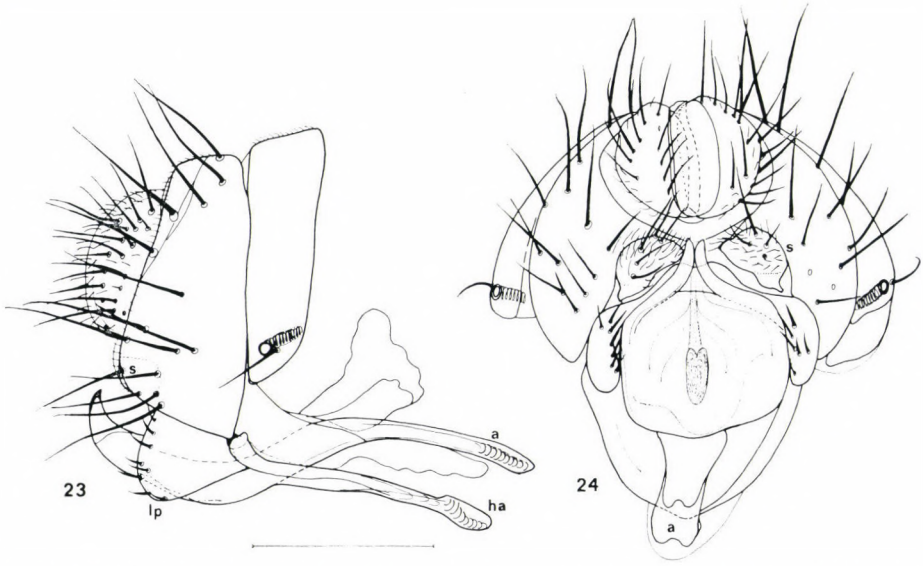
Arista with numerous dorsal and ventral rays: dorsals up to 0.09—0.10 mm, ventrals to 0.07 mm; hairs on 3rd antennal joint 0.035 mm long. Clypeus U-shaped ± protruding, palpi with some moderately long bristles, postero-ventral part of genae with 3 long bristles on both sides. Postvertical bristles cruciate, *oc* slightly longer than *ors*, 2 pairs of reclinate *ors*, *vte*, *vti* strong, postoculars in more than one row. Second antennal joint dorsally with a thin but rather long bristle, ventrally with several thin and moderately long bristles. Thoracic chaetotaxy: 1 *h*, 2 *np*, 1 *prst*, 1 + 3 *dc*, 1 *prsc*, 1 *sa*, 2 *pa*, 0 *ia*, 2 *sc*, 1 *mp*, 2 *st* pairs. Acrostichals only in 2 rows, 4—5 pairs of short presutural *acmi*, 1 + 2 pairs of enlarged acrostichals and the additional *prsc*

pair. Mesopleuron with thin but long (up to 0.13 mm) bristles, similar small bristles on caudal part of sternopleuron; 1 thin supracoxal propleural pair. All tibiae with long dorsal preapicals, middle tibia with a single, long ventroapical spur, hind tibia with a short (0.13 mm) ventral spur. Fore femora with 4—5 pairs of long posteroventral bristles. Wings (Fig. 22) light brownish, veins ochreous to light brown, except for areas of spots, dark hind crossvein, humeral vein, basal crossvein and basal parts of subcostal vein and of the r_s. Costa with a long basal bristle, black spots on costa with merger of *sc*, on r_1 and r_s, on anterior crossvein, on upper distal edge of discal cell and small spots at apices of r_{2+3}, r_{4+5} and median vein. Costal section 3 0.745 mm, section 4 0.48 mm, terminal section of *m* 1.57 mm, intracrossvein section 0.80 mm, ratio 1.965.

Male genitalia symmetrical and rather peculiar (see above, Figs 23, 24). Pregenital tergum with a pair of stigmatical bristles.

Holotype male: USSR: Юж. Приморье, Кедр. падь, 21. IX. 1980, leg. A. A. Шаталкин. Paratypes: 5 ♂, 1 ♀: data same as for the holotype. The holotype and four paratypes are deposited in the collection of the Zoological Museum of the Moscow State University, two paratypes in the collection of the Zoological Department of the Hungarian Natural History Museum, Budapest.

I dedicate this new subgenus to Professor Dr. A. A. Shatalkin (Zoological Museum, Moscow State University), who has supported my research in acalyptrates by sending invaluable dipterous materials collected in the Soviet Far East.



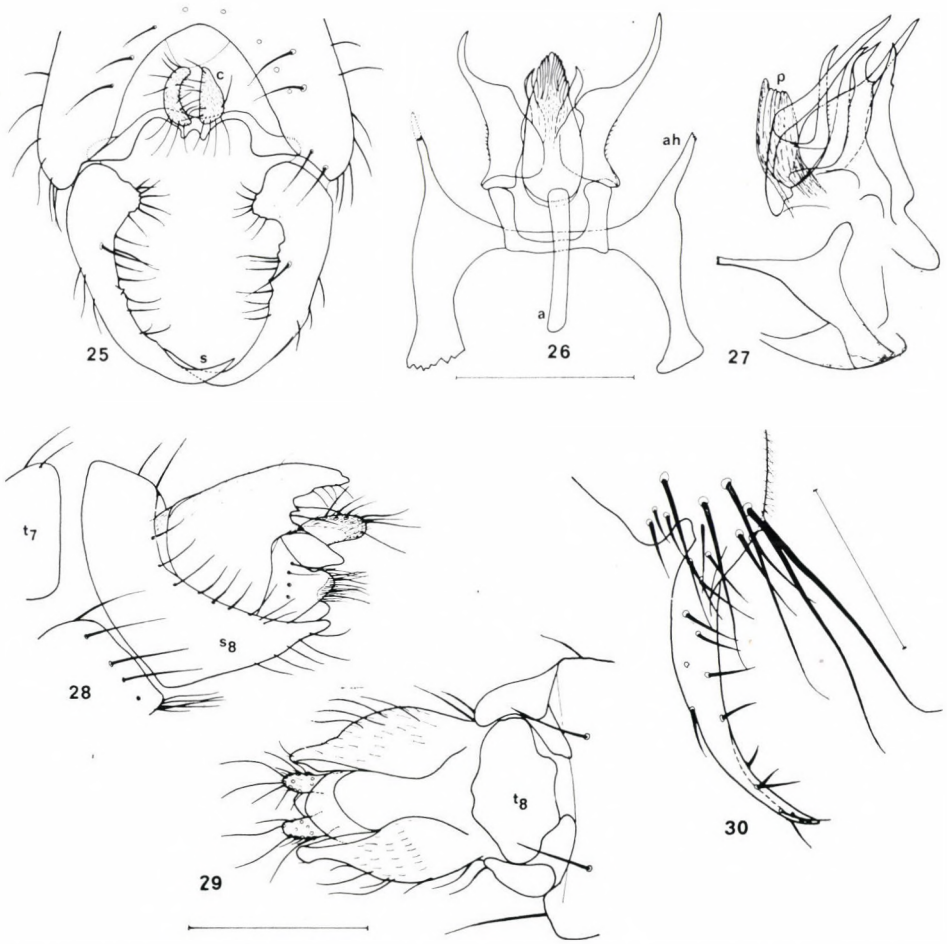
Figs 23—24. *Lyciella* (*Shatalkinia*) *supraorientalis* sp. n. paratype male, genitalia. 23 = genitalia with tergum 7 in lateral view, 24 = genitalia in a subventral view (*a*: phallapodeme, *ha*: hypandrium, *lp*: lateral process of hypandrium, *s*: surstylus). Scale: 0.2 mm

Calliopum ceianui sp. n.

Measurements in mm: body length 4.37 (holotype), 3.71—4.71 (paratypes); wings 4.68 × 1.94 (holotype), 4.32 × 1.74—4.64 × 1.86 (paratypes).

Body and legs shining black, knees, middle and hind tibiae and tarsi yellow, antennae yellow, third joint ochreous to light brown.

Orbital plates anteriorly far removed from eye margin with 2 pairs of reclinate *ors*, *oc* short, only 0.22 mm. Antennal joints 0.10, 0.16 and 0.40 mm long. Longest hairs on arista shorter than 0.05 mm. Gena and facial plate



Figs 25—30. 25—27. *Calliopum ceianui* sp. n., paratype male, genitalia. 25 = ventral part of epandrium with cerci and surstyli, 26 = inner genitalia in ventral view, 27 = same in lateral view; 28—29. *C. ceianui* sp. n., paratype female, genitalia. 28 = lateral view, 29 = dorsal view; 30 = *Homoneura koreana* sp. n., holotype male, ventral part of epandrium and surstylus (*a*: phallapodeme, *ah*: appendage of hypandrium, *c*: cercus, *p*: phallus, t_7, t_8: tergum 7 and 8, s_8: sternum 8). Scales: 0.5 mm for Figs 25—29, 0.2 mm for Fig. 30

below eyes 0.21 mm, eyes 0.74 mm high. Jowls with light greyish micropubescence. Facial plate convex, occiput concave. Mesonotum and scutellum shining with some dark micropubescence. Thoracic chaetotaxy: 1 *h*, 2 *np*, 1 *prst*, 1 *sa*, 2 *pa*, 0 *ia*, 0 + 3 *dc*, 1 *prsc*, 2 *sc*, 1 *mp*, 1 small hairlike + 1 posterior large *stp*. Acrostichal microchaetae in 4 rows. Ventral cranial third of mesopleuron bare, shining, other parts with fine hairs like on sternopleuron. Prosternum hairy. Male middle metatarsus ventrally with a brush of small black bristles, hind tibia ventroapically with a short wide brush of similar black bristles. Middle tibia bears a single spur. Wings yellow with yellow veins. Terminal section of median vein 1.40 mm, intracrossvein section 0.84 mm, ratio 1.66. Halteres ochreous.

Male epandrium(periandrium) comparatively large, cerci small; an intraperiandrial sclerit present (Fig. 25) with a pair of small medial processes. Surstyli (Fig. 25) long and slender with sharp curved apex, basally and medially with numerous moderately long bristles. Hypandrium large (Fig. 26), aedeagal apodeme and phallus rather short. Postgonites rather asymmetrical (Fig. 26) with two apices each. There is another pair of asymmetrical appendages in the aedeagal complex (Fig. 27). Female terminalia peculiar. Sternum 7 with dense ventral bristles. Sternum 8 large and very high (Fig. 28), tergum 8 small, bare and much less sclerotized. Sternum 9 small and hairy, tergum 9 bipartite (Fig. 29) with a dorsal caudal process and with two teeth somewhat ventrally; the two parts of tergum 9 bear short or moderately long thin bristles; there is a weakly chitinized area between them. Female cerci small with moderately long bristles and short hairs.

Holotype male: Roumania, Clg. Mold. [Cimpulung Moldovenesc], V. Caselor, 27. 07. 1976; paratypes: 2 ♀: data same as for holotype; 1 ♂, 1 ♀: ibid., 22. 07. 1976, Pod Bucatar. All the type series was collected by Dr. I. CEIANU, to whom I dedicate this new species. I got them through the courtesy of DR. V. MARTINEK (State Forestry and Game Management Research Institute, Prague, Czechoslovakia). The holotype and one paratype male and female each were sent back to DR. MARTINEK, one male and one female paratypes are deposited in the collection of the Hungarian Natural History Museum, Budapest.

Calliopum ceianui sp. n. is related to *C. elisae* (MEIG.) but it is easily separable from the latter by a comparison of genital structures in both sexes.

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Acta Zoologica Hungarica 30 (1–2), pp. 179–187 (1984)

NOTES ON THE GENUS AGROCHOLA HÜBNER, 1821 (LEPIDOPTERA: NOCTUIDAE). PART II*

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(Received 31 March, 1983)

Description of two new subgenera and two new species with some systematical and zoogeographical comments.

The taxonomic relegation of species of the genus *Agrochola*, so far treated as uniform, is rather uncertain. Some authors (DE LAEVER, 1979; BERIO, 1981) subdivided it and described new genera for the species groups considered previously as members of the genus. Moreover, in BERIO's elaboration only the type-species (*Agrochola lychnidis* DENIS et SCHIFFERMÜLLER, 1775) remained in the genus. Unfortunately these investigations were based only on the European species and did not take into consideration the others; the majority of species do not even occur in Europe. In order to decide the characteristics uniting the species groups and their subsequent interpretation as to taxonomic rank — subgenera or distinct genera — a full revision is needed. At this time I propose to treat these previously described taxa as subgenera of the genus *Agrochola*, and, in accordance with this point of view, the two taxa described below will also be treated as subgenera. The description of these subgenera already represents an initial part of the revision of the entire genus.

The *mansueta* group

The interesting species *Agrochola mansueta* was described by HERRICH-SCHAEFFER in 1850 based on the specimens from the vicinity of the sea of Marmora ("Smyrna", recently Izmir); they are preserved in the collection of IMRE FRIVALDSZKY. Subsequently the species was recorded also from Asia Minor, Armenia, Syria, Palestine, Crete (and Sicily ?). The comparative investigation of the type-specimens and the Syrian exemplars showed that "*mansueta*" is in fact not a single species, but a closely related, probably vicarious pair of species. The true *mansueta* is distributed in Western Asia Minor, while the populations inhabiting Syria (and Palestina) belong to the new species.

* Part I. has been published in the Folia ent. hung., *43* (1), 1982.

In the autumn of 1982, DR. A. VOJNITS found, in the collection of the Zoological Institute of the Academy, Leningrad, three specimens of an interesting *Agrochola* species, which seemed to belong in this group, with the labels: "var. *judaea* STGR. in litt.". DR. A. VOJNITS also took a photo of a male specimen. On this basis I could unambiguously decide that the picture shows a specimen of the new species. After this interesting finding DR. H. J. HANNEMANN, acting on my request, detected in the STAUDINGER collection an other specimen of this species with same labelling; and very kindly sent it to me. I designate it hereby as the holotype.

STAUDINGER described also *mansueta* var. *pontica* in 1901; fortunately I had opportunity to examine also this specimen (Plate I/5). It indeed belongs to *mansueta*, but differs both in colouration and configuration of genitalia from the nominate race. The differences are well discernible in colouration and wing pattern, but only slightly in the genitalia. Very probably "*pontica*" is a true subspecies of *mansueta*, but as only a single specimen is known, further material and investigations to solve this problem are needed.

To define the identity of this pair of species mentioned above it was necessary to examine the type-specimens and to designate the lectotype of *Agrochola mansueta*.

This pair of species belongs, at the same time, in a distinct new subgenus (*Frivaldszkyola* subg. n.), whose description follows the diagnoses of the species concerned.

Agrochola (*Frivaldszkyola*) *mansueta* (HERRICH-SCHAEFFER, 1850)

Systematische Bearbeitung der Schmetterlinge von Europa. II., p. 322. (Cerastis).

Lectotype designation: The type-series is preserved in the FRIVALDSZKY collection (in the Hungarian Natural History Museum, Budapest); consists of four specimens: three males and one female. From these three males two are identical with the original description of HERRICH-SCHAEFFER. As one of them is slightly injured, the totally intact specimen was designated as lectotype, and the other ones as paralectotypes.

Lectotype: male, its labelling: "Smyrna, coll. E. Frivaldszky" and "Friv. 1292" (Pl. I, Fig. 1). Paralectotypes: two males and one female, with same labels. Slides: Nos 466, 532 (males) and 1020 (female), gen. prep. DR. L. RONKAY (Pl. I, Fig. 2). All specimens are deposited in HNHM, Budapest.

Agrochola (Frivaldszkyola) staudingeri sp. n.

Holotype: male, "Jerusalem, 91 Paulus" "var. *judaea* STGR."; slide No. 1010, gen. prep. DR. L. RONKAY; in coll. Staudinger (Pl. I, Fig. 3). Paratypes: one male, Syria, Beiruth, 1906, coll. Cremona, gen. prep. No. 467 (in coll. HNHM Budapest), two females with no locality, in coll. ULBRICH (HNHM, Budapest), slide No. 1021 (Pl. I, Fig. 4). The specimens labelled as "judaea" (two males and a female from Palestine) also belong to this species, as identified from a photo taken of a male specimen; so they are also to be treated as paratypes.

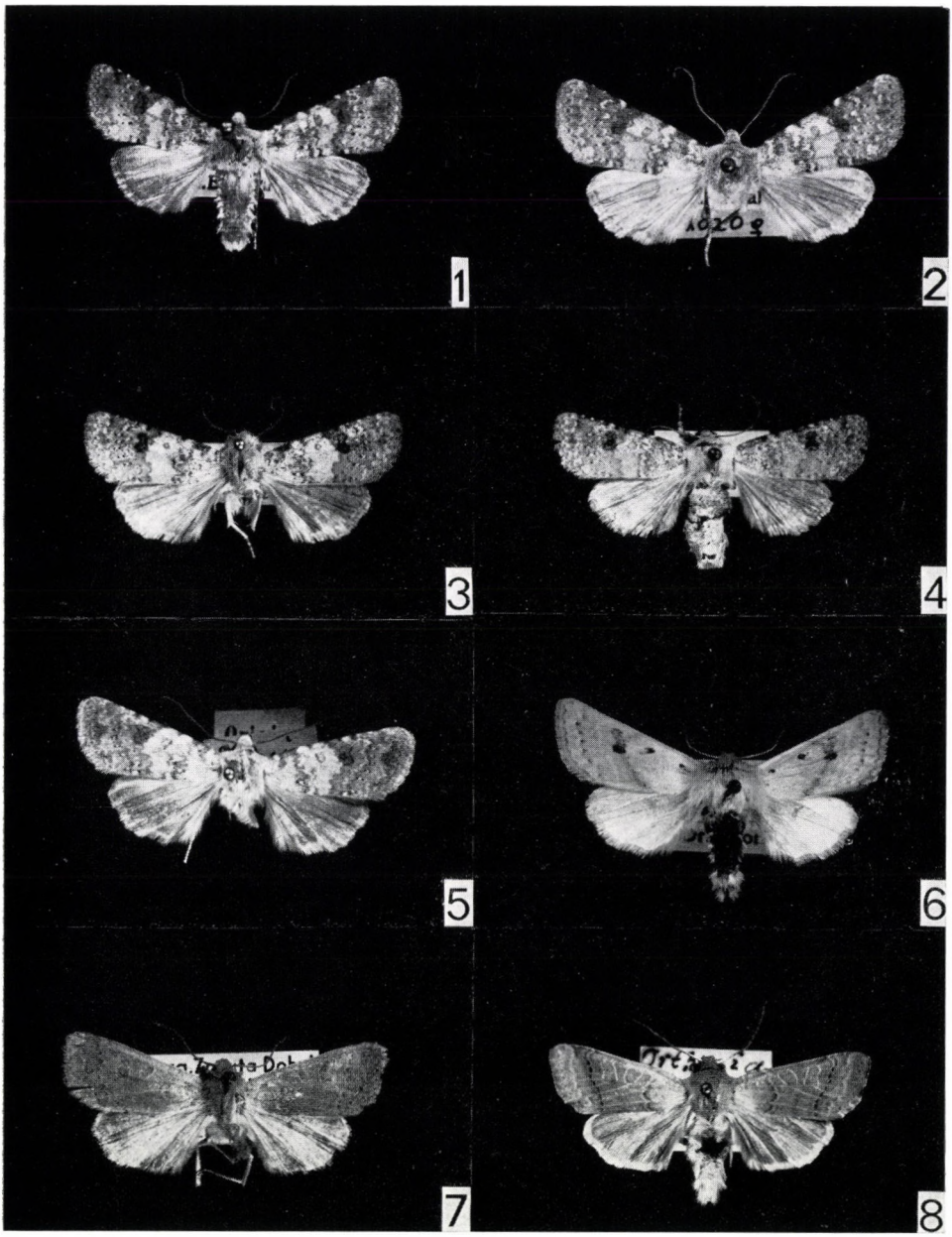


Plate I

Figs 1—8. 1 = *Agrochola mansueta* HERRICH-SCHAEFFER. Lectotype, male, Smyrna; 2 = *Agrochola mansueta* HERRICH-SCHAEFFER. Paralectotype, female; Smyrna; 3 = *Agrochola staudingeri* sp. n. Holotype, male, Jerusalem; 4 = *Agrochola staudingeri* sp. n. Paratype, female; 5 = *Agrochola mansueta* "var." *pontica* STAUDINGER. Type, Amasia; 6 = *Agrochola egorovi* BANG-HAAS. Male, Armenia; 7 = *Agrochola imitata* sp. n. Holotype, male, Iraq; 8 = *Agrochola thurneri* BOURSIN. Male, Macedonia

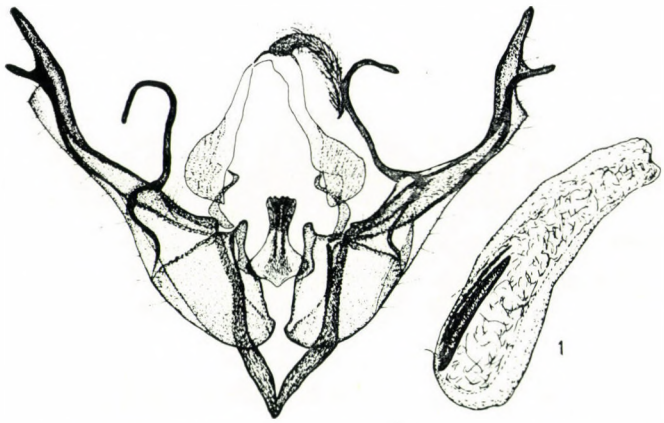


Fig. 1. Male genitalia of *Agrochola staudingeri* sp. n. Paratype, Syria, Beiruth, gen. prep. No. 467, L. RONKAY

D e s c r i p t i o n : Alar expanse 30—32 mm. Basic colour of fore wing much lighter than in *mansueta*, not greenish-grey, but yellowish-grey with a very slight bluish-greenish irroration, mainly in the basal field. Antemedial line double, sinuous. Lightest part of wing the medial area, yellowish grey with some orange-brown in lower part. Orbicular very small, round, defined by brown, reniform well-discernible, elliptical, filled with dark grey-brown. Medial line sinuous with strong orange-brownish stripe on outer side. Postmedial line double, discontinuous, composed of triangular spots, subterminal yellowish. Apex with greenish-grey tinge, cilia yellow-brown with two lines of dark spots at base and on middle. Hind wing also lighter than in *mansueta*, greyish with darker grey terminal band and cellular lunula. Underside yellowish grey, inner area of fore wing darker. Postmedial lines and lunules not as strong as in *mansueta*.

Male genitalia (Fig. 1): shape of valvae similar to the one of *mansueta* (Fig. 2), but the pollex originating much near to apex, latter being less pointed. Harpe, instead of being composed of a regular arch, follows an undulating course. Basis of fultura inferior narrower, its apices not so much pointed. In aedoeagus the cornutus much larger and stronger (twice as much), with a narrow "ribbon" consisting of slightly chitinized, short spinules.

Female genitalia (Fig. 3): similar to *mansueta* (Fig. 4) with some differences in characteristic features, as follows: with a chitinized lamella on the bursa copulatrix between the "arms" of strongly sclerotized part of ductus bursae; with a very strongly chitinized, conical, pocket-like formation on the marginal part of bursa copulatrix; sternite VIII less chitinized and smaller with narrower excision.

The two species, *mansueta* and *staudingeri* are essentially similar to each other, but differences in colouration and genitalia are well discernible, so one can separate them easily.

Frivaldszkyola subgen. n.

Type-species: *Agrochola mansueta* (HERRICH-SCHAEFFER, 1850)

D i a g n o s i s : Male genitalia (see Figs 1—2): Uncus normal, thin, relatively long and pointed. Tegumen typical for the genus, shape of valvae elongated, strongly curved and pointed. Pollex strong, short, harpe very long,

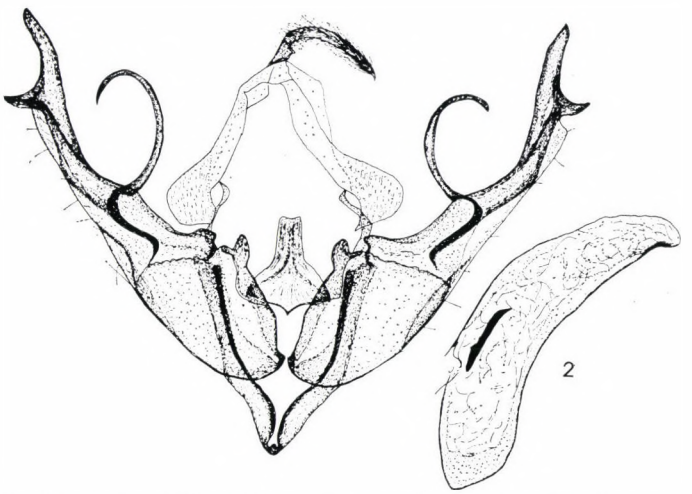
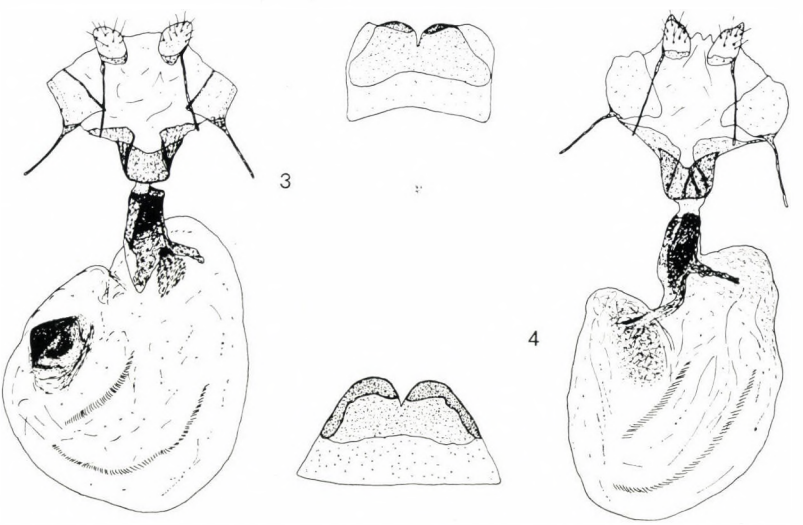


Fig. 2. Male genitalia of *Agrochola mansueta* HERRICH-SCHAEFFER. Paralectotype, Smyrna, gen. prep. No. 532, L. RONKAY



Figs 3—4. 3 = Female genitalia and sternite VIII (above) of *Agrochola staudingeri* sp. n. Paratype, gen. prep. No. 1021; 4 = Female genitalia and sternite VIII (below) of *Agrochola mansueta* HERRICH-SCHAEFFER. Paralectotype, Smyrna, gen. prep. No. 1020, L. RONKAY

more or less arched, slightly incurving. Fultura inferior subtriangular (dragon-like), vinculum strong, V-shaped; sacculus with finger-like process at costa. Aedoeagus moderately long, wide, with one basal cornutus, which being accompanied by a ribbon consisting of narrow spinules.

Female genitalia (see Figs 3—4): Ovipositor short, gonapophyses small. Ostium bursae wide, relatively strongly chitinized. Ductus bursae also strong, short and connection with bursa copulatrix branch-like. Bursa copulatrix large with two long, chitinized stripes and a more or less strongly sclerotized lamella. Sternite VIII very large and massive, hardly sclerotized, with deep excision on caudal edge.

S y s t e m a t i c p o s i t i o n : This new subgenus with its two species is relatively distant from the other species groups belonging to this genus, most closely related group being the *egorovi* group (*Alpichola* subgen. n.). These two subgenera differ from each other in many characteristic features, their relationship is shown fundamentally by the shape of the valvae. The most important differential characters are as follows: wing shape and pattern, male genitalia with longer and incurving harpe, strong pollex and different aedoeagus. Female genitalia completely dissimilar (see Figs 1—7).

The *egorovi* group

There are four species of this group: *A. egorovi* O. BANG-HAAS, 1934; *A. lactiflora* (DRAUDT, 1934); *A. wautieri* DUFAY, 1975 and *A. gratiosa* (STAUDINGER, 1881). This group forms an other well-characterizable new subgenus which is described below.

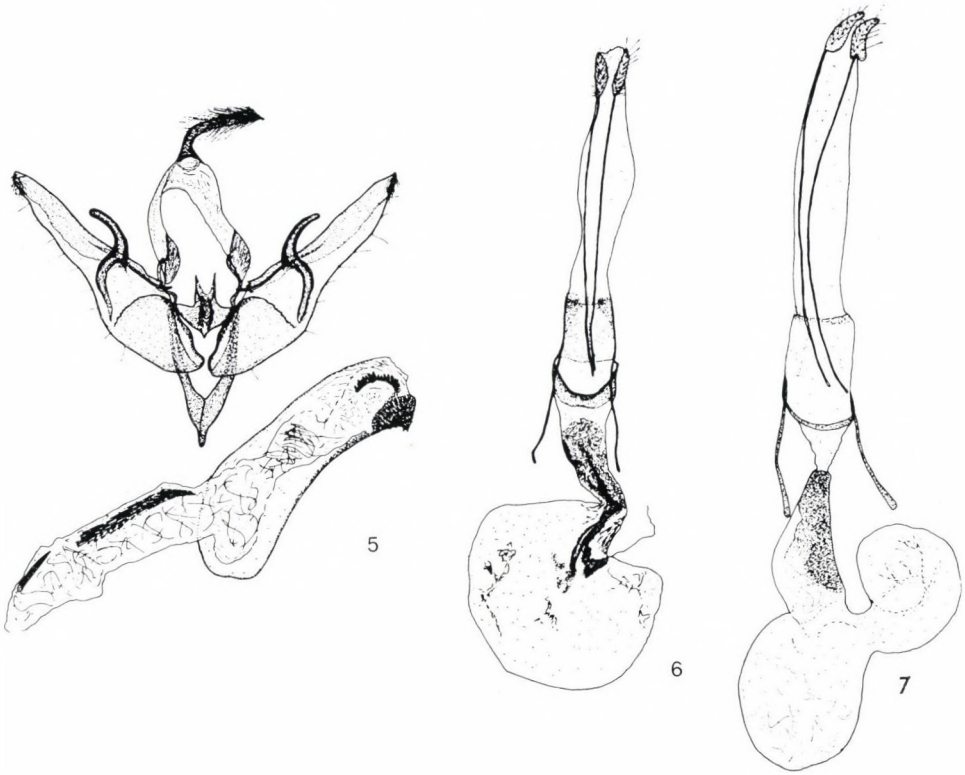
Alpichola subgen. n.

Type-species: *Agrochola egorovi* O. BANG-HAAS, 1934 (Pl. I, Fig. 6)

D i a g n o s i s : Male genitalia: uncus moderately long, pointed, tegumen high, narrow. Shape of valvae elongate, slender, sword-like, reminiscent of *Conistra* HÜBNER, 1821. Harpe less long than in *Frivaldszkyola*, thick, fultura inferior subtriangular. Aedoeagus with a basal cornutus and a bundle of bristles and one or two apical serrated lamina. In the case of *Agrochola gratiosa* harpe long, fultura inferior large, wide, aedoeagus with only one, less chitinized basal pin-like cornutus.

Female genitalia: gonapophyses very long, principally the caudal pair, ostium or sickle or U-shaped, ductus bursae relatively long and strongly chitinized, bursa small, rounded. In the case of *gratiosa* ductus bursae wider, less chitinized, bursa bilobate.

S y s t e m a t i c p o s i t i o n : As it was mentioned above, the most closely allied group is the subgenus *Frivaldszkyola*, but the two subgenera differ from each other in some important features: wing shape and pattern



Figs 5—7. 5 = Male genitalia of *Agrochola egorovi* BANG-HAAS. Armenia, gen. prep. No. 780, L. RONKAY; 6 = Female genitalia of *Agrochola egorovi*, Armenia, gen. prep. No. 1019, L. RONKAY; 7 = Female genitalia of *Agrochola gratiosa* STAUDINGER. Mardin, Taurus, gen. prep. No. 581, L. RONKAY

dissimilar, in male genitalia valvae shorter, without pollex, harpe not so long, thicker, aedoeagus also shorter with more differentiated cornuti. Female genitalia show a very different structure: ovipositor much longer, bursa smaller, without chitinized lamina.

The three species of this subgenus, *egorovi*, *lactiflora* and *wautieri* are very similar to one another nearly in all the characters, the fourth, *gratiosa* shows differences both in colouration and genitalia. It is not impossible that *gratiosa* belongs to a monotypical subgenus, but taking the common features such as valval shape and very long ovipositor into consideration, in my opinion it is preferable to place this interesting species into the discussed subgenus.

Since the genitalia of *egorovi* (both sexes) and *gratiosa* (female) have never been figured, along with the description of this new subgenus are also published (Figs 5—7). The *A. lactiflora-wautieri* pair of species were sufficiently discussed by DUFAY (1975) and the photo of the male genitalia of *A. gratiosa* was published by BOURSIN (1951).

Agrochola (Anchoscelis?) imitata sp. n.

Holotype male: "Iraq, Zawita Dohuk, 1—3. XII. 1977, leg. Gy. Topál and F. Zilahy". Slide: 412, gen. prep. L. Ronkay (Pl. I, Fig. 7). Deposited in HNHM, Budapest.

D e s c r i p t i o n : Alar expanse 31 mm, length of the fore wing 15 mm. Very similar to *thurneri* (Plate: 8) and *deleta*, but on fore wing orbicular spot small, narrow, oblique with darker brownish filling; reniform also smaller than

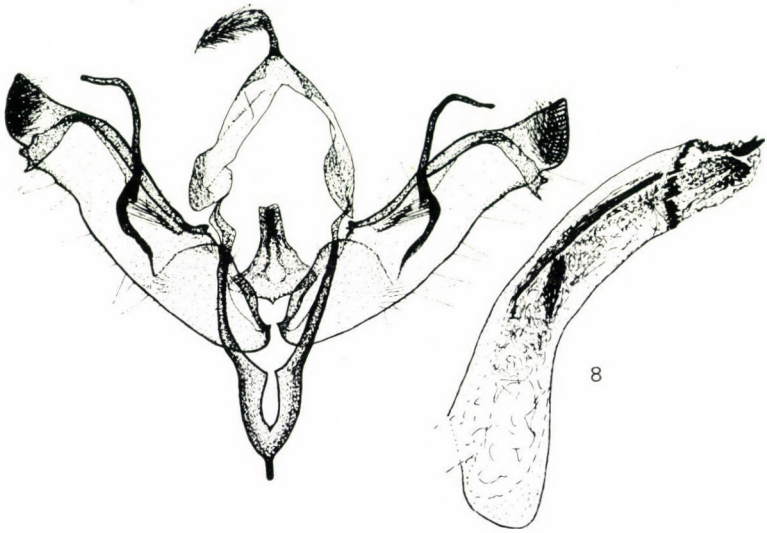


Fig. 8. Male genitalia of *Agrochola imitata* sp. n. Holotype, Iraq, Zawita Dohuk, gen. prep No. 412, L. Ronkay

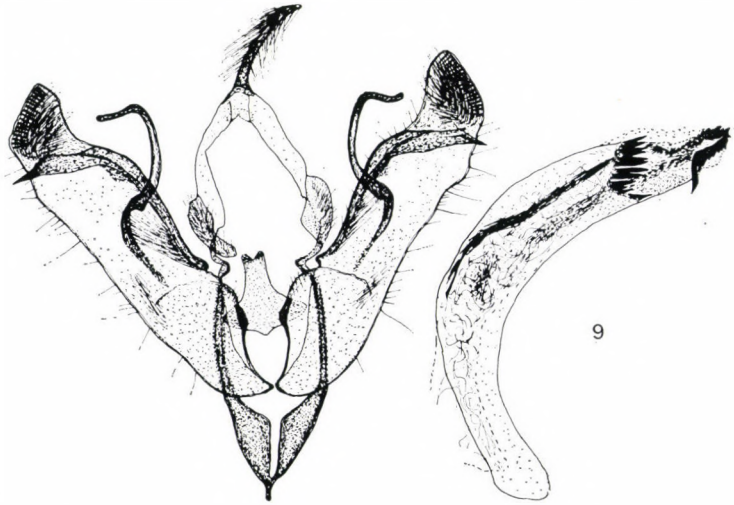


Fig. 9. Male genitalia of *Agrochola thurneri* Boursin. Macedonia, gen. prep. No. 528, L. Ronkay

in the case of the above-mentioned two species, its filling darker, especially in its lower part. Hind wing with lighter medial and basal area and visible cellular lunula.

Male genitalia (Fig. 8): similar to *thurneri* (Fig. 9), the differential characters are as follows: cucullus not angled inwards to costa, narrower, pollex wider, double peaked, harpe slender and longer, originated near to the outer margin of valva; fultura inferior with very typical serrated apex. Aedoeagus not so curved as in *thurneri*, on distal part with saw-like corona of spinules consisting of shorter spinules, hook-like terminal process shorter and less serrated.

From zoogeographical point of view the *thurneri* group is very interesting. When *thurneri* was described by BOURSIN in 1953, it seemed that *thurneri* and *deleta* are vicariant sibling species. But *A. prolai* was discovered in Italy by BERIO (1976) which is more closely related to *deleta* than *thurneri* and probably they are truely vicarious pair of species, while the *imitata* must be the pair of the *thurneri*. So far as known all the four species are allopatric, however, it is not impossible that *deleta* and *imitata* are sympatric in the Eastern part of Asia Minor, only because of their similarity they have not been recognized in collections. In the material from Anatolia which I had the opportunity to examine I have found only *deleta*.

Acknowledgements

I would like to express my gratitude to DR. H. J. HANNEMANN for sending me material from the STAUDINGER collection. I am also indebted to DR. A. VOJNITS for his very important help and useful advice; and to DR. L. GOZMÁNY and DR. A. DEMETER for their helping in the preparation of this paper.

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Acta Zoologica Hungarica 30 (1–2), pp. 189–204 (1984)

THE DERMAPTERA MATERIAL IN THE MUSEO CIVICO DI STORIA NATURALE DI VERONA (ITALY)

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(Received 17 March, 1983)

Seven new Dermaptera species (*Aborolabis rufocapitata* sp. n., *Spongovostox osellai* sp. n., *Chaetospania ferox* sp. n., *C. dexter* sp. n., *C. bellator* sp. n., *C. celer* sp. n., and *Eulithinus hispanicus* sp. n.) are described and figured from the material of the Verona Museum.

In recent years I have been studying the Dermaptera material of various European Museums. Through the kindness of DR. B. G. OSELLA I also had the opportunity to examine the Dermaptera collection of the Museo Civico di Storia Naturale, Verona, which proved to be rather rich in this respect. Besides the mixed and very valuable Oriental and Indo-Australian materials a good collection represented the South European fauna.

The present paper gives a survey of this material from taxonomical viewpoint well complemented with the genital apparatus of the males of the types and of the less known species.

Family **Pygidicranidae** VERHOEFF, 1902

Echinosoma convolutum HINCKS, 1959

Echinosoma convolutum HINCKS, 1959, Syst. Mon. Dermaptera, **2:** 152. — Terra typica: Burma.
Echinosoma albisquama BEY-BIENKO, 1959, Revue d'Ent. USSR, **38:** 597. — Terra typica: China: Yunnan.

Ultimate tergite of male (Fig. 1) very broad, simple, without medial longitudinal furrow. Male forceps with pubescence extending to about middle; cylindrical. Pygidium exposed for a short distance, transverse and pubescent, its caudal margin concave.

Distribution: Thailand, Laos, India: Annam, China: Yunnan, and Vietnam.

Material examined: Thailand, 1 male.

Family **Carcinophoridae** POPHAM, 1965

Aborolabis angulifera (DOHRN, 1864)

Brachylabis angulifera DOHRN, 1864, Stett. ent. Zeit., **25:** 294. — Terra typica: Sao Thomé.
Anisolabis angulifera (DOHRN): BORMANS, Das Tierreich, **11:** 51. — *Aborolabis angulifera* (DOHRN); STEINMANN, Folia ent. hung., (ser. n.) **31:** 183.

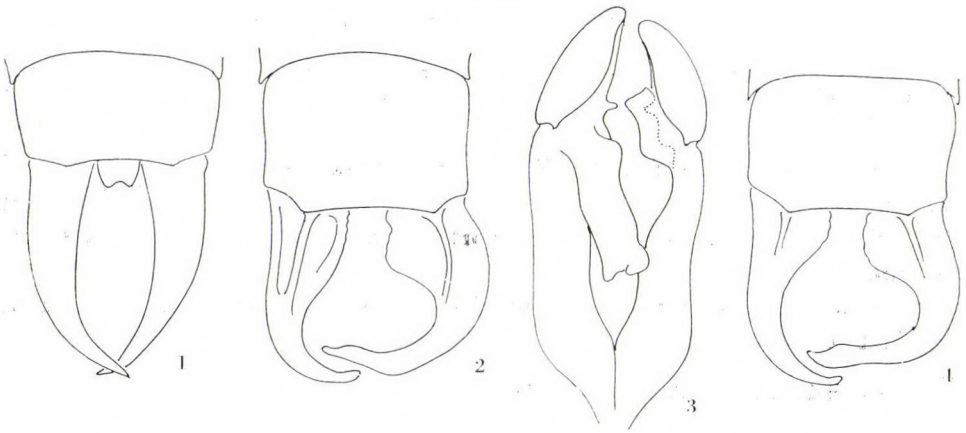
Male head a little longer than broad; eyes relatively small, shorter than first antennal joint. Pronotum transverse, black; lateral margins expanded to posterior margin; all angles rounded. Tegmina and wings absent. Male forceps asymmetrical, trigonal basally cylindrical and curved apically (Fig. 2). Male genitalia well developed; paramere large, V-shaped, median incision of anterior margin very deep and wide apically (Fig. 3); genital lobes without virgae; external parameres of *Anisolabis*-type, but triangular process of inner margin large.

Distribution: Sao Thomé Island, Morocco, Algeria.

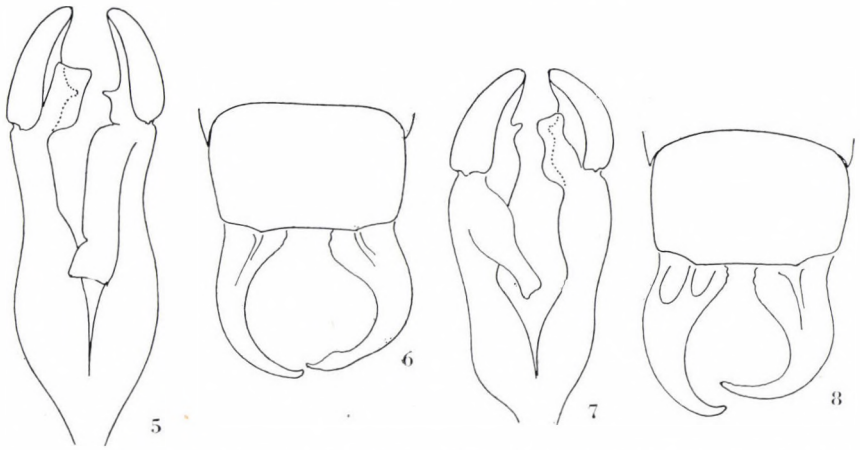
Material examined: Algeria, 1 male (gen. prep. No. 808, det. DR. H. STEINMANN), and ditto, 3 females.

Aborolabis rufocapitata sp. n.

Male: general colour dark reddish-brown; legs yellow, unicolour. Vertex red. Head broad, a little broader than the width of pronotum; postfrontal sutures and coronal suture distinct; eyes small, shorter than first antennal joint. Antennae 27-jointed; first joint long, but shorter than distance between antennal bases; second quadrate, third a little longer than fourth or fifth. Pronotum transverse, slightly expanded posteriorly; lateral margins straight, all angles rounded; medial longitudinal furrow present. Tegmina and wings



Figs 1—4. 1 = Male ultimate tergite and forceps of *Echinosoma convulutum* HINCKS, 1959. — 2 = Male ultimate tergite and forceps of *Aborolabis angulifera* (DOHRN, 1864), and 3 = ditto, male genitalia. — 4 = Ultimate tergite and forceps of *A. rufocapitata* sp. n. (Original)



Figs 5—8. 5 = Holotype genital armature of *Aborolabis rufocapitata* sp. n. — 6 = Male ultimate tergite and forceps of *A. mauritanica* (LUCAS, 1846), and 7 = ditto, male genitalia. — 8 = Male ultimate tergite and forceps of *Euborellia stali* (DOHRN, 1864) (Original)

entirely absent. Meso- and metanotum normal, simple. Abdomen cylindrical, expanded at median segments; abdominal tergites carinate laterally. Ultimate tergite broad, smooth, with medial longitudinal furrow. Forceps asymmetrical (Fig. 4), large, trigonal basally, curved and cylindrical apically. Penultimate sternite broad, posterior margin rounded. Genitalia (Fig. 5) characteristic, large, medial incision of anterior margin of central parameral plate deep; genital lobes fully developed, without virgae; anterior margin of triangular process and inner margin of external parameres obtuse-angled.

Female similar to male, but forceps more or less symmetrical, broad and trigonal basally, tapering, contiguous; inner margins with large blunt denticles.

Length of body with forceps: in both sexes: 24—28 mm.

Holotype male: Algeria, Kabylie Mte, Gouffre, 1750 m, 23. V. 1978, legit: MEREGALLI, gen. prep. No. 807, det. DR. H. STEINMANN. Paratypes, ditto, 3 females (deposited in the Museo Civico di Storia Naturale, Verona), and ditto, 1700 m, 28. IV. 1978, legit: MEREGALLI, 1 female (deposited in the Hungarian Natural History Museum, Budapest).

Aborolabis mauritanica (LUCAS, 1846)

Forficesila mauritanica LUCAS, 1846, Explor. Alger., **3:** 4. — Terra typica: unknown locality.
Brachylabis mauritanica (LUCAS); DOHRN, 1864, Stett. ent. Zeit., **25:** 292. — *Anisolabis mauritanica* (LUCAS); BORMANS, 1900, Das Tierreich, **11:** 45. — *Aborolabis mauritanica* (LUCAS); STEINMANN, 1978, Folia ent. hung., (ser. n.) **31:** 183.

Male colour variable, very dark castaneous to blackish-brown or reddish-brown. Head tumid, postfrontal and coronal sutures very deep. Antennae 23-jointed. Pronotum a little broader than long, parallel-sided, convex to

posterior margin. Femora bicolour, yellow basally and black apically. Tibiae black, shining. Male forceps (Fig. 6) asymmetrical, trigonal basally, strongly curved apically. Genitalia (Fig. 7) well developed, large, paramere broad, median incision of anterior margin very deep and wide; genital lobes without virgae; external paramere a little of *Gonolabis*-type, curved apically; triangular process of inner margin extended at middle section.

Distribution: Mauritania, Morocco, Algeria, Tunisia, Spain.

Material examined: Algeria, 2 males and 2 females; Tunisia, 1 male.

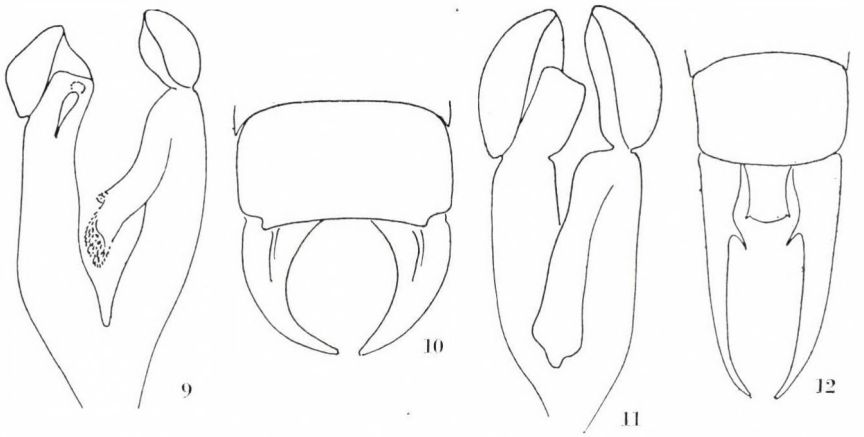
Identification key to the species

1 (6) Oriental species.
2 (3) Triangular process of the inner margin of male external parameres relatively short, about half as long as length of external paramere **nepalensis** (BRINDLE, 1974)
3 (2) Triangular process of the inner margin of external parameres large, about as long as length of external paramere.
4 (5) Legs brownish, femora and tibiae slender, banded with black; median incision of anterior margin of male genitalia broad **pervicina** (BURR, 1913)
5 (4) Legs brownish-yellow; femora without black bands; median incision of anterior margin of male genitalia narrow **kalaktangensis** SRIVASTAVA, 1972
6 (1) Palaearctic species.
7 (12) Tibiae and femora yellow. Triangular process of the inner margin of male genitalia broad and large at basal section.
8 (9) Head and pronotum black. Posterior margin of penultimate sternite of male rounded. Paramere of male genitalia (Fig. 3) narrow; anterior margin of triangular process and inner margin of external paramere rectangular **angulifera** (DOHRN, 1864)
9 (8) Head red or reddish-brown, body blackish-brown or reddish-brown.
10 (11) Head light red or a little orange, body dark blackish-brown. Pronotum transverse, lateral margins expanded to posterior margin. Triangular process of external paramere of male genitalia small (Fig. 5) **rufocapitata** sp. n.
11 (10) Head and body unicolour, reddish-brown. Pronotum subquadrate, lateral margins parallel-sided. Triangular process of external paramere of male genitalia large **cerrobarjai** STEINMANN, 1979
12 (7) Tibiae black, femora uni- or bicolour. Inner process of external paramere is at middle section.
13 (14) Femora unicolour, orange or yellowish-orange. Genital lobe relatively long and narrow; inner process of external paramere obtuse **mordax** STEINMANN, 1978
14 (13) Femora bicolour, yellow basally, and black apically. Genital lobe relatively short and broad; inner process of external paramere extended **mauritanica** (LUCAS, 1846)

Euborellia stali (DOHRN, 1864)

Forcinella stali DOHRN, 1864, Stett. ent. Zeit., **25:** 286. — Terra typica: Java.
Anisolabis stali (DOHRN); SCUDDER, 1876, Proc. Boston Soc. Nat. Hist., **18:** 308. — *Borellia stali* (DOHRN); BURR, 1910, The Fauna of British India, Dermaptera, p. 88. — *Euborellia stali* (DOHRN); BURR, 1911, Genera Insectorum, **122:** 31.

Male head slightly transverse, lustrous black, sometimes brillant; eyes moderately short, shorter than first antennal joint. Antennae 15-jointed. Pronotum about as long as broad, lateral margins widened posteriorly. Tegmina present as small ovale flaps on the side of the mesonotum. Male forceps (Fig. 8) asymmetrical, short, trigonal in basal half, tapering and cylindrical in apical



Figs 9—12. 9 = Male genital armature of *Euborellia stali* (DOHRN, 1864). — 10 = Male ultimate tergite and forceps of *Gonolabis acuta* BOESEMAN, 1954, and 11 = ditto, male genitalia. — 12 = Male ultimate tergite and forceps of *Spongovostox mucronatus* (STÅL, 1860) (Original)

half. Genitalia (Fig. 9) with median incision of anterior margin deep and wide; genital lobes with characteristic denticulated pads.

Distribution: Cosmopolitan, distributed in the Neotropical, Oriental and Malgassian faunal regions.

Material examined: Bali, 1 male (gen. prep. No. 812, det. DR. H. STEINMANN), and ditto, 1 male, 9 females; Cebu 4 females; Celebes 2 males, 1 female; Flores 1 female; Lombok 2 males, 23 females; Palawan 1 female; Sumbawa 1 female, and Thailand 1 male, 3 females.

Gonolabis acuta BOESEMAN, 1954

Gonolabis acuta BOESEMAN, 1954, Zool. Verh., Leiden, **21:** 33. — Terra typica: Java.

Male head tumid, slightly longer than broad; rounded posteriorly; postfrontal sutures finely, coronal suture strongly visible. Pronotum slightly longer than broad, sides slightly diverging posteriorly. Tegmina and wings entirely absent. Ultimate tergite very broad; median longitudinal sulcus well marked; posterior margin concave medially. Forceps (Fig. 10) specific, more or less symmetrical, branches characteristic medially. Genitalia (Fig. 11) of *Gonolabis*-type, paramere oval, median incision of anterior margin deep; genital lobes fully developed, and without virgae.

Distribution: Java.

Material examined: Bali, 1 male (gen. prep. No. 816, det. DR. H. STEINMANN). — New for the fauna of Bali.

Family **Labiduridae** VERHOEFF, 1902

Labidura riparia (PALLAS, 1773)

Forficula riparia PALLAS, 1773, Reise Russ. Reiche, **2:** 727. — Terra typica: Siberia.
Labidura riparia (PALLAS); LEACH, 1815, Edinbourgh Encycl., **9:** 48.

Male usually dark brown, variegated with yellow or reddish yellow; head reddish or darker, antennae brown or yellowish basally; pronotum blackish or dark brown, lateral margins yellow. Forceps relatively broad, arcuate, with one inner tooth towards apex, tooth directed ventro-medially, branches widely separated at base.

Distribution: Cosmopolitan.

Material examined: Palawan, 1 male and 1 female.

Family **Labiidae** BURR, 1909

Nesogaster amoenus (STÅL, 1855)

Forficula amoena STÅL, 1855, Öfvers. K. Vetensk. Akad. Förh., **12:** 360. — Terra typica: Java.
Nesogastrella amoena (STÅL); VERHOEFF, 1902, Zool. Anz., **1902:** 46. — *Nesogaster amoenus* (STÅL); BURR, Ann. Mag. nat. Hist., (8) **1:** 46.

Male colourful, head and abdomen reddish, antennae brown, basal joints red or yellow, joints 4—9 brown, 10th joint white, 11th brown; pronotum dark brownish black, tegmina brown, with a large yellow spot at lateral margins; legs yellow, femora dark brown banded.

Distribution: Malaysia, Sumatra, Borneo, Java.

Material examined: Borneo, 7 males and 16 females.

Spongovostox mucronatus (STÅL, 1860)

Forficula mucronata STÅL, 1860, Kongl. Svenska Freg. Eugenie's Resa, p. 303. — Terra typica: Burma.
Labia mucronata (STÅL); DOHRN, Stett. ent. Zeit., **25:** 423. — *Spongovostox mucronatus* (STÅL); STEINMANN, 1979, Dtsch. Ent. Z., **26:** 290.

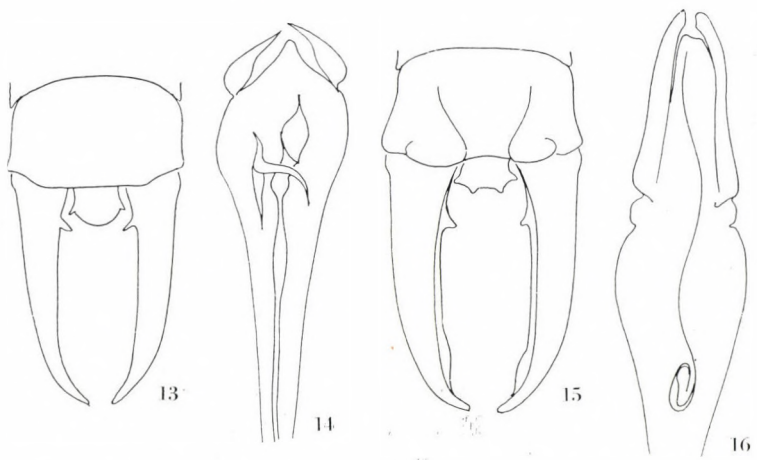
Pronotum shining black, brown laterad; slightly narrower than head cephalad, somewhat expanded caudad; slightly transverse; median sulcus well marked; posterior margin truncate with well rounded disto-lateral angles. Ultimate tergite broad; surface moderately strongly punctured with microsculpture between punctures. Male pygidium large and prominent; upper surface somewhat convex with a well-marked median longitudinal groove; wider at base than apex; sides more or less parallel and terminating in a small, sharp, lateral tubercle (Fig. 12).

Distribution: a widely distributed species recorded from Sri Lanka, Sikkim, Burma, and throughout the Malay Archipelago to New Guinea.

Material examined: Thailand, 11 females; Palawan, 1 female, and Borneo, 1 female.

Spongovostox osellai sp. n.

Male general colour black or yellow. Head black, antennae brownish black, legs black, except femora apically, yellow. Tegmina and abdomen dark brown, wings yellow; forceps yellowish brown. Tegmina bicolour, dark brown medially and laterally, but both tegmina with a narrow longitudinal stripe, yellow; wings yellow with a narrow longitudinal stripe, brown. Head tumid; postfrontal and coronal sutures present. Eyes comparatively large, but shorter than length of head behind eyes. Antennae broken in holotype; first joint very short, slightly shorter than distance between antennal bases; second joint transverse. Pronotum subquadrate, all angles rounded; median longitudinal furrow well marked. Tegmina fully developed, wings present. Abdomen typical, simple; ultimate tergite broad, truncate caudad, without tubercles, depressed mesad near posterior margin. Pygidium very similar to *mucronatus* (STÅL), but shorter, more or less quadrate, as long as wide; posterior margin rounded, with two very small tubercles laterally. Forceps (Fig. 13) slender, straight except towards apex, trigonal in section at base, and cylindrical apically. Inner margin with a single tooth basally. Penultimate sternite transverse, rounded distad. Genitalia (Fig. 14) characteristic, very slender; central parameral plate comparatively broad, external paramere small, with a very narrow apex. Virga within genital lobe very long, specific as in Fig. 14.



Figs 13—16. 13 = Male ultimate tergite and forceps of *Spongovostox osellai* sp. n., and 14 = ditto, genital armature of holotype. — 15 = Male ultimate tergite and forceps of *Chaetospania ferox* sp. n., and 16 = ditto, genital armature of holotype (Original)

Length of body with forceps: 5.5 mm.
Female unknown.

Holotype male: Thailand, Pahani (Songkhia), 19. I. 1981. legit: Dr. G. Osella, gen. prep. No. 811, det. Dr. H. Steinmann. — Deposited in the Museo Civico di Storia Naturale, Verona.

Its neares ally is *Spongovostox mucronatus* (Stål, 1860), with the following differences:

	osellai sp. n.	**mucronatus** (Stål)
1. Tegmina	with a narrow stripe	with a large patch
2. Pygidium	short, as in Fig. 13	long, as in Fig. 12
3. Genital lobe	expanded apically	normal, parallel-sided

Chaetospania thoracica (Dohrn, 1867)

Platylabia thoracica Dohrn. 1867, Stett. ent. Zeit., **28:** 348. — Terra typica: Ceylon.
Chaetospania thoracica (Dohrn); Burr, 1911, Genera Insectorum, **122:** 54.

Head, pronotum, tegmina and wings dark brownish black; legs light brown, abdomen and forceps dark reddish brown. Male pygidium with hind margin triangular with a tubercle in the middle. Forceps very long, trigonal basally, cylindrical apically; inner margin with a large tooth medially.

Distribution: Oriental region.

Material examined: Bali, 1 male and 1 female.

Chaetospania ferox sp. n.

Male colourful; head dark brown, antennae brown, pronotum brown, except lateral margins, yellow; tegmina and wings unicolour, brownish black; legs yellow, but femora brown at basal half; abdomen brown dorsally, but ultimate tergite and forceps light brown. Head rounded, postfrontal and coronal sutures well marked. Eyes comparatively large, but slightly shorter than length of head behind eyes. Antennae broken in holotype; first joint more or less as long as distance between antennal bases; second joint transverse, third and fourth joints twice as long as broad. Pronotum a little longer than broad; lateral margins parallel-sided, posterior margin rounded. Tegmina and wings fully developed. Abdomen more or less parallel-sided; ultimate tergite broad, its surface with two prominent tubercles posteriorly. Pygidium characteristic, short, wider than long, as in Fig. 15. Forceps trigonal in cross section, comparatively large, elongated; inner margin with a well-marked tooth. Genitalia (Fig. 16) specific; central parameral plate very long; virga within genital lobe long, narrow; external paramere elongated, characteristic.

Length of body with forceps: 12.5 mm.
Female unknown.

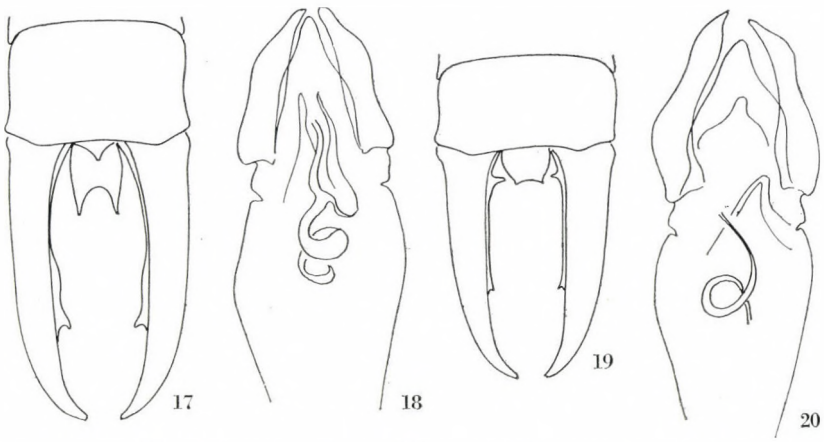
Holotype male: Bali, Bedung ul, 13. II. 1981, legit: DR. G. OSELLA, gen. prep. No. 797, det. DR. H. STEINMANN. — Deposited in the Museo Civico di Storia Naturale, Verona.

Its nearest ally is *Chaetospania kurseongae* HEBARD, 1923, with the following differences:

	ferox sp. n.	**kurseongae** HEBARD
1. Size	large: 12.5 mm	smaller: 9—10 mm
2. Pygidium	large	very narrow
3. Forceps	with median tooth at basal section	with large tooth at apical section

Chaetospania celer sp. n.

Male very narrow, general colour light brown, unicolour. Head rounded, tumid, smooth; postfrontal and coronal sutures finely marked. Eyes very small, slightly smaller than length of head behind eyes. Antennae 12-jointed; first joint normal, more or less as long as distance between antennal bases; second quadrate, third joint long, a little longer than fourth. Pronotum longer than broad, lateral margins straight, but slightly expanded caudad, all angles rounded; median longitudinal furrow present, long. Tegmina well developed, shining; wings absent or very small. Abdomen more or less parallel-sided, ultimate tergite broad, smooth, median longitudinal sulcus absent. Pygidium (Fig. 17) characteristic, longer than broad, posterior margin excised with rounded emargination. Forceps well developed, straight except apically. Strongly trigonal in cross section; inner margin with a single, but character-



Figs 17—20. 17 = Male ultimate tergite and forceps of *Chaetospania celer* sp. n., and 18 = ditto, genital armature of holotype. — 19 = Male ultimate tergite and forceps of *C. dexter* sp. n., and 20 = ditto, genital armature of holotype (Original)

istic tooth. Genitalia (Fig. 18) comparatively short and broad; central parameral plate or genital lobe with characteristic virga; external parameres long, outer margins undulate.

Female very similar to male, but forceps straight, inner margin with 4—5 large teeth; pygidium very broad with hind margin truncate.

Length of body with forceps: male: 8.5—9.5, female: 8—9 mm.

Holotype male: Thailand, Chiang Dao, 12. I. 1980, legit: Dr. G. Osella, gen. prep. No. 794, det. Dr. H. Steinmann. — Paratypes: ditto, 2 males and 3 females (deposited in the Museo Civico di Storia Naturale, Verona). — Paratypes, ditto, 1 male, and ditto, 16. I. 1980, legit: Dr. G. Osella, 1 female (deposited in the Hungarian Natural History Museum, Budapest).

Its nearest ally is *Chaetospania shillongensis* Srivastava, 1982, with the following differences:

	celer sp. n.	**shillongensis** Srivastava
1. Wings	very small or absent	well developed
2. Head, pronotum	light brown	black
3. Legs	light brown	clear yellow
4. Female forceps	with small tubercles at inner margin	with one very large tooth at inner margin

Chaetospania dexter sp. n.

Male general colour light brownish yellow. Very small species. Head tumid, smooth, rounded, a little broader than pronotum. Postfrontal and coronal sutures absent. Eyes very small, slightly shorter than length of head behind eyes. Antennae broken in holotype. First joint long, but a little shorter than distance between antennal bases; second joint transverse, third joint a little longer than fourth. Pronotum longer than broad, lateral margins more or less parallel-sided, all angles rounded; median longitudinal furrow very fine. Tegmina normal, longer than broad; wings absent. Abdomen a little expanded medially; ultimate tergite broad, smooth. Penultimate sternite broadly rounded posteriorly. Pygidium as in fig. 19; posterior margin with two very small tubercles. Forceps with branches depressed, stout, at base separated by the pygidium, almost straight, tapering, gently curved near apex with tip pointed; inner margin with a single and prominent tooth basally, and a narrow flange medially. Genitalia (Fig. 20) broad and short; median or genital lobe well developed, virga within genital lobe as in Fig. 20. External parameres elongated, undulate, pointed.

Length of body with forceps: 6 mm.

Female unknown.

Holotype male: Sulawesi (Celebes), Ujung Pandang, Malino, 2000 m, legit: Dr. G. Osella, gen. prep. No. 795, det. Dr. H. Steinmann. — Deposited in the Museo Civico d Storia Naturale, Verona.

Its nearest ally in *Chaetospania foliata* (BURR, 1911) with the following differences:

	dexter sp. n.	**foliata** (BURR)
1. Pygidium	broader than long	as long as broad
2. Forceps	with inner tooth	without inner tooth
3. Genitalia	broad, virga turned	narrow, virga straight

Chaetospania feae BORMANS, 1894

Chaetospania feae BORMANS, 1894, Ann. Mus. Stor. Nat. Genova, **14:** 390. — Terra typica: Burma.

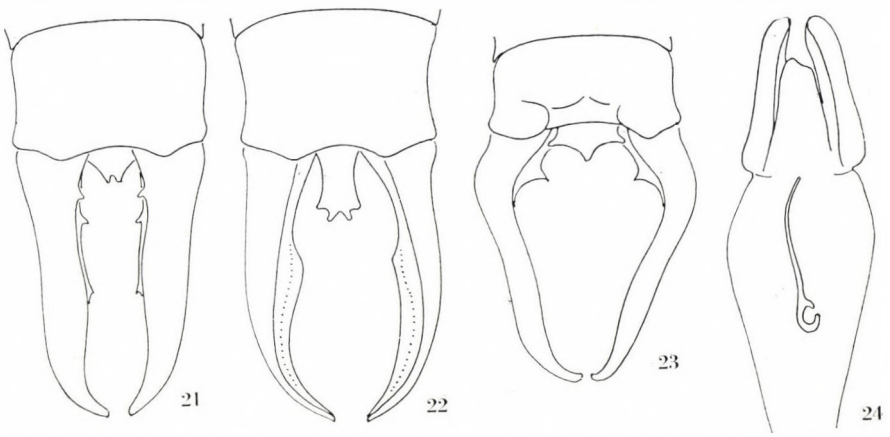
Very dark species. General colour blackish-brown, except legs, light brown. Antennae with large joints. Tegmina and wings fully developed, coriaceous, black. Male forceps more or less straight, strongly trigonal basally, cylindrical and curved apically. Male pygidium as in Fig. 21.

Distribution: Oriental region.

Material examined: Bali, 6 males and 12 females.

Chaetospania bellator sp. n.

Female large; colour brown or brownish red and black. Head, and abdomen except ultimate tergite, black; pronotum, tegmina, wings and legs brown, ultimate tergite and forceps reddish brown. Head comparatively small, smooth, tumid; eyes small, shorter than length of head behind eyes. Postfrontal and coronal sutures present. Antennae broken, first joint long, a little longer than distance between antennal bases; second joint quadrate, third as long as fourth. Pronotum longer than broad, a little oval, all angles rounded;



Figs 21—24. 21 = Male ultimate tergite and forceps of *Chaetospania feae* BORMANS, 1894. — 22 = Male ultimate tergite and forceps of *C. bellator* sp. n. — 23 = Male ultimate tergite and forceps of *Eulithinus analis* (RAMBUR, 1838), and 24 = ditto, male genital armature (Original)

median longitudinal furrow well marked. Tegmina fully developed, wings present. Abdomen depressed, gently dilated in the middle, faintly punctulate. Ultimate tergite very broad, large, posterior margin faintly emarginate in middle. Penultimate sternite broadly rounded posteriorly. Pygidium narrow, slightly longer than broad, narrow and subvertical at base and middle, afterwards deplanate, sides concave with two pairs of minute points apically. Forceps strongly trigonal in cross-section, with characteristic flange at apical half.

Length of body with forceps: 13.5 mm.

Male unknown.

Holotype female: Bali, Bedung ul, 13. II. 1981, legit: Dr. G. Osella (deposited in the Museo Civico di Storia Naturale, Verona). — Paratype female, deposited in the Hungarian Natural History Museum, Budapest.

Its nearest ally in *Chaetospania nigriceps* (Kirby, 1891), with the following differences:

	bellator sp. n.	**nigriceps** (Kirby)
1. Pronotum and tegmina	brown	dark brownish-black
2. Wings	short	very long
3. Head	as broad as pronotum	broader than pronotum

Labia minor (Linné, 1758)

Forficula minor Linné, 1758, Syst. nat., (10), **2:** 423. — Terra typica: Congo.
Labia minor (Linné); Leach, 1815, Edinb. Encycl., **19:** 118.

General colour dark brownish black: legs light brown, forceps reddish. Pronotum more or less as long as broad; lateral margins parallel-sided. Tegmina and wings well developed. Each branch of forceps trigonal basally, cylindrical distally, ventral inner margin with a basal tooth and with isolated small crenulations distally.

Distribution: Cosmopolitan.

Material examined: Palawan, 3 females.

Labia curvicauda (Motschulsky, 1868)

Forficesila curvicauda Motschulsky, 1868, Bull. Soc. nat. Moscou, **36:** 2. — Terra typica: Ceylon.
Labia curvicauda (Motschulsky); Burr, 1907, Berl. ent. Z., **52:** 205.

Abdomen broad, depressed, narrowed at base. Each branch of forceps trigonal at base, inner margin with an inner tooth-like process, distal part cylindrical and strongly curved.

Distribution: Cosmopolitan.

Material examined: Thailand, 6 males, and 8 females; Flores, 2 males, and 3 females; Kalimantan, 1 male, and 1 female; Sulawesi, 1 female; Palawan, 12 males, and 12 females.

Family **Chelisochidae** Burr, 1907

Proreus simulans (Stål, 1860)

Forficula simulans Stål, 1860, Eugenies Resa Ins., p. 302. — Terra typica: Malay Archipelago.
Lobophora simulans (Stål); Dohrn, 1864, Stett. ent. Zeit., **25:** 290. — *Chelisoches simulans* (Stål); Scudder, 1876, Proc. Boston Soc. Nat. Hist., **28:** 309. — *Proreus simulans* (Stål); Burr, 1910, Trans. Linn. Soc. London, (14) **1:** 131.

Head long, first antennal joint very long, slightly longer than distance between antennal bases. Pronotum longer than broad; lateral margins parallel-sided. Tegmina dark brown with broad longitudinal stripe, yellow.

Distribution: from Burma to Malaysia.

Material examined: Kalimantan (Borneo), 1 female.

Family **Forficulidae** Burr, 1907

Eparchus insignis (de Haan, 1842)

Forficula insignis de Haan, 1842, Verh. Nat. Gesch. Nederl. Bezitt. Orth., p. 243. — Terra typica: Java.
Opisthocosmia insignis (de Haan); Dohrn, 1865, Stett. ent. Zeit., **26:** 81. — *Eparchus insignis* (de Haan); Burr, 1910, The Fauna of British India, Dermaptera, p. 192.

Very dark species. Head, pronotum and abdomen black, shining; antennae, legs and tegmina dark brown; wings bicolour, yellow and brown. Legs very long, and narrow; female forceps very narrow, acute.

Distribution: Oriental region.

Material examined: Thailand, 2 females.

Eparchus burri (Bormans, 1903)

Opisthocosmia burri Bormans, 1903, Ann. Mag. nat. Hist., (7) **11:** 267. — Terra typica: Celebes.
Eparchus burri (Bormans); Burr, 1910, The Fauna of British India, Dermaptera, p. 194.

Female very dark, more or less unicolour, dark brownish-black, except wings, yellow medially. Abdominal tergites 3, with large tubercles, laterally. Female forceps slender, very long and narrow, inner margins finely crenulate.

Distribution: from Philippines to Borneo.

Material examined: Java, 1 female; Sulawesi (Celebes), 19 females.

Eulithinus analis (Rambur, 1838)

Forficula analis Rambur, 1838, Faune Ent. Andalousie, Orth., **2:** 10. — Terra typica: Spain.
Chelidura analis (Rambur); Dubrony, 1878, Ann. Mus. Stor. Nat. Genova, **12:** 434. — *Pseudochelidura analis* (Rambur); Burr, 1910, Entomolog. News, **22:** 186. — *Lithinus analis* (Rambur); Burr, 1911, Deutsch. Ent. Zeitsch., **1911:** 327. — *Eulithinus analis* (Rambur); Hincks, 1935, Ent. Mon. Mag., **71:** 274.

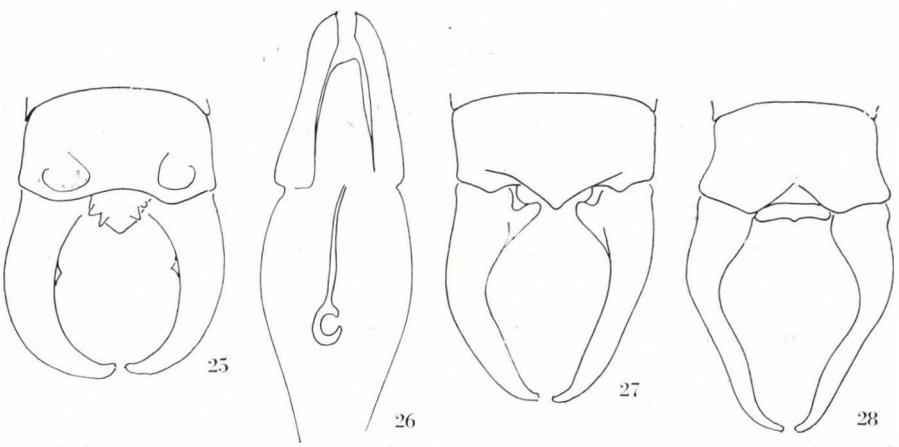
Ultimate tergite wide, posterior margin largely transverse, but margin visibly and convexly crenulate. Basal section of male forceps curved, apically straightened, beyond a straight section incurved (Fig. 23). Pygidium wide, trapezoid, lateral angles peg-shaped. Male genitalia (Fig. 24) forficuloid in type; external parameres long, narrow, more than five times longer than wide. Virga within genital lobe short, basal vesiculum of *Forficula*-type.

Distribution: Spain.

Material examined: Spain: Sierra Nevada, 15 females.

Eulithinus hispanicus sp. n.

Male general colour dark reddish brown or a little blackish. Head broad, a little broader than pronotum; eyes comparatively small, slightly shorter than distance between antennal bases. Postfrontal sutures and coronal suture very well marked, deep. Antennae 12-jointed; first joint long, a little longer than third; second quadrate, third longer than fourth. Pronotum very transverse, lateral margins straight, parallel-sided; posterior margin with posterior angles rounded; median longitudinal furrow present. Tegmina short with prominent keels laterally; wings entirely absent. Abdomen depressed, gently dilated in the middle, abdominal tergites 3—4 with small tubercles. Ultimate tergite broad, dorsal surface with two prominent tubercles at posterior margin. Pygidium characteristic, posterior margin with two pairs of minute denticles apically, as in Fig. 25. Forceps with branches depressed, strongly curved; trigonal basally, cylindrical apically; inner margin with a single and small tooth medially. Genitalia (Fig. 26) simple, of *Forficula*-type; central par-



Figs 25—28. 25 = Male ultimate tergite and forceps of *Eulithinus hispanicus* sp. n., and 26 = ditto, genital armature of holotype. — 27 = Male ultimate tergite and forceps of *Pseudochelidura minor* STEINMANN, 1979, and 28 = male ultimate tergite and forceps of *Anechura chelmosensis* (MAŘAN, 1965) (Original)

ameral plate or genital lobe well developed, virga within genital lobe with basal vesicle. External parameres straight, with a very small spine at apex.

Length of body with forceps: 7.5—8 mm.

Female unknown.

Holotype male: Spain, Sierra Nevada, Réf. Universitario, 2600 m, VII. 1979. legit: Dr. G. Osella, gen. prep. No. 813, det. Dr. H. Steinmann (deposited in the Museo Civico di Storia Naturale, Verona). — Paratype male, ditto, deposited in the Hungarian Natural History Museum, Budapest.

Identification key to the species

1 (2) Larger species, body length with forceps 10—12 mm. General colour brownish or a little yellowish brown. Male forceps strongly curved in basal section, and apically straightened; inner margin with one prominent tooth basally. Pygidium very broad, as in Fig. 23 **analis** (Rambur, 1838)

2 (1) Smaller species, body length with forceps 7.5—8 mm. General colour dark reddish brown or a little blackish. Male forceps strongly curved basally and apically; inner margin with a small tooth medially. Pygidium large, as in Fig. 25 **hispanicus** sp. n.

Pseudochelidura minor Steinmann, 1979

Pseudochelidura minor Steinmann, 1979, Folia ent. hung., (ser. nov.) **32:** 167. — Terra typica: France: Pyrennes.

Male colour reddish brown to black. Posterior margin of ultimate tergite strongly elongated and in a superior view projecting deeply between forceps (Fig. 27). Forceps comparatively short, strong, thick; inner margins with a large-sized robust tooth each, apically nearly touching.

Distribution: France and Spain.

Material examined: Spain, 1 male.

Chelidurella acanthopygia (Gené, 1832)

Forficula acanthopygia Gené, 1832, Saggio Monogr. Forf., p. 13. — Terra typica: Europe.
Chelidurella acanthopygia (Gené); Verhoeff, 1902, Zool. Anz., No. **665:** 187.

Male large; head broad, pronotum a little transverse, tegmina very short, wings absent. Abdomen more or less parallel-sided, a little expanded medially. Ultimate tergite broad, simple, smooth. Pygidium in superior view short, but acute vertically. Male forceps slender, cylindrical, simple, dorsal margin with a small tubercle basally.

Distribution: Europe, from Sweden to France and from the Baltic States to Italy and Serbia.

Material examined: Italy, 1 male.

Anechura chelmosensis (MAŘAN, 1965)

Borelliola chelmosensis MAŘAN, 1965, Acta Ent. Mus. Nat. Pragae, **36:** 677. — Terra typica: Greece: Peloponnesos.
Anechura chelmosensis (MAŘAN); STEINMANN, 1977, Acta zool. hung., **23:** 206.

Male general colour reddish brown to dark brown. Pronotum very transverse, tegmina abbreviated, very short; wings entirely absent. Abdomen more or less parellel-sided, only a little expanded medially. Ultimate tergite broader at hind half; median longitudinal sulcus short, but present. Male pygidium short and transverse, simple, as in Fig. 28. Male forceps slender, slightly elongated, cylindrical.

Distribution: Greece: Peloponnesos.

Material examined: Peloponnesos, 11 males, and 2 females.

Forficula auricularia LINNÉ, 1758

Forficula auricularia LINNÉ, 1758, Syst. Nat. **10:** 423. — Terra typica: Europe.

Distribution: basically Palaearctic, but occurs as an adventive in all faunal regions.

Material examined: Spain, 1 male, and 3 females; Algeria, 1 male, and Tunisia, 2 males, and 1 female.

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Acta Zoologica Hungarica 30 (1—2), pp. 205—211 (1984)

ZWEI NEUE PLUSIINAE-SUBSPEZIES VON DER BALKANHALBINSEL (LEPIDOPTERA: NOCTUIDAE)

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(Eingegangen am 13. Dezember 1982)

Description of *Euchalcia variabilis fuscolivacea* ssp. n. (Bulgaria, Rila mts.) and *Panchrysia v-argenteum pantheon* ssp. n. (Greece, Olympos mts.).

Nachfolgend werden — als Fortsetzung einer früheren Arbeit (VARGA und RONKAY, 1982) — zwei weitere Plusiinae-Subspezies beschrieben, die in den letzten Jahren in den Hochgebirgen der Balkanhalbinsel erbeutet worden sind.

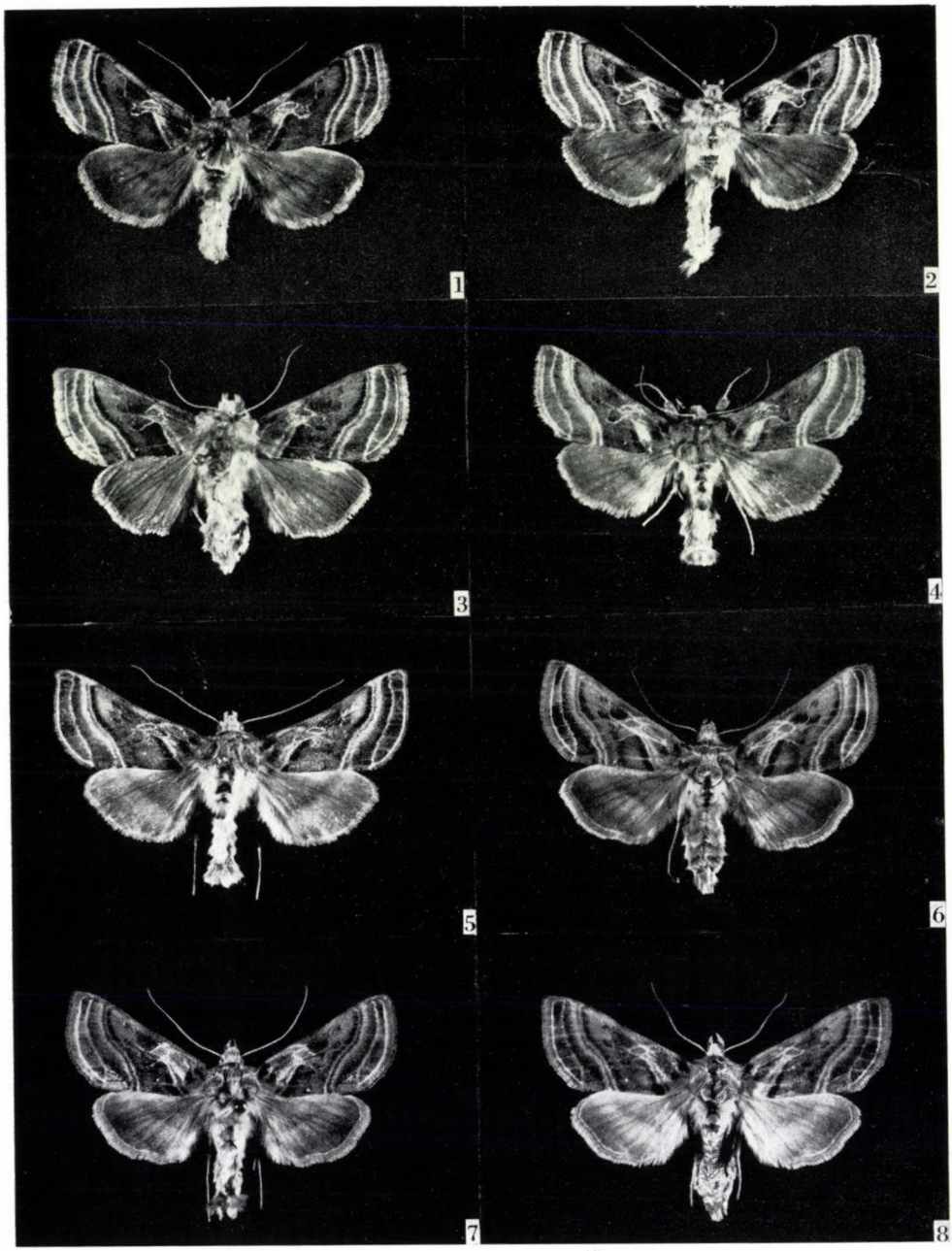
Euchalcia variabilis fuscolivacea ssp. n.

Holotypus: ♂, Rila-Gebirge, Grančar-Hütte, 2260 m, 24. VII. 1979 (Lichtfang), leg. VARGA, Gen. präp. No. 79, RONKAY. (In coll. VARGA.) Paratypen: 13 ♂, 4 ♀; Rila-G., Grančar-H., 2260 m, 24. VII. 1979, leg. VARGA (2 ♂, 1 ♀), vom selben Fundort, aber von 28.—29. VII. 1972 und 29. VII.—1. VIII. 1975, leg. VARGA und GYULAI (7 ♂, 2 ♀); Rila-G., Ribni Jezera, ca. 2200 m, 3.—4. VIII. 1980, leg. GYULAI (1 ♂), vom selben Fundort, 4.—5. VIII. 1980, leg. GYULAI (1 ♂), 15.—16. VII. 1982, leg. GYULAI (2 ♂), 4.—5. VII. 1978, leg. GYULAI (1 ♀). (In coll. NWM Budapest, GYULAI und VARGA.)

Präparate: 75/63 u. 118 (VARGA) und 77, 78, 80 u. 286 (RONKAY), vgl. Abb. 14.

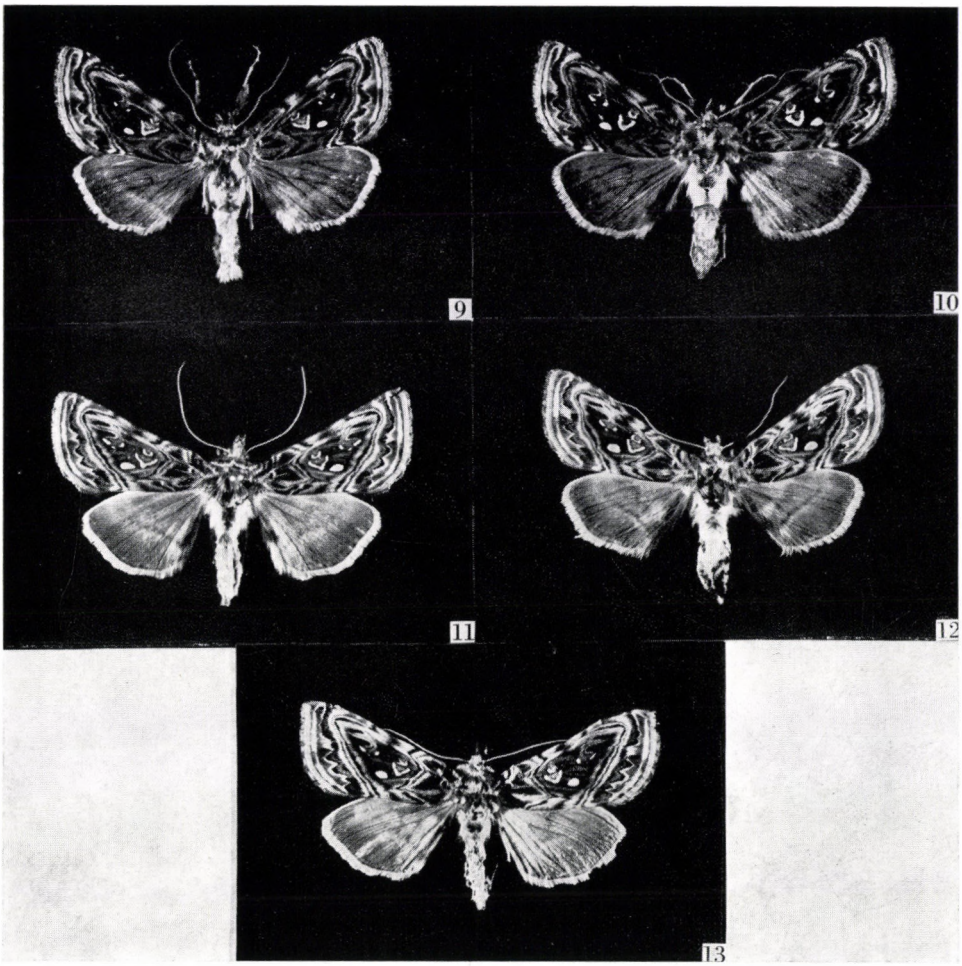
In Größe (Vfl. 17—19 mm, Spannweite 33—38 mm) und in den äußeren Strukturmerkmalen (Fühler, Palpen, Beine) mit der Stammform übereinstimmend. Vf.-Form kürzer, gedrungener; Apex mehr abgerundet. Die doppelte äußere Querlinie weniger gebogen. Das helle Signum, gebildet aus dem Ring- und Zapfenmakel, recht deutlich, weißlich ockergrau umrandet und mit zerstreuten hellen Schuppen von gleicher Farbe ausgefüllt. Der rosafarbige Anflug der hellen Flügelpartien fehlt fast vollständig; die olivgrauen Töne herrschen vor. Die Farbe des Körpers, der Hf. bzw. der F. Useite weicht von jenen der Stammform nicht ab. Die beiden Geschlechter sind kaum verschieden; die kurze, gedrungene Flügelform kommt bei dem ♀ noch mehr zum Ausdruck (vgl. Abb. 3).

Die ♂-Genitalien zeigen gegenüber der nominotypischen Subspezies eine Anzahl kleiner, aber recht charakteristischer Unterschiede, die eindeutig als subspezifisch gelten können. Weil sie auf den Abb. 14—15 — auch mit Rück-



Tafel I

Abb. 1—3. *Euchalcia variabilis fuscolivacea* ssp. n. 1 = ♂, Holotypus, Rila, Grančar, 24. VII. 1979, leg. VARGA; 2—3 = ♂ und ♀ Paratypen mit gleichen Angaben. 4—8. *Euchalcia variabilis variabilis* (PILLER et MITTERPACHER). 4 = ♂, Ötztaler-Alpen, Kaunser Tal; 5 = ♂, Transsylvania, Gyilkos-tó (Lacu Roşu), Kupás-völgy (Valea Cupaş); 6 = ♀, Pilis-Gebirge, Fekete-kő, Ungarn; 7—8 = ♂ und ♀, Budaer Geb., Farkasvölgy, Ungarn



Tafel II

Abb. 9—10. *Panchrysia v-argenteum pantheon* ssp. n. 9 = ♂, Holotypus, Olympos, Kataphygion A, Griechenland, 8.—9. VIII. 1981, leg. VARGA; 10 = ♀, Paratypus mit gleichen Angaben. 11—13. *Panchrysia v-argenteum v-argenteum* (ESPER). 11 = ♂, Alpen, S-Tirol; 12 = ♀, Ötztaler Alpen, Kaunser Tal; 13 = ♀, Transsylvania, Gyilkos-tó (Lacu Roşu)

sicht auf ihre Variationsbreite — detailliert wiedergegeben sind, sollen sie hier nur »stichwortartig« aufgezählt werden.

Die Valvenform mehr abgerundet, distal erweitert; Seitenkanten divergent. Ampulla plumper, kürzer; Distalende breit, abgerundet. Auch Clavus kürzer, Spitze weniger ausgezogen. Aedoeagus-Dorn schmal und spitz. Der schräg nach oben gerichtete Fortsatz der Fultura inf. schmäler, schnabelförmig. Der stärker chitinisierte Innenteil des 8. Tergits mehr zweigespaltet.

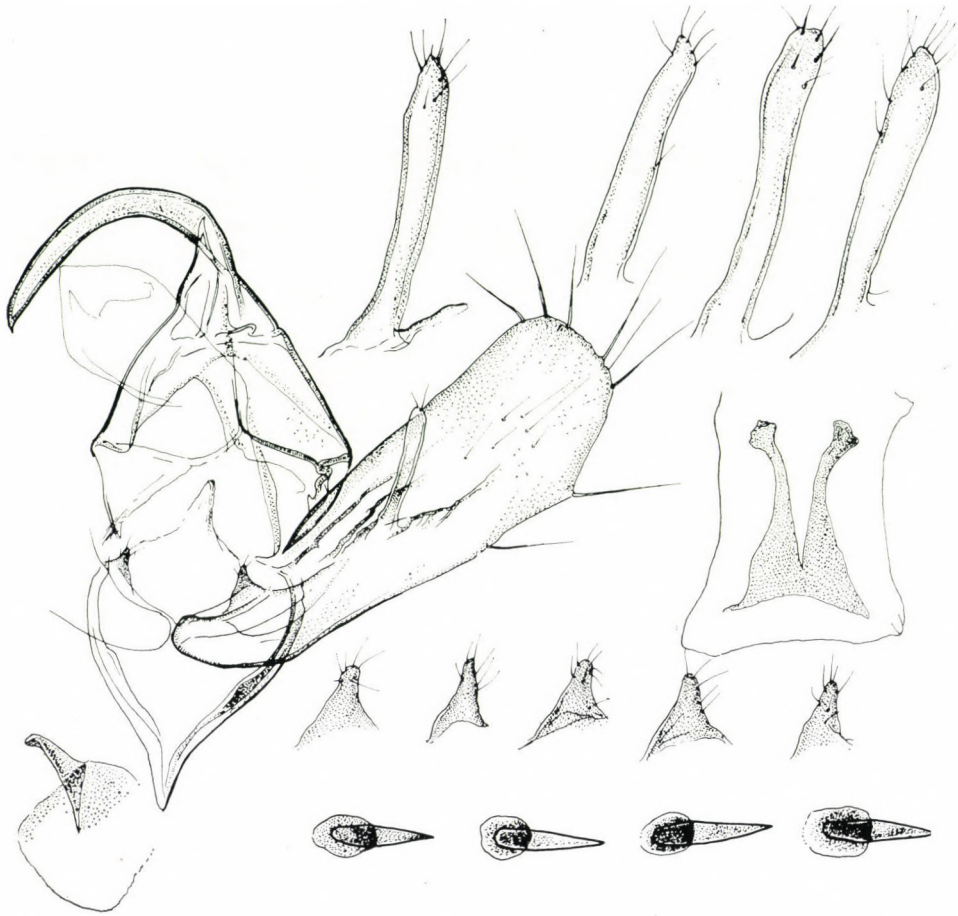


Abb. 14. Die ♂-Genitalien der *Euchalcia variabilis fuscolivacea* ssp. n. Totalbild, Präp. 79, Holotypus (rechte Valve weggelassen, Vergr. 24×) und Details (Vergr. ca. 60×): obere Reihe — Ampulla; Mitte rechts — VIII. Tergit; unten: Clavus; ganz unten links — Fultura inferior; ganz unten — Cornuti

Die neue Ssp. wurde auch mit der, aus dem N-Kaukasus beschriebenen *E. variabilis obscurior* ALBERTI verglichen. Letztere ist aber noch mehr spitzflügeliger als die Stammform, Flügelbasis mehr verdunkelt, wesentlich undeutlicher gezeichnet und der purpurrosa Anflug der Vf. stark ausgeprägt. Die ♂-Genitalien der ssp. *obscurior* stimmen mehr mit der Stammform überein, als mit jenen der neuen Subspezies.

Hier möchten wir noch bemerken, daß wir auch je eine kleinere Serie von *E. variabilis* (PILLER et MITTERPACHER) aus Transsylvanien (Retezat-Gebirge und Umgb. Gyilkos-tó — Lacu Roșu) untersucht haben, die aber — abgesehen von kleineren Farbunterschieden — eine wesentliche Überein-

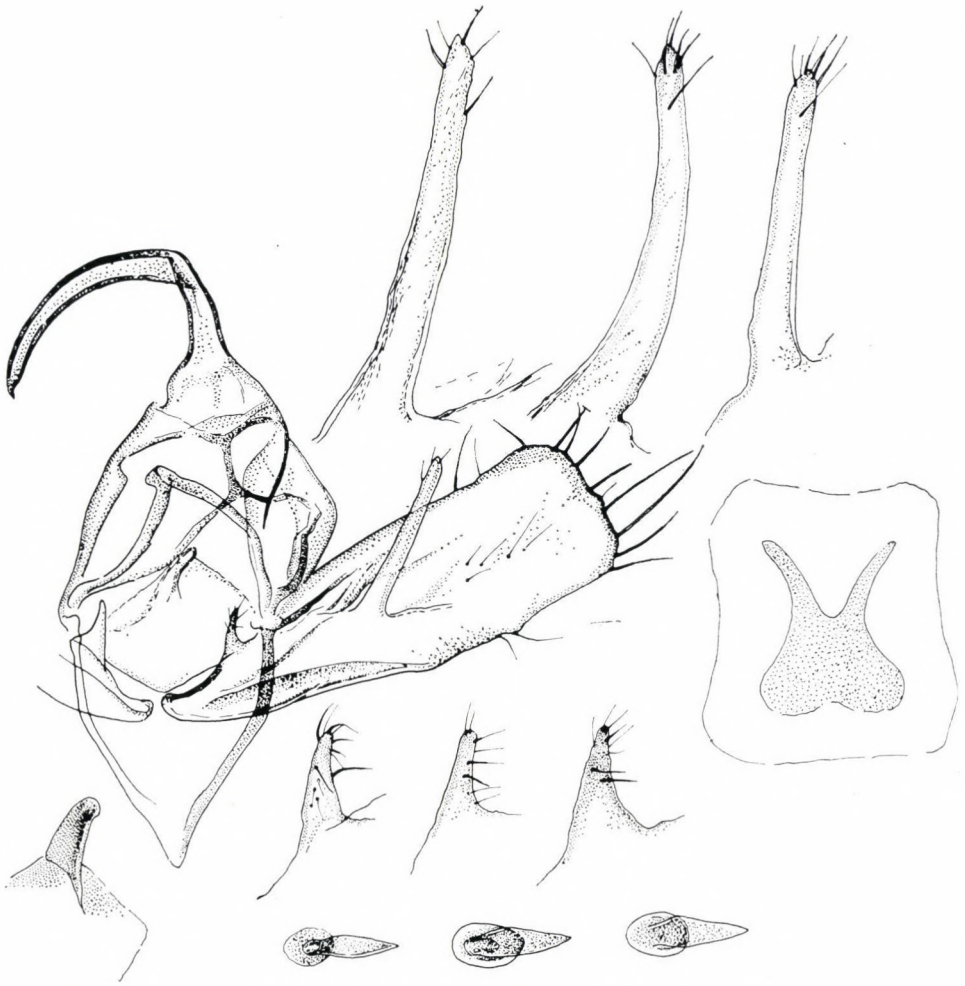


Abb. 15. Die ♂-Genitalien der *Euchalcia variabilis variabilis* (PILLER et MITTERPACHER). Details wie auf der Abb. 14

stimmung mit der nominotypischen Subsp. zeigen (untersucht: Ungarn — Mts. Budaer Hügelland, Pilis, Vértes; Österreich — Ötztaler Alpen; N-Italien — Südtirol, Schnalstal; Schweiz — Wallis, Zeneggen; Jugoslawien — Julische Alpen, Vršić-Sattel, Rošica; S-Frankreich — Hautes-Alpes, Alpes-Maritimes) zeigen.

Panchrysia v-argenteum pantheon ssp. n.

Holotypus: ♂, Griechenland, Olympos, Kataphygion A, 2100 m, 8.—9. VIII. 1981, leg. VARGA (Lichtfang), in coll. VARGA. Paratypen: 6 ♂, 2 ♀ mit gleichen Angaben, in coll. NWM Budapest, GYULAI und VARGA.

Präparate: 1520 (VARGA) und 237, 238 (RONKAY).



Abb. 16. Die ♂-Genitalien der *Panchrysia v-argenteum pantheon* ssp. n. Totalbild der ♂-Genitalien (Präp. 1520, Paratypus, rechte Valve weggelassen, Vergr. 24×). Details: obere Reihe — Ampulla; mittlere Reihe — Clavus; untere Reihe — Cornuti

In der Größe (Vfl. 16—17,5 mm, Spannweite 32—34 mm) und den äußeren Strukturmerkmalen von der Stammform nicht verschieden. Die Form der Vf. kürzer (Verhältnis Vorderrand) Außenrand ca. 1,5 : 1; bei der nominotypischen Subspezies ca. 1,7 : 1). Die silberne V-Zeichnung mehr nach innen gerichtet, weniger »geöffnet«. Mittelfeld schwärzlich verdunkelt, die dunkle Schattierung der Wellenlinie stärker als bei der Stammform. Die Vf.-Grundfarbe zeigt Farbtöne von gelbgrau bis trüb fleischrot; von den gelblichen bzw. rosa Farben der Stammform klar verschieden (Tafel II).

Auch in den ♂-Genitalien sind eine Anzahl kleinerer Unterschiede festzustellen (vgl. Abb. 16—17). Valvenform schmäler, von gleichmäßiger Breite. Ampulla länger, schmäler; Clavus relativ kurz. Der Hauptdorn der distalen Cornuti trifid.

P. v-argenteum Esp. wurde schon 1937 auf dem Olymp (Höhle der Musen, 1750 m) von Ch. Tuleschkow in 2 Exemplaren erbeutet, später aber scheinbar nicht mehr wiedergefunden. Hier möchten wir noch bemerken, daß *P. v-argenteum* Esp. auch in den Transsylvanischen Karpaten vorkommt



Abb. 17. Die ♂-Genitalien der *Panchrysia v-argenteum v-argenteum* (ESPER). Details wie auf der Abb. 16

(Gyilkos-tó — Lacu Roşu, 2 ♀, leg. BÁLINT). Die uns von dort vorliegenden Exemplare stimmen sehr gut mit der Stammform (untersuchtes Material: Österreich, Ötztaler Alpen; Schweiz, Wallis; N-Italien, S-Tirol; Frankreich, Hautes-Alpes) überein.

Die vollständige Verbreitung der beiden Arten in den balkanischen Hochgebirgen ist freilich durch systematisches Sammeln deren Raupen zu klären, weil scheinbar nur die Imagines sehr mäßig lichtaktiv sind. Deshalb haben wir uns jetzt enthalten, zoogeographische Schlußfolgerungen über die Verbreitung der beiden neuen Subspezies zu ziehen.

SCHRIFTTUM

BÁLINT, ZS. (1981): New data to the distribution of Macrolepidoptera in Transylvania II. (Lepidoptera). — Folia ent. hung., **42** (34): 227—235.

TOULECHKOFF (TULESCHKOW), CH. (1951): Études faunistiques d'Olymp de la Grèce. — Bull. Inst. Zool. Acad. Sci. Bulgare, Sc. **1:** 305—328.

VARGA, Z. & RONKAY, L. (1982): Syngrapha devergens rilaecacuminum ssp. n., — eine neue Unterart aus den bulgarischen Hochgebirgen (Lepidoptera: Noctuidae). — Acta zool. hung., **28** (1—2): 149—155.

Acta Zoologica Hungarica 30 (1–2), pp. 213–240 (1984)

NEW DATA TO THE EUPITHECINI FAUNA OF CHINA BASED ON HÖNE'S COLLECTIONS*

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(Received 31 March, 1983)

The descriptions of twenty-two new species from the Chinese provinces South Shensi, North Yuennan and from Tibet: *Eupithecia egena, perpetua, cuneata, fervida, seminuda, inexhausta, profana, epileptica, garrula, refertissima, captiosa, infortunata, fragmentaria, acerba, mortua, sempiterna, adoranda, insana, incorrupta, mentita, arenosa, tempestuosa*, spp. n.; new data to the occurrence of the rare species *Eupithecia impolita* VOJNITS, *sacrosancta* VOJNITS, *intolerabilis* VOJNITS, *granata* VOJNITS and *Eva flexa* VOJNITS.

In the course of the studies made in the Collection of Lepidoptera of the Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, and during the elaboration of the *Eupithecia* material ceded by this Institute as compensation for setting-work done on their collections, representatives of many new species as well as those of previously described ones have again been detected. In the present instance I desist from the diagnosis of species which are represented by female specimens only, even if they display highly characteristic and unequivocal features. In view namely of the great number of taxa and the complexity of the Asiatic material, this self-imposed restriction at the present state of elaboration and information is rather necessary in oder to obviate later confusion.

Eupithecia egena sp. n.

(Derivation of specific name: egenus = indigent)

D i a g n o s i s : Alar expanse of fore wings of the single known male specimen 20 mm. Wings elongate. Fore wing an isosceles triangle. Apex pointed. Hind wing elongate, angular. Holotype rather worn. Basic colour brown; postmedian of fore wing strikingly angulate (acute) in upper one-fourth and discal spot far removed from it. Underside of wing light, cilia yellowish brown.

G e n i t a l i a ♂: Uncus short, rotund with an acicular apex; valva short, wide, vinculum semicircular. Aedoeagus short and squat, with a chitinous spine and a clot. Basis of sternite VIII angulately excised, lateral arms heavy (Fig. 1). ♀ unknown.

* Studies on Palaeartic Eupithecia-species XX.

Biology: First stages and foodplant unknown. The holotype specimen flew in September.

Distribution: Known from China. Locus typicus: A-tun-tse. North Yuennan, 4000 m.

Specific differences: As regards genitalia, the new species stands nearest to *Eupithecia lasciva* VOJNITS. As to external morphological characters, it is larger, the wings more elongate and the pattern different. The similarity if the male genitalia is great, but the uncus is more rotund, the valva more elongate, the aedoeagus more robust and the chitinous spine is very characteristic.

Holotype ♂: "A-tun-tse (Nord Yünnan), Mittlere Höhe (ca. 4000 m), 6. 9. 1936. H. HÖNE" "gen. prep. No. 13755 ♂ DR. A. VOJNITS". Holotype deposited in the Hungarian Natural History Museum, Budapest. Slide: No. 13755 (♂), gen. prep. A. VOJNITS.

Eupithecia perpetua sp. n.

(Derivation of specific name: perpetuus = perpetual)

Diagnosis: Alar expanse of fore wings of the two known male specimens 21 mm. Wings broad. Costa of fore wing slightly, termen more arcuate while dorsum straight. Apex projecting. Hind wing angular. Basic colour of fore wing yellowish brown, transverse striate pale brown. Discal spot dark brown, elongate. Underside of fore wing light brownish yellow, that of hind wing whitish. Cilia striated yellowish brown and brown.

Genitalia: ♂: Uncus much elongated, valva long, vinculum broad. Aedoeagus small, with two small chitinous clots. Basis of sternite VIII deeply excised, lateral arms long (Fig. 2). ♀ unknown.

Biology: First stages and foodplant unknown. The type-specimens have been caught in May.

Distribution: A Chinese species. Locus typicus: A-tun-tse, North Yuennan, 3000 m.

Specific differences: The early period of flight, the whitish hind wing and the configuration of the aedoeagus and the uncus distinguish it from the similar Chinese species.

Holotype ♂: "A-tun-tse (Nord Yünnan), Talsohle ca. 3000 m, 26. 5. 1937. H. HÖNE" "gen. prep. No. 14102 ♂ DR. A. VOJNITS". Paratype as above, but from 16. 5. 1937, a male, Holotype deposited in the Hungarian Natural History Museum, Budapest, paratype in the Koenig Museum, Bonn. Slides: Nos 14102, 14103 (♂♂), gen. prep. A. VOJNITS.

Eupithecia cuneata sp. n.

(Derivation of specific name: cuneatus = cuneiform)

Diagnosis: Alar expanse of fore wings of the single known male specimen 19 mm. Wings elongate. Fore wing long, narrow, margins hardly

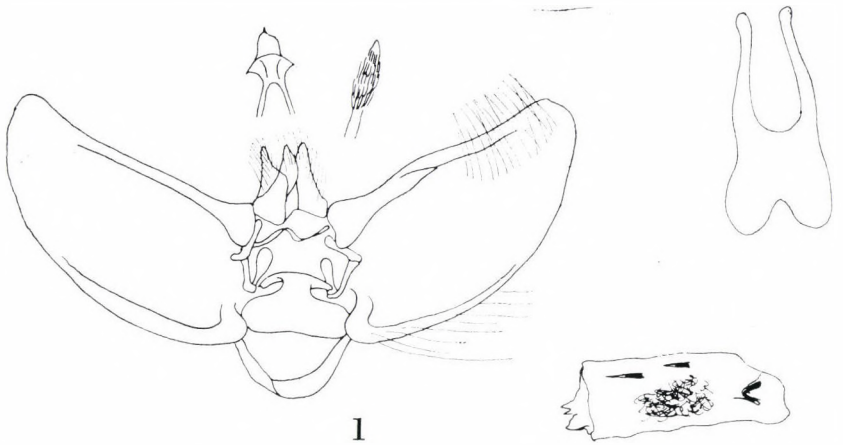

Fig. 1. Male genitalia and sternite VIII of *Eupithecia egena* sp. n.

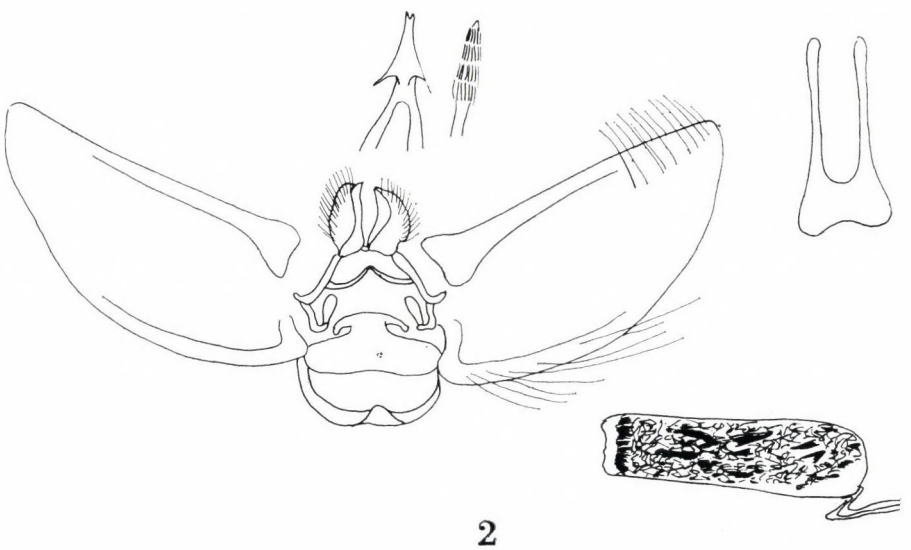

Fig. 2. Male genitalia and sternite VIII of *Eupithecia perpetua* sp. n.

arcuate, apex pointed. Hind wing long, narrow, angulate. Basic colour of fore wing fuscous with a rufous irroration, transverse stripes grey, discal spot minute. Underside of fore wing pale brown, that of hind wing pale brownish yellow; pattern elements brown. Cilia brown.

Genitalia ♂: Uncus and valva long, dorsum and ventrum largely parallel, apex broadly rounded. Vinculum apicate. Aedoeagus cylindrical, with several small chitinous formations. Sternite VIII highly characteristic: tulip-shaped distally (Fig. 3). ♀ unknown.

Biology: First stages and foodplant unknown. The holotype was collected in the middle of September.

Distribution: A Chinese species. Locus typicus: Li-kiang, North Yuennan.

Specific differences: Only *Eupithecia irreperta* VOJNITS displays a somewhat similarly formed sternite VIII, but all other parts of the male genitalia are considerably different.

Holotype ♂: "Li-kiang (China), Provinz Nord-Yuennan, 11. 9. 1934. H. HÖNE" "gen. prep. No. 13771 ♂ DR. A. VOJNITS". Holotype deposited in the Hungarian Natural History Museum, Budapest. Slide: No. 13771 (♂), gen. prep. A. VOJNITS.

Eupithecia fervida sp. n.

(Derivation of specific name: fervidus = hot)

Diagnosis: Alar expanse of fore wings of three male specimens 20, 21 and 21.5 mm; that of the single female exemplar 20 mm. Wings elongate. Costa of fore wing strongly arcuate at apex; termen and dorsum of equal length, termen slightly arching; tornus practically absent, termen and dorsum constituting a single long arc. Hind wing angulate. Basic colour of fore wing yellowish brown, veins covered with dark brown scales. Dark brown cuneiform spots at costa and in terminal zone. Transverse stripes rather pale, discal spot large, oval, dark brown. Hind wing brownish yellow, transverse stripes brown, discal spot minute, round. Underside of wings mate yellow, pattern elements sharp and brown. Cilia striated yellowish brown and brown.

Genitalia ♂: Uncus long and robust. Valva short, wide, dorsum slightly arched, ventrum angulate. Vinculum wide. Aedoeagus with a single large, flat, terminally pointed and slightly arcuate chitinous spine. Lateral arms of sternite VIII very long (Fig. 4). ♀: Bursa copulatrix a soft sack of irregular shape padded with chitinous spines in several zones and in a distinct field. Both posterior and anterior apophyses short and thin, papillae anales small (Fig. 7).

Biology: First stages and foodplant unknown. Flight period in July.

Distribution: A Chinese species. Locus typicus: A-tun-tse, North Yuennan. 4000 m.

Specific differences: Male genitalia resembling those of *Eupithecia granata* VOJNITS, but the uncus is robuster, the valva is unlike an orange slice, the chitinous spine of the aedoeagus is thicker, and the arms of sternite VIII do not terminate in a spine.

Holotype ♂: "A-tun-tse (Nord Yünnan), Mittlere Höhe (ca. 4000 m), 3. 7. 1936. H. HÖNE" "gen. prep. No. 14097 ♂ DR. A. VOJNITS". Paratypes: A-tun-tse, North Yuennan, 4000 and 4500 m, 17. and 21. 7. 1936, 2 ♂♂, 1 ♀. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in Budapest and the Koenig Museum, Bonn. Slides: Nos 14067, 14071, 14097 (♂♂), 14053 (♀), gen. prep. A. VOJNITS.

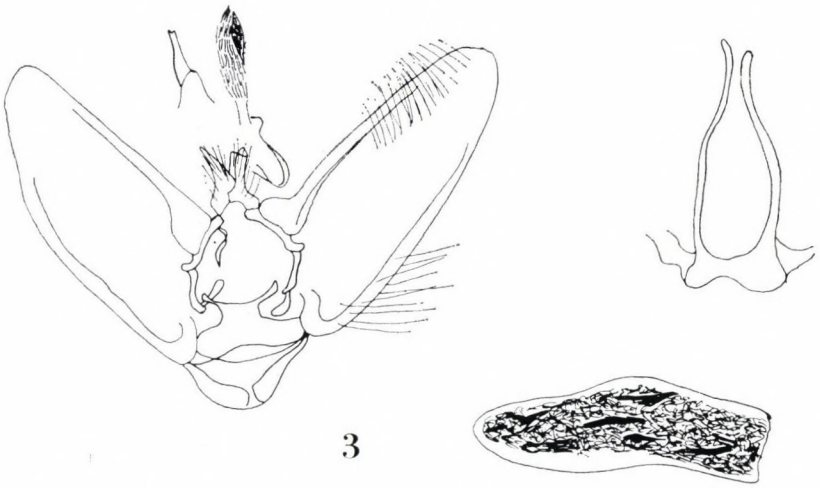

Fig. 3. Male genitalia and sternite VIII of *Eupithecia cuneata* sp. n.

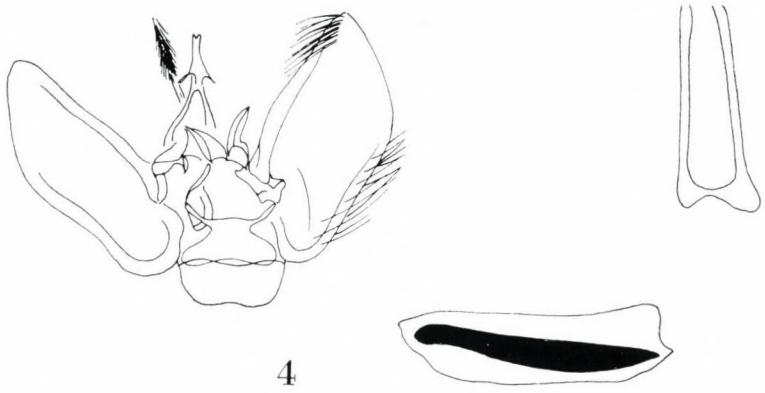

Fig. 4. Male genitalia and sternite VIII of *Eupithecia fervida* sp. n.

Eupithecia seminuda sp. n.

(Derivation of specific name: seminudus = half nude)

D i a g n o s i s : Alar expanse of fore wings of the single known male specimen 21 mm; that of the nine females 18– 21, averaging 19.5 mm. Wings elongate. Fore wing an isosceles triangle. Costa more arcuate than termen. Apex projecting. Hind wing elongate, obtusely angulate. Fore wing fuscous, transverse stripes grey, discal spot large, conspicuously black, rounded. Hind wing lighter, also transverse lines paler, discal spot hardly discernible. Underside still lighter, transverse striae pale, discal spot well visible on every wing. Cilia abraded.

Genitalia ♂: Uncus pointed, valva wide, shaped like an orange slice, dorsum slightly sinuous, ventrum evenly arcuate, apex pointed. Aedoeagus short, evenly cylindrical, with a large and irregularly shaped chitinous formation and a medium large and a small chitinous spine. Lateral arms of sternite VIII very long, straight, apically clavate (Fig. 5). ♀: bursa copulatrix pyriform, spherical section with minute chitinous spinelets, attenuating section ribbed with small scattered chitinous spines. Both posterior and anterior apophyses short and thin, papillae anales elongate (Fig. 8).

Biology: First stages and foodplant unknown. The known specimens were captured from July till September.

Distribution: A Chinese species. Locus typicus: Batang, 3800 m.

Specific differences: The genitalia are highly similar to those of *Eupithecia nonpurgata* VOJNITS; it is the aedoeagi which rather differ. As to external appearance, however, the two species do not even resemble each other, they differ widely as regards size, colour and pattern.

Holotype ♂: "Batang (Tibet), Untere Urwaldzone (ca. 3800 m), 2. 9. 1936. H. HÖNE", "gen. prep. No. 13858 ♂ DR. A. VOJNITS". Paratypes: Batang, Tibet, 3800 m, 2.—12. 8. 1936. 3 ♀♀; Mien-shan, Shan si, 2000 m, 7.—14. 8. 1937, 4 ♀♀; A-tun-tse, North Yuennan, 9. 8. 1936, 31. 7. 1937, 2 ♀♀. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in Budapest and in the Koenig Museum, Bonn. Slides: Nos 13858 (♂), 13264, 13267, 13319, 13736, 13738, 13742, 13745, 13851, 13863 (♀♀), gen. prep. A. VOJNITS.

Eupithecia inexhausta sp. n.

(Derivation of specific name: inexhaustus = inexhaustible)

Diagnosis: Alar expanse of fore wings of the two known male specimens: 20 and 21 mm; that of single female 19 mm. Costa gently arcuate, apex rounded. Hind wing angulate. Basic colour of fore wing yellowish brown. Transverse stripes yellow, external half of median field very characteristically yellow. Discal spot small and black. Hind wing obsolete yellow with a brownish irroration, transverse stripes pale, discal spot minute. Underside of wings pale yellow, pattern elements pale brown. Cilia striated yellow and brown.

Genitalia ♂: Uncus elongate, valva large, angulate, dorsum finely sigmoid, ventrum angled. Vinculum wide. Aedoeagus with a long, flat, twisted chitinous spine. Lateral arms of sternite VIII very long (Fig. 6). ♀: Anterior part of bursa copulatrix rotund, densely padded with chitinous spinelets; posterior part soft, infundibuliform. Anterior and posterior apophyses robust and medium long, papillae anales elongate (Fig. 9).

Biology: First stages and foodplant unknown. The type-specimens were collected from July till September.

Distribution: A Chinese species. Locus typicus: A-tun-tse, North Yuennan, 3500 m.

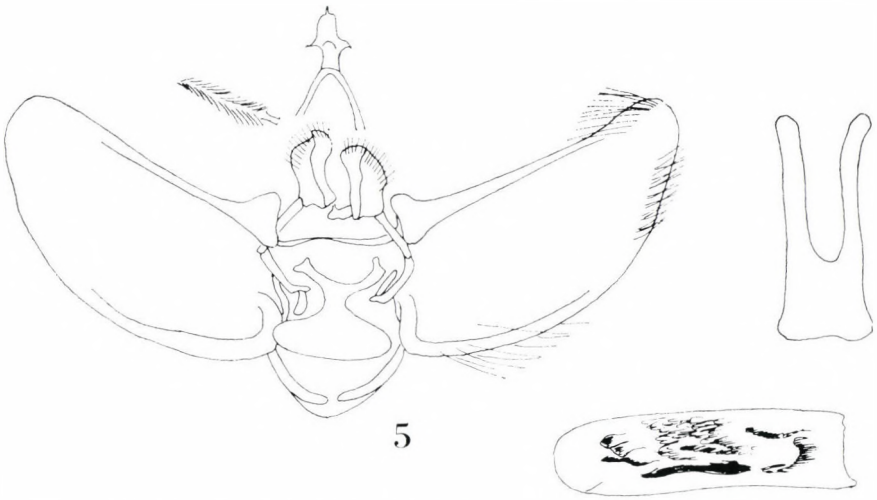

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Fig. 5. Male genitalia and sternite VIII of *Eupithecia seminuda* sp. n.

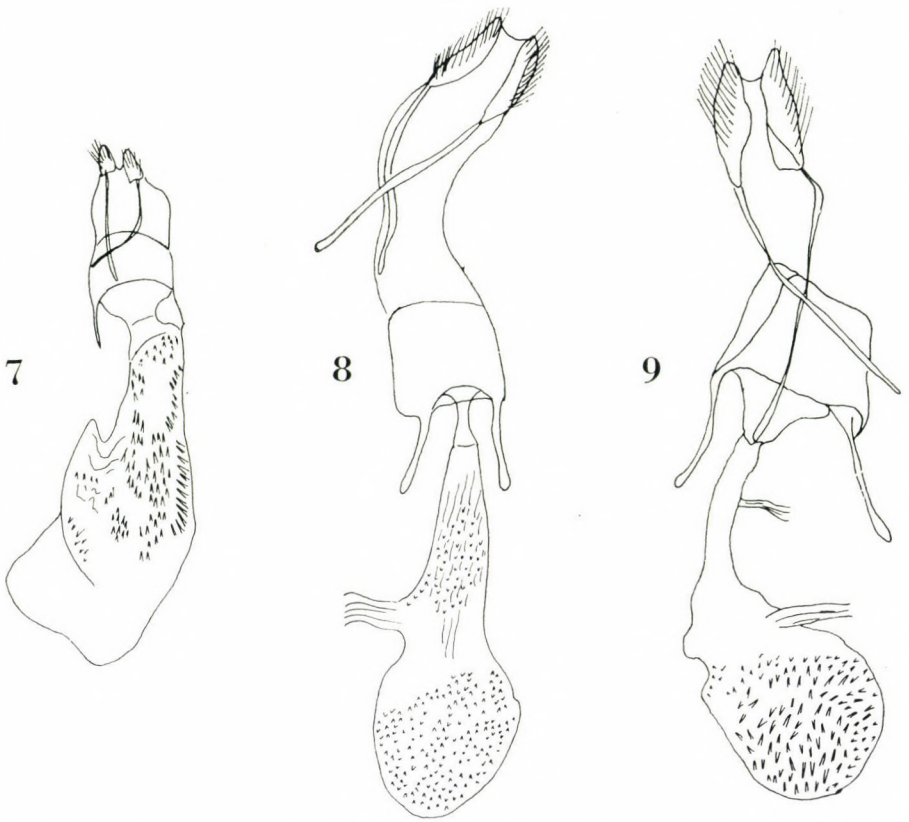


6

Fig. 6. Male genitalia and sternite VIII of *Eupithecia inexhausta* sp. n.

Species differences: By the large spine in the aedoeagus, the new species resembles *Eupithecia granata* VOJNITS, *E. vana* VOJNITS and *E. impavida* VOJNITS, but in all other respects the genitalia as well as the external characteristics differ.

Holotype ♂: "A-tun-tse (Nord Yünnan), Talsohle (ca. 3500 m), 5. 9. 1936. H. HÖNE" "gen. prep. No. 14115 ♂ DR. A. VOJNITS". Paratypes: A-tun-tse, North Yuennan, 4000 and 4500 m, 30. 7, 15. 8. 1936, 1 ♂, 1 ♀. Slides: Nos 14115, 14118 (♂♂), 14095 (♀), gen. prep. A. VOJNITS.



Figs 7—9. 7 = Female genitalia of *Eupithecia fervida* sp. n. 8 = Female genitalia of *E. seminuda* sp. n. 9 = Female genitalia of *E. inexhausta* sp. n.

Eupithecia profana sp. n.

(Derivation of specific name: profanus = profane)

D i a g n o s i s : Alar expanse of fore wings of the single known male specimen 21 mm, that of the sole female 23 mm. A large-sized, broad-winged species. Costa of fore wing slightly, termen more, arcuate, dorsum straight. Apex obtuse. Hind wing wide. Basic colour yellowish brown, hind wing lighter. Discal spot of fore wing big, dark brown, that of hind wing minute. Underside of wings yellowish brown, pattern elements clear. Cilia long, striated brown and dark brown.

G e n i t a l i a ♂: Uncus thick, wide, valva short. Vinculum broad. Aedoeagus small, with a short and two longer but thinner chitinous spines as well as a very long one (reaching half length of aedoeagus) and a chitinous clot. Sternite VIII damaged (Fig. 10). ♀: bursa copulatrix astonishingly small,

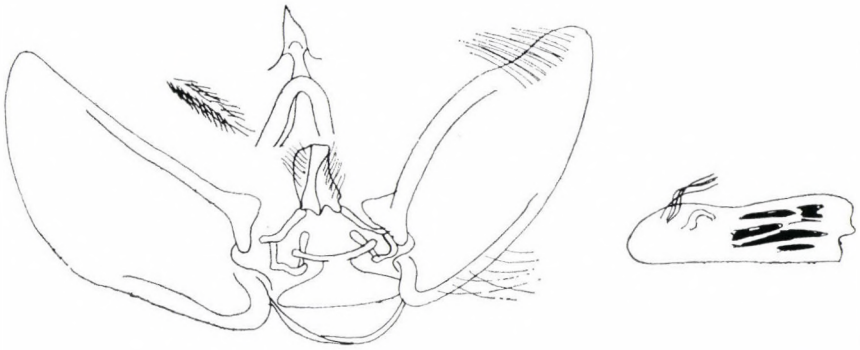


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Fig. 10. Male genitalia of *Eupithecia profana* sp. n.

elongate, padded with minute spinelets. Posterior and anterior apophyses medium long and thin. Papillae anales small (Fig. 13).

Biology: First stages and foodplant unknown. The type-specimens derive from June.

Distribution: A Chinese species. Locus typicus: Li-kiang, North Yuennan.

Specific differences: The new species differs from the similarly large and conspicuous Chinese congeners by the male aedoeagus and the female bursa copulatrix.

Holotype ♀: "Li-kiang (China), X Provinz Nord-Yuennan, 11. 6. 1934. H. HÖNE." "gen. prep. No. 13769 ♀ DR. A. VOJNITS". Paratype: as above, but: 14. 6. 1934, 1 ♂. Holotype and paratype deposited in the Hungarian Natural History Museum, Budapest. Slides: Nos 14201 (♂), 13769 (♀), gen. prep. A. VOJNITS.

Eupithecia epileptica sp. n.

(Derivation of specific name: epilepticus = epileptic)

Diagnosis: Alar expanse of fore wings of the sole known male specimen 19 mm, that of the single female 20 mm. Wings much elongated. Costa and termen of fore wing strongly, dorsum less heavily, arcuate. Apex pointed. Hind wing elongate, angulate. Basic colour fuscous, median field of fore wing rufous. Hind wing light. Discal spot of fore wing large and black, on hind wing minute. Underside of wings yellowish brown, transverse stripes brown. Cilia striated mate yellow and brown.

Genitalia ♂: Uncus long, valva long and very narrow. Vinculum broad. Aedoeagus thin, with a chitinous spine and a clot. Arms of sternite VIII long and narrow (Fig. 11). ♀: Bursa copulatrix small, spherical, with

minute chitinous spines. Both posterior and anterior apophyses short, papillae anales rotund and rather large (Fig. 14).

Biology: First stages and foodplant unknown. The type-specimens were taken in July and September.

Distribution: A Chinese species. Locus typicus: A-tun-tse, North Yuennan, 4500 m.

Species differences: The most characteristic features are the conspicuously elongate wings, the configuration of the male valva and the very small female bursa, a combination by which the new species differs from all congeners.

Holotype ♀: "A-tun-tse (Nord Yünnan), Obere Höhe (ca. 4500 m), 17. 7. 1936. H. HÖNE" "gen. prep. No. 13935 ♀ DR. A. VOJNITS". Paratype: Li-kiang, Nort Yuennan, 4. 9. 1935, 1 ♂. Holotype and paratype deposited in the Hungarian Natural History Museum, Budapest. Slides: Nos 13783 (♂), 13935 (♀), gen. prep. A. VOJNITS.

Eupithecia garrula sp. n.

(Derivation of specific name: garrulus = garrulous)

Diagnosis: Alar expanse of fore wing of four males between 18 and 20 mm, that of the single female 17 mm. Fore wing an isosceles triangle. Costa and termen arcuate, dorsum straight. Apex pointed. Hind wing obtusely angulate. All type-specimens rather worn. Fore wing yellowish brown, transverse striae brown, discal spot round, small, black. Hind wing lighter, whitish brown. Underside of wings light, pattern elements pale brown. Cilia striated brown and whitish brown.

Genitalia ♂: Uncus thick, robust. Valva shaped like an orange slice, dorsum slightly sinuous, ventrum evenly arched, apex rounded. Vinculum rounded. Aedoeagus cylindrical, with a long chitinous lamella and several clots. Sternite VIII attenuating, terminally lip-shaped (Fig. 12). ♀: Bursa copulatrix elongate, medially widening. Anterior part padded with densely arranged chitinous spines, medially with larger spines on a chitinous plate, cervically ribbed. Both anterior and posterior apophyses short and thin. Papillae anales rice-shaped (Fig. 15).

Biology: First stages and foodplant unknown. The type-specimens were taken in July and August.

Distribution: A Chinese species. Locus typicus: A-tun-tse, 4000 m.

Specific differences: Externally, the rather worn specimens preclude a safe separation from the similar Chinese species, but the characteristic aedoeagus and the formation of sternite VIII distinguish it satisfactorily.

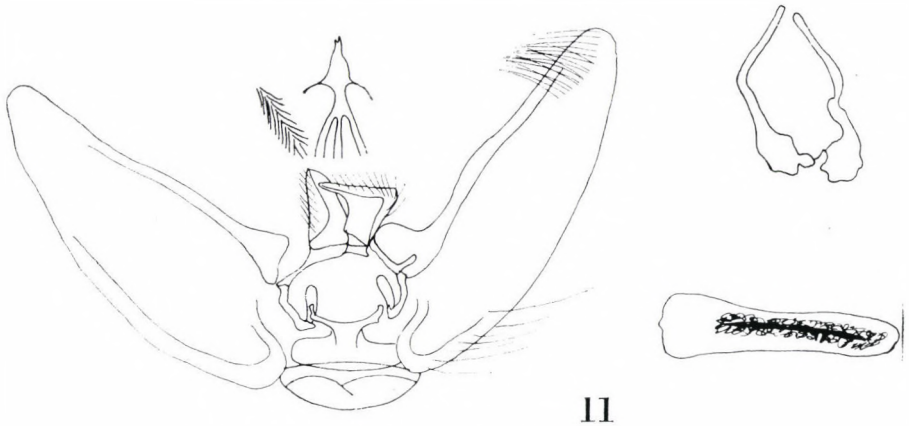

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Fig. 11. Male genitalia of *Eupithecia epileptica* sp. n.

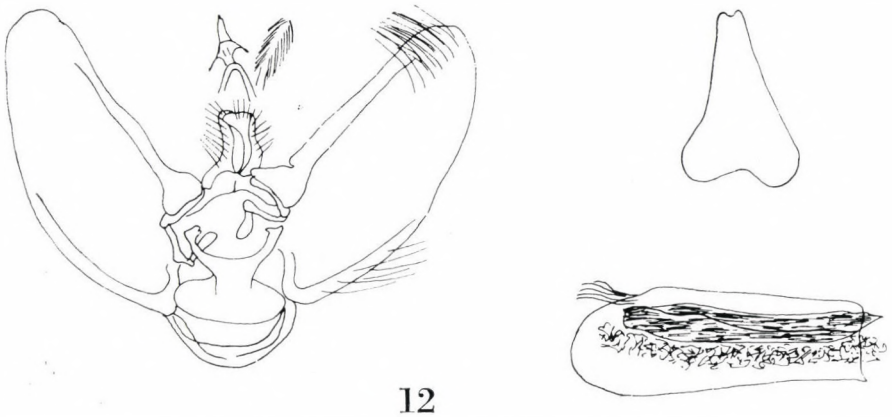

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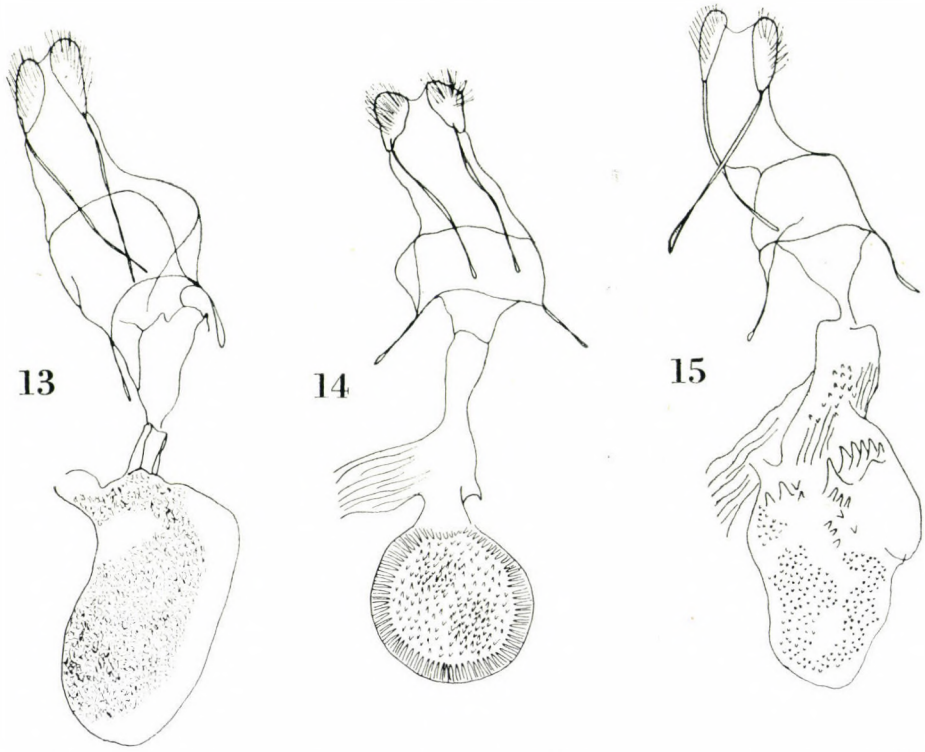
Fig. 12. Male genitalia of *Eupithecia garrula* sp. n.

Holotype ♂: "A-tun-tse 4000 19. 8. 36." "gen. prep. No. 13285 ♂ Dr. A. Vojnits". Paratypes: Li-kiang, North Yuennan, 2000 m, 14. 7. 1934, 1 ♂; Batang, Tibet, 3800 m, 1.—7. 8. 1936, 2 ♂♂; Batang, Tibet, Yangtze, 2800 m, 18. 9. 1936, 1 ♀. Holotype deposited in the Koenig Museum, Bonn, paratypes in Bonn and in the Hungarian Natural History Museum, Budapest. Slides: Nos 13271, 13285, 13822, 13852 (♂♂), 13882 (♀), gen. prep. A. Vojnits.

Eupithecia refertissima sp. n.

(Derivation of specific name: refertissimus = crammed)

Diagnosis: Alar expanse of fore wings of the single known male specimen 20 mm, that of the sole female 21 mm. Wings slightly elongate. Costa of fore wing arcuate at apex, termen entirely arched; apex pointed, tornus widely rounded. Hind wing elongate. Basic colour fuscous with a rufous yellowish suffusion, hardly lighter on hind wing than on fore wing. Trans-



Figs 13—15. 13 = Female genitalia of *Eupithecia profana* sp. n. 14 = Female genitalia of *E. epileptica* sp. n. 15 = Female genitalia of *E. garrula* sp. n.

verse stripes grey, obsolescent. Discal spot of fore wing black, hardly discernible on hind wing. Terminal field of fore wing with dark brown cuneiform spots. Underside of wings light, brownish yellow, pattern elements brown. Cilia striated yellowish brown and brown.

Genitalia ♂: Uncus robust valva wide, ventrum arched, vinculum rounded. Aedoeagus with several irregularly shaped chitinous formations and cornuti, the most characteristic being a ribbed chitinous object. Arms of sternite VIII long (Fig. 16). ♀: Bursa copulatrix pyriform, anteriorly padded with chitinous spines, attenuating section soft. Posterior and anterior apophyses thin and medium long. Papillae anales small (Fig. 25).

Biology: First stages and foodplant unknown. The type-specimens were taken in September.

Distribution: A Tibetan species. Locus typicus: Batang, 3800 m.

Specific differences: By the configuration of the genitalia, the new species stands near *Eupithecia sacrosancta* VOJNITS, although the chitinous formations of the aedoeagis differ. Externally, differences appear both in wing shape and pattern.

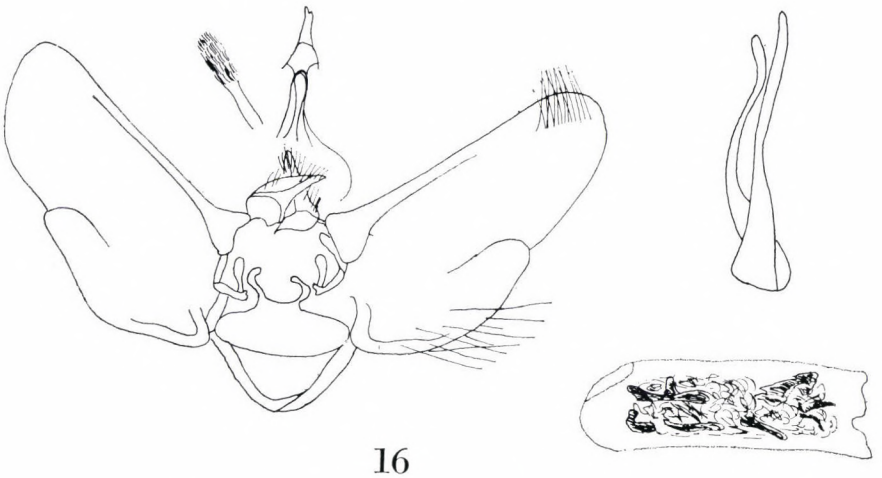


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Fig. 16. Male genitalia and sternite VIII of *Eupithecia refertissima* sp. n.

Holotype ♂: "Batang (Tibet), Untere Urwaldzone (ca. 3800 m), 22. 9. 1936. H. HÖNE." "gen. prep. No. 13883 ♂ DR. A. VOJNITS". Paratype: as above, but: 2. 8. 1936, 1 ♀. Holotype and paratype deposited in the Hungarian Natural History Museum, Budapest. Slides: Nos 13883 (♂), 13803 (♀), gen. prep. A. VOJNITS.

Eupithecia captiosa sp. n.

(Derivation of specific name: captiosus = deceptive)

D i a g n o s i s : A large-sized, conspicuous species. Alar expanse of fore wings of the two male specimens 21 and 22 mm, that of the two females 21.5 and 22.5 mm. Termen of fore wing strongly arcuate, apex rounded, tornus obtuse. Hind wing long. Basic colour of fore wing dark fuscous; transverse striae backed by grey umbrous stripes. Discal spot situated at half distance between base and apex, oval, black. Hind wing brownish yellow with a greyish suffusion. Transverse stripes brown, discal spot minute. Underside of wings yellowish brown, pattern elements brown, well discernible. Cilia striated yellowish brown and dark brown.

G e n i t a l i a ♂: Uncus long, valva large, dorsum straight, ventrum with a hardly projecting tooth, apex rounded. Vinculum wide. Aedoeagus large, stout, with a longer and a shorter sinuous chitinous spine and a hook-shaped chitinous object. Sternite VIII of male paratypes damaged (Fig. 17). ♀: Bursa copulatrix spherical, padded with very densely arranged chitinous spinules, elongate cervical section with a chitinous squama and a chitinous collar. Both anterior and posterior apophyses short and thin. Papillae anales small (Fig. 26).

B i o l o g y : First stages and foodplant unknow. The type-specimens were collected from June till September.

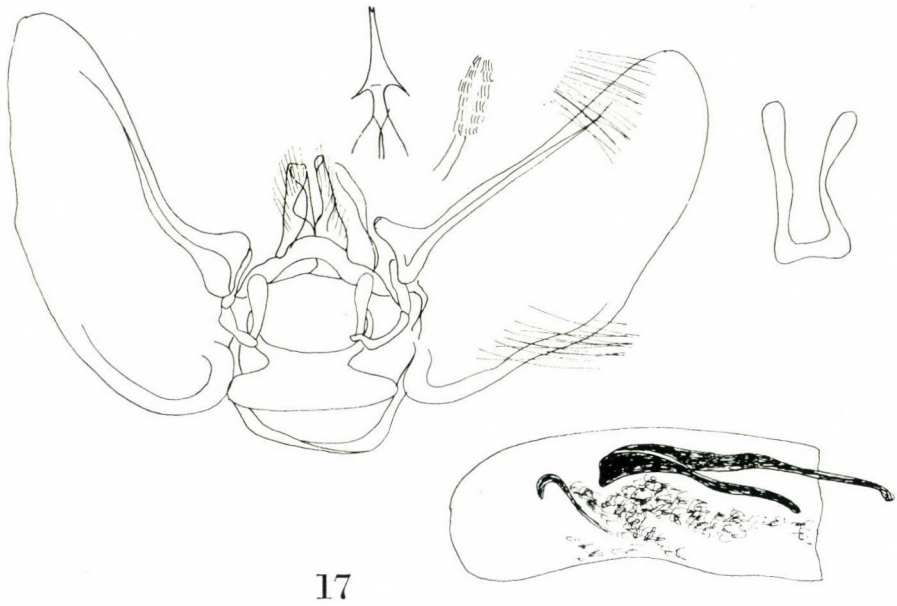

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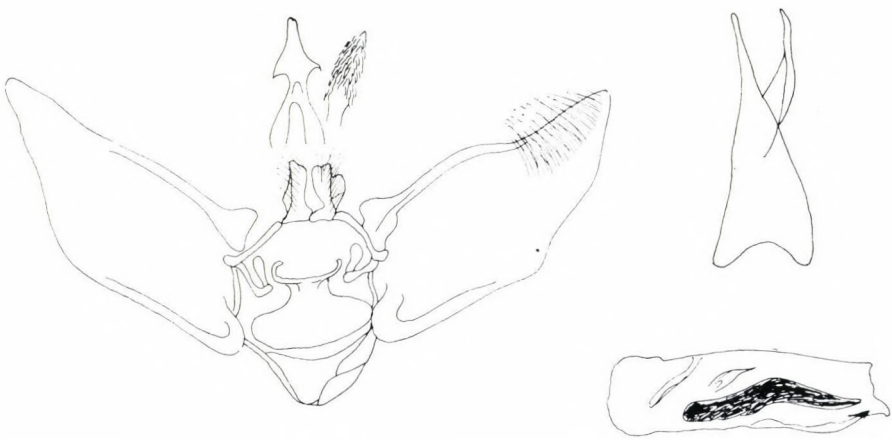
Fig. 17. Male genitalia and sternite VIII of *Eupithecia captiosa* sp. n.



18

Fig. 18. Male genitalia and sternite VIII of *Eupithecia infortunata* sp. n.

Distribution: A Chinese species. Locus typicus: Li-kiang, North Yuennan.

Specific differences: By the peculiar aedoeagus, the new species differs satisfactorily from some similar congeners; the species possessing also a pair of aedoeagal spines — *Eupithecia vasta* VOJNITS and *E. vana*

VOJNITS — differ both by the rest of the genital features and the external morphological characteristics.

Holotype ♂: "Li-kiang (China), Provinz Nord-Yuennan, 22. 7. 1935. H. HÖNE." "gen. prep. No. 14185 ♂ DR. A. VOJNITS". Paratypes: Li-kiang, North Yuennan, 4. 8., 8. 9. 1935, 1 ♂, 1 ♀; A-tun-tse, North Yuennan, 3000 m, 21. 6. 1937, 1 ♀. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in Budapest and in the Koenig Museum, Bonn. Slides: Nos 14185, 14186 (♂♂), 14183, 14189 (♀♀), gen. prep. A. VOJNITS.

Eupithecia infortunata sp. n.

(Derivation of specific name: infortunatus = unfortunate)

D i a g n o s i s : Alar expanse of fore wings of the single known male specimen 20 mm. Wings strikingly elongated. Costa of fore wing remarkably angulate before apex. Termen and dorsum very finely arcuate, tornus rounded. Hind wing elongate, rounded. Basic colour of fore wing rufous brown, hind wing brown, discal spot dark brown. Hind wing brownish white, discal spot minute. Underside of fore wing light, that of hind wing nearly white. Cilia of fore wing brown, that of hind wing white.

G e n i t a l i a ♂: Uncus robust, valva long and narrow, apex pointed. Vinculum projecting. Aedoeagus short, with a robust chitinous spine and two chitinous clots. Sternite VIII terminally pincer-shaped (Fig. 18). ♀ unknown.

B i o l o g y : First stages and foodplant unknown. The holotype specimen was taken in the middle of June.

D i s t r i b u t i o n : A Chinese species. Locus typicus: A-tun-tse, North Yuennan, 4000 m.

S p e c i f i c d i f f e r e n c e s : The elongate fore wing, the aedoeagus, the attenuating valva and the form of sternite VIII, as a combination of characters, distinguish the new species from all known congeners.

Holotype ♂: "A-tun-tse (Nord Yünnan), Mittlerer Höhe (ca. 4000 m), 13. 6. 1936. H. HÖNE" "gen. prep. No. 14196 ♂ DR. A. VOJNITS". Holotype deposited in the Hungarian Natural History Museum, Budapest. Slide: No. 14196 (♂), gen. prep. A. VOJNITS.

Eupithecia fragmentaria sp. n.

(Derivation of specific name: fragmentarius = fragmented)

D i a g n o s i s : Alar expanse of fore wings of the single male specimen 16.5 mm. A broad-winged species. Costa and termen of fore wing arcuate, dorsum straight. Apex pointed. Hind wing large, angulate. Basic colour of fore wing yellowish brown, and especially median field rufous. Transverse stripes backed by greyish spots. Discal spot elongate, black. Hind wing greyish yellow, transverse striae fuscous, discal spot minute. Underside brownish yellow, pattern elements well discernible. Cilia yellowish brown.

Genitalia ♂: Uncus long and wide. Valva shaped like an orange slice. Vinculum semicircular. Aedoeagus long thin and arcuate, with a small chitinous object. Sternite VIII with two arched arms (Fig. 19). ♀ unknown.

Biology: First stages and foodplant unknown. Flight period August.

Distribution: A Chinese species. Locus typicus: A-tun-tse, North Yuennan.

Specific differences: By its male genitalia, the new species stands nearest the Nepalese *Eupithecia lineidistincta* VOJNITS, *E. violacea* VOJNITS, and *E. matura* VOJNITS. Besides differing from these externally, differences can be found also in the reproductive organs. Compared with *E. lineidistincta* VOJNITS, the uncus is wider, the aedoeagus considerably thinner and longer, the vinculum rounded, the arms of sternite VIII longer and narrower; against *E. violacea* VOJNITS the uncus is not so attenuated, the valva resembles an orange slice, the vinculum is semicircular, the aedoeagus is different, the arms of sternite VIII are arcuate; and as for *E. matura* VOJNITS, the uncus is different, the vinculum is not angulate, the aedoeagus is longer and arcuate, the arms of sternite VIII are longer.

Holotype ♂: "A-tun-tse (Nord Yünnan), Mittlere Höhe (ca. 4000 m), 17. 8. 1936. H. HÖNE" "gen. prep. No. 13308 ♂ DR. A. VOJNITS". Holotype deposited in the Hungarian Natural History Museum, Budapest. Slide: No. 13308 (♂), gen. prep. A. VOJNITS.

Eupithecia acerba sp. n.

(Derivation of specific name: acerbus = bitter)

Diagnosis: Alar expanse of fore wings of the single known male 17 mm. A broad-winged species. Costa of fore wing arcuate at apex, termen and dorsum straight, but tornus widely rounded. Hind wing wide, obtusely angulate. Fore wing brown with a violet sheen. Hind wing light, whitish, decurrence of transverse striae characteristically zigzaggy. Discal spot dark brown, round, situated near costa. Hind wing lighter, transverse striae brown, discal spot small. Underside of wings pale, pattern elements brown. Cilia brown.

Genitalia ♂: Highly similar to those of *Eupithecia fragmentaria* VOJNITS, but valva wider, aedoeagus larger, arms of sternite VIII shorter, its basis wider (Fig. 20), ♀ unknown.

Biology: First stages and foodplant unknown. The holotype was taken at the beginning of July.

Distribution: A Chinese species. Locus typicus: Tapaishan, Tsinling, South Shensi.

Specific differences: A comparison of the new species with *Eupithecia fragmentaria* VOJNITS is most interesting: the configuration of the genitalia is misleadingly similar while the external morphological features widely differ. The basic colour is different as well as the decurrence of the

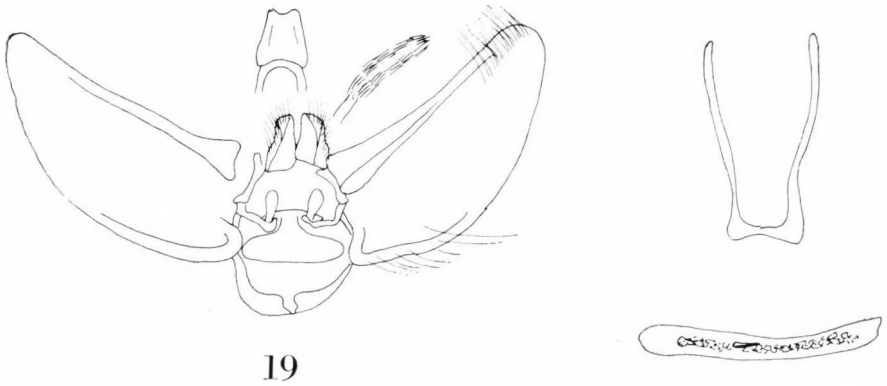


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Fig. 19. Male genitalia and sternite VIII of *Eupithecia fragmentaria* sp. n.

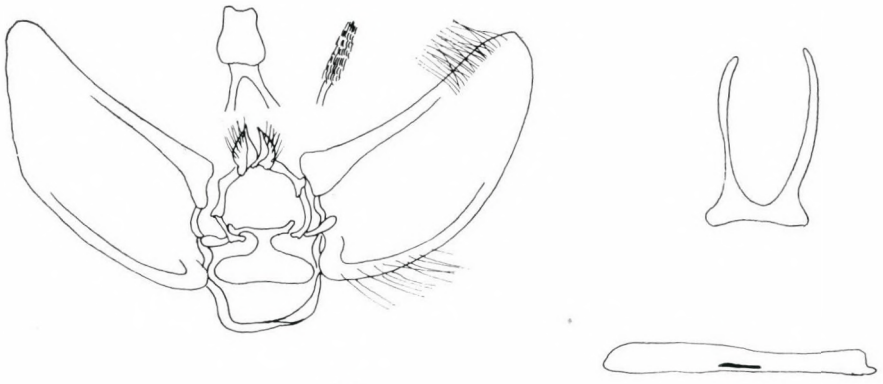

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Fig. 20. Male genitalia and sternite VIII of *Eupithecia acerba* sp. n.

transverse striae, and whereas the discal spot lies in the median transverse stripe in the new species, it appears based of the median stripe in *E. fragmentaria* VOJNITS.

Holotype ♂: "Tapaishan im Tsinling Sued-Shensi (China), L 2. 7. 1935. H. HÖNE" "gen. prep. No. 13270 ♂ DR. A. VOJNITS". Holotype deposited in the Hungarian Natural History Museum, Budapest. Slide: No. 13270 (♂), gen. prep. A. VOJNITS.

Eupithecia mortua sp. n.

(Derivation of specific name: mortuus = extinct)

D i a g n o s i s : Alar expanse of fore wings of the single known male specimen 18 mm. Fore wing an isosceles triangle. Costa and dorsum slightly, termen considerably more, arcuate. Apex somewhat pointed. Hind wing short, obtusely angulate. The holotype specimen is rather worn. Fore wing brown,

median field darker than rest of wing. Discal spot dark brown, on hind wing hardly discernible. Underside of wings pallid, pattern elements pale brown. Cilia brown.

Genitalia ♂: Uncus short and thick. Valva angulate, dorsum straight, ventrum arcuate then angled, apex rounded. Vinculum nearly straight. Aedoeagus with two closely adjacent and thus very characteristic chitinous spines: a longer and a shorter one, both arcuate; in addition a minute pair of spinules and a chitinous clot also present. Sternite VIII attenuating (Fig. 21). ♀ unknown.

Biology: First stages and foodplant unknown. The holotype was taken in August.

Distribution: A Chinese species. Locus typicus: A-tun-tse, North Yuennan, 4500 m.

Specific differences: As to external morphology, the new species (or as characterizable here owing to the bad state of preservation of the holotype) does not stand out much from the long series of similar Chinese congeners. With reference to the genitalia, it resembles those of *Eupithecia noxia* VOJNITS, but the configuration of the uncus and especially of the valva is different.

Holotype ♂: "A-tun-tse (Nord Yünnan), Obere Höhe (ca. 4500 m), 13. 8. 1936. H. HÖNE" "gen. prep. No. 15120 ♂ DR. A. VOJNITS". Holotype deposited in the Hungarian Natural History Museum, Budapest. Slide: No. 14120 (♂), gen. prep. A. VOJNITS.

Eupithecia sempiterna sp. n.

(Derivation of specific name: sempiternus = perpetual)

Diagnosis: Alar expanse of fore wings of the two known male exemplars 16 and 17 mm. Costa of fore wing arcuate at apex, termen and dorsum also arcuate and transitional in a common arc into each other. Basic colour of fore wing yellowish brown with a greyish irroration. Transverse stripes fuscous. Discal spot round, black. Hind wing yellowish, transverse striae pale, discal spot minute. Underside of wings with sharp pattern elements. Cilia brown.

Genitalia ♂: Uncus medium large. Valva shaped like an orange slice. Vinculum wide. Aedoeagus large, with a long, pointed, chitinous lamella, a similarly long and slightly arcuate spine and a chitinous clot. Base of sternite VIII straight, plate attenuating evenly (Fig. 22). ♀ unknown.

Biology: First stages and foodplant unknown. The type-specimens were collected in August and September.

Distribution: A Chinese species. Locus typicus: Li-kiang, North Yuennan.

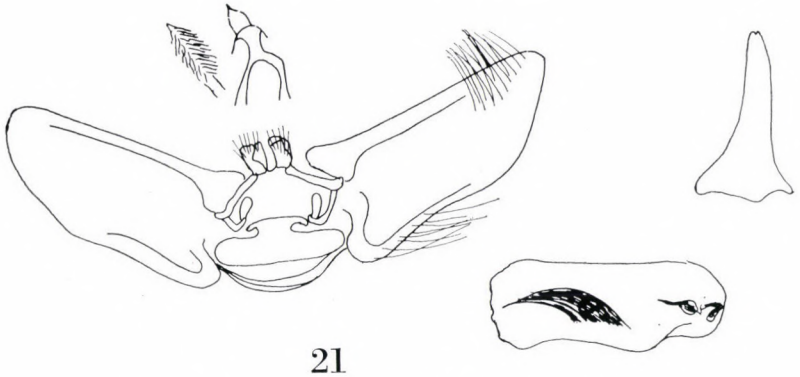

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Fig. 21. Male genitalia and sternite VIII of *Eupithecia mortua* sp. n.

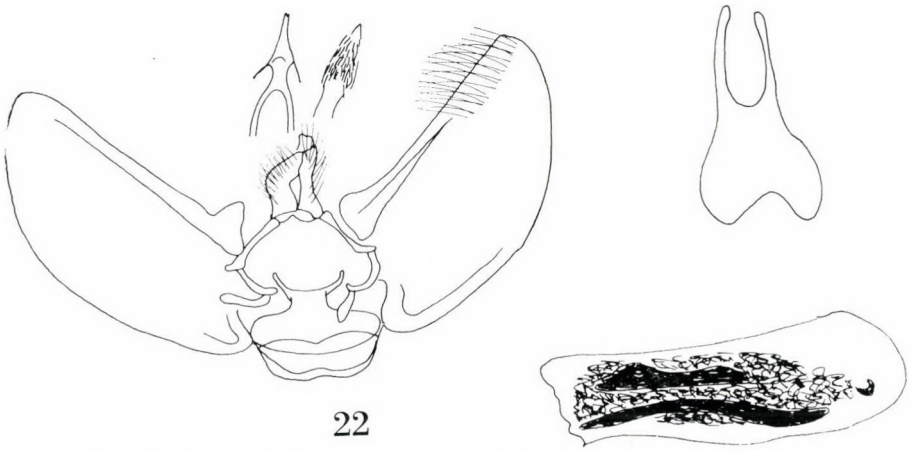

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Fig. 22. Male genitalia and sternite VIII of *Eupithecia sempiterna* sp. n.

S p e c i f i c d i f f e r e n c e s : The configuration of mainly the aedoeagus and its cornuti distinguish the new species from its congeners of a similar size and brown basic colour.

Holotype ♂: "Li-kiang (China), X Provinz Nord-Yuennan, 27. 8. 1934. H. HÖNE." "gen. prep. No. 13338 ♂ DR. A. VOJNITS". Paratype: same data, but from 21. 9. 1935, 1 ♂. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratype in the Koenig Museum, Bonn. Slides: Nos 13252, 13338 (♂♂), gen. prep. A. VOJNITS.

Eupithecia adoranda sp. n.

(Derivation of specific name: adorandus = adorable)

D i a g n o s i s : Alar expanse of fore wings of the single known male specimen 18 mm. Margins of fore wing only slightly arcuate; apex somewhat obtuse, tornus angulate. Hind wing broad. Fore wing yellowish brown, trans-

verse stripes yellowish, discal spot brown. Hind wing slightly lighter, transverse striae obsolescent discal spot indiscernible. Underside of wings yellowish, pattern elements pale brown. Cilia yellow.

Genitalia ♂: Uncus thick, robust. Valva short, wide, dorsum straight, ventrum evenly arcuate, apex rounded. Vinculum wide. Aedoeagus large, cylindrical, with two longer and two shorter chitinous objects and two smaller chitinous clots. Basis of sternite VIII wide, its lateral arms strongly attenuating (Fig. 23). ♀ unknown.

Biology: First stages and foodplant unknown. The holotype was taken at the end of June.

Distribution: A Chinese species. Locus typicus: Mien–shan, Shansi, 2000 m.

Specific differences: Genitally the new species resembles *Eupithecia vasta* VOJNITS, but the structure of the aedoeagus is different. The external features also differ.

Holotype ♂: "Mien-shan (prov. Shansi), Obere Höhe, ca. 2000 m, 30. 7. 1937. H. HÖNE" "gen. prep. No. 13741 ♂ DR. A. VOJNITS". Holotype deposited in the Hungarian Natural History Museum, Budapest. Slide: No. 13741 (♂), gen. prep. A. VOJNITS.

Eupithecia insana sp. n.

(Derivation of specific name: insanus = insane)

Diagnosis: Alar expanse of fore wings of the two known male specimens 20 and 21 mm, that of the five female exemplars between 19 and 23, on the average 20 mm. Costa and termen of fore wing evenly arcuate, apex pointed. Hind wing wide. Basic colour fuscous, fore wing slightly darker than hind wing. Transverse stripes of fore wing backed by conspicuous grey striae. Discal spot large, round, black. Hind wing with densely arranged transverse striae, discal spot small yet well discernible. Underside of wings yellowish grey, pattern elements grey. Cilia grey.

Genitalia ♂: Uncus short, valva long, dorsum straight, ventrum finely arcuate. Vinculum wide. Aedoeagus with a multiply bent chitinous formation and two long lamellae. Arms of sternite VIII long, terminally slightly expanded (Fig. 24). ♀: Bursa copulatrix elongate, gourd-shaped, its three-fifths padded with minute spines. Both anterior and posterior apophyses extremely long and robust. Papillae anales elongate (Fig. 27).

Biology: First stages and foodplant unknown. The type specimens were taken in August and October.

Distribution: A Tibetan species. Locus typicus: Batang, 2800 m.

Specific differences: Concerning the characteristics of the male genitalia, the new species resembles *Eupithecia sempiterna* VOJNITS and *E. adoranda* VOJNITS, but the uncus and some details of the aedoeagus are different. The external differences are conspicuous.

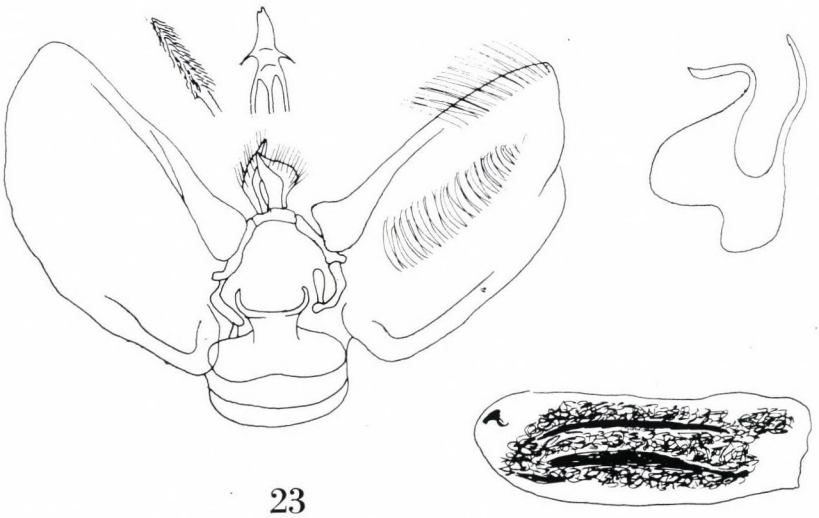

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Fig. 23. Male genitalia and sternite VIII of *Eupithecia adoranda* sp. n.

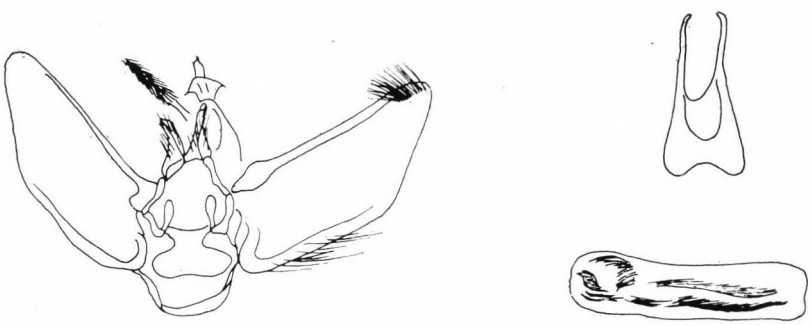

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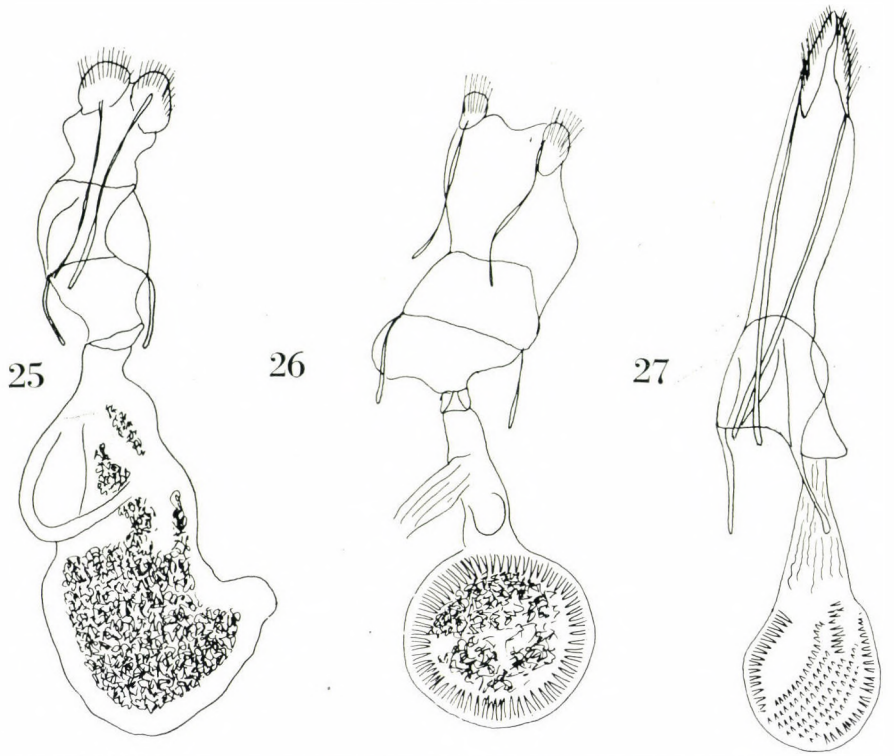
Fig. 24. Male genitalia and sternite VIII of *Eupithecia insana* sp. n.

Holotype ♂: "Batang (Tibet). In Tal des Yangtze (ca. 2800 m), 28. 8. 1936. H. HÖNE." "gen. prep. No. 13802 ♂ DR. A. VOJNITS". Paratypes: Batang, Tibet, 2800—3800 m, 2. 8., 6. 10. 1936, 1 ♂, 5 ♀♀. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in Budapest and the Koenig Museum, Bonn. Slides: Nos 13802, 13811 (♂♂), 13812, 13847, 13854, 13861, 14049 (♀♀), gen. prep. A. VOJNITS.

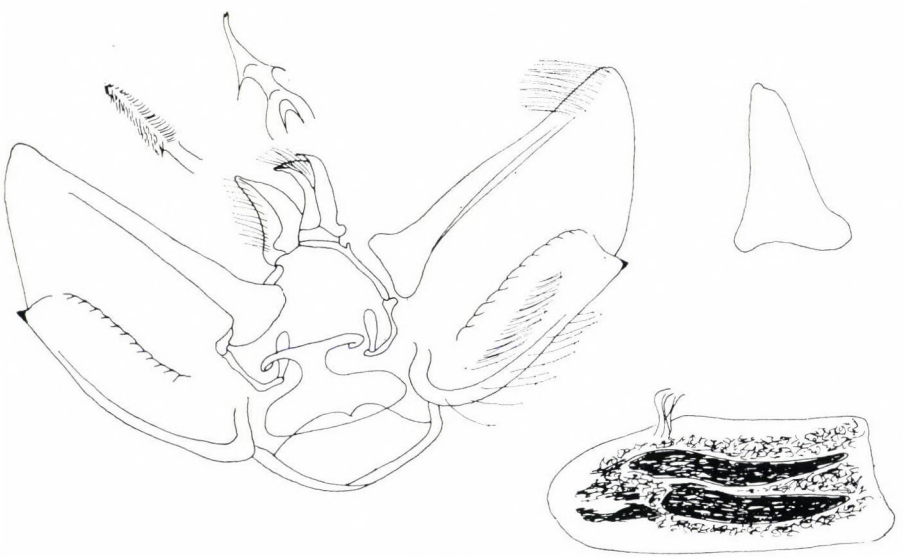
Eupithecia incorrupta sp. n.

(Derivation of specific name: incorruptus = not counterfeit)

D i a g n o s i s : A wide-winged, large-sized Eupithecia species. Alar expanse of fore wings of the two known male exemplars 22 mm. Costa of fore wing straight, termen slightly, dorsum hardly, arcuate. Apex pointed, tornus



Figs 25—27. 25 = Female genitalia of *Eupithecia refertissima* sp. n. 26 = Female genitalia of *E. captiosa* sp. n. 27 = Female genitalia of *E. insana* sp. n.



28

Fig. 28. Male genitalia and sternite VIII of *Eupithecia incorrupta* sp. n.

angulate. Basic colour of fore wing brownish yellow, transverse striae yellow, discal spot dark brown. Marginal zone of hind wing as fore wing, otherwise lighter. Basal and median fields with densely arranged transverse lines; discal spot minute, elongate. Underside of wings yellowish white, pattern elements conspicuous. Cilia brownish yellow.

Genitalia ♂: Uncus elongate. Valva wide, dorsum slightly arched, ventrum angulate at 2/3, with a dentiform projection. Vinculum flat and wide. Aedoeagus very short, thick, with two stout chitinous spines and several chitinous formations. Sternite VIII attenuating and terminally rounded (Fig. 28). ♀ unknown.

Biology: First stages and foodplant unknown. The type specimens were captured in the second half of May and the first half of June.

Distribution: A Chinese species. Locus typicus: A-tun-tse, North Yuennan, 3000 m.

Specific differences: Resembling *Eupithecia impavida* VOJNITS to some extent, but it is larger and by the genitalic features unequivocally different. The shape of the valva of the new species is especially characteristic, as also the aedoeagus.

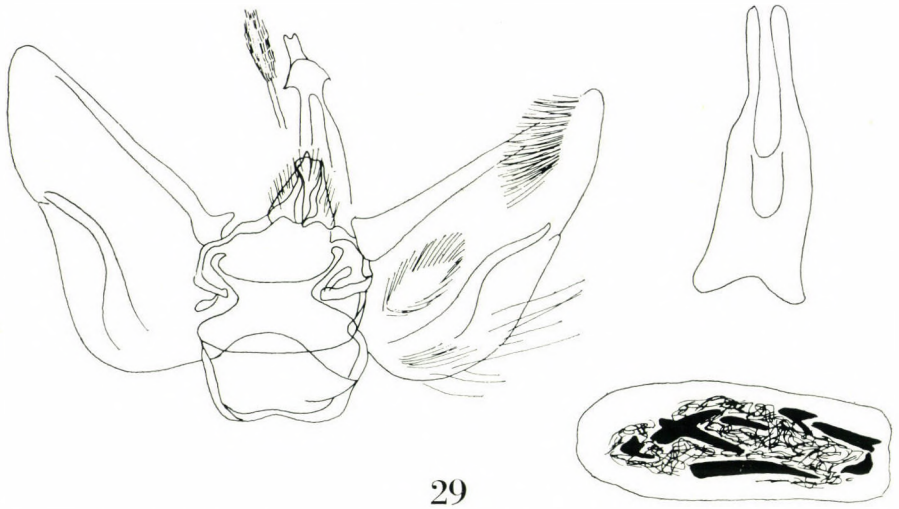
Holotype ♂: "A-tun-tse (Nord-Yünnan), Talsohle, ca. 3000 m, 9. 6. 1938. H. HÖNE" "gen. prep. No. 13759 ♂ DR. A. VOJNITS". Paratype: as the holotype, but: 18. 5. 1937, 1 ♂. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratype in the Koenig Museum, Bonn. Slides: Nos 13759, 13761 (♂♂), gen. prep. A. VOJNITS.

Eupithecia mentita sp. n.

(Derivation of specific name: mentitus = feigned)

Diagnosis: Alar expanse of fore wings of the two known male specimens 18 and 18.5 mm, that of the single female 20 mm. Costa of fore wing slightly, termen more, dorsum hardly, arcuate. Apex pointed, tornus widely rounded. Hind wing rather short, rounded. Basic colour yellowish brown, hind wing rather yellow. Postmedian stripe of fore wing greyish, discal spot elongate, conspicuous, dark brown. Transverse striae of hind wing pallid, discal spot minute and obsolescent. Underside of wings yellowish, discal spots marked on both fore and hind wings. Cilia striated yellowish brown and dark brown.

Genitalia ♂: Uncus short but robust. Valva angular, ventrum arched, excised, with a corniform inner process (? ampulla; surprising in *Eupithecia* species). Aedoeagus short, thick and cylindrical, with a larger and a smaller chitinous spine and several irregularly shaped chitinous formations. Arms of sternite VIII long (Fig. 29). ♀: cross section of bursa copulatrix oval, anterior part padded with minute chitinous spinules, posterior part with a chitinous plate. Anterior and posterior apophyses short, papillae anales small (Fig. 32).



29

Fig. 29. Male genitalia and sternite VIII of *Eupithecia mentita* sp. n.

Biology: First stages and foodplant unknown. The type specimens were taken in August.

Distribution: A Chinese species. Locus typicus: Batang, 3800 m.

Specific differences: By the genital structure, the new species belongs in the alliance of *Eupithecia impavida* VOJNITS, but differs in some marked features.

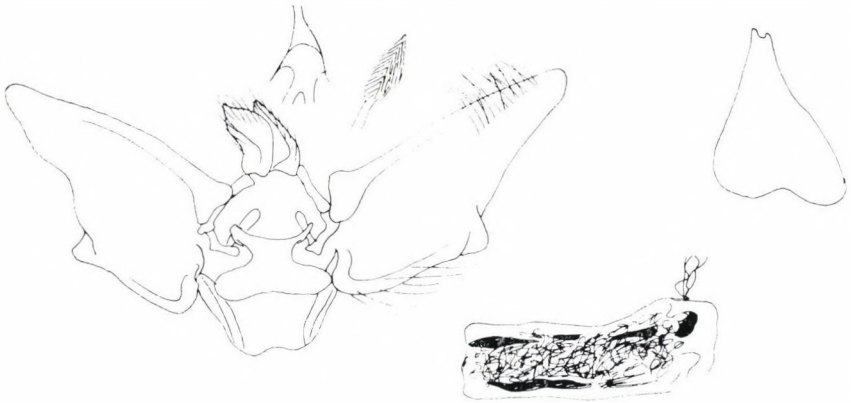
Holotype ♂: "Batang (Tibet), Untere Urwaldzone (ca. 3800 m), 6. 8. 1936. H. HÖNE." "gen. prep. No. 13832 ♂ DR. A. VOJNITS". Paratypes: Li-kiang, North Yuennan, 14. 8. 21. 8. 1935, 1 ♂, 1 ♀. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in Budapest and in the Koenig Museum, Bonn. Slides: Nos 13352, 13832 (♂♂), 14144 (♀), gen. prep. A. VOJNITS.

Eupithecia arenosa sp. n.

(Derivation of specific name: arenosus = sandy)

Diagnosis: Alar expanse of fore wings of the single known male specimen 20 mm. Fore wing elongate, margins finely arcuate, apex pointed. Hind wing short, angulate. Fore wing yellowish brown, postmedian a wide band, terminal field with dark dots and cuneiform spots, discal spot obsolete. Hind wing, however, with a well discernible discal spot. Underside of wings yellowish brown, pattern elements brown, discal spots marked on both pairs of wings. Cilia striated yellow and brown.

Genitalia ♂: Most characteristic, of a robust structure. Uncus large, thick and long. Valva short, attenuating, apex pointed, dorsum slightly concave, ventrum with a dentiform projection. Vinculum angulate. Aedoeagus stout, with two larger and several shorter elongate chitinous objects. Sternite



30

Fig. 30. Male genitalia and sternite VIII of *Eupithecia arenosa* sp. n.

VIII gradually then abruptly tapering, with a labiate termination (Fig. 30). ♀ unknown.

Biology: First stages and foodplant unknown. The holotype was collected in May.

Distribution: A Chinese species. Locus typicus: A-tun-tse, North Yuennan, 3000 m.

Specific differences: By the male genitalia and sternite VIII, the new species resembles *Eupithecia infecta* VOJNITS, but the aedoeagi are completely different. A similarity exists also with *E. inchoata* VOJNITS, but the aedoeagus again essentially differs. Externally it is wholly dissimilar from both.

Holotype ♂: "A-tun-tse (Nord-Yünnan), Talsohle (ca. 3000 m), 25. 5. 1937. H. HÖNE" "gen. prep. No. 14108 ♂ DR. A. VOJNITS". Holotype deposited in the Hungarian Natural History Museum, Budapest. Slide: No. 14108 (♂), gen. prep. A. VOJNITS.

Eupithecia tempestuosa sp. n.

(Derivation of specific name: tempestuosus = tempestuous)

Diagnosis: Alar expanse of fore wings of the single known male specimen 20 mm, that of the single female exemplar 18 mm. Costa and termen of fore wing slightly arcuate, dorsum straight. Apex elongate. Hind wing elongate, angulate. Both type-specimens rather worn. Basic colour yellowish brown, transverse striae brown, discal spot of fore wing marked, not discernible on hind wing. Underside of wings light. Cilia brownish yellow.

Genitalia ♂: Uncus thick, valva short and wide, dorsum straight, ventrum medially heavily arcuate, apex pointed. Vinculum elongate, angulate.

Aedoeagus cylindrical, with a minute chitinous clot. Sternite VIII large, terminally lip-shaped (Fig. 31). ♀: Bursa copulatrix broken in an acute angle, its sacculiform part padded with chitinous spinules the long cervical section ribbed. Both posterior and anterior apophyses short, papillae anales small (Fig. 33).

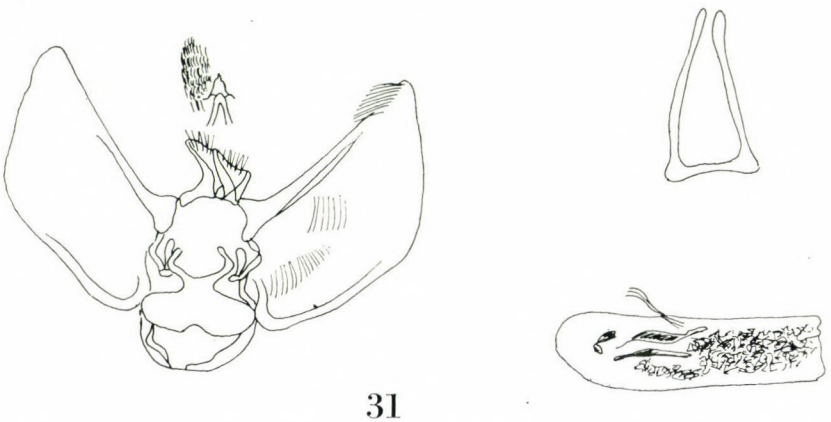
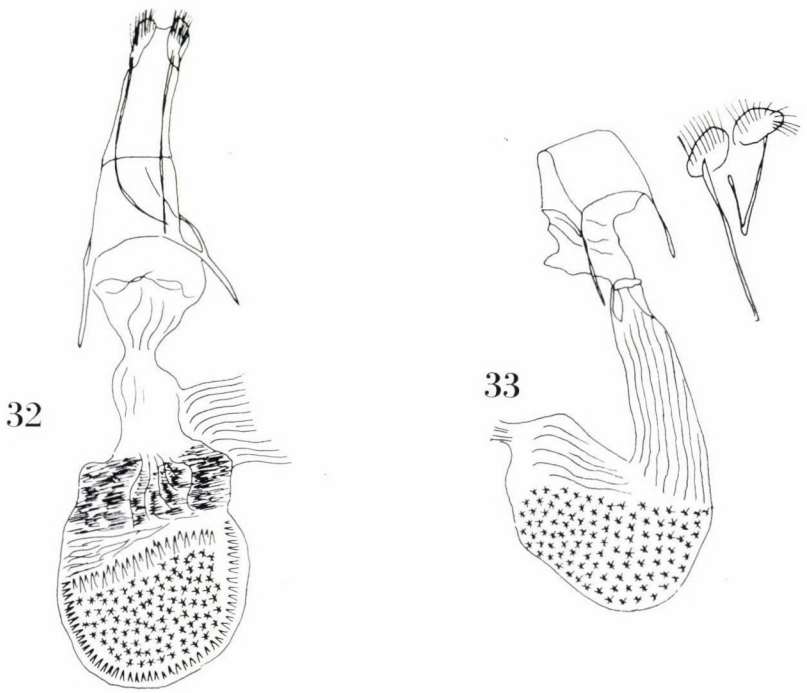


Fig. 31. Male genitalia and sternite VIII of *Eupithecia tempestuosa* sp. n.



Figs 32—33. 32 = Female genitalia of *Eupithecia mentita* sp. n. 33 = Female genitalia of *E. tempestuosa* sp. n.

Biology: First stages and foodplant unknown. The type-specimens were taken in the first days of August.

Distribution: A Tibetan species. Locus typicus: Batang, 3800 m.

Specific differences: By the shape of sternite VIII, the new species resembles *Eupithecia infensa* VOJNITS, but the structure of the uncus and the aedoeagus as well as the shape of the valva are different.

Holotype ♂: "Batang (Tibet), Untere Urwaldzone (ca. 3800 m), 1. 8. 1931. H. HÖNE." "gen. prep. No. 13844 ♂ DR. A. VOJNITS". Paratype: as the holotype, but: 3. 8. 1936, 1 ♀. Holotype and paratype deposited in the Hungarian Natural History Museum, Budapest. Slides: Nos 13844 (♂), 13835 (♀), gen. prep. A. VOJNITS.

Eupithecia impolita VOJNITS, 1980

Acta zool. hung., **26:** 433—435, Figs 1—2, 17.

The specimens found recently had been collected in the same localities and period as given for the published exemplars.

Examined material: Mien-shan, Shansi, 1500 m, 3—10. 6. 1937, 1 ♂, 2 ♀♀. Slides: Nos 13735 (♂), 13733, 13734 (♀♀), gen. prep. A. VOJNITS.

Eupithecia sacrosancta VOJNITS, 1979

Acta zool. hung., **25:** 206, Fig. 17.

The recently detected specimen had flown in the period corresponding to that given in the description, but it had been taken in another locality.

Examined material: Li-kiang, North Yuennan, 25. 8. 1935, 1 ♂. Slide: No. 13351 (♂), gen. prep. A. VOJNITS.

Eupithecia intolerabilis VOJNITS, 1981

Acta zool. hung., **27:** 423—425, Figs 42—45.

The recently discovered specimens had been captured partly in different localities and at different times.

Examined material: Li-kiang, North Yuennan, 3. 9. 1935, 1 ♂; A-tun-tse, North Yuennan, 4000 m, 18. 8. 1936, 1 ♂. Slides: Nos 13260, 13306 (♂♂), gen. prep. A. VOJNITS.

Eupithecia granata VOJNITS, 1979

Acta zool. hung., **25:** 193—195, Figs 1—2.

The locality and flight period data agree with those given in the original publication.

Examined material: Li-kiang, North Yuennan, 18. 8., 29. 8. 1934, 3. 9. 1935, 3 ♂♂. Slides: Nos 13255, 13261, 13262 (♂♂), gen. prep. A. VOJNITS.

Eva flexa VOJNITS, 1981

Acta zool. hung., **27:** 408—410, Figs 1—7.

A specimen found in the examined material from the already known locality, but with a new date. The new flight datum (July) renders the supposition of a bivoltine species uncertain, indeed, it rather suggests a single brood with a protracted flight period.

Examined material: Li-kiang, North Yuennan, 10. 7. 1934, 1 ♂. Slide: No. 13350 (♂), gen. prep. A. VOJNITS.

Acknowledgements. A research grant of more than one year, given by the Alexander von Humboldt Foundation, made it possible to study the materials of some larger museums: I should like to express my gratitude to the Directors of the Foundation also in this place. I am also indebted to Prof. Dr. Nobis (Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn) for his extensive help; his support has largely contributed to the successful execution of my work.

Acta Zoologica Hungarica 30 (1—2), pp. 241—248 (1984)

NEUE REGENWÜRMER AUS RUMÄNIEN (OLIGOCHAETA: LUMBRICIDAE)

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(Eingegangen am 31. März 1983)

Description of two new lumbricid species, *Octodrilus transylvanicus* sp. n. and *Octodrilus compromissus* sp. n., as well reintroduction of the Taxon *Fitzingeria annectens* (Rosa, 1895) comb. n. are given.

Während eines Studienaufenthaltes von V. V. Pop in Budapest, der von der Ungarischen Akademie der Wissenschaften unterstützt wurde, konnten anhand verschiedener in Rumänien gesammelter Regenwürmer, unter Berücksichtigung der neueren taxonischen Kenntnisse, interessante Feststellungen gemacht werden. Bei dieser Gelegenheit wurden in erster Linie die Vertreter der Gattung *Octodrilus* Omodeo, 1956 in den Vordergrund der Untersuchungen gestellt, doch sind auch Arten anderer Gattungen diskutiert worden. Über die gemeinsamen Erfahrungen, die bei der Durchsicht des verschiedenen Materials gemacht wurden, soll in nachstehender Arbeit berichtet werden.

Octodrilus Omodeo, 1956

Wie bereits darauf hingewiesen wurde (Zicsi, 1971) sind innerhalb der Gattung *Octodrilus*, vorwieglich in den Kalkgebieten Jugoslawiens, Italiens, Österreichs und der Schweiz (Tessin) zahlreiche Formen angetroffen worden, die den bis dahin bekannten Arten nicht eingereiht werden konnten. Durch die Revision einiger Typen sowie durch Heranziehen bisher unberücksichtigter morphologischer und anatomischer Merkmale ist es anhand von Serienmaterial gelungen, gut begrenzbare neue Taxa festzulegen (Zicsi, 1970, 1979, 1981).

In der Fauna Rumäniens, die innerhalb der Gattung *Octodrilus* auch Endemiten aufweist, werden unter Berücksichtigung der Erstbeschreibungen die Arten dieser Gattung von Pop (1948) in seinem Bestimmungsbuch zusammengefaßt. Da diese Diagnosen auf erweiterten Merkmalkombinationen beruhen, sollen einige Arten, von denen neueres Untersuchungsmaterial zur Verfügung steht, einer Revision unterzogen werden. Es handelt sich um *O. exacystis* (Rosa, 1896) und um die als *O. lissaensis* (Michaelsen, 1891) in der Fauna Rumäniens angeführten Arten.

Octodrilus exacystis (ROSA, 1896)

Laut Originalbeschreibung sollen ROSA [Loc. Schuler presso Kronstadt (Siebenbürgen) 4000 piedi s. m] vom Postavar bei Braşov verschieden große Exemplare (20 cm bzw. 10—11 cm) zur Beschreibung vorgelegen haben. Die Segmentzahl wird bei der großen Form mit 170, bei den kleinen mit 165—180 bezeichnet. Der Gürtel erstreckt sich bei den kleinen Tieren vom 30.— 37. Segment, die Pubertätsstreifen verlaufen entlang des ganzen Gürtels bis zum 38. Segment. Beim großen Tier erstreckt sich der Gürtel vom 30.—38. Segment, die Pubertätsstreifen reichen bis zum 39. Segment. Von ROSA wird hervorgehoben, daß die Testikelblasen fehlen. POP (1948) übernimmt diese Diagnose und ergänzt in einer Bemerkung, daß er bei allen von ihm untersuchten Tieren Testikelblasen im 10 u. 11. Segment nachweisen konnte.

Inzwischen wurden zahlreiche Exemplare dieser Art in verschiedenen Teilen Transsylvaniens gesammelt, selbst am Locus typicus wurden Sammlungen durchgeführt, wo u. a. auch mehrere Exemplare dieser Art erbeutet werden konnten.

Bei allen von uns untersuchten, äußerst verschiedengroßen Tieren fanden wir die Lage der Pubertätsstreifen stets konstant vom 30.—38. Segment reichend. Der Gürtel erstreckt sich im allgemeinen vom 30.— 37. Segment, manchmal lassen sich Anschwellungen auch am 1/2 29. und 1/2 38. Segment erkennen. Bei keinem der untersuchten Tiere fanden wir die von ROSA für das große Exemplar kennzeichnende Gürtellage und die Pubertätsstreifen bis zum 39. Segment reichend. Da wir die Ausdehnung der Pubertätsstreifen als bedeutendes Merkmal in dieser Gattung betrachten, halten wir nur die Tiere zur Art *O. exacystis* gehörend, bei denen sich der Gürtel vom 1/2 29., 30.—37., 1/2 38. Segment erstreckt, die Pubertätsstreifen bis zum 38. Segment reichen.

Wie aus den weiter unten angeführten hervorgeht, handelt es sich um eine in Transsylvanien sehr verbreitete Art, die bedeutende Größenunterschiede aufweist.

Die Originalbeschreibung von ROSA und die Ergänzungen von POP berücksichtigend, geben wir eine genaue Diagnose von *O. exacystis* an.

Länge 50—310 mm, Durchmesser 4—9 mm, Segmentzahl 100—252.

Farbe: dorsal dunkelgrau, sonst unpigmentiert, Exemplare aus dem Hochgebirge weiß, unpigmentiert.

Kopf epilobisch 1/2 offen. Segmente doppelt oder mehrfach geringelt. Nephridialporen verlaufen in einer Linie oberhalb der Borsten b. Erster Rückenporus auf Intersegmentalfurche 9/10 – 14/15. Erster Porus manchmal schwer zu erkennen. Borsten ungepaart, $aa : ab : bc : cd = 3 : 2 : 1{,}3 : 0{,}9$; $dd = 1/4$ u. Borstenpapillen fehlen. Weibliche Poren auf dem 14. Segment in der Linie der Nephridialporen. Männliche Poren auf dem 15. Segment, zwischen der Borstenlinie *b* und *c* winzig kleine Öffnungen. Gürtel vom 1/2 29.,

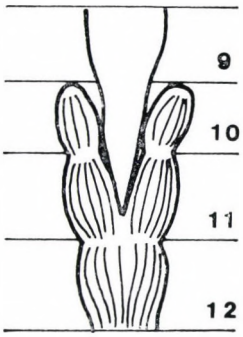

Abb. 1. Form der Kalkdrüsen bei *Octodrilus exacystis* (Rosa, 1896)

30.—37., 1/2 38. Segment, Pubertätsstreifen konstant vom 30.—38. Segment.

Dissepimente 5/6—8/9 stark, 9/10—12/13 weniger stark, 13/14—14/15 wieder stark verdickt. Herzen im 6.—11. Segment. Kalkdrüsenstruktur im 10.—12. Segment, mit Ausbuchtungen im 10. Segment (Abb. 1). Periösophageale Testikelblasen im 10. und 11. Segment, die die Hoden und Samentrichter sowie die Samensäcke der entsprechenden Segmente einschließen. 4 Paar Samensäcke im 9.—12. Segment, die des 11. Segmentes klein. 6 Paar Samentaschen im 5.—10. Segment, Samentaschenporen in den Intersegmentalfurchen 5/6—10/11 in der Borstenlinie c. Kropf im 15.—16. Segment, Muskelmagen im 17.—19. Segment. Muskulatur vom gefiederten Typus.

Fundorte: Z/162. 1 Ex. Schuler (Postăvar) 1600 m, 20. 8. 1959. leg. Zicsi; Z/464. 7 Ex. Schuler (Postăvar) 1750 m, 21. 7. 1962. leg. Zicsi; Z/300. 2 Ex., Z/325. 3 Ex., Z/330. 1 Ex., Z/334. 4 Ex., Z/362—63. 7 Ex., Z/394. 2 Ex., Z/429. 2 Ex. Piatra craiului, am Kleinen und Großen Königstein in verschiedenen Höhenlagen 600—2000 m, in Laubwäldern und oberhalb der Baumgrenze; 3.—5. 7. 1961. leg. Zicsi; Z/352. 2 Ex. Tîrgul Secuesc, 18. 7. 1961, leg. Zzcsi; Z/3376 Tîrgul Secuesc, 3 Ex. 4. 4. 1964. leg. Zicsi; Z/7895. 3 Ex. Bucegi, Poiana Stîni 1200 m, 24. 8. 1974. leg. Zicsi; Z/7989. 1 Ex. Bucegi, Caraiman 25. 8. 1974, leg. Zicsi; Z/7920. 5 Ex., Z/7927. 9 Ex. Piatra Mare, Weg zu den Leitern, 27. 8. 1974. leg. Zicsi; Mt. Apuseni, Codru Moma Cîmp-Vaşcău 450—500 m. 36 Ex. 15. 11. 1972. leg. V. V. Pop; Mt. Zarandului: Cladova, Milova, Bîrzava, Mădrigeşti, Slatina de Mureş, Honţişor, Aciuţa, Stejar, Corbeşti, 200—400 m, 15.—18. 11. 1972. leg. V. V. Pop. 73 Ex.; Mt. Metaliferi: Vaţa de Jos, Buceş Vulcan 17.—19. 9. 1971. leg. V. V. Pop. 25 Ex.; Rîşculiţa, Crăsciuneşti, Mada, 300—500 m, 7.—14. 6. 1972. leg. V. V. Pop. 9 Ex.; Mt. Trascăului: Huda lui Papară, 30. 7. 1973. leg. V. V. Pop. 4 Ex.; Geogel, Rimeţi, Vălişoara, 400—900 m, 21.—23. 9. 1972. leg. V. V. Pop. 17 Ex.

Octodrilus transylvanicus sp. nov.

Im Karpatenbogen, ausschließlich in den Gebirgen um Braşov (Kronstadt), konnte eine neue Octodrilus Art entdeckt werden, die sich weder zu *O. exacystis* noch zu *O. lissaensis* einreihen läßt.

Länge: Holotypus 58 mm, Durchmesser 5 mm, Segmentzahl 107. Paratypen: Länge 40—70 mm, Durchmesser 4 - 6 mm, Segmentzahl 91—156.

Farbe: pigmentlos, Dorsalseite hellgrau.

Kopf epilobisch 1/2 offen. Erster Rückenporus auf Intersegmentalfurche 12/13. Segmente einfach geringelt. Nephridialporen verlaufen in einer Linie oberhalb der Borste b. Borsten ungepaart. Borsten *aa* : *ab* : *bc* : *cd* = 3,2 : 2,2 : 1,5 : 1; *dd* = 1/4 u. Borstenpapillen fehlen. Weibliche Poren auf dem 14. Segment, in der Linie der Nephridialporen oberhalb der Borstenlinie b. Männliche Poren beim Holotypus auf dem 18. Segment, winzig kleine Öffnungen zwischen der Borstenlinie *b* und *c*. Bei den Paratypen liegen die männlichen Poren außer auf dem 18. Segment auch auf dem 16., 17. und 19. Segment beiderseits, oder einerseits auf dem 17. anderseits auf dem 18. Segment, oder 18. und 19. Segment. Bei keinem der untersuchten Tiere fanden wir die männlichen Poren in normaler Stellung auf dem 15. Segment. Gürtel konstant vom 29.—36. Segment, Pubertätswällen vom 30.—37. Segment.

Dissepimente 5/6—8/9 verdickt, 9/10—12/13 kaum verdickt, 13/14—14/15 mäßig verdickt. Kalkdrüsenstruktur im 10.—11. Segment, mit kleinen Ausbuchtungen im 10. Segment. Herzen im 6.—11. Segment, perlschnurartig. Periösophageale Testikelblasen im 10. u. 11. Segment, die die Hoden und Samentrichter sowie die Samensäcke der betreffenden Segmente einschließen. 4 Paar Samensäcke im 9.—12. Segment. 6 Paar Samentaschen im 5.—10. Segment. Samentaschenporen münden in die Intersegmentalfurchen 5/6—10/11 in der Borstenlinie *c*. Typhlosolis verzweigt, endet beim Holotypus im 88. Segment, bei den Paratypen im 78.—98. Segment. Muskulatur vom gefiederten Typus.

Die neue Art unterscheidet sich von den Octodrilus-Arten deren männliche Poren hinter dem 15. Segment liegen, durch die im 5.—10. Segment befindlichen Samentaschen sowie durch die andere Lage des Gürtels und der Pubertätswällen.

Fundorte. Holotypus: Z/9793. Bucegi, Poiana Stîni, 1200 m. 24. VIII. 1974. leg. A. ZICSI. — Paratypen: Z/7896. 2 Ex. Fundort wie beim Holotypus. Z/161. 6 Ex. Postăvar (Schuler) 1600 m. 20. VIII. 1959. leg. ZICSI; Z/166. 2 Ex. Postăvar (Schuler) 1800 m. 18. VIII. 1959. leg. ZICSI; Z/463. 4 Ex. Postăvar (Schuler) 1500 m. 21. VII. 1962. leg. ZICSI; Z/392. 4 Ex. Piatra Craiului (Königstein), 2200 m. 4. VIII. 1961. leg. BORSOVICZKY u. ZICSI; Z/7919. 7 Ex. Piatra Mare (Hohenstein), Weg zu den Leitern, 27. VIII. 1974. leg. ZICSI; Z/7908. 3 Ex. Bucegi, Sinaia. 19. VIII. 1974. leg. ZICSI; Z/7988. 1 Ex. Bucegi, Jepii Mari 2000 m. 25. VIII. 1974. leg. ZICSI; Z/7987. 1 Ex. Bucegi, Jepii Mari, 2200 m. 25. VIII. 1974. leg. ZICSI. Ein Exemplar vom Fundort Z/463 wird in der Sammlung von DR. V. V. POP (Cluj-Napoca), das übrige Typenmaterial wird in der Sammlung des Lehrstuhls für Tiersystematik und Ökologie der Universität, Budapest, aufbewahrt.

Die in der Literatur aus Rumänien als *O. lissaensis* angeführten Exemplare (POP, 1948, 1964) wurden einer genauen Durchsicht unterzogen und mit dem Typenmaterial von Michaelsen verglichen. (Lectotypus V/140 und Paralectotypen OL 13096 sind in der Sammlung des Zoologischen Instituts und Museums von Hamburg aufbewahrt und wurden von ZICSI revidiert.) Außer dem bedeutenden Größenunterschied (*O. lissaensis* MICHAELSEN: 55 mm lang, 2,5—3,5 mm dick, Segmentzahl 123.) zeigt sich ein konstanter Unterschied in der Ausdehnung der Pubertätswällen. Da sich der Ausdehnung der Pubertätswällen bei den verschiedenen Taxa der Gattung *Octodrilus* im Karpatenbecken eine auch statistisch gesicherte Beständigkeit nachweisen ließ (V. V. POP, 1978), wird diesem Merkmal eine ausschlaggebende Bedeutung bei der Trennung der Arten zugeschrieben.

Octodrilus compromissus sp. nov.

Holotypus: Länge 150 mm, Durchmesser 6 mm, Segmentzahl 178. Bei den übrigen Exemplaren: Länge 66—193 mm, Durchmesser 3—6 mm, Segmentzahl 91—206.

Farbe: grauweiß, auf der Dorsalseite mit rötlichem Schimmer.

Kopf epilobisch 1/2 offen. Erster Rückenporus auf Intersegmentalfurche 11/12 oder 12/13. Segmente hinter den männlichen Poren doppel geringelt. Borsten ungepaart. Borsten *aa* : *ab* : *bc* : *cd* = 3,5 : 2,3 : 1,5 : 0,9; *dd* = 1/3 u. Nephridialporen in einer Linie unmittelbar oberhalb der Borstenlinie *b*. Weibliche Poren auf dem 14. Segment in der Linie der Nephridialporen. Männliche Poren auf dem 15. Segment, winzig kleine Öffnungen zwischen der Borstenlinie *b* und *c*. Gürtel vom 29.—36. Segment, Pubertätswällen vom 29.—37. Segment.

Dissepimente 5/6–9/10 mäßig verdickt, 13/14—14/15 stark verdickt. Kalkdrüsenstruktur im 10.—12. Segment, mit Ausbuchtungen im 10. Segment (Abb. 2). Perlschnurartige Herzen im 6.—11. Segment. Periösophageale Testikelblasen im 10. u. 11. Segment, die die Hoden und Samentrichter sowie die Samensäcke der betreffenden Segmente einschließen. 4 Paar Samensäcke im 9.—12. Segment. 6 Paar Samentaschen im 5.—10. Segment, Samentaschenporen münden in die Intersegmentelfurchen 5/6—10/11 in der Borstenlinie *c*. Kropf im 15.—16. Segment, Muskelmagen im 17.—19. Segment. Typhlosolis endet im 85.—136. Segment, einfach verzweigt.

Die neue Art steht *O. lissaensis* am nächsten, unterscheidet sich von dieser durch die größeren Dimensionen und durch die Lage der Pubertätswällen.

Fundorte: Holotypus: Rumänien Mt. Apuseni, Cristiorul de Sus, 600 m. 15. XI. 1972. leg. V. V. Pop. Paratypen 21 Ex Fundort wie beim Holotypus. Mt. Bihorului, Padiș-Cetățile Ponorului 1 Ex. 11. XI. 1950. leg. Matic.-Gilău, 950 m. 4 Ex. 14. IV. 1971. leg. V. V. Pop. — Mt. Mare, Scărița Belioara, 600—1100 m. 8 Ex. 1. VIII. 1971. leg. V. V. Pop. — Mt. Zarandului, Cladova, 200—300 m, 2 Ex. 17. XI. 1972. leg. V. V. Pop. — Bîrzava, Cloaca

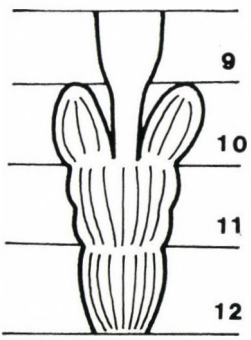

Abb. 2. Form der Kalkdrüsen bei *Octodrilus compromissus* sp. nov.

Popii, 400 m, 3 Ex. 15. XI. 1972. leg. V. V. Pop. — Mădrigeşti, 360 m, 1 Ex. 16. XI. 1972. leg. V. V. Pop. — Honţişor, 400 m, 2 Ex. 16. XI. 1972. leg. V. V. Pop. — Mt. Metaliferi, Buceş Vulcan, 4 Ex. 550 m, 23. V. 1975. leg. V. V. Pop. Almaşu de Munte, 700 m, 4 Ex. 12. VI. 1972. leg. V. V. Pop. — Balşa, 500 m, 4 Ex. 13. VI. 1972. leg. V. V. Pop. — Mt. Trascăului, Vălişoara, 400 m, 5 Ex. 20. IX. 1972. leg. V. V. Pop. — Rîmeţi, 780 m, 11 Ex. 23. IX. 1972. leg. V. V. Pop.

Holotypus und Paratypen werden in der Sammlung von V. V. Pop, Cluj-Napoca aufbewahrt. Je ein Paratypus vom Fundort Cristiorul de Sus Z/9794 und Bîrzava Z/9795 wird in der Sammlung des Lehrstuhls für Tiersystematik und Ökologie der Universität Budapest aufbewahrt.

Fitzingeria annectens (Rosa, 1895) comb. n.

Allolobophora ganglbaueri v. *annectens* Rosa, 1895 in: Boll. Mus. Torino 10. Nr. 215. p. 7.

Ohne auf die Vielfältigkeit der Varietäten, Unterarten und Arten, die als Synonyme der Art *Dendrobaena byblica* (Rosa, 1893) betrachtet werden (Zicsi, 1982), eingehen zu müssen, befassen wir uns an dieser Stelle nur mit der von Rosa aus Transsylvanien beschriebenen *A. gangbaueri* v. *annectens*.

Ein Exemplar dieser Varietät konnte von Zicsi im Zoologischen Institut und Museum, Hamburg einer Revision unterzogen werden. Es wurde angenommen, daß es sich um ein Exemplar des Typenmaterials von Rosa handelt, da die Beschriftung, wenn auch nicht eindeutig, darauf hinweist. Unter Inv. Nr. V. 4494 liegt ein Tier mit der Beschriftung *D. ganglbaueri* v. *annectens* Rosa, Siebenbürgen, leg. Marenzeller, vor.

Der Originalbeschreibung von Rosa konnte entnommen werden, daß die in seinem Aufsatz »Nuovi lombrichi dell'Europa orientale« zur Beschreibung vorgelegenen, aus verschiedenen Ländern stammenden und von verschiedenen Sammlern gesammelten Tiere, aus dem Hofmuseum von Wien und von Dr. E. von Marenzeller an Rosa versandt wurden. Die vom Bâlea-See (Fogarascher Gebirge) stammenden Exemplare der v. annectens sind aber laut Originalbeschreibung von Ganglbauer gesammelt worden. Trotzdem wird angenommen, daß es sich um ein Exemplar aus der Typenserie Rosa's handelt, da Michaelsen sich einerseits 1902 bei der Beschreibung der Varietät olympiaca mit diesem Problem befaßte, anderseits, wie dies bei anderen Arten eindeutlich nachgewiesen werden konnte, so mit Rosa wie mit Marenzeller in enger Austauschverbindung stand.

Im vorliegenden Fall ist dies deswegen von Bedeutung, da bei der Revision dieses Exemplares, welches vollkommen der Originalbeschreibung von Rosa entspricht, festgestellt werden konnte, daß die männlichen Poren auf dem 23. Segment liegen und nicht, wie bei den übrigen Taxa die zu byblica synonymisiert wurden, auf dem 15. Segment. Da aus den Gebirgen des Karpatenbogens Postăvar (Schuler), Piatra Mare (Hohenstein), Piatra Craiului (Königstein) und Bucegi] zahlreiche Exemplare mit männlichen Poren vor dem Gürtelsegment angetroffen wurden, wird annectens als gute Art betrachtet und in die Gattung Fitzingeria Zicsi, 1978 eingereiht.

Da außer der Lage der männlichen Poren, die in der Originalbeschreibung mit »Aperture ♂ affatto invisibili« von ROSA bezeichnet werden, stimmen die neu gesammelten Exemplare mit der Erstbeschreibung in allen wesentlichen Merkmalen überein. Deswegen verzichten wir auf eine Wiederholung der Beschreibung und geben bei der Bekanntmachung der Fundorte bei den einzelnen Exemplaren die Lage der männlichen Poren an. Es ist offensichtlich, daß ROSA die genaue Lage der männlichen Poren nicht erkannt hat, so auch die im 10. und 11. Segment befindlichen Testikelblasen. Ferner sind die Angaben des Kropfes und Muskelmagens falsch angeführt, da ersterer im 15.—16. Segment, letzterer im 17.—18. Segment liegt.

Fundorte: Rumänien, Postăvar, 1700 m, 18. VIII. 1959. leg. ZICSI. 1 Ex. ♂ 22. Segment. — Postăvar, 1800 m, 21. VII. 1962. leg. ZICSI. 6 Ex. Bei 3 Ex. ♂ auf dem 23. Segment, bei 1 Ex. ♂ auf dem 22. Segment, bei 1 Ex. ♂ rechts auf dem 23. links auf dem 22. Segment. — Z/395. Piatra Craiului, 1800 m, 3. VIII. 1961. leg. ZICSI. 1 Ex. ♂ auf dem 23. Segment. — Z/356. Piatra Craiului, bei der Schutzhütte, 4. VIII. 1961. leg. ZICSI. 2 Ex. ♂ auf dem 23. Segment. Z/7932 u. Z/7913. Piatra Mare, Weg zu den Leitern, 27. VIII. 1974. leg. ZICSI. 4 Ex. bei 2 Ex. ♂ auf dem 23. Segment, bei 1 Ex. ♂ rechts auf dem 28. links auf dem 24. Segment, bei 1 Ex. ♂ rechts auf dem 23. links auf dem 24. Segment. — Z/7906. Bucegi, Sinaia, 19. VIII. 1974. leg. ZICSI. 1 Ex. ♂ auf dem 23. Segment.

Lumbricus improvisus ZICSI, 1963

Da diese Art seit der Erstbeschreibung vom Postăvar nur in zwei Exemplaren bei Racoşu de Jos von POP (1964) in der Fauna Rumäniens erwähnt wird, führen wir die weiteren Fundorte ebenfalls an.

Fundorte: Z/7936. Bucegi, Sinaia, 1000 m, 22. VIII. 1974. leg. ZICSI. 6 Ex. — Z/7897. Bucegi, Poiana Stîni, 1200 m, 24. VIII. 1974. leg. ZICSI. 1 Ex. — Z/7918 u. Z/7933. Piatra Mare, Weg zu den Leitern, 27. VIII. 1974. leg. ZICSI. 14 Ex.

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Date of publication: April 1984

PRINTED IN HUNGARY

Akadémiai Kiadó és Nyomda Budapest

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FORMERLY ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE

Acta Zoologica Hungarica

VOLUME 30, NUMBERS 3–4, 1984

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Akadémiai Kiadó, Budapest
ACTA ZOOL. HUNG. 30 (3-4) 249-550 (1984) HU ISSN 0236-7130

ACTA ZOOLOGICA HUNGARICA

A QUARTERLY OF THE HUNGARIAN ACADEMY OF SCIENCES

Acta Zoologica is published in yearly volumes of four issues by

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

Subscription information

Orders should be addressed to

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Acta Zoologica is indexed in Current Contents

Acta Zoologica Hungarica 30 (3—4), pp. 249—255 (1984)

ON THE MORPHOLOGY OF THE PALAR PEGS OF SOME CORIXIDAE (HETEROPTERA)

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(Received 12 November, 1983)

The morphology of palar pegs of 10 Corixidae species was examined by light and scanning electron microscope. The form of the pegs was found to be crescent-shaped. The proximal pegs — except on *Corixa* species — are symmetric in the median plain. The distal pegs are asymmetric, their forms are various and they are differently developed. The function of the palar pegs during copulation and the taxonomic value of the form of the pegs are discussed.

Corixids are rapid water-bugs. Even while copulating they often swim, feed, or have to escape predators. Thus the smaller male could detach from the dorsum of the female. Males have three organs protecting them from losing the female: *a)* external genitalia, *b)* palar pegs on the tarsus of the front leg, and *c)* the strigil.

Each of these organs is effective alone when conspecific partners meet but all are useless when attempting to copulate with the female of another species.

The short chitinous pegs on the tarsi of the fore legs of the male corixids are characteristic formations. Their arrangement and number is rather constant. Therefore they are important features of the species although recently Jansson (1978) has reported abberant arrangement of pegs in some species.

The number of the peg rows and the number of pegs in one row is given in the description of each species. But the form and size of the pegs are not described. Lundblad's (1928a, b; 1929) and Tamanini's (1979) papers are exceptional from this point of view. Recently Furth & al. (1978) have reported detailed morphological description of the palar pegs of three species of Corixidae. Their examinations confirm the generally accepted hypothesis that "The paleal pegs are composed of a circular base on which is a short penducle supporting a larger conical structure" (Popham, 1961). They demonstrate that "The studies showed the pegs to be basically conical and chevron-ridged, with a wide base that tapered off to a narrow apex" (Furth & al., 1978). They confirm Popham's (1961) assumption that the better developed and bigger pegs by which the males grasp the lateral flange of the female's hemelytron, in species with straight tibia and pala they are situated proximally,

while in species with curved tibia and pala they are situated distally. Our preliminary examinations showed, that there might be several objections against the previous and above-mentioned agreeing results, especially as regards the form of the pegs. In our present study, therefore, we wanted to answer the question: what is the form of the palar pegs of corixids ? Further more we examined whether the form of the pegs carries a taxonomical value on the species level ? And at least, how general is the supposed relation between the form of the tibia and the pala, and the development of distal and proximal pegs, respectively.

For the examinations the following species were collected near Gödöllő in Hungary: *Hesperocorixa linnei* (FIEBER, 1848), *Callicorixa concinna* (FIEBER, 1848), *Callicorixa praeusta* (FIEBER, 1848), *Corixa affinis* LEACH, 1818, *Corixa punctata* ILLIGER, 1807, *Sigara falleni* (FIEBER, 1848), *S. lateralis* (LEACH, 1818), *S. striata* (LINNÉ, 1758). The *Corixa panzeri* (FIEBER, 1848) specimens were found on the territory of the Kondor-tó (Kiskunság National Park, Great Hungarian Plain). The specimens were put into alcohol. Their identification was made according to Soós (1963). The Hungarian Natural History Museum (Collection of Heteroptera) lent us a *Glaenocorisa propinqua* (FIEBER, 1860) specimen (Loc.: Szent Anna-tó; Transsylvania; Rumanian People's Republic). The light microscopic (LM) photos were made by using Zeiss Docuval Microscope and the scanning electron microscope (SEM) photos were made by JEOL JSM-35 instrument, with C and AU evaporation at an accelerating voltage 8 kV. The chosen genera from *Glaenocorisa* to *Sigara* represent a possible phylogenetical line. At least one species was examined of each corixid genus found in Hungary and males have palar pegs. Species belonging to the same genera treated by POPHAM (1961) and FURTH & al. (1978) were examined except the genus *Trichocorixa*. The form of the tibia and pala of the chosen *Corixa* species is similar to each other, but that of the *Sigara* species differs, so they seemed to be good objects to test POPHAM's assumption. The palar pegs of every species were examined with LM and SEM, except *Glaenocorisa propinqua*.

The palar pegs of corixid species differ not only on their number and size, but they have several types according to their forms, too. Phylogenetically they can be considered as shortened hairs. It can be well examined on *Glaenocorisa propinqua*, living as glacial relictum in the lakes of high mountains, that the long hairs which are unfitted for grasping, change into short, stocky, strong pegs (Fig. 5).

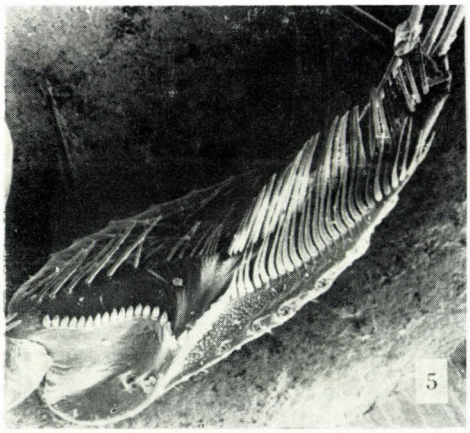
In all the species examined by us the gradual change of pegs can be seen from the base of the pala to the distal direction. This change seems to be more characteristic than the changes in size. The proximal pegs are symmetric on their median plain (Fig. 1). A few *Corixa* species are exceptions. Their proximal pegs are asymmetric, too (Fig. 2). Proximodistally the pegs

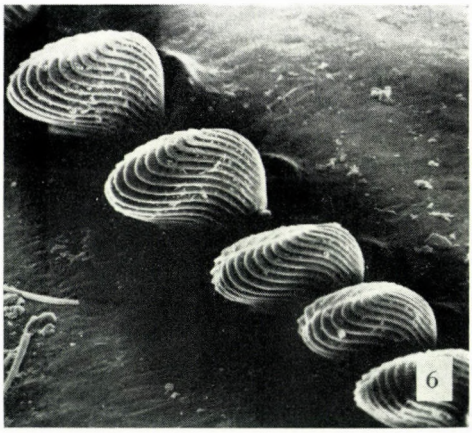


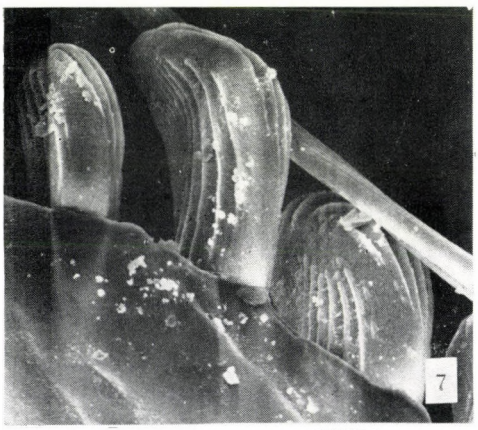
Figs 1—4. 1 = Proximal peg of *Hesperocorixa linnei* (×3000, SEM); 2 = Proximal peg of *Corixa affinis* (×3000, SEM); 3 = *Sigara striata*, the arrow shows a typical distal asymmetric palar peg, bending towards the claw (×300, SEM); 4 = Distal palar pegs of *Corixa affinis* (×1000, SEM)

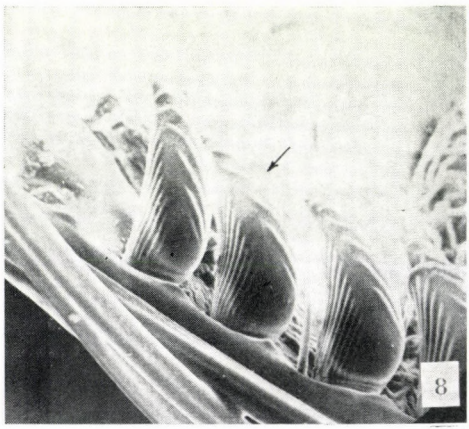
become gradually asymmetric also in the other species. The apex of the pegs at the end of the row always bend towards the claw.

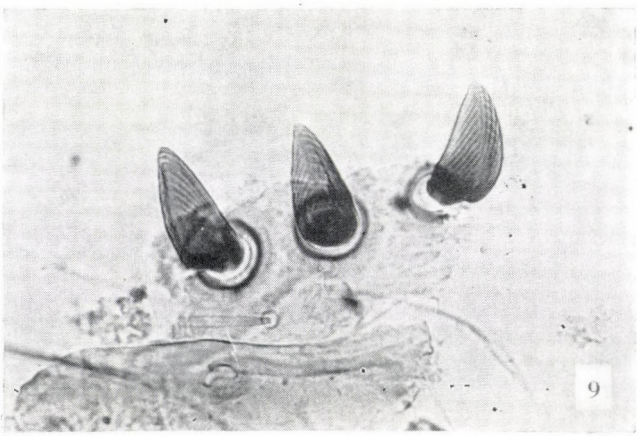
The form of the proximal pegs shows relatively little variation in the different species. Viewed from the upper (outer) edge of the pala they seem to be cones sitting on a short peduncle (POPHAM, 1961, FURTH & al., 1978). But the lateral view of the prepared pegs shows that they are of more complicated formations, which are crescent-shaped sitting on short peduncles,











Figs 5—9. 5 = Pala of *Glaenocorisa propinqua*. The transition from the usual long hairs to the palar pegs is gradual (×72, SEM); 6 = Proximal palar pegs of *Corixa punctata* (×600, SEM); 7 = Distal palar pegs of *Callicorixa praeusta* (×1500, SEM); 8 = Distal palar peg of *Corixa panzeri*. The arrow shows to the upper, convex surface of the peg (×600, SEM); 9 = Proximal palar pegs of *C. panzeri* (×600, LM)

rather thick, more or less curved and flat (Fig. 9). SEM photographs also show that the pegs are not conical (Fig. 6). The distal pegs display considerable variability. In the case of some species they become flat (*C. praeusta*, *S. falleni*). They are higher than the proximal pegs, on the upper part in the median plain they are wide and asymmetric (Fig. 7). In other cases just to the contrary, their size decreases, their upper part becomes laterally thicker (*C. affinis*; Fig. 4). But the most frequent one is the formation which starts from a wide basis, narrows at the edge, it is asymmetric and bends to the claw (*H. linnei*, *C. punctata*, *C. panzeri*, *C. concinna*, *S. lateralis*, *S. striata*; Fig. 3). Even within this group the distal pegs of *H. linnei* and *C. punctata* are smaller than the others, and the distal pegs of *C. panzeri*, *C. concinna*, *S. lateralis* and *S. striata* are considerably better developed than the other pegs in the rows.

The ridges covering the surface of the pegs are well visible in light microscope, as well as on the SEM photographs. Their number and course are characteristic. Their number considerably decreases on the distal pegs of *H. linnei* and the *Corixa* species. A similar reduction can be seen on the asymmetric pegs, especially on the last distal pegs, on the side facing the claw. In the case of *H. linnei* and *C. affinis*, the ridges do not meet on the proximal pegs. FURTH & al. (1978) found a similar case. Although we have not examined the inner construction of the pegs, it was to be seen during the preparation for light microscope examinations that the pegs are not compact but hollow formations. The hollows are in connection with the hollow of the pala through the peduncle of the peg.

According to POPHAM's (1961) theory, which was confirmed by FURTH & al. (1978) the development of the distal and proximal pegs and their sizes are in connection with the form of the pala and the tibia. In the case of primitive species the dorsal margin of the pala and the tibia are straight and the proximal pegs are better developed. With more specialized species both the tibia and the dorsal margin of the pala are curved and the distal pegs are well developed. According to our results it definitely does not stand for *Corixa* species. In the three species examined the form of the tibia and pala and the arrangement of the peg rows are rather similar. But the distal pegs of *C. affinis* are very small and squat (Fig. 4).* The same of *C. panzeri* are definitely better developed than the proximal pegs (Fig. 8). The distal pegs of *C. punctata* are somewhat similar to those mentioned above, but they are more vestigial. On the whole we can say that the important difference among the species is rather in the curves, form, size and finer construction of distal pegs than in the form and size of the proximal pegs. Consequently, the specific form of the distal pegs

* In my opinion the small distal pegs found by FURTH & al. (1978) in *Hesperocorixa interrupta* are similar to these, but taken photo from a different view.

is at least as important a factor in the isolation of species, as the development and size of the same pegs.

In a recent paper FURTH & al. (1978) have confirmed the generally accepted opinion, that palar pegs have a conical form and a narrow apex. Our examinations proved the contrary, that in the species examined the slightly curved, pointless, crescent-shaped pegs (Fig. 9) as well as the asymmetric ones bending towards the claw (Fig. 8) were much more characteristic. Since the male grasps these pegs in copula on the lateral flange of the hemelytron of the female, the upper, wide, convex and chevron-ridged surface of the pegs provides a better linkage between the sexes. According to our opinion, if the upper, convex surface of the pegs and the lower, concave surface of the longitudinal ridge are similarly arched, the result will be a better linkage. Therefore, the form of the pegs coming into connection with the hemelytron of the female is essential. Consequently, the specific form of the distal pegs is at least as important a factor in the isolation of species, as the development and size of the same. This hypothesis, however, must be controlled by functional morphological examinations.

Form, size and arrangement of the palar pegs have a taxonomical value both on species and generic level. The species of the genus *Corixa* according to their asymmetric proximal pegs form a separate, characteristic group. In the case of *Sigara* species on the generic level no characteristic sign was found. The three *Corixa* species were separated on the basis of their distal pegs. Considering, that in the case of some species distal pegs are characteristic, SEM investigations of palar pegs might be useful also in the separation of related species.

The most primitive species examined by us was *Glaenocorisa propinqua*. This species has only proximal palar pegs. The following species have morphologically similar proximal pegs: *H. linnei*, *C. praeusta*, *S. falleni*, *S. striata*, *S. lateralis*. These pegs, according to POPHAM (1961), do not play any role in the linkage of the different sexes (except *Hesperocorixa linnei*). In *Corixa* species, where the males grasp the females with the proximal pegs, these are asymmetric.

Acknowledgement. The SEM photos were made by MRS. E. GONDÁR (Textile Research Institute). The author is very grateful for her kind help. Many thanks are due to DR. I. KISS for making the light microscope photos (University of Gödöllő). We are indebted to DR. T. VÁSÁRHELYI (Hungarian Natural History Museum) for the very helpful comments on the manuscript.

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Acta Zoologica Hungarica 30 (3—4), pp. 257—313 (1984)

A REVIEW OF THE ORIBATULOIDEA THOR, 1929 (ACARI: ORIBATEI)

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(Received 15 December, 1983)

The suprageneric revision of the superfamily Oribatuloidea is given together with the description of many new higher taxa fitted into keys of identification. With 253 figures.

1. The superfamily Oribatuloidea was erected by WOOLLEY in 1958. According to his suggested classification Pterogasterina is divided into three superfamilies. The members of Oribatelloidea possess immovable pteromorphae reaching further than anterior margin of notogaster and not curved ventrad, or neither curved ventrally nor do their anterior tips project beyond the notogaster and the lamellae well developed, flattened plates. Here belong the families Tenuialidae and Oribatellidae. The superfamily Oribatuloidea include those families of Pterogasterina which possess true but immovable pteromorphae, here belong the families Notaspididae, Microzetidae, Oribatulidae, Ceratozetidae and Oripodidae. Finally the superfamily Peloptoidea include the remaining families of Pterogasterina having hinged and movable pteromorphae. Here belong the families, according to WOOLLEY, Haplozetidae, Pelopidae, Galumnidae, Parakalummidae and Epactozetidae.

Owing to the studies of GRANDJEAN and his students, and partly to the large number of new Pterogasterina genera described after 1958, it became evident that the so far accepted system needs modification. The new results were incorporated in the system published by BALOGH in 1961. In this system the superfamily Oribatuloidea included the families Oribatulidae, Chaunoproctidae, Haplozetidae, Oripodidae and Zetomotrichidae. This system was later developed by him in 1965 and in 1972.

Meanwhile two important works were published which concern this superfamily: that of COETZER (1968) regarding the family Oribatulidae, and that of AOKI and OHKUBO (1974) regarding the family Oripodidae. The results of these two works with due criticism were used also in our present contribution.

2. The superfamily Oribatuloidea THOR, 1929 (sensu BALOGH, 1972) includes some 130 genera, thereby it is one of the biggest superfamilies in Oribatei. Two such genera are *Zygoribatula* BERLESE, 1917 and *Scheloribates*

BERLESE, 1908 both comprising many species. A part of the species of the two genera inhabit open, grassy areas, besides also agricultural plots. Several species are intermediary hosts of certain *Anoplocephalida* worms, consequently are important from parasitological point of view. The genus *Oribatula* BERLESE, 1896, giving also the name for the superfamily, includes those species which possess areae porosae; pteromorpha absent, four pairs of genital setae and three tarsal claws present. BERLESE later erected many related genera which may well be characterized by the combination of a few features. The survey of some earlier genera is given hereunder. The denotations are as follows:

1. Octotaxic organ: P = poronotic; S = sacculonotic
2. Pteromorphae: E = movable; I = immovable; A = missing (apterous)
3. Number of genital setae: 4 = four pairs; 5 = five pairs
4. Number of notogastral setae: 10 = ten pairs; 14 = fourteen pairs
5. Number of claws: 1 = monodactyle; 3 = tridactylous

Protoribates BERLESE, 1908	P	E	4	10	1
Oribatula BERLESE, 1896	P	A	4	14	3
Peloribates BERLESE, 1908	S	E	5	14	3
Scheloribates BERLESE, 1908	S	I	4	10	3
Hemileius BERLESE, 1916	S	A	4	10	3

3. Recent oribatologists generally work with the characteristics used by BERLESE, sometimes complemented with some other features. Accordingly, special role is played by the chaetotaxy of the genito-anal region (GAC; sensu AOKI and OHKUBO), which give the number of the genital, aggenital, anal and adanal setae; the presence of prolamella or its absence, or some other features, which we decline treating herewith. Generally these features are used by recent oribatologists: AOKI (and co-workers), BALOGH, COETZER, CORPUZ-RAROS, HAMMER, JACOT, MAHUNKA, PÉREZ-INIGO, SUBIAS, TRAVÉ and others. As a result of their works the number of genera within the superfamily Oribatuloidea increased as tabulated below:

	annually	total
1896—1910	10	10
1911—1920	3	13
1921—1930	6	19
1931—1940	2	21
1941—1950	—	21
1951—1960	16	37
1961—1970	57	94
1971—1983	36	130

These data reveal the following two facts

1. Out of the 130 genera of Oribatuloidea 109 genera: a round 87% of the total, were described after 1951, i.e. in the last 32 years.

2. The number of newly described genera reached its peak between 1961 and 1970, since then, in spite of the efforts of oribatologists, the trend is in the decrease.

3. Interestingly enough a similar trend may be established also for the whole of Oribatid mites. Thus it seems that in the last decade, the "mass" discovery of Oribatid genera passed off. With this large increase of genera, the situation within the individual families has become rather entangled, this is why a new arrangement is more than timely.

4. This brief summary we should like to make only the initial steps in the rebuilding of the system of the superfamily Oribatuloidea. Our work is limited to the grouping of genera on the basis of readily recognizable characteristics used throughout the technical literature. For our purpose we use the following features:

1. Type of octotaxic organ
2. Type of pteromorphae
3. Chaetotaxy of genito-anal region (GAC)
4. Number, presence or absence of notogastral setae
5. Number of claws
6. Presence or absence of dorsosejugal suture

From among the above characteristics we established nine features for all genera of Oribatuloidea. These are listed in identical sequence, with letter and number denotations, in the code tables. The sequence of the nine features are as follows:

1. Type of octotaxic organ (P, S, PS)
2. Type of pteromorpha (E, I, A)
3. Presence or absence of dorsosejugal suture (D, I)
4. Number of genital setae (1—6)
5. Number of aggenital setae (1—3)
6. Number of anal setae (1—2)
7. Number of adanal setae (0—3)
8. Number of notogastral setae (10, 14, exceptionally 7—9 or 30—34)
9. Number of claws (1—3)

By scrutinizing the code tables given below it is revealed that the great majority of the genera can readily be separated by using only these nine characteristics. Genera whose data are identical within the code tables may be separated by using the traditional keys. Finally we give one or two drawnings of each genus: dorsal view and in many cases also the ventral view. In cases when the ventral view does not give significant information in recognizing the genus we decline publishing it. Like many similar endeavours the present work too may be used with some restrictions. Consequently, when studying any particular details and no unanimous conclusion is reached then the expert is referred back to the original publication of the respective taxon. We should especially like to stress that the present contribution does not substitute but simply give preliminary clues to the comprehensive study of Oribatuloidea on

Number of family, subfamily and generic name	Octotaxic o.	Pteromorpha	Dorsosejugal s.	*G*-setae	*Ag*-setae	*An*-setae	*Ad*-setae	*N*-setae	Claws	No. of figures
1. **Xylobatidae** fam. n.										
1.1. Xylobatinae subfam. n.										
1.1.1. *Plenoxylobates* HAM., 1980	P	E	D	5	1	2	3	14	3	1—2
1.1.2. *Setoxylobates* BAL. et MAH., 1967	P	E	D	5	1	2	3	14	1	3—4
1.1.3. *Brasilobates* P.-IN. et BAG., 1980	P	E	D	5	1	2	3	10	3	5
1.1.4. *Xylobates* JACOT, 1929	P	E	D	5	1	2	3	10	1	6—7
1.1.5. *Trixylobates* BAL. et MAH., 1978	P	E	D	5	3	2	3	(10)	2	8—9
1.1.6. *Vilhenabates* BAL., 1963	P	E	D	5	1	2	3	(10)	1	10
1.1.7. *Polyxylobates* HAM., 1973	P	E	D	5	1	2	3	(12)	1	11—12
1.1.8. *Phalacrozetes* AOKI, 1965	P	E	D	5	1	2	3	(10)	3	13—14
1.1.9. *Perxylobates* HAM., 1972	P	E	I	5	1	2	3	10	1	15—16
1.2. Cribrozetinae subfam. n.										
1.2.1. *Cribrozetes* J. BAL., 1970	P	E	D	5	1	2	3	(10)	3	17—18
2. **Protoribatidae** fam. n.										
2.1. Protoribatinae subfam. n.										
2.1.1. *Protoribates* BERL., 1908	P	E	D	4	1	2	3	10	1	19—20
2.1.2. *Rajskibates* gen. n.	P	E	I	4	1	2	3	10	1	21
2.1.3. *Tuxenia* HAM., 1958	P	E	I	3	1	2	3	10	1	22—23
2.1.4. *Totobates* HAM., 1961	P	E	I	3	1	2	3	10	1	24—25
2.1.5. *Maculobates* HAM., 1961	P	I	I	3	1	2	3	10	1	26—27
2.1.6. *Subulobates* HAM., 1972	P	I	I	3	1	2	3	10	1	28—29
2.1.7. *Angullozetes* HAM., 1967	P	I	I	3	1	2	3	10	1	30—31
2.1.8. *Reductobates* BAL. et MAH., 1966	P	E	I	2	1	2	3	10	1	32—33
2.1.9. *Ingella* HAM., 1967	P	A	I	2	1	2	3	10	1	34—35
2.1.10. *Baobabula* MAH., 1975	P	A	I	2	1	2	3	9	1	36—37
2.2. Liebstadiinae subfam. n.										
2.2.1. *Liebstadia* OUD., 1906	P	I	I	4	1	2	3	10	1	38
2.2.2. *Haloribatula* SCHUSTER, 1957	P	I	I	4	1	2	3	13	1	39—40
3. **Nesozetidae** fam. n.										
3.1.1. *Nesozetes* HAM., 1971	P	I	D	4	0	2	2	10	1	41—42
4. **Symbioribatidae** AOKI, 1966										
4.1.1. *Symbioribates* AOKI, 1966	P	A	I	4	0	1	3	10	1	43—45
4.1.2. *Piffliella* HAM., 1980	P	I	I	4	0	1	3	10	1	46—47
5. **Lamellareidae** BAL., 1972										
5.1.1. *Lamellarea* KOK, 1968	P	A	D	5	0	1	3	9, 10	1	48—49
5.1.2. *Tenuelamellarea* SUB. et IT., 1978	P	A	D	5	0	1	3	9	1	50—51

6. **Oribatulidae** THOR, 1929										
6.1. Crassoribatulinae subfam. n.										
6.1.1. *Crassoribatula* HAM., 1967	P	A	D	6	1	2	3	10	3	52—53
6.2. Sellnickiinae subfam. n.										
6.2.1. *Sellnickia* OUD., 1927	P	A	I	6	1	2	3	(10)	3	54—55
6.2.2. *Grandjeania* BAL., 1963	P	A	I	5	1	2	3	(10)	3	56—57
6.3. Capilloppiinae subfam. n.										
6.3.1. *Romanobates* FEID. et VAS., 1970	P	A	D	5	1	2	3	13	3	58—59
6.3.2. *Capilloppia* BAL. et MAH., 1966	P	A	D	5	1	2	3	10	3	60—61
6.3.3. *Lunoribatula* MAH., 1982	P	A	D	5	1	2	3	10	3	62—63
6.3.4. *Mochloribatula* MAH., 1978	P	A	I	5	1	2	3	10	3	64—65
6.3.5. *Wolleybates* gen. n.	P	A	D	5	1	2	3	10	3	66—67
6.4. Oribatulinae THOR, 1929										
6.4.1. *Oribatula* BERL., 1896	P	A	D	4	1	2	3	12—14	3	68
6.4.2. *Zygoribatula* BERL., 1917	P	A	D	4	1	2	3	14	3	69
6.4.3. *Eporibatula* SELLN., 1928	P	A	D	4	1	2	3	14	3	70
6.4.4. *Phauloppia* BERL., 1908	P	A	D	4	1	2	3	14	3	71—72
6.4.5. *Lucoppia* BERL., 1908	P	A	D	4	1	2	3	14	3	73
6.4.6. *Reticuloppia* BAL. et MAH., 1966	P	A	D	4	1	2	3	14	3	74—75
6.4.7. *Spinoppia* HIGG. et WOOL., 1966	P	A	D	4	1	2	3	14	3	76—77
6.4.8. *Phauloppiella* SUB., 1977	P	A	I	4	1	2	3	13	3	78—79
6.4.9. *Pseudoppia* P.-IN., 1966	P	A	I	3	1	2	3	14	3	80—81
6.4.10. *Senoribula* MAH., 1975	P	A	I	2	1	2	3	11	3	82—83
6.4.11. *Subphauloppia* HAM., 1967	P	A	D	4	1	2	3	10	3	84—85
6.4.12. *Diphauloppia* gen. n.	P	A	D	2	1	2	3	10	3	86—87
6.4.13. *Gerloubia* COET., 1968	P	A	I	4	1	2	3	10	3	88—89
6.4.14. *Paraphauloppia* HAM., 1967	P	A	I	3	1	2	3	10	3	90—91
7. **Neotrichozetidae** BAL., 1965										
7.1.1. *Neotrichozetes* TRAVÉ, 1971	P	A	D	6	1	2	3	35	3	94
8. **Maudheimiidae** fam. n.										
8.1.1. *Maudheimia* DAL., 1958	P	I	D	6	1	2	3	10	3	92—93
9. **Greozetidae** fam. n.										
9.1.1. *Areozetes* HAM., 1961	P	I	D	4	1	2	3	10	3	95—96
10. **Drymobatidae** fam. n.										
10.1.1. *Drymobates* GRANDJ., 1930	SP	A	D	4	1	2	3	14	3	97—98
11. **Haplozetidae** GRANDJ., 1936										
11.1. Pilobatinae subfam. n.										
11.1.1. *Pilobates* BAL., 1960	S	E	D	6	3	2	3	14	1	99
11.1.2. *Pilobatella* BAL. et MAH., 1967	S	E	D	6	3	2	3	10	1	100—101
11.1.3. *Paraxylobates* BAL. et MAH., 1969	S	E	D	6	1	2	3	10	3	102—103
11.2. Peloribatinae subfam. n.										
11.2.1. *Peloribates* BERL., 1908	S	E	D	5	1, 3	2	3	14	1, 3	104—105

Number of family, subfamily and generic name	Octotaxic o.	Pteromorpha	Dorsosejugal s.	*G*-setae	*Ag*-setae	*An*-setae	*Ad*-setae	*N*-setae	Claws	No. of figures
11.2.2. *Acutozetes* BAL., 1970	S	E	D	5	1	2	3	13	1	106—107
11.2.3. *Tentaculozetes* BAL., 1970	S	E	I	5	1	2	3	14	1	108—109
11.3. Rostrozetinae subfam. n.										
11.3.1. *Rostrozetes* SELLN., 1925	S	E	D	5	1	2	3	10, 14	1	110
11.3.2. *Cosmobates* BAL., 1959	S	E	D	4, 5	1	2	3	10	3	111
11.3.3. *Nixozetes* MAH., 1977	S	E	D	5	1	2	3	10	3	112—113
11.3.4. *Sundazetes* HAM., 1980	S	E	D	5	1	2	3	10	3	114—115
11.4. Haplozetinae (GRANDJ., 1936)										
11.4.1. *Flagellobates* MAH., 1978	S	E	D	4	1	2	3	14	3	116—117
11.4.2. *Incabates* HAM., 1961	S	E	D	4	1	2	3	(10)	3	118—9 11
11.4.3. *Mancoribates* HAM., 1961	S	E	D	4	1	2	3	(10)	3	120—121
11.4.4. *Berlesiella* HAM., 1980	S	E	D	3	1	2	3	10	1	122—123
11.4.5. *Haplozetes* WILLM., 1935	S	E	D	5, 4	1	2	3	10	3, 1	124
11.4.6. *Lauritzenia* HAM., 1958	S	E	D	4	1	2	3	10	1	125—126
11.4.7. *Magyaria* BAL., 1963	S	E	D	4	1	2	3	(10)	1	127—128
11.4.8. *Conozetes* BAL. et MAH., 1969	S	E	D	4	1	2	3	(10)	1	129
12. **Nasobatidae** BAL., 1972										
12.1.1. *Nasobates* WOOLL., 1966	S	E	D	6	1	2	3	10	3	130—131
13. **Scheloribatidae** fam. n.										
13.1. Similobatinae subfam. n.										
13.1.1. *Similobates* MAH., 1982	S	I	D	4	1	2	3	1 + (9)	1	132—133
13.2. Scheloribatinae subfam. n.										
13.2.1. *Topobates* GRANDJ., 1958	S	I	D	4	1	2	3	14	3	134
13.2.2. *Setobates* BAL., 1961	S	I	D	4	1	2	3	13	3	135—136
13.2.3. *Neoscheloribates* HAM., 1973	S	I	D	4	0	2	3	10	3	137—138
13.2.4. *Fissurobates* BAL. et MAH., 1969	S	I	D	4	1	2	3	(10)	3	139
13.2.5. *Andeszetes* HAM., 1961	S	I	D	4	1	2	3	10	3	140—141
13.2.6. *Striatobates* HAM., 1973	S	I	D	4	1	2	3	11	3	142—143
13.2.7. *Aelenobates* MAH., 1978	S	I	D	4	1	2	3	10	3	144—145
13.2.8. *Nannerlia* COET., 1968	S	I	D	4	1	2	3	10	3	146—147
13.2.9. *Muliercula* COET., 1968	S	I	D	4	1	2	3	(10)	1	148—149
13.2.10. *Grandjeanobates* HAM., 1967	S	I	D	4	1	2	3	10	1, 3	150—151
13.2.11. *Scheloribates* BERL., 1908	S	I	D	4	1	2	3	10	3	152
13.2.12. *Samoabates* HAM., 1973	S	I	D	4	1	2	3	14	1	153—154
13.2.13. *Cantharozetes* HAM., 1961	S	I	D	4	1	2	3	(10)	1	155
13.2.14. *Ischeloribates* COR.-RAR., 1980	S	I	D	4	1	2	3	(10)	1	156
13.2.15. *Fijibates* HAM., 1971	S	I	D	4	1	2	3	10	1	157, 159

13.2.16. *Makischeloribates* Cor.-Rar., 1980	S	I	D	4	1	2	3	(10)	1	158
13.2.17. *Pachygena* Ham., 1972	S	I	D	4	1	2	3	10	1	160—161
13.2.18. *Perscheloribates* Ham., 1973	S	I	D	4	1	2	3	10	1	162—163
13.3. Tribatinae subfam. n.										
13.3.1. *Otaheitea* Ham., 1972	S	I	D	3	1	2	3	(10)	3	164—165
13.3.2. *Hammerabates* Bal., 1970	S	I	D	3	1	2	3	10	3	166—167
13.3.3. *Euscheloribates* Kunst, 1958	S	I	D	3	1	2	3	10	1	168—169
13.3.4. *Philoribates* Cor.-Rar., 1980	S	I	D	3	1	2	3	(10)	1	170
13.3.5. *Tribates* Mah., 1978	S	I	D	3	1	2	3	(10)	1	171—172
13.4. Planobatinae subfam. n.										
13.4.1. *Planobates* Ham., 1973	S	I	D	1	1	2	3	(10)	3	173—174
13.5. Nanobatinae subfam. n.										
13.5.1. *Nanobates* gen. n.	S	I	D	3	0	2	3	10	1	175—176
13.5.2. *Rhabdoribates* Aoki, 1967	S	I	D	3	0	2	3	14	1	177
14. **Oripodidae** Jacot, 1925										
14.1. Protoripodinae Aoki et Ohkubo, 1974										
14.1.1. *Protoripoda* Bal., 1970	S	I	D	4	1	2	3	10	3	178—179
14.1.2. *Pteroripoda* Bal. et Mah., 1974	S	I	D	4	0	2	3	10	3	180—181
14.2. Oripodinae (Jacot, 1925)										
14.2.1. *Truncopes* Grandj., 1956	S	I	D	2—3	1	2	3	10	3	182—183
14.2.2. *Oripoda* Banks, 1904	S	I	D	2	1	2	3	10	3	184—185
14.2.3. *Cosmopirnodus* Bal., 1970	S	I	D	2	1	2	3	10	3	186
14.2.4. *Gymnobates* Banks, 1902	S	I	D	2	1	2?	1?	9	3	187—188
14.2.5. *Anoripoda* Selln., 1959	S	I	D	2	1	2	3	7?	3	189
14.2.6. *Scriptoripoda* P. Bal., 1984	S	I	D	2	1	2	3	10	3	190—191
14.3. Pirnodinae Grandj., 1956										
14.3.1. *Pirnodus* Grandj., 1956	S	I	D	1	1	2	3	10	3	192—195
14.4. Parapirnodinae Aoki et Ohkubo, 1974										
14.4.1. *Parapirnodus* Bal. et Mah., 1968	S	I	D	1	1	2	3	10	1	200—201
14.4.2. *Cryptoribatula* Jacot, 1934	S	I	D	1	0	2	3	10		196—197
14.4.3. *Euaella* Ham., 1973	S	I	D	1	0	2	3	10		198—199
14.5. Benoibatinae Aoki et Ohkubo, 1974										
14.5.1. *Gymnobatoides* Woodl., 1966	S	I	D	3	0	1	2	10	3	202—203
14.5.2. *Benoibates* Bal., 1958	S	I	D	2	1	1	2	10	3	204—205
14.5.3. *Haploripoda* Bal. et Mah., 1966	S	I	D	1	1	1	2	10	3	206—207
15. **Hemileidae** fam. n.										
15.1. Hemileinae subfam. n.										
15.1.1. *Multoribates* Ham., 1961	S	A	D	4	1	2	3	14	3	208—209
15.1.2. *Nesoribatula* Aoki, 1964	S	A	D	4	1	2	3	13	3	210—211
15.1.3. *Heteroleius* Bal. et Mah., 1966	S	A	D	3	1	2	3	12	3	212—213
15.1.4. *Monoschelobates* Bal. et Mah., 1969	S	A	D	4	1	2	3	10	1	214—215
15.1.5. *Urubambates* Ham., 1961	S	A	D	4	1	2	3	10	3	216—217

Number of family, subfamily and generic name	Octotaxic o.	Pteromorpha	Dorsosejugal s.	*G*-setae	*Ag*-setae	*An*-setae	*Ad*-setae	*N*-setae	Claws	No. of figures
15.1.6. *Nasozetes* SELLN., 1930	S	A	D	4	1	2	3	8, 9	3	218—220
15.1.7. *Mucrobates* BAL. et MAH., 1979	S	A	D	4	1	2	3	10	3	221—222
15.1.8. *Wallworkiella* HAM., 1980	S	A	D	4	1	2	3	10	3	223—224
15.1.9. *Hemileius* BERL., 1916	S	A	D	4	1	2	3	10	3	225—226
15.2. Tuberemaeinae subfam. n.										
15.2.1. *Tuberemaeus* SELLN., 1930	S	A	D	4	1	2	3	10, 14	1, 3	227—228
15.3. Stelechobatinae (GRANDJ., 1965)										
15.3.1. *Stelechobates* GRANDJ., 1965	S	A	D	5	1	2	3	14	3	229
15.4. Calobatinae subfam. n.										
15.4.1. *Calobates* BAL., 1961	S	I	D	4	1	2	3	10	3	230
16. **Fenicheliidae** fam. n.										
16.1. Fenicheliinae subfam. n.										
16.1.1. *Fenichelia* BAL., 1970	S	A	D	4	0	2	2	14	3	231—232
16.1.2. *Brassiella* BAL., 1970	S	A	D	4	0	2	2	8?	3	233—234
16.2. Plumobatinae subfam. n.										
16.2.1. *Plumobates* BAL. et MAH., 1966	S	A	D	3	1	2	3	10	3	235—236
16.3. Constrictobatinae subfam. n.										
16.3.1. *Constrictobates* BAL. et MAH., 1966	S	A	I	2	1	2	3	13	3	237—238
16.4. Phylloribatulinae subfam. n.										
16.4.1. *Phylloribatula* BAL. et MAH., 1978	S	A	D	4	1	2	3	14	3	239
17. **Birobatidae** fam. n.										
17.1.1. *Birobates* BAL., 1970	S	I	D	3	0	1	3	10	1	240—241
17.1.2. *Vesiculobates* HAM., 1980	S	I	D	4	0	1	3	10	3	242—243
17.1.3. *Brachyoripoda* BAL., 1970	S	I	I	4	0	1	3	10	1	244—245
18. **Campbellobatidae** fam. n.										
18.1.1. *Campbellobates* WALLW., 1964	S	I	D	4	1	1	3	10	1	246—247
19. **Chaunoproctidae** BAL., 1961										
19.1.1. *Chaunoproctus* PLARCE, 1906	S	A	D	6	1	2	3	10	3	248
20. **Zetomotrichidae** GRANDJ., 1934										
20.1. Zetomotrichinae (GRANDJ., 1934)										
20.1.1. *Zetomotrichus* GRANDJ., 1934	S?	I	I	4	1	2	2	10	3	249
20.1.2. *Mikizetes* HAM., 1958	S?	I	I	5	1	2	2	9?	3	250
20.1.3. *Ghilarovus* KRIV., 1966	S?	I	I	4	1	2	3	10	3	251
20.2. Rohriinae subfam. n.										
20.2.1. *Rohria* BAL. et MAH., 1977	S?	I	D	5	1	2	3	11	3	252—253

the one hand, or to the development of a phylogenetical system, on the other. For the latter, however, a more thorough knowledge of the world fauna is indispensable.

5. For the arrangement of the genera we first used the type of the octotaxic organ. Since we found that in all Oribatuloidea this may be differentiated into poronotic and sacculonotic types. Though, there is one transitional form: *Drymobates*, wherein the notogaster possesses both sacculi and areae porosae. It should be noted that we placed at the end of the sacculinotic genera, as if in appendix, two families which differ the most widely from all the other Oribatuloidea. The two families are Chaunoproctidae and Zetomotrichidae, which octotaxic organ is strongly modified. It is not impossible that at a future date, after further investigations, these families shall be taken out of the superfamily Oribatuloidea. On the other hand, it is quite likely that the family Mochlozetidae should be ranked under Oribatuloidea as proposed by GRANDJEAN (1960), although we have not yet studied the representatives of this group. Accordingly, the superfamily Oribatuloidea includes three major groups: Oribatuloidea poronota, mixonota and sacculonota.

The first four families of the poronotic subgroup exclusively are monodactyle, the following three familes include only tridactylous genera. The first family of the monodactyle group has exclusively setate, reclinate sensillus (reclinate = first outward then backward oriented setiform sensillus). The sensillus of the other three families is short, globular or fusiform, never setate and reclinate.

Two families of the latter group have 2 pairs of anal setae, while two families only 1 pair of anal setae.

The tridactylous subgroup includes two specialized families with one genus each, and a large family: Oribatulidae with a genus rich in species. The latter may be divided into five subfamilies on the basis of a decreasing number of genital setae.

The mixonotic subgroup includes a single family Drymobatidae with the genus *Drymobates* GRANDJEAN, 1930.

The first two families of the sacculonotic subgroup includes those genera which have movable pteromorphae. Further two families: Campbellobatidae and Birobatidae have 1 pair of anal setae. The other three families rich in species are rather versatile, divisible into 4 or 5 subfamilies. The family Scheloribatidae has pteromorpha and mostly well developed setation in the genito-anal region, the family Oripodidae displays a strong reduction of setae in the genito-anal region, while the family Hemileidae lacks pteromorpha. Finally, the last two places are occupied by the atypical families Chaunoproctidae and Zetomotrichidae.

The generic arrangement of the superfamily Oribatuloidea is made somewhat dubious by the appearance of identical characteristics isolated from

one another. Thus, e.g. it is obvious that *Benoibates* with 1 pair of anal setae is closer to *Oripoda* with 2 pairs of anal setae than to *Campbellobates* having again only 1 pair of anal setae. In certain cases the identical feature in various subgroups plays different roles. Thus, e.g. in the Oribatuloidea poronota group the setate-reclinate type of sensillus occurs in a single family, there it is exclusive, while in the Oribatuloidea sacculonota group the same occurs in different families, in the Oribatuloidea poronota group both monodactyle and tridactylous types of families occur, in the Oribatuloidea sacculonota group these features may vary within one family. On the whole, it appears that the poronotic Oribatuloidea are not uniform than are the sacculinotic. These examples taken at random readily indicate that the system of the superfamily Oribatuloidea is in the making and the arrangement presented hereunder is suitable as a general guide for a preliminary grouping of the genera only.

The System of the Oribatuloidea

A) ORIBATULOIDEA PORONATA

1. **Xylobatidae** fam. n.
1.1. Xylobatinae subfam. n.
1.2. Cribrozetinae subfam. n.
2. **Protoribatidae** fam. n.
2.1. Protoribatinae subfam. n.
2.2. Liebstadiinae subfam. n.
3. **Nesozetidae** fam. n.
4. **Symbioribatidae** AOKI, 1966
5. **Lamellareidae** BALOGH, 1972
6. **Oribatulidae** THOR, 1929
6.1. Crassoribatulinae subfam. n.
6.2. Sellnickiinae subfam. n.
6.3. Capilloppiinae subfam. n.
6.4. Oribatulinae (THOR, 1929)
7. **Neotrichozetidae** BALOGH, 1965
8. **Maudheimiidae** fam. n.
9. **Areozetidae** fam. n.

B) ORIBATULOIDEA MIXONOTA

10. **Drymobatidae** fam. n.

C) ORIBATULOIDEA SACCULONOTA

11. **Haplozetidae** GRANDJEAN, 1936
11.1. Pilobatinae subfam. n.
11.2. Peloribatinae subfam. n.
11.3. Rostrozetinae subfam. n.
11.4. Haplozetinae (GRANDJEAN, 1936)
12. **Nasobatidae** BALOGH, 1972
13. **Scheloribatidae** fam. n.
13.1. Similobatinae subfam. n.
13.2. Scheloribatinae subfam. n.
13.3. Tribatinae subfam. n.
13.4. Planobatinae subfam. n.
13.5. Nanobatinae subfam. n.
14. **Oripodidae** JACOT, 1925
14.1. Protoripodinae AOKI et OHKUBO, 1974
14.2. Oripodinae (JACOT, 1925)
14.3. Pirnodinae GRANDJEAN, 1956
14.4. Parapirnodidae AOKI et OHKUBO, 1974
14.5. Benoibatinae AOKI et OHKUBO, 1974
15. **Hemileidae** fam. n.
15.1. Hemileinae subfam. n.
15.2. Tuberemaeinae subfam. n.
15.3. Stelechobatinae (GRANDJEAN, 1965)
15.4. Calobatinae subfam. n.
16. **Fenicheliidae** fam. n.
16.1. Fenicheliinae subfam. n.
16.2. Plumobatinae subfam. n.
16.3. Constrictobatinae subfam. n.
16.4. Phylloribatulinae subfam. n.
17. **Birobatidae** fam. n.
18. **Campbellobatidae** fam. n.
19. **Chaunoproctidae** BALOGH, 1961
20. **Zetomotrichidae** GRANDJEAN, 1934
20.1. Zetomotrichinae (GRANDJEAN, 1934)
20.2. Rohriinae subfam. n.

Identification keys of the families

1 (20) At least one pair of true areae porosae on notogaster.
2 (3) Both areae porosae and sacculi on notogaster: *Sa* and S_1 are sacculi; in the region of A_2 and A_3 there are 3—4 true areae porosae each 10. **Drymobatidae** fam. n.

3 (2) Only true areae porosae on notogaster.
4 (5) Sensillus long, reclinate, setiform; often slightly lanceolate at tip. Dorsosejugal suture mostly present 1. **Xylobatidae** fam. n.
5 (4) Sensillus either capitate with short stalk, or fusiform; never setiform and reclinate.
6 (13) Legs monodactyle. Pori *iad* in adanal position.
7 (10) 1 pair of anal setae.
8 (9) 5 pairs of genital setae. Dorsosejugal suture present 5. **Lamellareidae** BALOGH, 1972
9 (8) 4 pairs of genital setae. Dorsosejugal suture absent 4. **Symbioribatidae** AOKI, 1966
10 (7) 2 pairs of anal setae.
11 (12) Broad hyaline membranes covering lateral parts of prodoposoma present 3. **Nesozetidae** fam. n.
12 (11) Broad hyaline membranes covering lateral parts of propodosoma absent 2. **Protoribatidae** fam. n.
13 (6) Legs tridactylous.
14 (15) 30—35 pairs of long, blackish notogastral setae 7. **Neotrichozetidae** BALOGH, 1965
15 (14) At most 14 pairs of notogastral setae.
16 (17) Pteromorphae absent 6. **Oribatulidae** THOR, 1929
17 (16) Pteromorphae present, immovable.
18 (19) 6 pairs of genital setae. Arese porosae minute, punctiform. Pteromorphae short, triangular 8. **Maudheumiidae** fam. n.
19 (18) 4 pairs of genital setae. Areae porosae normal, circular. Pteromorphae longer 9. **Areozetidae** fam. n.
20 (1) True areae porosae absent: sacculi or pori on notogaster, or apparently pycnonotic.
21 (22) Rostrum and mouthparts extraordinarily constructed: transformed into a tube 12. **Nasobatidae** BALOGH, 1972
22 (21) Rostrum and mouthparts never transformed into a tube.
23 (24) Shoulders prominent, each bearing a long, thick spine. There are numerous refracting punctures or pores arranged irregularly and parallel with the border of notogaster 20. **Zetomotrichidae** GRANDJEAN, 1934
24 (23) No prominent shoulders bearing each a long, thick spine.
25 (26) Lamellae with translamella. Notogaster foveolate 19. **Chaunoproctidae** BALOGH, 1961
26 (25) Translamella absent.
27 (32) 1 pair of anal setae.
28 (29) Aggenital setae present 14. **Oripodidae** JACOT, 1925 (pars)
29 (28) Aggenital setae absent.
30 (31) Apedemata 2—4. coalesced into a sternal ridge 18. **Campbellobatidae** fam. n.
31 (30) Apodemata not coalesced into a sternal ridge 17. **Birobatidae** fam. n.
32 (27) 2 pairs of anal setae.
33 (34) Pteromorphae hinged, movable 11. **Haplozetidae** GRANDJEAN, 1936
34 (33) Pteromorphae not hinged, immovable or absent.
35 (38) Pteromorphae immovable.
36 (37) Dorsosejugal suture straight. 1—2, exceptionally 3 or 4 genital setae. Notogastral setae always present 14. **Oripodidae** JACOT, 1925 (pars)
37 (36) Dorsosejugal suture arched. Mostly 4, exceptionally 3, 5 or only 1 pairs of genital setae; in the latter case notogastral setae absent 13. **Scheloribatidae** fam. n.
38 (35) Pteromorphae absent.
39 (40) At least one of the following characters present: pori *iad* in preanal position; setae *in* plumose or phylliform; setae *ag* missing, 2 pairs of genital setae 16. **Fenicheliidae** fam. n.
40 (39) None of the above characters present; that is: pori *iad* adanal: setae *in* never plumose or phylliform: setae *ag* present, 4 or 3 pairs of genital setae 15. **Hemileidae** fam. n.

1. **Xylobatidae** fam. n.

True areae porosae present. Pteromorphae movable. Sensillus long, setiform; often slightly lanceolate at tip. Dorsosejugal suture mostly present (single exception: *Perxylobates*). Two subfamilies.

1 (2) Notogaster with 4 or 3 pairs of areae porosae 1.1. **Xylobatinae** subfam. n.
2 (1) Notogaster with 14—18 pairs of scattered areae porosae, more or less grouped in the sites corresponding to normally situated areae porosae 1.2. **Cribrozetinae** subfam. n.

1.1. **Xylobatinae** subfam. n.

1 (2) Dorsosejugal suture absent. — Samoa (Figs 15—16) 9. **Perxylobates** HAMMER, 1972
2 (1) Dorsosejugal suture present.
3 (4) Area porosae *Aa*, A_2 and A_3 very long and bandlike, A_1 round and small. 12 pairs of notogastral alveoli; notogastral setae extremely short. — Samoa (Figs 11—12) 7. **Polyxylobates** HAMMER, 1973
4 (3) Areae porosae *Aa*, A_2 and A_3 round.
5 (8) 13—15 pairs of notogastral setae.
6 (7) Legs monodactyle. 13 pairs of very short notogastral setae. — Vietnam (Figs 3—4) 2. **Setoxylobates** BAL. et MAH. 1967
7 (6) Legs tridactylous. 15 pairs of long notogastral setae. — Java (Figs 1—2) 1. **Plenoxylobates** HAMMER, 1980
8 (5) 10—11 pairs of notogastral setae or alveoli.
9 (10) 3 pairs of aggenital setae. — Amazonia (Figs 8—9) 5. **Trixylobates** BAL. et MAH. 1978
10 (9) 1 pair of aggenital setae.
11 (12) Interlamellae setae extremely short; areae porosae very small. — Thailand (Figs 13—14) 8. **Phalacrozetes** AOKI, 1965
12 (11) Interlamellar setae long; areae porosae of normal size.
13 (14) Notogaster with scattered, small foveolae and punctulation. Notogastral setae represented only by alveoli. — W. Africa Ceylon (Fig. 10) 6. **Vilhenabates** BALOGH, 1963
14 (13) Notogaster smooth. Notogastral setae short but present.
15 (16) Legs monodactyle. — Cosmopolitan (Figs 6—7) 4. **Xylobates** JACOT, 1929
16 (15) Legs tridactylous. — Brazil (Fig. 5) 3. **Brasilobates** PÉR.-INIGO et BAGGIO, 1980

1.2. **Cribrozetinae** subfam. n.

Single genus. — Ceylon (Figs 17—18) 1. **Cribrozetes** BALOGH, 1970

2. **Protoribatidae** fam. n.

True areae porosae present. Pteromorphae movable, immovable or absent. Sensillus either capitate with short stalk or fusiform, never setiform and reclinate. Dorsosejugal suture mostly absent (single exception: *Protoribates*). 2 pairs of anal setae. Broad hyaline membranes covering the lateral parts of propodosoma absent. Two subfamilies.

1 (2) Either 2—3 pairs of genital setae, or 4 pairs combinated with movable pteromorphae 2.1. **Protoribatinae** subfam. n.
2 (1) 4 pairs of genital setae combined with short, horizontal, immovable preromorphae 2.2. **Liebstadiinae** subfam. n.

2.1. **Protoribatinae** subfam. n.

1 (4) 4 pairs of genital setae.
2 (3) Dorsosejugal suture present. — Cosmopolitan (Figs 19—20) 1. **Protoribates** BERLESE, 1908
3 (2) Dorsosejugal suture absent. — Europe (Fig. 21) 2. **Rajkskibates** gen. n.

4 (1) 3 or 2 pairs of genital setae.
5 (14) 3 pairs of genital setae.
6 (9) Pteromorphae hinged, movable.
7 (8) Posterior part of pteromorphae standing out from the outline of hysterosoma: between pteromorphae and the outline of hysterosoma there is a forward directed incision each. — S. America (Figs 22—23) 3. **Tuxenia** HAMMER, 1958
8 (7) Posterior part of pteromorpha passing over without incision to the outline of hysterosoma. — S. America and Subantartic Islands, New Zealand (Figs 24—25) 4. **Totobates** HAMMER, 1961
9 (6) Pteromorphae immovable.
10 (11) Interlamellar, lamellar and notogastral setae absent, represented only by alveoli. — New Zealand (Figs 30—31) 7. **Angullozetes** HAMMER, 1967
11 (10) Interlamellar, lamellar and notogastral setae present.
12 (13) From the acetabulum of each leg a pointed awl-like chitinization directed forward. Circumpedal ridge absent. — Tahiti (Figs 28—29) 6. **Subulobates** HAMMER, 1972
13 (12) The above pointed chitinization absent. Circumpedal ridge present. — Southern S. America, Antarctis, New Zealand, Oceania (Figs 26—27) 5. **Maculobates** HAMMER, 1961
14 (5) 2 pairs of genital setae.
15 (16) Pteromorphae movable. — Australia (Figs 32—33) 8. **Reductobates** BAL. et MAH. 1966
16 (15) Pteromorphae immovable or absent.
17 (18) Setae *ta* as long as remaining notogastral setae. — New Zealand (Figs 34—35) 9. **Ingella** HAMMER, 1967
18 (17) Setae *ta* much longer than remaining notogastral setae. — Senegal (Figs 36—37) 10. **Baobabula** MAHUNKA, 1975

Rajskibates gen. n.

Fam. Protoribatidae. True areae porosae present. Pteromorphae movable. Dorsosejugal suture absent. 4 pairs of genital setae. Geniti-anal setal formula: 4123.10 pairs of notogastral setae. Legs monodactyle.

Type-species: *Protoribates variabilis* RAJSKI, 1958

2.2. **Liebstadiinae** subfam. n.

1 (2) 10 pairs of notogastral setae. — Cosmopolitan (Fig. 38) 1. **Liebstadia** OUDEMANS, 1906
2 (1) 14 pairs of notogastral setae. — Europe (Figs 39—40) 2. **Haloribatula** SCHUSTER, 1957

3. **Nesozetidae** fam. n.

Only 2 pairs of visible areae porosae present. Sensillus spindle-shaped. Dorsosejugal suture present. 4 pairs of genital setae. Aggenital setae absent. 2 pairs of adanal setae. Broad hyaline membranes covering the lateral parts of propodosoma present.

Single genus. — Fiji (Figs 41—42) 1. **Nesozetes** HAMMER, 1971

4. **Symbioribatidae** AOKI, 1966

4 pairs of areae porosae present. Sensillus capitate with short stalk. Legs monodactylous. Pori *iad* in adanal position. Only 1 pairs of anal setae.

Dorsosejugal suture absent. 4 pairs of genital setae. Aggenital setae absent 10 pairs of notogastral setae.

1 (2) Rostrum rounded. — New Guinea (Figs 43—45) 1. **Symbioribates** AOKI, 1966
2 (1) Rostrum with a blunt protruding extension. — Java (Figs 46—47) 2. **Piffliella** HAMMER, 1980

5. **Lamellareidae** BALOGH, 1972

2 pairs of small areae porosae present. Sensillus capitate. Legs monodactyle. Pori *iad* in adanal position. Only 1 pair of anal setae. Dorsosejugal suture present. 5 pairs of genital setae. Aggenital setae absent. 10 or 9 pairs of notogastral setae. Prodorsum with lamellae and translamella.

1 (2) Lamellae broad, connected with a short translamellar part. — S. Africa (Figs 48—49) 1. **Lamellarea** KOK, 1968
2 (1) Lamellae linear, with long translamellar line. — Spain, Hawaii (Figs 50—51) 2. **Tenuelamellarea** SUB. et IT. 1978

6. **Oribatulidae** THOR, 1929

1—4, exceptionally 5 pairs of true areae porosae. Sensillus capitate with short stalk or fusiform: never setiform and reclinate. Legs tridactylous. Pori *iad* mostly preanal. Pteromorphae absent. 10—14 pairs of notogastral setae or 10 pairs of alveoli. Genital setae 4—5 pairs; exceptionally 6, 3 or 2 pairs, often inclined to reduction. 4 subfamilies.

1 (6) 5 or 6 pairs of genital setae.
2 (3) Notogastral setae reduced, only their alveoli (10 pairs) present. Dorsosejugal suture absent. 5 or 6 pairs of genital setae. Pori *iad* adanal 6.2. **Sellnickiinae** subfam. n.
3 (2) Notogastral setae always present.
4 (5) 6 pairs of genital setae. Pori *iad* adanal 6.1. **Crassoribatulinae** subfam. n.
5 (4) 5 pairs of genital seta. Pori *iad* mostly preanal 6.3. **Capilloppiinae** subfam. n.
6 (1) Mostly 4, exceptionally 3 or 2 pairs of genital setae 6.4. **Oribatulinae** THOR, 1929 (s. str.)

6.1. **Crassoribatulinae** subfam. n.

A single genus. New Zealand (Figs 52—53) 1. **Crassoribatula** HAMMER, 1967

6.2. **Sellnickiinae** subfam. n.

1 (2) 6 pairs of genital setae. Rostrum truncated. Notogaster with a single conical appendage posteriorly. — Australia, New Zealand, Asia (Figs 54—55) 1. **Sellnickia** OUDEMANS, 1927
2 (1) 5 pairs of genital setae. Rostrum rounded. Notogaster with 2 obtusely conical apices posteriorly. — W. Africa (Figs 56—57) 2. **Grandjeania** BALOGH, 1963

6.3. **Capilloppiinae** subfam. n.

1 (2) 14 pairs of notogastral seate. Areae porosae ribon-like. — Romania (Figs 58—59) 1. **Romanobates** FEID.-VAS. et CAL. 1965
2 (1) 10 pairs of notogastral setae.

3 (4) 8 pairs of notogastral setae extraordinarly long. 4 pairs of ribon-like areae porosae on notogaster. — S. Africa (Figs 60—61) 2. **Capilloppia** BAL. et MAH., 1966
4 (3) 10 pairs of notogastral setae of normal length.
5 (6) Dorsosejugal suture absent in the middle. Area porosae Aa, A_2 and A_3 ribon-like. Posterior end and of notogaster with a small incisure. — Dominica (Figs 64—65) 4. **Mochloribatula** MAHUNKA, 1978
6 (5) Dorsosejugal suture present. Areae porosae circular.
7 (8) Notogaster with a rough polygonate structure. — Ethiopia (Figs 62—63) 3. **Lunoribatula** MAHUNKA, 1982
8 (7) Notogaster with a longitudinally striated structure. — Argentina (Figs 66—67) 5. **Woolleybates** gen. n.

Wolleybates gen. n.

Fam. Oribatulidae. 4 pairs of trie areae porosae present. Pteromorphae absent. Dorsosejugal suture present. 5 pairs of genital setae. Geniti-anal setal formula: 5123.10 pairs of notogastral setae. Legs tridactylous. Notogaster lined.

Type-species: *Oribatula dactyloscopia* BAL. et MAH., 1968

6.4. **Oribatulinae** (THOR, 1929)

1 (20) 11—14 pairs of notogastral setae.
2 (7) Dorsosejugal suture interrupted in the middle.
3 (4) Notogaster longitudinally striated. 4 pairs of genital setae. — Spain (Figs 78—79) 8. **Phauloppiella** SUBIAS, 1977
4 (3) Notogaster never striated. 1—3 pairs of genital setae. Lamellar setae connected with a translamellae line.
5 (6) 14 pairs of notogastral setae. — S. Europe (Figs 80—81) 9. **Pseudoppia** PÉREZ-INIGO, 1966
6 (5) 11 pairs of notogastral setae. — Senegal (Figs 82—83) 10. **Senoribatula** MAHUNKA, 1975
7 (2) Dorsosejugal suture continuous.
8 (11) Prodorsum with translamellar line.
9 (10) Lamellae short: lamellar setae much nearer to interlamellar setae than to rostral ones. — Holarctical (Fig. 73) 5. **Lucoppia** BERLESE, 1908
10 (9) Lamellae long: lamellar setae nearer to rostral setae than to interlamellar ones, or half way in between. — Cosmopolitan (Fig. 69) 2. **Zygoribatula** BERLESE, 1917
11 (8) Prodorsum without translamellar line.
12 (15) Notogaster with reticulate structure. Notogastral setae either long and pilose, or shorter and serrate.
13 (14) Notogastral setae long, ciliate. Lenticulus present. — Australia (Figs 74—75) 6. **Reticuloppia** BAL. et MAH., 1966
14 (13) Notogastral setae of medium size, unilaterally serrate. — Florida (Figs 76—77) 7. **Spinoppia** WOOLEY, 1966
15 (12) Notogaster without reticulate structure. Notogastral setae short.
16 (17) Lamellae broadening anteriorly and are without cuspis. — ? Cosmopolitan (Fig. 68) 1. **Oribatula** BERLESE, 1896
17 (16) Lamellae linear or absent.
18 (19) Two pairs of scapular setae thicker than remaining notogastral setae. — ? Cosmopolitan (Fig. 70) 3. **Eporibatula** SELLNICK, 1928
19 (18) Scapular setae not thicker than remaining notogastral setae. — ? Cosmopolitan (Figs 71—72) 4. **Phauloppia** BERLESE, 1908
20 (1) 10 pairs of notogastral setae.
21 (24) Dorsosejugal suture interrupted in the middle.
22 (23) Lamellar and rostral setae connected by a sublamellar line. Basal part of dorsosejugal suture directed forward and inward, almost parallel with lamellae. 4 pairs of well-visible genital setae (sometimes inclined asymmetrically to reduction). — ? Cosmopolitan (Figs 88—89) 13. **Gerloubia** COETZER, 1968

23 (22) Sublamellar line absent. Basal part of dorsosejugal suture directed inward, almost horizontal. 3 pairs of extremely small genital alveoli. — New Zealand (Figs 90—91)
14. **Paraphauloppia** HAMMER, 1967

24 (21) Dorsosejugal suture continuous.

25 (26) 4 pairs of genital setae: 4th pair often represented only by alveoli. Anal plates without oblique rib. Notogaster smooth. — New Zealand (Figs 84—85)
11. **Subphauloppia** HAMMER, 1967

26 (25) 2 pairs of genital setae on anterior half of genital plates. Anal plates behind anal setae each with an oblique rib. Notogaster punctulate. — Samoa (Figs 86—87)
12. **Diphauloppia** gen. n.

Diphauloppia gen. n.

Fam. Oribatulidae. 4 pairs of true areae porosae, present. Pteromorphae absent. Dorsosejugal suture present, protruding to the lamellar region. 2 pairs of genital setae. Geniti-anal setal formule: 2123.10 pairs of notogastral setae. Across the anal plates there is an oblique line.

Type-species: *Subphauloppia luminosa* HAMMER, 1973

7. **Neotrichozetidae** BALOGH, 1965

8 pairs of true areae porosae present. Sensillus capitate. Dorsosejugal suture present. 6 pairs of genital setae. 30—35 pairs of long, ciliate, blackish notogastral setae. Legs tridactylous.

One genus. — Southern S. America, New Zealand, Temperate Australia (Fig. 34)
1. **Neotrichozetes** TRAVÉ, 1971

8. **Maudheimiidae** fam. n.

4 pairs of small, punctiform areae porosae present. Sensillus capitate. 6 pairs of genital setae. Pori *iad* adanal, but transitional to preanal position. 10 pairs of notogastral setae. Linear lamellae with incised cuspis. Rostrum rounded, extremely broad. Legs tridactylous.

Single genus. — Antarctis (Figs 92—93) 1. **Maudheimia** DALENIUS, 1958

9. **Areozetidae** fam. n.

4 pairs of marginated areae porosae present. Sensillus short, fusiform. 4 pairs of genital setae. Pori *iad* preanal, very short and disappearing. 10 pairs of notogastral setae. Lamellae band-like, broad, with blunt cuspis. Legs tridactylous. Isolated genus, somewhat resembling Ceratozetoidea, but the structure of prodorsum, etc. fundamentally different.

Single genus. — Peru (4800 m, Páramo) (Figs 95—96)
1. **Areozetes** HAMMER, 1961

10. **Drymobatidae** fam. n.

Both areae porosae and sacculi on notogaster: *Sa* and S_1 are sacculi; in the region of A_2 and A_3 there are each 3—4 true areae porosae. 14 pairs of small notogastral setae. 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Anal plates very big: twice longer than genital plates. Pori *iad* adanal. Legs tridactylous.

Unique genus. — Martinique (Figs 97—98) 1. **Drymobates** GRANDJEAN, 1930

11. **Haplozetidae** GRANDJEAN, 1936

4 pairs of sacculi present. Sensillus either setiform (ofter with a fusiform tip) or fusiform-capitate. Legs monodactyle or tridactylous. 4—6, exceptionally 3 pairs of genital setae. Pori *iad* adanal. Pteromorphae movable. 4 subfamilies.

1 (2) 6 pairs of genital setae. Mostly 3 pairs of aggenital setae
11.1. **Pilobatinae** subfam. n.
2 (1) 4—5, exceptionally 3 pairs of genital setae. Mostly 1 pair of aggenital setae.
3 (4) 4 or 3 pairs of genital setae (2 *Haplozetes* species and 1 *Lauritzenia* species with 5 pairs of genital setae needing revision!) 11 4. **Haplozetinae** (GRANDJEAN, 1936)
4 (3) 5 pairs of genital setae.
5 (6) 14 or 13 pairs of notogastral setae. Setae c_1 originating near to dorsosejugal suture
11.2. **Peloribatinae** subfam. n.
6 (5) 10 pairs of notogastral setae. (Unique *Rostrozetes* species is exception!) All notogastral setae originating relatively far from dorsosejugal suture
11.3. **Rostrozetinae** subfam. n.

11.1. **Pilobatinae** subfam. n.

1 (2) 1 pair of aggenital setae. Legs tridactylous. 10 pairs of notogastral setae. — S. America (Figs 102—103) 3. **Paraxylobates** BAL. et MAH., 1969
2 (1) 3 pair of aggenital setae. Legs monodactyle.
3 (4) 14 pairs of notogastral setae. — W. Africa (Fig. 99) 1. **Pilobates** BALOGH, 1960
4 (3) 10 pairs of notogastral setae. — W. Africa (?) (Figs 100—101)
2. **Pilobatella** BAL. et MAH., 1967

11.2. **Peloribatinae** subfam. n.

1 (2) Dorsosejugal suture interrupted in the middle. Notogastral setae with a clubby tip. — New Guinea (Figs 108—109) 3. **Tentaculozetes** BALOGH, 1970
2 (1) Dorsosejugal suture not interrupted. Notogastral setae without a clubby tip.
3 (4) Legs monodactyle. Rostrum pointed. — New Guinea, Java, Malaysia (Figs 106—107) 2. **Acutozetes** BALOGH, 1970
4 (3) Legs tridactylous (exceptionally monodactyle). Rostrum rounded. — Cosmopolitan (Figs 104—105) 1. **Peloribates** BERLESE, 1908

11.3. **Rostrozetinae** subfam. n.

1 (2) Legs tridactylous. Interlamellar setae incrassate, plumose. — W. Africa (Fig. 111)
2. **Cosmobates** BALOGH, 1959
2 (1) Legs monodactyle. Interlamellar setae never incrassate and plumose.

3 (4) Dorsosejugal suture with three arches. Notogaster mostly with coarse structure. — Circumtropical (Fig. 110) 1. **Rostrozetes** SELLNICK, 1925
4 (3) Dorsosejugal suture normal, only with one arch. Notogaster smooth, or only with fine structure.
5 (6) Anal plates with protruding longitudinal chitinous thickenings. — New Guinea, Java, Ceylon (Figs 112—113) 3. **Nixozetes** MAHUNKA, 1977
6 (5) Anal plates without longitudinal chitinous thickenings. — Java (Figs 114—115) 4. **Sundazetes** HAMMER, 1979

11.4. **Haplozetinae** (GRANDJEAN, 1936)

1 (2) 14 pairs of partly flagellate notogastral setae. — Mauritius (Figs 116—117) 1. **Flagellobates** MAHUNKA, 1978
2 (1) 10 pairs of notogastral setae or alveoli.
3 (4) 3 pairs of genital setae. Monodactyle. 10 pairs of notogastral setae. — Java (Figs 122—123) 4. **Berlesiella** HAMMER, 1980
4 (3) 4 pairs of genital setae.
5 (8) Legs tridactylous.
6 (7) Rostral setae siting on short, conical apophyses. — S. America, Japan, Philippines, New Zealand, Oceania (Figs 120—121) 3. **Mancoribates** HAMMER, 1961
7 (6) Short, conical apophyses, bearing rostral setae absent. — S. America, Oriental Region, Oceania (Figs 118—119) 2. **Incabates** HAMMER, 1961
8 (5) Legs monodactyle.
9 (10) Anterior margin of pteromorphae, near to notogaster, with a sharp incision. Notogaster and prodorsum mostly with sculpture. — Circumtropic (Figs 127—128) 7. **Magyaria** BALOGH, 1963
10 (9) No incision on anterior margin of pteromorpha.
11 (12) Lamellae connected with translamella or translamellar line. — S. America (Fig. 129) 8. **Conozetes** BAL. et MAH., 1969
12 (11) Lamellae without translamella or translamellar line.
13 (14) Interlamellar setae originating in front of dorsosejugal sutue. Notogastral setae well visible. — S. America, New Zealand (Figs 125—126) 6. **Lauritzenia** HAMMER, 1958
14 (13) Interlamellar setae originating on dorsosejugal suture. Notogastral setae reduced. — S. America, Malaysia, Holarctis (Fig. 124) 5. **Haplozetes** WILLMANN, 1935*

12. **Nasobatidae** BALOGH, 1972

4 pairs of sacculi present. Rostrum and mouthparts extraordinarily constructed: transformed into a tube. 6 pairs of genital, 10 pairs of notogastral setae. Dorsosejugal suture absent (interrupted in the middle). Legs tridactylous.

Single genus. — C. and S. America (Figs 130—131) 1. **Nasobates** WOOLLEY, 1966

13. **Scheloribatidae** fam. n.

4, exceptionally 5 pairs of sacculi on notogaster. Pteromorphae immovable. Dorsosejugal suture always present. A somewhat artificial unit. 5 subfamilies.

1 (2) 5 pairs of genital setae. 1 pair of extremely long notogastral setae: the setae p_1: the remaining ones represented only by alveoli 13.1. **Similobatinae** subfam. n.
2 (1) 4, 3 or exceptionally 1 pair of genital setae.

* The genus *Haplozetes* WILLMANN, 1935 is in need of revision. *H. quadripilus* (BERL.) sensu HAMMER, 1971, Fiji and *H. insignis* BAL. et MAH., 1966, Congo are not *Haplozetes* species!

3 (4) 1 pair of genital setae — 13.4. **Planobatinae** subfam. n.
4 (3) 3—4 pairs of genital setae.
5 (6) 4 pairs of genital setae — 13.2. **Scheloribatinae** subfam. n.
6 (5) 3 pairs of genital setae.
7 (8) Aggenital setae present. Rostrum not incised — 13.3. **Tribatinae** subfam. n.
8 (7) Aggenital setae absent. Rostrum with 2 incisions — 13.5. **Nanoribatinae** subfam. n.

13.1. **Similobatinae** subfam. n.

Single genus — Ethiopia (Figs 132—133) — 1. **Similobates** MAHUNKA, 1982

13.2. **Scheloribatinae** subfam. n.

1 (22) Legs tridactylous.
2 (5) 13—14 pair of notogastral setae.
3 (4) Notogaster granulated. — S. Europe (Fig. 134) — 1. **Topobates** GRANDJEAN, 1958
4 (3) Notogaster smooth or finely punctulated. — ? Cosmopolitan (Figs 135—136) — 2. **Setobates** BALOGH, 1951
5 (2) 10—11 pairs of notogastral setae or alveoli.
6 (7) Setae *ag* agsent. Notogastral setae present. — Samoa (Figs 137—138) — 3. **Neoscheloribates** HAMMER, 1973
7 (6) Setae *ag* present.
8 (11) Sensillus setiform.
9 (10) Notogaster with 5 pairs of fissuriform sacculi. — S. America (Fig. 139) — 4. **Fissurobates** BAL. et MAH., 1969
10 (9) Notogaster with 4 pairs or small but normal sacculi. — Peru (Figs 140—141) — 5. **Andeszetes** HAMMER, 1961
11 (8) Sensillus capitate or fusiformly sharp, setiform tip.
12 (13) Posterior part of notogaster with two obtuse tubercles. Notogaster striated longitudinally. 11 pairs of notogastral setae. — Samoa (Figs 142—143) — 6. **Striatobates** HAMMER, 1973
13 (12) Posterior part of notogaster without obtuse tubercles. Notogaster not striated longitudinally.
14 (15) Ventral plate with two longitudinal ribs. — Réunion and Mauritius (Figs 144—145) — 7. **Aellenobates** MAHUNKA, 1978
15 (14) Ventral plate without longitudinal ribs.
16 (17) Sacculi *Sa* divided into *Saa* and *Sap*. Border of notogaster overhanging the border of ventral plate. — S. Africa, Pakistan (Figs 146—147) — 8. **Nannerlia** COETZER, 1968
17 (16) Sacculi *Sa* simple. Border of notogaster does not overhang the border of ventral plate.
18 (19) Prodorsum with tutorium. — S. Africa (Figs 148—149) — 9. **Muliercula** COETZER, 1968
19 (18) Prodorsum without toturium.
20 (21) Dorsosejugal suture straight. — New Zealand (Figs 150—151) — 10. **Grandjeanobates** HAMMER, 1967
21 (20) Dorsosejugal suture arched. — Cosmopolitan (Fig. 152) — 11. **Scheloribates** BERLESE, 1908
22 (1) Legs monodactyle.
23 (24) 14 pairs of notogastral setae. Rostrum pointed. — Samoa (Figs 153—154) — 12. **Samoabates** HAMMER, 1973
24 (23) 10—11 pairs of notogastral setae or alveoli present.
25 (26) Sensillus short, with a filiform smooth end. — Peru (Fig. 155) — 13. **Cantharozetes** HAMMER, 1961
26 (25) Sensillus either long, outward and backward directed, unilaterally ciliated and at apical half slightly dilated, or fusiform or capitate with short stalk.
27 (28) Sensillus long, outward and backward directed, unilaterally ciliated, with setiform tip. — Philippines (Fig. 156) — 14. **Ischeloribates** CORPUZ-RAROS, 1980
28 (27) Sensillus shorter, forward and outward directed, with fusiform or capitate head.
29 (30) Rostral setae to each other, on dorsal part of rostrum. Dorsosejugal suture evanescent. — Fiji, Oceania, Philippines (Figs 157, 159) — 15. **Fijibates** HAMMER, 1971

30 (29) Rostra setae removed from each other, on lateral part of rostrum. Dorsosejugal suture present.
31 (32) Rostrum tripartite. — Philippines (Fig. 158)
16. **Makischeloribates** CORPUZ-RAROS, 1980
32 (31) Rostrum without incisure.
33 (34) Sensillus similar to the flame of a candle. Lamellae marginal. Apodemata 3 long, meeting with apodemata sejugal. Notogastral setae well developed. — Tahiti (Figs 160—161) 17. **Pachygena** HAMMER, 1972
34 (33) Sensillus capitate or fusiform. Lamellae not marginal. Apodemata 3 short or reduced, never meeting with apodemata sejugal. — Samoa, Philippines (Figs 162—163)
18. **Perscheloribates** HAMMER, 1973

13.3. **Tribatinae** subfam. n.

1 (4) Legs tridactylous.
2 (3) 10 pairs of short but well-visible notogastral setae. Frontal end of pteromorphae farther back than dorsosejugal suture. Body elongate: almost three times longer than wide. — New Guinea (Figs 166—167) 2. **Hammerabates** BALOGH, 1970
3 (2) Notogastral setae represented only by alveoli (setae p_1 sometimes visible but short). Body at most less than twice longer than wide. — Tahiti (Figs 164—165)
1. **Otaheitae** HAMMER, 1972
4 (1) Legs monodactyle or bidactylous.
5 (6) 10 pairs of short, but well-visible notogastral setae. Sensillus with setiform end. — Europe (Figs 168—169) 3. **Euscheloribates** KUNST, 1958
6 (5) Notogastral setae represented only by alveoli. Sensillus with capitate or obtuse end.
7 (8) Legs bidactylous, rather heterodactyle. Ventral plate without lateral ribs. — Philippines (Fig. 170) 4. **Philoribates** CORPUZ-RAROS, 1980
8 (7) Legs monodactyle. Ventral plate lateral each with a longitudinal rib. — Mauritius, Réunion (Figs 171—172) 5. **Tribates** MAHUNKA, 1978

13.4. **Planobatinae** subfam. n.

Single genus. — Samoa (Figs 173—174) 1. **Planobates** HAMMER, 1973

13.5. **Nanobatinae** subfam. n.*

1 (2) 14 pairs of notogastral setae. — Thailand (Fig. 177) 2. **Rhabdoribates** AOKI, 1967
2 (1) 10 pairs of notogastral setae. — Philippines, New Guinea, Fiji (Figs 175—176)
1. **Nanobates** gen. n.

Nanobates gen. n.

Fam. Scheloribatidae. 2—4 pairs visible sacculi present. Pteromorphae immovable. Dorsosejugal suture present. 3 pairs of genital setae. Aggenital

* This subfamily includes two genera: *Rhabdoribates* AOKI, 1967 and *Nanoribates* gen. n. The letter genus comprises the following species: *Birobates fenicheli* J. BALOGH, 1970 (New Gwinea), *Trischeloribates latus* HAMMER, 1971 (Fiji), *T. rotundus* HAMMER, 1971 (Fiji) and *Birobates payatosensillus* CORPUZ-RAROS, 1975 (Philippines). Since the *Birobates* J. BALOGH, 1970 genus having one pair of anal setae is reserved for the following species: *B. reductus* J. BALOGH, 1970 (New Guinea), *Trischeloribates acutus* HAMMER, 1971 (Fiji) and *B. makinisus* CORPUZ-RAROS, 1975 (Philippines), and that the genus *Trischeloribates* HAMMER, 1971 is a junior synonim of *Birobates* J. BALOGH, 1970, the species having two pairs of anal setae should be included in a new genus: *Nanobates* gen. n.

setae absent. Geniti-anal setal formule: 3023.10 pairs of notogastral setae. Rostrum tripartite. Legs monodactyle.

Type-species: *Birobates fenicheli* BALOGH, 1970

14. **Oripodidae** JACOT, 1925

4 pairs of sacculi present. Pteromorphae immovable. Sensillus strongly clavate. Reduction in number of setae in the genito-anal region: mostly 1—2 pairs of genital setae. Notogastral shield covering wholly or in part the sensilli. 5 subfamilies.

1 (2) 1 pair of anal setae — 14.5. **Benoibatinae** AOKI et OHKUBO 1974
2 (1) 2 pairs of anal setae.
3 (4) 4 pairs of genital setae — 14.1. **Protoripodinae** AOKI et OHKUBO, 1974
4 (3) 2, 3 or 1 pair of genital setae.
5 (8) 1 pair of genital setae.
6 (7) Legs monodactyle — 14.4. **Parapirnodinae** AOKI et OHKUBO, 1974
7 (6) Legs tridactylous — 14.3. **Pirnodinae** AOKI et OHKUBO, 1974
8 (5) 2 or 3 pairs of genital setae — 14.2. **Oripodinae** (JACOT, 1925)

14.1. **Protoripodinae** AOKI et OHKUBO, 1974

1 (2) Aggenital setae present. — Ceylon, New Guinea (Figs 178—179)
1. **Protoripoda** BALOGH, 1970
2 (1) Aggenital setae absent. — Cuba (Figs 180—181) 2. **Pteroripoda** BAL. et MAH., 1974

14.2. **Oripodinae** (JACOT, 1925)

1 (2) 3 pairs of genital setae. — Cosmopolitan (Figs 182—183)
1. **Truncopes** GRANDJEAN, 1956
2 (1) 2 pairs of genital setae.
3 (4) Rostrum with prominent projections each bearing rostral seta. — Oceania (Fig. 189)
5. **Anoripoda** SELLNICK, 1959
4 (3) Rostral setae not sitting on projections.
5 (6) Lamellae short, adjacent to dorsosejugal suture. Lamellar setae near to interlamellar setae. Conspicuous chitinous structures forming type M on the anterior part of notogaster. — Hawaii (Figs 190—191) 6. **Scriptoripoda** P. BALOGH, 1984
6 (5) Neither adjacent, short lamellae nor conspicuous chitinous structures on the anterior part of notogaster present.
7 (8) 9 pairs of notogastral setae. 1 pair of adanal setae. — N. America (Figs 187—188)
4. **Gymnobates** BANKS, 1902
8 (7) 10 pairs of notogastral setae. 3 pairs of adanal setae.
9 (10) Prodorsum and notogaster with large foveolae. — New Guinea (Fig. 186)
3. **Cosmopirnodus** BALOGH, 1970
10 (9) Prodorsum and notogaster without large foveolae. — Cosmopolitan (Figs 184—185)
2. **Oripoda** BANKS, 1904

14.3. **Pirnodinae** (GRANDJEAN, 1956)

Single genus. — Cosmopolitan (Figs 192—195) 1. **Pirnodus** GRANDJEAN, 1956

14.4. **Parapirnodinae** Aoki et Ohkubo, 1974

1 (2) The interval between genital and anal plates twice longer than length of anal plates. Apical part of bothridium and the shole of sensillus free. Body with parallel sides. — Argentina (Figs 200—201) 1. **Parapirnodus** Bal. et Mah., 1968
2 (1) The interval between genital and anal plates not longer than length of anal plates, or genital and anal plates are touching. Sensillus at least partly covered by the anterior margin of notogaster.
3 (4) Genital and anal plates touching. — Samoa (Figs 198—199) 3. **Euaella** Hammer, 1973
4 (3) Genital and anal plates separated. — China, Samoa (Figs 196—197) 2. **Cryptoribatula** Jacot, 1934 (sensu Hammer, 1973)*

14.5. **Benoibatinae** Aoki et Ohkubo, 1974

1 (2) 3 pairs of genital setae. Aggenital setae absent. — N. America (Figs 202—203) 1. **Gymnobatoides** Woolley, 1966
2 (1) 2 or 1 pairs of genital setae. Aggenital setae present.
3 (4) 2 pairs of genital setae. — N. America, Neotropis, W. Africa (Figs 204—205) 2. **Benoibates** Balogh, 1958
4 (3) 1 pair of genital setae. — W. Africa (Figs 206—207) 3. **Haploripoda** Bal. et Mah., 1966

15. **Hemileidae** fam. n.

4 pairs of sacculi present. Pteromorphae absent. Sensillus mostly clavate or capitate. 4, exceptionally 3 or 5 pairs of genital setae. Legs tridactylous. Dorsosejugal suture always present. 4 subfamilies.

1 (2) 5 pairs of genital setae. 14 pairs of partly extremely long notogastral setae 15.3. **Stelechobatinae** (Grandjean, 1965)
2 (1) 4 or exceptionally 3 pairs of genital setae.
3 (4) Notogaster smooth, neither foveolate, striate nor tuberculate 15.1. **Hemileinae** subfam. n.
4 (3) Notogaster with rough sculpture.
5 (6) Dorsosejugal suture straight. Shoulder protruding like a small horizontal pteromorpha 15.4. **Calobatinae** subfam. n.
6 (5) Dorsosejugal suture arched. Shoulder rounded 15.2. **Tuberemaeinae** subfam. n.

15.1. **Hemileinae** subfam. n.

1 (6) 13—14 pairs of notogastral setae.
2 (3) 3 pairs of genital setae. Notogastral setae very short. — W. Africa (Figs 212—213) 3. **Heteroleius** Bal. et Mah., 1966
3 (2) 4 pairs of genital setae.
4 (5) Dorsosejugal suture straight. Sensillus capitate. 13 pairs of notogastral setae. — Hawaii (Figs 210—211) 2. **Nesoribatula** Aoki, 1964
5 (4) Dorsosejugal suture arched. Sensillus fusiform with pointed tip. — S. America (Figs 208—209) 1. **Multoribates** Hammer, 1961
6 (1) 10 pairs of notogastera setae or alveoli.
7 (8) Legs monodactyle. — S. America (Figs 214—215) 4. **Monoscheloribates** Bal. et Mah., 1969
8 (7) Legs tridactylous.

* It is possible that the male *Euaella gittae* Hammer, 1973 is the male of *Cryptoribatula euaensis* Hammer, 1973.

9 (12) Notogastral setae extremely short or represented only by alveoli.
10 (11) Bothrydium covered, sensillus capitate. Rostrum with an expanding appendage medially (♂). — Sumatra, Guam (Figs 218—220) 6. **Nasozetes** SELLNICK, 1930
11 (10) Bothrydium not covered, sensillus fusiform with pointed tip. Pedotecta II with laterally protruding tip. — Cuba (Figs 221—222) 7. **Mucrobates** BAL. et MAH., 1979
12 (9) Notogastral setae present.
13 (14) Sensillus slightly fusiform with long, setiform end. Notogaster long: about two times longer than wide. — S. America, E. Europe (Figs 216—217) 5. **Urubambates** HAMMER, 1961
14 (13) Sensillus capitate, never setiform.
15 (16) Rostrum is drawn out into a long "nose". Notogastral setae each in a marginal row. — Java (Figs 223—224) 8. **Wallworkiella** HAMMER, 1979
16 (15) Rostrum without "nose". Setae *ti* and *ms* further in than the remaining setae. — Cosmopolitan (Figs 225—226) 9. **Hemileius** BERLESE, 1916

15.2. **Tuberemaeinae** subfam. n.

Single genus. — Circumtropic (Figs 227—228) 1. **Tuberemaeus** SELLNICK, 1930

15.3. **Stelechobatinae** (GRANDJEAN, 1965)

Single genus. — C. America (Fig. 229) 1. **Stelechobates** GRANDJEAN, 1965

15.4. **Calobatinae** subfam. n.

Single genus. — W. Africa, S. America (Fig. 230) 1. **Calobates** BALOGH, 1961

16. **Fenicheliidae** fam. n.

Sacculi present or apparently pycnonotic. Pteromorphae absent. At least one of the following characters present: pori *iad* in preanal position; setae *in* plumose or phylliform; setae *ag* absent; 2 pairs of genital setae. 4 subfamilies.

1 (4) 4 pairs of genital setae.
2 (3) Aggenital setae absent. 2 pairs of adanal setae 16.1. **Fenicheliinae** subfam. n.
3 (2) Aggenital setae present. 3 pairs of adanal setae 16.4. **Phylloribatulinae** subfam. n.
4 (1) 2—3 pairs of genital setae.
5 (6) 3 pairs of genital setae. 10 pairs of notogastral setae. Dorsosejugal suture present. Setae *in* and setae *ta* plumose 16.2. **Plumobatinae** BAL. et MAH., 1966
6 (5) 2 pairs of genital setae. 13 pairs of notogastral setae. Dorsosejugal suture absent. Setae *in* and setae *ta* setiform 16.3. **Constrictobatinae** BAL. et MAH., 1966

16.1. **Fenicheliinae** subfam. n.

1 (2) Notogaster ovate. 14 pairs of phylliform notogastral setae. — New Guinea, Ethiopia (Figs 231—232) 1. **Fenichelia** BALOGH, 1970
2 (1) Notogaster circular. 7 pairs of long plumose, 3 pairs of small setiform notogastral setae. — Ceylon, New Guinea, Oceania (Figs 233—234) 2. **Brassiella** BALOGH, 1970

16.2. **Plumobatinae** subfam. n.

Single genus. — Australia (Figs 235—236) 1. **Plumobates** BAL. et MAH., 1966

16.3. **Constrictobatinae** subfam. n.

Single genus. — Australia (Figs 237—238) 1. **Constrictobates** BAL. et MAH., 1966

16.4. **Phylloribatulinae** subfam. n.

Single genus. — S. America (Fig. 239) 1. **Phylloribatula** BAL. et MAH., 1978

17. **Birobatidae** fam. n.

True areae porosae absent, presumably sacculonotic (*Birobates*) or sacculonotic with 4 pairs of sacculi (*Brachyoripoda*, *Vesiculobates*). Sensillus capitate. 1 pair of anal setae. Aggenital setae absent. Apodemata not coalesced into a sternal ridge. 3 distant genera.

1 (2) Legs tridactylous. — Java (Figs 242—243) 2. **Vesiculobates** HAMMER, 1980
2 (1) Legs monodactyle.
3 (4) 3 pairs of genita setae. Dorsosejugal suture present. — New Guinea, Philippines (Figs 240—241) 1. **Birobates** BALOGH, 1970
4 (3) 4 pairs of genital setae. Dorsosejugal suture absent. — Ceylon (Figs 244—245) 3. **Brachyoripoda** BALOGH, 1970

18. **Campbellobatidae** fam. n.

True areae porosae absent, 1—2 pairs of sacculi or nothing. Sensillus capitate; bothrydium covered. 1 pair of anal setae. Aggenital setae absent. Apodemata 2—4 coalesced in to a sternal ridge.

Unique genus. — Subantarctic, New Zealand, Hawaii, Philippines (Figs 246—247) 1. **Campbellobates** WALLWORK, 1964

19. **Chaunoproctidae** BALOGH, 1961

True areae porosae absent; 5 pairs of small pori on notogaster. Lamellae and translamella present. Shoulder each only with small, protruding tubercles. 6 pairs of genital setae. 10 pairs of notogastral setae. Legs tridactylous.

Unique genus. — Circumtropic (Fig. 248) 1. **Chaunoproctus** PEARCE, 1906

20. **Zetomotrichidae** GRANDJEAN, 1934

10 or 11 pairs of notogastral setae. Shoulders prominent, bearing each a long, thick spine: the spine *ta*. There are numerous refracting punctures or pores scattered irregularly and in two parallel bands with the border of notogaster. Two subfamilies.

1 (2) Dorsosejugal suture absent. Frontal margin of rostrum denticulated. Setae *ta* (the shoulder setae) with acuminate end 20.1. **Zetomotrichinae** (GRANDJEAN, 1934)
2 (1) Dorsosejugal suture present. Frontal margin of rostrum entirely smooth. Setae *ta* with fusiform end 20.2. **Rohriinae** subfam. n.

20.1. **Zetomotrichinae** (GRANDJEAN, 1934)

1 (2) Marginal denticulation of rostrum absent in the middle: apical part rounded. — N. Africa (Fig. 249) 1. **Zetomotrichus** GRANDJEAN, 1934
2 (1) Marginal denticulation of rostrum complete.
3 (4) Setae *ta* (shoulder setae) not lanceolate. — S. America (Fig. 250) 2. **Mikizetes** HAMMER, 1958
4 (3) Setae *ta* lanceolate with serrated margin. — C. Asia (Fig. 251) 3. **Ghilarovus** KRIV., 1966

20.2. **Rohriinae** subfam. n.

Single genus. — Brasil (Figs 252—253) 1. **Rohria** BAL. et MAH., 1977

Families, subfamilies and genera

1. **Xylobatidae** fam. n.
1.1. Xylobatinae subfam. n.
1.1.1. *Plenoxylobates* HAMMER, 1980 — Java
Type-species: *P. ramosus* HAMMER, 1980
1.1.2. *Setoxylobates* BAL. et MAH., 1967 — Vietnam
Type-species: *S. foveolatus* BAL. et MAH., 1967
1.1.3. *Brasilobates* PÉR.-INIGO et BAGGIO, 1980 — Brazil
Type-species: *B. bipilis* PÉR.-INIGO, 1980
1.1.4. *Xylobates* JACOT, 1929 — Cosmopolitan (?)
Type-species: *Oribates lophotrichus* BERLESE, 1904
1.1.5. *Trixylobates* BAL. et MAH. 1978 — Brazil
Type-species: *T. bidactylus* BAL. et MAH., 1978
1.1.6. *Vilhenabates* BALOGH, 1963 — W. Africa, Ceylon
Type-species: *Peloribates minutus* BALOGH, 1958
1.1.7. *Polyxylobates* HAMMER, 1973 — Samoa
Type-species: *P. diversiporosus* HAMMER, 1973
1.1.8. *Phalacrozetes* AOKI, 1965 — Thailand
Type-species: *P. sinatus* AOKI, 1965
1.1.9. *Perxylobates* HAMMER, 1972 — Java, Oceania
Type-species: *Xylobates vermiseta* BAL. et MAH., 1968
1.2. Cribrozetinae subfam. n.
1.2.1. *Cribrozetes* BALOGH, 1970 — Ceylon
Type-species: *C. multiareolatus* BALOGH, 1970

2. **Protoribatidae** fam. n.
2.1. Protoribatinae subfam. n.
2.1.1. *Protoribates* BERLESE, 1908 — Cosmopolitan (?)
Auxiliary type-species: *P. gratiosus* FEID., VAS. et CAL., 1970
2.1.2. *Rajskibates* gen. n. — Europe
Type-species: *Protoribates variabilis* RAJSKI, 1958
2.1.3. *Tuxenia* HAMMER, 1958 — S. America
Type-species: *T. complicata* HAMMER, 1958
2.1.4. *Totobates* HAMMER, 1961 — Southern S. America, New Zealand, Subantarctic Is.
Type-species: *T. discifer* HAMMER, 1961
2.1.5. *Maculobates* HAMMER, 1961 — Southern S. America, Antarctis, New Zealand, Oceania
Type-species: *M. longiporosus* HAMMER, 1962
2.1.6. *Subulobates* HAMMER, 1972 — Tahiti
Type-species: *S. albulus* HAMMER, 1972
2.1.7. *Angullozetes* HAMMER, 1967 — New Zealand
Type-species: *A. rostratus* HAMMER, 1967
2.1.8. *Reductobates* BAL. et MAH., 1966 — Australia, New Zealand, Oceania
Type-species: *R. humeratus* BAL. et MAH., 1966

2.1.9. *Ingella* HAMMER, 1967 — New Zealand, Oceania
Type-species: *I. bullager* HAMMER, 1967
2.1.10. *Baobabula* MAHUNKA, 1975 — Senegal
Type-species: *B. mussardi* MAHUNKA, 1975
2.2. Liebstadiinae subfam. n.
2.2.1. *Liebstadia* OUDEMANS, 1906 — Cosmopolitan (?)
Type-species: *Notaspis similis* MICHAEL, 1888
2.2.2. *Haloribatula* SCHUSTER, 1957 — Europe
Type-species: *H. tenareae* SCHUSTER, 1957

3. **Nesozetidae** fam. n.
3.1.1. *Nesozetes* HAMMER, 1971 — Fiji
Type-species: *N. rostopterus* HAMMER, 1971

4. **Symbioribatidae** AOKI, 1966
4.1.1. *Symbioribates* AOKI, 1966 — New Guinea
Type-species: *S. papuensis* AOKI, 1966
4.1.2. *Piffliella* HAMMER, 1980 — Java
Type-species: *P. eduardi* HAMMER, 1980

5. **Lamellareidae** BALOGH, 1972
5.1.1. *Lamellarea* KOK, 1968 — S. Africa
Type-species: *L. ardua* KOK, 1968
5.1.2. *Tenuelamellarea* SUB. et IT., 1978 — Spain, Hawaii
Type-species: *T. hispanica* SUB. et IT., 1978

6. **Oribatulidae** THOR, 1929
6.1. Crassoribatulinae subfam. n.
6.1.1. *Crassoribatula* HAMMER, 1967 — New Zealand
Type-species: *C. maculosa* HAMMER, 1967
6.2. Sellnickiinae subfam. n.
6.2.1. *Sellnickia* OUDEMANS, 1927 — Australia, New Zealand, Java
Type-species: *Notaspis caudata* MICHAEL, 1898
6.2.2. *Grandjeania* BALOGH, 1963 — W. Africa
Type-species: *Grandjeanella bicaudata* BALOGH, 1961
6.3. Capilloppiinae subfam. n.
6.3.1. *Romanobates* FEID., VAS. et CAL., 1970 — Romania
Type-species: *R. reticulatus* FEID. — VAS. et CAL., 1970
6.3.2. *Capilloppia* BAL. et MAH., 1966 — S. Africa
Type-species: *C. capillata* BAL. et MAH., 1966
6.3.3. *Lunoribatula* MAHUNKA, 1982 — Ethiopia
Type-species: *L. polygonata* MAHUNKA, 1982
6.3.4. *Mochloribatula* MAHUNKA, 1978 — Dominica
Type-species: *M. multiporosa* MAHUNKA, 1978
6.3.5. *Woolleybates* gen. nov. — Argentina
Type-species: *Oribatula dactyloscopica* BAL. et MAH., 1968
6.4. Oribatulinae (THOR, 1929)
6.4.1. *Oribatula* BERLESE, 1896 — Cosmopolitan
Type-species: *Notaspis tibialis* NICOLET, 1855
6.4.2. *Zygoribatula* BERLESE, 1917 — Cosmopolitan
Type-species: *Oribatula connexa* BERLESE, 1904
6.4.3. *Eporibatula* SELLNICK, 1928 — Cosmopolitan (?)
Type-species: *Eremaeus rauschenensis* SELLNICK, 1908
6.4.4. *Phauloppia* BERLESE, 1908 — Cosmopolitan
Type-species: *Oppia conformis* BERLESE, 1895
6.4.5. *Eucoppia* BERLESE, 1908 — Holarctical
Type-species: *Zetes lucorum* C. L. KOCH, 1840
6.4.6. *Reticuloppia* BAL. et MAH., 1966 — Australia
Type-species: *R. reticulata* BAL. et MAH., 1966
6.4.7. *Spinoppia* WOOLLEY, 1966 — N. America
Type-species: *S. magniserrata* HIG. et WOOLLEY, 1966
6.4.8. *Phauloppiella* SUBIAS, 1977 — Europe
Type-species: *P. striata* SUBIAS, 1977

7.4.9. *Pseudoppia* PÉREZ-INIGO, 1966 — S. Europe
Type-species: *Lucoppia mediocris* MIHELČIČ, 1957
6.4.10. *Senoribula* MAHUNKA, 1975 — Senegal
Type-species: *S. africana* MAHUNKA, 1975
6.4.11. *Subphauloppia* HAMMER, 1967 — New Zealand
Type-species: *S. dentonyx* HAMMER, 1967
6.4.12. *Diphauloppia* gen. n. — Samoa
Type-species: *Subphauloppia luminosa* HAMMER, 1973
6.4.13. *Gerloubia* COETZER, 1968 — Cosmopolitan (?)
Type-species: *Eporibatula bicuspidata* HAMMER, 1958
6.4.14. *Paraphauloppia* HAMMER, 1967 — New Zealand
Type-species: *P. novazealandica* HAMMER, 1967

7. **Neotrichozetidae** BALOGH, 1965
7.1.1. *Neotrichozetes* TRAVÉ, 1971 — S. America, New Zealand, Australia
Type-species: *Notaspis spinulosa* MICHAEL, 1908

8. **Maudheimiidae** fam. n.
8.1.1. *Maudheimia* DALENIUS, 1958 — Antarctic
Type-species: *M. wilsoni* DALENIUS, 1958

9. **Areozetidae** fam. n.
9.1.1. *Areozetes* HAMMER, 1961 — Peru
Type-species: *A. altimontanus* HAMMER, 1961

10. **Drymobatidae** fam. n.
10.1.1. *Drymobates* GRANDJEAN, 1930 — Martinique
Type-species: *D. silvicola* GRANDJEAN, 1930

11. **Haplozetidae** GRANDJEAN, 1936
11.1. Pilobatinae subfam. n.
11.1.1. *Pilobates* BALOGH, 1960 — W. Africa
Type-species: *Protoribates pilosellus* BALOGH, 1958
11.1.2. *Pilobatella* BAL. et MAH., 1967 — W. Africa
Type-species: *P. punctulata* BAL. et MAH., 1967
11.1.3. *Paraxylobates* BAL. et MAH., 1969 — S. America
Type-species: *P. imitans* BAL. et MAH., 1969
11.2. Peloribatinae subfam. n.
11.2.1. *Peloribates* BERLESE, 1908 — Cosmopolitan
Type-species: *Oribata peloptoides* BERLESE, 1888
11.2.2. *Acutozetes* BALOGH, 1970 — New Guinea, Java, Malaysia
Type-species: *A. rostratus* BALOGH, 1970
11.2.3. *Tentaculozetes* BALOGH, 1970 — New Guinea
Type-species: *T. loksai* BALOGH, 1970
11.3. Rostrozetinae subfam. n.
11.3.1. *Rostrozetes* SELLNICK, 1925 — Circumtropical
Type-species: *R. foveolatus* SELLNICK, 1925
11.3.2. *Cosmobates* BALOGH, 1959 — W. Africa
Type-species: *C. tunicatus* BALOGH, 1959
11.3.3. *Nixozetes* MAHUNKA, 1977 — Java, Philippines
Type-species: *N. javanus* MAHUNKA, 1977
11.3.4. *Sundazetes* HAMMER, 1980 — Java
Type-species: *S. crispus* HAMMER, 1980
11.4. Haplozetinae (GRANDJEAN, 1936)
11.4.1. *Flagellobates* MAHUNKA, 1978 — Mauritius
Type-species: *F. berndhauseri* MAHUNKA, 1978
11.4.2. *Incabates* HAMMER, 1961 — S. America, Oceania, Philippines, Japan
Type-species: *I. nudus* HAMMER, 1961
11.4.3. *Mancoribates* HAMMER, 1961 — Peru, Brasil
Type-species: *M. rostropilosus* HAMMER, 1961
11.4.4. *Berlesiella* HAMMER, 1980 — Java
Type-species: *B. scutata* HAMMER, 1980
11.4.5. *Haplozetes* WILLMAN, 1935 — Cosmopolitan
Type-species: *H. vindobonensis* WILLMAN, 1935

11.4.6. *Lauritzenia* HAMMER, 1958 — S. America, New Zealand
Type-species: *L. longipluma* HAMMER, 1958
11.4.7. *Magyaria* BALOGH, 1963 — Circumtropical
Type-species: *Scheloribates reticulatus* BALOGH, 1958
11.4.8. *Conozetes* BAL. et MAH., 1969 — S. America
Type-species: *C. arcualis* BAL. et MAH., 1969

12. **Nasobatidae** BALOGH, 1972
12.1.1. *Nasobates* WOOLLEY, 1966 — C. and S. America
Type-species: *N. spinosus* WOOLLEY, 1966

13. **Scheloribatidae** fam. n.
13.1. Similobatinae subfam. n.
13.1.1. *Similobates* MAHUNKA, 1982 — Ethiopia
Type-species: *S. demeterorum* MAHUNKA, 1982
13.2. Scheloribatinae subfam. n.
13.2.1. *Topobates* GRANDJEAN, 1958 — Holarctis
Type-species: *T. granifer* GRANDJEAN, 1958
13.2.2. *Setobates* BALOGH, 1951 — Tanzania, New Zealand
Type-species: *S. magnus* BALOGH, 1962
13.2.3. *Neoscheloribates* HAMMER, 1973 — Tonga
Type-species: *N. grandiporosus* HAMMER, 1973
13.2.4. *Fissurobates* BAL. et MAH., 1969 — S. America
Type-species: *F. spectabilis* BAL. et MAH., 1969
13.2.5. *Andeszetes* HAMMER, 1961 — Peru
Type-species: *A. diversidactylus* HAMMER, 1961
13.2.6. *Striatobates* HAMMER, 1973 — Samoa
Type-species: *S. tuberculatus* HAMMER, 1973
13.2.7. *Aellenobates* MAHUNKA, 1978 — Mauritius, Réunion
Type-species: *A. cryptacus* MAHUNKA, 1978
13.2.8. *Nannerlia* COETZER, 1968 — S. Africa, Pakistan
Type-species: *N. longinqua* COETZER, 1968
13.2.9. *Muliercula* COETZER, 1968 — S. Africa, Hawaii
Type-species: *M. muliercula* COETZER, 1968
13.2.10. *Grandjeanobates* HAMMER, 1967 — New Zealand
Type-species: *G. novazealandicus* HAMMER, 1967
13.2.11. *Scheloribates* BERLESE, 1908 — Cosmopolitan
Type-species: *Oribates latipes* BERLESE, 1886, not *Zetes latipes* C. L. KOCH, 1844; (*Oribates latipes* BERLESE, 1886 is a junior synonym of *Zetes pallidulus* C. L. KOCH, 1841 !)
13.2.12. *Samoabates* HAMMER, 1973 — Samoa
Type-species: *S. acutirostrum* HAMMER, 1973
13.2.13. *Cantharozetes* HAMMER, 1961 — Peru
Type-species: *C. lucens* HAMMER, 1961
13.2.14. *Ischeloribates* CORPUZ-RAROS, 1980 — Philippines, S. Africa
Type-species: *I. benguetensis* COR.-RAR., 1980
13.2.15. *Fijibates* HAMMER, 1971 — Oceania, Java, Philippines
Type-species: *Scheloribates rostratus* HAMMER, 1958
13.2.16. *Makischeloribates* CORPUZ-RAROS, 1980 — Philippines
Type-species: *M. tripartitus* COR.-RAR., 1980
13.2.17. *Pachygena* HAMMER, 1972 — Tahiti
Type-species: *P. falcata* HAMMER, 1972
13.2.18. *Perscheloribates* HAMMER, 1973 — Samoa, Philippines
Type-species: *P. clavatus* HAMMER, 1973
13.3. Tribatinae subfam. n.
13.3.1. *Otaheitea* HAMMER, 1972 — Tahiti
Type-species: *O. sulcata* HAMMER, 1972
13.3.2. *Hammerabates* BALOGH, 1970 — New Guinea
Type-species: *H. trisetosus* BALOGH, 1970
13.3.3. *Euscheloribates* KUNST, 1958 — Europe
Type-species: *E. samsinaki* KUNST, 1958
13.3.4. *Philoribates* CORPUZ-RAROS, 1980 — Philippines
Type-species: *P. filipinus* COR.-RAR., 1980

13.3.5. *Tribates* MAHUNKA, 1978 — Mauritius, Réunion
Type-species: *T. mixtus* MAHUNKA, 1978
13.4. Planobatinae subfam. n.
13.4.1. *Planobates* HAMMER, 1973 — Tonga
Type-species: *P. circumalatus* HAMMER, 1973
13.5. Nanobatinae subfam. n.
13.5.1. *Nanobates* gen. n. — New Guinea, Philippines, Fiji
Type-species: *Birobates fenicheli* BALOGH, 1970
13.5.2. *Rhabdoribates* AOKI, 1967 — Thailand
Type-species: *R. siamensis* AOKI, 1967

14. **Oripodidae** JACOT, 1925
14.1. Protoripodinae AOKI et OHKUBO, 1974
14.1.1. *Protoripoda* BALOGH, 1970 — Ceylon, Mauritius, New Guinea
Type-species: *P. woolleyi* BALOGH, 1970
14.1.2. *Pteroripoda* BAL. et MAH., 1974 — Cuba
Type-species: *P. minutissima* BAL. et MAH., 1974
14.2. Oripodinae (JACOT, 1925)
14.2.1. *Truncopes* GRANDJEAN, 1956 — Cosmopolitan (?)
Type-species: *T. optatus* GRANDJEAN, 1956
14.2.2. *Oripoda* BANKS, 1904 — Cosmopolitan (?)
Type-species: *O. elongata* BANKS, 1904
14.2.3. *Cosmopirnodus* BALOGH, 1970 — New Guinea
Type-species: *C. pulcherrimus* BALOGH, 1970
14.2.4. *Gymnobates* BANKS, 1902 — Neotropis, Nearctis
Type-species: *G. glaber* BANKS, 1902
14.2.5. *Anoripoda* SELLNICK, 1959 — Oceania
Type-species: *A. nasalis* SELLNICK, 1959
14.2.6. *Scriptoripoda* P. BALOGH, 1984 — Hawaii
Type-species: *S. excellens* P. BALOGH, 1984
14.3. Pirnodinae GRANDJEAN, 1956
14.3.1. *Pirnodus* GRANDJEAN, 1956 — Cosmopolitan (?)
Type-species: *P. detectidens* GRANDJEAN, 1956
14.4. Parapirnodinae AOKI et OHKUBO, 1974
14.4.1. *Parapirnodus* BAL. et MAH. 1968 — Argentina
Type-species: *P. longus* BAL. et MAH., 1968
14.4.2. *Cryptoribatula* JACOT, 1934 — China, Samoa
Type-species: *C. thaishanensis* JACOT, 1934
14.4.3. *Euaella* HAMMER, 1973 — Tonga I.
Type-species: *E. gittae* HAMMER, 1973
14.5. Benoibatinae AOKI et OHKUBO, 1974
14.5.1. *Gymnobatoides* WOOLLEY, 1966 — C. and S. America
Type-species: *Gymnobates longus* EWING, 1909
14.5.2. *Benoibates* BALOGH, 1958 — Circumtropical
Type-species: *B. flagellifer* BALOGH, 1958
14.5.3. *Haploripoda* BAL. et MAH., 1967 — Congo
Type-species: *H. reducta* BAL. et MAH., 1967

15. **Hemileidae** fam. n.
15.1. Hemileinae subfam. n.
15.1.1. *Multoribates* HAMMER, 1961 — Peru, New Zealand
Type-species: *M. chavinensis* HAMMER, 1961
15.1.2. *Nesoribatula* AOKI, 1964 — Hawaii
Type-species: *N. pacifica* AOKI, 1964
15.1.3. *Heteroleius* BAL. et MAH., 1966 — Congo
Type-species: *H. longissimus* BAL. et MAH., 1966
15.1.4. *Monoschelobates* BAL. et MAH., 1969 — S. America
Type-species: *M. parvus* BAL. et MAH., 1969
15.1.5. *Urubambates* HAMMER, 1961 — S. America
Type-species: *U. punctatus* HAMMER, 1961
15.1.6. *Nasozetes* SELLNICK, 1930 — Sumatra, Oceania
Type-species: *N. sumatrensis* SELLNICK, 1930

15.1.7. *Mucrobates* BAL. et MAH., 1979 — Cuba
Type-species: *M. fissuratus* BAL. et MAH., 1979
15.1.8. *Wallworkiella* HAMMER, 1980 — Java
Type-species: *W. nasalis* HAMMER, 1980
15.1.9. *Hemileius* BERLESE, 1916 — Circumtropical (?)
Type-species: *Protoribates* (*Scheloribates*) *initialis* BERLESE, 1908
15.2. Tuberemaeinae subfam. n.
15.2.1. *Tuberemaeus* SELLNICK, 1930 — Circumtropical
15.3. Stelechobatinae (GRANDJEAN, 1965)
15.3.1. *Stelechobates* GRANDJEAN, 1965 — Mexico
Type-species: *S. megalotrichus* GRANDJEAN, 1965
15.4. Calobatinae subfam. n.
15.4.1. *Calobates* BALOGH, 1961 — W. Africa, S. America
Type-species: *Oripoda ornatissima* BALOGH, 1959

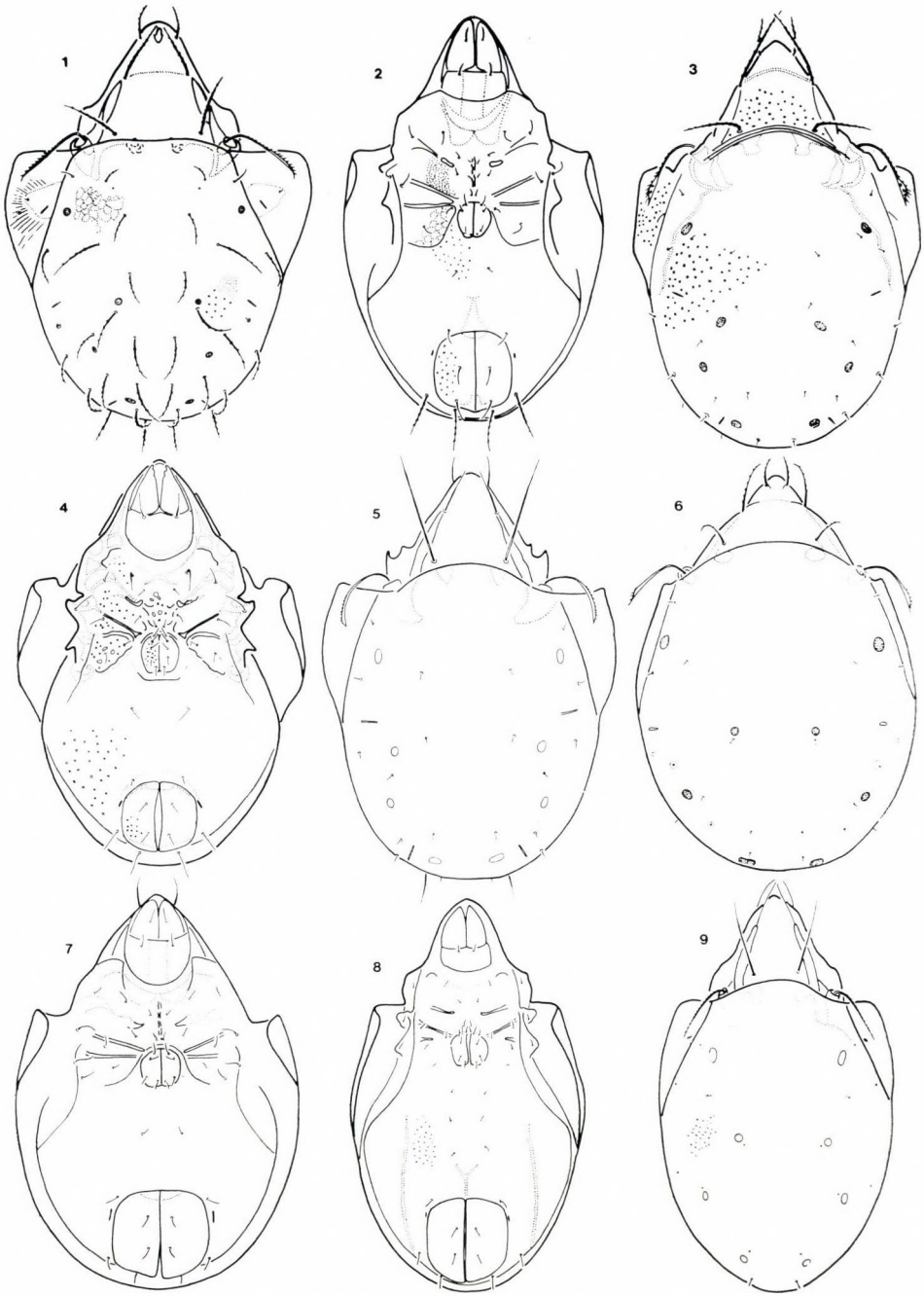
16. **Fenicheliidae** fam. n.
16.1. Fenicheliinae subfam. n.
16.1.1. *Fenichelia* BALOGH, 1970 — New Guinea, Ethiopia
Type-species: *F. biroi* BALOGH, 1970
16.1.2. *Brassiella* BALOGH, 1970 — Ceylon, Australia, Oceania
Type-species: *Carabodes reticulatus* OUDEMANS, 1916
16.2. Plumobatinat subfam. n.
16.2.1. *Plumobates* BAL. et MAH., 1966 — Australia
Zype-species: *P. decoratus* BAL. et MAH., 1966
16.3. Constrictobatinae subfam. n.
16.3.1. *Constrictobates* BAL. et MAH., 1966 — Australia
Type-species: *C. lineolatus* BAL. et MAH., 1966
16.4. Phylloribatulinae subfam. n.
16.4.1. *Phylloribatula* BAL. et MAH., 1978 — Brazil
Type-species: *P. pulchella* BAL. et MAH., 1978

17. **Birobatidae** fam. n.
17.1.1. *Birobates* BALOGH, 1970 — New Guinea, Philippines
Type-species: *B. reductus* BALOGH, 1970
17.1.2. *Vesiculobates* HAMMER, 1980 — Java
Type-species: *V. silvaticus* HAMMER, 1980
17.1.3. *Brachyoripoda* BALOGH, 1970 — Ceylon
Type-species: *B. foveolata* BALOGH, 1970

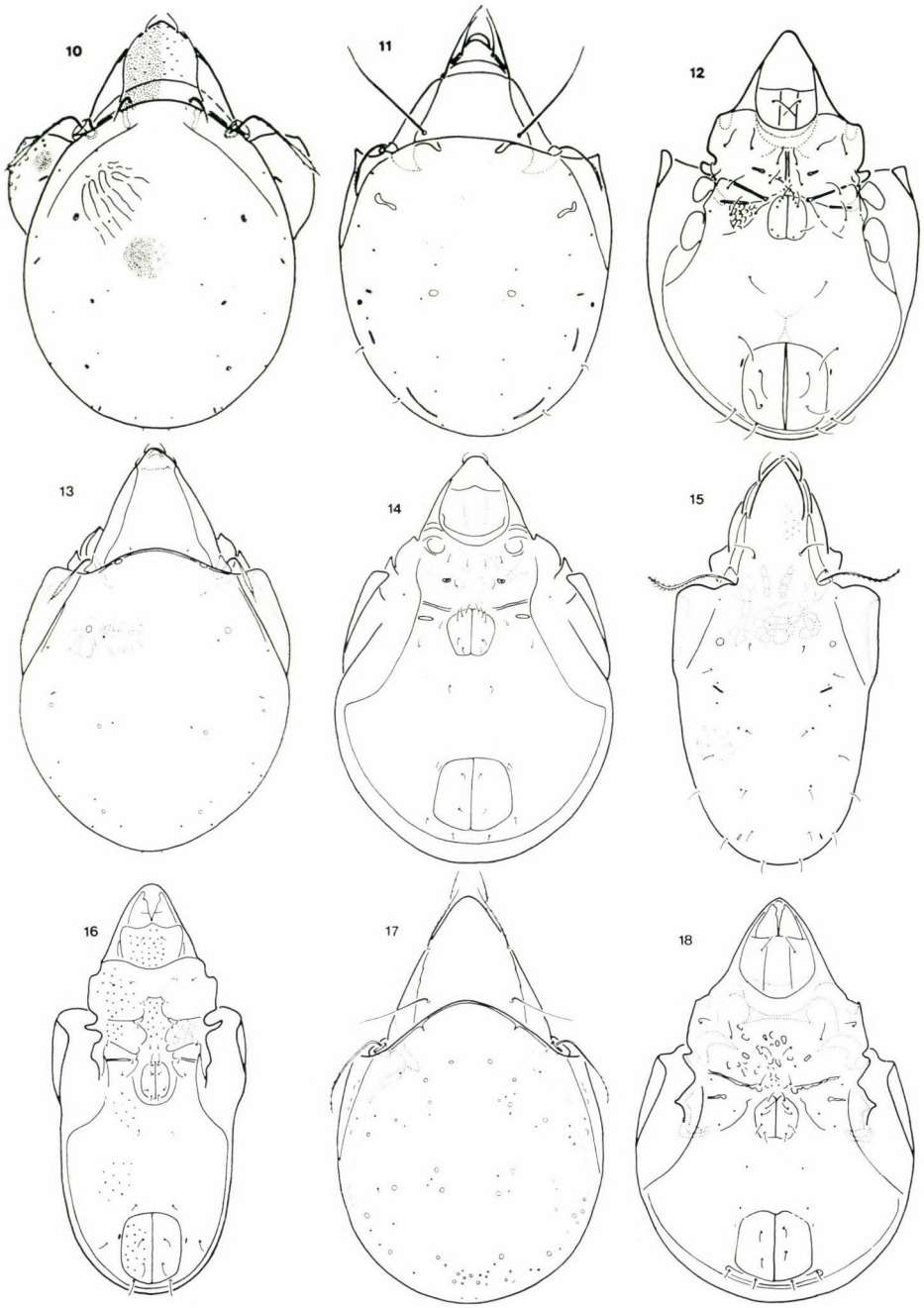
18. **Campbellobatidae** fam. n.
18.1.1. *Campbellobates* WALLWORK, 1964 — Campbell Is., New Zealand, Hawaii
Type-species: *C. acanthus* WALLWORK, 1964

19. **Chaunoproctidae** BALOGH, 1961
19.1.1. *Chaunoproctus* PEARCE, 1906 — Circumtropical (?)
Type-species: *C. cancellatus* PEARCE, 1906

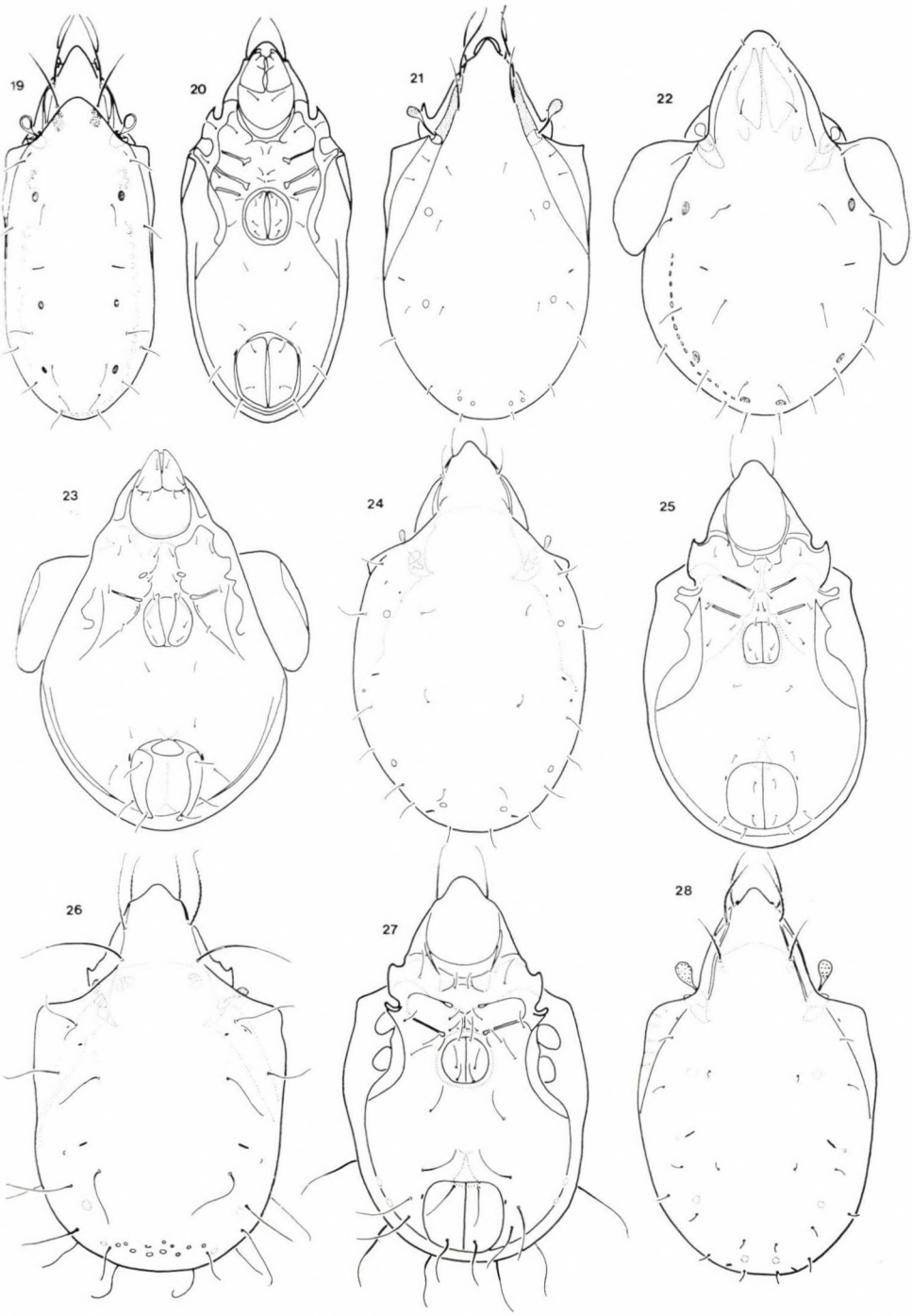
20. **Zetomotrichidae** GRANDJEAN, 1934
20.1. Zetomotrichinae (GRANDJEAN, 1934)
20.1.1. *Zetomotrichus* GRANDJEAN, 1934 — N. Africa, Pakistan
Type-species: *Z. lacrimans* GRANDJEAN, 1934
20.1.2. *Mikizetes* HAMMER, 1958 — S. America
Type-species: *M. diamantensis* HAMMER, 1958
20.1.3. *Ghilarovus* KRIVOLUTSKY, 1966 — C. Asia
Type-species: *G. humeridens* KRIVOLUTSKY, 1966
20.2. Rohriinae subfam. n.
20.2.1. *Rohria* BAL. et MAH., 1977 — Brazil
Type-species: *R. pulchella* BAL. et MAH., 1977



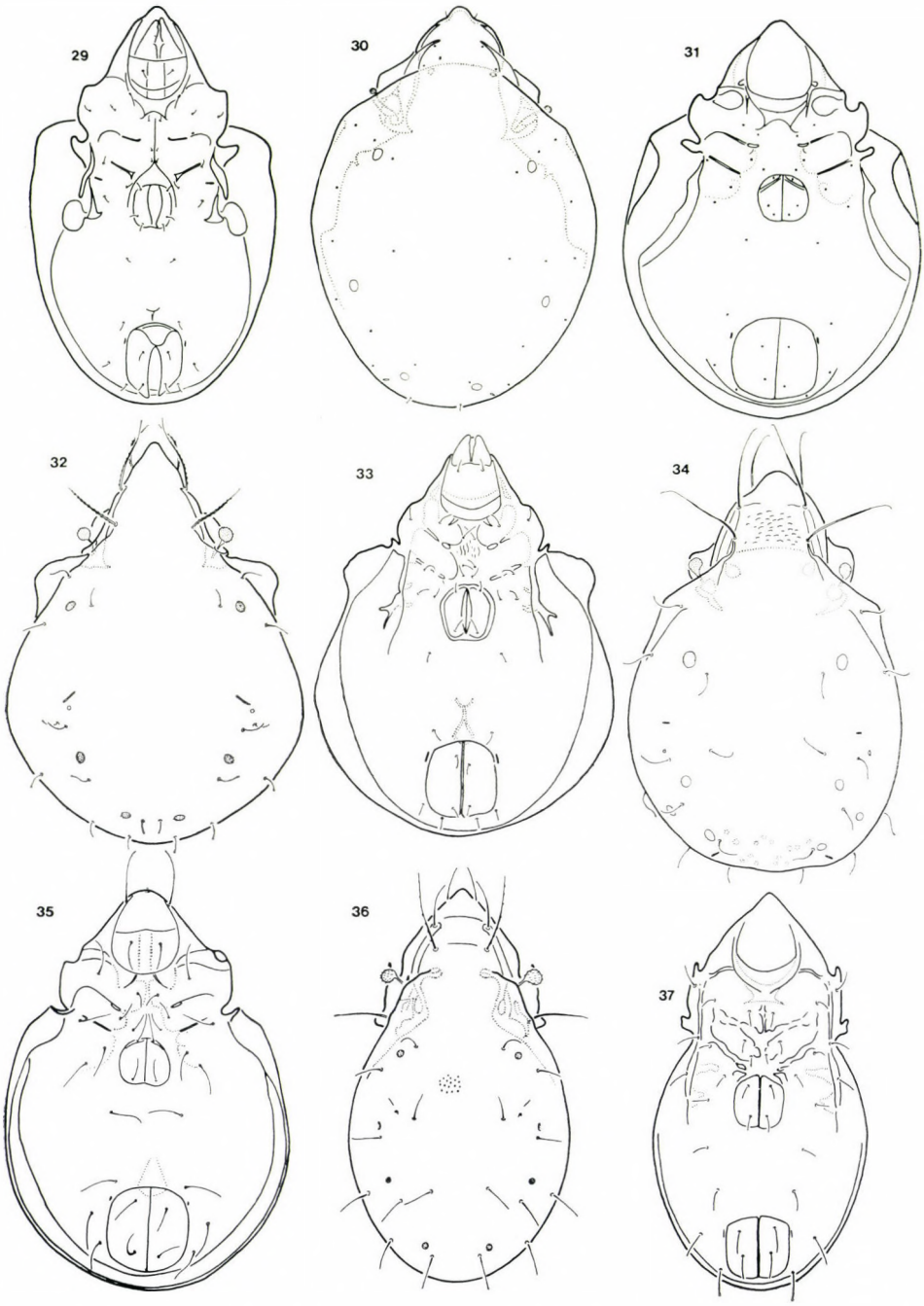
Figs 1—9. 1—2 = *Plenoxylobates ramosus* HAMMER, 1980, 3—4 = *Setoxylobates foveolatus* BAL. et MAH., 1967, 5 = *Brasilobates bipilis* PÉREZ-INIGO et BAGGIO, 1980, 6—7 = *Xylobates acutus* HAMMER, 1980, 8—9 = *Trixylobates bidactylus* BAL. et MAH., 1978



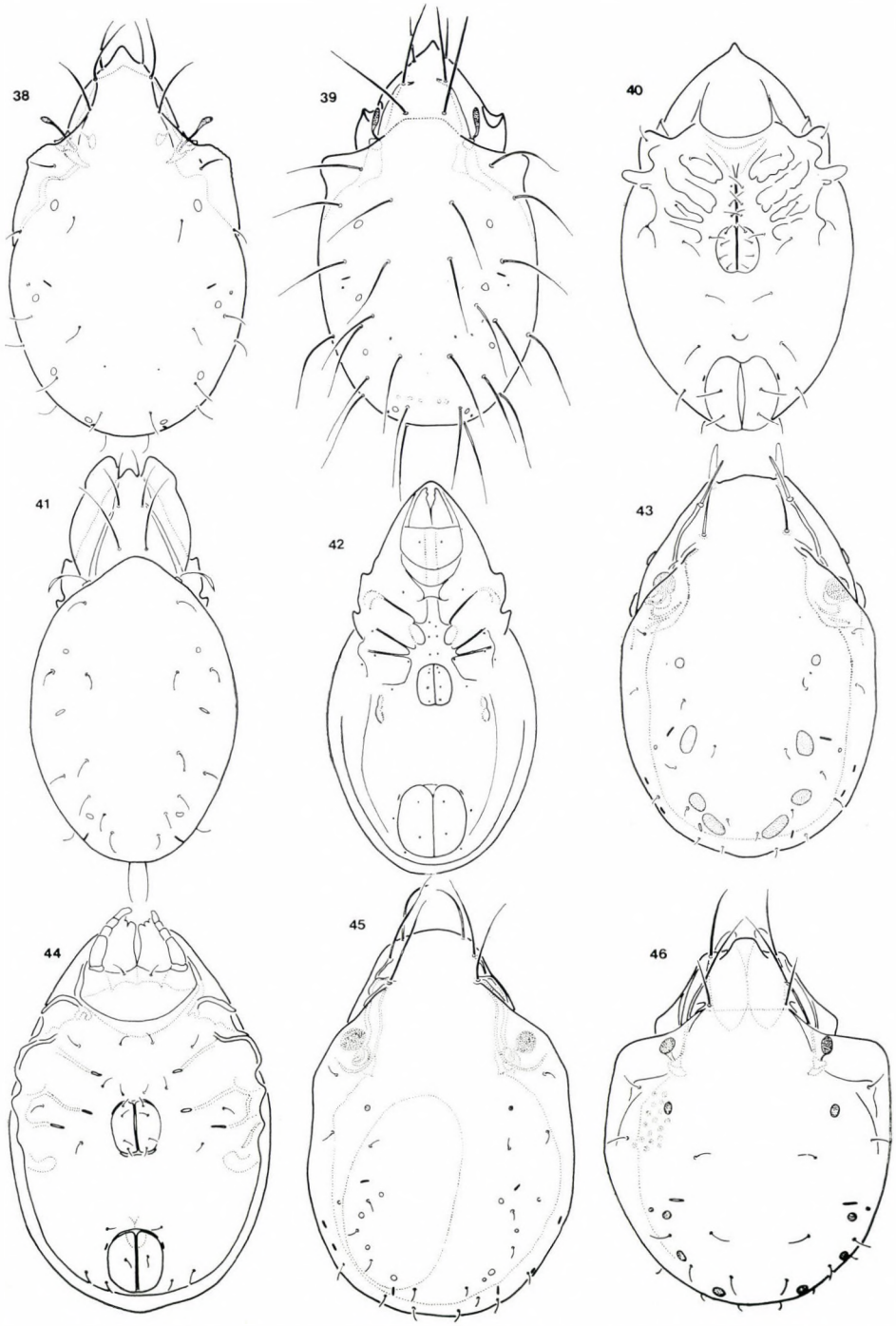
Figs 10—18. 10 = *Vilhenabates minutus* (BALOGH, 1958), 11—12 = *Polyxylobates diversiporosus* HAMMER, 1973, 13—14 = *Phalacrozetes sinuatus* AOKI, 1965, 15—16 = *Perxylobates vermiseta* (BAL. et MAH., 1968), 17—18 = *Cribrozetes multiareolatus* BALOGH, 1970



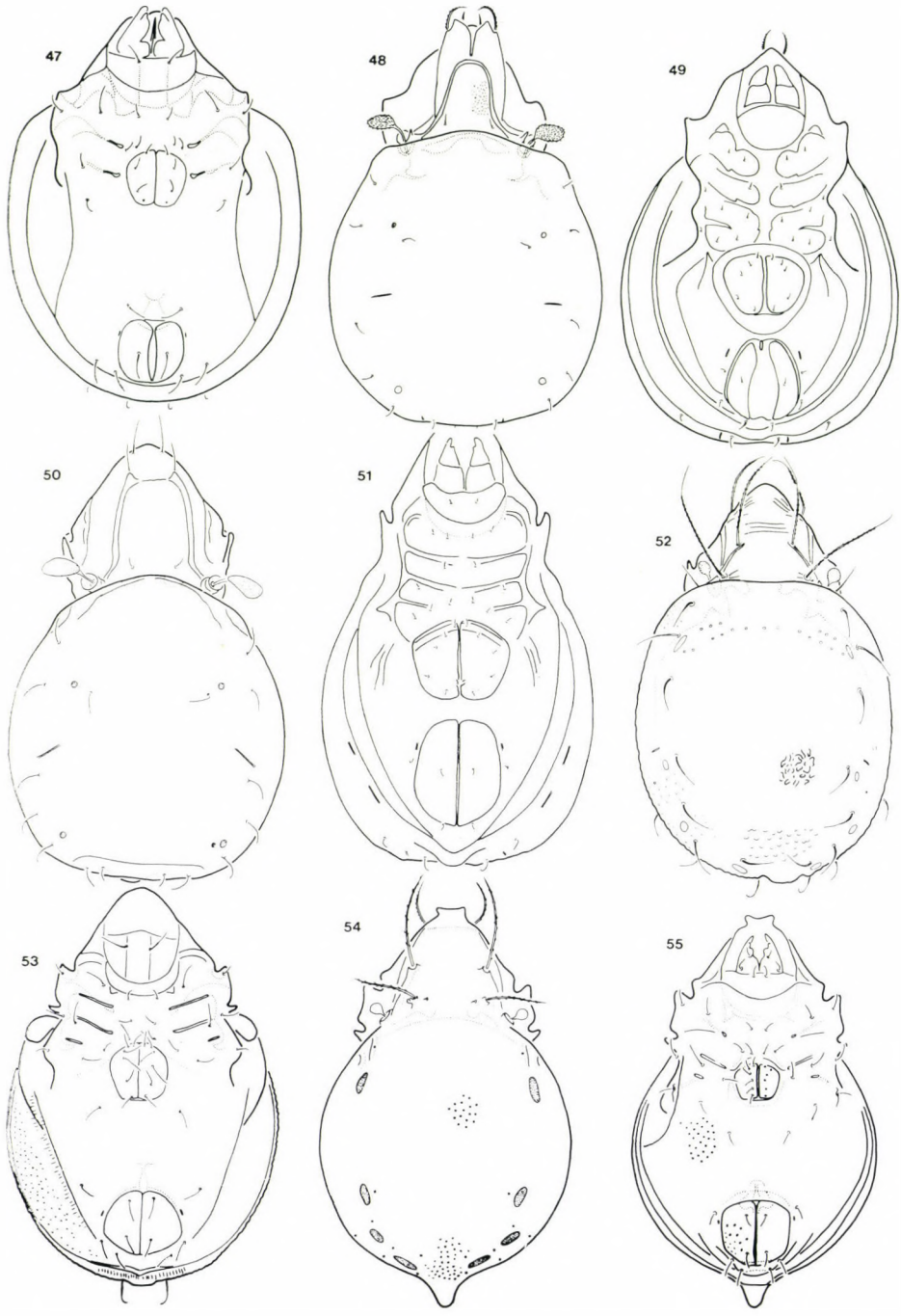
Figs 19—28. 19—20 = *Protoribates gratiosus* FEID., VAS. et CAL., 1970, 21 = *Rajskibates pannonicus* (WILLMANN, 1951), 22—23 = *Tuxenia brevis* COVARRUBIAS, 1967, 24—25 = *Totobates antarcticus* WALLWORK, 1961, 26—27 = *Maculobates longipilosus* HAMMER, 1967, 28 = *Subulobates albulus* HAMMER, 1972



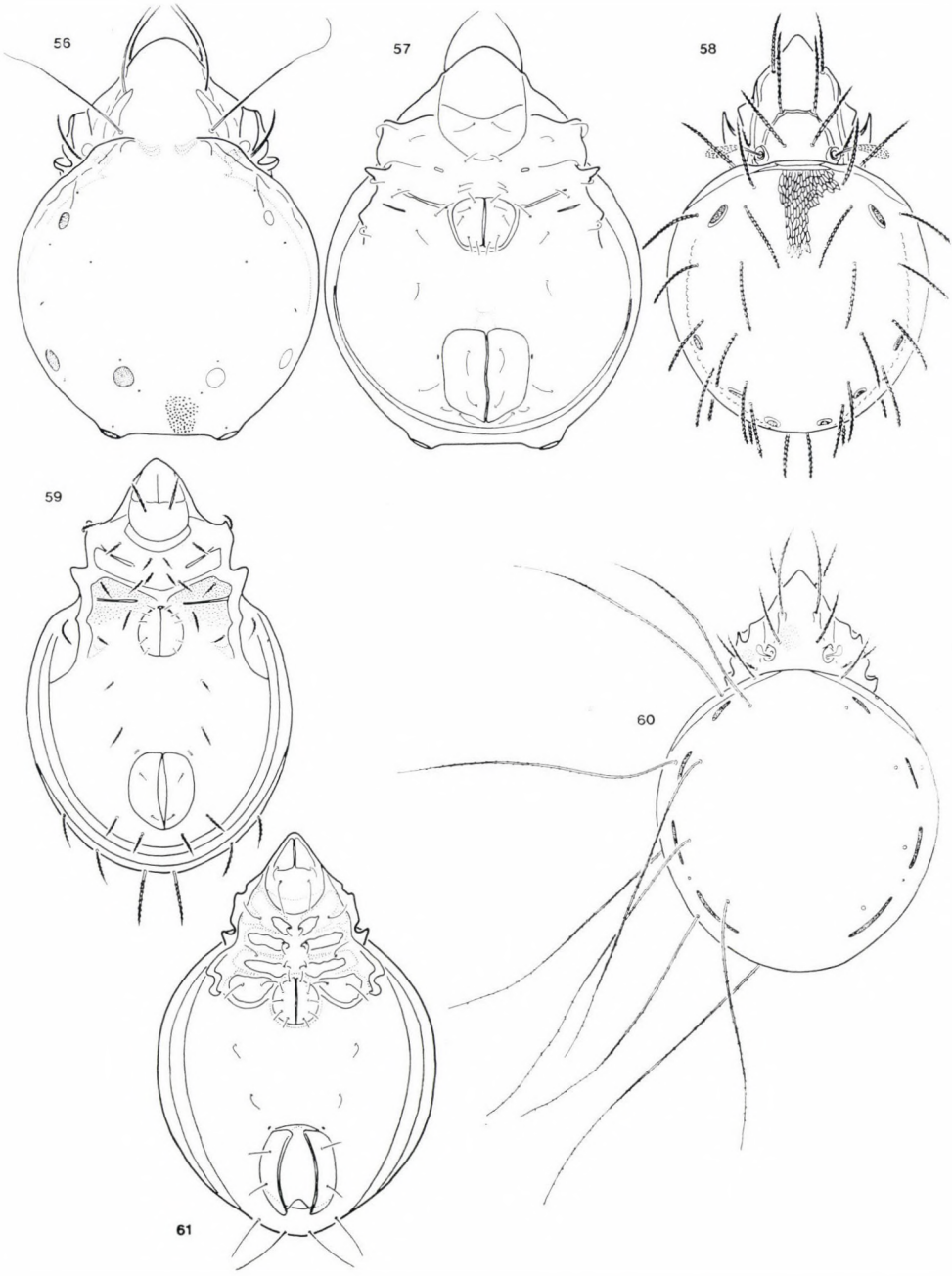
Figs 29—37. 29 = *Subulobates albulus* HAMMER, 1962, 30—31 = *Angullozetes rostratus* HAMMER, 1967, 32—33 = *Reductobates humeratus* BAL. et MAH., 1966, 34—35 = *Ingella bullager* HAMMER, 1967, 36—37 = *Baobabula mussardi* MAHUNKA, 1975



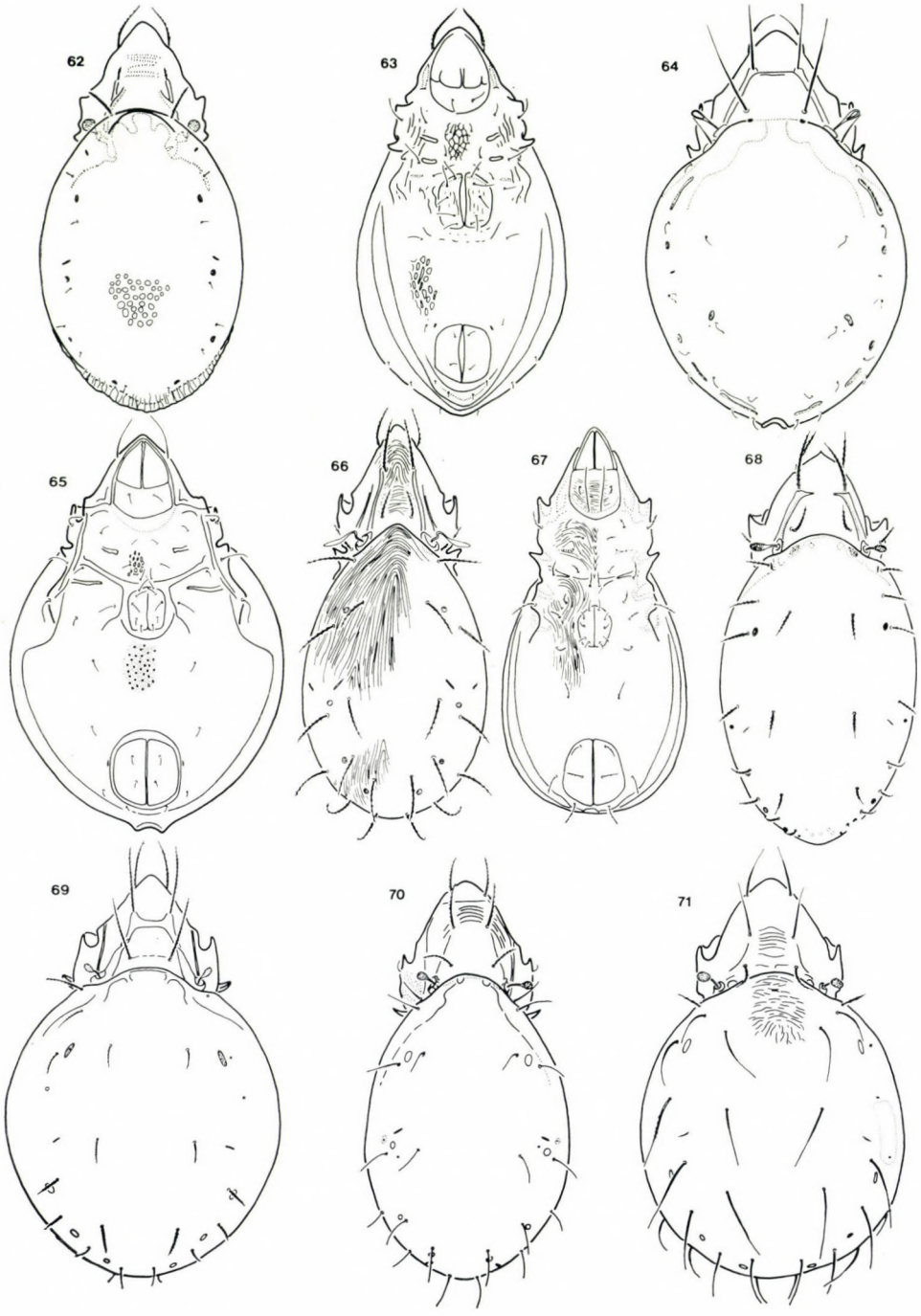
Figs 38—46. 38 = *Liebstadia similis* (MICH., 1888), 39—40 = *Haloribatula tenareae* SCHUSTER, 1957, 41—42 = *Nesozetes rostratus* HAMMER, 1971, 43—44: *Symbioribates papuensis* AOKI, 1966, male, 45 = female, 46 = *Piffliella eduardi* HAMMER, 1980



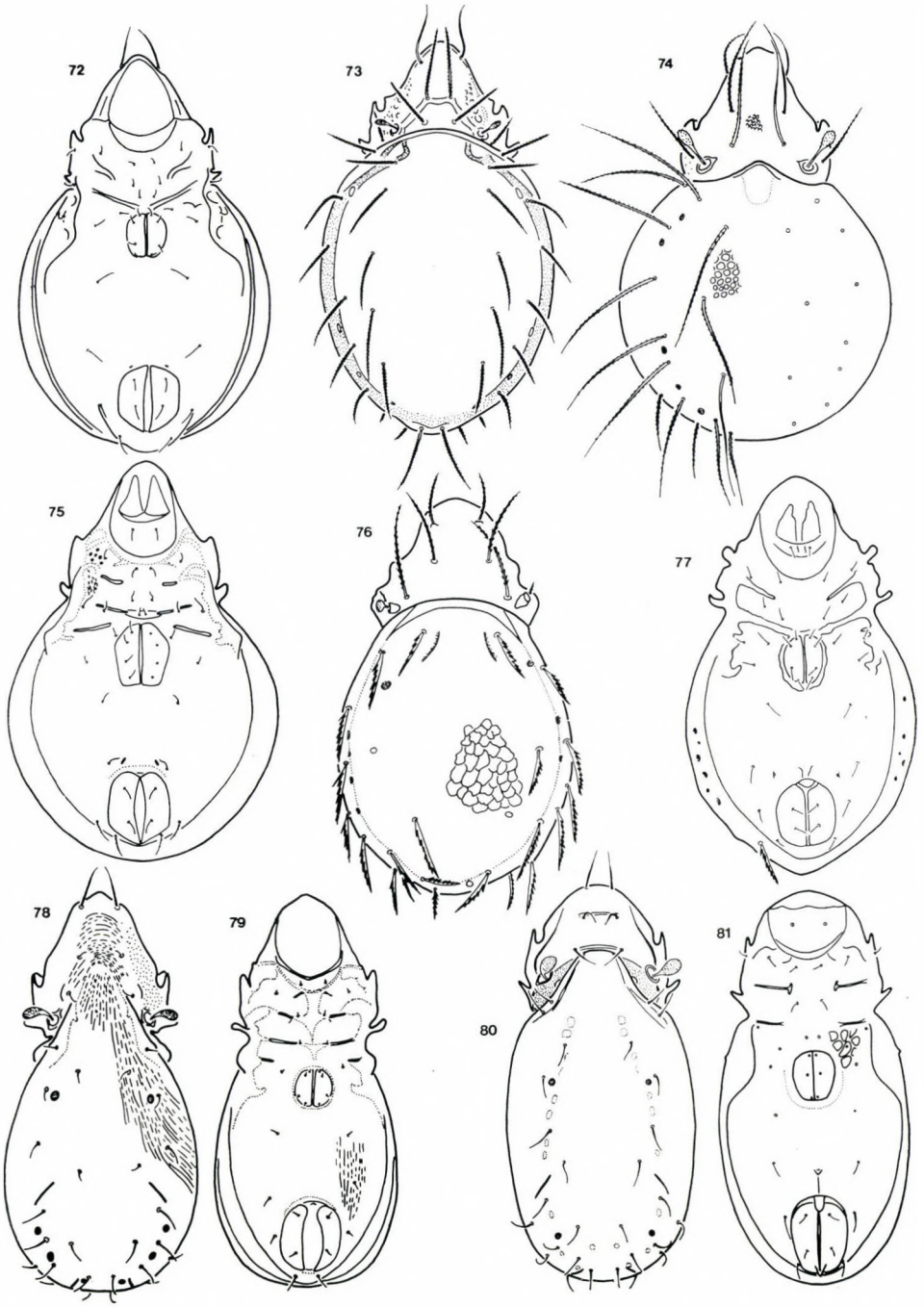
Figs 47—55. 47 = *Piffliella eduardi* HAMMER, 1980, 48—49 = *Lamellarea ardua* KOK, 1968, 50—51 = *Tenuelamellarea inexpectata* P. BALOGH, 1984, 52—53 = *Crassoribatula maculosa* HAMMER, 1967, 54—55 = *Sellnickia caudata* (MICH., 1898)



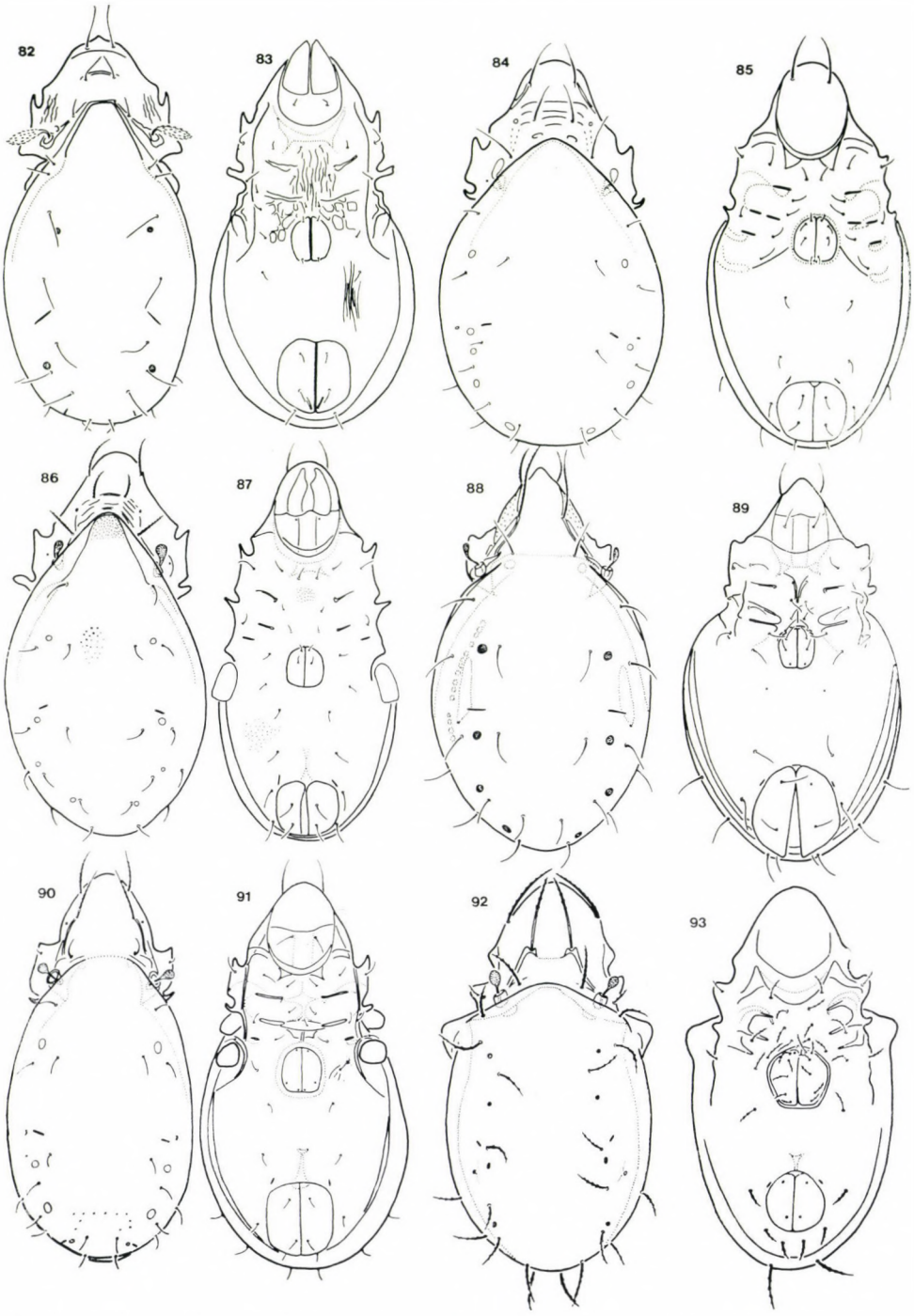
Figs 56—61. 56—57 = *Grandjeania bicaudata* (BALOGH, 1961), 58—59 = *Romanobates reticulatus* FEID., VAS. et CAL., 1970, 60—61 = *Capilloppia capillata* BAL. et MAH., 1966



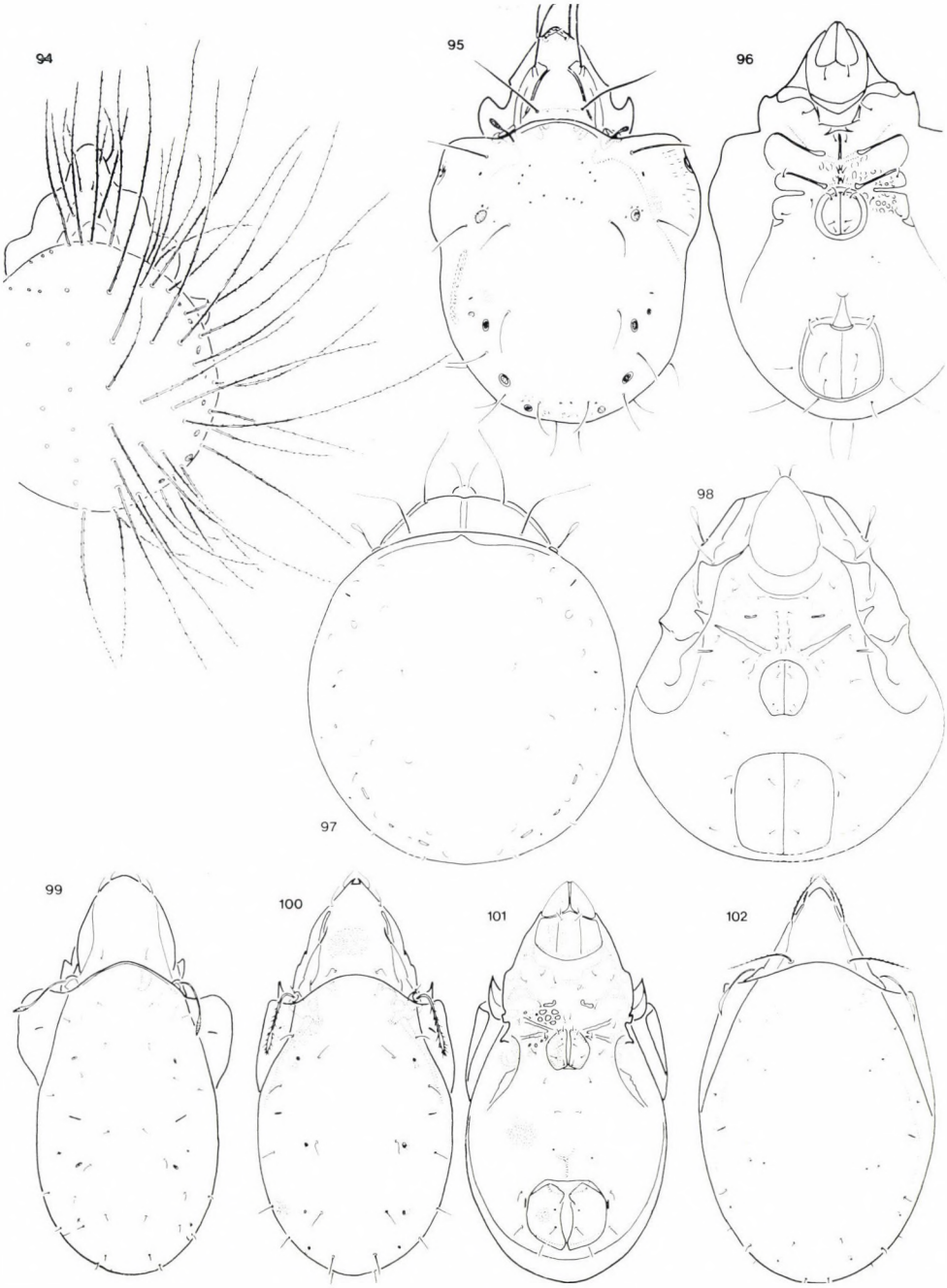
Figs 62—71. 62—63 = *Lunoribatula polygonata* MAHUNKA, 1982, 64—65 = *Mochloribatula multiporosa* MAHUNKA, 1978, 66—67 = *Woolleyibates dactyloscopia* (BAL. et MAH., 1968), 68 = *Oribatula acuminata* WALLW., 1964, 69 = *Zygoribatula longicuspis* BALOGH, 1966, 70 = *Eporibatula australis* HAMMER, 1962, 71 = *Phauloppia vallei* TRAVÉ, 1973



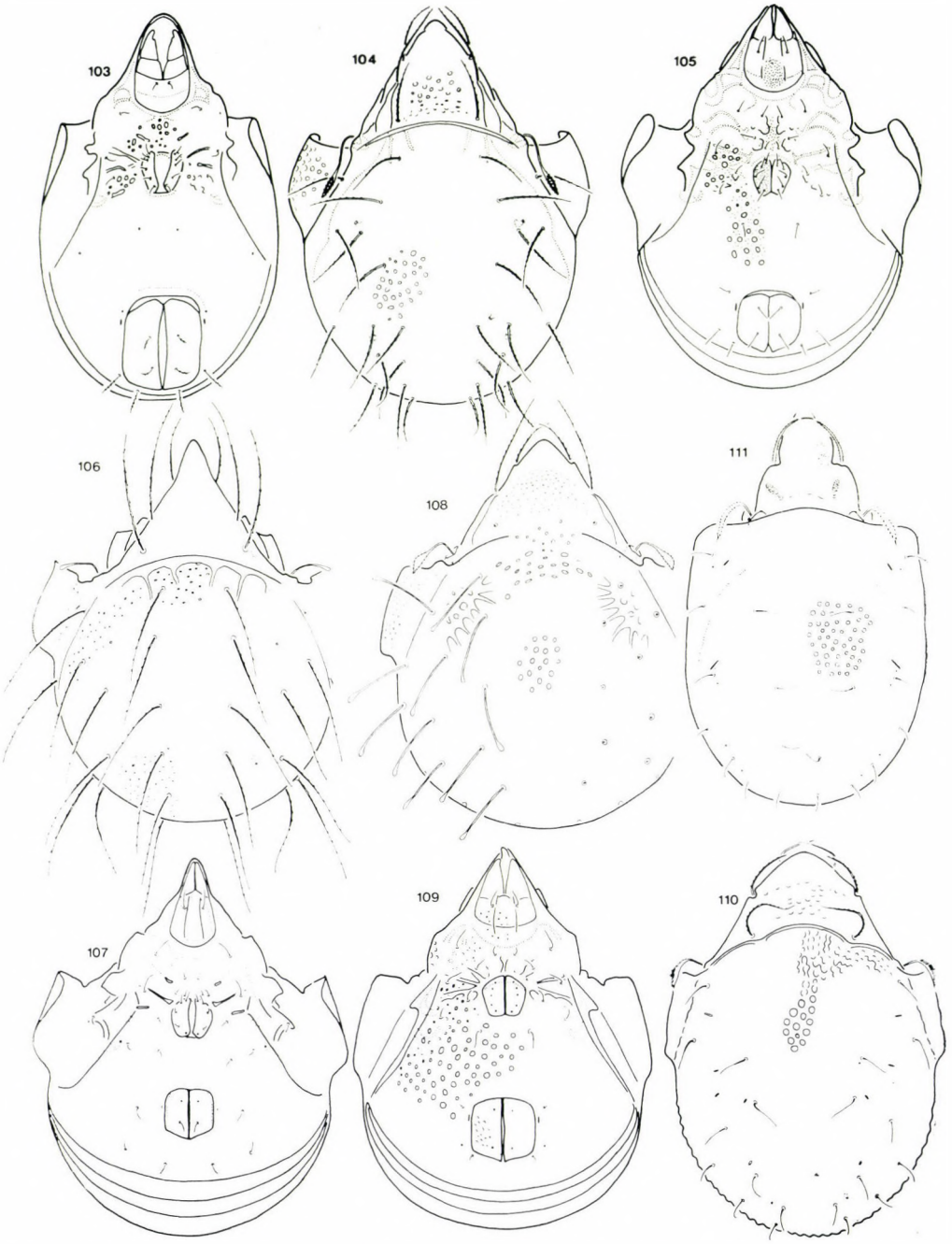
Figs 72—81. 72 = *Phauloppia vallei* TRAVÉ, 1973, 73 = *Lucoppia spinosissima* (MIHELCIC, 1956), 74—75 = *Reticuloppia reticulata* BAL. et MAH., 1966, 76—77 = *Spinoppia magniserrata* HIG. et WOOL., 1966, 78—79 = *Phauloppiella striata* SUBIAS, 1977, 80—81 = *Pseudoppia mediocris* (MIHELCIC, 1957)



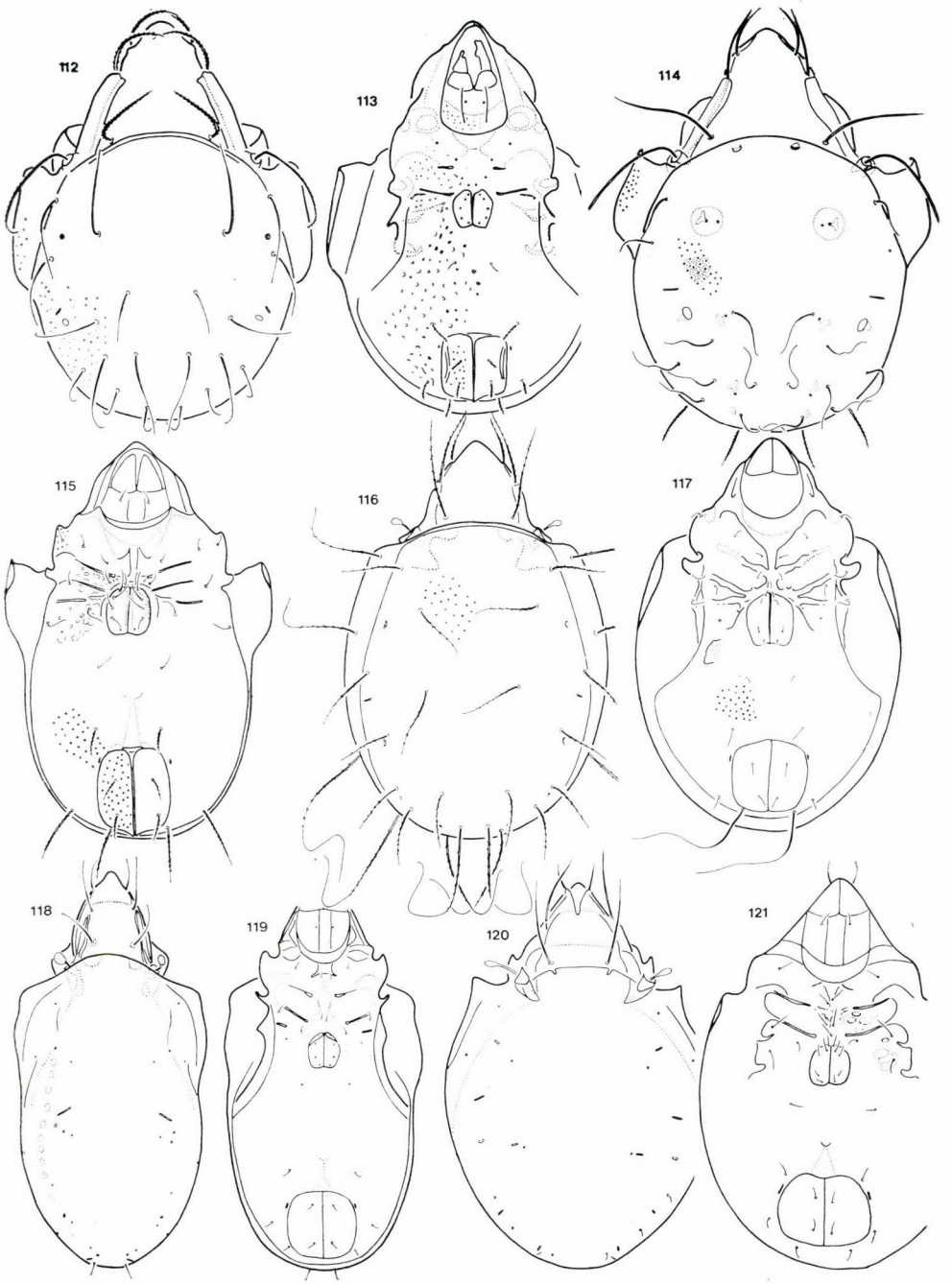
Figs 82—93. 82—83 = *Senoribatula africana* MAHUNKA, 1975, 84—85 = *Subphauloppia dentonyx* HAMMER, 1967, 86—87 = *Diphauloppia luminosa* (HAMMER, 1973), 88—89 = *Gerloubia saifulmalukensis* HAMMER, 1977, 90—91 = *Paraphauloppia novazealandica* HAMMER, 1967, 92—93 = *Maudheimia petronia* WALLW., 1962



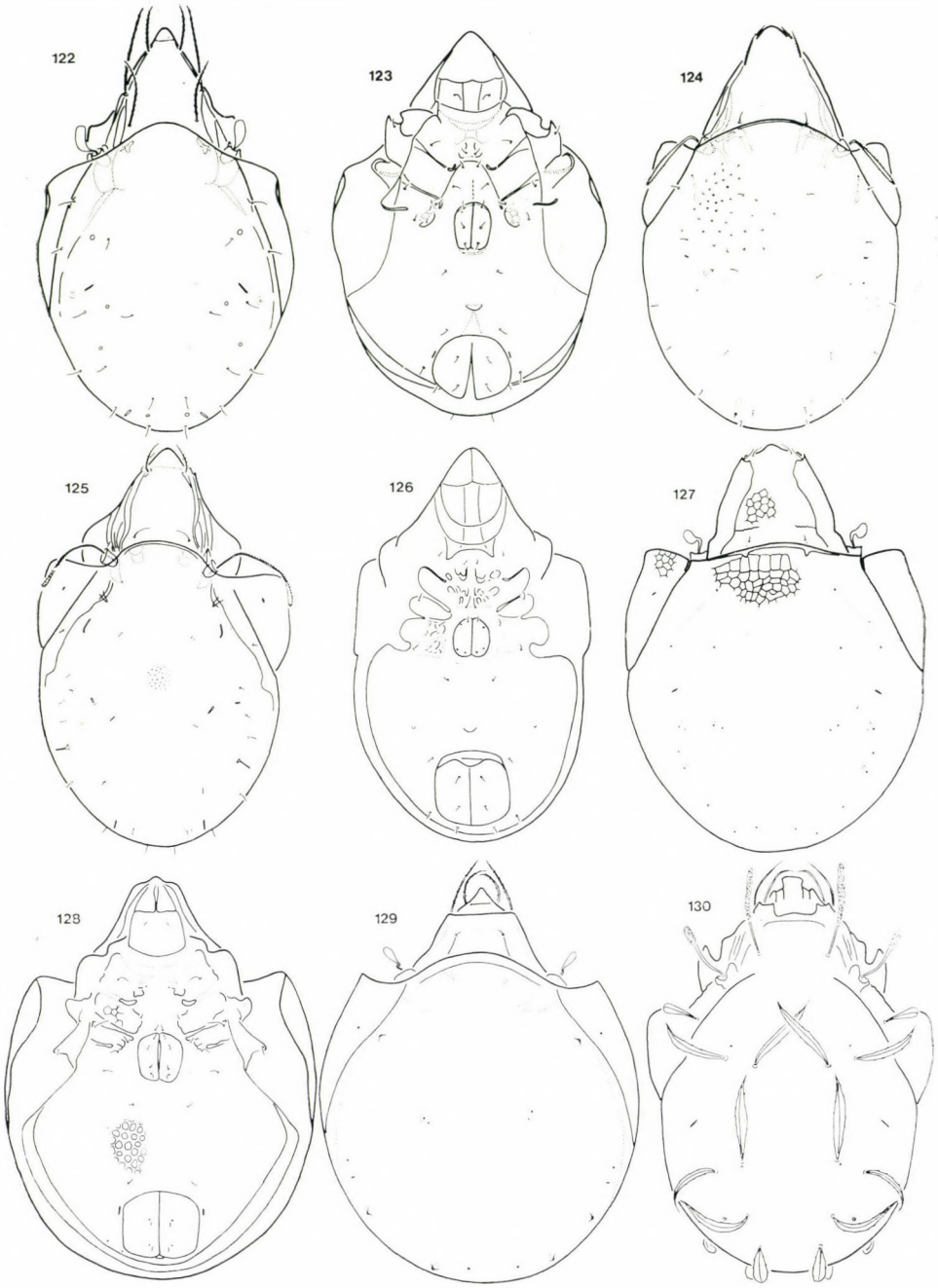
Figs 94—102. 94 = *Neotrichozetes spinulosa* (MICH., 1908), 95—96 = *Areozetes altimontanus* HAMMER, 1961, 97—98 = *Drymobates silvicola* GRANDJ., 1930, 99 = *Pilobates carpentanus* PÉREZ-INIGO, 1969, 100—101 = *Pilobatella punctulata* (BAL. et MAH., 1967), 102 = *Paraxylobates imitans* BAL. et MAH., 1969



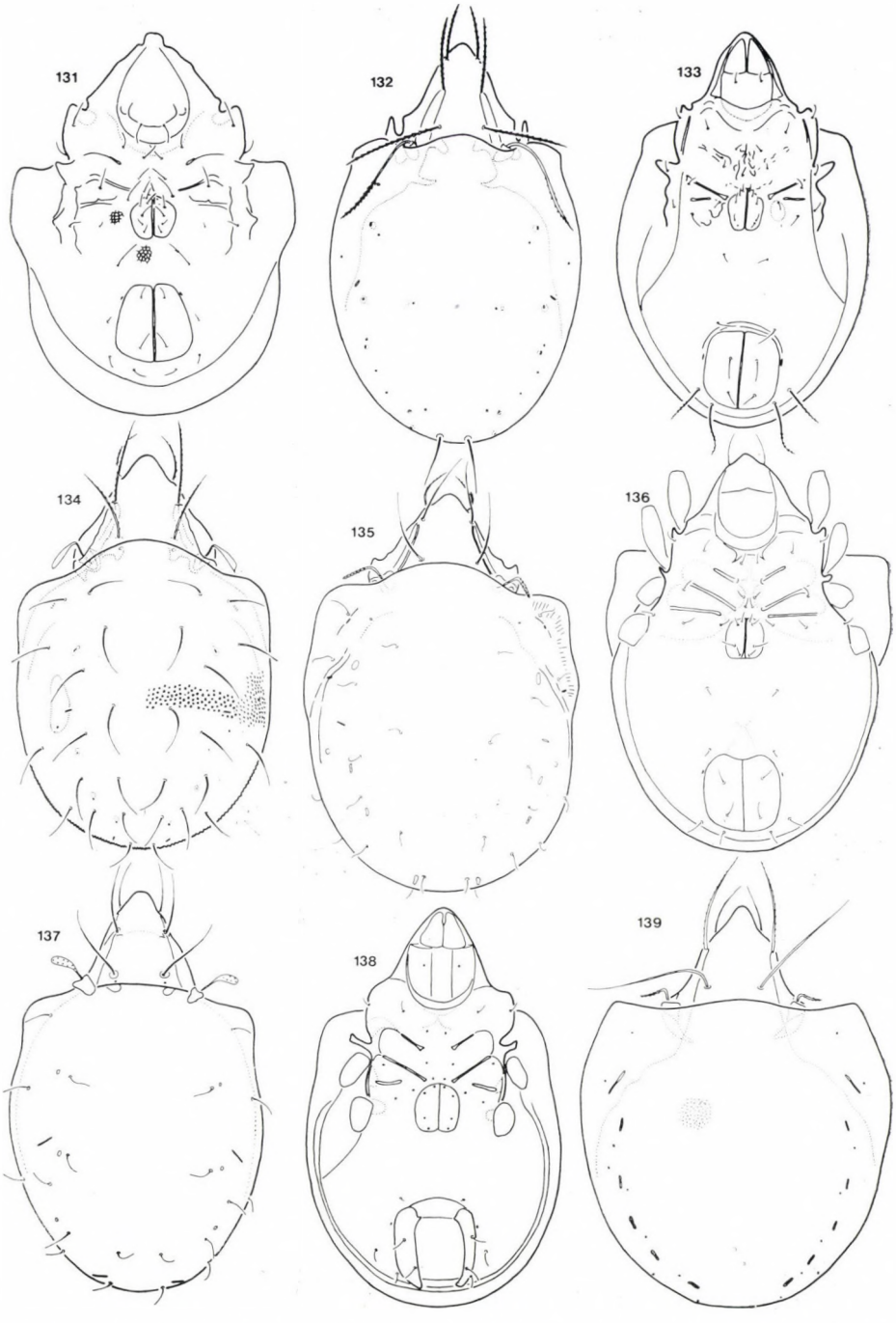
Figs 103—111. 103 = *Paraxylobates imitans* BAL. et MAH., 1969, 104—105 = *Peloribates gressitti* BAL. et MAH., 1967, 106—107 = *Acutozetes rostralis* BALOGH, 1970, 108—109 = *Tentaculozetes loksai* BALOGH, 1970, 110 = *Rostrozetes foveolatus* SELLN., 1925, 111 = *Cosmobates tunicatus* BALOGH, 1959



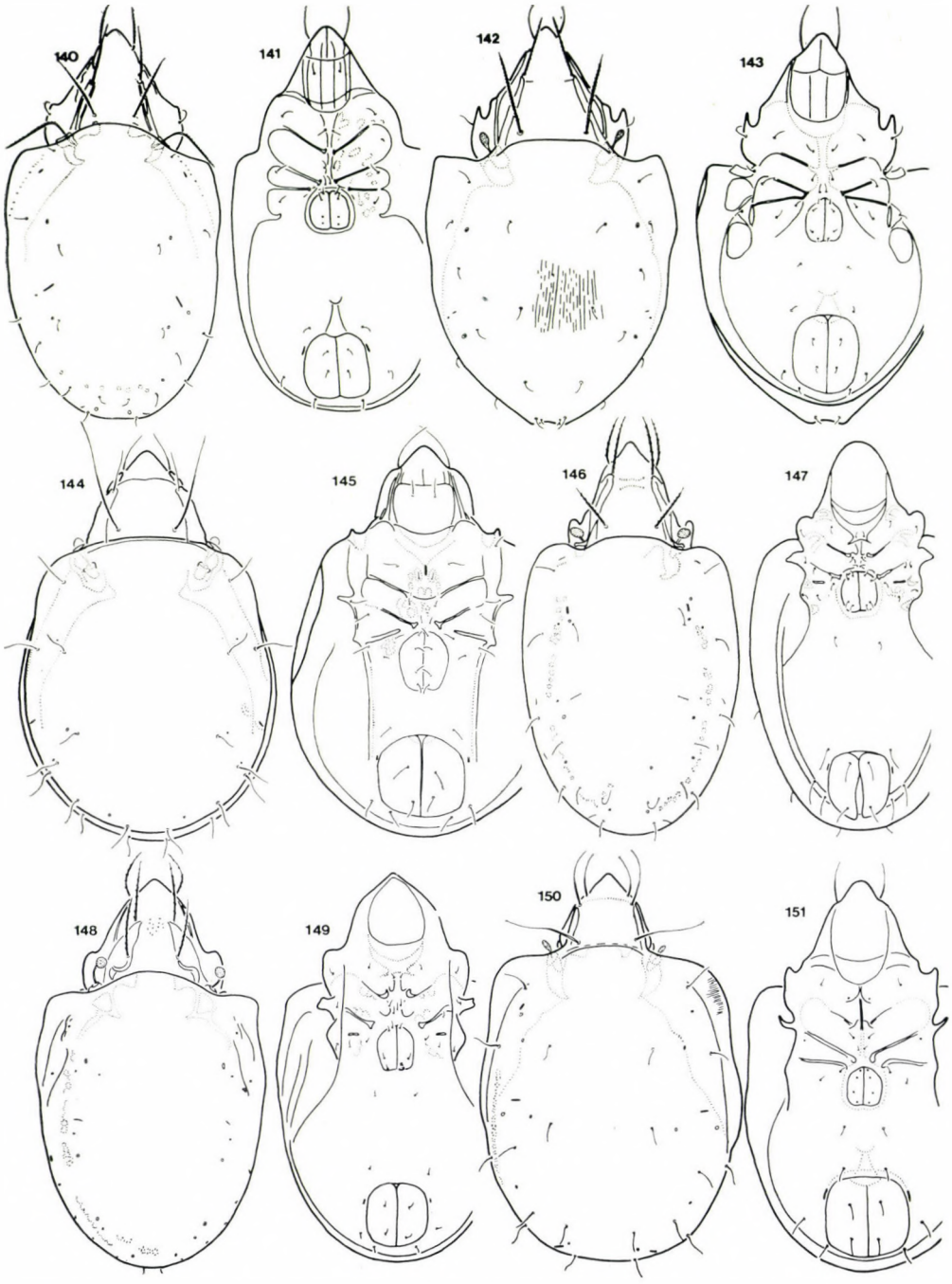
Figs 112—121. 112—113 = *Nixozetes gregoryi* (BALOGH, 1970), 114—115 = *Sundazetes crispus* HAMMER, 1980, 116—117 = *Flagellobates berndthauseri* MAHUNKA, 1978, 118—119 = *Incabates angustus* HAMMER, 1967, 120—121 = *Mancoribates rostropilosus* HAMMER, 1961



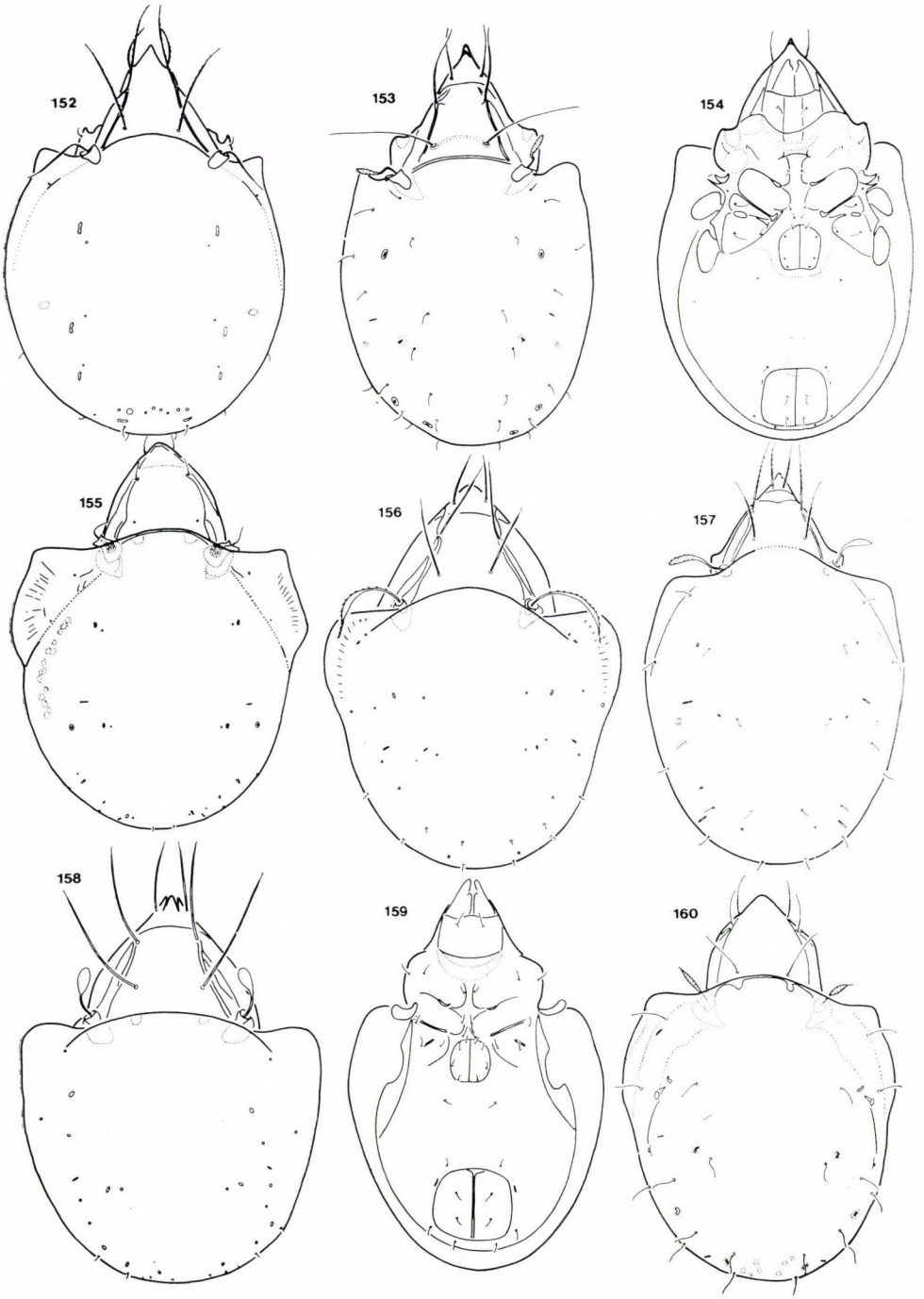
Figs 122—130. 122—123 = *Berlesiella scutata* HAMMER, 1980, 124 = *Haplozetes triungulatus* BECK, 1964, 125—126 = *Lauritzenia longipluma* HAMMER, 1958, 127—128 = *Magyaria breviseta* MAHUNKA, 1978, 129 = *Conozetes arcualis* BAL. et MAH., 1969, 130 = *Nasobates mirabilis* BAL. et MAH., 1969



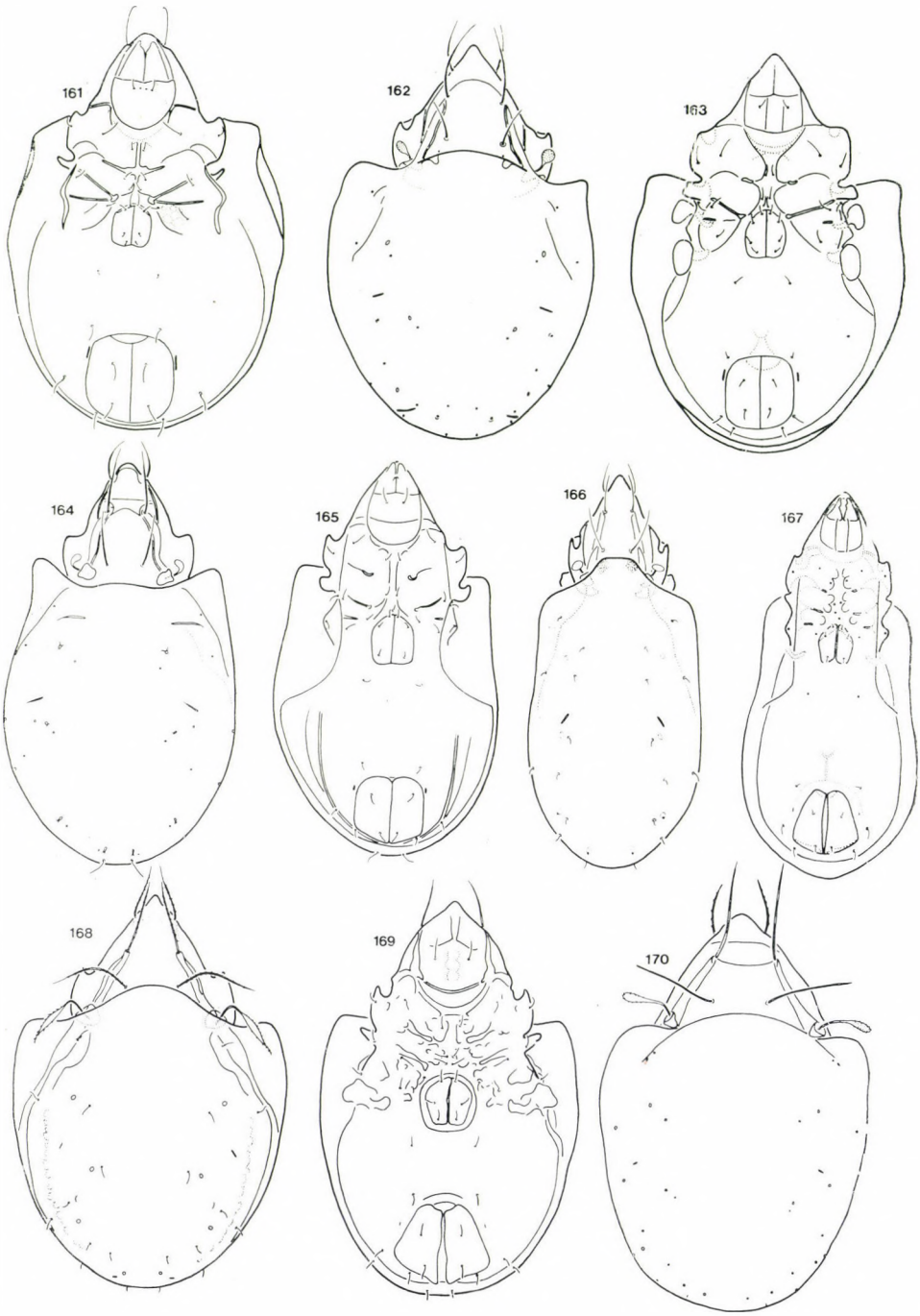
Figs 131—139. 131 = *Nasobates mirabilis* BAL. et MAH., 1969, 132—133 = *Similobates demeterorum* MAHUNKA, 1982, 134 = *Topobates granifer* GRANDJEAN, 1958, 135—136 = *Setobates medius* HAMMER, 1967, 137—138 = *Neoscheloribates longiporosus* HAMMER, 1973, 139 = *Fissurobates spectabilis* BAL. et MAH., 1969



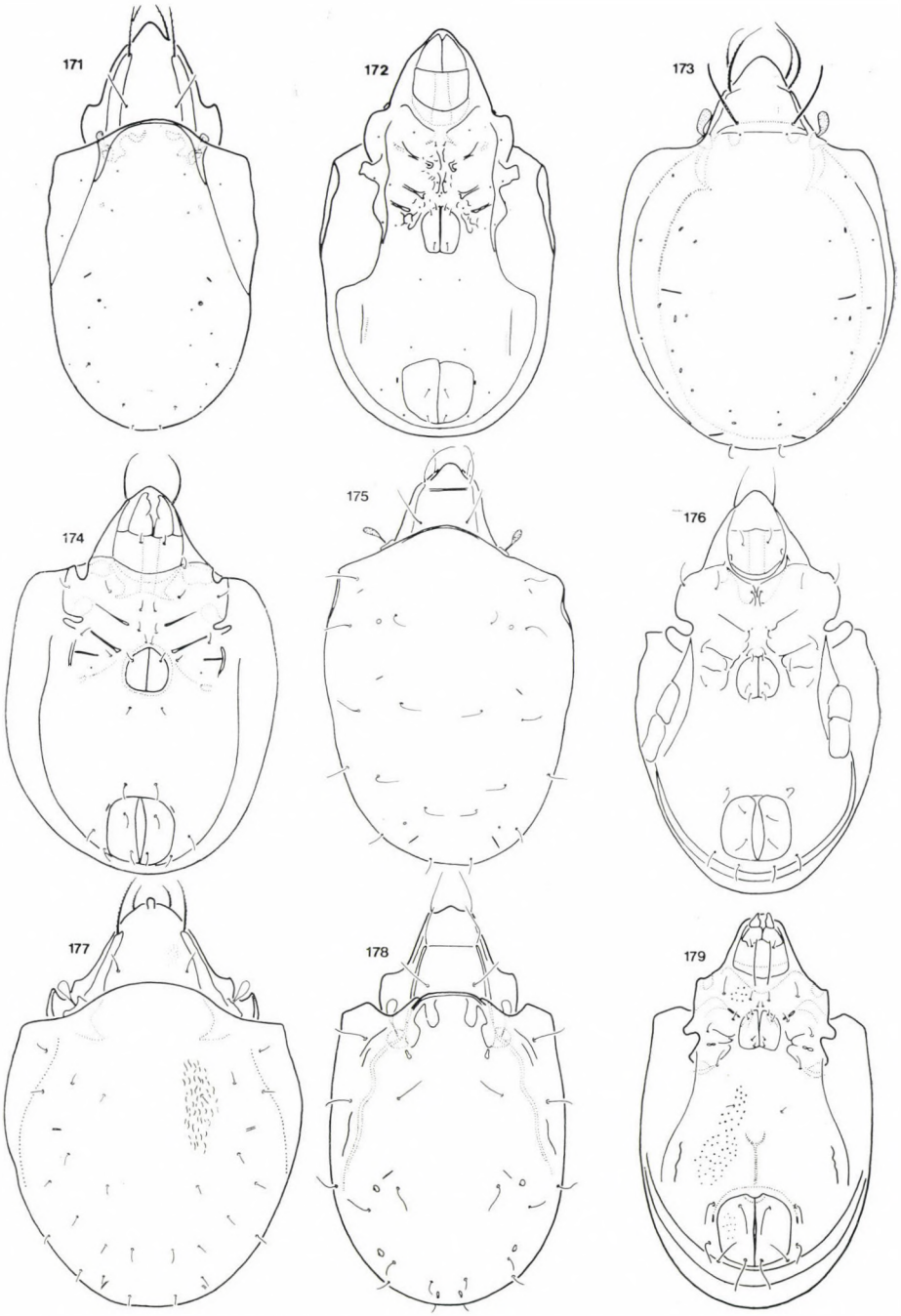
Figs 140—151. 140—141 = *Andeszetes diversidactylus* HAMMER, 1961, 142—143 = *Striatobates tuberculatus* HAMMER, 1973, 144—145 = *Aellenobates cryptacus* MAHUNKA, 1978, 146—147 = *Nannerlia longiqua* COETZER, 1968, 148—149 = *Muliercula muliercula* COETZER, 1968, 150—151 = *Grandjeanobates novazealandicus* HAMMER, 1967



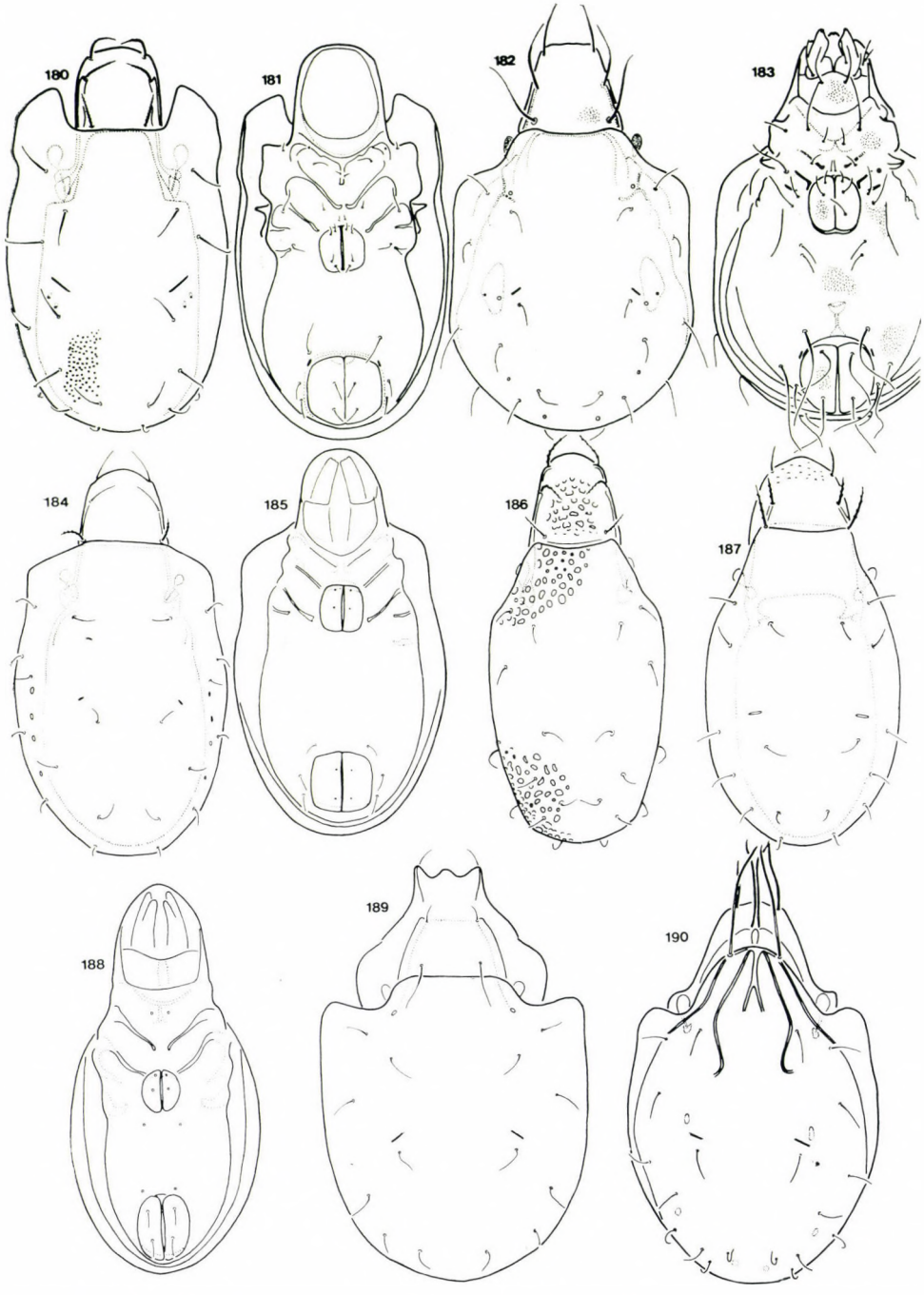
Figs 152—160. 152 = *Scheloribates sphaeroides* HAMMER, 1973, 153—154 = *Samoabates acutirostrum* HAMMER, 1973, 155 = *Cantharozetes lucens* HAMMER, 1961, 156 = *Ischeloribates quezonensis* COR.-RAR., 1980, 157 = *Fijibates rostratus* (HAMMER, 1958), 158 = *Makischeloribates tripartitus* COR.-RAR., 1980, 159 = *Fijibates rostratus* (HAMMER, 1958), 160 = *Pachygena falcata* HAMMER, 1972



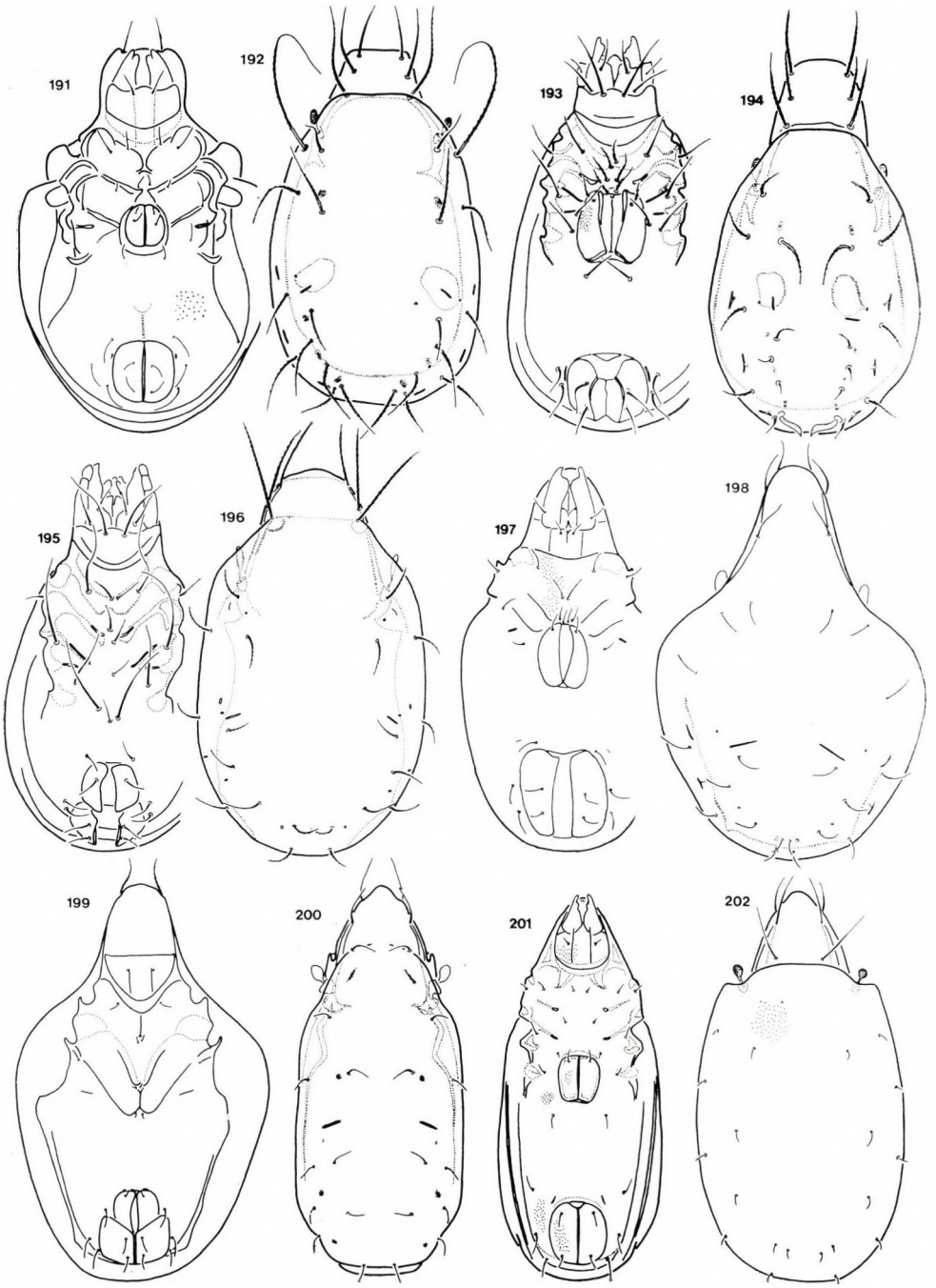
Figs 161—170. 161 = *Pachygena falcata* HAMMER, 1972, 162—163 = *Perscheloribates clavatus* HAMMER, 1973, 164—165 = *Otaheitea sulcata* HAMMER, 1972, 166—167 = *Hammerabates trisetosus* BALOGH, 1970, 168—169 = *Euscheloribates samsinaki* KUNST, 1958, 170 = *Philoribates filipinus* COR.-RAR., 1980



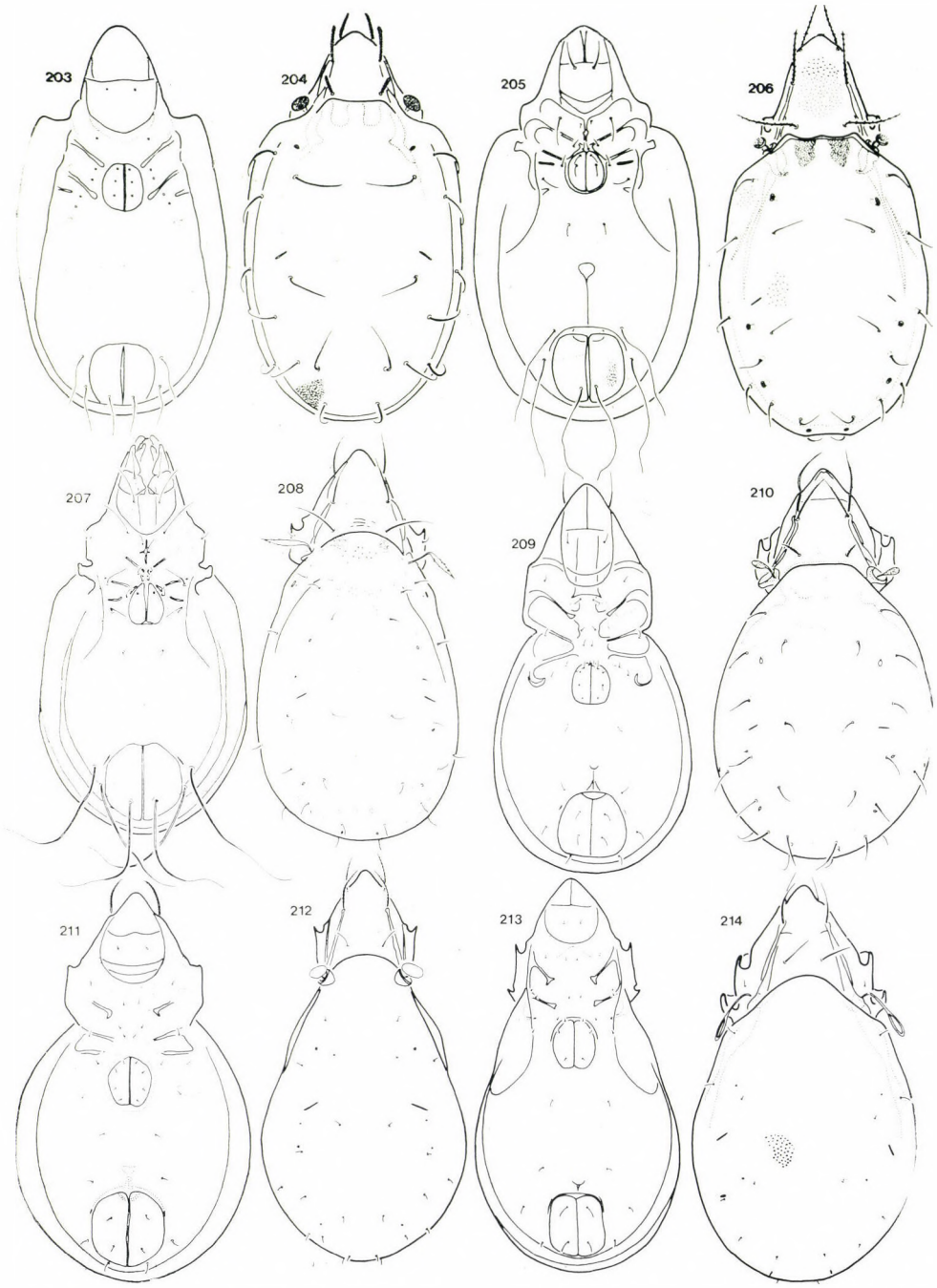
Figs 171—179. 171—172 = *Tribates cryptus* MAHUNKA, 1978, 173—174 = *Planobates circumalatus* HAMMER, 1973, 175—176 = *Nanobates fenicheli* (BALOGH, 1970), 177 = *Rhabdoribates siamensis* AOKI, 1967, 178—179 = *Protoripoda woolleyi* BALOGH, 1970



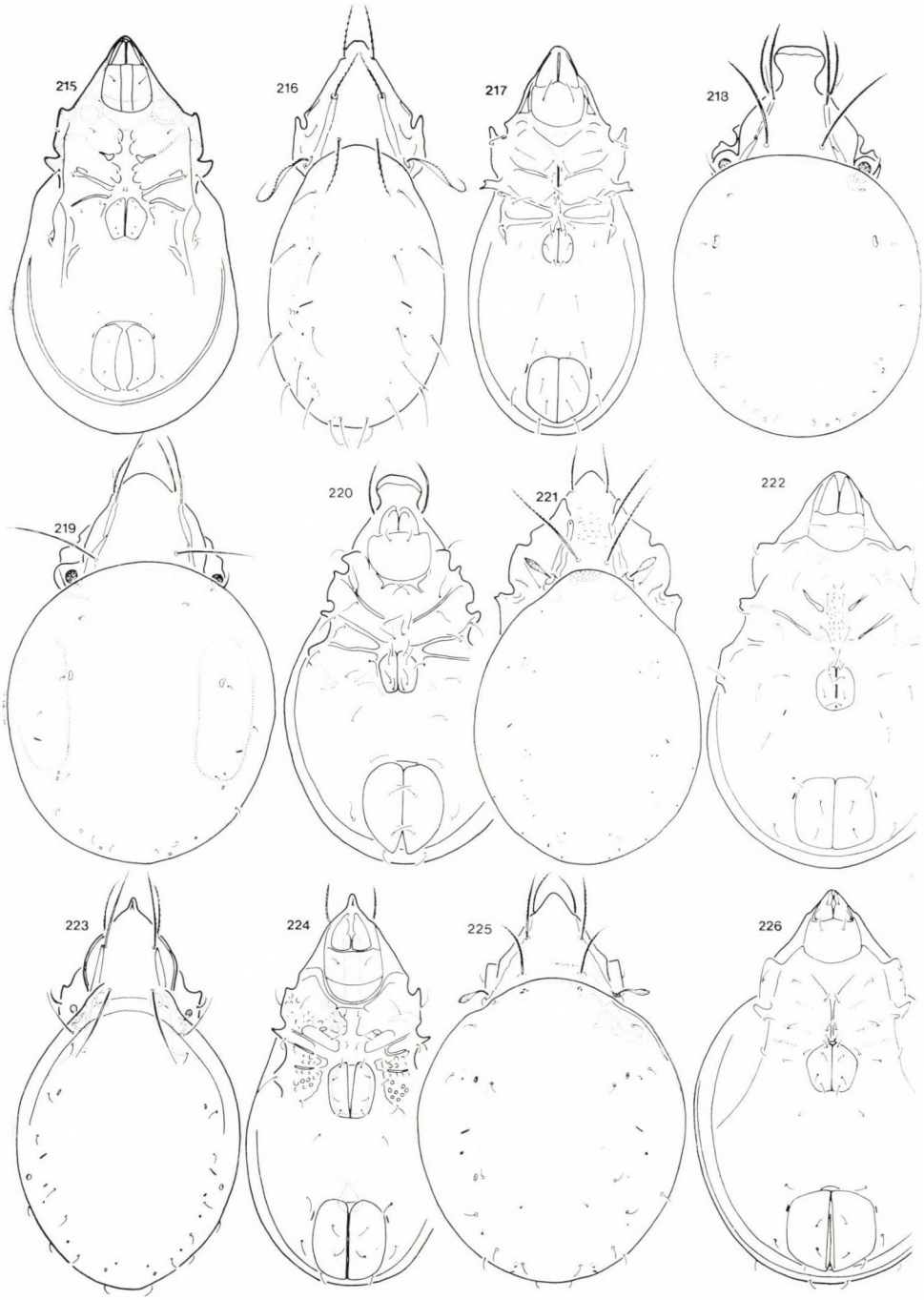
Figs 180—190. 180—181 = *Pteroripoda minutissima* BAL. et MAH., 1974, 182—183 = *Truncopes optatus* GRANDJEAN, 1956, 184—185 = *Oripoda elongata* BANKS, 1904, 186 = *Cosmopirnodus pulcherrimus* BALOGH, 1970, 187—188 = *Gymnobates glaber* BANKS, 1902, 189 = *Anoripoda nasalis* SELLN., 1959, 190 = *Scriptoripoda tenorioae* P. BALOGH, 1984



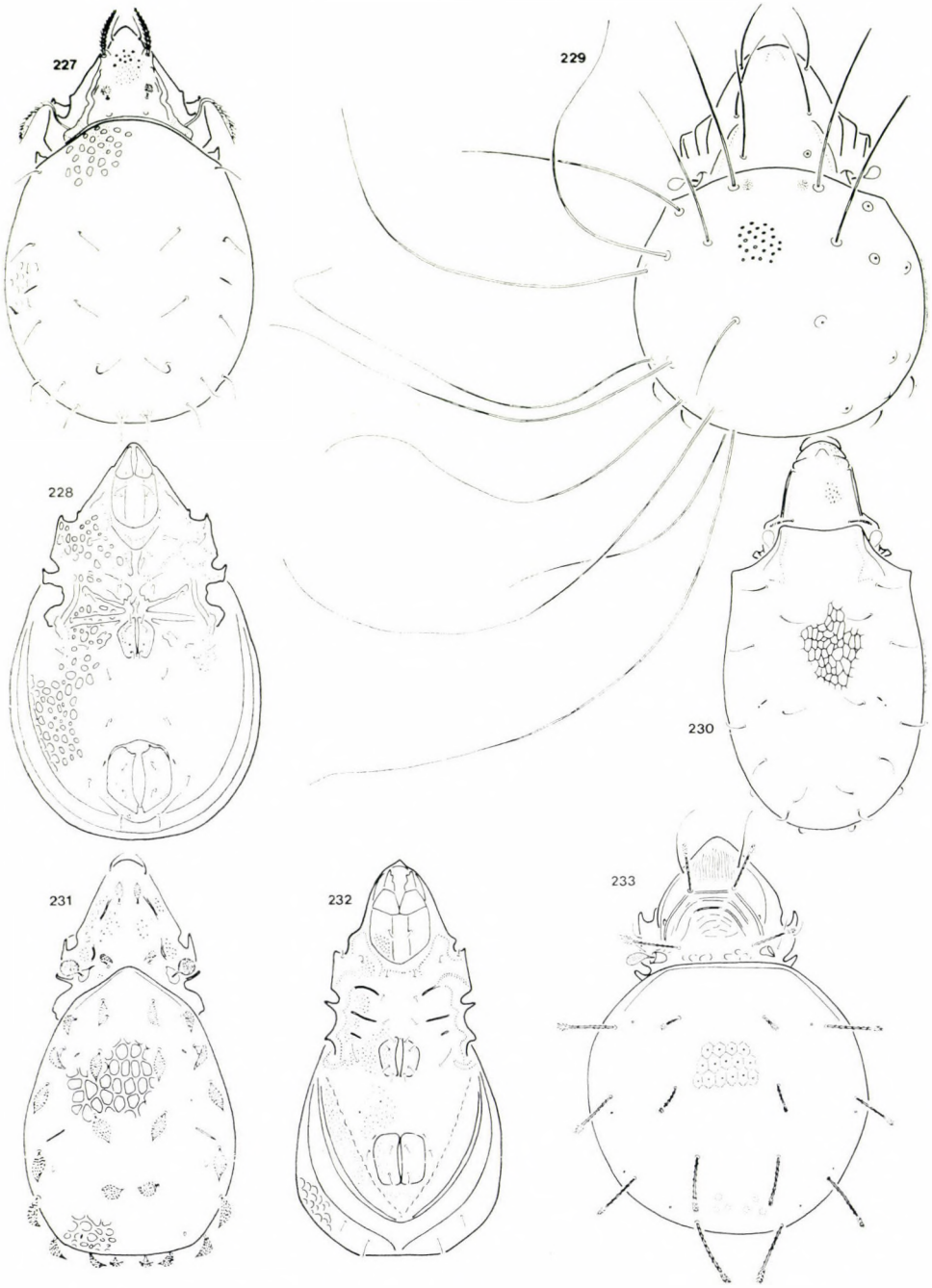
Figs 191—202. 191 = *Scriptoripoda tenorioae* P. BALOGH, 1984, 192—193 = *Pirnodus soyeri* TRAVÉ, 1969, female, 194—195 = male, 196—197 = *Cryptoribatula euaensis* HAMMER, 1973, 198—199 = *Euaella gittae* HAMMER, 1973, 200—201 = *Parapirnodus longus* BAL. et MAH., 1968, 202 = *Gymnobatoides longus* (EWING, 1909)



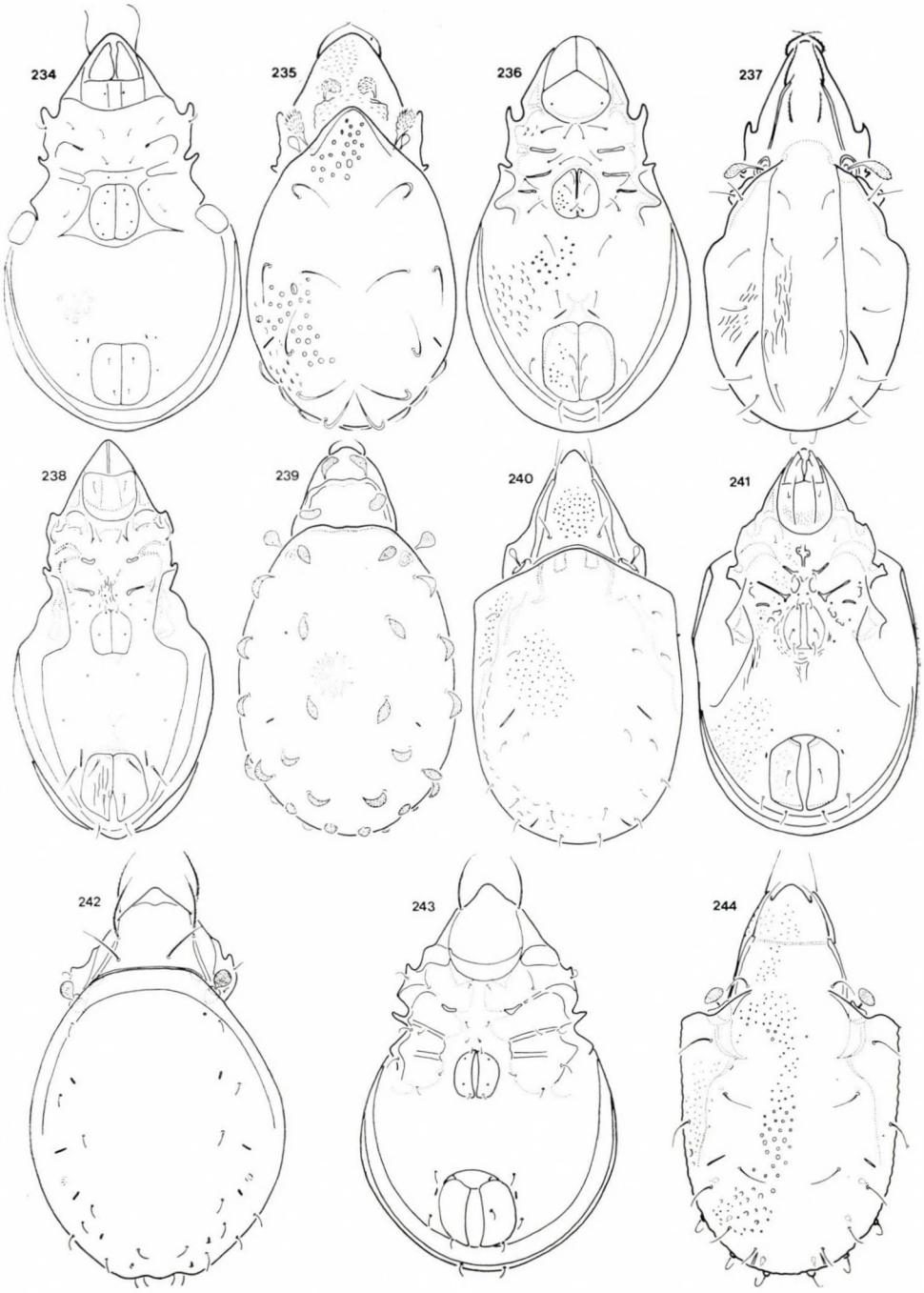
Figs 203—214. 203 = *Gymnobatoides longus* (EWING, 1909), 204—205 = *Benoibates flagellifer* BALOGH, 1958, 206—207 = *Haploripoda reducta* BAL. et MAH., 1967, 208—209 = *Multoribates chavinensis* HAMMER, 1961, 210—211 = *Nesoribatula pacifica* AOKI, 1964, 212—213 = *Heteroleius longissimus* BAL. et MAH., 1966, 214 = *Monoschelobates parvus* BAL. et MAH., 1969



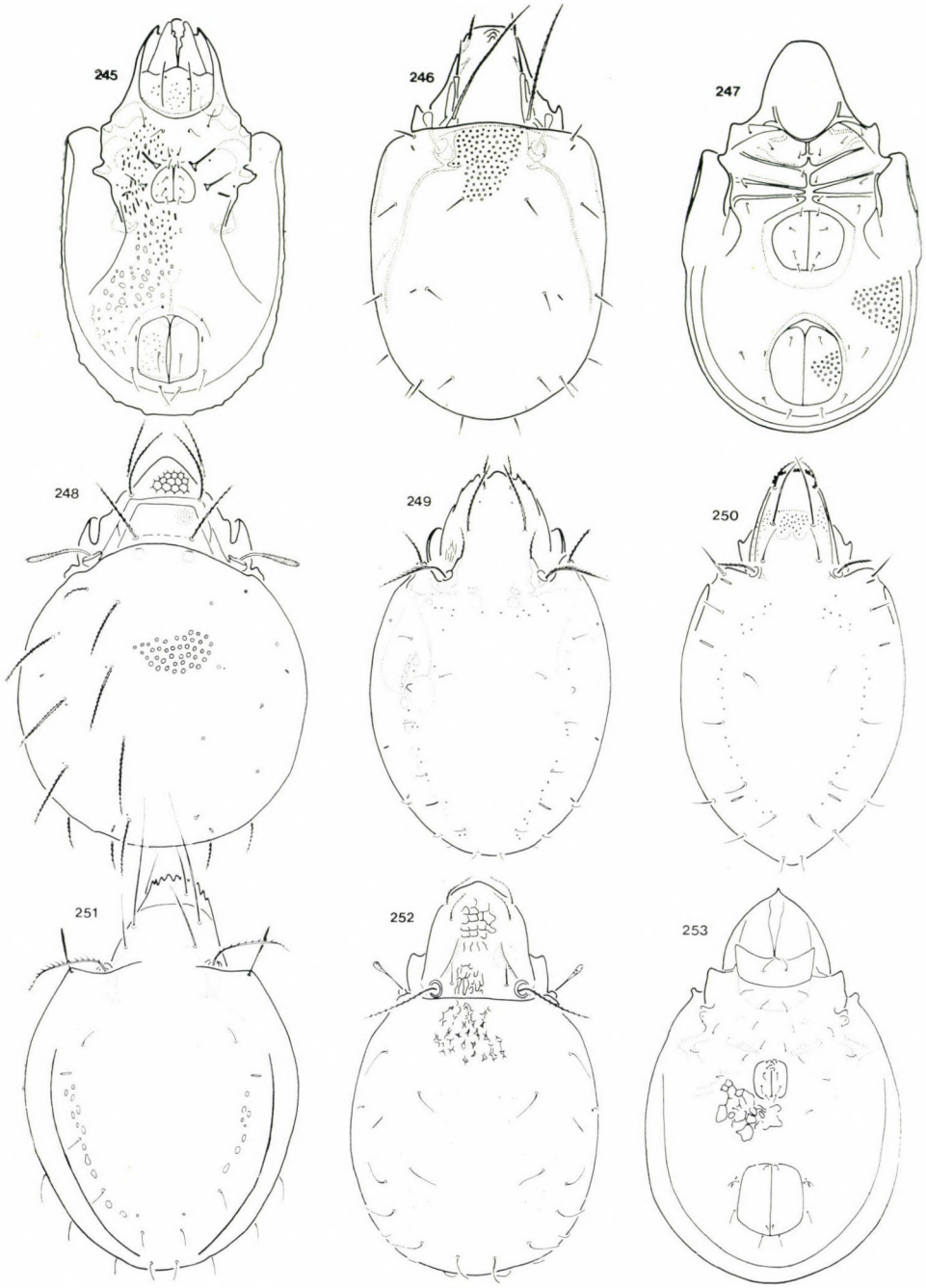
Figs 215—226. 215 = *Monoschelobates parvus* BAL. et MAH., 1969, 216—217 = *Urubambates paraguayensis* BAL. et MAH., 1981, 218, 220 = *Nasozetes stunkardi* SENGBUSCH, 1957, male, 219 = female, 221—222 = *Mucrobates fissuratus* BAL. et MAH., 1979, 223—224 = *Wallworkiella nasalis* HAMMER, 1980, 225—226 = *Hemileius initialis* (BERLESE, 1908)



Figs 227—233. 227—228 = *Tuberemaeus areolatus* BAL. et MAH., 1967, 229 = *Stelechobates megalotrichus* GRANDJEAN, 1965, 230 = *Calobates ornatissimus* (BALOGH, 1961), 231—232 = *Fenichelia biroi* BALOGH, 1970, 233 = *Brassiella penicillifer* HAMMER, 1961



Figs 234—244. 234 = *Brassiella penicillifer* HAMMER, 1961, 235—236 = *Plumobates decoratus* BAL. et MAH., 1966, 237—238 = *Constrictobates lineolatus* BAL. et MAH., 1966, 239 = *Phyllloribatula pulchella* BAL. et MAH., 1978, 240—241 = *Birobates reductus* BALOGH, 1970, 242—243 = *Vesiculobates silvaticus* HAMMER, 1980, 244 = *Brachyoripoda foveolata* BALOGH, 1970



Figs 245—253. 245 = *Brachyoripoda foveolata* BALOGH, 1970, 246—247 = *Campbellobates acanthus* WALLW., 1964, 248 = *Chaunoproctus basilewskyi* (BALOGH, 1958), 249 = *Zetomotrichus lacrimans* GRANDJEAN, 1934, 250 = *Mikizetes diamantensis* HAMMER, 1958, 251 = *Ghilarovus humeridens* KRIVOL., 1966, 252—253 = *Rohria pulchella* BAL. et MAH., 1977

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Acta Zoologica Hungarica 30 (3—4), pp. 315—326 (1984)

ORIBATID MITES FROM COLOMBIA II (ACARI)

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(Received 10 December, 1983)

Seven new species from Colombia (South America) are described, along with figures for one earlier described South American species.

I made ample reference to the importance of collections made by Prof. Dr. H. Sturm (Hildesheim, BRD) in Colombia (Acta zool. hung., **30** (1—2): 29, 1984]. From among the seven newly described species three: *Procorynetes espeletiae*, *P. andinus* and *Rhaphidosus alticola* belong to two such genera which have hitherto been unknown from South America, and their representatives inhabit mostly the Holarctic Region. The Oribatid mites of Holarctic distribution also occurring in the higher elevations of the Andes have great significance in the development of the Andean fauna. For better knowing the problem it is necessary to be fully acquainted to the entire fauna. However, the systematic and zoogeographical research of the South American Oribatid mites has only made its initial steps.

Gymnozetes gen. n.

Fam. Microzetidae. Interlamellar setae short, originating on lamellae proper. Sensillus proclinate and exclinate, long bacilliform. Lamellae very wide, covering almost the entire prodorsum. Lamellar setae sitting on apical truncate part of cuspides. Notogaster excavated. Notogastral setae in marginal position.

Type-species: *Gymnozetes marginatus* sp. n.

R e m a r k s : The generic division of the family Microzetidae is highly problematic. The great majority of the so far described genera is monotypic and may be separated by the combination of a few artificial characters: position and length of interlamellar setae, direction and form of sensillus, etc. Still, it should be admitted that the erected genera as regards overall habitus on the whole seem to be as distant from one another as are the genera having many species in the families of Oribatidae. At the same time, several genera which for quite some time stood monotypic recently acquired several new

species (*Nellacarus*, *Acaroceras*). It is highly probable that the great majority of the species belonging in this family is yet unknown and most of the problems arise from the small number of known species only.

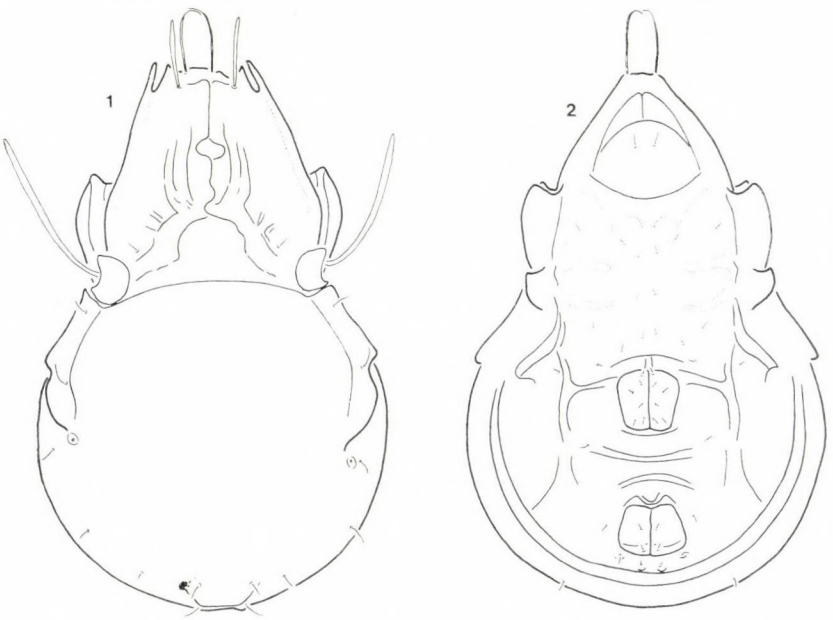
The new genus may be ranged in BALOGH's The Oribatid genera of the World handbook in the coded table *1 1 1 2* code combination on pages 120—121 (*Rhabdozetes*, *Protozetes*, *Rhoplaozetes*, *Fusozetes*, *Plumozetes*, *Calozetes*, *Szentivanyella*). But the new genus differs from all these genera basically in the excavated notogaster and that all the notogastral setae are shifted into marginal position. Such a modified position of the notogastral setae in all other Oribatid families qualifies to be of generic rank.

Gymnozetes marginatus sp. n. (Figs 1—2)

Length: 250—287 μm; breadth: 180—199 μm.

P r o d o r s u m : Lamellae meeting medially, covering almost entire prodorsum. Lamellar cuspides broad, truncate, with an incisure at the exterior margin. Lamellar setae parallel, bacilliform. Setae *in* short, originating on basal part of lamellae. Sensillus proclinate and exclinate, long, bacilliform.

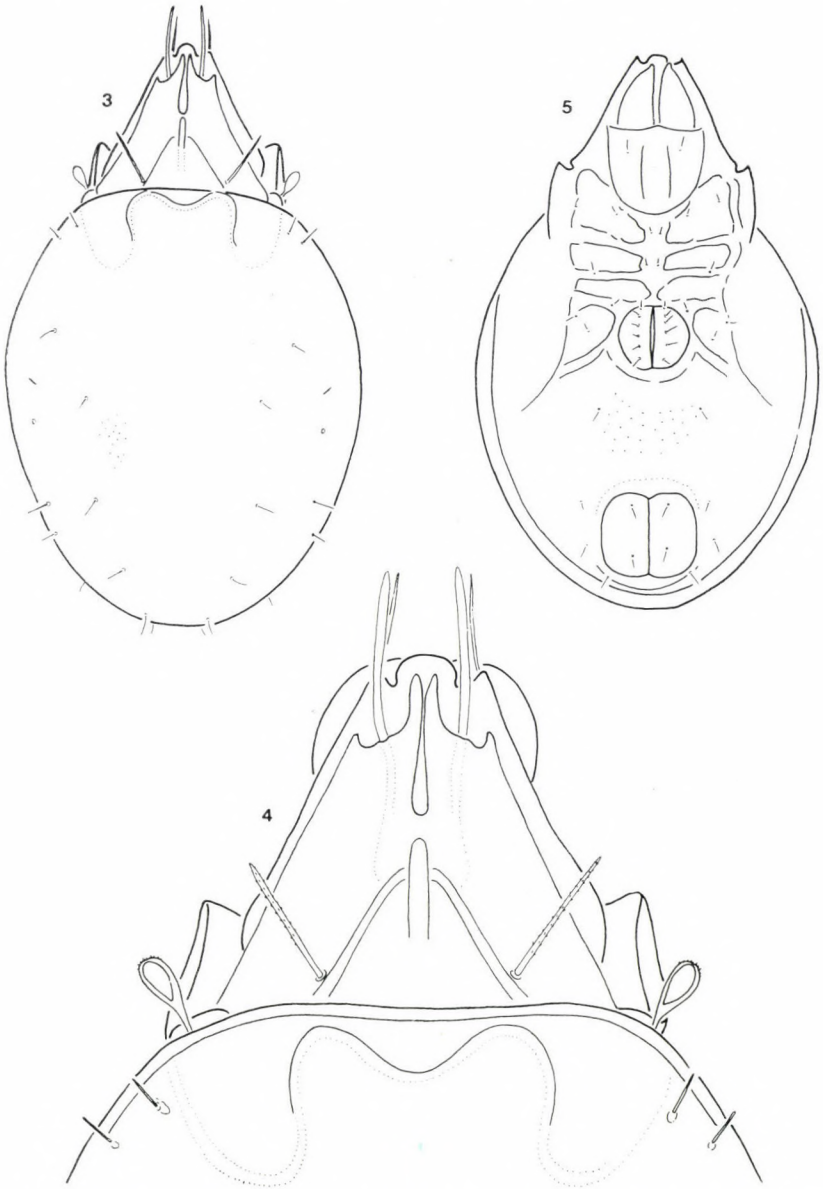
N o t o g a s t e r : 7 pairs of visible notogastral setae; all in marginal position. One pair of setae *p* visible, but only on ventral side. Anterior half of notogaster excavate.



Figs 1—2. *Gymnozetes marginatus* sp. n. — 1 = dorsal side, 2 = ventral side

Ventral side: 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Epimeral setal formula: *3—1—3—3*. All setae very fine and short. Ventral side the usual Microzetidae-type.

Material examined: Colombia, Páramo del Huila, 30. VII. 1978, cca 3700 m, *Espeletia hartwegiana*, dead leaves, Berlese-sample, 1 holotype, 5 paratypes.



Figs 3—5. *Procorynetes espeletiae* sp. n. — 3 = dorsal side, 4 = prodorsum, 5 = ventral side

Procorynetes espeletiae sp. n. (Figs 3—5)

Length: 690—828 μm, breadth: 332—513 μm.

P r o d o r s u m : Sensillus short, capitate, with short stalk, and apically with very short and fine cilia. Setae *in* medium long, with very short cilia; setae *le* and *ro* medium long, parallel. Lamellae converging and basally coalesced, with long excised cuspis: inner tooth much longer than outer one. Lamellae not lineated.

N o t o g a s t e r : 11 pairs of short, rigid notogastral setae. Surface of notogaster finely punctulated.

V e n t r a l s i d e : 6 pair of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae; ad_2 and ad_3 in adanal position.

R e m a r k s : This is the first *Procorynetes* WOOLLEY, 1969 (= *Liacarus* MICHAEL, 1898 sensu lato, with capitate sensillus) species from South America.

M a t e r i a l e x a m i n e d : Colombia, Páramo del Huila, 30. VII. 1978, cca 3700 m, *Espeletia hartwegiana* dead leaves, Berlese sample, 1 holotype, 5 paratypes.

Procorynetes andinus sp. n. (Figs 6—8)

Length: 672—697 μm, breadth: 439—480 μm.

P r o d o r s u m : Sensillus capitate, smooth, with short stalk. Setae *in* long; setae *le* and *ro* shorter; *le* diverging. Lamellae converging and basally coalesced, with long, excised cuspis; excision being deep and the inner tooth is only a little longer than outer *te*. Lamellae longitudinally lineated.

N o t o g a s t e r : 11 pairs of notogastral setae; notogastral setae a little longer than those of *P. espeletiae* sp. n. Notogaster not punctulated.

V e n t r a l s i d e : Similar as in *P. espeletiae* sp. n. but without fine punctulation.

R e m a r k s : The form of lamellar cuspis and the lineated lamellae separates it from the previous species.

M a t e r i a l e x a m i n e d : Colombia, Páramo de Monserrate, 3. V. 1968, 3230 m, *Espeletia grandifolia*, among the dead leaves, 1 holotype, 7 paratypes.

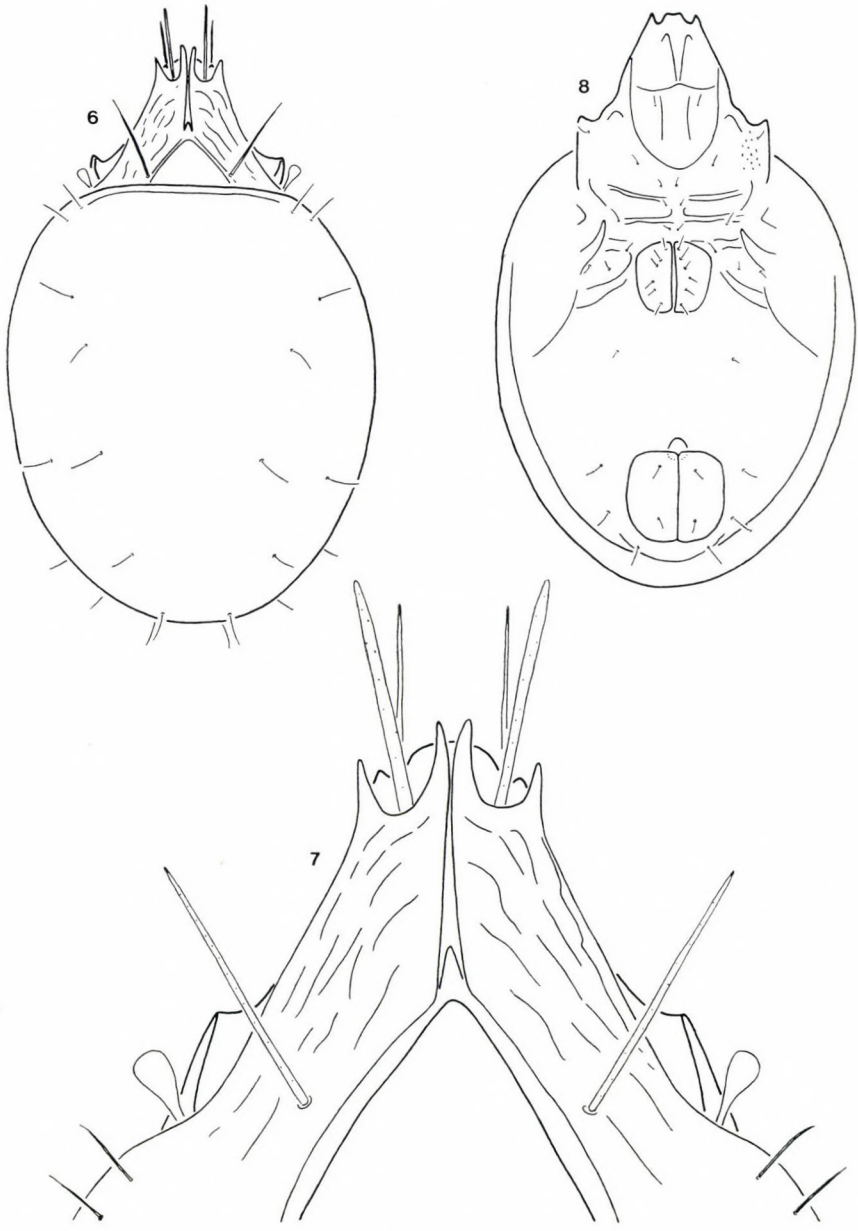
Rhaphidosus alticola sp. n. (Fig. 9)

Length: 820—885 μm; breadth: 549—640 μm.

P r o d o r s u m : Sensillus long, rod-like, apical half hardly dilated and very finely ciliate, Setae *in* very long, setiform, setae *le* and *ro* shorter, somewhat curving inwards. Lamellae resembling those of *P. espeletiae* sp. n., i.e. with long inner and with short outer teeth.

N o t o g a s t e r : 11 pairs of fairly long, fine notogastral setae. Setae c_1 much longer than setae c_2. Notogaster not punctulated.

V e n t r a l s i d e : 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Adanal setae ad_2 and ad_3 in adanal position.



Figs 6—8. *Procorynetes andinus* sp. n. — 6 = dorsal side, 7 = prodorsum, 8 = ventral side

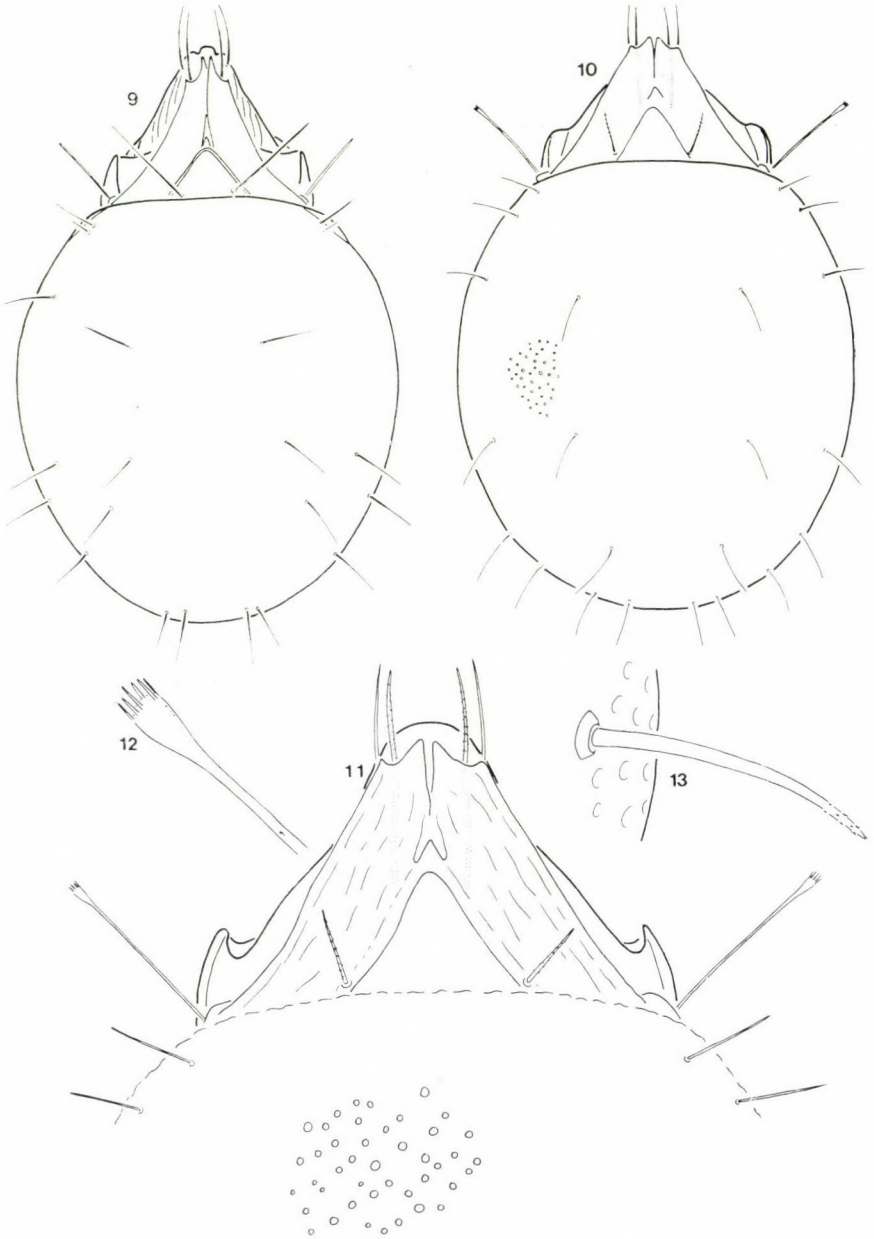


Fig. 9. *Rhaphidosus alticola* sp. n., dorsal side

Figs 10—13. *Xenillus columbianus* sp. n. — 10 = dorsal side, 11 = prodorsum, 12 = sensillus, 13 = notogastral seta r_3

Remarks: This is the first *Rhaphidosus* WOOLLEY, 1969 (= *Liacarus* MICHAEL, 1898 sensu lato, with rod-like sensillus) species from South America.

Material examined: Columbia, Páramo de Monserrate, 3. V. 1968, 3200 m, *Espeletia grandifolia*, amongs the dead leaves, 1 holotype, 1 paratype.

Xenillus columbianus sp. n. (Figs 10—13)

Length: 631 μm; breadth: 426 μm.

Prodorsum: Sensillus long, rod-like, with small, dilated head and with 5—6 apical spines. Setae *in* short, setiform, with scattered granulation, setae *le* similar; setae *ro* smooth and straight. Lamellae converging and coalesced, with long, obliquely truncated *cuspis* and with fine, longitudinal lines.

Notogaster: 11 pairs of short, smooth, rigid notogastral setae; setae c_1 and c_2 of same length. Notogastral setae apically with small spines (seen under higher magnification). Surface of notogaster with scattered, irregular foveolae.

Ventral side: 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae.

Remarks: There are several *Xenillus*-species described from the tropical rainforest region of South America: *X. brazilianus* BALOGH et MAHUNKA, 1969 from Brazil; *X. nutantanensis* PÉREZ-INIGO et BAGGIO, 1980 from Brazil; *X. capitatus* BALOGH et MAHUNKA, 1977 from Brazil; *X. disjunctus* BALOGH et MAHUNKA, 1977 from Brazil; *X. fusifer* BALOGH et MAHUNKA, 1977 from Brazil; *X. longipes* MAHUNKA, 1983 from Paraguay; *X. longisetosus* BALOGH et MAHUNKA, 1969 from Brazil, *X. sanctipauli* PÉREZ-INIGO et BAGGIO, 1980 from Brazil; *X. variabilis* BALOGH et MAHUNKA, 1981 from Bolivia. None of them has this combination of characters; e.1. long rod-like sensillus with dilated, small head and with small, apical spines; 2. longitudinally lineated, coalesced lamellae; 3. scattered, irregular foveolae on notogaster.

Material examined: Colombia, Macarena, 22. II. 1956, tropical rainforest, litter, 1 holotype.

Pentabodes gen. n.

Fam. Carabodidae. 10 pairs of notogastral setae. 5 pairs of genital setae. Setae *le* on the rostral half of the interlamellar area in dorsal position. Type-species: *Pentabodes insolitus* sp. n.

Remarks: The above combination of characters is quite unique in the family of Carabodidae.

Pentabodes insolitus sp. n. (Figs 14—18)

Length: 463—504 μm; breadth: 205—271 μm.

Prodorsum: Sensillus long, exteriorly and posteriorly directed with slightly fusiform, spinate head. Setae *in* and *le* dilated, with obliquely truncated and incised and; finely ciliated. Setae *le* in unusual position: originated dorsally on the apical half of the interlamellar area. Setae *ro* setiform directed inwards. Prodorsum densely tuberculated.

Notogaster: 10 pairs of dilated and obliquely truncated notogastral setae: similar to setae *in* and *le*. The position of notogastral setae as in *Carabodes* s. str. Notogaster densely tuberculated.

Ventral side: Epimeral setal formula: *1—1—3—3*. Epimeral setae long and smooth. 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Setae *ag* fine and long; setae *ad* short, bacilliform, unilaterally serrate. Genital plates with irregular and scattered punctulation. Anal plates with irregular areolae. Ventral plate areolated.

Material examined: Colombia, Eastern Cordillere, Monterredondo, rest of undisturbed forest; litter, 3. I. 1956; 1 holotype, 1 paratype.

Suctobelba decorata sp. n. (Figs 19—22)

Length: 217 μm; breadth: 127 μm.

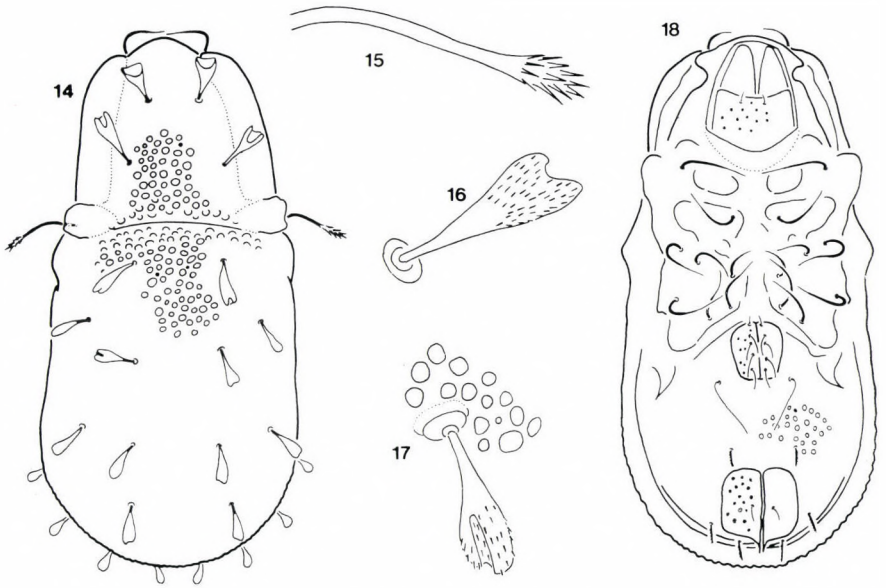
Prodorsum: Sensillus long, exteriorly and anter orly directed, apical half slightly fusiform, with pointed tip and unilerally ciliated. Lamellar knob triangular and pointed anteriorly. Tectopedial fields well limited. Medial border of tectopedial fields with very small tubercles. Rostral lobe very large, dilated, covering the under part of rostrum. Lamellar and interlamellar setae very small, but exist.

Notogaster: 10 pairs of thin, smooth notogastral setae. Dorsosejugal suture with two pairs of small teeth. Anterior part of notogaster with very fine, evanescent longitudinal lines, gradually transformed into net-structure.

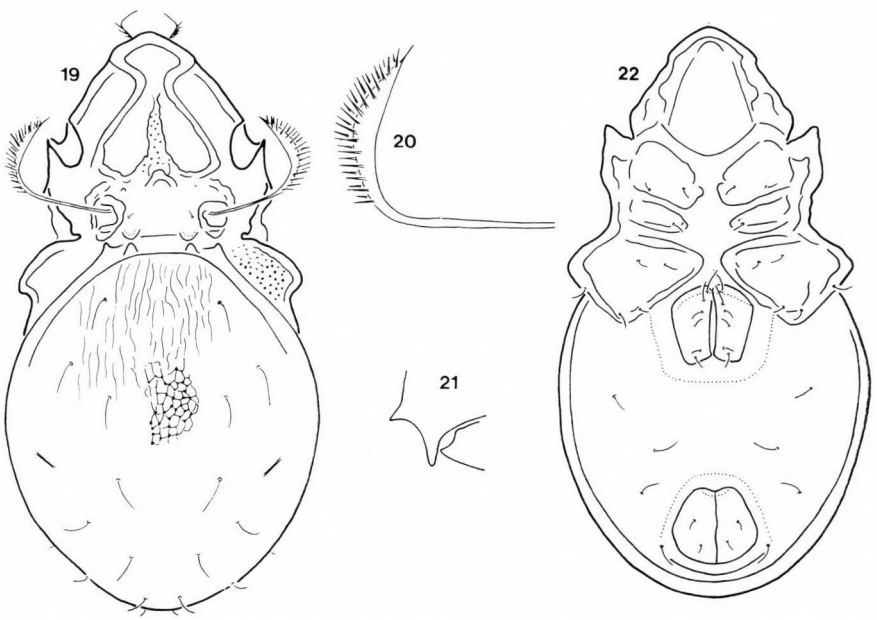
Ventral side: 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae.

Remarks: The peculiar sculpture, combined with the 6 pairs of genital setae, the 2 pairs of very small dorsosejugal teeth and with the extremely large, dilated rostral lobe is unique in the *Suctobelba* sensu lato.

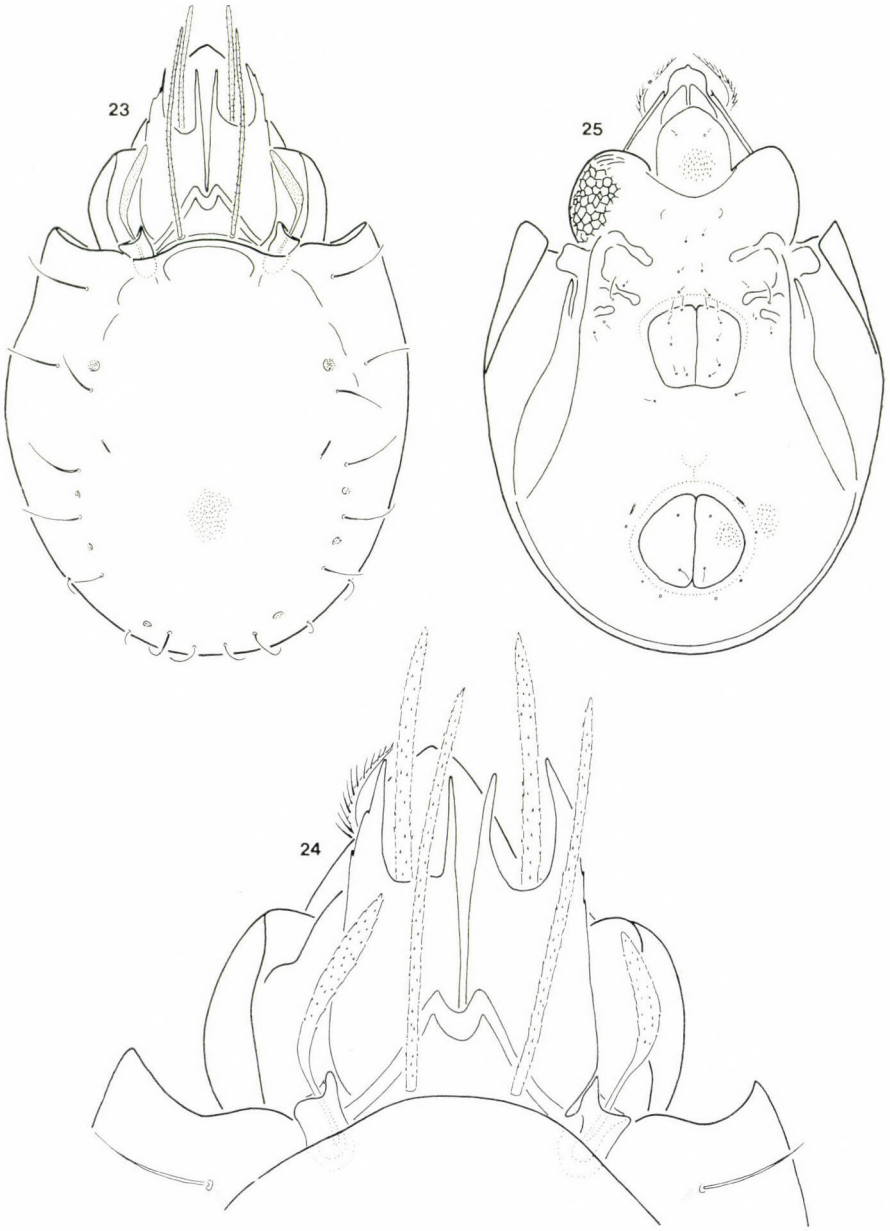
Material examined: Colombia, Iconzo, 5. I. 1968, Puente Natural, Middle Magdalena Valley, cca 75 km SW from Bogota, rest of undisturbed forest; 1 holotype, 1 paratype.



Figs 14—18. *Pentabodes insolitus* sp. n. — 14 = dorsal side, 15 = sensillus, 16 = seta in, 17 = notogastral seta *ms*, 18= ventral side



Figs 19—22. *Suctobelba decorata* sp. n. — 19 = dorsal side, 20 = sensillus, 21 = rostrum, c 22 = ventral side



Figs 23—25. *Oribatella punctata* HAMMER, 1958 — 23 = dorsal side, 24 = prodorsum, 25 = ventral side

Oribatella punctata HAMMER, 1958 (Figs 23—25)

The single captured specimen may well be identified with the description and figure of M. HAMMER.

Length: 464 μm; breadth: 324 μm.

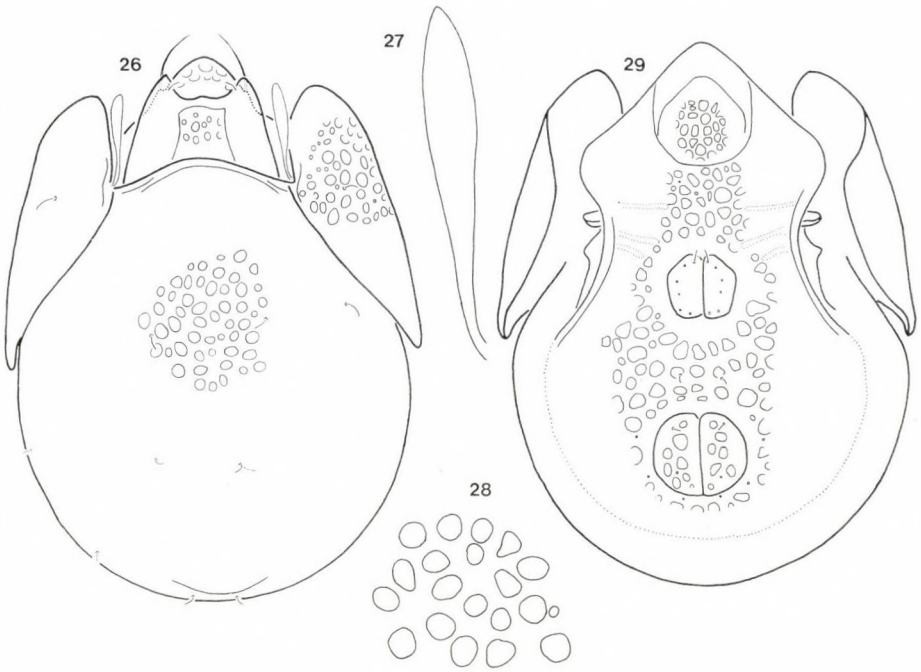
Material examined: Colombia, Páramo de Cocuy, 24. IX. 1978, in *Calamagrostis*-soil, 1 exemplar.

Truncozetes sturmi sp. n. (Figs 26—29)

Length: 308—336 μm; breadth: 176—185 μm.

Prodorsum: Lamellae broad with obtuse cuspis and translamella. Setae *le* very fine and short, originating, on the oblique interior margin of cuspis. Setae *in* invisible; setae *ro* long, originating far from each other. Rostrum rounded. Rostral and interlamellar area with irregular foveolae. Sensillus long, fusiform, directed forward, only a little shorter than lamellae.

Notogaster: Probably 10 pairs of fine, short notogastral setae, but setae p_1, p_2 and p_3 invisible. Notogaster with irregular areolae. There is a blunt tubercle on the posterior part of notogaster, on level with setae r_1



Figs 26—29. *Truncozetes sturmi* sp. n. — 26 = dorsal side, 27 = sensillus, 28 = sculpture of the notogaster, 29 = ventral side

Ventral side: 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Epimeral setae invisible. Epimeral region, mentum, ventral plate and anal plates with irregular areolae. Anal plates without areolae.

Remarks: Similar to *Truncozetes mucronatus* BAL. et MAH., 1969 (S. America), but the areolae are larger and the mentum and the epimeral region are without oblique lines.

Material examined: Colombia, Bogota, 14. II. 1969, 1 holotype, 39 paratypes.

Acta Zoologica Hungarica 30 (3—4), pp. 327—352 (1984)

SOME NEW OR LESS KNOWN PARADOXOSOMATIDAE (DIPLOPODA: POLYDESMIDA) FROM INDIA

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(Received 17 August, 1983)

A collection of the millipede family Paradoxosomatidae from India has proved to comprise 16 species out of 13 genera, including *Topalosoma setiferum* gen. et sp. n., *Curiosoma bispinosum* gen. et sp. n., *Parchondromorpha indica* gen. et sp. n., *P. similis* sp. n., *Laterogonopus simplex* gen. et sp. n., *Substrongylosoma distinctum* gen. et sp. n., *S. falcatum* sp. n., *Polydrepanum horridum* sp. n., and *Paranedyopus elongissimus* sp. n. For the less known species *Kronopolites spiniger* ATTEMS, 1936, *Sundanina granulifera* ATTEMS, 1936 and *Strongylosoma montigena* CARL, 1935, all redescribed upon new materials, the new monotypic genera *Armolites* gen. n., *Hindomorpha* gen. n. and *Himalomorpha* gen. n. have been erected, respectively. The genus *Akribosoma* CARL, 1935, with the only type species *A. cylindrica* CARL, 1935 also redescribed from its terra typica, has turned out to be but a junior synonym of *Paranedyopus* CARL, 1932 (syn. n.), resulting in *P. cylindricus* (CARL, 1935), comb. n. Descriptions and allocations of the new taxa established have been presented.

The millipede family Paradoxosomatidae is known to constitute a very important part of the Indian fauna (ATTEMS, 1936). Therefore, no wonder the extensive collection of the Diplopoda taken in India in 1967 by Dr. Gy. TOPÁL of the Hungarian Natural History Museum, Budapest, has proved to comprise a very important material of paradoxosomatids. Among the 16 species out of 13 genera of this family recognized, nine forms have turned out to be new to science, with eight new genera erected and one more synonymized. The present paper deals with a treatment of this fine collection, descriptions of the new taxa and allocations among related forms.

Apart from a few duplicate specimens retained, as indicated hereinafter, in the author's collection for a subsequent deposition in the Zoological Institute of the USSR Academy of Sciences, Leningrad, all the materials, including all holotypes, have been returned to the Hungarian Natural History Museum. I feel particularly indebted to DR. Z. KASZAB and DR. S. MAHUNKA (Budapest) for the opportunity to study the above collection, as well as to DR. GY. TOPÁL for providing full information on the localities and habitats where the millipedes were taken. Besides, my deep appreciation concerns DR. F. R. WANLESS of the British Museum (Natural History), London, who kindly loaned me for a direct comparison the only gonopod of a *Telodrepanum* sp. kept at the Museum.

Kaschmiriosoma contortipes SCHUBART, 1935

M a t e r i a l s : India, Jammu and Kashmir, Pahalgam, 2300 m, coniferous forest, 3 ♂♂, 3 ♀♀ — 2. VI. 1967 (No. 408), leg. TOPÁL. — Same locality, 2900 m, W slopes, sparse forest, 1 ♂, 1 ♀. — 3. VI. 1967 (No. 416), leg. TOPÁL. — Same locality, 2300 m, under stones in forest, 1 ♂ — 13. VI. 1967 (No. 516), leg. TOPÁL. — Jammu and Kashmir, on way from Pahalgam to Kolahoi Glacier, between Lidderwat and "base camp", 3000—3300 m, 7 ♂♂, 7 ♀♀, 2 fragm. — 6. VI. 1967 (Nos 440—441), leg. TOPÁL. — Material examined: 25 specimens.

R e m a r k s : This species seems to be endemic to Kashmir and has recently been revised (GOLOVATCH, 1983).

Chondromorpha mammifera ATTEMS, 1936

M a t e r i a l : India, Maharashtra, Sivapur, 700 m, under stones in savannah, 1 ♂, 1 ♀ — 1. VIII. 1967 (No. 591), leg. TOPÁL. — Maharashtra, Pune, 700 m, in and around town, 1 ♂ (without gonopods), 2 ♀♀ — 5. VIII. 1967 (No. 585), leg. TOPÁL. — Material examined: 5 specimens.

R e m a r k s : This species has hitherto been recorded in Orissa, Bihar, Ahmedabad and Bombay, i.e. from the E and W of India (ATTEMS, 1936, 1937). Therefore, the rediscovery of *Ch. mammifera* in Maharashtra is no news.

The material at hand agrees quite well with the known descriptions (ATTEMS, 1936, 1937), though the size is more variable — metazona 3.7 mm wide in ♂♂ and 3.0 to 4.0 mm wide in ♀♀. Besides, the middle row of small tergal setae is displayed but on metazonite 19, perhaps due to their fragility.

Kronopolites occidentalis GOLOVATCH, 1983

M a t e r i a l s : India, Jammu and Kashmir, Srinagar, near ruins of Monastery Pari Mahal, 1500 m, under cattle dung and stones, 1 ♂, 1 ♀, 1 juv., 1 fragm. — 26. V. 1967 (No. 393), leg. TOPÁL. — Same locality, 1 ♂, 1 ♀ fragm., 2 ♀♀, 2 ♀♀ fragm. — 27. V. 1967 (No. 394), leg. TOPÁL. — Material examined: 10 specimens.

R e m a r k s : This species has recently been described from Kashmir (GOLOVATCH, 1983). The materials at hand correspond very well to the original description.

Topalosoma gen. n.

Body of medium size (ca. 2 cm long). Paraterga moderately developed. Paranota 2 well below collum. Pleural keels present, though poor. A large trapeziform lamina between male coxae 4. Legs rather long, without special modifications, grow in length toward telson.

Gonopods very slender and high. Coxite long. Prefemoral part moderate, acropodite without evidence of torsion, but with a good sulcus demarcating postfemoral region. Seminal groove runs all along inner side and, after passing onto a ridge proximal of demarcation sulcus, ends by a relatively short and slender solenomerite. Tibiotarsus basally shifted laterad, suberect, rather complex. Lamina lateralis with a parabasal comb (*r*) and an apical scapula (*s*); lamina medialis bifid; both laminae well developed, subequal in height.

Type species: *Topalosoma setiferum* sp. n.

R e m a r k s : *Topalosoma* gen. n. belongs to the tribe Orthomorphini wide-spread in Southeast Asia (JEEKEL, 1968) and seems to be especially closely related to the genus *Diglossosternum* JEEKEL recently erected for the only species *D. bipulvillatum* (CARL, 1902) from Java (JEEKEL, 1980a). However, both genera are distinguishable by the lack of an additional

sternal process on the 4th male somite, presence of a comb and apical scapula on the lamina lateralis of the gonopods of the new form.

Derivatio nominis: The new genus is gladly dedicated to its collector, Dr. Gy. TOPÁL of the Budapest Museum.

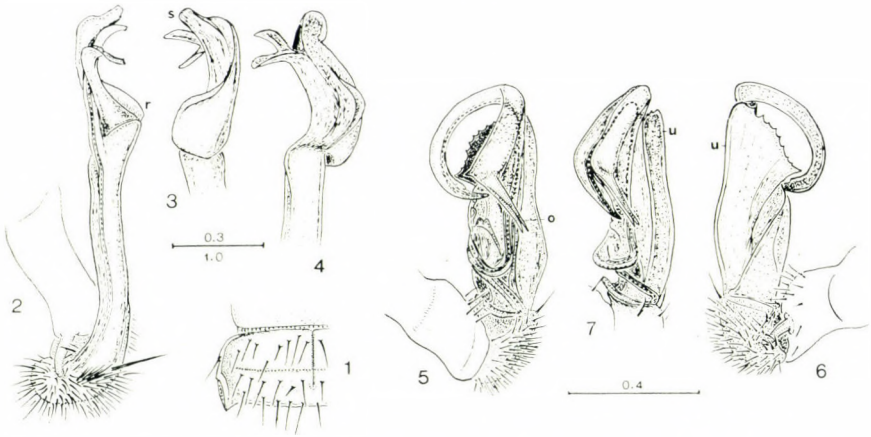
Topalosoma setiferum sp. n. (Figs 1—4)

Locality: India, W Bengal, Darjeeling, below North Point, 900 m, in grass, 2 ♂♂ (including holotype) — 17. X. 1967 (Nos 844—847), leg. TOPÁL. — Material examined: 2 specimens.

Both holotype and paratype have been deposited in the Hungarian Natural History Museum, Budapest.

Description: Length 19 mm (holotype) and 21 mm (paratype), width of pro- and metazona 1.2 and 1.8 mm (holotype) and 1.6 and 2.1 mm (paratype), respectively. Colour chocolate brown, legs and ventrum somewhat paler, yellowish-brown.

Collum a bit broader than 2nd somite, scarcely narrower than 3rd and 4th ones, subequal to head. From segment 5 onward, body parallel-sided until ring 17 to taper regularly and gently further on. Antennae reach middle of segment 4, long, slender, slightly clavate. Vertigial suture distinct, dorsal axial suture visible only on metazona, ^th^er poor. Paraterga moderately developed (Fig. 1), acute beak-like posteriorly from ring 2 onward, especially well protruding caudad from rings 15 or 16, always set rather low thus leaving dorsum quite convex, projecting beyond tergal caudal margin already from collum, on segment 2 well below 3rd and collum, laterally with a couple of small teeth and set off by thin peritremata. Tergal surface in general smooth and shining; prozona finely shagreen; metazona poorly rugose on posterior halves, laterally rather coarsely granulated. Suture between pro- and metazona rather deep and thin, longitudinally striated. Sulcus thin, deep, at bottom granulated, begins from segment 4, but fully developed from metazonite 5 onward where it reaches base of paranota. Collum with 3 transverse rows of long fragile setae situated on poor knobs. Metazona with 3 to 4 rows of such setae, anterior row up to somites 7 or 8 with 4 + 4 setae, further on toward telson their number gradually increases to start from metazonie 10 (Fig. 1) onward a 2nd row, irregular and also situated in front of sulcus; 3rd row irregular as well, but lies behind sulcus; 4th row especially dense, comprises up to 12 + 12 setae, situated right at the tergal caudal margin. Tergal pubescence increases gradually toward telson, and metazona 18 and 19 are densely clothed with setae all over their surface. Pleural keels present, though very poor and distinct only up to segment 4 becoming rather substituted by poor swellings on further few somites. Epiproct rather long, straight, apically with a couple of small terminal papillae and a pair of rather large subapical lateral teeth. Subanal scale subtrapeziform, with a pair of apical hairs.



Figs 1—4. *Topalosoma setiferum* gen. et sp. n., ♂ paratype: 1 = metazonite 10 (left half, dorsal view), 2 = left gonopod (mesal view), 3—4 = distal part of left gonopod (lateral and subventral views, respectively). — Figs 5—7. *Curiosoma bispinosum* gen. et sp. n., ♂ holotype: 5—6 = right gonopod (lateral and mesal views, respectively), 7 = telopodite of right gonopod (ventro-lateral view). Scale in mm

Legs rather long and enlarged, perhaps thinner in ♀, without special modifications, with tarsal brushes and relatively long claws, gradually and gently lengthening toward telson. Femora 1 or 2 without adenostyles. Sterna very sparsely setose, on segments 8 to 18 each with a pair of smaller spines between anterior and a pair of larger spines between hind coxae. A large, high (higher than coxae), subquadrate, setose lamina between coxae 4, its ventral margin somewhat concave and ventro-lateral corners rounded.

Gonopods (Figs 2–4) with long, subcylindrical and distally setose coxite. Telopodite very high and slender; prefemur rather short and densely setose; femorite without evidence of torsion; seminal groove runs entirely along inner side to move onto free and rather short solenomerite via a conspicuous ridge. Division of femorite into femur and postfemoral part distinct due to a good demarcation sulcus. Tibiotarsus suberect, relatively short, shifted basally laterad; lamina medialis distinctly bifid, a little shorter than lamina lateralis which has a characteristic parabasal comb (*r*) and ends by a scapula (*s*); solenomerite lies between the two laminae.

Curiosoma gen. n.

Body of medium size (ca. 1.5 cm). Paraterga small. Paranota 2 below collum. Pleural keels present. A large trapeziform lamina between male coxae 4. Legs rather long, without special modifications, gently growing in length toward telson.

Gonopods complex. Coxite rather long. Prefemoral part moderate, acropodite with good evidence of torsion. A large ventral lamella and femorite proper split just immediately distad of prefemur; seminal groove runs chiefly laterally and makes a couple of loops before moving onto long and thin solenomerite completely sheathed by slender curved tibiotarsus. Femur remarkably shortened.

Type species: *Curiosoma bispinosum* sp. n.

Remarks: *Curiosoma* gen. n. obviously belongs to the subfamily Alogolykinae defined and redefined several times (JEEKEL, 1968, 1980b, c). The subfamily is known to comprise two tribes, Polydrepanini and Alogolykini, both restricted to the Indian and Far Indian regions.

JEEKEL (1980c), in his last version, has given emphasis to the torsion of the gonopod femorite: Polydrepanini stated to be characterized by a torded femorite, whereas the Alogolykini by an untorded one. If so, *Curiosoma* gen. n. certainly falls into the former tribe. Moreover, among all the known Polydrepanini the new genus is most conspicuous in having, besides a shortened gonofemur, the seminal groove making two distinct loops immediately distad of the junction of the prefemur and femorite. Judging from the presence of a very big characteristic lamina (*u*) at the very base of the femorite, as well as of two spines (*o*) at the base of the tibiotarsus, *Curiosoma* gen. n. seems especially closely related to another polydrepanine, namely to *Telodrepanum* CARL. I have been able to see a gonopod of a *Telodrepanum* (Figs 8—11)* and can provide now overwhelming evidence on basic similarities and differences between the two genera in question. As one can see (Figs 8—11), immediately distad of the junction of the prefemur and femorite, the latter splits into a huge and somewhat differently torded lamina (*u*), and there is also a good spine (*o*) at the base of the tibiotarsus. However, *Telodrepanum* seems to have a conspicuous dorso-lateral prefemoral outgrowth (*g*) and lacks, as well as all the other so far known polydrepanines, the parabasal loops of the seminal groove.

Curiosoma bispinosum sp. n. (Figs 5—7)

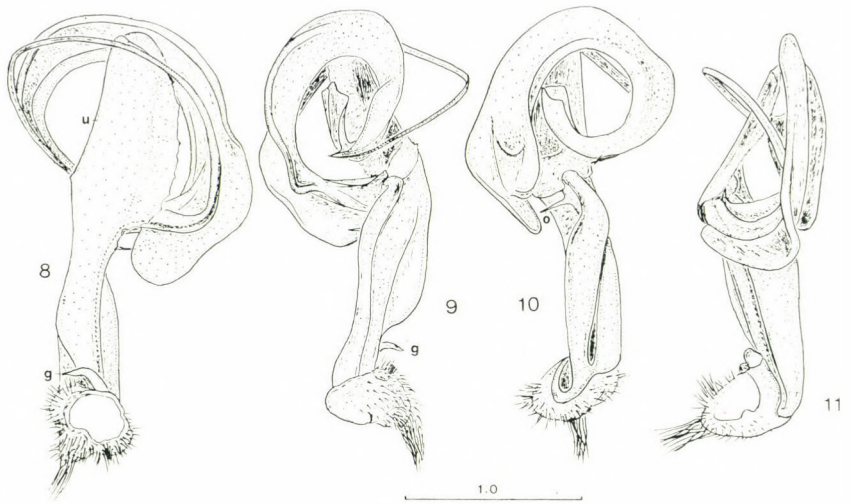
Locality: India, Maharashtra, Bhaja, 800 m, on slopes above the village, 1 ♂ (holotype) — 6. VIII. 1967 (No. 591), leg. TOPÁL. — Material examined: the above specimen.

Holotype has been deposited in the Hungarian Natural History Museum, Budapest.

Description: Length ca. 15 mm, width of mid-body pro- and metazona 0.8 and 1.0 mm, respectively. Colour dark brown, legs and ventrum paler, yellowish to light brown.

Collum considerably narrower than head and a little narrower than terga 2 and 3; from ring 5, which is subequal to head, onward until somite 17 body parallel-sided, further on regularly and gently tapering. Antennae reaching segment 5, long, slender, slightly clavate. Vertigial suture distinct, dorsal axial suture thin, visible only on metazona. Paraterga small, set low thus leaving dorsum rather convex, on somite 2 well below collum and somewhat below 3rd, developed from collum to ring 18, absent on segment 19,

* This gonopod makes part of the collection of the British Museum (Nat. Hist.), London, and had been identified as belonging to a *Telodrepanum* close to the only known type species *T. badaga* CARL, 1932, also from India (CARL, 1932), by Prof. R. L. HOFFMAN long before I could see and illustrate it. Unfortunately, the torso of this specimen taken from Dharwar on 17. VIII. 1975 is missing, thus making a description of this presumably new species impossible.



Figs 8—11. *Telodrepanum* sp., ♂ from Dharwar, India: 8—11 = right gonopod (dorsal, submesal, subventral and sublateral views, respectively). Scale in mm

only on 18th posteriorly pointed beak-like, while on preceding terga posteriorly roundly rectangular, always within tergal contour, laterally with a thin rim and a couple of setiferous knobs, on pore-bearing segments laterally slightly sinuate, with pores lying ca. 1/3 of metazonite length off posterior angle inside a small cavity. Tergal surface rather smooth and shining, only posterior halves of metazona somewhat rugose resembling a polygonal pattern: prozona and lateral parts of metazona rather finely shagreen. Suture between pro- and metazona deep, rather wide, longitudinally striated. Sulcus starting from metazonite 5, thin, deep, at bottom granulated, always reaching base of paranota. Collum with 3 transverse arched rows of rather long hairs on very poor knobs: 4 + 4, 2 + 2 and 3 + 3, besides 1 + 1 lateral ones. Up to segment 4, three rows of such setae, onward with 4 rather irregular rows of 4 to 5 hairs from each side, in pairs in front of and behind sulcus. Pleural keels present, small, somewhat better developed to segment 7, very poor on somites 8 and 9, onward represented but by poor swellings on subsequent few rings. Epiproct very short, straight, apically with a gentle concavity dividing terminal papillae, with a pair of small, though distinct subapical lateral teeth. Subanal scale roundly subtrapeziform, with a pair of apical hairs.

Legs rather long, somewhat growing in length toward ring 17, perhaps thicker than in ♀♀, without special modifications. No adenostyles on femora 1 or 2. Sterna sparsely setose, without spines. A high (higher than coxae), subquadrate, setose lamina with ventral margin in the form of a rounded triangle between coxae 4.

Gonopods (Figs 5—7) very complex. Coxite quite long, subcylindrical, distally setose. Prefemur moderate, densely setose, acropodite with good evidence of torsion. Femorite immediately distad of its junction with prefemur splits into a very large and distally serrate lamina (*u*) and a very short femur proper. Spermal groove runs chiefly along lateral side, makes a couple of conspicuous parabasal loops to pass onto long and slender solenomerite completely sheathed by tibiotarsus. Latter well curved, semicircular, at base with a pair of long spur-like spines (*o*).

Polydrepanum horridum sp. n. (Figs 12—17)

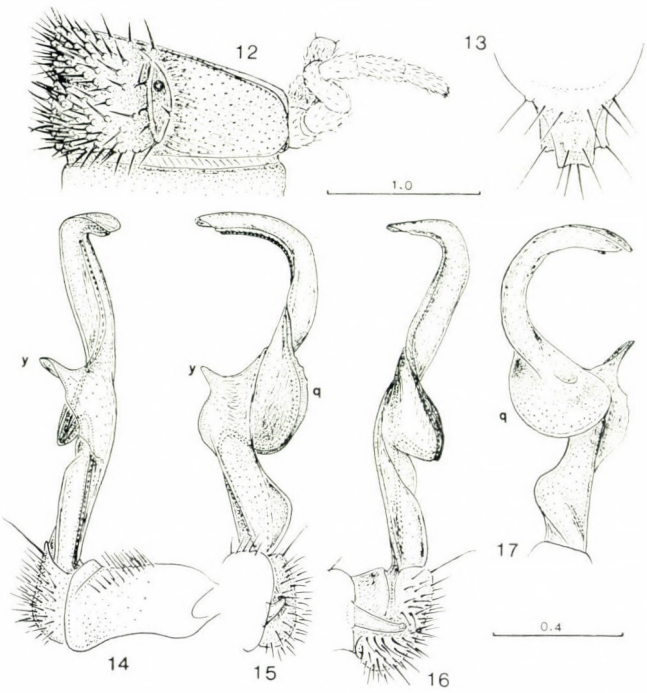
Locality: India, Maharashtra, Wenchi, 700 m, under stones and cattle dung, 4 ♂♂ (including holotype), 5 ♀♀ — 7. VIII. 1967 (No. 612), leg. TOPÁL. — Material examined: 9 specimens.

Holotype and 7 paratypes have been deposited in the Hungarian Natural History Museum, Budapest; 1 ♂ paratype has been left in the author's collection.

Diagnosis: Judging from the structure of both peripheral and gonopod characters, *P. horridum* sp. n. seems especially closely related to *P. asperrimum* (CARL, 1932) recently revised by JEEKEL (1980c), but is easily distinguishable by a different shape of the tibiotarsus and its processes, by a denser pubescence of metazona, etc., in the new species.

Description: Length ca. 18 mm in ♂♂ (including holotype) and 18 to 21 mm in ♀♀, width of pro- and metazona 1.4 and 1.7 mm (paratypes) or 1.5 and 1.8 mm (holotype) in ♂♂, respectively, and 1.9 and 2.2 mm in ♀♀. Colour from black-brown to brown, somewhat paler (brownish or yellowish-brown) are legs, ventrum, labrum and tip of epiproct.

Collum scarcely narrower than head, but a little broader than both 2nd and 3rd somites; from 5th to 17th, body parallel-sided, onward gently and regularly tapering. Antennae rather long, in ♂♂ reaching middle of somite 4, in ♀♀ up to 3rd segment, always slender and slightly clavate. Vertigial suture distinct, dorsal axial suture absent. Paraterga rather poorly developed, with a thin lateral rim, on pore-bearing segments (Fig. 12) laterally as if truncate, with a good lateral cavity where, approximately at 1/3 of paranotal length off posterior angle, lies a large pore; on 2nd somite well below both collum and 3rd one; always with 3 to 4 lateral setae on knobs situated right at rims, nowhere pointed posteriorly, all within tergal contour. Tergal surface dull, metazona beset with long and dense setae on rather good knobs arranged almost irregularly, ca. 8 in a transverse row from each side on mid-body somites; prozona finely shagreen, metazona laterally below paranote rather finely granulated. On collum and terga 2 and 3, the setae are a bit shorter and sparser than on mid-body or especially hind metazona. Sulcus starts from ring 5, always reaching base of paranota, deep. Suture between pro- and metazona deep, rather wide, longitudinally striated (except subventrally). Pleural keels present only up to segment 3, though somewhat in front of limbus each of subsequent somites carries an almost transverse rim ventrally



Figs 12—17. *Polydrepanum horridum* sp. n., ♂ paratype: 12 = metasomite 10 (lateral view), 13 = epiproct (dorsal view), 14—17 = left gonopod (lateral, submesal, mesal and subventral views, respectively). Scale in mm

nearly reaching coxae (Fig. 12). Epiproct not very long (Fig. 13), broad, apically gently concave, with a pair of good subapical lateral teeth. Subanal scale roundly subtrapeziform, with a pair of hairs.

Legs relatively short and stout, in ♂♂ scarcely incrassate, almost not growing in length toward telson, with a short claw and tarsal brush. Femur 1 without adenostyle, femur 2 with a small, but distinct adenostyle. A low (a little lower than coxae), subquadrate, setose lamina with narrowly rounded ventral corners between male coxae 4; a pair of low, paramedial, setose knobs between male coxae 5. Other sterna without modifications, moderately setose.

Gonopods (Figs 14—17) high, slender, relatively simple. Coxite long, subcylindrical, distally setose. Prefemur moderately developed, densely setose, acropodite with good evidence of torsion. Femorite high, carries seminal groove first on dorsal side, at mid-height of telopodite the groove moves via a loop mesad and gets onto thin and rather long solenomerite almost completely sheathed by tibiotarsus. Latter has a pronounced mesal rounded lamella (even a couple of them, both hiding seminal groove between them) with somewhat serrate margin (*q*) and a good lateral lamina with a finger at the end (*y*); the rest high, slender, somewhat torded and curved laterad.

Remarks: Two valid species of *Polydrepanum* CARL have hitherto been known, *P. tamilum* CARL, 1932 and *P. asperrimum* (CARL, 1932), both from South India (CARL, 1932, and both recently revised (JEEKEL, 1980c). *P. implicatum* CARL, 1941 from the environs of Bombay (CARL, 1941) has, indeed, nothing to do with this distinctly outlined genus (JEEKEL) 1968, 1980c). The new species, *P. horridum* n. sp., is a third good member of *Polydrepanum* and brings nothing new into the known diagnosis of the genus (CARL, 1932; JEEKEL, 1980c).

Hindomorpha gen. n.

Body relatively large (2.5—3 cm long). Paraterga well developed. Paranota 2 below collum. Pleural keels absent. A relatively small subtrapeziform lamina between male coxae 4. Legs long, gently lengthening toward telson.

Gonopods high and slender. Coxite long. Prefemur rather large, acropodite with good evidence of torsion. A process at both inner and dorsolateral ends of femorite; seminal groove runs chiefly laterally and makes a conspicuous loop before moving onto thin and relatively short solenomerite. Tibiotarsus rather short, sheathing solenomerite all along its length, moderately curved dorso-mesad.

Type species: *Sundanina granulifera* ATTEMS, 1936

Remarks: The new genus *Hindomorpha*, erected herewith for the only type species *H. granulifera*, is clearly a member of the tribe Polydrepanini as the seminal groove runs chiefly laterally and makes a characteristic loop before moving onto the solenomerite. JEEKEL (1968, 1980c) correctly supposed that *S. granulifera* deserved a genus of its own, which ought to be placed among other polydrepanine forms, and I take now the opportunity to formalize the issue by creating *Hindomorpha* gen. n. and to supplement the descriptions by ATTEMS (1936, 1937).

Hindomorpha granulifera (ATTEMS, 1936) (Figs 18—19)

Materials: India, Maharashtra, Bhaja, 800 m, under stones on a grazed hillside, 1 ♂ — 30. VII. 1967 (No. 574), leg. TOPÁL. — Same locality, on slopes above the village, 13 ♂♂, 12 ♀♀ — 6. VIII. 1967 (No. 591), leg. TOPÁL. — Material examined: 26 specimens. Besides 1 ♂ and 1 ♀ retained in the author's collection, all the materials have been deposited in the Hungarian Natural History Museum, Budapest.

Redescription: Length ranging from 25 to 31 mm in both sexes, width of pro- and metazona up to 1.5 and 2.5 mm in ♂♂, respectively, and up to 2.5 and 3.2 mm in ♀♀. Colour dark to yellowish-brown, antennal joints 6 and 7 always darkened; legs, ventrum and paraterga always paler.

Collum scarcely broader than head, other terga always considerably broader than head, from segment 5 to ring 17 body parallel-sided, further on abruptly tapering. Antennae long, reaching somite 5 in ♂♂, somewhat shorter in ♀♀, always slender and slightly clavate. Vertigial suture distinct, dorsal axial suture thin, shallow, visible only on metazona. Paraterga well developed, wing-like, produced caudad from somite 5, in ♂♂ somewhat raised thus making dorsum but slighter convex, in general set rather low, with a couple of small

lateral teeth at margin, thinly rimmed, on segment 2 well below both collum and 3rd, posteriorly obtuse, only on 16th ring considerably and on 17th one much protruding caudad beyond tergal contour. Tergal surface rather smooth and shining. Collum with 3 transverse rows of rather short setae on poor knobs: 4 + 4, 2 + 2 and 4 + 4, besides 1 + 1 lateral ones. Metazona with 2 + 2 and 4 + 4 such setae in 2 rows, one in front of and the other behind sulcus. Latter starts from segment 4, but fully expressed and reaches base of paranota from metazonite 5, rather thin and deep. Suture between pro- and metazona rather thin, deep, longitudinally striated. Pleural keels absent. Prozona finely shagreen, metazona below paraterga finely rugose. Epiproct rather short, broad, straightly truncate, without terminal papillae, but with a pair of small dorsal paramedian pre-apical knobs and a pair of subapical lateral teeth, poor and setiferous. Subanal scale roundly subtrapeziform, with a couple of apical hairs.

Legs long, in ♂♂ a little incrassate, with very good tarsal brushes, slightly growing in length toward telson, with rather long claws. In ♂♂, adenostyle on femur 1 wanting, on femur 2 absent. Sterna moderately setose, without spines. A small, roundly subtriangular, setose lamina between male coxae 4.

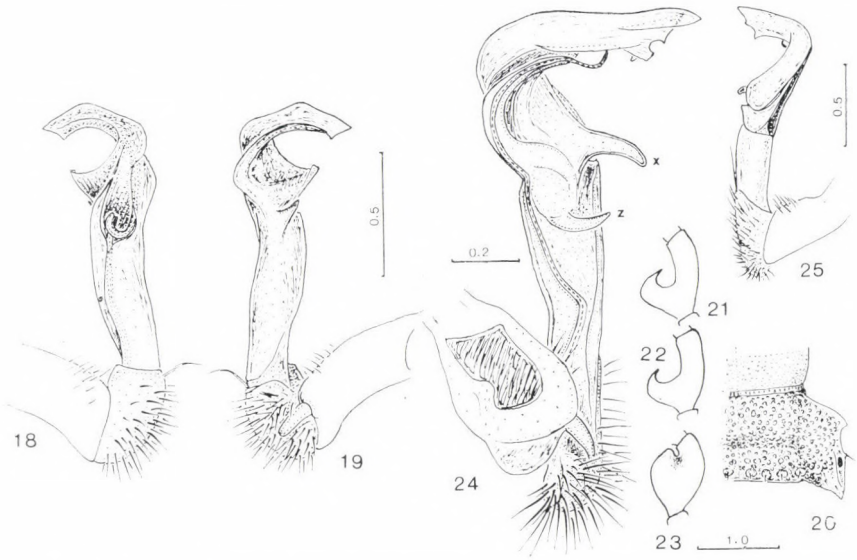
Gonopods (Figs 18—19) rather simple, high and slender. Coxite very long, slender, distally setose. Prefemur rather large, densely setose, acropodite well torded. Femorite slender, high, subcylindrical, distally with a spiny inner and a spiny dorso-mesal process, with seminal groove concealed on lateral side until opening at base of the dorso-mesal process where the groove makes a characteristic loop to pass onto thin and not very long solenomerits. Tibiotarsus completely sheathes latter between good lamina lateralis and poorer lamina medialis, moderately curved dorso-mesad, not very long, with a parabasal dorso-mesal lamella.

R e m a r k s : This species has hitherto been recorded but from the environs of Bombay (Attems, 1936, 1937), therefore it is no news in Maharashtra.

Parchondromorpha gen. n.

Body from medium size to rather large (2—3 cm long). Paraterga well developed. Paranota 2 below collum. Pleural keels absent. A good subtrapeziform lamina between male coxae 4. Legs long, with special modifications, slightly growing in length toward telson.

Gonopods high, relatively simple. Coxite long. Prefemur large, acropodite untorded. Distal part of high femorite with an inner process (*z*); seminal groove runs along mesal side. A good sulcus demarcating postfemur. Tibiotarsus with a basal ventral process (*x*); lamina lateralis profound, lamina lateralis rather



Figs 18—19. *Hindomorpha granulifera* (ATTEMS, 1936), comb. n., ♂: 18—19 = right gonopod (lateral and mesal views, respectively). Scale in mm. — Figs 20—25. *Parchondromorpha indica* gen. et sp. n., ♂ holotype: 20 = metazonite 10 (right half, dorsal view), 21 = femur 4 (lateral view), 22 =femur 5 (lateral view), 23 = femur 6 (lateral view), 24—25 = left gonopod (dorso-mesal and lateral views, respectively). Scale in mm

poorly developed. Solenomerite moderately long, slender, far from being entirely sheathed by large, curved mesad tibiotarsus.

Type species: *Parchondromorpha indica* sp. n.

Besides, the new genus comprises *P. similis* sp. n., also from India.

Remarks: *Parchondromorpha* gen. n. is a good member of the tribe Sulciferini widespread throughout Asia. It seems especially closely related to the genera *Chondromorpha* SILV. and *Anoplodesmus* POC., both richly represented in the Indian and Far Indian regions, but whereas *Chondromorpha* lacks a disal femoral inner process and *Anoplodesmus*, besides that, has two basal processes of tibiotarsus of the gonopods, *Parchondromorpha* seems well defined in possessing the characteristic disto-femoral gonopod process *z*. In addition, the new genus resembles to some extent certain Cnemodesmini, for instance *Pyragrogonus* Jeekel from Sri Lanka (JEEKEL, 1980c), but this rather witnesses of a feeble distinction of the latter tribe from the Sulciferini.

Parchondromorpha indica sp. n. (Figs 20—25)

Locality: India, Maharashtra, Kanheri near Bombay, 200 m, beaten from bushes in sparse forest on hill-side, 1 ♂ (holotype), 1 ♀ — 27. VIII. 1967 (No. 725), leg. TOPÁL. — Material examined: 2 specimens.

Both holotype and paratype have been deposited in the Hungarian Natural History Museum, Budapest.

Description: Length ca. 27 mm (holotype) and 30 mm (paratype) width of pro- and metazona 1.7 and 2.6 mm, respectively, in holotype and 2.0 and 3.0 mm in paratype. Colour dark brown (holotype) or chocolate

brown (paratype); legs, ventrum and posterior corners of paraterga paler, light brownish.

Collum a bit broader than head and somewhat narrower than terga 2 and 3, on segments 5 to 16 body parallel-sided, further on gently and regularly tapering. Antennae long, reaching end of somite 4 in ♂♂ and somewhat shorter in ♀♀, slender, slightly clavate. Vertigial suture distinct, dorsal axial suture absent even on metazona. Paraterga well developed, begin from collum, on segment 2 well below both collum and 3rd, laterally thinly margined and provided with a good anterior and a poor pre-pore tooth, posteriorly slightly protruding caudad beak-like beyond tergal contour to ring 16, on metazona 17 to 19 especially acute and projecting backward better, all set rather high (dorsum but slightly convex, especially in ♂♂) and directed somewhat obliquely upward. Tergal surface dull, prozona finely shagreen, metazona below paranota finely granulated, dorsally covered with numerous more or less small tubercles or knobs of which 5 + 5 situated at hind tergal edge and bearing short hairs are marked (Fig. 20), as well as sometimes (especially in ♀) 2 + 2 or 3 + 3 in front of sulcus. Tergal hairs very fragile, almost everywhere lost. Larger knobs on metazona better expressed on fore segments than on hind ones. Suture between pro- and metazona deep, rather narrow, longitudinally striated. Sulcus starts from segment 5, deep and rather thin, reaches base of paraterga. Pleural keels absent. Epiproct moderately long, narrow, roundly truncate at the apex, without terminal papillae, but with a pair of good, though quite small subapical lateral teeth. Subanal scale roundly subtrapeziform, with a couple of apical hairs.

Legs long, slender, incrassate in ♂♂, with rather long claws. In ♂, femur 1 without adenostyles, femur 2 already with minute adenostyles; from femur 3 to 6th one, adenostyles becoming increasingly large (Figs 21—23). Sterna moderately setose, without spines. A high (higher than coxae), subquadrate, setose lamina with rounded ventral corners divided by a deep and rather narrow (to mid-height) notch between male coxae 4.

Gonopods (Figs 24—25) high, rather slender and simple. Coxite long, subcylindrical, distally setose. Prefemur large, densely setose, acropodite untorded. Femorite high, slender, subcylindrical, slightly clavate; seminal groove runs along inner side. A good, hook-like, inner disto-femoral process (*z*) at base of relatively short and slender solenomerite. Postfemur distinctly set off from femur proper by demarcation sulcus. Tibiotarsus moderately large, slightly curved mesad, at base with a good finger-shaped ventral process (*x*), a very good lamina lateralis and a poorer lamina medialis. Solenomerite not hidden.

Parchondromorpha similis sp. n. (Figs 26—28)

Locality: India, Maharashtra, Bhaja, 800 m, on slopes above the village, 1 ♂ (holotype) — 6. VIII. 1967 (No. 591), leg. TOPÁL. — Material examined: above specimen. Holotype has been deposited in the Hungarian Natural History Museum, Budapest.

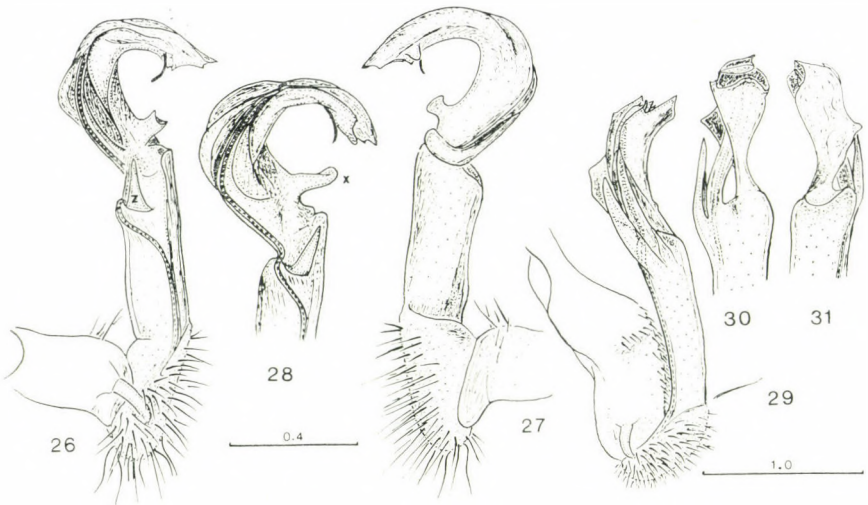
Diagnosis: Very similar to *P. indica* sp. n., especially as regards the gonopod structure, but is easily distinguishable from the latter by smaller body, reduced number of knobs on metazona, better developed lamina medialis, etc.

Description: Length ca. 20 mm, width of pro- and metazona 1.2 and 1.9 mm, respectively. Colour uniformly brown, legs, ventrum, lateral and posterior parts of paraterga paler, light brown to yellowish.

Collum scarcely narrower than head, subequal to somite 3; segment 2 in width subequal to head, from ring 5 to 17th body parallel-sided, onward relatively abruptly tapering. Antennae reaching segment 5, long, slender, slightly clavate. Vertigial suture distinct, dorsal axial suture expressed but on hind half of collum, onward absent even on metazona. Paraterga well developed, starting from collum, laterally thinly margined, directed somewhat obliquely upward, with a couple of subequally small lateral marginal teeth, posteriorly also very finely serrate, on segment 2 well below both collum and 3rd, always acute beak-like, slightly projecting backward beyond hind tergal contour until somite 16, on segments 17 to 19 protruding caudad better. Pores lie almost dorsally. Paraterga set rather high, dorsum but slightly convex. Tergal surface relatively smooth, slightly shining, finely shagreen, metazona almost dull, with 5 + 5 small knobs bearing a medium-sized seta each at hind tergal edge and 3 + 3 or (on fore segments) 4 + 4 very poor setiferous tubercles in another transverse row in front of sulcus. Latter thin, shallow, starts from ring 4, but fully developed and reaching base of paranota from segment 5 onward. Surface below paraterga finely granulated. Suture between pro- and metazona rather narrow, deep, longitudinally striated. Pleural keels absent. Epiproct small, rather short, apically narrowly truncate, without terminal papillae, but with a pair of very small subapical lateral teeth. Subanal scale roundly subtrapeziform, with a pair of apical hairs.

Legs rather crassate, slightly growing in length toward telson, with rather long claws and good tarsal brushes. Femora 1 to without adenostyles, femur 4 with a wanting adenostyle, from femur 5 to 7th there are increasingly good adenostyles as in *P. indica* sp. n. A high (higher than coxae), roundly subquadrate, setose lamina with a big, setiferous, medial, basal hind tubercle between male coxae 4. Sterna moderately setose, without spines.

Gonopods (Figs 26—28) high, slender, rather simple. Coxite long, subcylindrical, distally setose. Prefemur large, densely setose, acropodite untorded. Femorite relatively high, subcylindrical, not clavate, distally with a good curved inner process (*z*), distinctly set off from postfemur by demarcation sulcus; seminal groove runs along inner side. Tibiotarsus rather large,



Figs 26—28. *Parchondromorpha similis* sp. n., ♂ holotype: 26—27 = left gonopod (mesal and lateral views, respectively), 28 = distal part of left gonopod (dorso-mesal view). Scale in mm. — Figs 29—31. *Armolites spiniger* (Attems, 1936), comb. n., ♂: 29 = left gonopod (mesal view), 30—31 = distal part of left gonopod (ventral and dorsal views, respectively). Scale in mm

curved ventro-mesad, with a good basal finger-shaped process (*x*), both laminae well developed, though lamina lateralis more so. Solenomerite relatively short, slender, almost nowhere concealed.

Armolites gen. n.

Body rather large (more than 3 cm long). Paraterga rather poorly developed. Paranota 2 below collum. Pleural keels absent. Legs long, slightly growing in length toward telson, without special modifications. A large subtrapeziform lamina between male coxae 4.

Gonopods high, slender, suberect. Coxite large, subcylindrical. Prefemur rather large, arcopodite untorded. Femorite distally with a good mesal process, solenomerite rather short, relatively thick. Seminal groove runs along mesal side. Tibiotarsus relatively small, rather stout, complex, with both laminae rather well developed, poorly concealing solenomerite.

Type species: *Kronopolites spiniger* Attems, 1936

Remarks: *Armolites* gen. n., erected for the only species *A. spiniger*, is another difficult genus to be placed into a tribe. However, it seems to be neither a Polydrepanini, as it was once believed by Jeekel (1968), nor an Alogolykini, as Jeekel (1980c) thinks now. Most probably we face another disjunct Sulciferini, judging from the course of the spermal groove and presence of a good disto-femoral process of the gonopods. A stricter allocation is believed warranted but upon a revision of the huge and seemingly heterogenous tribe Sulciferini.

. *Armolites spiniger* (ATTEMS, 1936) (Figs 29—31)

L o c a l i t i e s : India, Darjeeling in W Bengal, below North Point, 1400 m, beaten from bushes, 1 ♀ — 17. X. 1967 (Nos 844—847), leg. TOPÁL. — Darjeeling distr., Kurseong, 1000 m, from mosses on bark of trees, 1 ♂ juv. — 18. X. 1967 (No. 851), leg. TOPÁL. — Darjeeling distr., Ghum, Senchal Reserve Forest, 2200 m, in pitfall traps, 1 ♀ juv. — 10—21. X. 1967 (No. 871), leg. TOPÁL. — Darjeeling, below North Point, 1000 m, in pitfall traps, 1 ♂ — 16—22. X. 1967 (No. 893), leg. TOPÁL. — Material examined: 4 specimens.

All the 4 specimens have been deposited in the Hungarian Natural History Museum, Budapest.

R e d e s c r i p t i o n : Length of adults 31 (♂) and 33 mm (♀), width of pro- and metazona 3.2 and 4.0 mm, respectively, in ♂ and 3.7 and 4.6 mm in ♀. Colour light brown, legs, ventrum, paraterga and tip of epiproct yellowish.

Collum a little broader than head and 2nd somite, but subequal to 3rd, from 5th somite until 16th body parallel-sided, onward gently and regularly tapering. Antennae slender, thin, short, reaching but end of segment 2. Vertigial suture distinct, dorsal axial suture expressed poorly, exists but on collum. Paraterga poorly developed, set low thus leaving dorsum well convex, rather thickly margined laterally (including collum) and without evident teeth along margin, on segment 2 well below both collum and 3rd, poster orly almost everywhere subrectangular and narrowly rounded and almost always well within hind tergal contour, only on ring 18 rather well produced caudad beak-like beyond the contour, but on 19, though more pointedly, again less prominent. Tergal surface rather smooth, only on posterior halves of metazona slightly rugose, below paranota finely granulated, prozona dull, finely shagreen. Collum with 3 transverse rows of rather short and sparse hairs, subsequent metaterga with 2 rows of such setae, one of 2 + 2 in front of and the other of 2 + 2 on segments 2 and 3, of 4 + 4 to 5 + 5 (on hind terga, especially fully preserved on segment 19) behind sulcus at hind tergal edge. Sulcus starts from somite 4, but fully developed from metazonite 5 where it reaches base of paranota, thin, in the form of a line, gradually coming to naught to 17th or 18th rings to disappear entirely on segment 19. Suture between pro- and metazona thin, rather deep, longitudinally striated. Pleural keels absent. Epiproct rather long, broadly truncate at the apex, with a pair of terminal papillae divided by a considerable median notch and a pair of minute subapical lateral teeth. Subanal scale roundly subtrapeziform, with 2 hairs.

Legs rather long, incrassate and longer in ♂, very slightly growing in length toward telson, with small claws, without tarsal brushes. Anterior femora without adenostyles. A broad and high (higher than coxae), roundly subtrapeziform, setose lamina with ventral margin broadly and rather deeply concave between male coxae 4. Sterna moderately setose, without spines.

Gonopods (Figs 29—31) very high, slender, suberect. Coxite long, massive, subcylindrical, setose. Prefemur rather large, densely setose. Femorite untorded, slender, subcylindrical, poorly clavate, distally with a large spiny

process directed cephalad and set at the very base of rather short, rather thick solenomerite; seminal groove runs along mesal side. Tibiotarsus relatively short and stout, with well-developed laminae lateralis and medialis, concealing but the very distal part of solenomerite.

Remarks: The species has hitherto been known only in Darjeeling (ATTEMS, 1936, 1937) and therefore is redescribed from its terra typica.

Laterogonopus gen. n.

Body of medium size (2—2.5 cm long). Paraterga well developed. Paranota 2 below collum. Pleural keels absent. Legs long, growing in length toward telson, with special modifications. A rather small subtrapeziform lamina between male coxae 4.

Gonopods high and slender, simple. Coxite large, subcylindrical. Prefemur moderate, acropodite untorded. Femorite very slender, subcylindrical, without processes, solenomerite rather long, thin. A good sulcus demarcating postfemoral portion. Seminal groove runs along mesal side. Tibiotarsus relatively short, slender, more or less curved laterad, consists only of lamina lateralis, sheathing most of solenomerite.

Type species: *Laterogonopus simplex* sp. n.

Remarks: *Laterogonopus* gen. n., judging from the absence of the gonopod tibiotarsal lamina medialis, seems a member of the tribe Xanthodesmini most closely related to the genus *Streptogonopus* ATT., with five species from India or Ethiopia, but is clearly distinguishable from it by a better development of paraterga, absence of pleural keels, presence of adenostyles on male anterior femora, much slenderer gonofemora, etc. (cf. ATTEMS, 1936, 1937). To some extent it also resembles certain Sundaninini which, too, lack a lamina medialis. So far *Laterogonopus* gen. n. comprises only its type species, *L. simplex* sp. n.

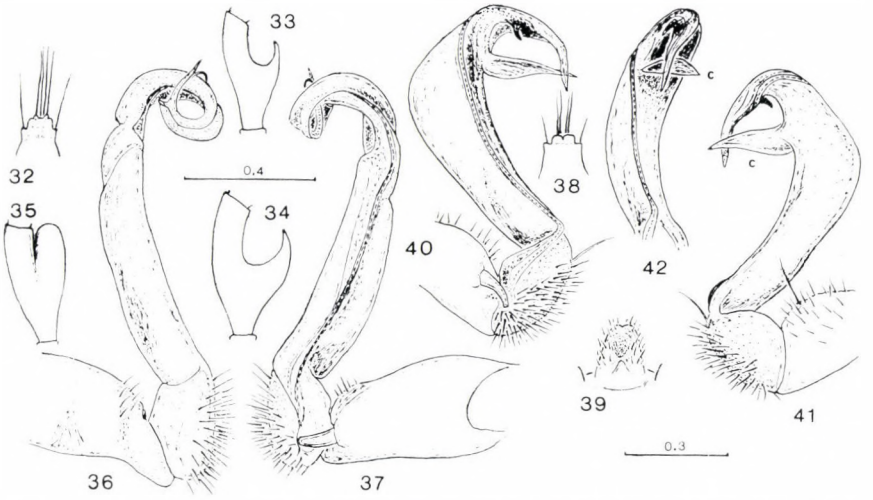
Laterogonopus simplex sp. n. (Figs 32—37)

Localities: India, Maharashtra, Pune, 700 m, in and around the town, 1 ♂, 1 ♀ — 5. VIII. 1967 (No. 585), leg. TOPÁL. — Maharashtra, Wenchi, 700 m, under stones and cattle dung, 1 ♂ (holotype), 1 ♀ — 7. VIII. 1967 (No. 612), leg. TOPÁL. — Material examined: 4 specimens.

Holotype with all the paratypes have been deposited in the Hungarian Natural History Museum, Budapest.

Description: Length up to 21 mm (holotype) or 23 mm (♂ paratype) and up to 24 mm in ♀♀, width of pro- and metazona 1.7 and 2.0 mm, respectively (holotype), or 1.7 and 2.1 mm (paratype) in ♂♂ and 1.9—2.0 and 2.4—2.6 mm in ♀♀. Colour from more or less uniformly chocolate brown to yellowish-brown, somewhat paler are legs, ventrum, paraterga and tip of epiproct.

Collum somewhat broader than head and segment 2, from ring 5 to 16th body parallel-sided, onward gently and regularly tapering. Antennae



Figs 32—37. *Laterogonopus simplex* gen. et sp. n., ♂ paratype: 32 = tip of epiproct (dorsal view), 33 = femur 4 (lateral view), 34 = femur 5 (lateral view), 35 = femur 7 (lateral view), 36—37 = right gonopod (lateral and mesal views, respectively). Scale in mm. — Figs 38—42. *Substrongylosoma distinctum* gen. et sp. n., ♂ paratype: 38 = tip of epiproct (dorsal view), 39 = sternal lamina between coxae 4 (caudal view), 40—41 = left gonopod (mesal and lateral views, respectively), 42 = telopodite of left gonopod (ventral view). Scale in mm

long and slender, slightly clavate, subequal in both sexes, reaching to end of somite 4. Vertigial suture distinct, dorsal axial suture absent even on metazona. Paraterga well developed, laterally rather thinly margined, always with a couple of small marginal teeth and posteriorly (even on collum) pointed, directed somewhat obliquely upward and protruding caudad beyond tergal contour, along posterior edge ginely serrate, set rather low thus leaving dorsum rather convex (less convex in ♂♂), on segment 2 well below both collum and 3rd. Pore lies in a narrow lanceolate lateral impression at ca. 1/3 of paratergal length off posterior corner, always visible in dorsal view. Tergal surface dull, finely granulated on dorsal side of metazona, finely shagreen on prozona and below paraterga. Metazona with 3 transverse rows of medium-sized hairs on poor knobs, besides 1 + 1 marginal one, of 4 + 4 in anterior (pre-sulcus) and middle (immediately behind sulcus) rows and of 5 + 5 ones in posterior row situated at hind tergal edge. Anterior and middle rows separated rather poorly, tergal hairs baton-shaped, a bit longer on anterior- and posteriormost somites. Collum with 3 transverse rows of setiferous knobs, all arched: 6 + 6, 4 + 4 and 4 + 4, regardless 1 + 1 ones at lateral margin. Suture between pro- and metazona good, shallow, without striae. Sulcus poor, thin, shallow, wanting on segment 2, better developed and almost reaches base of paranota from somite 5 onward. Pleural keels absent. Epiproct (Fig. 32) rather short, terminally with a pair of minute paramedian papillae and a pair of poor sub-

apical lateral teeth. Subanal scale roundly subtrapeziform, with a couple of hairs.

Legs long and slender, somewhat incrassate and considerably longer (especially toward telson) in ♂♂, densely setose, but without tarsal brushes. In ♂, leg-pair 1 usual, without adenostyles; pair 2 with a small inner coxal swelling; prefemora 4 to 7 especially enlarged, femora 4 to 6 with a good adenostyle each, which increases in volume from femur 4 onward so that on femur 7 becoming huge (Figs 33—35). A small (scarcely lower than coxae), roundly subquadrate, setose lamina between coxae 4 in ♂. Sterna densely setose, keep coxae well apart, without spines.

Gonopods (Figs 36—37) very slender, high, simple. Coxite long, subcylindrical, distally setose. Prefemur moderate, acropodite untorded. Femorite very slender, subcylindrical, without outgrowths, distinctly set off from postfemur by demarcation sulcus; seminal groove runs along mesal side. Solenomerite slender, rather long, tapering toward end, partly sheathed by slender and distally more or less dramatically curved laterad tibiotarsus represented but by lamina lateralis.

Substrongylosoma gen. n.

Body relatively small (ca. 1.5 cm long). Paraterga very poor, body substrongylosomoid. Paratergite 2 below collum. Legs long, growing in length toward telson, with special modifications. A prominent subtrapeziform lamina between male coxae 4.

Gonopods simple, more or less falcate, without evident solenomerite, at distal third with a good ventral process (*c*), without cingulum (= sulcus) demarcating postfemoral part. Coxite large. Prefemur rather large. Seminal groove chiefly runs mesally, though, well before it ends more or less proximad of gonopod tip on a small hook, it turns cephalo-laterally.

Type species: *Substrongylosoma distinctum* sp. n.

Besides, *Substrongylosoma* gen. n. includes *S. falcatum* sp. n., also from India.

Remarks: *Substrongylosoma* gen. n. is clearly most closely related to *Himalomorpha* gen. n. (see below), with the only sympatric Himalayan species *H. montigena* (CARL), but lacks a dorsal disto-femoral gonopod process (tibiotarsus?). Besides, *Substrongylosoma* gen. n. reminds one of the Euro-Mediterranean genus *Strongylosoma* BRANDT so vividly, as regards both somatic and gonopod characters, that if it were not for the conspicuous course of the seminal groove in the new genus, one could have easily taken the Indian forms for true *Strongylosoma*. However, upon a closer examination, a number of other sharp differences can be revealed: *Substrongylosoma* gen. n. has adenostyles, very poor paraterga, and the seminal groove ends on a small, but distinct subterminal hook.

Zoogeographically, the close affinities of the Himalayan genera *Substrongylosoma* gen. n. and *Himalomorpha* gen. n. with *Strongylosoma* is a fact of great importance, as it links the Ancient Mediterranean and Himalayan paradoxosomatid faunae. So far, no direct evidence

has been known of such relationships among the Paradoxosomatidae, one of the largest diplopod families (JEEKEL, 1968; HOFFMAN, 1979).

The splitting of the Euro-Mediterranean paradoxosomatid fauna into tribes is a matter of the future (JEEKEL, 1968). However, it seems reasonable now to create the tribe Strongylosomatini tribus n. to encompass at least the above three genera, thus emphasizing a natural entity characterised by the gonopods more or less falcate, lacking both solenomerite and sulcus demarcating postfemoral portion, having the seminal groove running chiefly along mesal side and the tibiotarsus absent or at best poor (anyway no solenophore), with a ventral disto-femoral process. A good number of Euro-Mediterranean genera allied to *Strongylosoma* (cf. JEEKEL, 1968) might join the Strongylosomatini as well.

Substrongylosoma distinctum sp. n. (Figs 38—42)

Localities: India, W Bengal, Darjeeling, below North Point, 1200 m, beaten from bushes after sunset, 5 ♂♂, 4 ♀♀ — 16. X. 1967 (No. 838), leg. TOPÁL. — Darjeeling distr., Lopchu, 1500 m, beaten from bushes in forest, 25 ♂♂ (including holotype), 24 ♀♀ — 20. X. 1967 (No. 857), leg. TOPÁL. — Material examined: 58 specimens.

Holotype and 53 paratypes have been deposited in the Hungarian Natural History Museum, Budapest, 2 ♂♂ and 2 ♀♀ paratypes retained in the author's collection.

Description: Length 17—19 mm in ♂♂ and 18—21 mm in ♀♀, width of pro- and metazona 1.4—1.5 and 1.7—1.9 mm, respectively, in ♂♂ and 1.7—1.8 and 1.9—2.1 mm in ♀♀. Holotype ♂ ca. 17 mm long and 1.4 and 1.7 mm wide on pro- and metazona, respectively. Colour in general light, whitish or yellowish, sometimes slightly marble; light brown only antennal joints 6 and 7, rarely only apex of joint 6.

Collum in width subequal to head (♀♀) or scarcely narrower than head (♂♂), a little narrower than segment 2, but a bit broader than both terga 3 and 4, from segment 5 to 17th body parallel-sided, onward gently and regularly tapering. Antennae long, slender, slightly clavate, in ♂ reaching end of segment 3, a bit longer than in ♀. Vertigial suture distinct, dorsal axial suture poor, thin, expressed but on hind half of collum and on metazona. Body moniliform, substrongylosomoid, paraterga very poorly developed, on segment 2 well below collum and 3rd, laterally thinly margined, set low (at mid-height) thus leaving dorsum well convex, situated on good lateral swellings, laterally even, deprived of marginal teeth, nowhere protruding caudad beyond hind tergal contour, on pore-bearing segments somewhat larger, postero-laterally always rounded and obtuse; only on segment 2 with a pair of minute marginal teeth and postero-laterally a little projecting caudad beyond hind contour. Tergal surface smooth and shining. Collum with 4 + 4 medium-sized hairs in an arched anterior and 1 + 1 similar hairs in a medial transverse row, latter being situated just in front of a poor transverse sulcus at ca. 1/3 of total length off posterior margin. Subsequent terga with 1 + 1 such hairs in a transverse row in front of metazonital sulcus. Latter thin, shallow, starts already from collum, wanting on somites 2 and 3, from 4th onward reaching base of paraterga. Suture between pro- and metazona deep, rather broad, longitudinally striated. Pores lie laterally at 1/3 to 1/4 of paratergite length

off caudal corner. Epiproct (Fig. 38) narrowly truncate, with a minute median notch and a pair of good subapical lateral incisions. Subanal scale roundly subtrapeziform, with a couple of apical hairs.

Legs rather long, slender, longer and slenderer in ♂♂, growing in length toward segment 17; in ♂, tarsal brushes present, femur 1 with a large adenostyle, femora 6, 7 and 9 (especially 6th) parabasally well enlarged, coxa 2 with a small inner tubercle, coxae 6 and 7 also with small, but distinct round tubercles bearing a long seta each. A high (higher than coxae), subquadrate, setose lamina bearing a small, but distinct posterior parabasal tubercle (Fig. 39) between male coxae 4. Sterna moderately setose, without spines, in ♂ between coxae 6 and 7 with a couple of very small, subtrapeziform, setose median outgrowths.

Gonopods (Figs 40—42) falcate, simple. Coxite large, subcylindrical, setose. Prefemur large, densely setose, acropodite untorded. Femorite thick, rather long, distally clavate at level of a good lamelliform pointed ventral process (*c*), whereupon distad abruptly narrowing and curved hook-like ventrad, at apex pointed. Seminal groove runs first along mesal side of femorite, distad of process *c* moves cephalad to come to lateral side before ending on a small distal hook. Neither solenomerite nor tibiotarsus present. No demarcation sulci.

Substrongylosoma falcatum sp. n. (Figs 43—46)

Localities: India, W Bengal, Darjeeling, below North Point, 1400 m, beaten from bushes, 3 ♂♂, 5 ♀♀ — 17. X. 1967 (No. 843), leg. Topál. — Darjeeling distr., Kurseong, 1000 m, in grass in forest, 1 ♂ (holotype) — 18. X. 1967 (No. 850), leg. Topál. — Material examined: 9 specimens.

Holotype and 7 paratypes have been deposited in the Hungarian Natural History Museum, Budapest, 1 ♂ paratype retained in the author's collection.

Diagnosis: Well distinguishable from the only known type species *S. distinctum* sp. n. by the form of the epiproct, presence of prefemoral tubercles on male leg-pairs 9 to 16, gonopod femorite better falcate, seminal groove ends subterminally, etc.

Description: Length ca. 16 mm in ♂♂ (including holotype) and 14—17 mm in ♀♀, width of pro- and metazona 1.2 and 1.4 mm, respectively, in ♂♂ (including holotype) and 1.4 and 1.6 mm in ♀♀. Colour uniformly pale, yellowish-pink, only distal half of 6th and proximal half of 7th joints of antennae light brown, rarer brownish are also basal half of joint 6 and even part of joint 5.

Collum scarcely narrower or subequal to head, a bit narrower than segment 2, but a little broader than both somites 3 and 4, from segment 5 to 16th body parallel-sided, onward gently and regularly tapering. Antennae somewhat longer in ♂, reaching middle of segment 4, slender, slightly clavate. Vertigial suture distinct, dorsal axial suture poor, expressed but on metazona. Body moniliform, substrongylosomoid, paraterga very poorly developed, on

segment 2 well below collum and 3rd, laterally thinly margined and without marginal teeth (except segment 2 provided with a couple of minute ones), set low (at mid-height) on good lateral swellings thus leaving dorsum well convex, well within hind tergal contour (except segment 2), with postero-lateral corners obtuse and rounded. Tergal surface smooth, prozona dull, metazona shining and on posterior half slightly rugose. Tergal surface smooth, metazona shining and on posterior half slightly rugose. Tergal hairs almost always (except on collum) lost, medium-sized, apparently of the same pattern as in *S. distinctum* sp. n. Pores as in latter. Sulcus starts from collum (at hind 1/3 of length), from segment 5 onward reaches base of paraterga. Suture deep, rather thin, longitudinally striated. Pleural keels absent as in *S. distinctum* sp. n. Epiproct (Fig. 43) rather short, with a pair of good apical papillae separated by a small notch and a pair of distinct subapical lateral knobs. Subanal scale usual.

Legs slender and long, in ♂ longer and slenderer, growing in length toward ring 17, with tarsal brushes; femur 1 with a large adenostyle, femora 6, 7 and 9 slightly, but distinctly parabasally enlarged, poorer on pair 6 and especially well on 9th. Coxae 2, 6 and 7 each with a small inner tubercle; prefemora 9 to 16 with a small setiferous tubercle from inner side at mid-length, more poorly developed on pairs 15 and 16. Sterna as in *S. distinctum* sp. n.

Gonopods (Figs 44—46) well falcate, slender, simple. Coxite rather large. Prefemur also rather large, acropodite untorded. Femorite long, slender, subcylindrical, without distal enlargement, gently and regularly tapering toward end terminating in 2 minute spines. A good lamelliform ventral process (*c*) on distal part of femorite. Seminal groove as in *S. distinctum* sp. n., but ends subterminally.

Himalomorpha gen. n.

Body of medium size (1.5 to 2 cm long). Paraterga moderately developed. Paranota 2 below collum. Pleural keels absent. Legs long, with special modifications, grow in length toward telson. A moderate lamina between male coxae 4.

Gonopods slender, more or less falcate, distally with a ventral and an oral process (tibiotarsus ?), without either solenomerite or cingulum demarcating postfemoral portion. Coxite large. Prefemur rather large. Seminal groove chiefly runs mesally, ends by a distinct suboral hook subterminally, before ending moves cephalo-laterad at base of (?) tibiotarsus.

Type species: *Strongylosoma montigena* CARL, 1935

R e m a r k s : *Himalomorpha* gen. n., erected to comprise only its type species *H. montigena* (CARL), is clearly most closely related to *Substrongylosoma* gen. n. (see above), but well

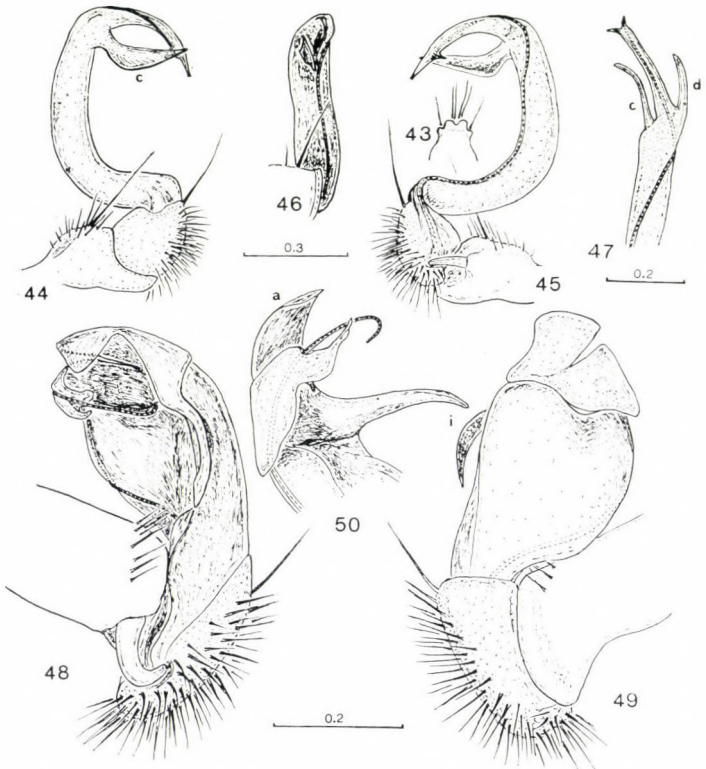
distinguishable by a better development of the praterga and the presence of a distal oral process (*d*) of the gonopods. JEEKEL (1968, 1980c) has already mentioned that *montigena* deserves a genus of its own, regarding quite correctly similaries in the gonopod structure between this species and *Akamptogonus* ATT. from New Zealand as but superficial (JEEKEL, 1964). However, in the light of the discovery of sympatric *Substrongylosoma* gen. n., with the basic traits so very similar to those of *montigena*, it seems superfluous further to treat the latter form as related to the tribe Alogolykini (cf. JEEKEL, 1980c).

Himalomorpha montigena (CARL, 1935) (Fig. 47)

M a t e r i a l : India, W Bengal, Darjeeling, below North Point, 1200 m, beaten from bushes after sunset, 1 ♂ — 16. X. 1967 (No. 838), leg. TOPÁL. — Darjeeling distr., Ghum, Senchal Reserve Forest, 2200 m, 1 ♂, 1 ♀ — 21—22. X. 1967 (No. 886), leg. TOPÁL. — Material examined: 3 specimens.

All the three specimens have been deposited in the Hungarian Natural History Museum, Budapest.

R e d e s c r i p t i o n : Length 13—15 mm in ♂♂ and 17 in ♀, width of pro- and metazona 0.8 and 1.1 mm and 1.1 and 1.4 mm in ♂♂, respectively,



Figs 43—46. *Substrongylosoma falcatum* sp. n., ♂ paratype: 43 = tip of epiproct (dorsal view), 44—45 = right gonopod (lateral and mesal views, respectively), 46 = telopodite of right gonopod (ventral view). Scale in mm. — Fig. 47. *Himalomorpha montigena* (CARL, 1935), comb. n., ♂: tip of right gonopod (mesal view). Scale in mm. — Figs 48—50. *Paranedyopus cylindricus* (CARL, 1935), comb. n., ♂: 48—50 = left gonopod (mesal and lateral views, respectively), 50 = distal part of left gonopod (subdorsal view). Scale in mm

and 1.6 and 2.0 mm in ♀. Colour from pink-yellowish to light brown; brownish always region at suture between pro- and metazona, as well as antennal joints 6 and 7; paler always legs, ventrum and paraterga.

Collum and 2nd somite in width subequal to head, onward a slight constriction up to segment 4, from ring 5 onward to ring 17 or even 18 body parallel-sided, further on more or less gently and regularly tapering. Antennae rather short, slender, slightly clavate, reach to middle of segment 3 and segment 2 in ♂ and ♀, respectively. Vertigial suture distinct, dorsal axial suture in the form of a line visible only on metazona. Paraterga moderately developed, laterally thinly margined, on segment 2 well below both collum and 3rd, always set low thus leaving dorsum rather convex, start from collum, protrude beyond hind tergal margin only on segments 17 to 19, postero-laterally beak-like on 18th and 19th, with 1 anterior or 2 marginal lateral incisions on pore-bearing and poreless rings, respectively. Tergal surface in general dull, smooth and finely shagreen on prozona and below paraterga. Collum with at least 2 transverse arched rows of medium-sized hairs on very poor tubercles. Subsequent metaterga with 2 + 2 setiferous knobs in a transverse row in front of and 4 + 4 (to segment 14) or 5 + 5 ones (from ring 14 onward) in a row behind sulcus. Latter thin, shallow, starts from segment 4, but only from somite 5 onward reaches base of paraterga. Suture between pro- and metazona rather thin and deep, longitudinally striated. Pleural keels absent. Epiproct rather short, apically slightly concave, with a pair of considerable subterminal lateral teeth. Subanal scale usual.

Legs long, in ♂ longer and incrassate, grow in length toward telson. In ♂, femur 1 with a very good adenostyle, femora 4 to those of ring 14 with a small inner basal swelling gradually coming to naught toward ring 14; coxae 2 with large rounded inner apical fingers; tarsal brushes present. A small, though rather high, roundly trapeziform, setose lamina between male coxae 4. Sterna moderately setose, without spines.

Gonopods (Fig. 47) simple, subfalcate, high and slender. Coxite long, setose. Prefemur large, densely setose, acropodite untorded. Femorite subcylindrical, laterally slightly compressed, withoug sulcus demarcating postfemoral portion, distally with a good somewhat flagelliform ventral (*c*) and a good spiny oral process (*d*) (? tibiotarsus), terminally pointed. Seminal groove runs along mesal side, but disto-femorally just at base of process *d* turns cephalo-laterad to end laterally and subterminally by a small oral hook,* without any trace of furcation.

R e m a r k s : The species has hitherto been known only in Darjeeling (CARL, 1935) and is described now again from its terra typica.

* CARL (1935) had erroneously depicted the end of the seminal groove in *montigena* bifurcate, thus having misled JEEKEL (1964) in thinking this character as unique among all known Paradoxosomatidae. As one can see now, this species is not disjunct in this respect from the rest of the family.

Paranedyopus cylindricus (CARL, 1935), comb. n. (Figs 48—50)

Material: India, W Bengal, Darjeeling distr., Ghum, Senchal Reserve Forest, 2200 m, from mosses on stones and forest litter, 1 ♂ (lacking a few posteriormost somites), 1 ♀, 1 juv. — 12. IV. 1967 (No. 318), leg. TOPÁL. — Same locality, 1 ♀ — 19. IV. 1967 (No. 342), leg. TOPÁL. — Material examined: 4 specimens.

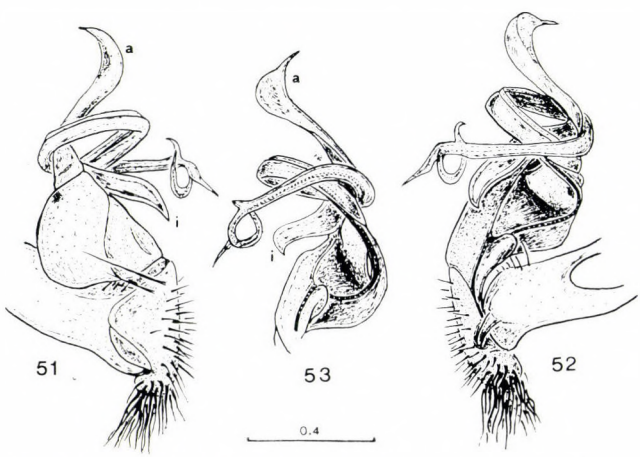
All the above specimens have been deposited in the Hungarian Natural History Museum, Budapest.

Redescription: Length up to 14 mm (♀), width 1.0 mm in ♂ and up to 1.7 mm in ♀. Colour brown to red-brown; paler a rather wide dorsal axial stripe and a somewhat narrower dorso-lateral longitudinal stripe from each side, as well as ventro-lateral parts of body rings.

No trace of paraterga, body subcylindrical, juloid, without lateral swellings. Antennae rather short, in both sexes reaching but end of metazonite 2. Pores obscure. Pleural keels very good, especially in ♂, reaching somite 15 in ♀, posteriorly pointed and projecting caudad. Sulcus absent. Collum with 2 transverse rows of medium-sized hairs: 4 + 4 in arched anterior and 2 + 2 in medium rows. Metazona at anterior third with 2 + 2 shorter hairs, which are a bit longer on anteriormost somites. Epiproct slender, rather long, narrowly truncate, without apical papillae or subterminal lateral incisions.

Legs rather long, well incrassate and longer in ♂, in both sexes slightly growing in length toward telson. Tarsal brushes present in ♂; prefemora at least up to ring 9 beset with tri- or bifid, stout and short setae; adenostyles absent. A rather large, setose, roundly subquadrate, directed somewhat anteriad lamina between male coxae 4. Sterna moderately setose, with spines.

Gonopods (Figs 48—50) short, stout. Coxite large, subcylindrical and distally setose. Prefemur large, densely setose, acropodite untorded. Femorite



Figs 51—53. *Paranedyopus elongissimus* sp. n., ♂ holotype: 51—52 = right gonopod (lateral and mesal views, respectively), 53 = distal part of right gonopod (dorso-mesal view). Scale in mm

rather stout, distally well set off from postfemoral portion by demarcation sulcus. Tibiotarsus relatively small, chiefly consists of 2 good outgrowths: an inner arm (*i*) and an apical lamella (*a*). Seminal groove chiefly runs along mesal side, only at distal third of femorite turns cephalo-dorsad to pass onto a flagelliform, but rather short solenomerite supported by a lamellate outer (3rd) branch (solenophore), curved mesad and a little shorter than *a*.

Remarks: This species has hitherto been known only from Darjeeling (CARL, 1935) and is redescribed therefore from its terra typica. In describing it, CARL (1935) erected an independent genus, *Akribosoma*, which was compared, among other forms, with *Paranedyopus* created for the only species *P. subcylindricus* CARL from South India (CARL, 1932). Since then the genus *Paranedyopus* has been revised (JEEKEL, 1980c), with the result of incorporating no less than four valid species from India or Ceylon. As one can easily see, there seems to be no difference whatever of generic rank between *Akribosoma* and *Paranedyopus*, if to stick oneself to the somewhat broadened concept of the latter proposed by JEEKEL (1980c), formally resulting in *Akribosoma* CARL, 1935 as a junior synonym of *Paranedyopus* CARL, 1932, as well as *P. cylindricus* (CARL, 1935) (both **syn. n., comb. n.**).

Paranedyopus elongissimus sp. n. (Figs 51—53)

Locality: India, W Bengal, Darjeeling distr., Kurseong, 1000 m, on mosses on bark of trees, 1 ♂ (holotype), 1 ♀ juv. (19 segments) — 18. X. 1967 (No. 851), leg. TOPÁL. — Material examined: 2 specimens.

Both holo- and paratype have been deposited in the Hungarian Natural History Museum, Budapest.

Diagnosis: Well distinguishable from all the five hitherto known species of *Paranedyopus* (see JEEKEL, 1980c and above) by the apical and solenophorous branches of the gonopod tibiotarsus much longer and slenderer.

Description: Length 17 mm (holotype) and 9 mm (paratype), width 1.7 and 0.9 mm, respectively. Colour light brown, ventrum and legs paler.

Body subcylindrical, juloid, metazona lacking even lateral swellings. Antennae rather short, slightly clavate, reaching end of somite 3. Collum subequal to head in width, up to segment 5 a slight constriction, from ring 5 onward to somite 17 body parallel-sided, further on gently tapering. Pores obscure. Pleural keels very well developed, reaching segment 17, posteriorly pointed and projecting caudad. Collum with 4 + 4 and 2 + 2 rather long thin hairs in 2 transverse arched rows; subsequent terga with 1 row at ca. 1/3 to 1/4 of metazonite length behind thin and shallow suture between pro- and metazona, of 2 + 2 hairs in each row. Sulcus absent, surface of metazona finely rough, especially on hind half of metazona. Epiproct slender, rather long, in dorsal view subtriangular, very narrowly truncate, with a pair of minute terminal and a pair of still minute subterminal lateral papillae. Subanal scale roundly subtrapeziform, with 2 long apical hairs.

Legs long, incrassate in ♂, with tarsal brushes; prefemora of ♂ with dense tri- or bifid stout and short setae; claw of medium size. Adenostyles

absent. A rather high (higher than coxae), small roundly subquadrate, setose lamina between coxae 4 of ♂, with its ventral margin slightly convex. From sternites of ring 8 of ♂, there are pairs of good paramedian spines directed obliquely caudad, better developed between hind coxae and gradually all coming to naught to ring 17.

Gonopods (Figs 51—53) short, stout, rather complex. Coxite large, subcylindrical, distally setose. Prefemur large, densely setose, acropodite untorded. Femorite broad and short, distally well set off from postfemoral part by demarcation sulcus. Tibiotarsus consisting of a torded apical (*a*) and a sabre-like inner process (*i*), as well as of a very long and curved mesad solenophore sheathing long flagelliform solenomerite almost all along its length. Seminal groove runs chiefly mesally, though, just before passing onto solenomerite, moves somewhat cephalad.

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Acta Zoologica Hungarica 30 (3—4), pp. 353—391 (1984)

ÜBER DIE MIT PIGEUS GEBIEN, 1917 UND HOPLOEDIPUS FAIRMAIRE, 1898 VERWANDTEN CAMARIINEN AUS DER ORIENTALISCHEN REGION (COLEOPTERA: TENEBRIONIDAE)

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(Eingegangen am 20. Oktober 1983)

A revision of the group *Pigeus-Hoploedipus* generic group and their relatives with clavate femora within Camariinae from the Oriental Region is given. The revision yielded the description of 6 genera (*Hoploedipinus*, *Pseudopigeus*, *Gigantopigeus*, *Dentatoploedipus*, *Pigeostrongylium* and *Pigeocaulinus*) and 14 new species (*Pigeus iridistriatus*, *Hoploedipinus strigipennis*, *Pseudopigeus unidentatus*, *Hoploedipus bryanti*, *H. malayicus*, *Gigantopigeus malayanus*, *G. bremeri*, *G. brendelli*, *G. mirabilis*, *G. masumotoi*, *Dentatoploedipus sembilanicus*, *Pigeostrongylium kedahense*, *P. pendleburyi* and *Pigeocaulinus sumatranus*). *Pseudocamerimena* PIC, 1923 is a junior synonym of *Pigeus* GEBIEN, 1917. *Hoploedipus basicruralis* FAIRMAIRE, 1898 is a synonym of *Camarimena* (= *Hoploedipus* FAIRM.) *armipes* (FAIRMAIRE, 1882), while *Hoploedipus acanthosternum* GEBIEN, 1917 is a junior synonym of *H. bidentulus* FAIRMAIRE, 1898.

Die Gattungszugehörigkeit der orientalischen Camariinen hat zuerst GEBIEN (1917: 146) geklärt. Er hat die hierher eingereihten Gattungen in zwei Gruppen geteilt: *a)* Gattungen mit einfachen, ungekeulten Beinen (*Homoeogenus* WATERHOUSE, 1882; *Eucamaria* GEBIEN, 1917; *Cerocamptus* GEBIEN, 1917) und *b)* Gattungen mit stark gekeulten Schenkeln (*Methistamena* GEBIEN, 1917; *Pigeus* GEBIEN, 1917; *Hoploedipus* FAIRMAIRE, 1892 und *Camarimena* MOTSCHULSKY, 1863). Unter diesen ist *Methistamena* GEBIEN mit der von PIC beschriebenen Gattung *Camarimorpha* PIC, 1915 synonym und sondert sich von den übrigen Gattungen »mit gekeulten Schenkel« durch das gerade Prosternum und den lang ausgezogenen Prosternalfortsatz ab. KULZER (1954: 59) beschäftigte sich später nochmals mit dieser Gruppe und gab eine neue Tabelle der asiatischen Camariinen. Er teilt die Gruppe aufgrund der Halsschildform und Beinform: *a)* Halsschild mehr oder weniger flach, mit Seitenrandkante, außerdem die Beine lang, Schenkel einfach und *b)* Halsschild zylindrisch, Seitenrand fehlt meist, Schenkel gekeult. Zu dieser letzteren zählt KULZER außer den drei Gattungen, welche GEBIEN ebenfalls zu dieser Gruppe zugeordnet hat, noch *Pseudocamarimena* PIC, 1923.

In dieser Arbeit habe ich einen Teil der hierher gehörenden Cnodaliniinen revidiert, namentlich die Gruppe mit gekeulten Schenkeln, ausgenommen die Gattung *Camarimena* MOTSCHULSKY, welche von den übrigen Gattungen

leicht unterschieden werden kann, die Arten dieser Gattung haben nämlich gerandetes Analsegment, ungezähnte Schenkel und Schienen und mehr als 2 Borsten der Onychien der Krallen.

Von den beschriebenen Arten gehören hierher die Arten der Gattungen *Pigeus* GEBIEN, 1917; *Hoploedipus* FAIRMAIRE, 1898; *Pseudocamarimena* PIC, 1923 und *Leprocaulinus* KASZAB, 1982. Es ist mir gelungen, alle hierher eingereihten Arten in typischen Exemplaren, vor allem aus dem Museum Paris, Museum G. FREY (Tutzing), British Museum (London) und Museum Leyden zur Untersuchung zu bekommen, wofür ich den Herren CL. GIRARD (Paris), Dr. G. SCHERER (München), M. D. J. BRENDELL (London) und Herrn I. KRIKKEN (Leyden) meinen Dank aussprechen möchte. Ferner bekam ich noch weiteres unbearbeitetes Material von der Herren Prof. Dr. H. I. BREMER (Düsseldorf) und K. MASUMOTO (Yokohama), wofür ich mich auch in dieser Stelle herzlich bedanken möchte.

Aufgrund meiner Untersuchungen beschreibe ich nachfolgend 6 neue Gattungen und 14 neue Arten, stelle eine combinatio nova auf und synonymisiere eine Gattung und 2 Arten.

Die orientalischen Cnodaloniinen mit gekeulten Schenkeln und zylindrischem Körper haben eine Sonderstellung innerhalb der Camariinen. Sie besitzen einen außerordentlich charakteristischen Aedoeagus, der dem keiner anderen Gruppe ähnelt. Im Vergleich zu der Körpergröße sind die ♂ Genitalien außerordentlich groß, manchmal die halbe Körperlänge übertreffend. Diese zeichnet sich außerdem noch durch die langgestreckte, dünne Form aus, weiters durch einige stark chitinisierten Teile in der Basalplatte, bei welcher die Oberseite auch der ganzen Länge nach durch eine Furche geteilt ist, weiters ist sie bei Ansicht von unten beiderseits scharf gekantet. Bei den meisten Arten sind die Parameren mehr oder weniger punktiert und mikroskopisch behaart. Das 8. Urosternit des ♂ in manchen Fällen beim ♂ in der Mitte am Ende tief ausgerandet oder sogar vollkommen geteilt, resp. zwischen den Seitenteilen nur dünne Chitinisierung vorhanden.

Die meisten Gattungen und Arten kommen auf der malayischen Halbinsel vor; einige Arten gibt es auch auf den Sundainseln östlich bis zu den Molukken und Philippinen, und nach Westen bis Sri Lanka und Indien, resp. in dem tropischen Himalaya-Gebiet.

Bestimmungstabelle der orientalischen Camariinen-Gattungen aus der Verwandtschaft der Gattungen Camarimena—Pigeus—Hoploedipus—Leprocaulinus

1 (2) Analsegment des ♂ und ♀ mehr oder weniger dick gerandet. Onychinen mit mehr als 2 starken Borsten. Alle Schenkel und Schienen ungezähnt. Fühler verhältnismäßig kurz, mit 4gliedriger, flacher Keule, die Keulenglieder sind quer, das Endglied kurzoval, flach (= *Sinopium* PASCOE, 1866) 1. **Camarimena** MOTSCHULSKY, 1863

2 (1) Analsegment ungerandet, höchstens der äußerste Rand strichförmig fein gerandet. Das Onychium meist mit 2 Borsten. Schenkel mit dünner Basis, die Vorderschenkel,

resp. auch die Vorderschiene meist gezähnt. Fühler beim ♂ dünn, vor allem das Endglied und die vorangehenden 3 Glieder, beim ♀ sind die Endglieder kürzer und dicker.

3 (4) Unterseite wie Oberseite nackt, glänzend, ohne anliegende dichte Behaarung, Schenkel und Schienen ohne Zähne. Fühler sehr dünn (Abb. 13), das Endglied beim ♂ parallel, mehr als doppelt so lang wie die Breite, beim ♀ kaum oval. Seiten des Halsschildes mit feiner Randleiste. Flügeldecken einfach punktiert-gestreift, am Ende ohne Zahn. Onychium mit 2 Borsten 4. **Pigeus** GEBIEN, 1917

4 (3) Unterseite fein und kurz oder länger und anliegend behaart. Halsschild höchstens vorn und an der Basis mit rudimentärer Randleiste.

5 (6) Schenkel und Schienen der Vorderbeine ohne Zahn. Alle Beine sind sehr grob und dicht punktiert. Körper oben und unten mit schuppenartiger, gelber Behaarung. Flügeldecken mit ungleich verteilten, glänzenden, schwarzen, rundlichen Körnchen, dazwischen ist die Punktierung nicht in Reihen geordnet. Die Fühlerglieder 8—11 allmählich erweitert (Abb. 48), das Endglied rundlich, Basalglieder, vor allem das 3. Glied, gestreckt. Onychium mit 2 Borsten 9. **Pigeocaulinus** gen. n.

6 (5) Entweder der Vorderschenkel innen im vorderen Drittel oder die Vorderschienen innen mit Zähnchen, meist aber Vorderschenkel und Schienen mit Zahn.

7 (10) Vorderschenkel innen ohne Zahn. Onychium mit 2 Borsten.

8 (9) Vorderschienen weit vor dem Ende mit einem scharfen Zahn (Abb. 47). Mittelschienen dünn und ohne Zahn. Oberseite sehr fein und dicht, kurz, staubartig behaart, Flügeldecken mit mehr oder weniger regelmäßigen Punktstreifen, ohne glänzende, erhabene Körnchen. Ende der Flügeldecken ohne Zahn, aber eckig 8. **Pigeostrongylium** gen. n.

9 (8) Vorder- und Mittelschienen bei beiden Geschlechtern vor dem Ende mit je einem sehr scharfen Zahn (Abb. 54—55) versehen. Oberseite mit schuppenartiger, langer, vollkommen anliegender Behaarung. Flügeldecken am Ende neben der Naht ohne Ecke oder Zahn, Oberseite der Flügeldecken mit glänzenden, ungleich verteilten, sehr spärlich stehenden Körnchen, dazwischen steht die Punktierung nicht in Reihen 10. **Leprocaulinus** KASZAB, 1982

10 (7) Vorderschenkel innen weit vor dem Ende mit einem kleineren oder größeren Zahn. Onychium meist mit 2 Borsten.

11 (12) Vorderschienen (Abb. 4) innen ohne Zahn, die Endhälfte aber ein wenig ausgebogen und abstehend dicht behaart, Mittelschienen (Abb. 5) bei Seitenansicht etwas S-förmig, gebogen. Vorderschenkel mit einem äußerst kleinen Körnchen. Flügeldecken mit scharfen Punktreihen, das Ende mit kurzen Zähnchen. Die drei vorletzten Fühlerglieder sind gleichgroß, das Endglied langoval (Abb. 3). Onychium mit 2 Borsten 3. **Pseudopigeus** gen. n.

12 (11) Vorderschienen bei beiden Geschlechtern mit einem scharfen Zahn. Zahn der Vorderschenkel an der Innenseite scharf und spitzig. Ende der Flügeldecken einzeln scharf zugespitzt.

13 (14) Fühler kurz, die vier letzten Glieder sind quer, das 8. breit dreieckig, das 9., 10. quer, das Endglied kurzoval (Abb. 2). Flügeldecken punktiert-gestreift. Schienen dick. Zahn der Vorderschienen (Abb. 1) findet sich etwa in der Mitte an der Innenseite. Onychium mit 2 Borsten 2. **Hoploedipinus** gen. n.

14 (13) Fühler beim ♂ dünn, die vorletzten drei Glieder und auch das Endglied bedeutend länger als breit (Abb. 38). Schienen meist dünn.

15 (18) Mittelschienen einfach, gerade, Innenseite in der Mitte ohne Zahn, ohne Ausschnitt an der Basis (♀) oder manchmal die Basis mehr oder weniger ausgeschnitten (♂) oder auch beim ♂ einfach (Abb. 27, 32, 34).

16 (17) Halsschild gleichmäßig dicht oder sehr dicht punktiert, die Zwischenräume der Punkte flach und schmal, die Punkte sind eng aneinanderstoßend. Flügeldecken fein oder scharf punktiert-gestreift, Onychium mit 2, manchmal mit mehreren Borsten 5. **Hoploedipus** FAIRMAIRE, 1898

17 (16) Halsschild grob und ungleich, meist spärlich punktiert, entweder mit größeren unpunktierten, gewölbten Spiegelflecken oder die Zwischenräume der Punkte etwas wurmartig gewölbt. Flügeldecken mit einfachen Punktreihen oder mit ungleich stehenden ovalen, großen Eindrücken. Onychium mit 2 Borsten 6. **Gigantopigeus** gen. n.

18 (15) Mittelschienen an der Innenseite, etwas vor der Mitte mit einem scharfen Zahn (Abb. 46), die Basis innen nicht ausgerandet. Vorder- und Mittelschenkel innen breit ausgerandet und dicht behaart. Fühler sehr lang und dünn. Halsschild dicht und grob punktiert. Flügeldecken mit Punktstreifen. Onychium mit mehr als 2 Borsten 7. **Dentatoploedipus** gen. n.

1. Gattung *Camarimena* MOTSCHULSKY, 1863

MOTSCHULSKY (1863): Bull. Soc. Imp. nat. Mosc. **36** (2): 473 (Typus: *ovicauda* MOTSCHULSKY, 1863).
MÄKLIN (1867): Acta Soc. sci. Fenn. **8:** 221.
GEBIEN (1917): Arch. Naturgesch. **83** (A 3): 29, 155.
Sinopium PASCOE (1866): J. Ent. **2:** 487 (Typus: *Strongylium variabile* WALKER, 1858).
Espitomorphus PIC (1921): Mélang. exot.-ent. **34:** 24 (Typus: *multicolor* PIC, 1921).

Gattungstypus: *Camarimena ovicauda* MOTSCHULSKY, 1863

In diese Gattung gehören 26 Arten, welche von Sri Lanka und Indien, weiters in dem ganzen orientalischen Gebiet samt den Großen Sundainseln bis zu den Philippinen verbreitet sind. Hier werde ich auf die nähere Behandlung der Gattung, resp. die Revision der hierher gehörenden Arten nicht eingehen, es wäre eine Arbeit für sich. Mit der Charakterisierung der Gattung gibt es seit der Arbeit von GEBIEN (1917), der die Gattung *Camarimena* in dem System der Camariinen geklärt hat, keine Probleme, umsomehr aber mit der Bestimmung der hierher gehörenden Arten, da bis jetzt keine Revision der Gattung vorliegt.

Die Gattung *Sinopium* hat erst GEBIEN (1917) und *Espitomorphus* wurde von mir (KASZAB, 1983) in Synonym gestellt.

Die ersten hierher gehörenden Arten wurden von WALKER unter dem Gattungsnamen *Strongylium* beschrieben (*laeviusculum* WALKER, *variabile* WALKER, 1858); MOTSCHULSKY, der die Gattung *Camarimena* beschrieb, hat schon vor der Beschreibung im Jahre 1861 eine gute Abbildung der typischen Art *C. ovicauda* geliefert. MÄKLIN, der Monograph der Strongyliinen beschäftigte sich auch mit *Camarimena* und hat richtig erkannt daß die WALKERschen Arten keine Strongyliinen sind. Die Erkenntnisse über *Camarimena* hat GEBIEN im Jahre 1917 zusammengefaßt. Es waren 11 beschriebene Arten bekannt und er fügte weitere 5 neue Arten hinzu. Nachher ist die Zahl der Arten vor allem durch die Tätigkeit von PIC, BLAIR, KULZER um zahlreiche Arten vermehrt worden, so daß momentan 26 Arten bekannt sind.

2. Gattung **Hoploedipinus** gen. n.

Gattungstypus: *Hoploedipus heterodoxus* FAIRMAIRE, 1898.

Sie gehört in die Nähe der Gattung *Camarimena* MOTSCHULSKY, 1863, von ihr unterscheidet sie sich vor allem durch die innen gezähnten Vorderschienen und -schenkel (Abb. 1), außerdem sind alle Schenkel deutlicher gekeult. Die Gattungen, welche gezähnte Vorderschienen und -schenkel besitzen (*Hoploedipus* FAIRMAIRE, 1898, *Gigantopigeus* gen. n. und *Dentatoploedipus* gen. n.), besitzen lang gestreckte, fadenförmige Fühler.

Körper wie ein *Strongylium* mit kurzen Beinen und Fühlern, schwach metallisch. K o p f mit großen, nierenförmigen Augen, Vorderrand bei Seiten-

ansicht durch die Wangen etwas eingeschnürt. Stirn breit und flach, Augenfurchen vorhanden und weit über den Hinterrand der Augen reichend. Wangen schmaler als die Augen, abgerundet, Clypeus vorn gerade abgestutzt, zwischen Clypeus und Oberlippe mit breiter, glänzender Gelenkshaut. Schläfen schmal und sehr kurz, vor allem unten plötzlich eingeschnürt. Fühler kurz mit abgeflachter, 4gliedriger Keule, Endglied breitoval. Halsschild zylindrisch, vorn verjüngt, seitlich ohne abgesetzten Rand, Vorder- und Hinterrand gerade, die Basis schwach gerandet. Flügeldecken querüber gewölbt, Seitenrand schmal abgesetzt, ausgenommen die Mitte, wo bei Ansicht von oben der Rand zu sehen ist. Oberseite mehr oder weniger stark in Reihen punktiert, die Naht am Ende einzeln zugespitzt, dornförmig. Unterseite dicht anliegend behaart. Prosternum in der Mitte der Biegung der Vorderhüften folgend gebogen, hinter den Hüften die Mitte eingedrückt und ausgezogen. Mittelbrust in der Mitte vorn eingedrückt, Hinterbrust lang. Beine kräftig, Schenkel stark gekeult, die Basis aller Schenkel dünn, Vorderschenkel innen, weit vor dem Ende mit einem kleinen, manchmal schwer sichtbaren Zähnchen. Vorderschienen dick, innen in der Mitte mit einem Zahn, von da an bis zur Spitze mit einer Leiste. Mittel- und Hinterschienen einfach, Tarsen unten dicht gelb behaart. Onychium mit je zwei Borsten.

Es gehören hierher 2 Arten.

Hoploedipinus heterodoxus (FAIRMAIRE, 1898) (Tafel I, Abb. 4)

Hoploedipus heterodoxus FAIRMAIRE (1898): Annls Soc. ent. Fr. **67:** 397.

FAIRMAIRE beschrieb sie aus »Singapore«, und ein weibliches Originalstück aus dem Museum Paris bezeichnete ich als Lectotypus ♀. Ich sah noch ein weiteres Exemplar dieser Art aus »Malacca, F. BATES 81—91« in der Sammlung des British Museums.

Sie unterscheidet sich in erster Linie von den Arten der Gattung *Hoploedipus* FAIRMAIRE, 1898 durch die kurzen Fühler, welche eine 4gliedrige Keule besitzen, außerdem ist die Körperform ebenfalls abweichend, d. h. der Körper bei *Hoploedipus* schmal, gestreckt, besitzt fein und spärlich punktierte Schenkel. Die Oberseite bei *H. heterodoxus* mit anliegend schuppenartiger Behaarung, welche am Kopf und Halsschild dicht, an den Flügeldecken spärlich oder abgerieben ist. Eigentlich wächst aus jedem groben Punkt des Kopfes und Halsschildes ein gelbweißes, anliegendes, dickes Haar. Die Reihenpunkte der Flügeldecken von den Nahtstreifen an nach außen stärker, die Punkte von der 3. Reihe an groß, sogar grübchenartig, der Grund der tiefen Punkte flach und chagriniert. Die Zwischenräume äußerst fein, kaum erkennbar punktiert, leicht gewölbt und mit je zwei in unregelmäßigen Streifen stehenden, schuppenartigen Haaren, welche leicht abgerieben sein können. — Länge: 10,5—12,5 mm.

Hoploedipinus strigipennis sp. n.

Holotypus (Geschlecht nicht untersucht): »Ent. Club. 44-42«, im British Museum.

Der Fundort dieser Art ist nicht bekannt, ich vermute, daß sie von der Malayischen Halbinsel stammt.

Einer *Camarimena* sehr ähnlich, in der Gattungsbeschreibung sind aber Charaktere angegeben, aus diesem Grund kann sie leicht von den zahlreichen Arten der Gattung *Camarimena* unterschieden werden. Robust, Vorderkörper und Unterseite glänzend braun mit metallischem Schimmer, Flügeldecken dunkel erzfarbig, Seitenrand vor dem Ende etwas kupferig. Beine schwarzbraun glänzend und metallisch, Fühler mit hellbrauner Geißel und dunkler Keule. Kopf mit vorstehenden, nierenförmigen Augen, Wangen und Schläfen gleichfalls schmaler als die Augen, Wangen verschmälernd stark gebogen verengt, zwischen Clypeus und Wangen ausgerandet, Clypealsutur leicht eingedrückt. Augenfurchen tief, verlaufen nach hinten divergierend, weit hinter die Augen reichend, Innenrand der Furche scharf. Stirn breit, etwas abgeflacht. Sehr grob, runzelig punktiert. Fühler (Abb. 2) hintergelegt die Mitte des Halsschildes nicht überragend, kurz, mit ziemlich gut abgesetzter, flacher, 4gliedriger Keule. Die Länge der Glieder 1—11 verhält sich wie 8 : 5 : 10 : 9,5 : 9 : 9 : 8 : 9 : 7 : 6,8 : 12 und die Breite wie 7 : 5 : 5 : 5 : 5,5 : 6,2 : 7,3 : 11,5 : 13 : 14 : 15. Halsschild zylindrisch, die Seite ungerandet ebenso wie der Vorderrand, Basis gerandet, sogar in der Mitte breit, aber an der breitesten Stelle ist die Randung erloschen. Die Basalhälfte parallel,

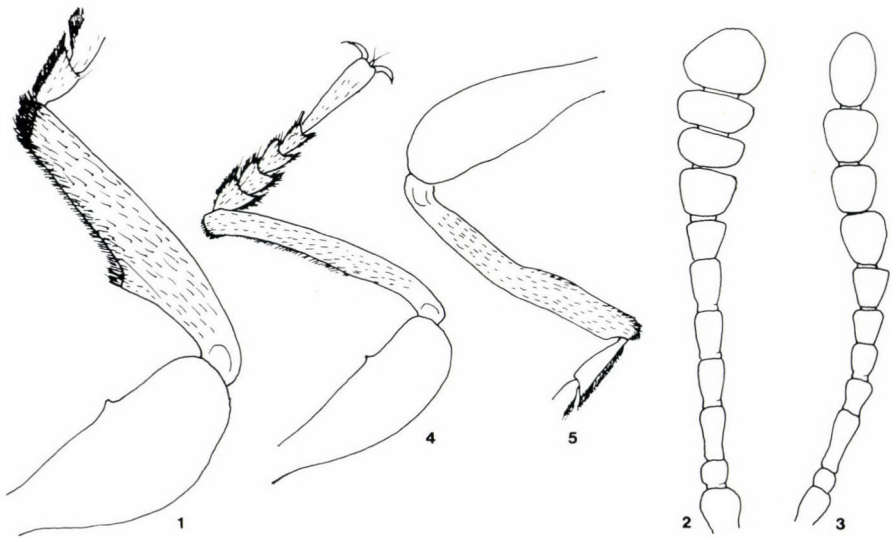


Abb. 1—2 = *Hoploedipinus strigipennis* gen. n., sp. n. Vorderbein (1), Fühler (2). — Abb. 3—5 = *Pseudopigeus unidentatus* gen. n., sp. n. Fühler des ♂ (3), Vorderbein des ♂ (4) und Mittelbein des ♂ (5)

nach vorn verschmälert. Länge und Breite verhalten sich wie 26 : 23. Oberseite sehr grob und dicht punktiert, die Ränder der Punkte bilden ein Maschenwerk, nicht gerunzelt. Jeder Punkt trägt ein feines Härchen, das aber in der Scheibe abgerieben ist. Flügeldecken mit vorstehenden Schulterbeulen, nach hinten etwas erweitert; doppelt so lang wie die breiteste Stelle im hinteren Drittel. Etwa 3mal so lang wie der Halsschild. Flügeldecken an der breitesten Stelle, an den Schulterbeulen, Halsschild an der Basis sowie der Kopf an den Augen verhalten sich wie 40 : 35 : 23 : 18,5. Bei Seitenansicht ist die Flügeldecke ziemlich breit und flach gebogen. Oberseite in der vorderen Hälfte grob punktiert, hinten punktiert-gestreift, die Punkte sind vorne und seitlich stärker, die Zwischenräume sind hinten einfach gewölbt, kaum erkennbar und sehr spärlich mit mikroskopischen Punkten, vorn sind die Zwischenräume durch Quervertiefungen uneben. Der Grund glänzend und kahl. Ende der Flügeldecken in je einem scharfen Dorn ausgezogen. Seitenrand der Epipleuren vorn und hinten ziemlich scharf, dazwischen abgerundet. Unterseite sehr dicht und anliegend fein hell behaart, so daß die Grundskulptur kaum zu sehen ist. Prosternum vor den großen Hüften sehr kurz, zwischen den Hüften in der Mitte der Länge nach eingedrückt, das Ende mit stumpfem Zahn. Hinterbrust sehr lang, fein punktiert. Abdomen dicht und fein, stellenweise seitlich fast runzelig punktiert. Beine sehr kräftig, Schenkel dick, gekeult, die Basis aller Schenkel dünn, Vorderschenkel am Innenrand weit vor dem Ende mit einem kleinen, scharfen Zähnchen (Abb. 1). Alle Schenkel sind dicht und ziemlich grob punktiert. Schienen ebenfalls kräftig, grob punktiert und gelb behaart. Mittel- und Hinterschienen gerade, im Querschnitt oval, Vorderschienen innen, ungef. in der Mitte, mit einem scharfen, stumpfen Zahn, Innenrand mit einer scharfen Leiste und vom Ende bis zum Zahn dicht abstehend behaart. Ausgenommen das Klauenglied, sind alle Füße unten gelb dicht filzartig behaart, die ersten Glieder sind erweitert. Endglied der Hintertarsen fast so lang wie die gemeinsame Länge der beiden ersten Tarsenglieder (wie 42 : 38). — Länge : 17 mm.

Nächstverwandte Art ist *H. heterodoxus* (FAIRMAIRE, 1898), welche bedeutend kleiner (10,5—12,5 mm) ist, Flügeldecken mit schuppenartiger Behaarung (wenigstens seitlich), außerdem die Reihenpunkte der Flügeldecken sehr tief und der Grund der Punkte chagriniert, Kopf und Halsschild ebenfalls mit schuppenartigen Haaren bedeckt. Vorder- und Mittelschienen kräftiger, Zahn der Vorderschenkel kleiner.

3. Gattung **Pseudopigeus** gen. n.

Gattungstypus: *Pseudopigeus unidentatus* sp. n.

Sehr nahe verwandt mit der Gattung *Hoploedipus* FAIRMAIRE, 1898, sie hat die gleiche Körperform. Unterscheidet sich aber duch die ungezähnten

Vorderschienen (Abb. 4), welche nahe des basalen Drittels nur leicht erweitert sind, aber ohne Zahn, außerdem besitzen die Fühler (Abb. 3) beim ♂ 4 größere Endglieder, von welchen die Glieder 8—10 etwa gleichlang sind und höchstens so breit wie lang oder länger als die Breite; das Endglied nur 1,5mal so lang wie breit, langoval und nicht — wie bei *Hoploedipus* — sehr langgestreckt. Unterseite behaart, Vorderschenkel (Abb. 4) mit einem kleinen Körnchen der Innenseite, Kopf mit scharfen Augenfurchen, Halsschild ohne Seitenrand. Flügeldecken mit scharfen Punktreihen, Ende der Naht mit scharfem Zahn. Letztes Abdominalsternit beim ♂ am Ende einfach. Mittelschienen beim ♂ am Enddrittel leicht dicker und an der Innenseite mit einer Leiste. Hierher gehört eine einzige Art.

Pseudopigeus unidentatus sp. n. (Tafel I, Abb. 1)

Holotypus ♂: »Penang (Lamb.), Pascoe Coll.«, befindet sich im British Museum.

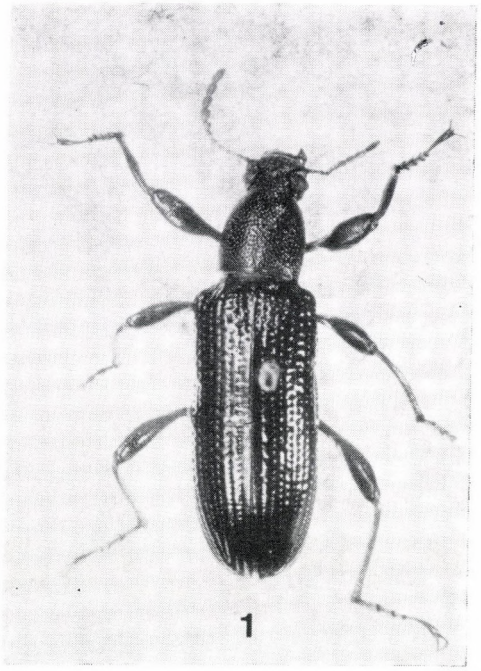
Körperform einer *Strongylium* ähnlich. Vorderkörper, Unterseite und Beine bräunlich, Flügeldecken dunkelbraun mit metallischer Farbe. Fühler und Palpen dunkel. Kopf (Abb. 9) mit vorstehenden Augen, welche der Länge nach gewölbt und nierenförmig sind. Zwischen Wangen und Clypeus scharf ausgeschnitten, Wangen vor den Augen stark gebogen. Clypealsutur leicht eingedrückt, Augenfurche tief eingeschnitten, furchenartig tief, weit bis zum Hals gezogen. Stirn flach und sehr dicht, fein punktiert, Scheitel und Hals gröber und spärlicher punktiert. Die Breite am Hals, an den Augen, an der Basis der Wangen, am Ausschnitt zwischen Wangen und Clypeus und an der Stirn verhält sich wie 38 : 48 : 44 : 29 : 21. Zwischen Clypeus und Oberlippe breite Gelenkshaut sichtbar. Fühler (Abb. 3) gestreckt, vom 6. Glied an dicker, die 4 Endglieder ziemlich gleich dick und länger. Die Länge der Glieder 2—11 verhält sich wie 11 : 34 : 18 : 20 : 20 : 23 : 30 : 28 : 30 : 42 und die Breite der Glieder 1—11 wie 14 : 12 : 13 : 15 : 15 : 18 : 21 : 26 : 27 : 30 : 29; das Endglied 1,45mal so lang wie breit, lang eiförmig. Halsschild länger als breit (wie 62 : 50), nach vorn leicht gebogen verengt, Seiten- und Vorderrand ungerandet, die Basis dick gerandet. Oberseite sehr grob, gleichmäßig und dicht, in der Scheibe etwas länglich punktiert, die Punkte sind eng aneinander gedrückt und tragen je ein kurzes, sehr feines Härchen, der Grund glänzend. Flügeldecken schmal, gestreckt, 2,74mal so lang wie die Breite an den Schulterbeulen (wie 230 : 84) und 3,7mal so lang wie der

→

Tafel I

Abb. 1. *Pseudopigeus unidentatus* gen. n., sp. n. ♂
Abb. 2. *Dentatoploedipus sembilanicus* gen. n., sp. n. ♂
Abb. 3. *Pigeostrongylium kedahense* gen. n., sp. n. ♂
Abb. 4. *Hoploedipinus heterodoxus* (FAIRMAIRE) ♀

(Foto: G. HORVÁTH & A. KEVE)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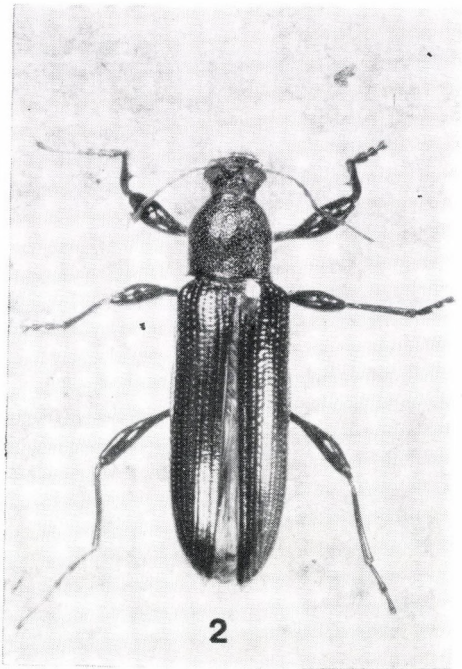
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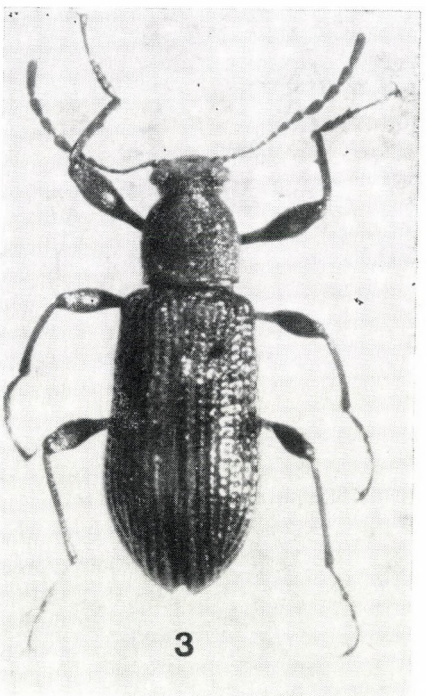
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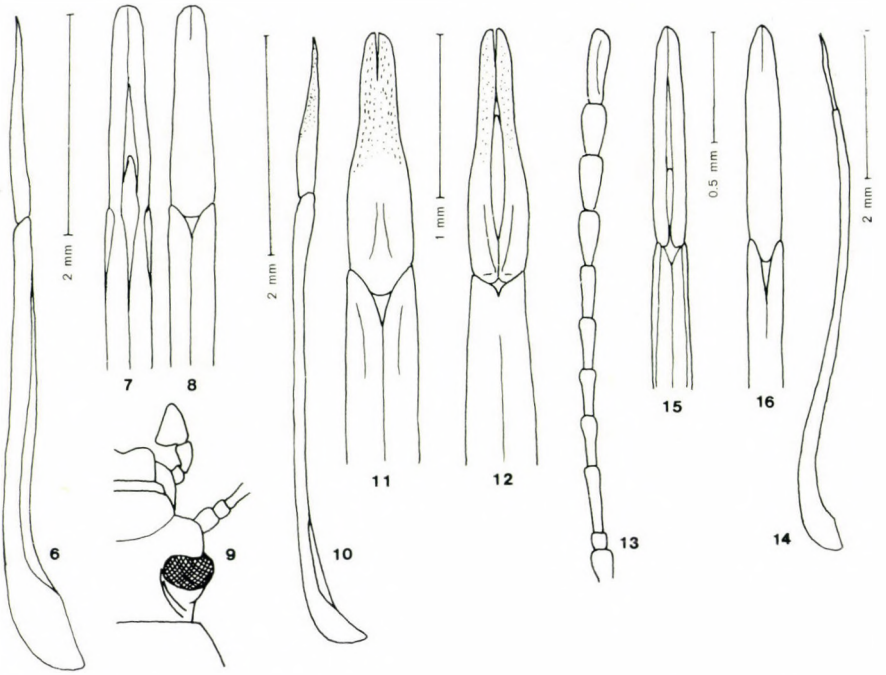


Abb. 6—9 = *Pseudopigeus unidentatus* gen. n., sp. n. Aedoeagus bei Seitenansicht (6), Parameren von unten (7), von oben (8) und Kopf des ♂ (9). — Abb. 10—13 = *Pigeus nitidipes* (FAIRMAIRE) Aedoeagus bei Seitenansicht (10), Parameren bei Ansicht von oben (11), von unten (12) und Fühler des ♂ (13). — Abb. 14—16 = *Hoploedipus bryanti* sp. n. Aedoeagus bei Seitenansicht (14) Parameren von unten (15) und von oben (16)

Halsschild. Oberseite mit Punktreihen, welche vorn grob sind und einzeln stehen, nach hinten allmählich feiner und die 3 inneren Reihen sitzen in Streifen; die Zwischenräume sind vorn weniger, hinten stärker gewölbt, glatt und kahl. Ende der Flügeldecken mit je einem kurzen Zähnchen. Epipleuren vorn ziemlich vertikal und der obere Rand erloschen, hinten horizontal und scharf gerandet. U n t e r s e i t e sehr fein anliegend, gelb und dicht behaart. Propleuren grob und runzelig punktiert, aber feiner als die Scheibe des Halsschildes, Prosternum vor den Hüften sehr kurz, in der Mitte zwischen den Hüften wie die Hüften gebogen, die Mitte eingedrückt, das Ende in einer stumpfen Ecke ausgezogen. Mittelbrust v-förmig eingedrückt, ohne seitliche Ecke, Hinterbrust lang, äußerst fein und erloschen punktiert, letztes Abdominalsegment des ♂ einfach. B e i n e lang, Schenkel kräftig gekeult, alle Schenkelbasen sind sehr dünn. Vorderschenkel (Abb. 4) am Innenrand weit vor dem Ende mit einem Kerbzähnchen. Schienen dünn. Vorderschienen (Abb. 4) innen ohne Zahn, nur im basalen Drittel breiter, und von der breitesten Stelle an bis zur Spitze zieht sich am Innenrand eine scharfe Leiste, und beiderseits findet sich eine Haarreihe, das Ende dichter gelb behaart.

Mittelschienen am Innenrand mit einer ebensolchen scharfen Leiste vom Ende bis zur Mitte, zur Basis ist sie dünner, deshalb erscheint sie etwas S-förmig. Hinterschienen gerade, dünn und im Querschnitt rundlich. Tarsen lang, Unterseite — ausgenommen das Krallenglied — unten dicht gelb befilzt, Vordertarsen stärker, Mitteltarsen kaum erweitert. An den Hintertarsen verhalten sich die Glieder 1—3 und das Krallenglied wie 46 : 24. Aedoeagus (Abb. 6—8): 6 mm lang, dünn, Parameren und Basalplatte verhalten sich wie 40 : 135, die Parameren sind 4,4mal so lang wie breit (wie 40 : 9). — Länge : 11,6 mm.

4. Gattung *Pigeus* Gebien, 1917

Gebien (1917): Arch. Naturgesch. **83** (A 3): 28, 153 (Gattungstypus: *Camarimena nitidipes* Fairmaire, 1893).
Gebien (1942): Mitt. münch. ent. Ges. **32** (1): 328 [726].
Pseudocamarimena Pic (1923): Mélang. exot.-ent. **40:** 21 (Gattungstypus: *striata* Pic, 1923), **syn. n.**

Gattungstypus: *Camarimena nitidipes* Fairmaire, 1893.

Von dieser Gattung gab H. Gebien eine ausgezeichnete Beschreibung, die ich hier nicht wiederholen will. Sie ist im Vergleich mit den Camariinen-Gattungen außer den langgestreckten, dünnen Fühlern (Abb. 13), noch durch weitere Merkmale gekennzeichnet: Schenkel und Schienen nicht gezähnt; Seiten des Halsschildes fein, Vorderrand dick gerandet, nur die Mitte erloschen, Kopf ohne oder nur mit ganz schwachen Augenfurchen; zwischen Clypeus und Oberlippe mit breiter Gelenkshaut; Ende der Flügeldecken nicht dornförmig ausgezogen; Flügeldecken mit Punktstreifen, die Reihenpunkte sind gleichmäßig, fein; Unterseite des Körpers ohne anliegende, dichte, feine Behaarung.

Pseudocamarimena Pic, 1923 ist synonym mit *Pigeus* Gebien, 1917, was ich aufgrund der Typenuntersuchungen feststellen konnte.

Es gehören hierher drei Arten, von welchen eine Art als neu beschrieben wird. Gebien stellte in seinem Katalog (1942) auch die von Blair beschriebene *Camarimena rugosistriata* Blair, 1913 hierher, was aber nicht richtig ist. Die Blairsche Art ist eine echte *Camarimena*.

Pigeus nitidipes (Fairmaire, 1893)

Camarimena nitidipes Fairmaire (1893): Annls Soc. ent. Belg. **37:** 298 (Typus: Lang Song).
Pigeus nitidipes Gebien (1917): Arch. Naturgesch. **83** (A 3): 154, Fig. 36, Taf. II, Fig. 26.
Pseudocamarimena tonkinea Pic (1927): Mélang. exot.-ent. **49:** 18 (Typus: Chapa), **syn. n.**

Die Synonymie der von Fairmaire und Pic beschriebenen Taxa ist aufgrund der Typenuntersuchung im Museum Paris bestätigt. Was Gebien in seiner Arbeit (Gebien, 1917) abgebildet hat, scheint mit der typischen Form

von *nitidipes* nicht identisch zu sein. Nach der Photographie ist der Halsschild grob runzelig punktiert, wie bei der von mir unten beschriebenen *P. iridistriatus* sp. n. Leider hat GEBIEN von der Art keine Beschreibung gegeben, und die Abbildung allein gibt nicht genug Anhaltspunkte, diese Frage zu klären.

Die Genitalien des ♂ entsprichen den übrigen Gattungen dieser Gruppe. Aedoeagus eines 17 mm großen Exemplars ist 6 mm, die Länge der Parameren und Basalplatte verhält sich wie 40 : 133, die Parameren sind dünn, 4,85mal so lang wie die Breite.

Fühler des ♂ sehr dünn und lang, hintergelegt die Basis des Halsschildes weit überragend; das 3. Glied dünn, 4,3mal so lang wie breit, länger als das 4. Glied, das Endglied ebenfalls länger als das 3. Endglied beim ♂ an der Unterseite der ganzen Länge nach breit eingedrückt, unpunktiert und glänzend. Die Länge der Glieder 1—11 verhält sich wie 13 : 6 : 28 : 21 : 19 : 21 : 22 : 22 : 23 : 21 : 32 und die Breite wie 8,5 : 6 : 6,5 : 7 : 7 : 7 : 7 : 9 : 10 : 11 : 10. Die Punktierung des Halsschildes zwar grob, in der Mitte aber sind die Abstände der Punkte meist weit größer als die Punkte, an den Seiten ist die Punktierung gröber und dichter. Der Grund chagriniert. Flügeldecken fein punktiert-gestreift, jeder Punkt etwas quer, an der 5. Reihe finden sich mehr als 60 Punkte, die Zwischenräume sind unpunktiert, ziemlich fettglänzend. Letztes Abdominalsternit am Ende unbehaart. Vorder- und Mittelschienen des ♂ leicht gebogen und innen am Ende gelb behaart.—L ä n g e : 17—23 mm.

FAIRMAIRE beschrieb sie aus Indochina: Lang-Song (coll. PERRAUDIERE) im Museum Paris. PIC hat seine *Pseudocamarimena tonkinea* aus Indochina: Chapa angegeben (Mus. Paris). Ich kenne sie aus Vietnam: Kon-Kuong (Ungarisches Naturwissenschaftliches Museum).

Pigeus striatus (PIC, 1923) comb. n. (Tafel II, Abb. 5)

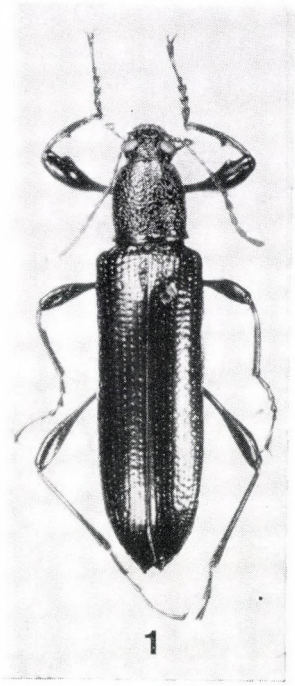
Pseudocamarimena striata PIC (1923): Mélang. exot.-ent. **40:** 22 (Typus: Chang-Hai).

PIC beschrieb sie aus »Shang-Hai« (18 mm), welche im Museum Paris zu finden ist. Unser Exemplar stammt aus »China« und ist etwas größer (21 mm) (im Ungarischen Naturwissenschaftlichen Museum).

Tafel II

Abb. 1. *Gigantopigeus bremeri* gen. n., sp. n. ♂
Abb. 2. *Gigantopigeus mirabilis* gen. n., sp. n. ♂
Abb. 3. *Gigantopigeus masumotoi* gen. n., sp. n. ♂
Abb. 4. *Gigantopigeus brendelli* gen. n., sp. n. ♂
Abb. 5. *Pigeus striatus* (PIC) ♂
Abb. 6. *Hoploedipus armipes* (FAIRMAIRE) ♂

(Foto: G. HORVÁTH & A. KEVE)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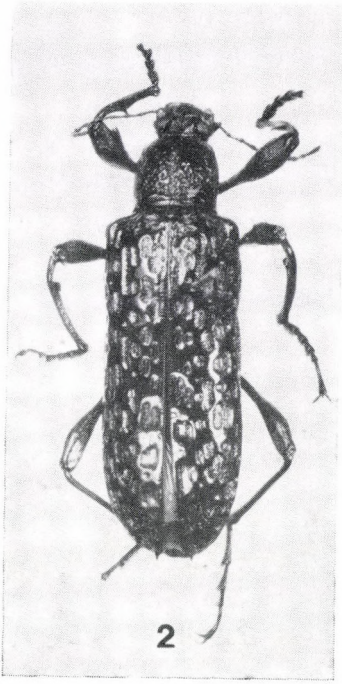
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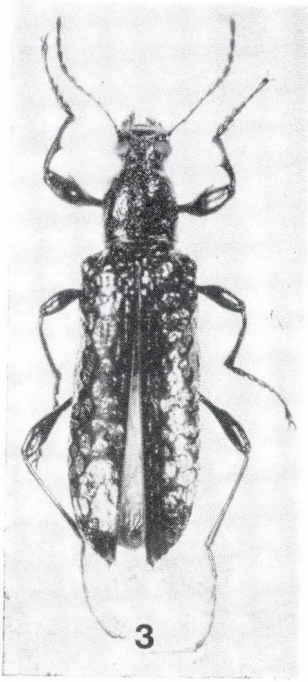
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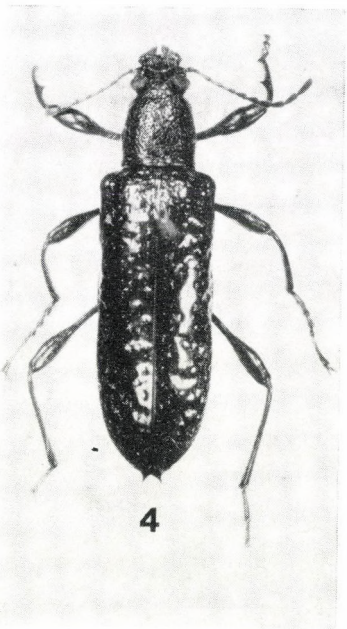
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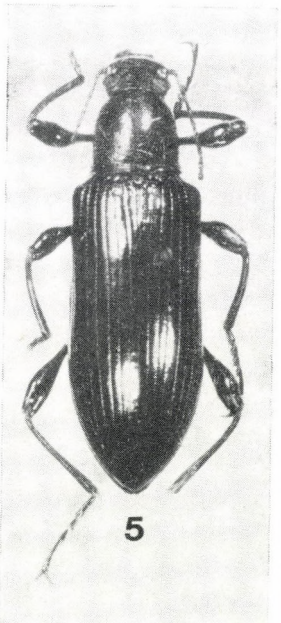
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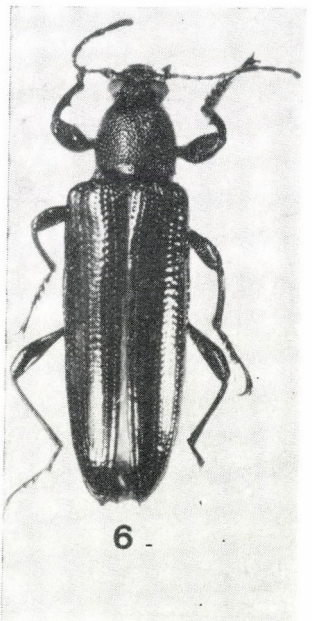
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Sie steht *P. nitidipes* (FAIRMAIRE, 1893) nahe, unterscheidet sich aber von ihr durch folgende Merkmale: Körper stark glänzend; Punktierung des Halsschides feiner und spärlicher; Längsstreifen der Flügeldecken feiner, an der 5. Punktreihe mehr als 80 Punkte; Zwischenräume der Flügeldecken flacher, erkennbar fein und sehr spärlich punktiert, der Grund glänzend; Vorder- und Mittelschienen des ♂ fast gerade, das Ende innen kaum behaart; Ende des letzten Abdominalsternits lang gelb behaart; Fühler sehr dünn, vor allem das 3. Glied, welches bedeutend länger ist als das 4. und etwas länger als das Endglied. Das Endglied beim ♂ unten ohne Eindruck. — Aedoeagus: Abb. 10—12.

Pigeus iridistriatus sp. n.

Holotypus ♀: Tonkin, Than-Moi, Juni—Juli, H. FRUHSTORFER. — Paratypus ♀: wie Holotypus. Beide Exemplare sind im Ungarischen Naturwissenschaftlichen Museum, Budapest aufbewahrt.

Körperform einer großen *Strongylium* ähnlich. Vorderkörper grünlicherzfarben mit kupferigem Glanz in der Halsschildscheibe und Stirn, Flügeldecken mit erzfarbigen Streifen: jeder Zwischenraum in der Mitte der Länge nach mit einem blaugrünen Streifen, beiderseits durch goldene, danach kupferige schmale Streifen und in den Punktreihen mit grünlicher Farbe; am Ende und bei dem seitlichen Zwischenraum fehlen die mittleren blaugrünen Streifen, nur kupferig. Der Grund leicht chagriniert, deshalb fettglänzend. Die Epipleuren und Epimeren der Mittel- und Hinterbrust kupferig, Mitte der Hinterbrust und Abdomen bläulich, seitliche Scheibe geht in Kupferglanz über. Schenkel glänzend schwarzgrün, die Knie mit den Außenseiten der Schienen leicht kupferig. Fühler und Palpen sowie die Tarsen schwarz. Kopf mit vorstehenden Augen, eine sehr schmale Augenfurche nur am Vorder- und Seitenrand der Augen zu sehen, welche aber den Hinterrand der Augen nicht erreicht. Stirn grob, fast runzelig, Clypeus und Hinterkopf deutlich feiner und nicht rugulos punktiert, kahl. Fühler beim ♀ hintergelegt die Basis des Halsschildes nur wenig überragend, das 3. Glied 5mal so lang wie breit. Die Länge der Glieder 1—11 verhält sich wie 16 : 6 : 35 : 23 : 22 : 22 : 22 : 20 : 18 : 17 : 23 und die Breite wie 12 : 6 : 7 : 7 : 7,5 : 8 : 10 : 12 : 12 : 12 : 12. Halsschild etwa so lang wie breit (wie 37 : 38), zylindrisch, seitlich fein gerandet, Vorderrand breit und die Randung in der Mitte unterbrochen, Basalrand scharf und dick. Oberseite sehr grob und dicht punktiert, seitlich gerunzelt, die Abstände der Punkte in der Scheibe an manchen Stellen ungleich und es entstehen spiegelfleckähnliche Formen; der Grund ist aber chagriniert. Flügeldecken breit, fast parallel, an den scharf vortretenden Schulterbeulen kaum schmaler als hinter der Mitte (wie 57 : 60); 2,36mal so lang wie an den Schulterbeulen und 3,65mal so lang wie der Halsschild. Die Längsreihen und Punktstreifen sind fein, in der 5. Punktreihe etwa 80 Punkte; die Zwischen-

räume sind leicht gewölbt, in der vorderen Hälfte fein gerunzelt, kaum erkennbar mit erloschener, sehr spärlicher Punktierung. Die Zwischenräume am Ende und der 9. Zwischenraum in der Mitte ziemlich abgeflacht. Unterseite kahl. Propleuren sehr grob punktiert, Prosternum zwischen den Hüften in der Mitte eingedrückt, vor und hinter den Hüften geneigt, hinter den Hüften mit einer stumpfen Ecke. Episternen und Epimeren der Mittelbrust grob und einzeln, Epipleuren der Hinterbrust feiner und dicht punktiert. Seiten der Abdominalsegmente 1—3 erloschen längsgerunzelt, die Mitte der Segmente fein punktiert. Seiten des letzten Abdominalsternits erloschen gerandet. Beine kräftig, Schenkel sehr stark gekeult, Hinterschenkel hintergelegt den Vorderrand des 5. Abdominalsegments erreichend. Schenkel glatt, fein und spärlich punktiert, die Keule etwas gröber, aber spärlich punktiert. Schienen einfach, Tarsen lang, die Tarsenglieder unten dicht befilzt, Vordertarsen leicht erweitert. Die Glieder 1—3 der Hintertarsen verhalten sich zu dem Krallenglied wie 30 : 18. — Länge: 27—28 mm.

Eine auffallende große Art, welche aufgrund der Färbung und gekeulten Schenkel sowie des ringsum gerandeten, grob skulptierten Halsschildes leicht zu erkennen ist. Zur besseren Orientierung gebe ich hier eine Tabelle der 3 *Pigeus*-Arten:

1 (4) Die Punktierung des Halsschildes ist gleichmäßig und ziemlich spärlich, die Abstände der Punkte viel breiter als die Punkte selbst und auch seitlich nicht gerunzelt. 23 mm nicht überragend. Flügeldecken einfarbig, erzglänzend.

2 (3) Ende des letzten Abdominalsegments ist kahl. Der Grund des Halsschildes und der Flügeldecken, vor allem aber der erstgenannte ist chagriniert und matt, Flügeldecken auch fettglänzend. Stirn so breit wie ein Auge. Vorder- und Mittelschienen beim ♂ leicht gebogen. Endglied der Fühler des ♂ unten der Länge nach eingedrückt und glänzend, nicht punktiert. — Länge: 17—23 mm (= *tonkinea* PIC, 1927)
nitidipes (FAIRMAIRE, 1893)

3 (2) Ende des letzten Abdominalsegments mit einem nach hinten gerichteten Bart. Grund der ganzen Oberseite stark glänzend, nicht chagriniert. Stirn bedeutend breiter als ein Auge. Vorder- und Mittelschienen des ♂ fast gerade. Endglied der Fühler beim ♂ normal, unten nicht eingedrückt und rundherum punktiert. — Länge: 18—21 mm
striatus (PIC, 1923)

4 (1) Die Punktierung des Halsschildes sehr grob und dicht, in der Scheibe weniger, seitlich gröber und dichter gerunzelt. Bedeutend größer. Flügeldecken in jedem Zwischenraum mit schmalen, in der Mitte blauen, beiderseits mit gold-kupferigen Streifen und die Punktstreifen mit grünlicher Farbe. Hinterschenkel den Vorderrand des letzten Sternits erreichend. Stirn breiter als ein Auge, Schienen fast gerade. — Länge: 27—28 mm
iridistriatus sp. n.

5. Gattung *Hoploedipus* FAIRMAIRE, 1898

FAIRMAIRE (1898): Annls Soc. ent. Fr. **67:** 395 (Gattungstypus: *Camarimena armipes* FAIRMAIRE, 1882).
GEBIEN (1917): Arch. Naturgesch. **83** (A 3): 29, 162.

Gattungstypus: *Camarimena armipes* FAIRMAIRE, 1882.

Es sind hierher von FAIRMAIRE außer der typischen Art noch weitere drei und von GEBIEN eine Art beschrieben. Es war mir möglich, alle dies-

bezüglichen Typen untersuchen zu können und ich habe festgestellt, daß eine Art von FAIRMAIRE, sie wurde unter dem Namen *Hoploedipus heterodoxus* FAIRMAIRE, 1898 aus Singapur beschrieben, nicht hierher gehört, deshalb verfaßte ich für sie eine neue, im Rahmen dieser Arbeit beschriebene Gattung: *Hoploedipinus* gen. n. Außerdem stellte ich fest, daß *Hoploedipus basicruralis* FAIRMAIRE, 1898 synonym mit *H. armipes* (FAIRMAIRE, 1882), weiters *Hoploedipus acanthosternum* GEBIEN, 1917 synonym mit *H. bidentatus* FAIRMAIRE, 1898 ist. In dem von mir untersuchten Material aus dem British Museum kamen noch zwei weitere neue Arten zum Vorschein, so daß es momentan vier valide Arten gibt.

Die Gattung *Hoploedipus* FAIRMAIRE, 1898 ist gut gekennzeichnet und aufgrund folgender Merkmale leicht zu erkennen: *Acroptera*-ähnliche, schmale Gestalt; scharf gezähnte Vorderschenkel und -schienen (Abb. 19, 25); tief eingedrückte, nach hinten divergierend laufende Augenfurche (Abb. 18); verhältnismäßig schmale Stirn; Vorder- und Seitenrand des Halsschildes ungerandet, Basis dick gerandet; Oberseite des Halsschildes sehr grob und dicht punktiert, höchstens mit je einem sehr kurzen und feinen, kaum erkennbaren Härchen; Flügeldecken in Reihen punktiert, glatt und glänzend; Ende der Flügeldecken in je einem scharfen Dorn ausgezogen; die 4 Endglieder der

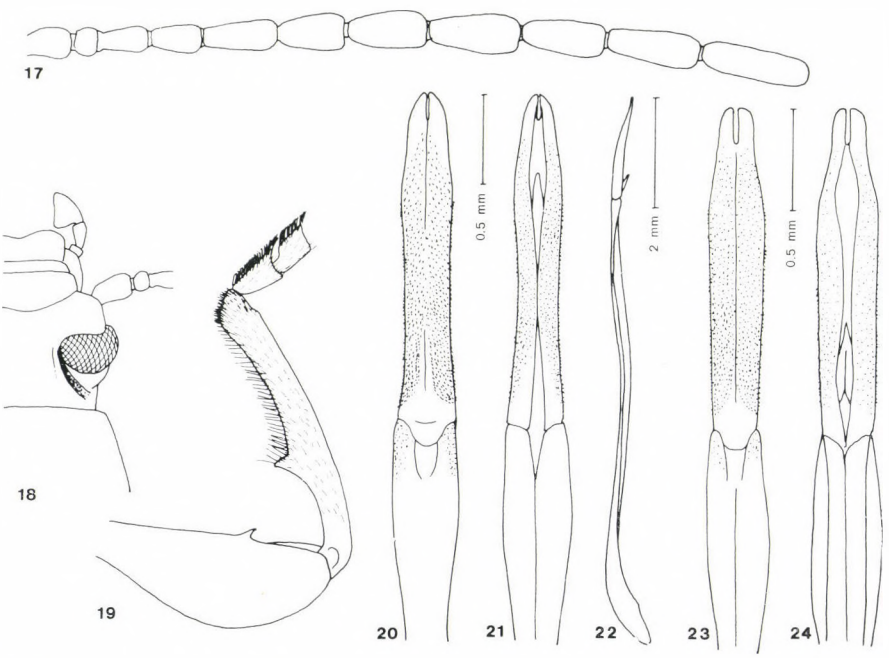

Abb. 17—19 = *Hoploedipus bryanti* sp. n. Fühler des ♂ (17), Kopf des ♂ (18), Vorderbein des ♂ (19). — Abb. 20—21 = *H. armipes* (FAIRMAIRE) Parameren bei Ansicht von oben (20) und von unten (21). — Abb. 22—24 = *H. bidentatus* FAIRMAIRE Aedoeagus bei Seitenansicht (22), Parameren bei Ansicht von oben (23) und von unten (24)

Fühler, besonders aber das 11. Glied beim ♂ äußerst lang, ziemlich parallel, etwa dreimal so lang wie breit, beim ♀ sind diese Glieder kürzer, das Endglied sogar eiförmig, und wenig länger als breit; Aedoeagus des ♂ etwa so lang wie die halbe Körperlänge; Unterseite fein anliegend dicht behaart.

Sie unterscheidet sich von der Gattung *Hoploedipinus* gen. n. durch die abweichende Fühlerform (*Hoploedipinus* besitzt kurze Fühler mit 4gliedriger Keule) und andere Körperform (*Hoploedipinus* ist robust); *Pigeus* FAIRMAIRE, 1898 ist unten glatt, Vorderschenkel und -schienen ohne Zahn; *Gigantopigeus* gen. n. ähnlich, Mittelschienen des ♂ besitzen sekundäre Geschlechtsmerkmale (die Basis innen mehr oder weniger stark ausgeschnitten, resp. eckig), Halsschild und Flügeldecken mehr oder weniger fein behaart, letztes Abdominalsternit am Ende beim ♂ breit abgeflacht resp. eingedrückt; *Dentatoploedipus* gen. n. besitzt scharf gezähnte Mittelschienen außer den gezähnten Vorderschienen und Vorderschenkeln; *Pigeostrongylium* gen. n., *Pigeocaulinus* gen. n. und *Leprocaulinus* KASZAB, 1982 sind schon weiter entfernt.

Die vier Arten der Gattung *Hoploedipus* FAIRMAIRE, 1898 sind voneinander schwer zu unterschieden. Die Genitalien des ♂ bieten aber gute Anhaltspunkte die hierher gehörenden Arten zu bestimmen.

Hoploedipus bryanti sp. n.

Holotypus ♂: »Mt. Matang, W. Sarawak, XII. 1913, G. E. BRYANT«, befindet sich im British Museum.

Körper gestreckt, stark glänzend, dunkelbraun, metallisch, Schenkel etwas violett, Schienen etwas bläulich, Tarsen und Fühler sowie die Palpen schwärzlich. Kopf (Abb. 18) mit großen, vorstehenden Augen, welche stark gewölbt sind, Wangen und Schläfen viel schmaler als die Augen, Schläfen kurz und plötzlich zum Hals verengt, Wangen in breiten Bogen verrundet, zwischen Clypeus und Wangen eckig ausgerandet. Stirn schmaler als ein Auge, grob punktiert, Clypeus feiner punktiert, anliegend fein behaart. Fühler (Abb. 17) fadenförmig, das 3. Glied nicht länger als das 4., das Endglied 3,2mal so lang wie breit. Die Länge der Glieder 1—11 verhält sich wie 25 : 13 : 25 : 27 : 30 : 35 : 40 : 45 : 43 : 47 : 55 und die Breite wie 16 : 14,5 : 13 : 15 : 16 : 18 : 20,5 : 20 : 20 : 20 : 17. Halsschild scheinbar länger als breit, in Wirklichkeit verhalten sich Länge und Breite wie 70 : 69; Seiten nach vorn von der Mitte an gebogen verengt. Oberseite sehr grob und dicht, einzeln punktiert, die Scheibe etwas spärlicher, so daß die Punkte nicht aneinander gedrückt sind; jeder Punkt trägt ein feines Härchen, sonst ist der Grund stark glänzend. Flügeldecken dreimal so lang wie die Breite an den Schulterbeulen und 3,3mal so lang wie der Halsschild. Die Breite der Flügeldecken an den Schulterbeulen, der Halsschild an der Basis und der Kopf an den Augen

verhalten sich wie 88 : 71 : 52. Die Punktreihen sind innen am Ende fein, seitlich und vorne stärker, ausgenommen den Nahtstreifen, der ist nicht vertieft; die Zwischenräume sind nur vorn und seitlich leicht gewölbt, dort sind sie ungleich, sonst flach, sogar abgeflacht und kaum erkennbar, sehr spärlich und unauffällig punktiert. Der 1. Zwischenraum endet am Ende in einem scharfen Zahn. U n t e r s e i t e dicht weißgelb, anliegend behaart, so daß die Skulptur bedeckt wird, beim ♂ ist außerdem das Analsegment noch mit längeren, stärkeren, schräg abstehenden Haaren besetzt. Propleuren sehr grob, dicht punktiert, Prosternum in der Mitte zwischen den Hüften eingedrückt, am Ende mit einem beulenförmig vorstehenden Zahn. B e i n e kräftig, der Zahn der Vorderschenkel (Abb. 19) scharf zugespitzt, der innere Zahn der Vorderschienen (Abb. 19) ebenfalls sehr scharf, er steht weiter vom Ende als von der Basis entfernt (wie 32 : 18), Innenrand mit einer kahlen Leiste, aber diese Leiste mit einer Haarreihe, und das Ende innen sehr dicht behaart, Mittelschienen fast gerade. Tarsen lang, die Glieder 1—4 der Vordertarsen und das Endglied verhalten sich wie 27 : 30, bei den Mitteltarsen wie 30 : 27 (Hinterbein fehlt bei dem untersuchten Exemplar). Tarsen unten dicht befilzt und erweitert. A e d o e a g u s (Abb. 14—16) äußerst dünn, 7 mm lang; die Länge der Parameren und Basalplatte verhält sich wie 30 : 170, Parameren fast 7mal so lang wie die Breite. — L ä n g e : 13,5 mm.

Diese Art ist durch die sehr feinen, fast erloschenen Reihenpunkte der Flügeldecken (hinter der Mitte und am Ende), weiters durch die sehr charakteristischen Genitalien des ♂ leicht kenntlich. *H. bidentatus* FAIRMAIRE, 1898, *H. armipes* (FAIRMAIRE, 1882) und *H. malayicus* sp. n. besitzen stärker punktierte Flügeldecken und abweichenden Aedoeagus.

Hoploedipus bidentatus FAIRMAIRE, 1898

FAIRMAIRE (1898): Annls Soc. ent. Fr. **67:** 369 (Typus: Singapore).
Hoploedipus acanthosternum GEBIEN (1917): Arch. Naturgesch. **83** (A 3): 163, Fig. 38, Taf. II, Fig. 28 (Typus: Borneo, Kaching), **syn. n.**

Im Museum Paris befindet sich ein ♀ von *H. bidentatus* mit handgeschriebenem Zettel von FAIRMAIRE aus »Singapore«, das ich als Lectotypus bezeichne. Ich untersuchte auch das von GEBIEN beschriebene ♀ Holotypus der *H. acanthosternum* aus »Borneo, Kaching« aus dem Museum G. FREY (Tutzing), welches von *bidentatus* nicht verschieden ist, deshalb wird es in Synonym gestellt. Außer diesen Typen sah ich nur ein einziges ♂ aus dem British Museum: Borneo, Sarawak, Matang, J. E. A. LEWIS (1910-116).

Bei dieser Art ist charakteristisch, daß die Zwischenräume der Flügeldecken auch vorn und seitlich abgeflacht sind und die Reihenpunkte scharfkantig und tief eingestochen erscheinen.

Körper braun metallisch oder der Körper schwärzlich, Kopf und Halsschild mit blauem, Flügeldecken mit grünlichem Schimmer. Schenkel manchmal mit messingfarbigem Glanz. Stirn beim ♂ schmaler als ein Auge, beim ♀ breiter, beim ♂ leicht eingedrückt, runzelig punktiert. Halsschild mit grober, dichter, gleichmäßiger, einzelnstehender, dicht aneinander gedrückter Punktierung. Zwischenräume der Flügeldecken glatt, nicht gerunzelt, stark glänzend und flach. Die sekundäre Punktreihe vorn zwischen Seitenrand und 8. Punktreihe gut entwickelt, fast bis zur Mitte der Flügeldecken reichend. Unterseite sehr dicht behaart. Prosternum hinter den Hüften in der Mitte mit starker, vorstehender Beule. Aedoeagus (Abb. 22—24) bei einem 15 mm langen Tier 10 mm lang; Basalplatte und Parameren verhalten sich wie 71 : 21, Parameren 10mal so lang wie die Breite; die Basalplatte ist im ersten Viertel, sehr stark eingeschnürt, bei seitlicher Ansicht doppelt S-förmig. Parameren am Ende bei Ansicht von oben schmaler. — L ä n g e : 15,2—16 mm.

Hoploedipus bryanti sp. n. besitzt erloschene feine Flügeldecken-Reihenpunkte; *H. armipes* (FAIRMAIRE, 1882) und *H. malayicus* sp. n. haben kräftige Reihenpunkte der Flügeldecken und wenigstens seitlich sind die Zwischenräume gewölbt, außerdem die sekundäre Punktreihe zwischen Seitenrand (9. Punktreihe) und 8. Punktreihe an der Schulterbeule merklich kürzer. Parameren der beiden letztgenannten Arten am Ende breiter.

Hoploedipus armipes (FAIRMAIRE, 1882) (Tafel II, Abb. 6)

Camarimena armipes FAIRMAIRE (1882): Notes Leyden Mus. **4:** 244 (Typus: Sumatra, Rawas).
Hoploedipus basicruralis FAIRMAIRE (1898): Annls Soc. ent. Fr. **67:** 396 (Typus: Singapore), **syn. n.**

Holotypus von *H. armipes* ist ein ♀ und befindet sich im Museum Leyden und stammt aus »Sum. Exp. Rawas 5/78«. Im Museum Paris befindet sich *H. basicruralis* mit einem handgeschriebenen Zettel von FAIRMAIRE, ebenfalls ein ♀, das ich als Lectotypus bezeichne. Außer diesen zwei Typen untersuchte ich noch das folgende Material:

Borneo: Penang, G. L. LEWIS (1 ♂, British Museum); Penang (Lamb.), PASCOE Coll. (1 ♀, British Museum); Bov. Kapalac, rd. 2 Ooster afdeeling, S. L. BRUG (2 ♀, Mus. Leyden); Borneo occ., Saniba, Dr. J. BOSCHA (1 ♀, Mus. Leyden); Insulae Natuna, A. L. v. HASSELT (1 ♂, Mus. Leyden); Insulae Bintang, Riouw arch., A. L. v. HASSELT (1 ♂, Mus. Leyden); »Sing.«[apure], WALLACE, F. BATES, 81-19 (1 ♂, British Museum); Singapore, Coll. BAKER (1 ♂, British Museum).

Sie ist mit den Arten *H. bidentulus* FAIRMAIRE, 1898 und *H. malayicus* sp. n. sehr nahe verwandt, *H. bryanti* sp. n. besitzt vollkommen abweichende Genitalien des ♂ und erloschen fein punktierte Reihen der Flügeldecken. Bei

bidentulus sind die Zwischenräume der Flügeldecken abgeflacht und die sekundäre Punktreihe unter der Schulterbeule länger entwickelt. *H. armipes* besitzt kaum quergerunzelte Flügeldecken, resp. sind die Zwischenräume nur vorn und seitlich bis zum 6. Zwischenraum leicht quergerunzelt, während bei *H. malayicus* die Zwischenräume seitlich stark, gegen die Naht allmählich feiner gerunzelt und die Punktierung des Halsschildes spärlicher sind. — Aedoeagus: Abb. 20—21.

Hoploedipus malayicus sp. n.

Holotypus ♂: »Malay Peninsula« ex F. M. S. Museum, »B. M. 1975-354«, befindet sich im British Museum.

Gestreckt, Kopf und Halsschild schwarz, Flügeldecken schwarz mit Erzglanz, Schienen mit violettem Schimmer, Fühler und Palpen schwarz. Kopf mit großen, vorstehenden, längsgewölbten Augen, Schläfen schmal und sehr kurz, plötzlich eingeschnürt, Wangen breit gebogen verengt, zwischen Clypeus und Wangen rechteckig ausgeschnitten. Stirn flach, zwischen den Augen merklich breiter als ein Auge. Augenfurchen tief, Hinterkopf sehr grob, nach vorn bis zum Clypeus allmählich feiner punktiert. Fühler dünn, die Basis des Halsschildes überragend, beim ♂ ist das Endglied 3,7mal so lang wie die Breite und 2,8mal so lang wie das 3. Glied. Die Länge der Glieder 1—11 verhält sich wie 25 : 15 : 30 : 30 : 34 : 38 : 45 : 55 : 47 : 53 : 85 und die Breite wie 18 : 15 : 15 : 14 : 15 : 20 : 21 : 26 : 22 : 22 : 23. Halsschild merklich länger als breit (wie 80 : 77), von der Mitte an gebogen verjüngt, sehr grob und dicht punktiert, die Punkte stehen einzeln, nicht ganz eng aneinander gedrängt, jeder Punkt trägt ein sehr feines und kurzes Härchen. Der Grund etwas fettglänzend. Flügeldecken gestreckt, 2,8mal so lang wie die Breite an den Schulterbeulen und 3,9mal so lang wie der Halsschild. Die Breite an den Schulterbeulen, an der Basis des Halsschildes und am Kopf bei den Augen verhält sich wie 110 : 77 : 60. Oberseite mit Punktreihen, welche nach hinten allmählich feiner sind, die Zwischenräume vorn mit Querrunzeln, welche besonders seitlich stark sind und bis zu dem 4. Zwischenraum reichen, der Grund ist sonst glänzend. Unterseite anliegend dicht behaart. Propleuren sehr eng und feiner punktiert als die Scheibe des Halsschildes. Prosternalfortsatz stumpf zahnförmig. Beine kräftig. Zahn der Vorderschenkel sehr klein, dagegen ist der Zahn der Vorderschienen (Abb. 25) dornförmig, sehr groß und spitzig, steht fast in der Mitte, der Raum zwischen Ende der Schienen und Zahn sowie zwischen Zahn und Basis am Innenrand verhält sich wie 37 : 25. Endglied der Vordertarsen etwas länger als die vorangehenden 4 Glieder zusammengenommen. (Genitalien des ♂ von Anthrenen zerfressen.) — Länge : 15,5 mm.

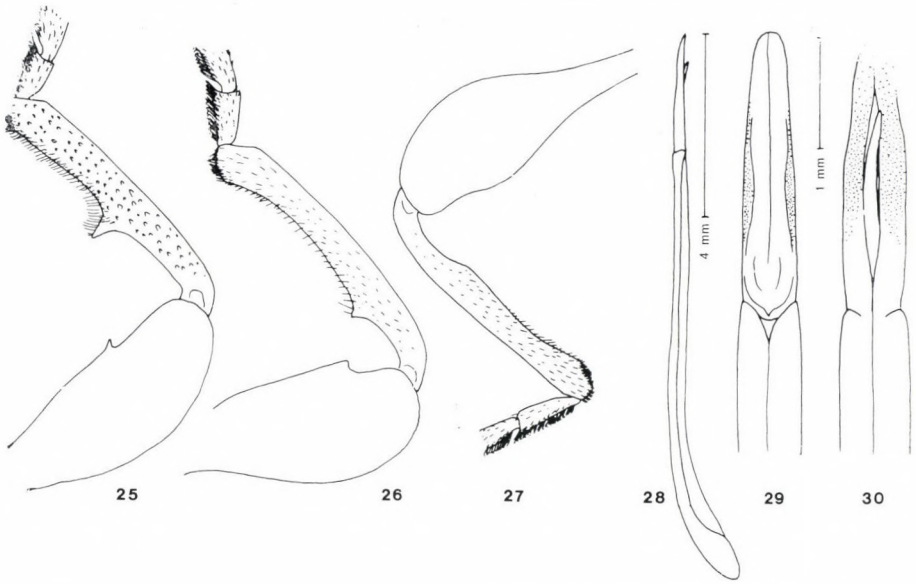

Abb. 25 = *Hoploedipus malayicus* sp. n. Vorderbein. — Abb. 26—27 = *Gigantopigeus malayanus* gen. n., sp. n. Vorderbein des ♂ (26), Mittelbein des ♂ (27). — Abb. 28—30 = *G. bremeri* sp. n. Aedoeagus bei Seitenansicht (28), Parameren von oben (29) und von unten (30)

Diese Art ist durch die Flügeldeckenskulptur gekennzeichnet. Bei allen übrigen Arten ist die Skulptur der Decken feiner, auch bei *H. armipes* (FAIRMAIRE, 1882), die Querrunzelung der Flügeldecken vorn von außen bis zum 6. Zwischenraum reichend.

Zur besseren Orientierung gebe ich unten eine Bestimmungstabelle der bis jetzt bekannten vier *Hoploedipus*-Arten:

1 (2) Die Punktreihen 1—4 der Flügeldecken in der Scheibe fast vollkommen erloschen, der Nahtstreifen auch hinten kaum vertieft und ohne erkennbare Punktreihen. Die Punktreihen von der 5. an gegen die Seiten vorn grob, die Zwischenräume 6—10 vorn wegen der großen und tiefen, nicht scharf umrandeten Punkte nicht flach und ungleich. Halsschild gleichmäßig dicht und grob punktiert, jedoch nicht runzelig. — Länge: 13,2 mm. Borneo (W. Sarawak) **bryanti** sp. n.

2 (1) Die ineren Punktreihen der Flügeldecken immer feiner als die äußeren, sie sind aber auch in der Mitte der Scheibe nicht erloschen. Nahtstreifen wenigstens von der Mitte an allmählich etwas stärker eingedrückt.

3 (4) Die Zwischenräume der Flügeldecken, auch die seitlichen sind vollkommen abgeflacht, die Ränder der Punkte scharf. Punktierung des Halsschildes grob und gleichmäßig, jeder Punkt steht separiert. — 15,2—16 mm. Singapur, Borneo (Kaching, Sarawak) (= *acanthosternum* GEBIEN, 1917) **bidentulus** FAIRMAIRE, 1898

4 (3) Wenigstens die seitlichen Zwischenräume, vor allem vorn mehr oder weniger gewölbt oder ungleich mit erloschenen flachen Querrunzeln.

5 (6) Die Punktierung des Halsschildes sehr grob und dicht, gegen die Basis nicht feiner. Die seitlichen Zwischenräume der Flügeldecken leicht gewölbt, und es gibt einige schwache Querrunzeln vorn seitlich, bis höchstens zu dem 6. Zwischenraum. — 11,5—15,5 mm. Malayische Halbinsel (Penang), Singapur, Bintang, Natuna, Sumatra, Borneo (= *basicruralis* FAIRMAIRE, 1898) **armipes** (FAIRMAIRE, 1882)

6 (5) Die Punktierung des Halsschildes in der Scheibe sehr grob, gegen die Basis und vorn bedeutend feiner, Flügeldeckenzwischenräume zwischen den Reihenpunkten mit seitlich stärkeren, gegen die Naht allmählich feineren Querrunzeln. Die Reihenpunkte sind vorn grob. — 15,5 mm. Malayische Halbinsel **malayicus** sp. n.

6. Gattung **Gigantopigeus** gen. n.

Gattungstypus: *Gigantopigeus mirabilis* sp. n.

Sehr nahe verwandt mit der Gattung *Hoploedipus* FAIRMAIRE, 1898 und durch die folgenden Merkmalen charakterisiert: bei beiden Geschlechtern sind die Vorderschenkel und Vorderschienen am Innenrand scharf gezähnt (Abb. 26, 31, 33, 40); Mittelschienen des ♀ einfach, des ♂ innen an der Basis mehr oder weniger stark ausgerandet, eckig oder abgerundet eckig (Abb. 27, 32, 34); Kopf mit tiefen Augenfurchen; Fühler des ♂ mit gestreckten Endgliedern (Abb. 38), vor allem das 11. Glied, beim ♀ kürzer, weniger als zweimal so lang wie die Breite, eiförmig (Abb. 39); zwischen Clypeus und Oberlippe breite Gelenkshaut vorhanden; alle Schenkel sind stark gekeult; Unterseite dicht behaart, Halsschild fein und spärlich behaart, Flügeldecken kahl oder ungleich sehr fein behaart; letztes Abdominalsternit des ♂ am Ende flach eingedrückt; Seiten und Vorderrand des Halsschildes ungerandet, Basis dick; Ende der Flügeldecken mit je einem sehr scharfen Dorn; Epipleuren der Flügeldecken vorn an den Schulterbeulen nicht gerandet; Flügeldecken mit normalen Punktreihen oder mit breiten, punktierten Flecken, welche in Reihen stehen, und dazwischen sind die Räume höher gewölbt.

Nahe steht auch die Gattung *Dentatoploedipus* gen. n., bei welcher auch die Mittelschienen nahe der Mitte stark gezähnt sind, außerdem die Epipleuren vorn scharf gerandet.

Hierher gehören 5 Arten, alle von der Malayischen Halbinsel, und sie sind hier zum erstenmal beschrieben.

Gigantopigeus malayanus sp. n.

H o l o t y p u s ♂: Malay Penin., Kedah Peak, 3300 ft, 22. III. 1928, at light, H. M. PENDLEBURY, coll. F. M. S. Museum, befindet sich im British Museum. — P a r a t y p e n: wie Holotypus, 3500 ft, 29. III. 1928, coll. F. M. S. Museum, 1 ♀ im British Museum; Penang (Lamb.), PASCOE Coll., 1 ♀ im British Museum.

Gestalt einer *Strongylium*-Art sehr ähnlich, Oberseite braun metallisch, mit schwachem grünlichem oder grünlich-goldenem Glanz, glänzend. K o p f mit sehr grober, etwas runzeliger Punktierung, Stirnbreite und die Breite des Kopfes an den Augen verhalten sich wie 22 : 57. F ü h l e r lang, das Endglied beim ♂ dreimal, beim ♀ 1,7mal so lang wie breit; die Länge der Glieder beim ♂ 1—11 verhält sich wie 18 : 15 : 38 : 34 : 30 : 36 : 40 : 45 : 43 : 46 : 63

und die Breite wie 16 : 13 : 14 : 15 : 15 : 20 : 22 : 24 : 22 : 23 : 21; die Länge der Glieder 7—11 beim ♀ wie 32 : 31 : 26 : 30 : 46 und die Breite wie 21 : 27 : 26 : 26 : 27; aus diesem Vergleich ist zu ersehen, daß die letzten Glieder der Fühler beim ♂ viel dünner sind als bei dem ♀. Halsschild länger als breit (wie 20 : 18), aber dicht und gedrängt, stellenweise runzelig punktiert, jeder Punkt trägt ein feines, langes, anliegendes Härchen. Vorderrand seitlich strichförmig gerandet. Flügeldecken gestreckt, 2,8mal so lang wie die Breite an den Schulterbeulen. Mit groben Punktreihen, welche hinter der Mitte allmählich feiner werden, sie stehen einzeln und nicht in Streifen, ausgenommen den Nahtstreifen hinter der Mitte und die übrigen weit vor dem Ende. Die 4. und 5. Reihe sind weit vor dem Ende verkürzt, in der 8. Punktreihe befinden sich etwa 30—40 Punkte, manchmal sind mehrere Punkte zu kurzen Linien verbunden. Die Zwischenräume leicht gewölbt und an den Punkten ziehen sich seitlich flache Querrunzeln. Der Grund glänzend, kaum oder nicht punktiert. Unterseite dicht anliegend behaart, Prosternalfortsatz stumpfeckig. Letztes Segment des Abdomens beim ♂ am Ende breit gerundet und das Ende in der Mitte leicht eingedrückt, die Mitte am Ende glatt und unbehaart. Beine sehr stark gekeult, die Basis auffallend dünn und bis zur Keule behaart. Vorderschienen (Abb. 26) außen leicht gebogen, der Zahn in der Innenseite befindet sich im basalen Drittel, die Räume zwischen diesem Zahn und dem Ende sowie zwischen ersterem und der Basis verhalten sich wie 48 : 18. Innenrand vom Ende bis zum Zahn mit einer scharfen Leiste, das Ende mit einer filzartig behaarten Erweiterung. Mittelschienen beim ♀ einfach, beim ♂ (Abb. 27) an der Basis dünn, im basalen Drittel erweitert und nachher wieder bis zum Ende verjüngt, Innenrand mit scharfer Leiste. Tarsen lang, unten dicht gelb behaart, leicht erweitert. Die Länge der Glieder 1—4 und die des Endgliedes der Vordertarsen verhält sich wie 34 : 32 und Glieder 1—3 und das Endglied der Hintertarsen wie 40 : 23. (Aedoeagus beim ♂ fehlt wegen Anthrenenfraß bei dem untersuchten Holotypus.) — Länge : 14,5—20 mm.

Nahe verwandt nur mit *G. bremeri* sp. n., welche gestreckter ist, Vorderschienen bei beiden Geschlechtern oben abgeflacht und außen etwas gekielt, außerdem der Halsschild, der fast eineinhalbmal so lang wie breit ist, schließlich die Mittelschienen beim ♂ zur Spitze nicht verjüngt.

Gigantopigeus bremeri sp. n. (Tafel II, Abb. 1)

Hopleodipus strongyloides GEBIEN in litt.

Holotypus ♂: Malaysia, Taiping, IV. 1978 (Coll. Dr. H. BREMER). — Paratypen: wie Holotypus (2 ♂, Coll. BREMER), id., VI. 1975 (1 ♀, Coll. BREMER); Cameron Highlands, 20. I. 1982 (1 ♂, Coll. BREMER); Perak, DOHERTY (3 ♀, British Museum); Perak, Taiping (1 ♀, Coll. F. M. S. Museum, im British Museum); Perak, Larut Hills, 4500 ft, 20.

II. 1932, H. M. PENDLEBURY (1 ♀, Coll. F. M. S. Museum, im British Museum): Malay Penin., Perak, Jaipin (1 ♀, Coll. F. M. S. Museum, im British Museum); Malay Penin., Bukit Kulu, 14. XII. 1910 (1 ♂, ex Coll. Agr. Dept., F. M. S. Museum, im British Museum); Gunong Angsi, Negri Sembilan, 2000—2790 ft, IV. 1918 (1 ♂, ex F. M. S. Museum, im British Museum); Buhit Kutu, Selanger, IV. 1915 (1 ♀, ex F. M. S. Museum, im British Museum); Pahang, Lubok Tamang, 3500 ft, 11. VI. 1923, at light, H. M. PENDLEBURY (1 ♂, ex F. M. S. Museum, im British Museum); Pahang, Cameron's Highlands, G. Berumban, 4000—4500 ft, 16. III. 1924, H. M. PENDLEBURY (1 ♂, ex F. M. S. Museum, im British Museum).

Sehr gestreckt und groß, meist grünlich, seltener etwas bläulich oder sogar kupferig, die Basis der Beine oft rötlich, Fühler und Palpen schwarz. K o p f mit grob punktierter, flacher Stirn; Stirnbreite und die Breite des Kopfes an den Augen verhalten sich wie 27 : 79. Wangen breit abgerundet. Clypeus fein und einzeln, Stirn und Scheitel grob, runzelig punktiert. F ü h l e r des ♂ hintergelegt die Basis des Halsschildes mit 2 Gliedern übertragend; das Endglied beim ♂ 2,6mal, beim ♀ 1,7mal so lang wie breit, das 3. Glied bei beiden Geschlechtern länger als das 4.; die Länge der Glieder 1—11 verhält sich beim ♂ wie 35 : 18 : 60 : 54 : 52 : 56 : 58 : 62 : 60 : 54 : 82 und die Breite wie 26 : 18,5 : 20 : 20 : 22 : 27 : 29 : 35 : 32 : 32 : 32; die Länge der Glieder 7—11 beim ♀ wie 32 : 32 : 28 : 27 : 43 und die Breite wie 19 : 23 : 24 : 25 : 26, sie sind also im Vergleich der ähnlichen Glieder des ♂ viel kleiner, resp. breiter. H a l s s c h i l d länger als breit (wie 40 : 28), zylindrisch, vordere Hälfte verjüngt. Oberseite sehr grob und ungleich, gerunzelt punktiert, dazwischen auch mit erhabenen ungleichartigen Spiegelflecken, jeder Punkt trägt ein feines, dünnes, helles Härchen. F l ü g e l d e c k e n gestreckt, 2,7mal so lang wie die Breite an den stark vorragenden Schulterbeulen. Oberseite regelmäßig in Reihen punktiert, die Punkte in den Nahtstreifen vor allem von der Mitte an fein, sie sitzen sogar in einem Streifen, die meisten Punkte stehen frei, nach vorn und seitlich allmählich gröber, vorn und in der Mitte gehen die Punktgrübchen der Quere nach breit in die Zwischenräume, deshalb etwas querrunzelig. Epipleuren der Flügeldecken vorn bis zum Niveau der Mitte der Hinterhüften stark erloschen gerunzelt. Die Zwischenräume erloschen, sehr fein und spärlich punktiert, der Grund glatt. U n t e r s e i t e dicht und lang, anliegend behaart, Prosternalfortsatz am Ende knopfförmig. Hinterbrust sehr lang, seitlich etwas raspelartig, aber dicht punktiert, die Epipleuren derselben sind erloschen leicht quergerunzelt. Letztes Abdominalsternit des ♂ am Ende breit gerundet, die Mitte leicht eingedrückt und nackt, kaum punktiert. B e i n e lang, die dünne Basis der Schenkel fein behaart, Vorderschenkel (Abb. 31) weit vor dem Ende mit einem rechteckigen Zahn. Mittelschenkel des ♂ (Abb. 32) am Außenrand weit vor der Spitze mit abgerundeter Ecke. Vorderschienen leicht gebogen, Oberseite flach, Außenseite stumpf gekielt, am Innenrand etwa in dem basalen Drittel mit einem großen, dreieckigen, vorstehenden Zahn, Ende der Schienen mit Haarfleck, Innenrand vom Ende bis zum Zahn ohne scharfe Leiste, eine solche ist aber bei den Mittelschienen vorhanden. Tarsen lang und kräftig, die Gesamtlänge der Glieder 1 – 4 der Vorder-

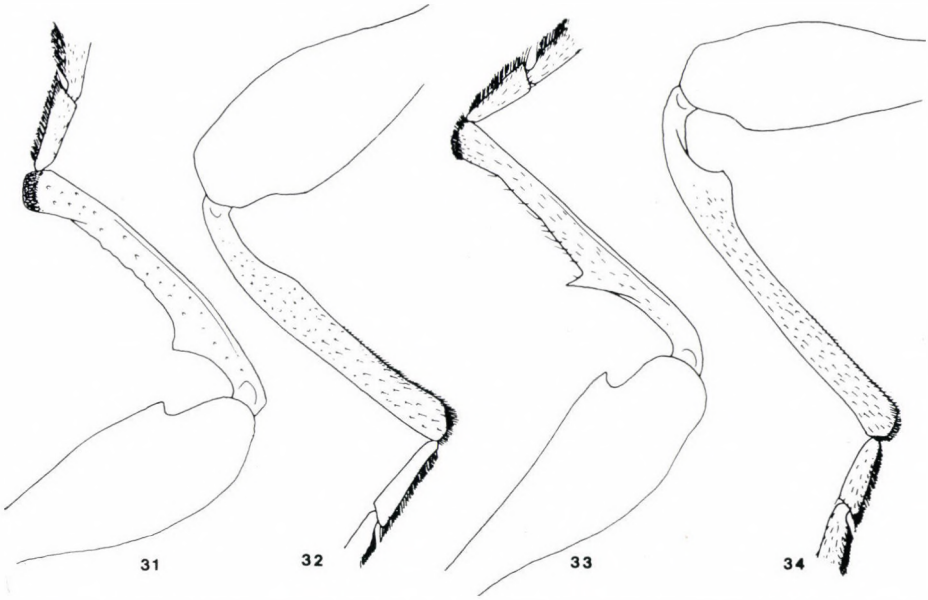

Abb. 31—32 = *Gigantopigeus bremeri* gen. n., sp. n. Vorderbein des ♂ (31) und Mittelschienen des ♂ (32). — Abb. 33—34 = *G. mirabilis* sp. n. Vorderbein des ♂ (33) und Mittelbein des ♂ (34)

tarsen, weiters die Länge des Krallengliedes (ohne Krallen) verhalten sich wie 62 : 50, bei den Hintertarsen die Glieder 1—3 und Krallenglied wie 62 : 50, das Endglied aber bei den Hintertarsen länger als das 1. Aedoeagus (Abb. 28—30) bei einem 22 mm ♂ beträgt 12,2 mm, die Länge der Parameren und der Basalplatte verhält sich wie 10 : 61; die Parameren sind 3,6mal so lang wie breit. — Länge: 16,5—23 mm.

Nächstverwandte Art ist *G. malayanus* sp. n., bei welcher der Halsschild verhältnismäßig kürzer, der ganze Körper weniger gestreckt, die Vorderschienen oben nicht abgeflacht und der Innenzahn viel kleiner sind.

Herrn Prof. Dr. H. J. Bremer gewidmet, der diese ausgezeichnete neue Art mir zum erstenmal für Studienzwecke gesendet hat.

Gigantopigeus mirabilis sp. n. (Tafel II, Abb. 2)

Holotypus ♂: Malaysia, Cameron Highland, X. 1980 (Coll. Dr. H. J. Bremer). — Paratypen: Malay Penin., Pahang, Fraser's Hill, 4200 ft, 18. VII. 1936, H. M. Pendlebury (1 ♀, ex F. M. S. Museum, im British Museum), id., at light, 17. VII. 1936, H. M. Pendlebury (1 ♀, ex F. M. S. Museum, im British Museum).

Groß, querüber stark gewölbt, glänzend dunkel bronzefarben, Fühler und Palpen sowie die Tarsen schwarz. Kopf mit sehr tiefen und breiten Augenfurchen, Stirn kaum breiter als ein Auge, leicht eingedrückt, ungleich punktiert, Augenfalten neben dem Innenrand der Augen abgerundet, aber

hoch. Clypealsutur eingeschnitten, Clypeus fein und spärlich punktiert. Die Breite am Hals, an den Augen und an der Basis der Wangen sowie die Stirn zwischen den Augen verhalten sich wie 21 : 26 : 23 : 10. F ü h l e r dünn und lang, überragen hintergelegt die Basis des Halsschildes, die Endglieder beim ♂ (Abb. 38) gestreckt, beim ♀ (Abb. 39) kürzer; das Endglied beim ♂ 2,6mal so lang wie breit, beim ♀ nur 1,5mal, lang eiförmig. Die Länge der Glieder 1—11 verhält sich beim ♂ wie 45 : 23 : 72 : 65 : 68 : 72 : 75 : 77 : 68 : 68 : 86 und die Breite wie 30 : 24 : 29 : 24 : 25 : 37 : 36 : 36 : 34 : 33 : 31; die Glieder 7—11 beim ♀ so lang wie 52 : 50 : 40 : 40 : 60 und so breit wie 33 : 33 : 34 : 36 : 40. H a l s s c h i l d länger als breit (wie 37 : 36), die Mitte der Länge nach leicht eingedrückt, sehr ungleich und grob, in der Mitte, vorn und seitlich dichter punktiert, die Zwischenräume der Punkte gewölbt, bilden stellenweise größere Spiegelflecke. Aus den Punkten ragen lange, dünne, anliegende feine, weißgelbe Haare. Basalrand dick, Vorderrand manchmal fein oder dick, in der Mitte aber erloschen. F l ü g e l d e c k e n parallel, mit vortretenden Schulterbeulen, 2,7mal so lang wie breit und 3,97mal so lang wie der Halsschild. Oberseite mit großen verschiedenartigen, länglichen oder langen am Grund flachen und punktierten Eindrücken, dazwischen sind die Zwischenräume gewölbt und glänzend. Die Punktierung der Eindrücke ist der Rest als Punktreihe anzusehen; die sind fein anliegend behaart. Ende der Flügeldecken an der Naht mit je einem scharfen, dornförmigen Zahn. Epipleuren vorn ungleich erloschen gerunzelt. U n t e r s e i t e dicht anliegend gelbweiß behaart. Prosternalfortsatz am Ende wenig hoch, zwischen den Hüften eingedrückt, nach vorn und hinten geneigt. Propleuren grob quergerunzelt. Hinterbrust erloschen fein punktiert. Letztes Abdominalsternit des ♂ im Enddrittel in der Mitte leicht, am Rand tiefer eingedrückt, glatt, unbehaart. B e i n e kräftig, Schenkel stark gekeult, Vorderschenkel (Abb. 33) an der Innenseite am Oberrand weit vor dem Ende mit etwas hakenartigem scharfem Zahn, Mittelschenkel (Abb. 34) beim ♂ vor dem Ende am Unterrand abgerundet, etwas eckig; Vorderschienen (Abb. 33) oben abgeflacht, innen am Ende erweitert und filzartig behaart, in der Nähe des basalen Drittels mit einem sehr scharfen Zahn; die Räume vom Ende der Vorderschienen bis zum Zahn und vom Zahn bis zur Basis verhalten sich wie 93 : 52. Außen abgeflacht, am Innenrand ohne Leiste. Mittelschienen des ♀ einfach, beim ♂ (Abb. 34) an der Basis innen an der Unterseite mit einer abgerundet stumpfwinkligen Erweiterung, welche nach oben gebogen und unten etwas ausgehöhlt ist. Tarsen kräftig, erweitert, unten gelb befilzt, die Länge der Glieder 1—3 der Hintertarsen und die des Krallengliedes (ausgenommen Krallen) verhält sich wie 145 : 52, das 1. Glied länger als das Klauenglied (wie 65 : 52). A e d o e a g u s (Abb. 35—37) sehr lang, bei einem 28 mm großen Tier 14,5 mm lang; die Länge der Parameren und der Basalplatte verhält sich wie 25 : 70, die Parameren sind 4,8mal so lang wie die Breite. — L ä n g e : 22—28 mm.

Nächstverwandte Arten sind *G. brendelli* sp. n. und *G. masumotoi* sp. n. Bei beiden Arten sind die Mittelschienen des ♂ an der Basis leicht ausgerandet, ohne erweiterte Lamelle nahe der Basis, außerdem haben die Flügeldecken bei *brendelli* keine großen, flachen punktierten Eindrücke, sondern weit unterbrochene feine Längsstriche, welche punktiert sind, und enthalten die reduzierten Reihenpunkte, bei *masumotoi* sind die Flügeldeckeneindrücke erloschen und die dazwischen liegenden Teile weniger erhaben.

Gigantopigeus brendelli sp. n. (Tafel II, Abb. 4)

H o l o t y p u s ♂: Pahang, Cameron's Highland, Tanah Raba, 4500 ft, 24. XI. 1923, CHULOW & KEDIT (Coll. F. M. S. Museum, im British Museum). — P a r a t y p e n : Pahang, F. M. S. Cameron's Highlands, Tanah Rita, 4800 ft, 16. VI. 1926, I. KEDIT (1 ♀, ex Coll. F. M. S. Museum, im British Museum), id., CHULOW & KEDIT (1 ♀, ex Coll. F. M. S. Museum, im British Museum); id., 4800 ft, 14. I. 1924, M. R. HUNDERSON (1 ♂, ex Coll. F. M. S. Museum, im British Museum), id., 4800 ft, 4. XII. 1924, I. KEDIT (1 ♀, ex Coll. F. M. S. Museum, im British Museum); Pahang, Ginting Kial, 5000 ft, 7. XII. 1939, H. M. PENDLEBURY (1 ♂, ex Coll. F. M. S. Museum, im British Museum), id., 20. V. 1939, H. M. PENDLEBURY (1 ♂, ex Coll. F. M. S. Museum, im British Museum); Pahang, Cameron's Highlands, No 4 Camp, 4800 ft, 17, 18. X. 1923, H. M. PENDLEBURY (1 ♂, 1 ♀, ex Coll. F. M. S. Museum, im British Museum); Malay Penin., Pahang, Blue Valley, 4580 ft, light, 29. II. 1936, B. RICHMOND (1 ♀, ex Coll. F. M. S. Museum, im British Museum); Perak, Batang Padang, 8. II. 1926, I. KEDIT (1 ♀, ex Coll. F. M. S. Museum, im British Museum).

Gestreckt, wie eine *Strongylium*-Art, dunkel bronzefarbig, Fühlerbasis und Tarsen etwas bläulich, Fühler und Palpen schwarz, die Basis der Schenkel oft hellbraun. K o p f mit schmalen und wenig tiefen Augenfurchen. Stirn flach, grob und dicht, aber wenig gerunzelt punktiert. Clypealsutur scharf. Die Breite am Hals, an den Augen, an der Wangenbasis und im Ausschnitt zwischen Wangen und Clypeus, weiters die der Stirn verhält sich wie 58 : 73 : 64 : 40 : 30. Augen beim ♂ groß, stark gewölbt. F ü h l e r hintergelegt beim ♂ die Basis des Halsschildes überragend, das 3. Glied länger als das 4., das Endglied beim ♂ 2,85mal so lang wie die Breite, beim ♀ viel kürzer oval, nur 1,3mal so lang wie breit. Die Länge der Glieder 1—11 verhält sich beim ♂ wie 35 : 18 : 53 : 47 : 55 : 55 : 65 : 62 : 63 : 65 : 80 und die Breite wie 24 : 18 : 19 : 21 : 21 : 26 : 28 : 30 : 29 : 29 : 28; die Verhältnisse zwischen Länge und Breite beim ♀ bei den Gliedern 7—11 wie 33 : 25 (7), 35 : 27 (8), 30 : 27 (9), 28 : 28 (10) und 40 : 30 (11). H a l s s c h i l d nur wenig länger als breit (wie 24 : 23,5), Oberseite grob und dicht punktiert, die Abstände zwischen den Punkten meist kleiner als die Punkte, sie sind meist etwas erhaben. Aus den Punkten wachsen lange, dünne, anliegende Haare. F l ü g e l d e c k e n gestreckt, parallel, 2,63mal so lang wie die Breite an den vorstehenden Schulterbeulen und viermal so lang wie der Halsschild; Ende an der Naht mit je einem sehr scharfen dornförmigen Zahn. Am Absturz an Stelle der 1. Punktreihe breiter Eindruck. Oberseite mit sehr spärlich stehenden, innen feinen, außen und vorn gröber eingeschnittenen kurzen Linien, in welchen ein oder mehrere

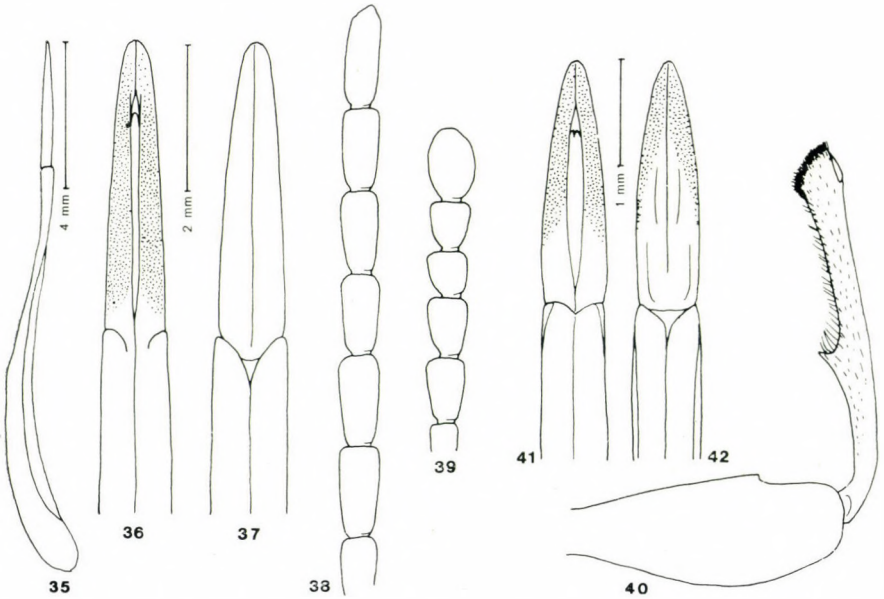

Abb. 35—39 = *Gigantopigeus mirabilis* gen. n., sp. n. Aedoeagus bei Seitenansicht (35), Parameren von unten (36), von oben (37), 6 letzte Glieder des Fühlers des ♂ (38) und des ♀ (39). — Abb. 40—42 = *G. brendelli* sp. n. Vorderbein des ♂ (40), Parameren von unten (41) und von oben (42)

Reihenpunkte sitzen; dazwischen ist die Oberfläche uneben und es sind einige breitere Querrunzeln vorhanden. Der Grund ist glatt, kaum erkennbar punktiert. U n t e r s e i t e anliegend hell behaart. Prosternalfortsatz hinter den Hüften abgerundet knopfförmig vortretend. Propleuren sehr grob und dicht punktiert, nicht gerunzelt. Hinterbrust und Abdomen dicht und fein punktiert. Analsegment beim ♂ am Ende leicht eingedrückt und nackt, glänzend, beim ♀ am Außenrand fein gerandet und dicht behaart. B e i n e lang, Schenkel stark gekeult, die Basis dünn, die Keule fein und dicht punktiert. Zahn der Vorderschenkel nicht hakenartig. Vorderschienen (Abb. 40) weder oben noch außen abgeflacht, Innenrand mit scharfem Zahn, etwas näher zur Basis als zum Ende, die Räume zwischen Ende und Zahn sowie Zahn und Basis verhalten sich wie 51 : 42. Innenrand mit scharfer Leiste. Mittelschienen des ♀ einfach, beim ♂ dünn, die Basis innen leicht ausgerandet und die Innenseite vom Ende bis zur Einschnürung mit einer scharfen Leiste. Tarsen sehr lang, die gesamte Länge der Glieder 1—4 und des Endgliedes verhält sich wie 56 : 45, das 1. Glied der Hintertarsen etwas kürzer als das Krallenglied (wie 40 : 50). A e d o e a g u s (Abb. 41—42) bei einem 21,5 mm großen ♂ 9,6 mm, die Länge der Parameren und der Basalplatte verhält sich wie 154 : 54, Parameren 3,73mal so lang wie breit. — L ä n g e : 15,5—21,5 mm.

Nahe verwandte Art ist *G. masumotoi* sp. n., welche beim ♂ sehr ähnliche äußere Geschlechtsmerkmale hat, d. h. die Mittelschienen des ♂ dünn, die Basis eingeschnürt und innen mit scharfer Leiste versehen. *G. masumotoi* besitzt aber abweichende Paramerenform, namentlich ist das Ende scharf zugespitzt, außerdem ähnelt die Skulptur der Flügeldecken *G. mirabilis* sp. n., ihr Körper ist aber robuster und die punktierten Eindrücke bedeutend breiter und tiefer.

Diese charakteristische neue Art soll meinem Kollegen, M. D. J. BRENDELL (British Museum) gewidmet sein, der mich ständig bei meiner Arbeit mit Untersuchungsmaterial unterstützt hat.

Gigantopigeus masumotoi sp. n. (Tafel II, Abb. 3)

H o l o t y p u s ♂: Malaya, Grong Sasar, 2. IV. 1976, Y. MIYATAKE (Coll. K. MASUMOTO). — P a r a t y p u s ♂: wie Holotypus (ex Coll. K. MASUMOTO im Ungarischen Naturwissenschaftlichen Museum).

Körper sehr gestreckt, schwarzgrün bis blau-bronzefarben, die Tarsen sind schwarzblau. Fühler und Palpen schwarz, Schenkelbasis dunkelbraun. K o p f mit schmalen Augenfurchen, Stirn flach, grob und dicht punktiert, Clypealsutur scharf eingeschnitten, Clypeus gleichmäßig und feiner punktiert. Die Breite am Hals, an den Augen, an der Basis der Wangen und am Ausschnitt zwischen Clypeus und Wangen, schließlich die der Stirn verhält sich wie 59 : 75 : 69 : 40 : 30. F ü h l e r dünn, hintergelegt die Basis des Halsschildes überragend, das 3. Glied nicht länger als das 4., das 8. das breiteste, das Endglied 2,66mal so lang wie die Breite. Die Länge der Glieder 1—11 beim ♂ verhält sich wie 25 : 18 : 50 : 50 : 57 : 53 : 56 : 60 : 58 : 58 : 80 und die Breite wie 18 : 16 : 17 : 18 : 20 : 24 : 28 : 33 : 30 : 30 : 30. H a l s s c h i l d merklich länger als breit, die Spuren des Seitenrandes vorn und die des Vorderrandes seitlich erkennbar. Sehr grob und ungleich verteilt punktiert, die Abstände der Punkte in der Scheibe sind gewölbt und glatt, größer als die Punkte selbst. Die Punkte tragen lange, dünne, anliegende Haare. F l ü g e l d e c k e n gestreckt, 2,7mal so lang wie die Breite an den Schulterbeulen und viermal so lang wie der Halsschild. Das Ende mit je einem dornförmigen Zahn, Oberseite mit seichten, meist rundlichen oder ovalen, nur stellenweise längeren Eindrücken, in welchen die Reste der Reihenpunkte als feine Punkte sichtbar sind; sie erscheint kahl und der Grund glänzend. U n t e r s e i t e dicht und lang, anliegend behaart. Prosternalfortsatz hinter den Hüften in einem großen Zahn vorgezogen, zwischen den Hüften nach vorn und hinten geneigt, die Mitte eingedrückt, Propleuren sehr dicht und grob gerunzelt punktiert. Hinterbrust und Seiten der Abdominalsegmente dicht und erloschen punktiert, das Analsegment am Ende leicht abgeflacht, glatt und kahl. B e i n e

lang, Schenkel stark gekeult, dicht und fein punktiert. Vorderschenkel innen vor dem Ende mit kleinem, rechtwinkligem Winkel. Vorderschienen dünn, innen mit sehr scharfem, spitzigem Zahn, die Räume zwischen Ende der Schienen und Zahn sowie Zahn und Basis verhalten sich wie 65 : 35, er steht also näher zur Basis; Innenrand vom Zahn bis Ende mit scharfer Leiste, ebenso wie bei den Mittelschienen. Die gesamte Länge der Vordertarsen 1—4 und die des Krallengliedes verhalten sich wie 52 : 42, das 1. Glied der Hintertarsen kürzer als das Klauenglied, wie 40 : 50. A e d o e a g u s (Abb. 43—44) sehr lang, bei einem 28 mm großen Tier 11 mm lang, bei Seitenansicht zweimal s-förmig leicht gebogen, Parameren scharf zugespitzt. — L ä n g e : 22—23 mm.

Aufgrund der Mittelschienen des ♂ ist sie mit *G. brendelli* sp. n. am nächsten verwandt; bei ihr ist die Penisspitze einfach zugespitzt, kürzer, die Skulptur der Flügeldecken abweichend, d. h. sie hat an den Flügeldecken keine flachen Eindrücke mit feiner Punktierung und Behaarung, sondern spärlich stehende, kurze Längsstriche oder Punkte mit sogar fast grübchenförmigen Vertiefungen. Die Skulptur der Decken ähnelt *G. mirabilis* sp. n., welche Art deutlich robuster ist, außerdem die Eindrücke der Decken tiefer, dicht behaart, dichter stehend und die Räume zwischen den Eindrücken mehr gewölbt. Bei *mirabilis* ist die Mittelschiene des ♂ abweichend, sie besitzt nämlich nahe der Basis eine lamellenartige, scharfe Erweiterung.

Ich dediziere die neue Art Herrn KIMIO MASUMOTO (Kyoto), der durch die Forschung der taiwanischen Tenebrionidenfauna große Verdienste erworben hat.

Die 5 neue *Gigantopigeus*-Arten lassen sich voneinander folgenderweise trennen:

1 (8) Das 3. Fühlerglied merklich länger als das 4.
2 (7) Mittelschienen des ♂ innen an der Basis leicht ausgeschweift. Flügeldecken mit in Reihen geordneten Punkten, ohne flache, große Vertiefungen.
3 (4) Oberseite der Vorderschienen abgeflacht, deshalb ist die obere Außenseite stumpf gekielt. Punktreihen der Flügeldecken normal, innen und am Ende fein, vorn und außen gröber. Körper sehr gestreckt. — Länge: 21,5—28 mm **bremeri** sp. n.
4 (3) Oberseite der Vorderschienen der Quere nach gewölbt, Außenseite ohne stumpfen Kiel.
5 (6) Flügeldecken mit normal groben Punktreihen, in der 8. Punktreihe mit etwa 40—50 Punkten. Die Zwischenräume wegen der groben und großen Punkte schmal und gewölbt, nicht gleichmäßig gewölbt. — Länge: 14,5—20 mm **malayanus** sp. n.
6 (5) Flügeldecken mit sehr spärlichen, rundlichen, manchmal strichförmigen Punkten, welche in großem Unfang eingedrückt sind, deshalb sind die Zwischenräume uneben. In der 8. Punktreihe befinden sich etwa 25 Punkte. — Länge 15,5—21,5 mm **brendelli** sp. n.
7 (2) Mittelschienen des ♂ vor der Basis unten mit einer scharfen, vorn eckiger, nach oben gebogener Lamelle. Flügeldecken mit großen, flachen Vertiefungen, welche fein behaart und punktiert sind. Große, robuste Art. — Länge: 22—28 mm **mirabilis** sp. n.
8 (1) Das 3. Fühlerglied genauso lang wie das 4. Glied. Mittelschienen des ♂ innen an der Basis leicht ausgerandet. Vorderschienen oben nicht abgeflacht. Flügeldecken mit rundlichen oder ovalen, seichten Eindrücken, welche punktiert sind, dazwischen sind die Zwischenräume ohne Reihenpunkte. — Länge: 22—23 mm **masumotoi** sp. n.

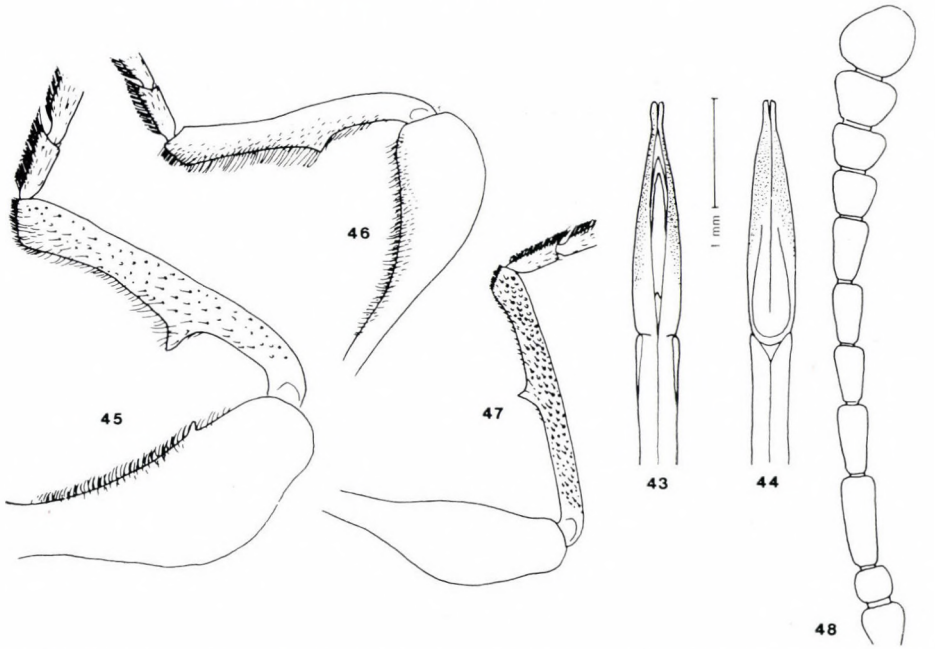

Abb. 43—44 = *Gigantopigeus masumotoi* gen. n., sp. n. Parameren von unten (43) und von oben (44). — Abb. 45—46 = *Dentatoploedipus sembilanicus* gen. n., sp. n. Vorderbein des ♂ (45) und Mittelbein des ♂ (46). — Abb. 47 = *Pigeostrongylium kedahense* gen. n., sp. n. Vorderbein des ♂. — Abb. 48 = *Pigeocaulinus sumatranus* gen. n., sp. n. Fühler des ♂

7. Gattung **Dentatoploedipus** gen. n.

Gattungstypus: *Dentatoploedipus sembilanicus* sp. n.

Sie steht der Gattung *Hoploedipus* FAIRMAIRE, 1898 sehr nahe, unterscheidet sich von ihr vor allem durch die beim ♂ scharf gezähnten Mittelschienen an der Innenseite nahe der Mitte. Die wichtigsten Charaktere sind folgende: zwischen Clypeus und Oberlippe mit breiter Gelenkshaut; Kopf mit tiefer, schmaler Augenfurche; große Augen und schmale Stirn beim ♂; ungerandete Halsschildseiten, dick gerandete Halsschildbasis, seitlich strichförmig gerandeter Vorderrand; schmale Flügeldecken mit vorstehenden Schulterbeulen; regelmäßige Punktreihen der Flügeldecken und vorn scharf gerandete Epipleuren; dicht behaarte Unterseite; beim ♂ unten stark gebogene und abstehend behaarte Schenkel (Abb. 45—46); gezähnte Vorderschenkel; gezähnte Vorder- und Mittelschienen des ♂ (ob auch beim ♀?); erweiterte und unten filzartig behaarte Tarsen; lange Fühler, beim ♂ gestreckte Endglieder.

Diese Gattung ist vor allem durch die Schenkelform aller Beine sowie die Zähne der Vorder- und Mittelschienen gekennzeichnet. Der nächstverwandte *Hoploedipus* enthält keinen Zahn an den Mittelschienen, außerdem die Schenkel unten unbehaart und nicht ausgebogen.

Hierher gehört nur eine unbeschriebene Art.

Dentatoploedipus sembilanicus sp. n. (Tafel I, Abb. 2)

Holotypus ♂: Malay Penin., West-coast, Sembilan & Slam & Pulau Rumbia, 10. III. 1926, S. SEIMUND (ex F. M. S. Museum, im British Museum).

Gestreckt, Körper schwarzbraun metallisch mit Bronzeglanz, Beine bräunlich mit metallischem Schimmer. Fühler und Palpen dunkelbraun. Kopf mit auffallend großen Augen, Stirn flach und so breit wie ein Auge, sehr dicht, gedrängt, fast gerunzelt punktiert. Clypealsutur kaum eingeschnitten. Augenfurche schmal und nur hinter den Augen tiefer. Zwischen Clypeus und Wangen dreieckig ausgeschnitten. Die Breite am Hals, an den Augen, an der Wangenbasis und am Ausschnitt zwischen Clypeus und Wangen sowie an der Stirn verhält sich wie 65 : 75 : 64 : 40 : 25. Fühler des ♂ sehr dünn, das Endglied 4,35mal so lang wie die Breite. Die Länge der Glieder 1—11 verhält sich wie 25 : 20 : 45 : 52 : 55 : 55 : 58 : 70 : 68 : 75 : 100 und die Breite wie 22 : 18 : 19 : 20 : 20 : 25 : 25 : 25 : 23 : 23 : 23. Halsschild etwas glockenförmig, der Quere nach stark gewölbt, etwa so lang wie breit (25 : 26), vorn gerundet verengt. Oberseite sehr grob und dicht punktiert, die Punktierung ist aber nur stellenweise eng aneinander gedrückt, der Grund glänzend, die Punkte tragen je ein kurzes Härchen. Flügeldecken kahl, gestreckt, 2,7mal so lang wie die Breite an den Schulterecken und 3,5mal so lang wie der Halsschild. Mit einfachen Punktreihen und fast flachen Zwischenräumen, die Punktierung vorn und seitlich gröber; in der 8. Punktreihe befinden sich etwa 50 Punkte. Die sekundäre Punktreihe zwischen der 8. und 9. ist gut ausgebildet, der Rand der Epipleuren auch vorn an den Schultern scharf. Unterseite anliegend dicht weißgelb behaart. Prosternalfortsatz scharf, eckig vorgezogen, zwischen den Hüften eingedrückt, nach vorn und hinten geneigt. Propleuren grob und dicht einzeln punktiert, jeder Punkt trägt ein langes, dünnes, helles, anliegendes Haar. Letztes Abdominalsegment nur am äußersten Ende schmal, kahl und glatt, nicht eingedrückt. Beine kräftig, Schenkel scharf gekeult, alle Schenkel unten breit gebogen und dicht, abstehend, hell behaart, Oberseite der Schenkel kahl und nur äußerst fein, spärlich punktiert. Vorderschienen (Abb. 45) gerade, Außen- und Oberseite querüber gewölbt, Innenrand näher zur Basis als zum Ende mit einem sehr scharfen, dornförmigen Zahn, die Räume vom Ende bis zum Zahn und vom Zahn bis zur Basis verhalten sich wie 53 : 29; Innenrand bis zur Basis mit scharfer Leiste, ober- und unterhalb dieser Leiste gelb, lang abstehend behaart. Mittelschienen (Abb. 46) des ♂ (auch die des ♀?) mit einem schwächeren, breiten, stumpfen, eckigen Zahn, welcher der Basis zu etwas näher steht als dem Ende zu, Innenrand mit Leiste, daneben lang abstehend behaart; Hinterschienen etwas aufwärts gebogen, einfach. Tarsen lang, das Endglied der Vordertarsen kürzer als die vorangehenden 4 Glieder zusammengenommen (wie 52 : 63), die Hintertarsen länger als das 1. Glied (wie 48 : 30). Aedoeagus ist nicht untersucht. — Länge: 20 mm.

8. Gattung **Pigeostrongylium** gen. n.

Gattungstypus: *Pigeostrongylium kedahense* sp. n.

Einer kleinen *Strongylium* sehr ähnlich. Sie ist charakterisiert durch folgende Merkmale: Kopf mit schmalen, tiefen Augenfurchen; Augen stark vortretend, Wangen breit abgerundet und wo die gebogene Stirnlinie einmündet, zwischen Clypeus und Wangen, eckig ausgerandet; zwischen Clypeus und Oberlippe eine glänzende, schmale Gelenkshaut sichtbar (Abb. 49); Halsschild nur an der Basis gerandet, Vorderrand und Seitenrand ungerandet; Flügeldecken mit Punktreihen resp. Punktstreifen; Nahtwinkel der Flügeldecken sehr scharf, aber ohne ausgesprochenen Dorn; Epipleuren der Flügeldecken scharf gerandet; eine sekundäre Punktreihe zwischen der 8. und 9. Reihe vorn seitlich bei der Schulterbeule vorhanden; Prosternum ziemlich flach, zwischen den Hüften nach vorn und hinten kaum geneigt; Unterseite dicht anliegend behaart; letztes Abdominalsegment beim ♂ einfach; Fühler (Abb. 50) beim ♂ länger, beim ♀ kürzer, die 4 letzten Glieder des ♂ gestreckt, beim ♀ kurz und das Endglied rundlich; Schenkel gekeult, alle Schenkel ungezähnt; Schienen lang und dünn, Vorderschienen (Abb. 47) bei beiden Geschlechtern innen mit scharfem Zahn; Tarsen lang und das Klauenglied kräftig, Tarsenglieder unten dicht behaart, sie sind leicht erweitert.

Die Gattung dieser Gruppe ist vor allem durch die ungezähnten Schenkel und gezähnten Vorderschienen gekennzeichnet und deshalb von allen übrigen Gattungen verschieden.

Pigeostrongylium kedahense sp. n. (Tafel I, Abb. 3)

H o l o t y p u s ♂: »Perak M^{ts}«, DOHERTY, FRY Coll. 1905-100 (British Museum). — P a r a t y p e n : wie Holotypus (2 ♀, British Museum); Malay Penin., Kedah Peah, 3300 ft, 25. III. 1928, H. M. PENDLEBURY (1 ♂, ex F. M. S. Museum, im British Museum), id., 3300—3950 ft, 11. III. 1928, H. M. PENDLEBURY (1 ♀, F. M. S. Museum, im British Museum), id., 3950 ft, 29. III. 1928, H. M. PENDLEBURY (ex F. M. S. Museum, im British Museum).

Dunkel bronzefarben, die Streifen der Zwischenräume mehr grünlich und die Schenkel lebhafter kupferig. Fühler und Palpen sowie die Tarsen schwarz, Mittel- und Hinterschenkel an der Basis bis zur Keule gelbrot, Mittel- und Hinterschienen heller braun, nur das Ende der Schienen dunkel. K o p f (Abb. 49) mit sehr stark vortretenden, außen breit gewölbten Augen. Wangen und Schläfen viel schmaler; Wangen etwas aufgebogen breit gebogen, stark verengt. Clypealsutur kaum eingedrückt. Stirn viel breiter als ein Auge, seicht eingedrückt, sehr dicht, wie die Mitte des Halsschildes punktiert. Die Breite am Hals, an den Augen, an der Wangenwurzel und am Ausschnitt zwischen Clypeus und Wangen, schließlich die der Stirn verhält sich beim ♂ wie 25 : 34 : 29 : 16 : 16, beim ♀ wie 25 : 32 : 26,5 : 17 : 18, d. h. beim ♀ ist die Stirn

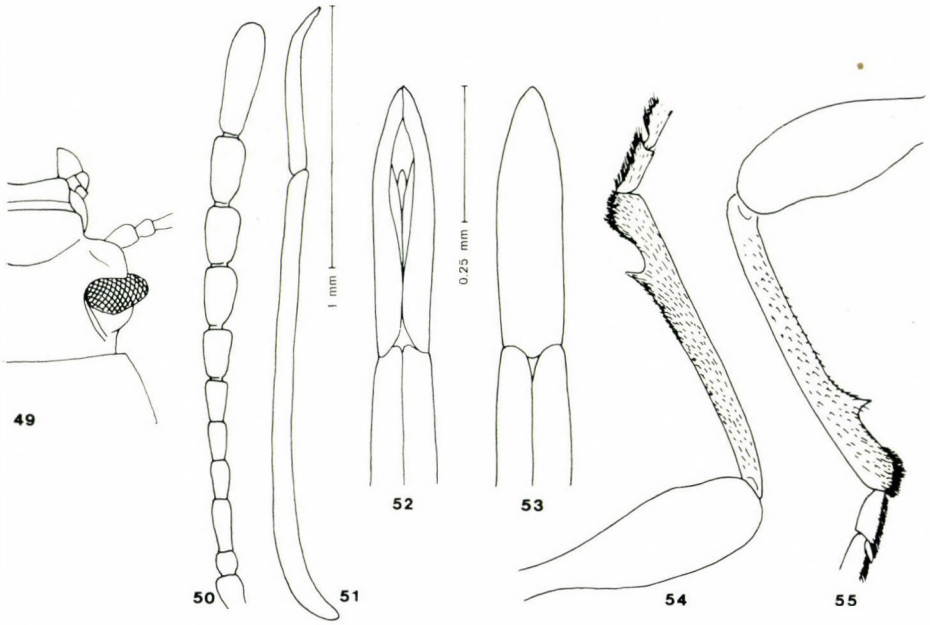

Abb. 49—53 = *Pigeostrongylium kedahense* gen. n., sp. n. Kopf des ♂ (49), Fühler des ♂ (50), Aedoeagus bei Seitenansicht (51), Parameren von unten (52), von oben (53). — Abb. 54—55 = *Leprocaulinus krikkeni* KASZAB Vorderbein des ♂ (54) und Mittelbein des ♂ (55)

breiter. Fühler (Abb. 50) beim ♂ gestreckt, beim ♀ kürzer und am Ende allmählich breiter; Endglied beim ♂ 3,2mal so lang wie breit, beim ♀ kaum länger als breit. Die Länge der Glieder 1—11 verhält sich beim ♂ wie 15 : 10 : 22 : 16 : 16 : 17 : 21 : 25 : 25 : 28 : 48 und die Breite wie 10 : 9 : 8 : 8 : 8,2 : 12 : 14 : 15 : 14 : 14 : 15; die drei letzten Glieder des ♀ sind kurz, die Länge wie 9 : 10 : 20 und die Breite wie 13 : 13 : 19. Halsschild breiter als lang (wie 36 : 40), von der Mitte an stärker nach vorn verengt, die Scheibe vor der Basis leicht quer eingedrückt, äußerst dicht, aneinandergedrückt punktiert, jeder Punkt trägt ein kurzes, dunkles Härchen. Flügeldecken 2,2mal so lang wie die Breite an den Schulterbeulen, nach hinten sind die Flügeldecken deutlich breiter, im hinteren Viertel am breitesten; 3,3mal so lang wie der Halsschild. Die Breite am hinteren Viertel, an den Schulterbeulen, an der Halsschildbasis und am Kopf bei den Augen verhält sich wie 62 : 54 : 40 : 34. Oberseite mit regelmäßigen Punktreihen, am Absturz und innen mit Punktstreifen; die Punkte von der 3. Reihe an grob, sie nehmen fast die ganzen Zwischenräume ein, so daß sie gerunzelt erscheinen; die inneren Zwischenräume und am Absturz einfach gewölbt, mit äußerst feiner, heller Behaarung. Der Grund fein und dicht punktiert, besonders die inneren Zwischenräume hinter der Mitte. Unterseite dicht anliegend weißlich behaart. Propleuren sehr dicht runzelig punktiert. Prosternum ziemlich flach, zwischen den

Hüften nach vorn und hinten wenig geneigt, Prosternalfortsatz flach, kurz dreieckig ausgezogen. Mittelbrust in der Mitte leicht eingedrückt. Hinterbrust lang, sehr dicht und fein etwas raspelartig punktiert, ebenso wie das Abdomen. Beine lang und kräftig, Schenkel stark gekeult, die Basis der Schenkel dünn, Oberfläche dicht punktiert, Vorderschenkel ohne Zahn. Schienen dünn, Vorderschienen (Abb. 47) innen mit einem sehr scharfen Zahn; die Räume zwischen Schienenende und Zahn sowie Zahn und Basis verhalten sich wie 52 : 60, er steht also von der Mitte ab näher zur Spitze. Tarsen lang, das Krallenglied aller Tarsen kräftig; bei den Vordertarsen ist die Länge der Glieder 1—4 und 5 wie 54 : 57, das Krallenglied also länger als die vorangehenden 4 Glieder gemeinsam, bei den Hintertarsen verhalten sich die Glieder 1—3 und 4 wie 67 : 55, das Krallenglied also kürzer. Aedoeagus (Abb. 51—53) 2,5 mm, die Länge der Parameren und der Basalplatte verhält sich wie 36 : 130, Parameren 2,4mal so lang wie die Breite. — Länge: 6,5—6,9 mm.

Nächstverwandte Art ist *P. pendleburyi* sp. n. Die Unterschiede sind groß, vor allem in der Skulptur der Flügeldecken, wie aus der folgenden Beschreibung zu sehen ist.

Pigeostrongylium pendleburyi sp. n.

Holotypus ♀: Pahang F. M. S., Gunong Tahan, Padang Sebrang, 4900 ft, 22. XII. 1922, H. M. PENDLEBURY (ex F. M. S. Museum, im British Museum).

Körper einfarbig braun, metallisch, oben und unten silberweiß dicht behaart, besonders der Halsschild und die Unterseite und auch die Beine. Fühler zur Spitze allmählich dunkler. Schenkelkeulen mit kupferigem Glanz. Kopf mit vorstehenden, gewölbten Augen; Wangen aufgebogen und breit gerundet verengt. Stirn breiter als Clypeus, fast flach, sehr dicht, fein und runzelig punktiert. Die Breite am Hals, an den Augen, an der Basis der Wangen und an der Ausrandung zwischen Clypeus und Wangen, schließlich die der Stirn verhält sich wie 32 : 40 : 34 : 19 : 21,5. Fühler kurz, hintergelegt die Basis des Halsschildes nicht erreichend, die 4 Endglieder bilden eine Keule (♀). Die Länge der Glieder 1—11 verhält sich beim ♀ wie 12 : 10 : 17 : 15 : 14 : 14 : 14 : 14 : 13 : 13 : 18 und die Breite wie 10,5 : 7 : 7 : 8 : 9 : 10 : 12 : 15 : 16 : 18 : 20, das Endglied kurzoval, etwas breiter als lang. Halsschild etwas breiter als lang (wie 50 : 47), in der Mitte am breitesten, nach vorn stärker, nach hinten weniger verengt, faßförmig; die Mitte der Länge nach und die Basis in der Quere etwas eingedrückt. Oberseite sehr dicht runzelig punktiert, die Behaarung ist auch auffallend. Flügeldecken 2,5mal so lang wie der Halsschild. Oberfläche mit mehreren flachen Eindrücken: im vorderen Viertel befindet sich ein sich schräg nach vorn ziehender Eindruck, welcher die inneren 6 Zwischenräume einbezieht; weit vor dem

Ende, beim Zusammenlaufen der Punktreihen 3—6 ist eine breite Verflachung, daneben sind die Zwischenräume 3 und 7 gewölbt und glänzend; außerdem ist die Naht in der Mitte zweimal leicht verflacht, der Seitenrand etwas vor der Mitte und der 6. Zwischenraum in der Mitte leicht eingedrückt, aber nicht flach. Vorn und am Absturz, weiters in den inneren Punktreihen mit feinen Punkten, in der Mitte sind die Reihen von der 4. an, vor allem die 5., 6. und 7. grob und ungleich punktiert. Oberseite dicht behaart, vor dem Ende, an der Verflachung ist die Behaarung auffallend dicht. Epipleuren der Flügeldecken gerunzelt. U n t e r s e i t e sehr dicht behaart, wie beim Gattungscharakter. B e i n e wenig lang, auch die Schenkelkeule dicht behaart. Basis der Mittel- und Hinterschenkel nicht gelbrot, die Beine sehr dicht punktiert. Vorderschienen innen mit scharfem Zahn, die Räume zwischen Zahn und Schienenende und Zahn und Basis verhalten sich wie 17 : 26, der Zahn steht also viel näher zur Spitze als zur Basis. Tarsen kräftig, die Länge der Glieder 1—4 der Vordertarsen und des Krallengliedes verhält sich wie 20 : 20, bei den Hintertarsen Glieder 1—3 und Krallenglied wie 28 : 21. — L ä n g e : 9 mm.

Nahe verwandt mit *P. kedahense* sp. n., bei dieser Art sind aber die Basis der Mittel- und Hinterschenkel gelbrot. Flügeldecken ohne flache Eindrücke, mit einfacher Skulptur und oben sehr feiner Punktierung.

Diese Art sei zum Andenken Herrn H. M. PENDLEBURY gewidmet, der in der Erforschung der Malayischen Halbinsel große Verdienste erworben hat.

9. Gattung **Pigeocaulinus** gen. n.

Gattungstypus: *Pigeocaulinus sumatranus* sp. n.

Nächstverwandt mit *Leprocaulinus* KASZAB, 1982 und durch folgende Merkmale charakterisiert: Kopf ohne Augenfurche; Stirn breit und flach; zwischen Clypeus und Oberlippe ist keine glänzende Gelenkshaut sichtbar; Fühler (Abb. 48) vom 8. Glied an allmählich erweitert, Endglied das breiteste, rundlich; Halsschild ohne abgesetzten Seiten- und Vorderrand, auch der Basalrand erloschen; Flügeldecken mit vortretenden Schulterbeulen; Nahtecke der Flügeldecken scharf, jedoch ohne Zahn; Oberseite mit feinen Punktreihen, nur die Nahtstreifen am Ende eingedrückt, die übrigen sind vollkommen flach, ebenso punktiert wie die Reihenpunkte, deshalb kann man die 9. Punktreihe kaum erkennen; in den Zwischenräumen gibt es spärlich stehende rundliche, glänzende Körnchen; Epipleuren der Flügeldecken scharf gerandet, am hinteren Drittel durch den seitlichen Zwischenraum überwölbt; Ober- und Unterseite schuppenförmig behaart; Prosternum zwischen den Hüften nach vorn und hinten kaum geneigt; Schenkel stark gekeult, Vorderschenkel ohne Zahn; Schienen gerade, nicht gezähnt; Tarsen kaum erweitert und unten dicht behaart.

Hierher gehört nur eine einzige Art. Der Gattung *Leprocaulinus* KASZAB, 1982 sehr ähnlich, sie besitzt ebenfalls keine Gelenkshaut zwischen Clypeus und Oberlippe, keine Augenfurchen, keinen Zahn an den Vorderschenkeln, ähnliche Flügeldecken und Halsschildform, aber Vorder- und Mittelschienen vor dem Ende mit je einem sehr scharfen Zahn versehen.

Pigeocaulinus sumatranus sp. n.

Holotypus ♂: Sumatra, Medan (Ungarisches Naturwissenschaftliches Museum). — Paratypus ♀: Sumatra, Umg. Dolok-Baros (Ungarisches Naturwissenschaftliches Museum).

Körper braunschwarz, manchmal ist die Naht der Flügeldecken und der Absturz heller braun, Beine und Fühler sowie die Palpen braun. Kopf mit ziemlich kleinen Augen und breiter Stirn, letztere etwas mehr als doppelt so breit wie ein Auge, flach, grob gerunzelt. Die Breite an der Stirn, am Hals und an den Augen verhält sich wie 22 : 34 : 42. Bei reinen Exemplaren ist die Oberfläche anliegend gelbbraun, dicht und fast schuppenartig behaart. Fühler (Abb. 48) hintergelegt die Mitte des Halsschildes kaum überragend, vom 8. Glied an bildet sich eine schwach abgesetzte Keule. Die Länge der Glieder 1—11 verhält sich wie 13 : 10 : 25 : 20 : 16 : 17 : 18 : 13 : 12 : 14 : 20 und die Breite wie 12 : 11 : 10 : 9 : 9 : 9 : 10 : 13 : 15 : 18 : 20; das Endglied rundlich und dick. Halsschild kaum breiter als lang (wie 53 : 55), sehr leicht glockenförmig, die Basis breit und sehr leicht quer verflacht. Vorderecken stumpf, seitlich und vorn keine Randung vorhanden. Oberfläche in der Mitte sehr grob gedrängt punktiert, gegen die Seiten gerunzelt-punktiert und die Seiten punktiert-gerunzelt-gekörnt. Bei einem reinen Exemplar ist die Oberfläche wie der Kopf anliegend schuppenartig behaart, die Schuppenhaare sind sich nach hinten gerichtet, ausgenommen die Scheibe beiderseits der Mitte, wo sie je ein Sternchen bilden. Flügeldecken 1,43mal so lang wie die Breite an den scharf vortretenden Schulterbeulen; nach hinten sind sie erweitert, die größte Breite hinten, die Breite an den Schulterbeulen, am Halsschild an der Basis und der Kopf an den Augen verhalten sich wie 95 : 77 : 55 : 42. Oberseite innen und am Absturz sehr fein, von dem 3. Punktreihe an allmählich stärker und ziemlich ungleich punktiert, von der 3. Zwischenraum an mit verschiedenen großen, rundlichen, glänzenden Körnchen, dazwischen haben die meisten Zwischenräume noch eine unregelmäßige Reihe von sehr spärlichen Mikrokörnchen. Der 7. Zwischenraum vor dem Ende kurz, der 9. Zwischenraum von der Mitte an fast kielförmig und überwölbt den Seitenrand der Epipleuren. Am Absturz ist der Raum zwischen der 4. bis zur 7. Punktreihe abgeflacht, es befindet sich am Vorderrand der Verflachung im 3. Zwischenraum ein sehr kleines, im 4. und 6. je ein größeres Körnchen,

welche mit dichteren, weißgelben Schuppenhaaren umgeben sind. Stellenweise ist die Behaarung auch außerhalb dieser Körnchen dichter, die Verflachung am Absturz fast kahl. U n t e r s e i t e ebenfalls dicht schuppenartig behaart. Propleuren grob gerunzelt punktiert-gekörnt und Prosternum wie beim Gattungscharakter, Hinterbrust und Abdomen grob und dicht behaart. B e i n e sehr grob, fast runzelig punktiert. Schenkel ungezähnt, Schienen auch beim ♂ einfach, Vorderschienen innen vor dem Ende kaum merklich ausgeschweift, das Ende kurz, dicht behaart. Die Länge der Glieder der Vordertarsen 1—4 und des Krallengliedes verhält sich wie 21 : 18, bei Hintertarsen die Glieder 1—3 und 4 wie 20 : 18. A e d o e a g u s nicht untersucht. — L ä n g e : 9,2 mm.

10. Gattung *Leprocaulinus* KASZAB, 1982

KASZAB (1982): Acta zool. hung. **28** (1—2): 75.

Gattungstypus: *Leprocaulinus krikkeni* KASZAB, 1982.

Diese Gattung ist durch die stark gekeulten Schenkel gekennzeichnet, von welchen auch die Vorderschenkel ungezähnt sind, außerdem die Vorder- und Mittelschienen vor dem Ende mit je einem sehr scharfen Zahn (Abb. 54—55). Bei dieser Gattung ist zwischen Clypeus und Oberlippe keine glänzende Gelenkshaut vorhanden, außerdem der Halsschild seitlich und vorn ungerandet und die Flügeldecken mit glänzenden, rundlichen Körnchen versehen, dazwischen ist der Grund spärlich punktiert, die Punktreihen aber nur stellenweise erkennbar.

Die Gattung ist bis jetzt monotypisch. Nächstverwandt nur die Gattung *Pigeocaulinus* gen. n., bei welcher die Schienen ungezähnt sind.

Leprocaulinus krikkeni KASZAB, 1982

KASZAB (1982): Acta zool. hung. **28** (1—2): 76, Abb. 17 (Typus: Nord-Sumatra: Bivouak, Mt. Bandahara).

Eine ausführliche Beschreibung von der Gattung und Art ist vor kurzem erschienen, deshalb verzichte ich hier, sie wiederzugeben. — L ä n g e : 7—12 mm.

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Acta Zoologica Hungarica 30 (3—4), pp. 393—444 (1984)

ORIBATIDS OF THE EASTERN PART OF THE ETHIOPIAN REGION (ACARI) VI

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(Received 12 September, 1983)

Thirty three new species are described from Tanzania and from the Republic of South Africa. Six new genera: *Austracarus*, *Cavernozetes*, *Peloptoribula*, *Pocsoppia*, *Tectoppiella*, *Afroleius* are erected.

The above series of papers is aimed to elaborate the Oribatid material deriving from the eastern parts of the Ethiopian Region and not solely from zoogeographical standpoint but also taxonomically and faunistically (MAHUNKA, 1969, 1982—83).

Besides continuing the work on the material from Tanzania I also started to study part of the material coming from the Republic of South Africa. This is all the more advisable since it appears that besides the relations existing with the northern territories, the connections with the south are equally important.

This study gives the description of 33 new species, of which seven represent new genera too. The elaborated materials have been collected partly by DR. T. PÓCS and partly by DR. S. ENDRŐDI. I should like to express my thanks to DR. S. ENDRŐDY-YOUNGA (Pretoria), my friend, who extensively helped me with further materials to be elaborated in the future.

LIST OF LOCALITIES

Afr. 105. — Tanzania, Kilimanjaro, Kibo, 3820 m, 1. VII. 1972, semi-desert area, tussocks of grass, leg. DR. T. PÓCS.

Afr. 117. — Tanzania, Dodoma Region, top of Mt. Kiboriam above Mwapwa town, 1980 m, 11. V. 1972, mats of moss taken from stem of Senecio cottonii, leg. DR. T. PÓCS.

Afr. 179. — Tanzania, Kilimanjaro, Barranco Hut environs, 3900 m, 22. IX. 1972, mats of moss taken from stem of Senecio cottonii, leg. DR. T. PÓCS.

Afr. 115. — Tanzania, Uluguru Mts., Morogoro. Humus taken from a rocky gallery forest behind the Teachers College, 670 m, 9. VII. 1972, leg. DR. T. PÓCS.

S.-Afr. 1. — Rep. South Africa, Cape Prov., Naturés Valley, 30 km E Plettenberg Bay 33°58′ S—23°32′ E, 9. XII. 1977, extracted from mats of moss, leg. DR. S. ENDRŐDI.

E—Y. No. 1310 — Rep. South Africa, Marathon, 34°—23′ 19′ E, 9. XII. 1976, cattle dung, leg. DR. S. ENDRŐDY-YOUNGA.

LOHMANNIIDAE Berlese, 1916

Austracarus gen. n.

Diagnosis. Lohmanniid habitus. All setae thin and simple, partly very long. Sensillus with 5 long branches. Dorsal or ventral neotrichy absent. Genital plates undivided, preanal plate wide. Anal and adanal plates well separated, four pairs of simple adanal and one pair of anal setae present. Femur of legs I and II with a well-developed crista, with a wide spur anteriorly.

Type species: *Austracarus cristatus* sp. n.

Remarks: The new taxon is distinguished from all known Lohmanniidae genera by the shape and chaetotaxy (*4 + 1* ano-adanal formula) of the anogenital region.

Austracarus cristatus sp. n.

Measurements. Length: 943—980 μm, width: 540—550 μm.

Dorsal side (Fig. 1): Rostrum with minute tubercles medially. Behind rostral setae a well observable line transversally. All setae thin, setae *ro* (Fig. 4) with serrated margin, some others with thin velum as in c_3 (Fig. 3). Sensillus (Fig. 2) with long branches. Setae *exa* much shorter and thinner than *exp*. Among notogastral setae great difference existing, setae c_1, c_2, d_1, d_2 nearly equal in length, e_1, e_2 and h_3 slightly shorter, all others much longer.

Ventral side (Fig. 5): Epimeral setal formula: *3—1—3—4*. Setae of mentum and setae *1a* with a fine, serrated marginal velum. All others simple, smooth. Anogenital region also with simple and thin setae, genital setae on inner margin scarcely shorter than outer ones. One pair of anal setae curved inwards.

Material examined: Holotypus (868-HO-83): Afr. 115; 2 paratypes (1 nymph): from the same sample. Holotypus and 1 paratype (868-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

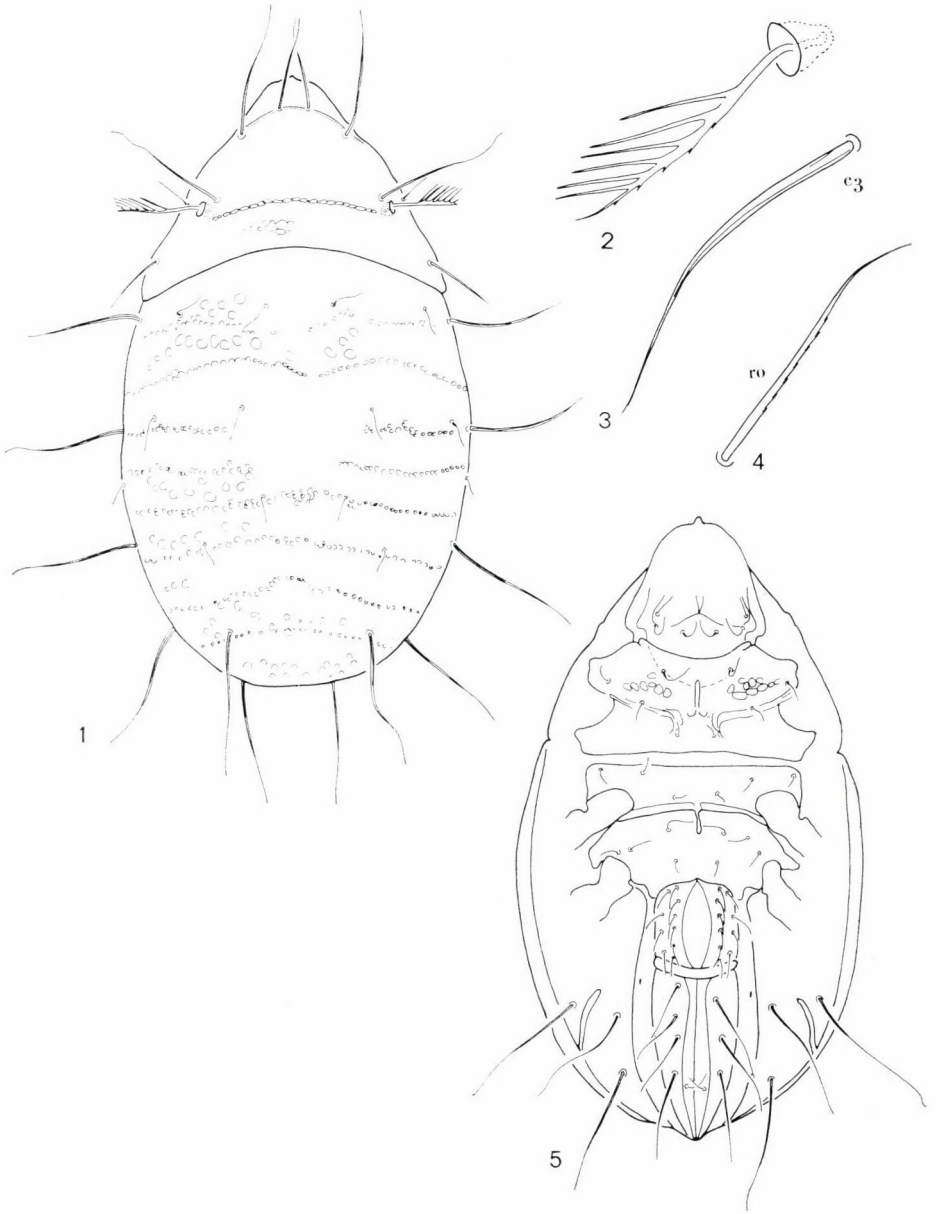
Remarks: On the ground of the generic diagnosis the new species is distinguish well from all known Lohmanniid taxa.

PHTHIRACARIDAE Perty, 1841

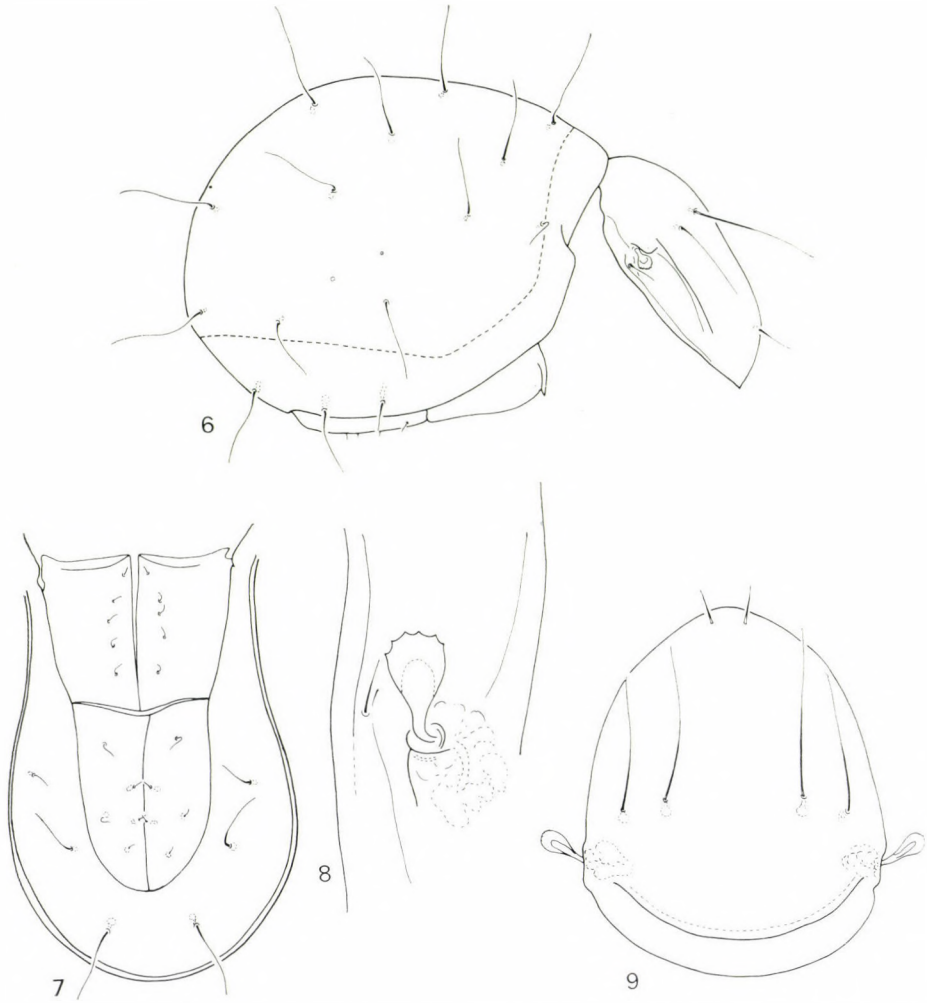
Archiphtiracarus endroedii sp. n.

Measurements. Length of aspis: 216—292 μm, length of notogaster: 356—520 μm, length of notogaster: 264—388 μm.

Aspis (Fig. 9): Slightly convex in lateral view. Two pairs of lateral carina, one of them much stronger than the other. All prodorsal setae long and



Figs 1—5. *Austracarus cristatus* sp. n. — 1 = dorsal side, 2 = sensillus, 3 = seta c_3, 4 = seta *ro*, 5 = ventral side



Figs 6—9. *Archiphthiracarus endroedii* sp. n. — 6 = lateral side, 7 = anogenital region, 8 = bothridial region with sensillus, 9 = aspis

thin, interlamellar ones much longer than lamellar setae. Sensillus short, its head nearly round, with serrated margin anteriorly (Fig. 8).

N o t o g a s t e r (Fig. 6): Surface finely punctate. All fourteen pairs of notogastral setae thin, like hairs. Setae c_1 originating behind collar line, shorter c_3 originating on it.

A n o g e n i t a l r e g i o n (Fig. 7): All five pairs of ano-adanal setae very short and simple.

M a t e r i a l e x a m i n e d : Holotypus (869-HO-83): S.-Afr. l.: 7 paratypes: from the same sample. Holotypus and 4 paratypes (869-PO-83) deposited in the Hungarian Natural

History Museum, Budapest, 2 paratypes in the Transvaal Museum, Pretoria and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

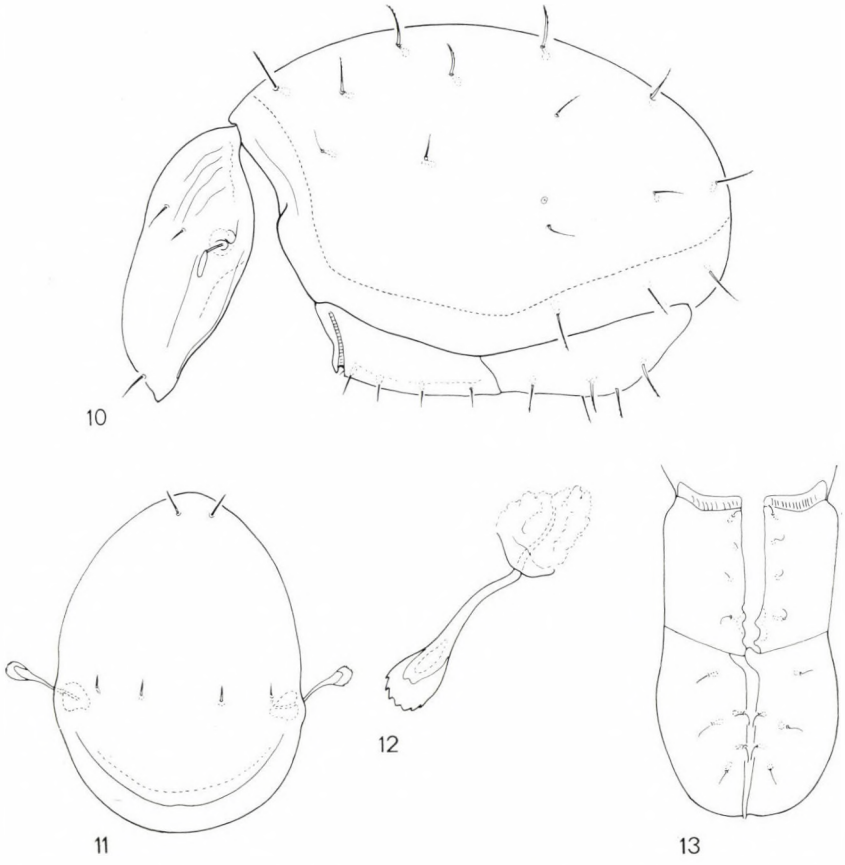
R e m a r k s : On the ground of the characteristic sensillus the new species is well distinguishable from all congerers.

I dedicate the new species to Dr. S. Endrődi (Budapest), the collector of this very rich material.

Hoplophorella austroafricana sp. n.

Measurements. Length of aspis: 222—316 μm, length of notogaster: 310—440 μm, leight of notogaster: 250—316 μm.

A s p i s (Fig. 11): Anterior surface smooth, basally only some rugae observable. Prodorsal setae very short, rostral setae slightly longer than lamel-

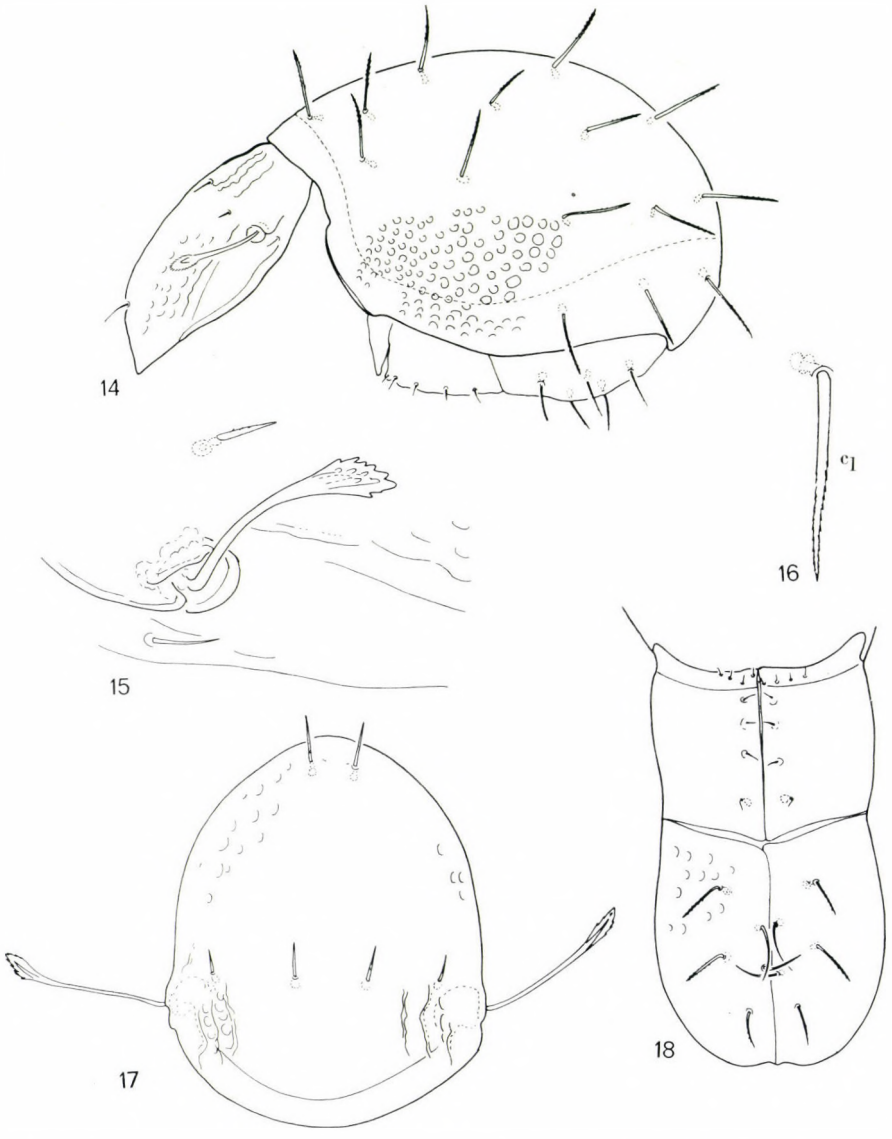


Figs 10—13. *Hoplophorella austroafricana* sp. n. — 10 = lateral side, 11 = aspis, 12 = sensillus, 13 = anogenital region

lar and interlamellar ones. Sensillus (Fig. 12): with comparatively long peduncle and nearly round but serrated head.

Notogaster (Fig. 10): Surface smooth. No great length difference among notogastral setae, all comparatively short, but thick and finely ciliate.

Anogenital region (Fig. 13): Ano-adanal setae similar to notogastral ones.



Figs 14—18. *Hoplophorella endroedyyoungai* sp. n. — 14 = lateral side, 15 = bothridial region with sensillus, 16 = seta c_1, 17 = aspis, 18 = anogenital region

Material examined: Holotypus (870-HO-83): S.-Afr. 1.: 9 paratypus: from the same sample. Holotypus and 6 paratypes (870-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Transvaal Museum, Pretoria and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well characterized by its smooth surface, the round sensillus and the equal length of the notogastral and ano-adanal setae. By these features it is distinguished from all congeners.

Hoplophorella endroedyyoungai sp. n.

Measurements. Length of aspis: 176 μm, length of notogaster: 308 μm, height of notogaster: 200 μm.

Aspis (Fig. 17): All prodorsal setae short, rostral ones slightly longer than the others. Two lateral carinae present on each side, chitinous crest absent. Sensillus (Fig. 15) very long, with dilated and serrated head. Surface ornamented by foveolae anteriorly and some rugae basally.

Notogaster (Fig. 14): Strong ornamentation consisting of large foveolae. Fifteen pairs of strong, erect notogastral setae (Fig. 16), their distal part well ciliated or squamosed.

Anogenital region (Fig. 18): All ano-adanal setae similar to notogastral ones, only slightly shorter.

Material examined: Holotypus (871-HO-83): S.-Afr. 1., deposited in the Hungarian Natural History Museum, Budapest.

Remarks: The new species is distinguished from all congeners by the characteristic shape of sensillus.

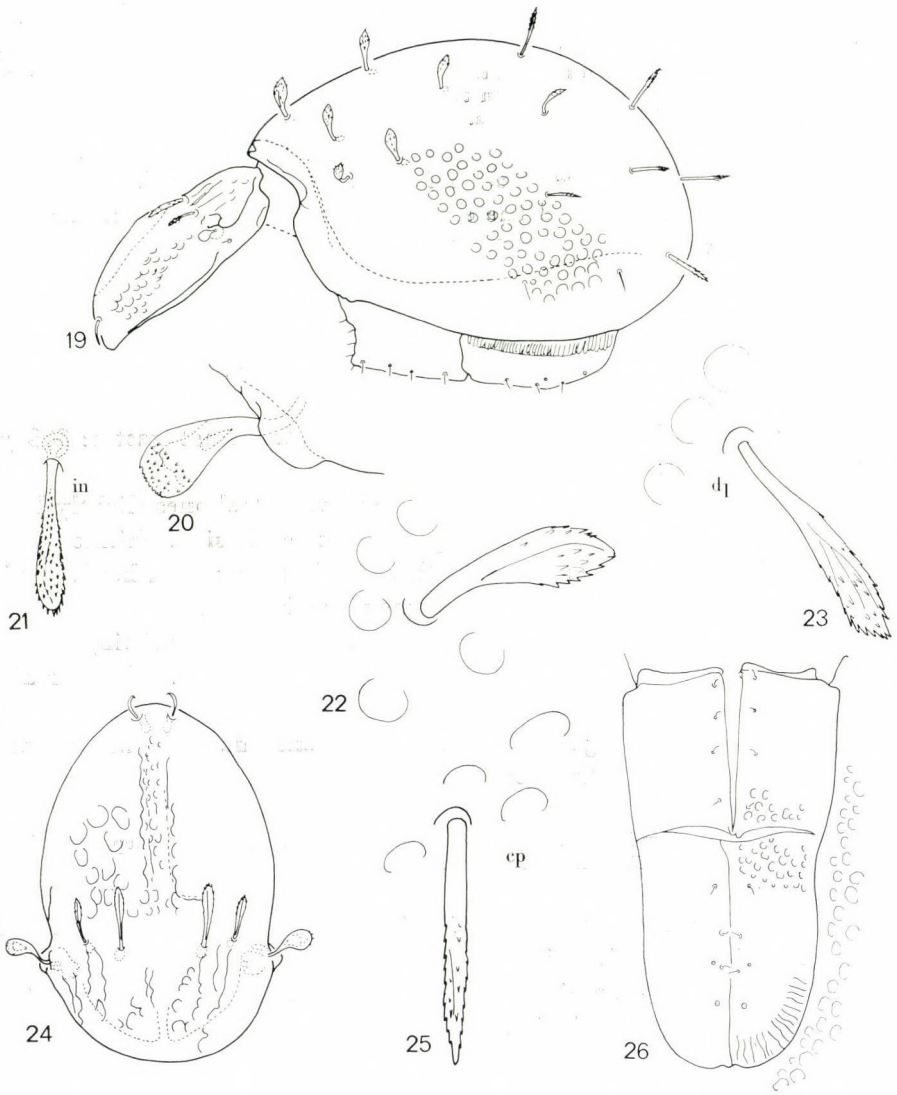
I dedicate the new species to my fried Dr. S. Endrődy-Younga (Pretoria), the renown coleopterologist.

Hoplophorella heterotricha sp. n.

Measurements. Length of aspis: 336—377 μm, length of notogaster: 631—713 μm, height of notogaster: 435—484 μm.

Aspis (Fig. 24): A low crista present. Surface — excepting basal and lateral parts — with great foveolae. Rostral setae slightly, interlamellar (Fig. 21) and lamellar ones strongly dilated, phylliform. Exobothridial setae simple, short. Sensillus (Fig. 20) short, with rounded head, its surface aciculate.

Notogaster (Fig. 19): Surface with strong sculpture. Fifteen, partly phylliform notogastral setae, setae c_1—cp, d_1—d_2, e_1—e_2 spoon-shaped,



Figs 19—26. *Hoplophorella heterotricha* sp. n. — 19 = lateral side, 20 = sensillus, 21 = seta *in*, 22—23 = notogastral setae, 24 = aspis, 25 = seta *cp*, 26 = anogenital region

others slightly dilated, ps_2 and ps_3 only spiniform. All ciliated or serrated marginally (Figs 22, 23, 25).

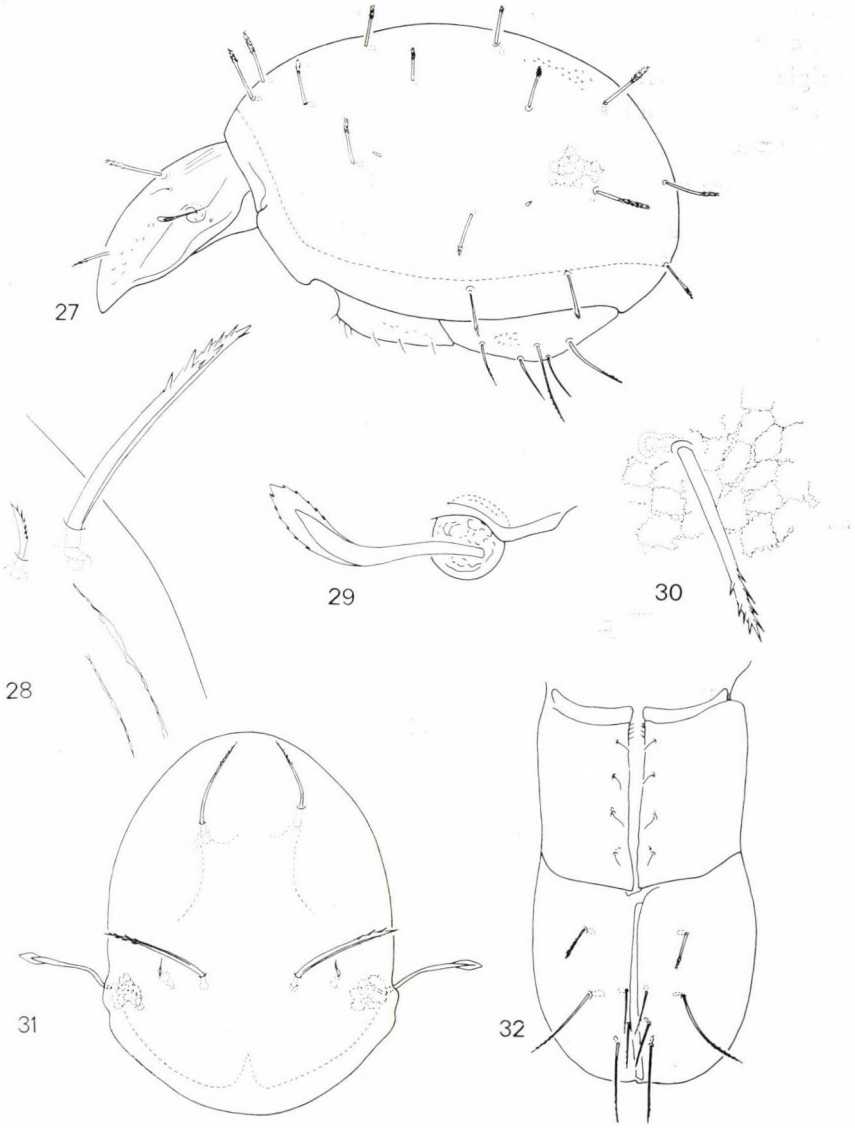
Anogenital region (Fig. 26): Genital plates and anterior part of anal plates foveolated, posterior part of anal plates nearly smooth but with transversal rugae marginally. Ten (!) pairs of genital, five pair of anoadanal setae, but ad_1 and ad_2 represented only by their alveoli!

Material examined: Holotypus (872-HO-83): S.-Afr.; 1 paratype: from the same sample. Holotypus deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The new species is well characterised by the different notogastral setae. The reduced setae ad_1 and ad_2 also unique in this genus.

Hoplophthiracarus brevisetus sp. n.

Measurements. Length of aspis: 295—328 μm, length of notogaster: 607—697 μm, height of notogaster: 377—451 μm.



Figs 27—32. *Hoplophthiracarus brevisetus* sp. n. — 27 = lateral side, 28 = lamellar and interlamellar setae, 29 = sensillus, 30 = notogastral seta, 31 = aspis, 32 = anogenital region

A s p i s (Fig. 31): Evenly convex in lateral view. A weak carina and lateral rim present. Its surface between carinae and rim smooth, foveolated between carinae, also some longitudinal ribs basally. Interlamellar setae rigid and erect, comparatively short, not much longer than rostral ones. Interlamellar setae with some spinules at their distal end, lamellar setae well ciliated (Fig. 28), rostral setae thinner. Sensillus (Fig. 29) with lanceolate head, its margin serrate.

N o t o g a s t e r (Fig. 27): Finely foveolated, visible only in the dorsal margin a fine polygonal ornamentation (Fig. 30) also visible. All notogastral setae rigid, short, with some coarse spines distally.

A n o g e n i t a l r e g i o n (Fig. 32): Both pairs of anal setae only slightly longer than seta ad_3, however, the latter much stronger and more heavily ciliated. Setae ad_1 and ad_2 longer than preceding ones.

M a t e r i a l e x a m i n e d : Holotypus (873-HO-83): Tanzania, Afr. 117: 5 paratypes from the same sample. Holotypus and 4 paratypes (873-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The present species can easily be relegated to the genus *Hoplophthiracarus* on the ground of the erectile interlamellar setae. However, the comparatively short prodorsal and notogastral setae readily distinguish it from the congeners. It stands nearest to *H. loebli* MAHUNKA, 1984 (India) and *H. sacyae* (MAHUNKA, 1983),* but the latter has a sword-shaped sensillus and the sculpture of *H. loebli* consists of well-developed and connecte d foveolae.

Hoplophthiracarus marginatus sp. n.

Measurement. Length of aspis: 410—508 μm, length of notogaster: 820—1025 μm, height of notogaster: 557—722 μm.

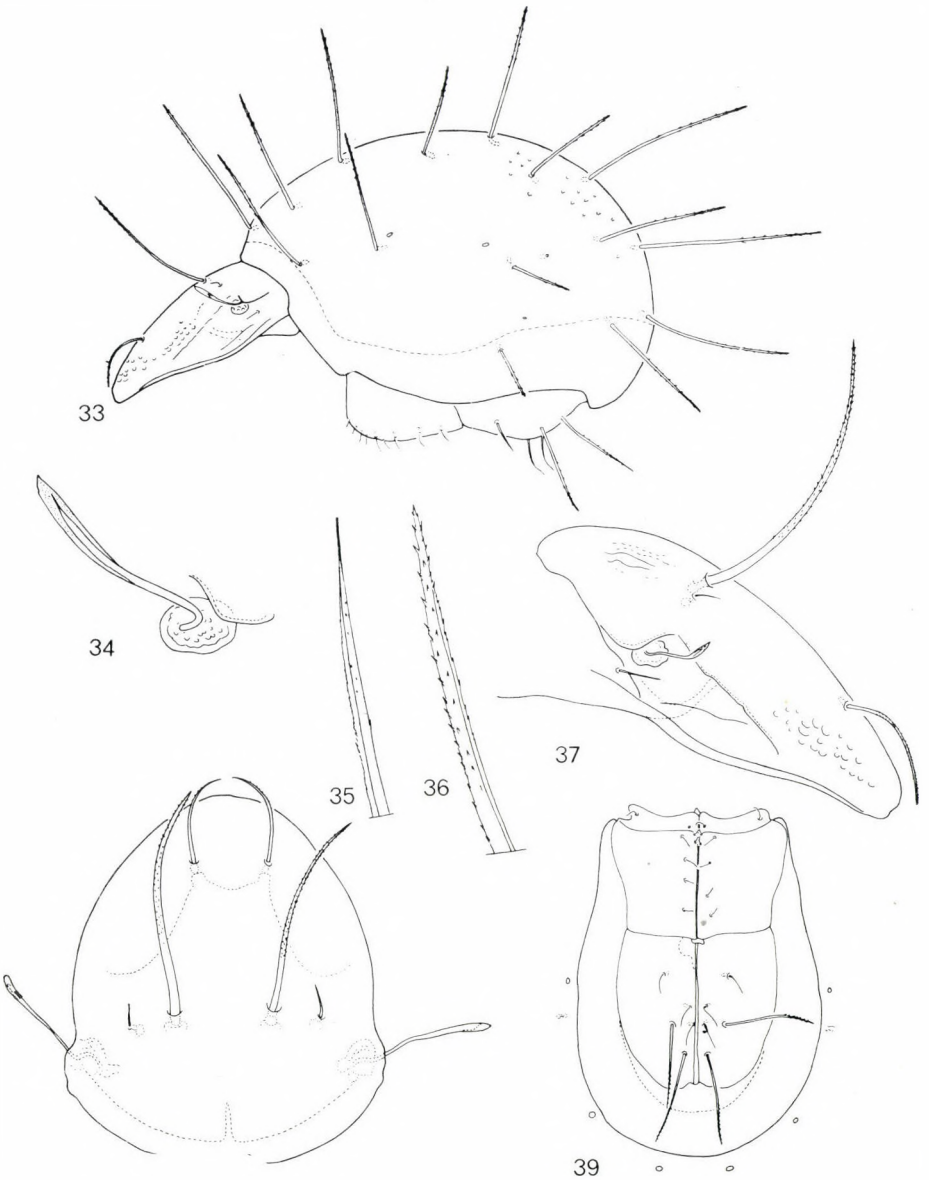
A s p i s (Fig. 38): Slightly convex in lateral view. A weak carina visible on each side, between them surface ornamented with foveolae, lateral part smooth. A lateral rim present. Sensillus (Fig. 34) long, lanceolate, its distal margin finely aciculated. Among prodorsal setae great difference observable, exobothridial setae fine, thin, lamellar setae minute, interbothridial setae long, erect, curved backward, its distal part (Fig. 37) finely ciliated, basal part roughened. Rostral setae curved forward, only roughened.

N o t o g a s t e r (Fig. 33): Only a weak sculpture present consisting of small foveolae. Fifteen pairs of erect and strong notogastral setae present, setae c_1, c_2, c_3 and cp nearly equal in length. Seta h_2 and ps_4 much shorter than

* *Hoplophthiracarus sacyae* (MAHUNKA, 1983) comb. nov. = *Steganacarus sacyae* MAHUNKA, 1983.

the others, h_1 and ps_1 the longest of all. Distal end of setae conical, this part finely ciliated.

A n o g e n i t a l r e g i o n (Fig. 39): Two pairs of anal setae short, smooth, setae ad_3 thicker, but slightly shorter than these two pairs, setae ad_1



Figs 33—39. *Hoplophthiracarus marginatus* sp. n. — 33 = lateral side, 34 = sensillus, 35 = end of seta ad_2, 36 = end of seta *in*, 37 = aspis from lateral side, 38 = aspis, 39 = anogenital region

and ad_2 the longest of all, sharply pointed, with a finely serrated marginal velum (Fig. 35).

Material examined: Holotypus (874-HO-1983): Tanzania, Afr. 117; 4 paratypes from the same sample. Holotypus and 3 paratypes (874-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is the third *Hoplophthiracarus* species from East Africa, which is characterized by the long and erectile notogastral setae. They may be distinguished by the following key:

1 (2) Setae c_3 and cp short, only 1/4 as long as setae c_1 **aokii** MAHUNKA, 1983
2 (1) Setae c_1, c_2, c_3 and cp nearly equal in length.
3 (4) Setae ps_3 and ps_4 nearly equal in length. Anal and adanal (excepting ad_3) setae nearly equal in length **peracutus** MAHUNKA, 1983
4 (3) Setae ps_3 more than twice longer than ps_4. Among anal and adanal setae a great difference in length exists **marginatus** sp. n.

Hoplophthiracarus wallworki sp. n.

Measurements. Length of aspis: 287—336 μm, length of notogaster: 525—623 μm, height of notogaster: 361—443 μm.

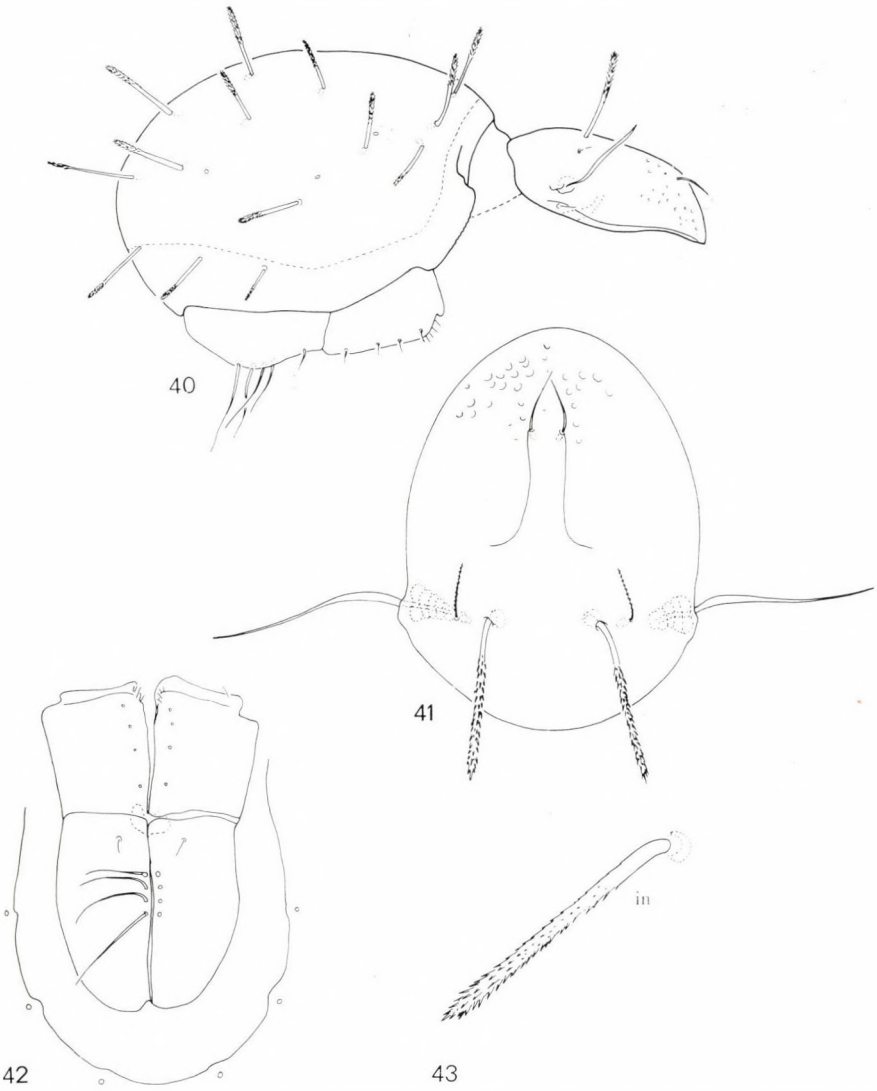
Aspis (Fig. 41): Surface only anteriorly and somewhat dorsally foveolated. Rostral and lamellar setae thin, simple, finely ciliated, latter slightly shorter. Interbothridial setae (Fig. 43) large, thick, erect and covered with small spinules, which are longer distally and minute proximally. Sensillus very long, thin, only scarcely dilated basally.

Notogaster (Fig. 40): The surface nearly smooth, only posterior end of notogaster foveolated. Fourteen pairs of different lengths, but evenly thick, erect short and spinulosed notogastral setae, among them setae ps_1 the longest, ps_4 the shortest.

Anogenital region (Fig. 42): Both pairs of anal setae and setae ad_1 and ad_2 originating in a longitudinal line, near to each other. Setae ad_3 much shorter and arising far from them.

Material examined: Holotypus (875-HO-83): Tanzania, Afr. 117, 1 paratype: from the same sample. Holotypus deposited in the Hungarian Natural History Museum, Budapest, paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species stands near to *H. aokii* MAHUNKA, 1983 described from Tanzania. It is distinguished from the new species by the shape of sensillus. On this ground the new species may be separated from all known *Hoplophthiracarus* taxa.



Figs 40—43. *Hoplophthiracarus wallworki* sp. n. — 40 = lateral side, 41 = aspis, 42 = anogenital region, 43 = seta *in*

ORIBOTRITIIDAE Grandjean, 1954

Indotritia africana sp. n.

Measurements. Length of aspis: 443—533 μm, length of notogaster: 820—1025 μm, height of notogaster: 582—730 μm.

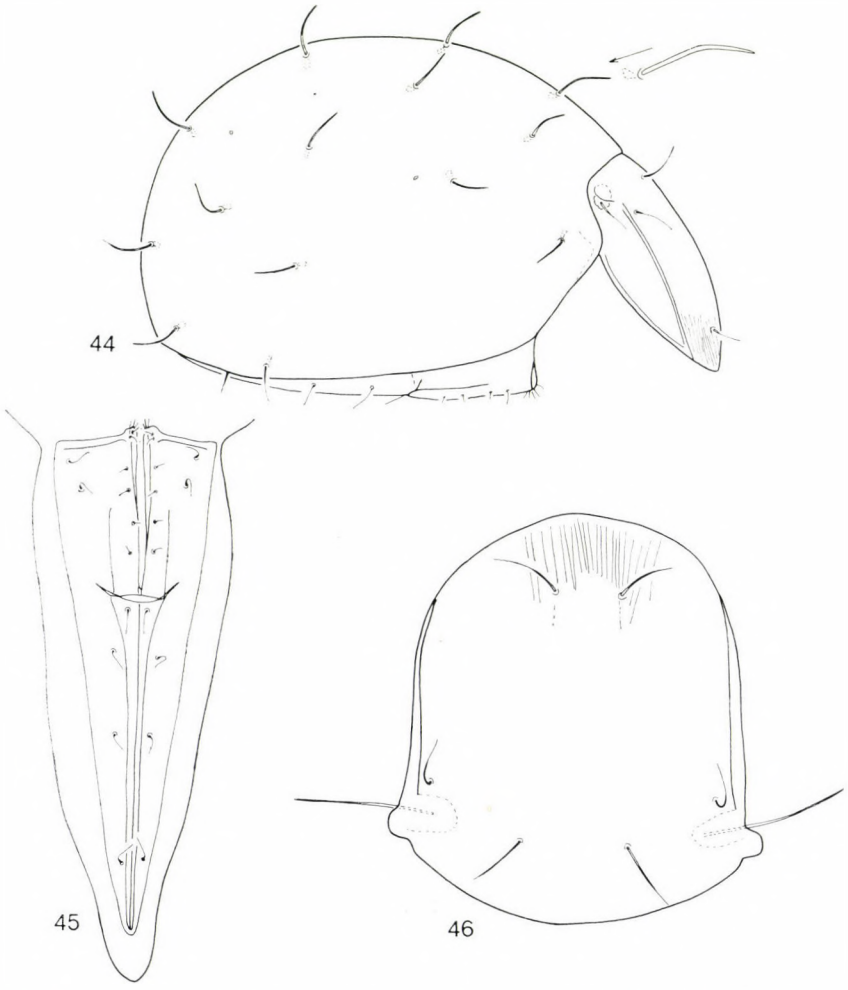
A s p i s (Fig. 46): Widely rounded anteriorly, rostral surface finely striated. Only one lateral carina on each side. Rostral and interlamellar setae

erect, interlamellar setae slightly longer than lamellar and rostral ones. Rostral setae curved outwards. Sensillus setiform, smooth, pointed at tip.

Notogaster (Fig. 44): Not arched in lateral view, elongated. All notogastral setae slightly curved, mostly anteriorly. All nearly equal in length.

Anogenital region (Fig. 45): Nine pairs of genital setae, among them 5 pairs originating on the dorsal surface of genital plates, 4 pairs on the anterior appendages. Two pairs of simple aggenital setae present. Aggenital cleft well observable. One pair of anal and three pairs of adanal setae, all nearly equal in length, thin and simple.

Material examined: Holotypus (876-HO-83): S.-Afr. 1.; 8 paratypes: from the same sample. Holotypus and 5 paratypes (876-HO-83) deposited in the Hungarian Natura



Figs 44—46. *Indotritia africana* sp. n. — 44 = lateral side, 45 = anogenital region, 46 = aspis

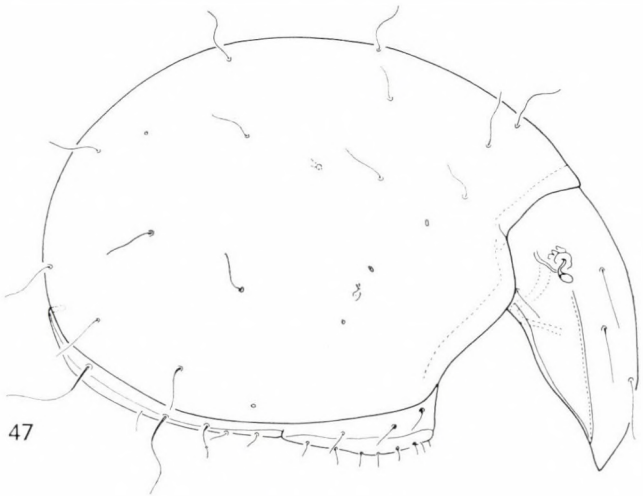
History Museum, Budapest, 2 paratypes in the Transvaal Museum, Pretoria and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

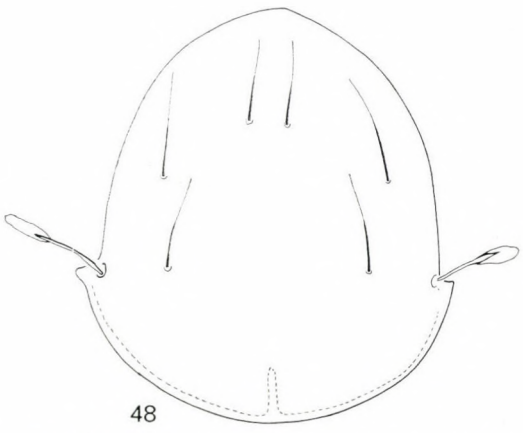
R e m a r k s : The genus *Indotritia* JACOT, 1929 was recently surveyed by AOKI (1980). The new species stands nearest to *I. javensis* (SELLNICK, 1929) however, the latter is much higher and two lateral carinae are present on its aspis.

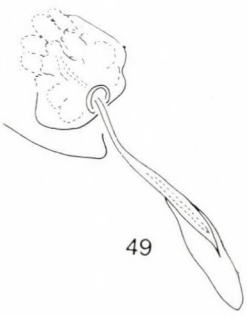
Mesotritia australis sp. n.

Measurements. Length of aspis: 295—320 μm, length of notogaster: 516—590 μm, height of notogaster: 385—435 μm.

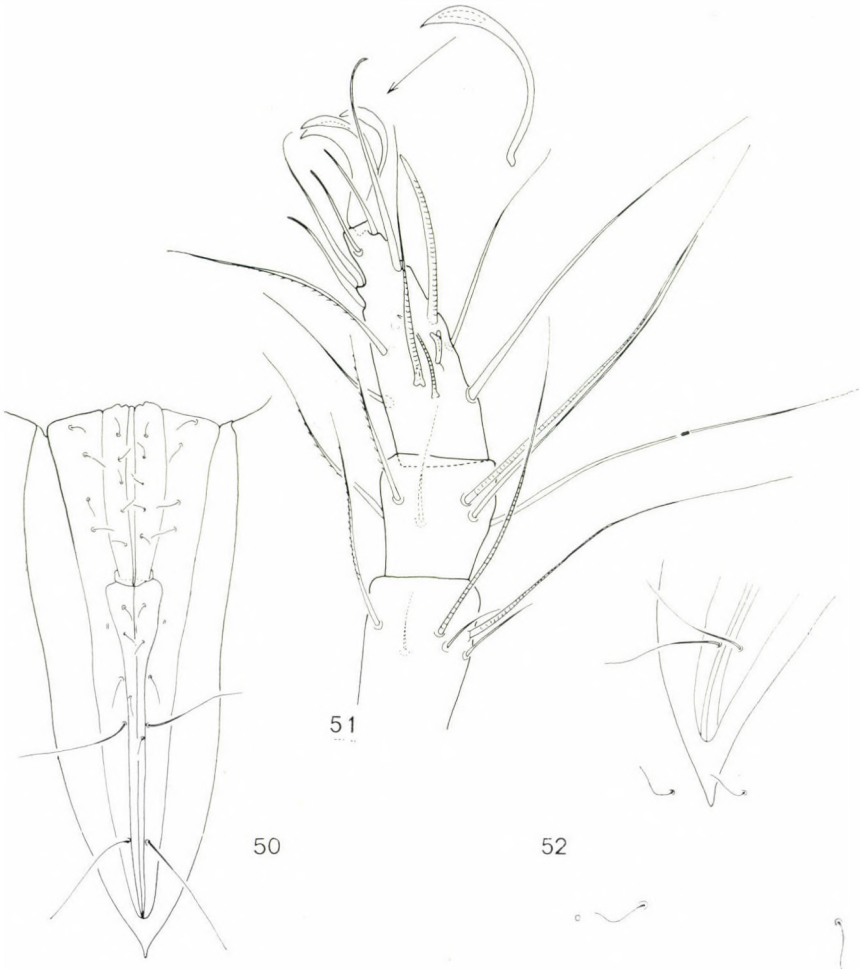
A s p i s (Fig. 48): All prodorsal setae thin and simple. Lamellar setae arising laterally, distance between them greater than same between inter-







Figs 47—49. *Mesotritia australis* sp. n. — 47 = lateral side, 48 = aspis, 49 = sensillus



Figs 50—52. *Mesotritia australis* sp. n. — 50 = anogenital region, 51 = leg I, 52 = endpart of body

lamellar setae. Rostral, lamellar and interlamellar setae nearly equal in length. Bothridial squama strong, undulate. Sensillus (Fig. 49) with dilated, phylliform, apically rounded head.

N o t o g a s t e r (Fig. 47): Smooth, all setae short, fine, flagelliform. Pori *im* originating very near to anterior lateral margin of body.

A n o g e n i t a l r e g i o n (Fig. 50): Six pairs of genital, three pairs of aggenital setae present. Setae ag_1 stand far from ag_2. Three pairs of anal and three pairs of adanal setae well visible, all anal setae equal in length, ad_1 and ad_2 long, ad_3 scarcely longer than anal ones. A very short anal fissure present (Fig. 52), resembling a narrow anal sinus (?). Median pori absent.

Legs. All legs with three claws, lateral claws thinner, but dilated distally (Fig. 51). ε of tarsus I bifurcate.

Material examined: Holotypus (877-HO-83): Tanzania, Afr. 117; 1 paratype: from the same sample. Holotypus deposited in the Hungarian Natural History Museum, Budapest, paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is the first record of this genus in the Ethiopian Region. It is distinguished from all congeners by the form of the sensillus and the anal fissure.

MICROZETIDAE GRANDJEAN, 1936

Cavernozetes gen. n.

Diagnosis: Rostrum sharply pointed dorsally, hatchet-shaped laterally. Lamellae very wide, long, covering the greatest part of prodorsum, only narrow middle part is left free. Insertion point of lamellar setae covered, interlamellar setae thin, short, arising on the inner margin of lamellae. Sensillus setiform, with long cilia, curved backwards. Dorsosejugal region excavated, dorsosejugal suture concave. Ventral plate without sculpture. Pedotecta 1 normally developed. Apodemes — excepting sejugal one — weakly developed.

Type species: *Cavernozetes excavatus* sp. n.

Remarks: The new genus belongs to the "*Dinatozetes*"-"*Hymenozetes*"-group, which is characterized by the wide lamellae and the thin interlamellar setae on the inner margin of lamellae. The new species cannot be not renked in the known genera on the ground of its excavated notogaster and the shape of rostrum.

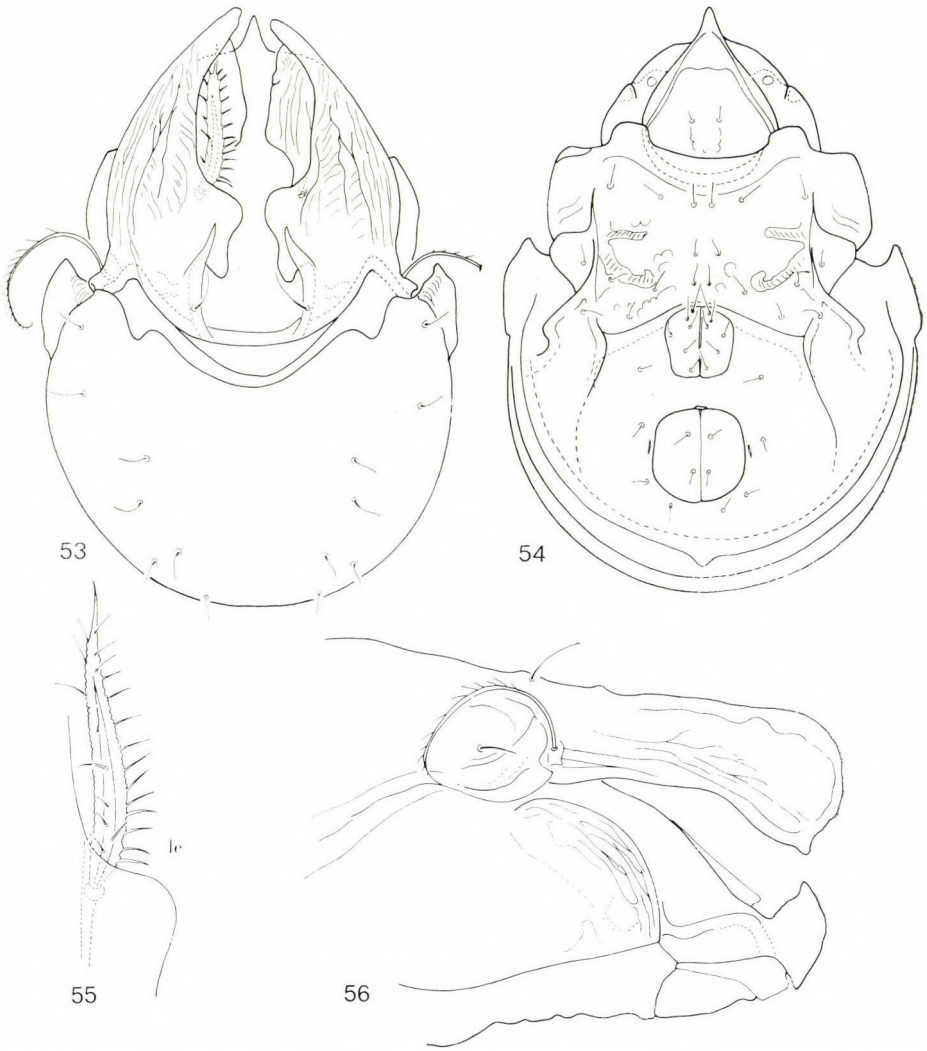
Cavernozetes excavatus sp. n.

Measurements. Length: 311—328 μm, width: 229—246 μm.

Dorsal side (Fig. 53): Lamellae curved inwards, elongated in dorsal, dilated in lateral view (Fig. 56) anteriorly. Rostral setae thin, simple, lamellae thick, pea-pod shaped (Fig. 55), undulate marginally. Interlamellar setae short, thin and simple, arising basally, on lamellar margin. Pteromorphae simple, without spur or teeth. Notogaster deeply excavated. Notogastral setae simple.

Ventral side (Fig. 54): Epimeral setae simple, nearly equal in length.

Material examined: Holotypus (878-HO-83): Tanzania, Afr. 117; 2 paratypes: from the same sample. Holotypus and 1 paratype (878-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.



Figs 53—56. *Cavernozetes excavatus* sp. n. — 53 = dorsal side, 54 = ventral side, 55 = lamellar seta, 56 = prodorsum from lateral view

R e m a r k s : On the ground of the generic diagnosis it is distinguished from all so far known Microzetidae taxa.

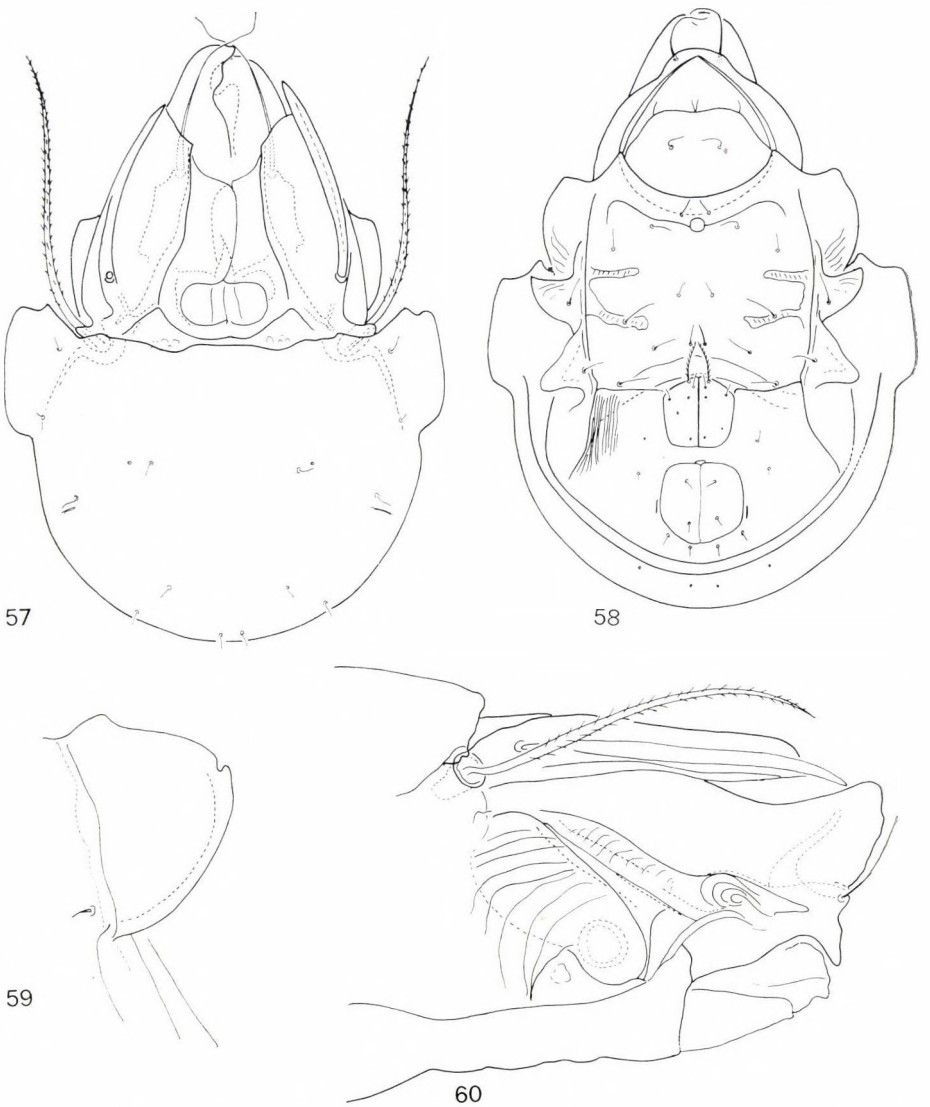
(?) **Phylacozetes ensifer** sp. n.

Measurements. Length: 232—240 μm, width: 172—180 μm.

D o r s a l s i d e (Fig. 57): Rostrum wide, bearing two expansions, covering each other anteriorly and being crista-like in lateral view (Fig. 60).

Lamellae comparatively short, nearly truncate anteriorly. Inner margin issuing a pair of thinner laminae, connected with a complicated laths-system (?) to each other. Lamellar setae dilated basally, flagelliform distally, insertion points covered by the lamellae. Interlamellar setae arising on the marginal surface of lamellae. Sensillus reaching rigidly forwards, thick, slightly ciliate. Pteromorphae (Fig. 59) incised laterally.

V e n t r a l s i d e (Fig. 58): Epimeral setae thin and simple. Epimeral

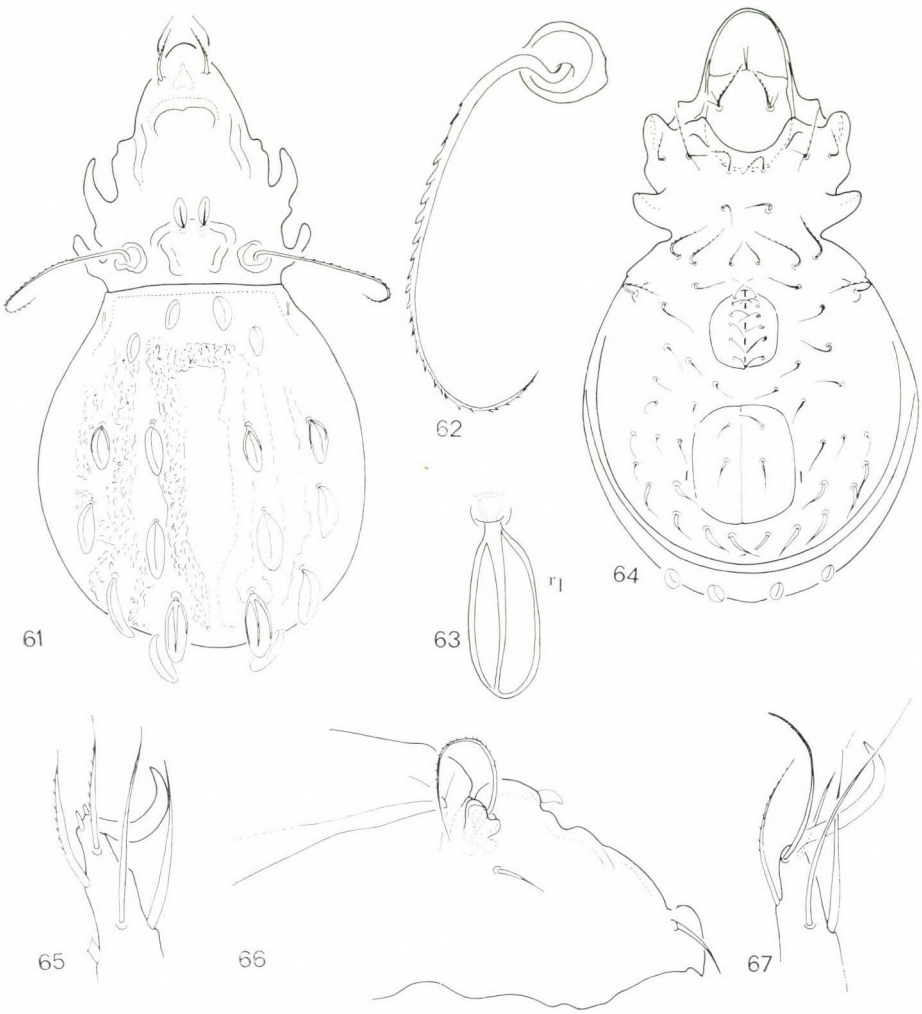


Figs 57—60. *Phylacozetes ensifer* sp. n. — 57 = dorsal side, 58 = ventral side, 59 = pteromorpha, 60 = prodorsum from lateral side

surface smooth, ventral plate striated laterally. Genital setae — excepting anterior ones — short, first pair long and strongly ciliated.

Material examined: Holotypus (879-HO-83): Tanzania, Afr. 117; 2 paratypes: from the same sample. Holotypus and 1 paratype (879-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The classification of the new species is very problematic. On the ground of the shape of lamellae, the sensillus and the interlamellar setae a relationship with the genus *Phylacozetes* GRANDJEAN, 1936 may be verifiable. In this family a new classification is highly necessary, therefore the establishment of a new, uncertain genus would be ill-timed.



Figs 61—67. *Eremobelba graciosa* sp. n. — 61 = dorsal side, 62 = sensillus, 63 = seta r_1, 64 = ventral side, 65 = leg II, 66 = prodorsum from lateral side, 67 = leg I

EREMOBELBIDAE BALOGH, 1961

Eremobelba graciosa sp. n.

Measurements. Length: 318—360 μm, width: 180—196 μm.

D o r s a l s i d e (Fig. 61): Body covered with secretin layer, which is somewhat arranged on the notogaster in longitudinal rows, however, no polygonal construction of granules is observable. Prodorsum with protuberances and depressions, swelling in lateral view (Fig. 66). Prodorsal chitinous structures — excepting interbothridial one — weakly developed, only in anterior part a transverse lath and one pair of weak lateral laths visible. A pairs of small tubercles originating in rostral part bearing lamellar setae. Rostral setae thin, lamellar setae slightly thickened basally, interlamellar setae arising near to each other, or interbothridial chitinous formation, phylliform. Sensillus (Fig. 62) normal, with large triangular spines. Eleven pairs of phylliform notogastral setae (Fig. 63), being smaller in anterior part, bigger in postero-lateral part of notogaster.

V e n t r a l s i d e (Fig. 64): Secretion layer present. Setae *hy*, *1b* stelliformly branched. All other setae slightly thickened basally finely ciliated. Six pairs of simple genital and two pairs of anal setae. A strong aggenital and adanal neotrichy present, these setae differ in length and thickness.

L e g s. All legs with phylliform setae. Claws of leg I (Fig. 67) thin, and much longer than claws of leg 2—4 (Fig. 65).

M a t e r i a l e x a m i n e d : Holotypus (880-HO-83): Tanzania, Afr. 117; 10 paratypes: from the same sample. Holotypus and 8 paratypes (880-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : On the ground of the very large different between the claws of leg I and leg II—IV the new species well distinguishes from all known *Eremobelba* species.

MULTORIBULIDAE BALOGH, 1972

Peloptoribula gen. n.

D i a g n o s i s : Family Multoribulidae. Habitus of the new taxon is very similar to the *Multoribula* BALOGH et MAHUNKA, 1966. The oral organs are modified, suctorial labiogenal articulation present, chelicerae peloptoid. Two claws on all tarsi, heterodactylia present. Modified setae on femur of leg II.

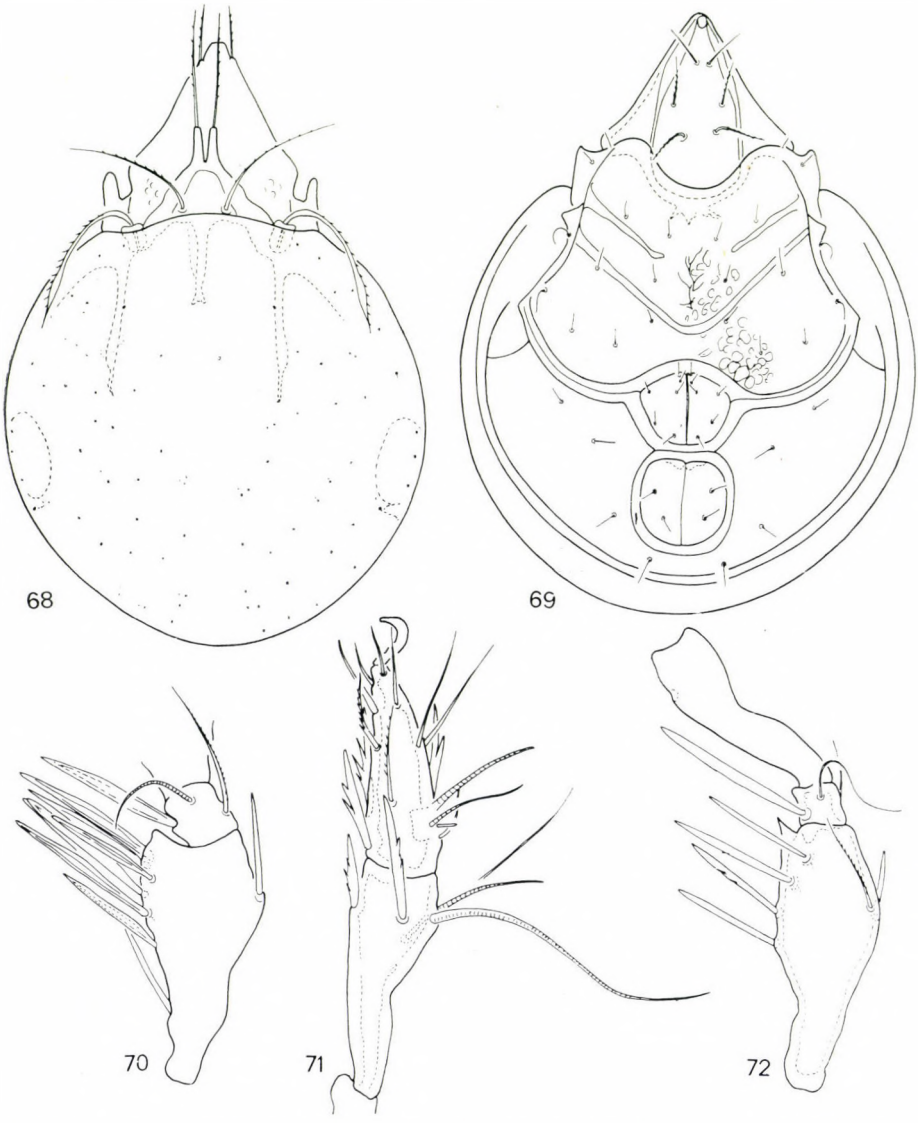
Type species: *Peloptoribula spinulosa* sp. n.

R e m a r k s : The new taxon is apparently very similar to the genus *Multoribula* BALOGH et MAHUNKA, 1966, however, it is well distinguishable by the number of claws and the development of the oral organs.

Peloptoribula spinulosa sp. n.

Measurements. Length: 394—476 μm, width: 304—328 μm.

D o r s a l s i d e (Fig. 68): Notogaster very high, hemispherical (height of notogaster: 170 μm, height of body: 328 μm). Rostrum elongated, straight anteriorly. Lamellae well developed, with long cuspis, not connected medially.



Figs 68—71. *Peloptoribula spinulosa* sp. n. — 68 = dorsal side, 69 = ventral side, 70 = femur of leg II, 71 = leg I. — Fig. 72 = *Multoribula multipunctata* BALOGH et MAHUNKA, 1966

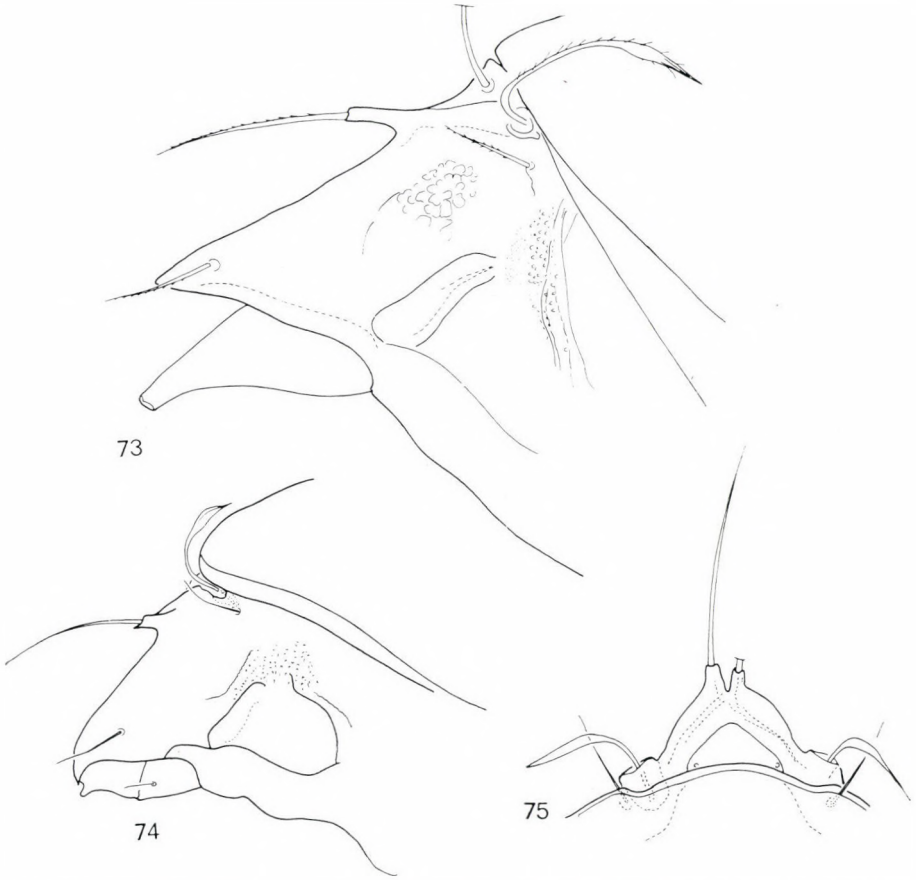


Fig. 73. *Peloptoribula spinulosa* sp. n. — Prodorsum from lateral side. — Figs 74—75. *Multoribula multipunctata* BALOGH et MAHUNKA, 1966. — 74 = prodorsum from lateral side, 75 = lamellar region

Rostral setae short, lamellar and interlamellar ones very long, *in* > *le*. Sensillus with very long peduncle and with a lanceolate head, its outer margin ciliate. Exobothridial setae thick, erect. Polygonal area on lateral part of prodorsum present. Notogaster with a weakly developed humeral expansion. About 40—45 alveoli present. Three strong chitinous thickenings on inner surface of notogaster well observable.

V e n t r a l s i d e (Fig. 69): Apodemes and bordures characteristically curved backwards. Sternal apodeme absent. Epimeral surface with large spots or polygonal ornamentation. Epimeral setal formula: *3—1—3—3*. All epimeral setae erectile, straight but not thickened. Six pairs short genital setae, one pair of aggenital setae originating laterally far from genital opening. Genital and anal opening very near to each other, both well framed. Anal and

adanal setae similar to epimeral ones, ad_3 in preanal (aggenital) position. *Iad* pori originating near to posterior part to anal plates.

O r a l o r g a n s : Suctorial labiogenal articulation, a tube well observable. Chelicerae peloptoid.

L e g s : All legs very long, a part of setae modified into long, strong spines, being the longest and the strongest on the femur of leg II (Fig. 70). Two claws on all tarsi, heterodactylia strong.

M a t e r i a l e x a m i n e d : Holotypus (881-HO-83): S.-Afr. 1; 17 paratypes: from the same sample; 1 paratype: S.-Afr. 1310. Holotypus and 14 paratypes (881-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 3 paratypes in the Transvaal Museum, Pretoria and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The new species is well distinguished from all Multoribulid taxa by the characteristics given in the generic diagnosis.

CARABODIDAE C. L. KOCH, 1837

Austrocarabodes erectus sp. n.

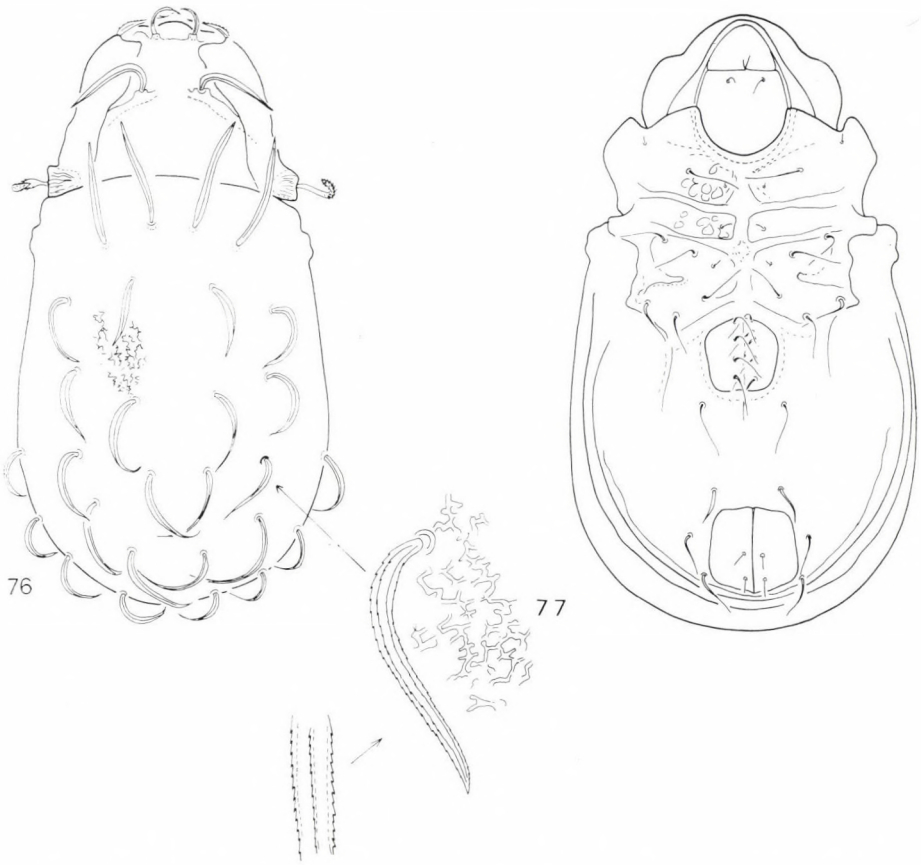
Measurements. Length: 467—566 μm, width: 238—312 μm.

D o r s a l s i d e (Fig. 76): Rostrum rounded, rostral setae arising on small chitinous tubercles, strongly curved inwards, slightly dilated. Rostral setae phylliform, serrated marginally. Lamellar setae originating on transversal chitinous laths, long and finely serrated marginally, curved outwards. Sensillus slightly dilated, lanceolate, but curved backwards. Notogaster smooth, covered with secretion consisting of a nearly polygonal sculpture. Fourteen pairs of strong, dilated notogastral setae: the two anterior pairs directed forwards, much longer than the others.

V e n t r a l s i d e (Fig. 77): Epimeral region well chitinized, transversal and longitudinal apodemes well observable. Epimeral surface ornamented with large spots, setae of different lengths. Setae *1a*, *1c*, *2a*, *3a* short, all others long and thin; all simple. Genital and aggenital setae also long and thin, adanal setae much shorter, but slightly dilated.

M a t e r i a l e x a m i n e d : Holotypus (882-HO-83): Afr. 117; 6 paratypes: from the same sample. Holotypus and 5 paratypes (882-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : On the ground of its notogastral sculpture the new species stands near to *Austrocarabodes rugosus* MAHUNKA, 1969, while on the ground of its notogastral setae, to *A. agressor* BALOGH et MAHUNKA, 1978. However, the other characteristics of both species is widely different from those of the new one.



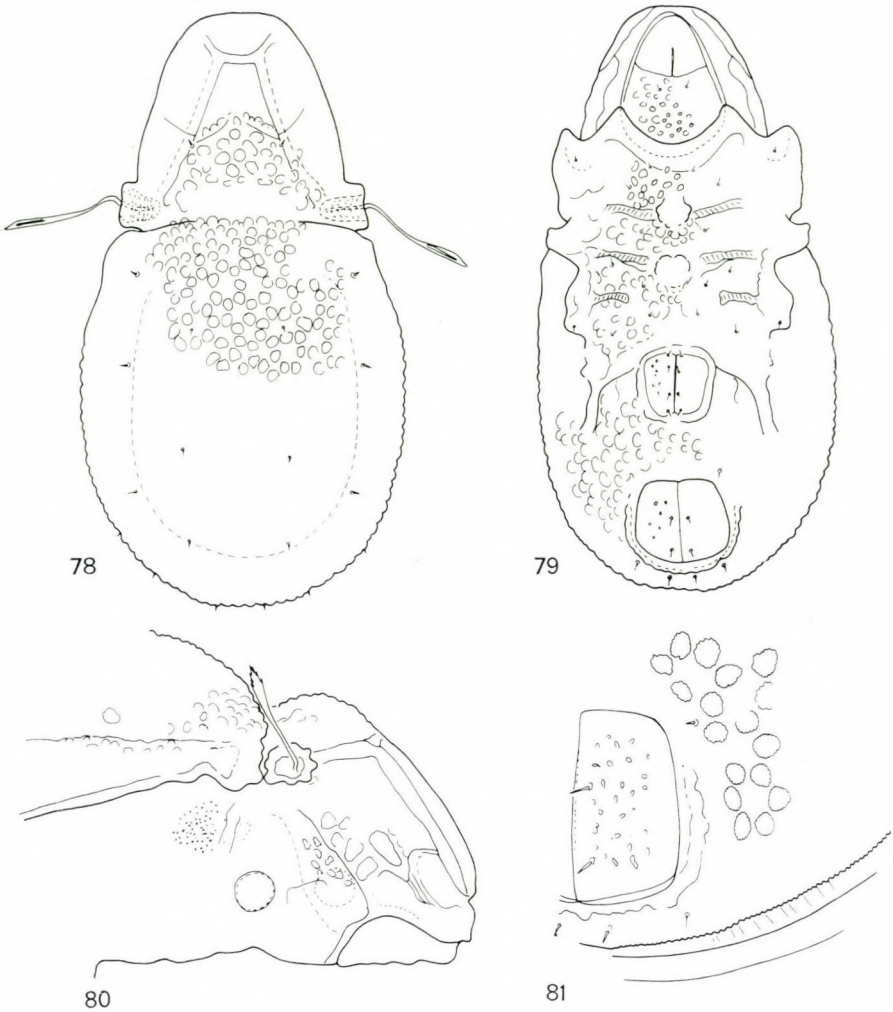
Figs 76—77. *Austrocarabodes erectus* sp. n. — 76 = dorsal side, 77 = ventral side

Carabodes microtrichus sp. n.

Measurements. Length: 280—344 μm, width: 148—192 μm.

D o r s a l s i d e (Fig. 78): Prodorsum very high in lateral view (Fig. 80), with some large spots and rugae. Rostrum rounded, lamellar wide, translamella present. Interlamellar region tuberculated medially smooth anteriorly and basally. All setae minute, hardly visible. Sensillus very long, slightly thickened distally, its end ciliated. Exobothridial part granulated. Notogaster with large tubercles, latter much greater than minute notogastral setae.

V e n t r a l s i d e (Fig. 79): Surface ornamented with foveolae of different size, the largest being in adanal position. Medially two nearly round, smooth surface areas present. Foveolae with undulate margin (Fig. 81). All setae minute. Adanal setae slightly thicker than the others, setae ad_1 and ad_2 in postanal position.



Figs 78—81. *Carabodes microtrichus* sp. n. — 78 = dorsal side, 79 = ventral side, 80 = prodorsum from lateral side, 81 = anal region

Material examined: Holotypus (883-HO-83): S.-Afr. 1.; 16 paratypes: from the same sample. Holotypus and 10 paratypes (883-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 4 paratypes in the Transvaal Museum, Pretoria and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

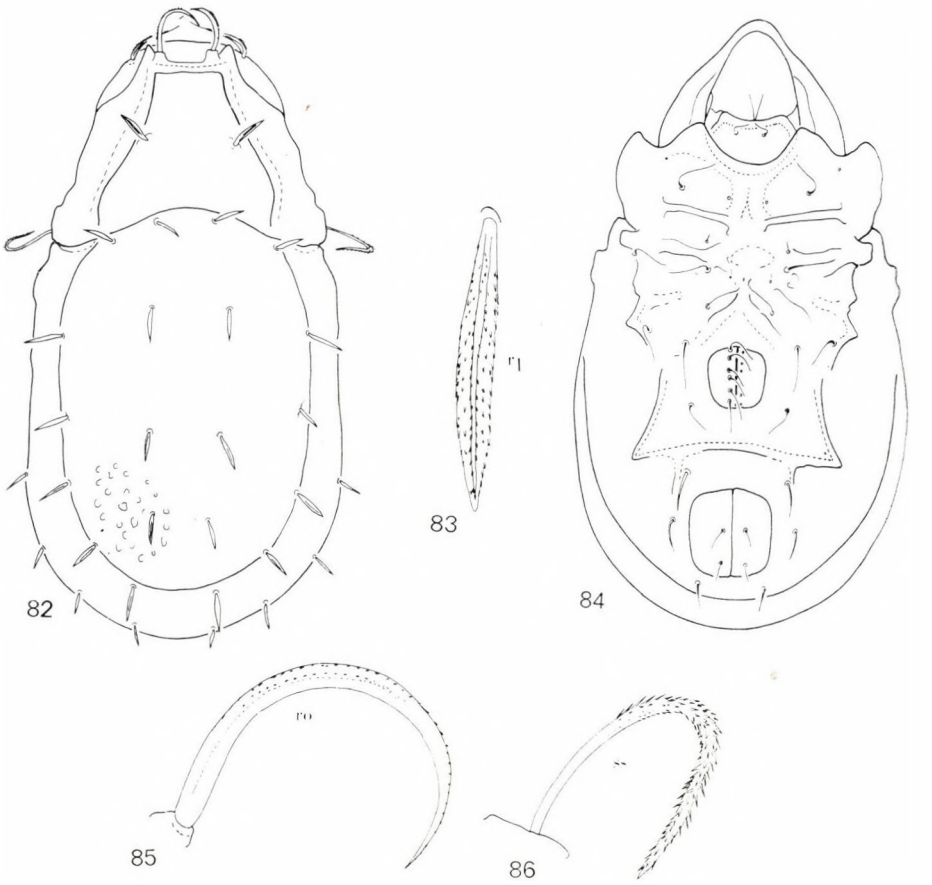
Remarks: The new species is well characterized by the very long sensillus, the minute setae of the body and by the ornamentation of the body. On the ground of this combination of characters the new species stands far from all the known *Carabodes* C. L. Koch, 1836 taxa.

Ulugurozetes grandis sp. n.

Measurements. Length: 779—927 μm, width: 410—517 μm.

D o r s a l s i d e (Fig. 82): Rostrum wide, rounded, lamellae covering it laterally. A well-developed translamella present. Rostral setae arising, on a separated tubercle each, near to translamella, not dilated, round in cross-section, only finely roughened (Fig. 85). Lamellar setae phylliform, elongated, well serrated marginally. Sensillus (Fig. 86) long, not dilated, covered with spines. Interlamellar setae phylliform, much shorter than similar lamellar ones, but slightly larger than the fourteen pairs of notogastral setae (Fig. 83). Surface of notogaster irregularly foveolated, foveolae large, sometimes connected with each other, between them rugae observable.

V e n t r a l s i d e (Fig. 84): Great difference in length among epimeral setae; setae *1a*, *1c*, *2a*, *3a* short and minute, setae *1b*, *3b*, *3c*, *4a*—*4c*, very long,



Figs 82—86. *Ulugurozetes grandis* sp. n. — 82 = dorsal side, 83 = seta r_1, 84 = ventral side, 85 = seta *ro*, 86 = sensillus

4b the longest of all. Apodemes and bordures normally developed, some foveolae on epimeres hardly observable. Anogenital region well chitinized, divided by chitinous laths. Six (rarely five) pairs of long, genital setae present, aggenital ones similar, anal ones much shorter. Adanal setae different in length, ad_1 and ad_2 nearly equal, ad_3 much longer and thicker.

Material examined: Holotypus (884-HO-83): Afr. 117; 6 paratypus: from the same sample. Holotypus and 5 paratypes (884-PO-83) in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species may be well ordered to the genus *Ulugurozetes* MAHUNKA, 1983. It is distinguished from the type species by the shape of the notogastral setae. The description of this genus was not compared to that of *Trichocarabodes* BALOGH, 1961. This latter genus is not homogeneous, thus, its division may only be made after further examinations; also I consider it to be valued only by the type. The type (*T. celisi* BALOGH, 1958) is distinguished from the *Ulugurozetes* species by the insertion point of setae c_2 (on the shoulder) and by the number of genital setae (eight in *Trichocarabodes*).

OTOCEPHEIDAE BALOGH, 1961

Nesotocepheus youngai sp. n.

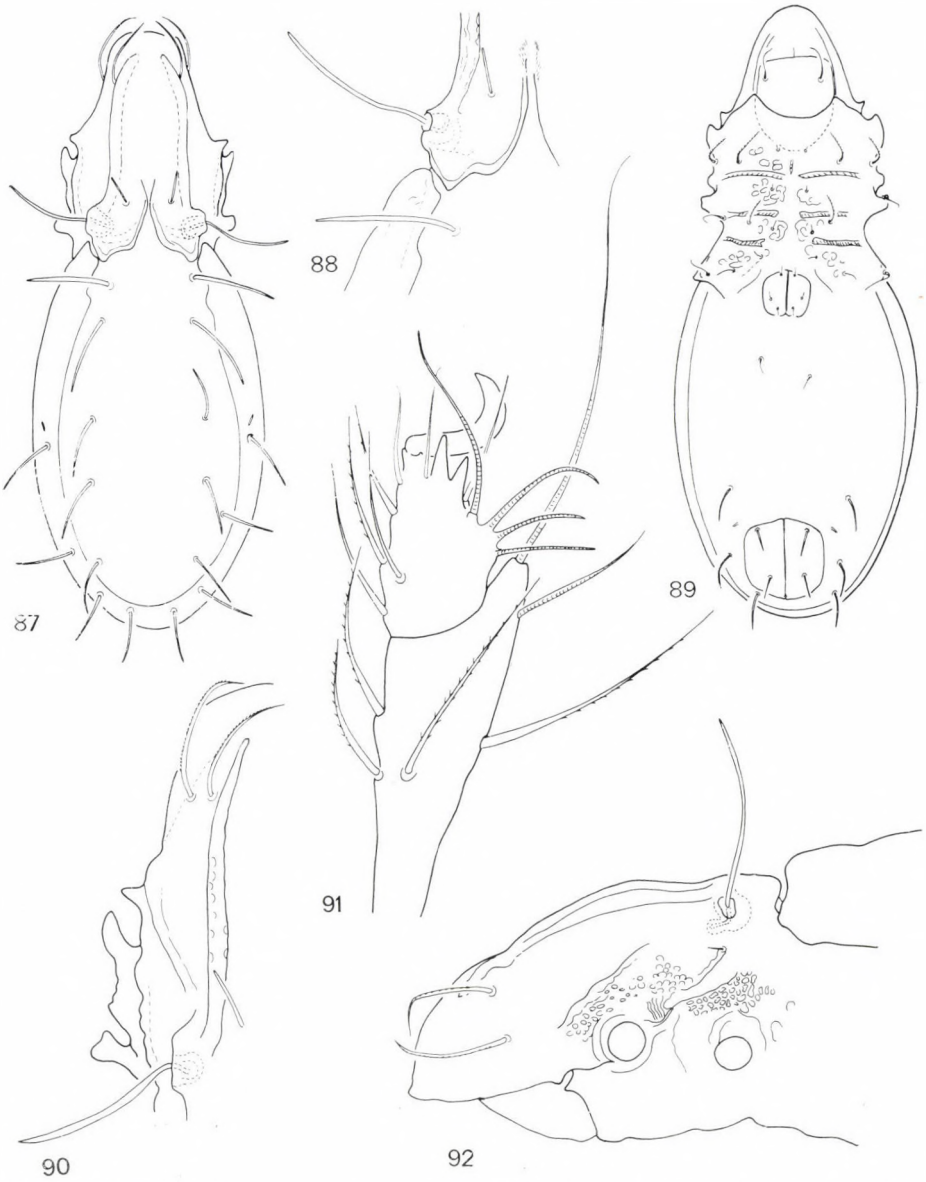
Measurements. Length: 820—1150 μm, width: 328—517 μm.

Dorsal side (Fig. 87): Rostrum very wide, lamellae long, curved inwards anteriorly. Lamellar and rostral setae arising near to each other (Fig. 90), both pairs finely roughened. Lateral lamelliform expansion short, ending far from rostral setae. Sensillus setiform, very long. Prodorsum with one pair of very large (Fig. 88) condyles (co. pl.). Exobothridial surface (Fig. 92) with polygonal reticulation and some rugae. Notogaster also with one pair of condyles, followed by a sharp crest framing the notogaster laterally. Ten pairs of strong notogastral setae present, setae *ta* and *te* much stronger than the others. Setae of the posterolateral margin of notogaster (ps_1—ps_4) equal in length.

Ventral side (Fig. 89): Epimeral surface ornamented by irregular spots. Epimeral setae short, partly finely ciliate. Three pairs of minute genital, one pair slightly longer aggenital setae. Anal and adanal setae much longer and stronger than preceding ones. Setae ad_3 in preanal position. Pori *iad* in apoanal position.

Material examined: Holotypus (885-HO-83): S.-Afr. 1; 3 paratypes: from the same sample. Holotypus and 1 paratype (885-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Transvaal Museum, Pretoria and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well distinguished from all other *Nesotocepheus* species by the shape of its prodorsal and notogastral condyles.

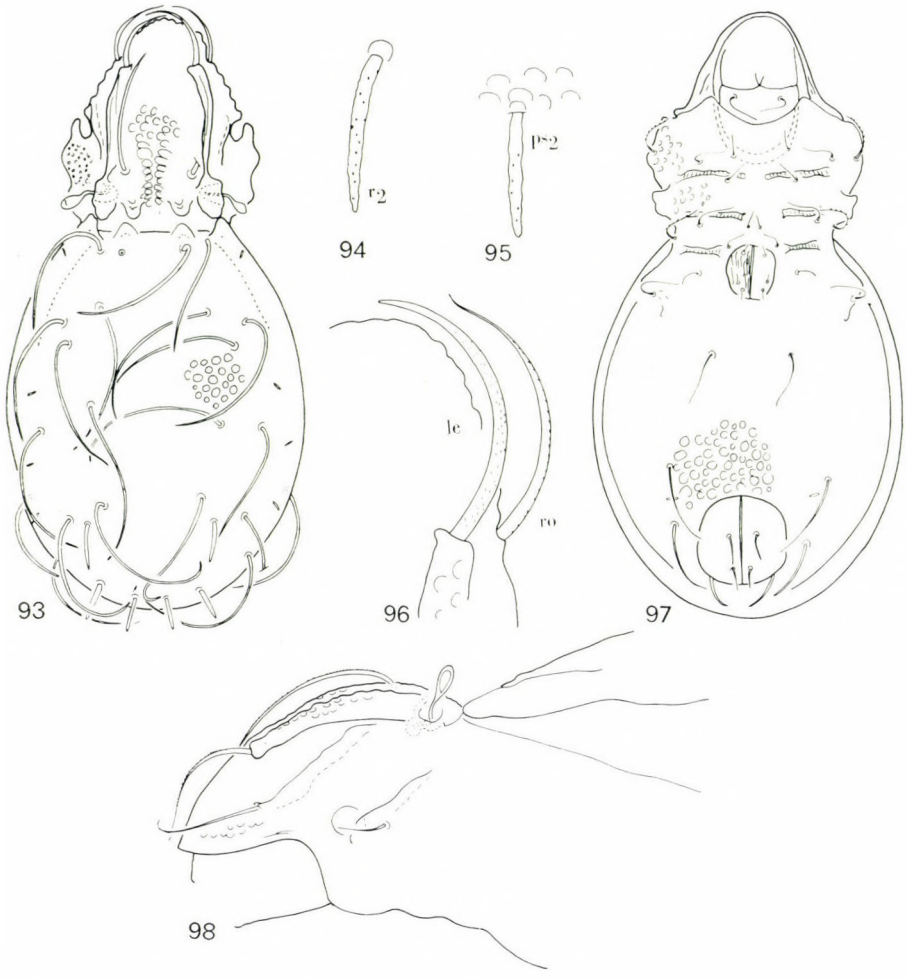


Figs 87—92. *Nesotocepheus youngai* sp. n. — 87 = dorsal side, 88 = bothridial region, 89 = ventral side, 90 = lamellar region, 91 = leg I, 92 = prodorsum from lateral side

Plenotocepheus africanus sp. n.

Measurements. Length: 780 μm, width: 402 μm.

D o r s a l s i d e (Fig. 93): Rostrum wide, its margin tuberculate, surface foveolated. Rostral setae thinner than lamellar ones (Fig. 96). Lamellae



Figs 93—98. *Plenotocepheus africanus* sp. n. — 93 = dorsal side, 94 = seta r_2, 95 = seta ps_2, 96 = rostral region, 97 = ventral side, 98 = prodorsum from lateral side

comparatively short, their cuspis straight. Interlamellar setae very long. Foveolae in interlamellar region ordered in to two longitudinal lines. Sensillus short, clavate. Prodorsal condyles well developed, lateral pair (co. *pl.*) slightly greater than the separated median ones (co. *pm.*). Notogastral condyles similar to prodorsal ones. Fourteen pairs of notogastral setae. Eleven pairs long, curved, smooth, three pairs (r_1, ps_1 and ps_2) short, rigid and roughened (Figs 94—95).

V e n t r a l s i d e (Fig. 97): Epimeral surface foveolated laterally. Epimeral setae simple, *1c*, *3c* and *4c* finely ciliated. Genital plates darker than ventral ones. Its surface striated. Three pairs of genital setae present. Ventral plates ornamented with large foveolae. Aggenital setae long, thin, adanal setae

different in lengths, blunt at tip, thicker than the others. Pori *iad* in apoanal position.

Material examined: Holotypus (886-HO-83): S.-Afr. 1; deposited in the Hungarian Natural History Museum, Budapest.

Remarks: The new species differens from the other *Plenotocepheus* HAMMER, 1966 species by the different shape of the notogastral setae.

OPPIIDAE GRANDJEAN, 1954

Globoppia gibba sp. n.

Measurements. Length: 508—566 μm, width: 320—369 μm.

Dorsal side (Fig. 99): Prodorsum wide, rostral setae arising laterally. These, and the lamellar setae long and thin, interlamellar setae represented only by their alveoli. A weak, hardly visible line present in lamellar region. Sensillus fusiform in lateral view (Fig. 102), finely aciculate. Exobothridial region strongly granulated, some granules also on inner surface of pedotecta 1. Notogaster very high in lateral view. Ten pairs of notogastral setae present, two pairs (*te* and *ti*) of them longer, all the others fine and short. Setae *ta* not shorter than setae *ms*.

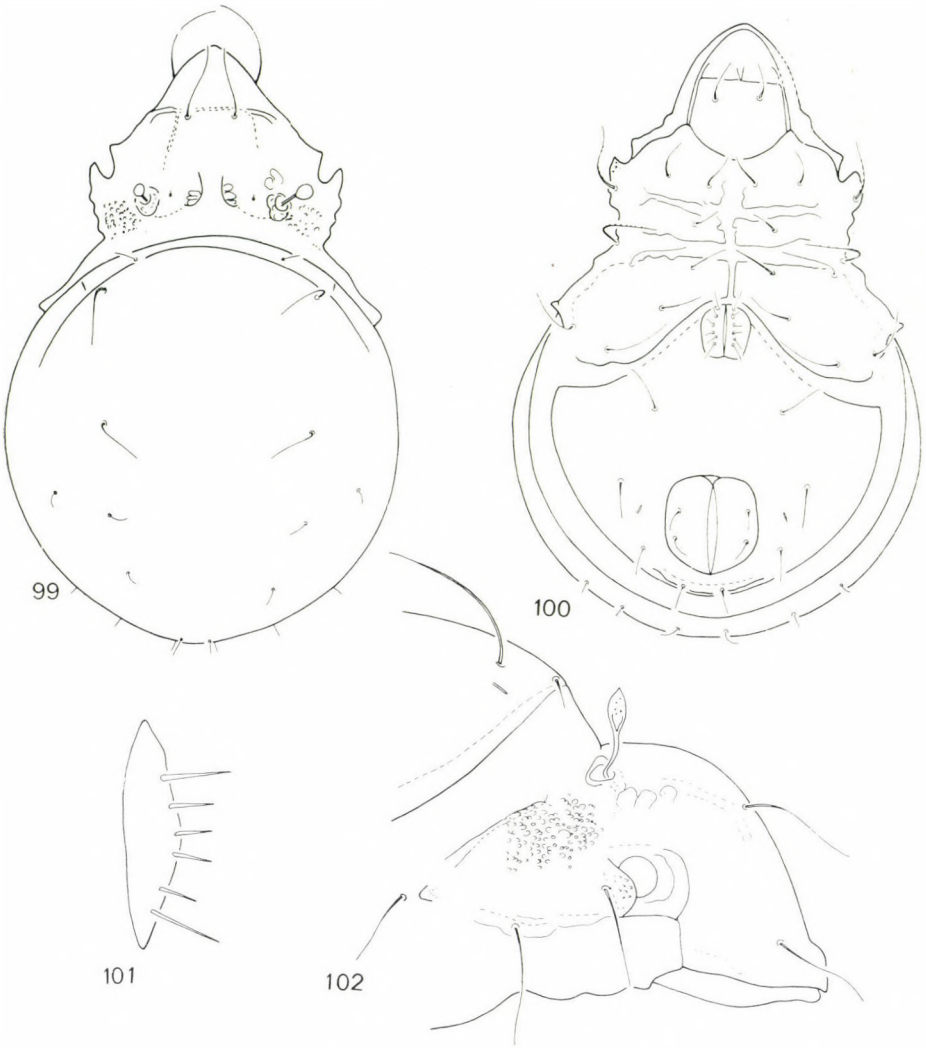
Ventral side (Fig. 100): Apodemes well developed. Epimeral surface without ornamentation. Epimeral setae long and thin, *1c*, *3c* and *4c* longer than the others and finely ciliated. Six pairs of genital setae (one paratype with five pairs !), setae *g1* and g_6 much longer than the others (Fig. 101). Aggenital setae long and thin, longer than adanal setae. Among the latter, setae ad_1 arising on a chitinous lath. *Iad* pori in apoanal position. Both pairs of anal setae originating marginally on the anal plates.

Material examined: Holotypus (887-HO-83): S.-Afr. 1; 13 paratypes: from the same sample. Holotypus and 8 paratypes (887-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 3 paratypes in the Transvaal Museum, Pretoria and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well placed in the genus *Globoppia* HAMMER, 1962. It is distinguished from all other congeners by the different length of the notogastral setae.

Pocsoppia gen. n.

Diagnosis: Rostrum rounded. Costula present, lamellar setae arising nearer to interlamellar, than to rostral ones. Sensillus very long, its distal part dilated, otherwise setiform, ciliate. Crista absent, a pair of sharp tubercles in lateral position present, setae *ta* arising on them. Ten pairs of notogastral



Figs 99—102. *Globoppia gibba* sp. n. — 99 = dorsal side, 100 = ventral side, 101 = genital plate, 102 = prodorsum from lateral side

setae present. Third and fourth apodemes missing. Six pairs *os* genital setae. All adanal setae and also *iad* pori in paraanal psotion.

Type species: *Pocsoppia extrema* sp. n.

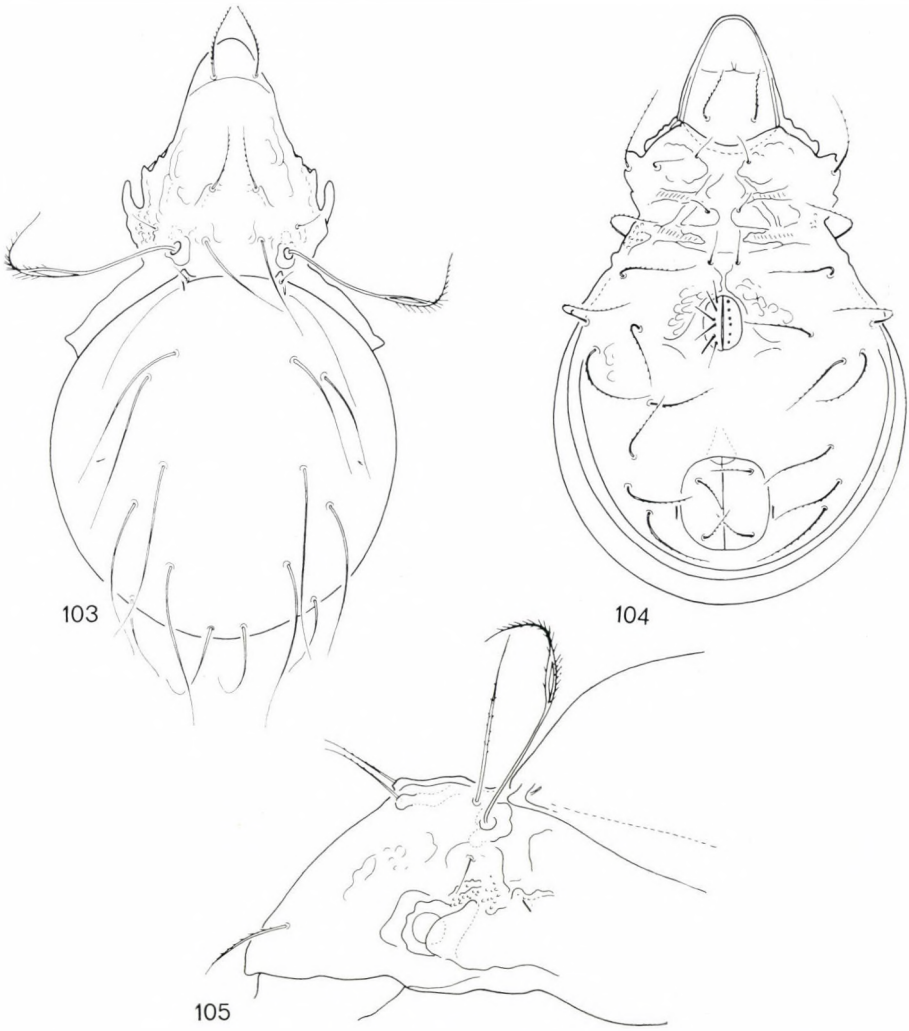
R e m a r k s : The new species is well distinguished from all known Oppiid taxa. It may be ordered in the subfamily Grunuloppiinae Balogh, 1983, however, the preceding has either prodorsal or notogastral sculpture.

I dedicate the new genus to my friend Dr. T. Pócs (Budapest), the renown bryologist.

Pocsoppia extrema sp. n.

Measurements. Length: 550 μm, width: 312 μm.

D o r s a l s i d e (Fig. 103): Prodorsum elongated anteriorly but rostrum widely rounded. Rostral and lamellar setae nearly equal in length, preceding ones slightly thicker. Short costulae present, lamellar seta arising on them. Interlamellar setae much longer, exobothridial setae much shorter, than lamellar ones. Sensillus extremely long, a long peduncle, lanceolate head and a long, curved, thin endpart observable. Its distal half ciliated on its outer



Figs 103—105. *Pocsoppia extrema* sp. n. — 103 = dorsal side, 104 = ventral side, 105 = prodorsum from lateral side

margin, and one or two cilia on inner margin. Exobothridial region (Fig. 105) granulated, also with some rugae. Notogaster with ten pairs of setae, *ta* short, five pairs (*te*, *ti*, *ms*, r_{2-3}) nearly equal in length, four pairs shorter than the others. All setae minutely ciliate.

Ventral side (Fig. 104): Epimeral surface with characteristic configuration, between 2nd and sejugal apodemes longitudinal ridges exist. Third and 4th apodemes absent. Epimeral setae different in length, all ciliated. *1c*, *3b*, *3c*, *4a—c* much longer than the others. Genital plates small, with six pairs of strong genital setae, arranged in to a longitudinal row. Aggenital and anal setae long, ciliated; all adanal setae in paraanal position.

Material examined: Holotypus (888-HO-83): Tanzania, Afr. 117; deposited in the Hungarian Natural History Museum, Budapest.

Remarks: The new species stands very far from all the known Oppiid taxa.

Tectoppiella gen. n.

Diagnosis: Family Oppiidae. Rostrum tripartite, divided by two deep incision. Costula absent, four or five strong, round tubercles present in interbothridial region. Lamellar setae arising far from interlamellar ones, much nearer to rostral setae. Sensillus very long, setiform. Exobothridial region granulated, partly tuberculated. Nine pairs (!) of notogastral setae or alveoli, setae *ta* minute or only their alveoli visible. Setae r_3 absent! Among notogastral setae great differences in length, four pairs very long, all others minute. All apodemes well developed, *ap* 4 arched backwards, Leg. IV. originating very far from leg III. Six pairs of genital setae. Adanal setae originating in post- or paraanal position. *Iad* pori in apoanal posit on. All legs very long and thin. Tibia without tubercles.

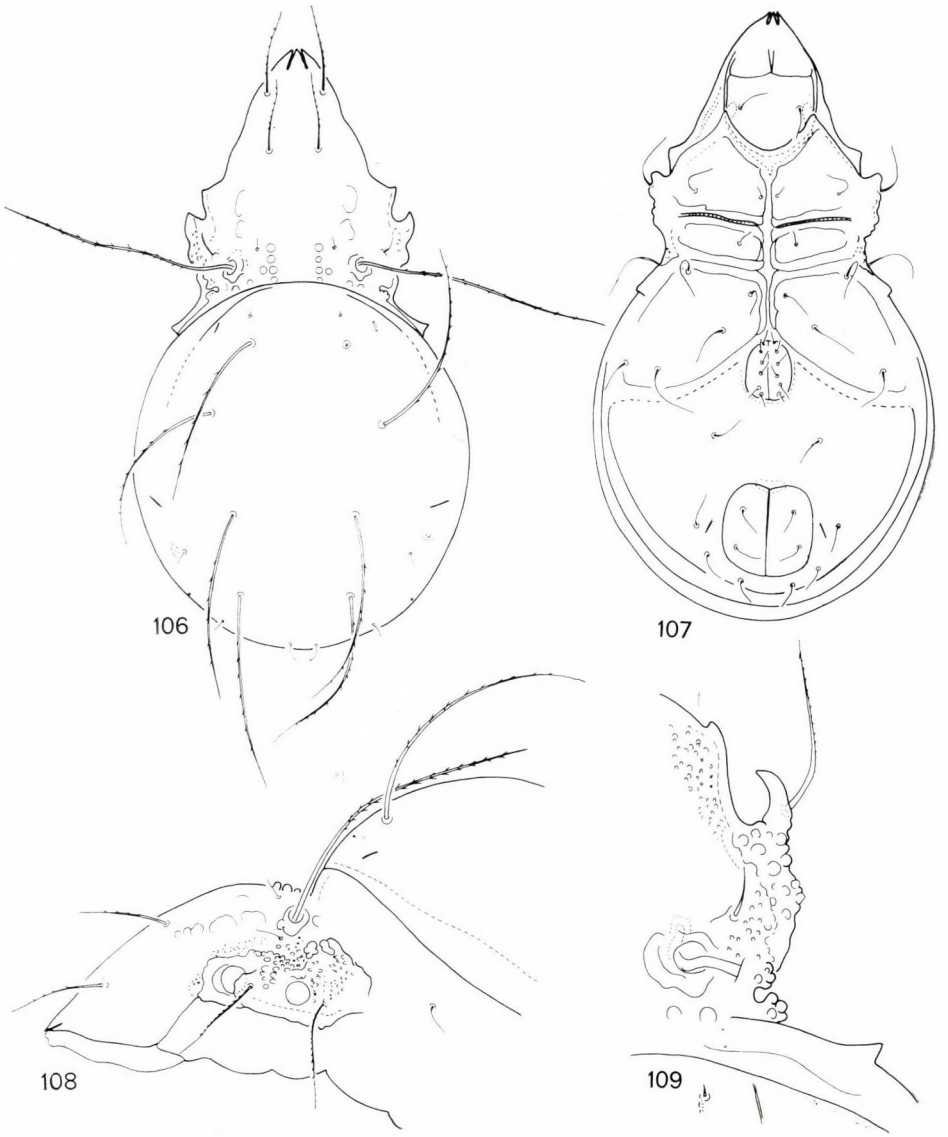
Type species: *Tectoppiiella tuberosa* sp. n.

Remarks: The new taxon may be ordered with Tectoppiinae (sensu BALOGH, 1983), however, it seems to have some relationship with *Setoppia* BALOGH, 1983. My opinion is that this new species and some of the *Setoppia* species (sensu BALOGH): *S. antennata* (BALOGH et MAHUNKA, 1966), on the ground of the position of setae *ta* or the shape of sensillus and chaetotaxy do not belong to the same species-group with *Setoppia toeroeki* BALOGH, 1982, therefore the erection of a new genus is needed.

Tectoppiella tuberosa sp. n.

Measurements. Length: 475—533 μm, with: 270—303 μm.

Dorsal side (Fig. 106): Rostral and lamellar setae nearly equal in length, finely ciliate. Interlamellar setae short, fine, shorter than exobothridial



Figs 106—109. *Tectoppiella tuberosa* sp. n. — 106 = dorsal side, 107 = ventral side, 108 = prodorsum from lateral side, 109 = pedotecta I

ones. Four or five pairs of strong tubercles in the interlamellar region, one or two pairs before the dorsosejugal suture, behind bothridium. Exobothridial region (Fig. 108) partly granulated (anteriorly), partly tuberculated (posteriorly and marginally). Posteriorly one pair of stronger, opposed tuberculated laths. Sensillus ciliated. Notogaster very high, semicircular. Setae *ta* minute or absent. Four pairs long setae ciliated, four pairs fine and minute.

Ventral side (Fig. 107): Setae *1c* arising on the margin of pedotecta (Fig. 109). Pedotecta *3—4* short, originating very far from legs IV. All epimeral setae long, finely ciliate or smooth. Setae *4c* much shorter than *4b*. Adanal setae simple, ad_1 in postanal, ad_2 and ad_3 in paraanal position.

Material examined: Holotypus (889-HO-83): S.-Afr. 1; 33 paratypes: from the same sample. Holotypus and 20 paratypes (88 -PO-83) deposited in the Hungarian Natural History Museum, Budapest, 10 paratypes in the Transvaal Museum, Pretoria and 3 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species stands nearest to *T. antennata* (BALOGH et MAHUNKA, 1966),* however, it is distinguished from it by the interbothridial tubercles and the short interlamellar setae.

Xenoppia oligocheta sp. n.

Measurements. Length: 312—324 μm, width: 184—192 μm.

Dorsal side (Fig. 110): Rostrum sharply pointed. Rostral setae originating laterally, thicker than lamellar and interlamellar ones, well ciliated. Prodorsum with some larger and three pairs of smaller spote. Exobothridial surface (Fig. 112) granulated. Sensillus long, its lanceolate head squamose or serrated laterally. Nine pairs of short, simple notogastral setae present, seta *ta* absent, only its alveolus visible.

Ventral side (Fig. 111): Labiogenal articulation disappearing. Apodema 2 and sejugal ones well developed, thick, apodema 3 and 4 disappeared. Epimeral surface with weak polygonal reticulation. Epimeral setae long, *1c* arising laterally, on pedotecta *1*. Four pairs of simple genital setae present.

Material examined: Holotypus (890-HO-83): Tanzania, Afr. 117; 14 paratypes: from the same sample. Holotypus and 10 paratypes (890-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species may be well ordered in the genus *Xenoppia* MAHUNKA, 1982, however, the type-species has 12 pairs of notogastral setae.

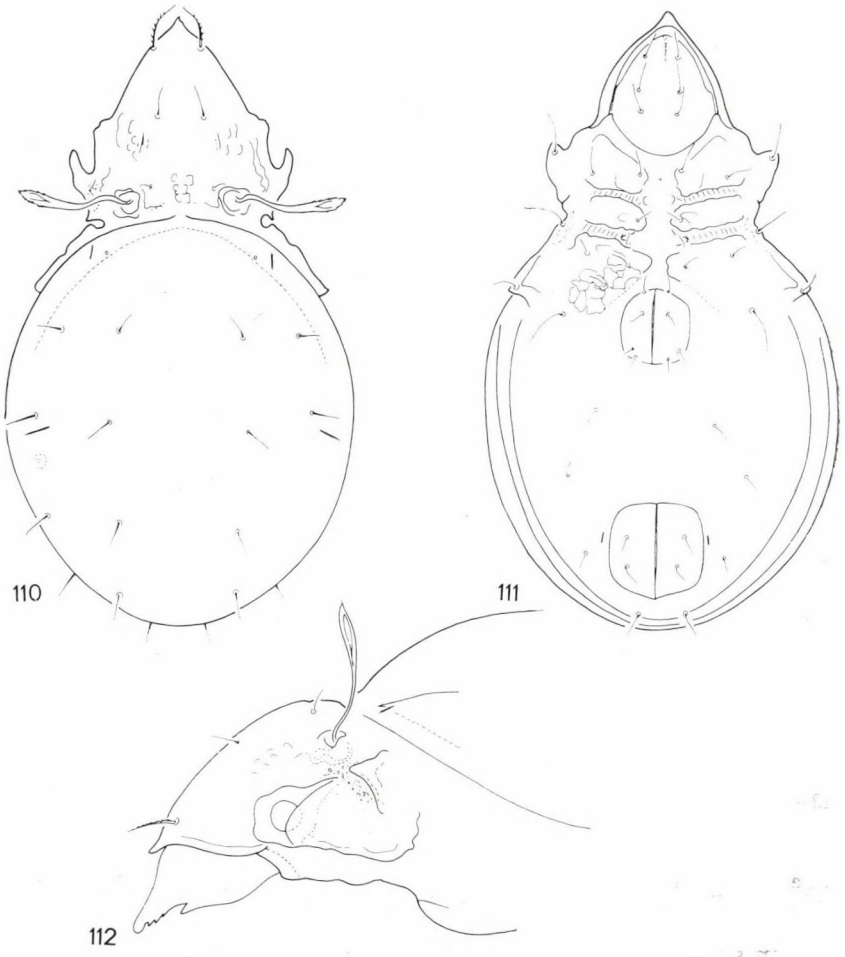
SCUTOVERTICIDAE GRANDJEAN, 1954

Scutovertex evansi sp. n.

Measurements. Length: 607 μm, width: 336 μm.

Dorsal side (Fig. 113): Entire body irregularly covered with secretion granules. Lamellae and translamella well developed, lamellar apex

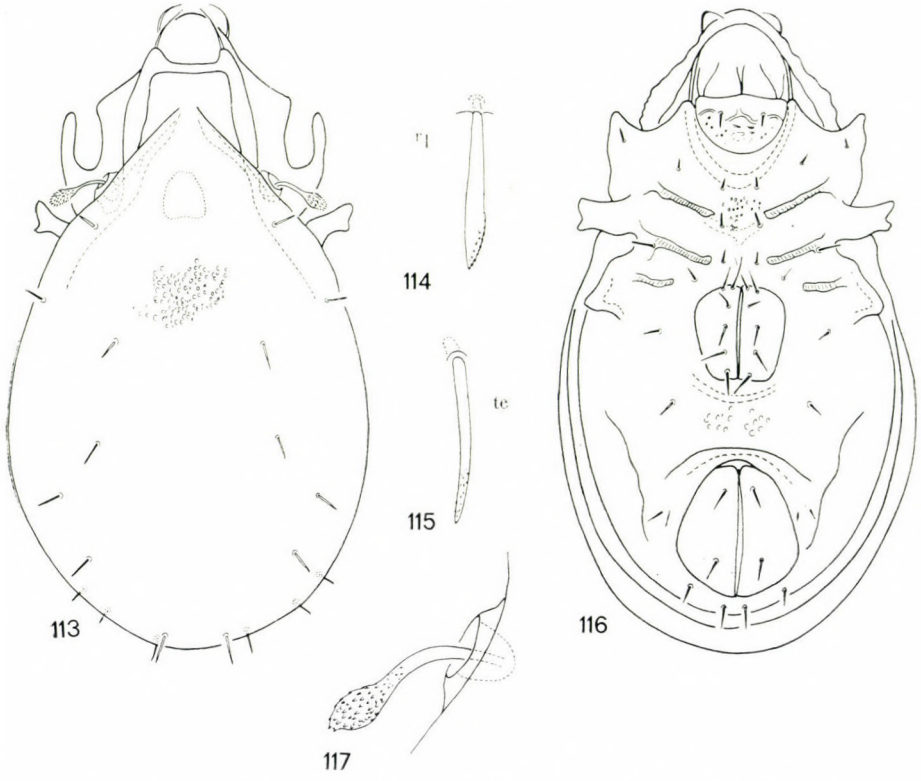
* *Tectoppiella antennata* (BAL. et MAH., 1966) comb. nov. (= *Oppia antennata* BAL. et MAH., 1966) = *Setoppia antennata* (BAL. et MAH., 1966) sensu BALOGH, 1983).



Figs 110—112. *Xenoppia oligochaeta* sp. n. — 110 = dorsal side, 111 = ventral side, 112 = prodorsum from lateral view

normal, short, not dilated anteriorly. Rostral and lamellar setae short, curved, interlamellar ones minute. Sensillus (Fig. 117) with long peduncle, and a small lanceolate head, covered with short spines. Dorsosejugal suture in the interlamellar region reaching forward. Ten pairs of short, straight and slightly spiniform notogastral setae, posterior setae (r_1—r_3) slightly dilated (Fig. 114), all the others spiniform (Fig. 115).

V e n t r a l s i d e (Fig. 116): Mentum with some rugae, rest of surface granulated, epimeral setae spiniform. Six pairs of genital setae long, especially the two inner pairs anteriorly. Behind genital plates, before anal plates and in the anogenital region laterally some strong rugae or laths present. Anal and adanal setae also spiniform.



Figs 113—117. *Scutovertex evansi* sp. n. — 113 = dorsal side, 114—115 = notogastral setae, 116 = ventral side, 117 = sensillus

Material examined: Holotypus (891-HO-83): Tanzania, Afr. 105. Holotypus deposited in the Hungarian Natural History Museum, Budapest.

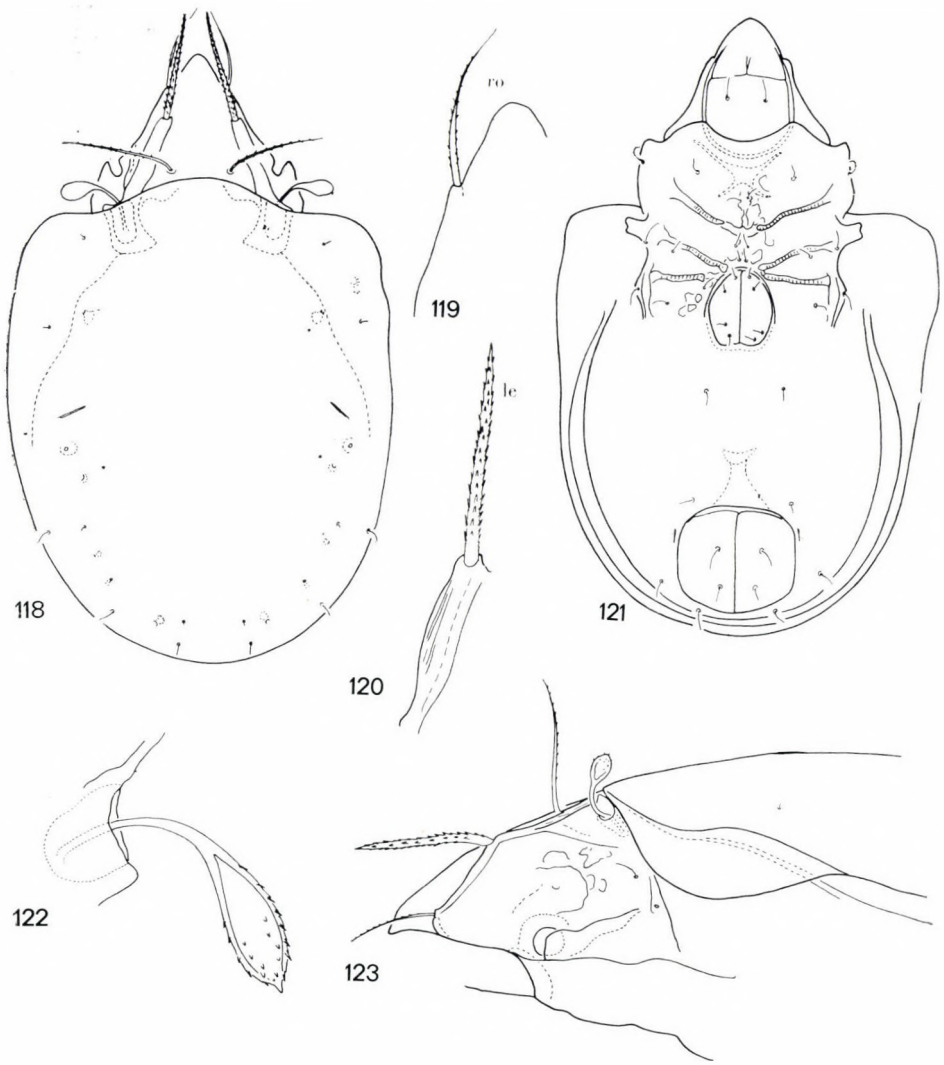
Remarks: The new species belong to the "*minutus*"-group. This group has not been known until now from East Africa. The new species is distinguished from *S. minutus* and from other related species by the thinner notogastral setae, the short and simple lamellar cuspis and the thick translamella.

ORIBATULIDAE Thor, 1929

Scheloribates pubescens sp. n.

Measurements. Length: ♀467—484, ♂: 400μm, ♀ width: 287—300, ♂: 224 μm.

Dorsal side (Fig. 118): Rostrum elongated, rostral setae (Fig. 119) thin, arising marginally, on a little tubercles of prelamella (Fig. 123). Lamellae wide, lamellar setae (Fig. 120) strongly thickened, distinctly barbed. Inter-



Figs 118—123. *Scheloribates pubescens* sp. n. — 118 = dorsal side, 119 = rostrum, 120 = lamella, 121 = ventral side, 122 = sensillus, 123 = prodorsum from lateral view

lamellar setae thin, normally developed. Sensillus (Fig. 122) short, with clavate head, its distal half aciculated. Notogaster is of a normal *Scheloribates*-type, with ten pairs of partly minute or scarcely visible setae, but setae ps_1—ps_3 slightly longer and stronger. Four pairs of small sacculi present.

V e n t r a l s i d e (Fig. 121): Epimeral setae nearly equal in length, finely ciliated. Setae of anogenital region much shorter and thinner. Setae ad_3 in preanal position.

Material examined: Holotypus (892-HO-83): S.-Afr. 1; 14 paratypes: from the same sample. Holotypus and 8 paratypes (892-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 4 paratypes in the Transvaal Museum, Pretoria and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well distinguished from all its congeners by the shape of prodorsal setae.

Urubambates calcaratus sp. n.

Measurements. Length: 484—500 μm, width: 238—246 μm.

Dorsal side (Fig. 124): Rostrum elongated, rounded. Rostral setae arising laterally, on a small tubercle of prelamellae. Rostral, lamellar and interlamellar setae long, thin, with short cilia, among them no great differences in length exist (Fig. 127). Sensillus reclinate, slightly thickened, setiform, pectinately ciliated on its outer margin. Dorsosejugal suture arched strongly forwards in interbothridial region. All setae very thin and simple. Surface punctulated.

Ventral side (Fig. 126): Epimeral setae nearly equal in length, all well ciliated. Epimeral surface with irregular spots. Apodemes well developed. Surface, also anogenital region, punctulated as is notogaster. Genital plates small, much smaller than anal ones. Four pairs of genital and one pair of aggenital setae simple, thin; adanal setae dilated, ciliated, ad_3 in preanal position.

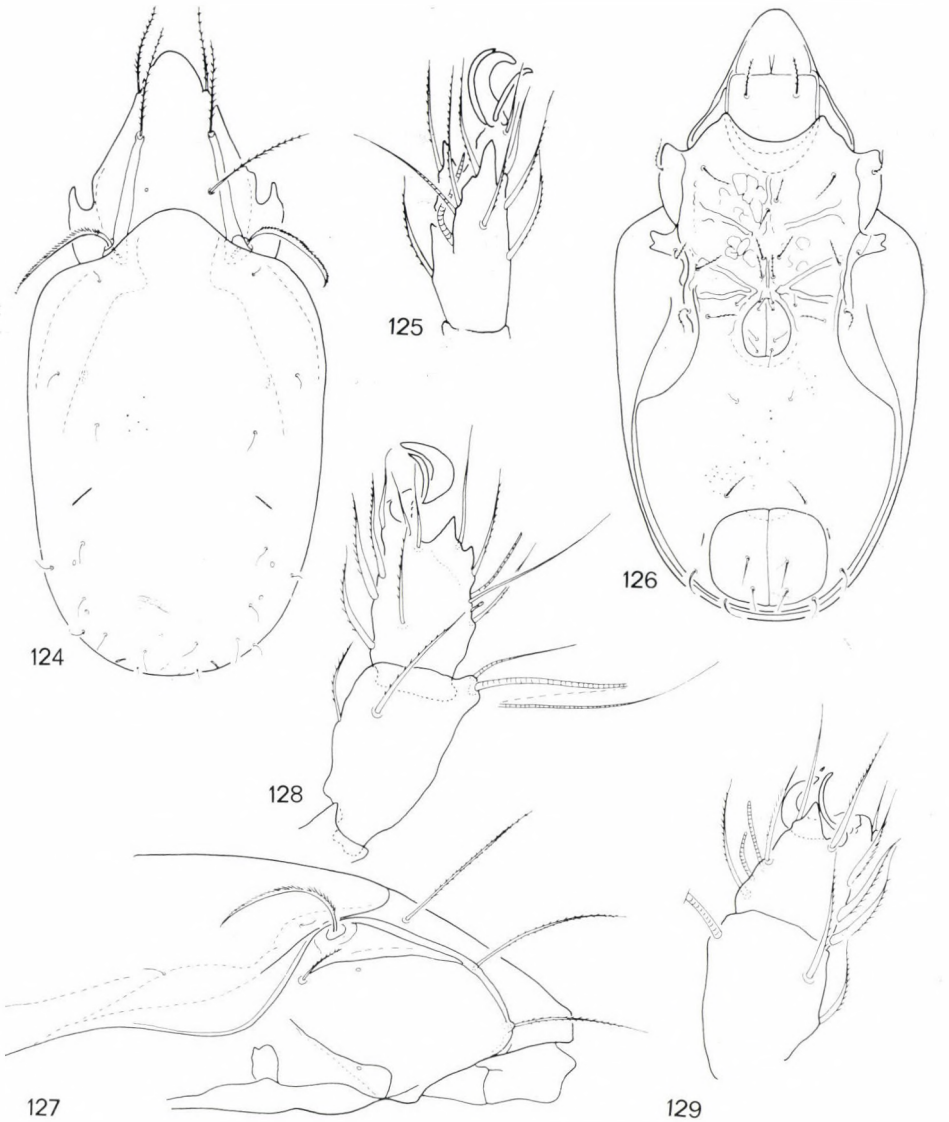
Material examined: Holotypus (893-HO-83): S.-Afr. 1; 4 paratypes: from the same sample. Holotypes and 2 paratypes (893-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Transvaal Museum, Pretoria and 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: It is the first species of the genus *Urubambates* HAMMER, 1961 from Africa. It is distinguished from the other species by the long, well-developed prelamella reaching to the insertion point of rostral seta.

HAPLOZETIDAE GRANDJEAN, 1936

Afroleius gen. n.

Diagnosis: Dark, well-chitinized and sculptured body. Lamellae wide, runing marginally, covering surface of prodorsum; a weak translamella present. Pteromorphae movable. Ten pairs of minute and short notogastral setae, four pairs sacculi present. Epimeral and ano-adanal surface also orna-



Figs 124—129. *Urubambates calcaratus* sp. n. — 124 = dorsal side, 125 = tarsus of leg II 126 = ventral side, 127 = prodorsum from lateral view, 128 = leg I, 129 = tarsus of leg I

mented. Six pairs of genital, 0 (?) or 1 pair of aggenital, 2 pairs of anal and three pairs of adanal setae observable. All legs tridactylous.

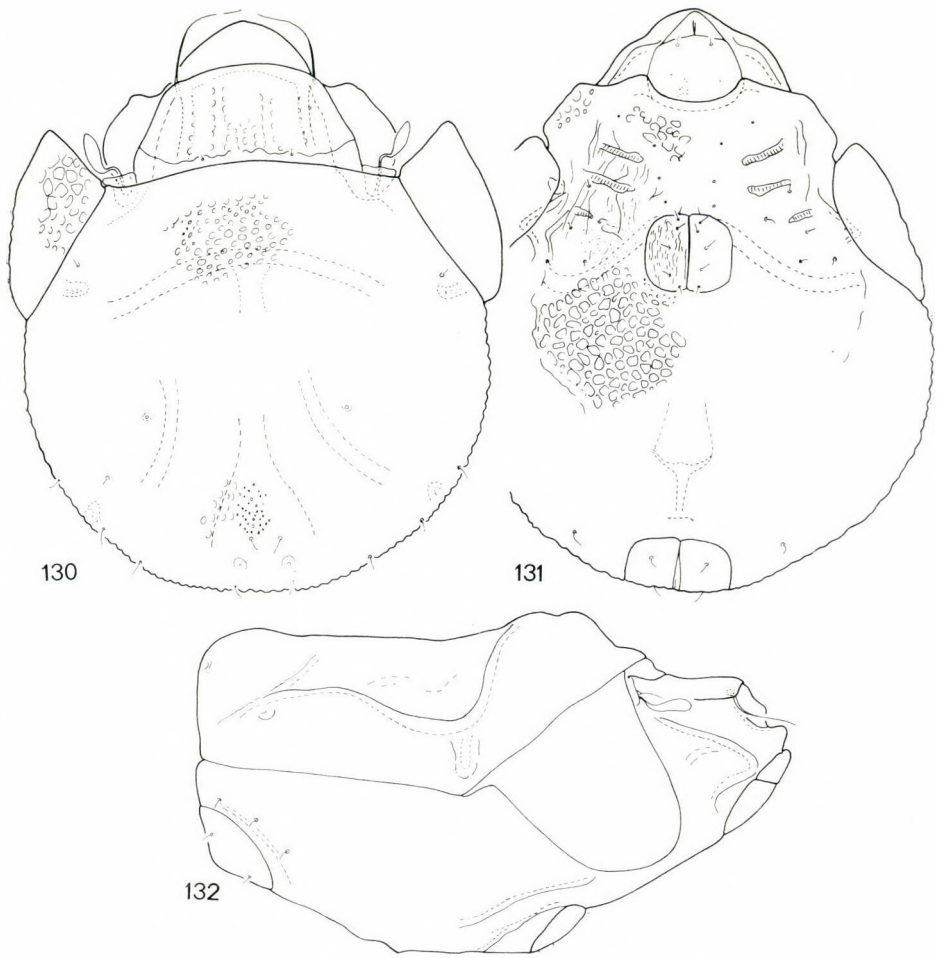
Type species: *Afroleius deformis* sp. n.

Remarks: The new genus resembling *Magyaria* Balogh, 1963, however, the latter has only 4 pairs of genital setae and one claw.

Afroleius deformis sp. n.

Measurements. Length: 377—418 μm, width: 303—336 μm.

D o r s a l s i d e (Fig. 130): Rostrum widely rounded. Rostral setae minute. Insertion of lamellar setae covered by wide lamellae, it has not separated cuspis. Sensillus with curved peduncle and clavate head. Prodorsal surface foveolated. Notogaster with a very high transversal elevation, behind it a longitudinal lath and a pair of deep cavity present (Fig. 132). Foveolae of different shapes and sizes, largest in the middle of the anterior part of notogaster and on pteromorphae, smallest laterally and on the posterior median protuberance of the body. Notogastral setae very thin and short, hardly visible. Sacculi well framed by a chitinous thickening.



Figs 130—132. *Afroleius deformis* sp. n. — 130 = dorsal side, 131 = ventral side, 132 = lateral side

Ventral side (Fig. 131): Surface with different ornamentation. Mentum with small and indistinct foveolae, around them epimeral surface with larger foveolae. Between setae *1a* and genital plates, surface only punctulated with some bigger crests laterally. Genital plates finely striated, anal ones foveolated. Anogenital region with very large foveolae. Epimeral setae very fine and short. Aggenital setae not observable.

Legs: All legs well chitinized. On genu of leg I a sharp spur present. All tarsi tridactylous, middle claw much stronger than the two lateral ones.

Material examined: Holotypus (894-HO-83): S.-Afr.; 13 paratypes: from the same sample. Holotypus and 8 paratypes (894-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 3 paratypes in the Transvaal Museum, Pretoria and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: See after the next *Afroleitus* species.

Afroleius minor sp. n.

Measurements. Length: 288—308 μm, width: 188—204 μm.

Dorsal side (Fig. 133): Rostral setae similar to lamellar one, only slightly shorter. Lamellar and prodorsal surface with polygonate sculpture consisting of large foveolae. Interlamellar setae minute. Sensillus long, peduncle curved, clavate head. Notogastral and pteromorphal surface also polygonated. Setae minute (Fig. 135).

Ventral side (Fig. 134): Very similar to that of the preceding species, however, the whole epimeral surface ornamented with large foveolae excepting a small punctated area before the genital opening. Foveolae of anogenital region much larger than epimeral or anal ones. Genital plates striated. All epimeral setae minute.

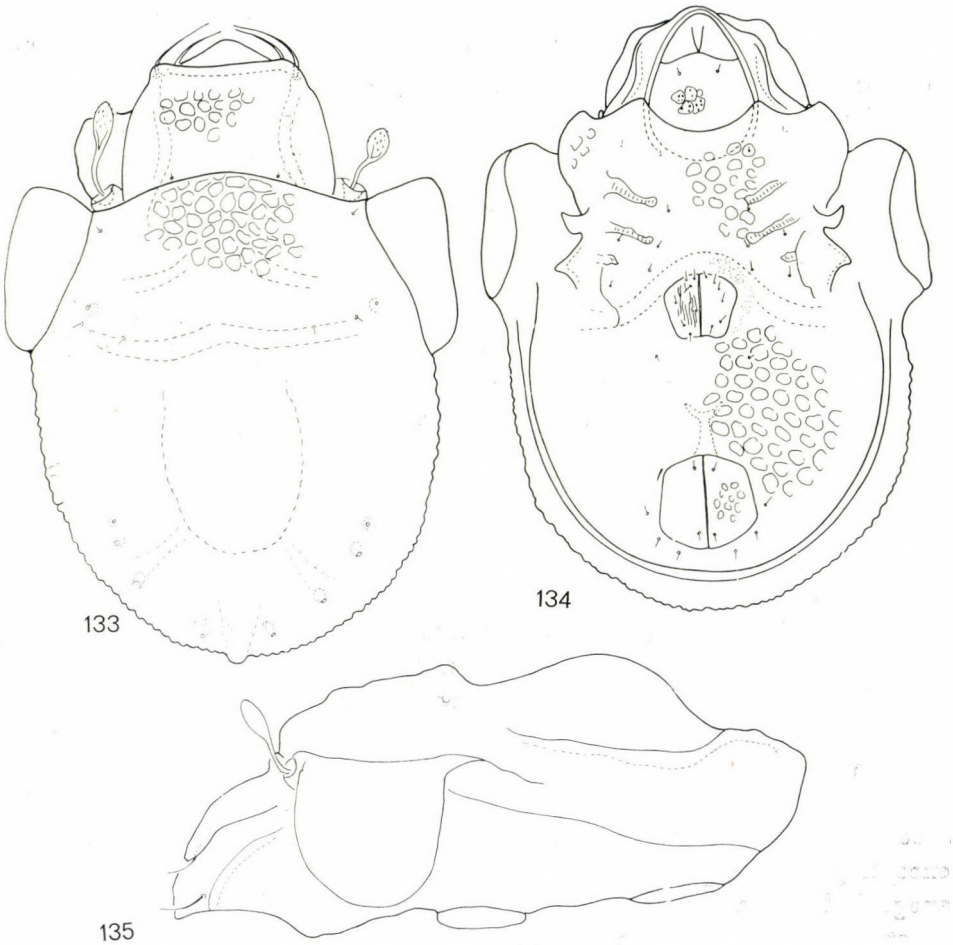
Material examined: Holotypus (895-HO-83): S.-Afr. 1; 11 paratypes: from the same sample. Holotypus and 6 paratypes (895-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 3 paratypes in the Transvaal Museum, Pretoria and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is distinguished from the preceding one by the sculpture of the epimeral region, the shape of its sensillus and by the long rostral setae.

Afroleius simplex sp. n.

Measurements. Length: 312—353 μm, width: 197—220 μm.

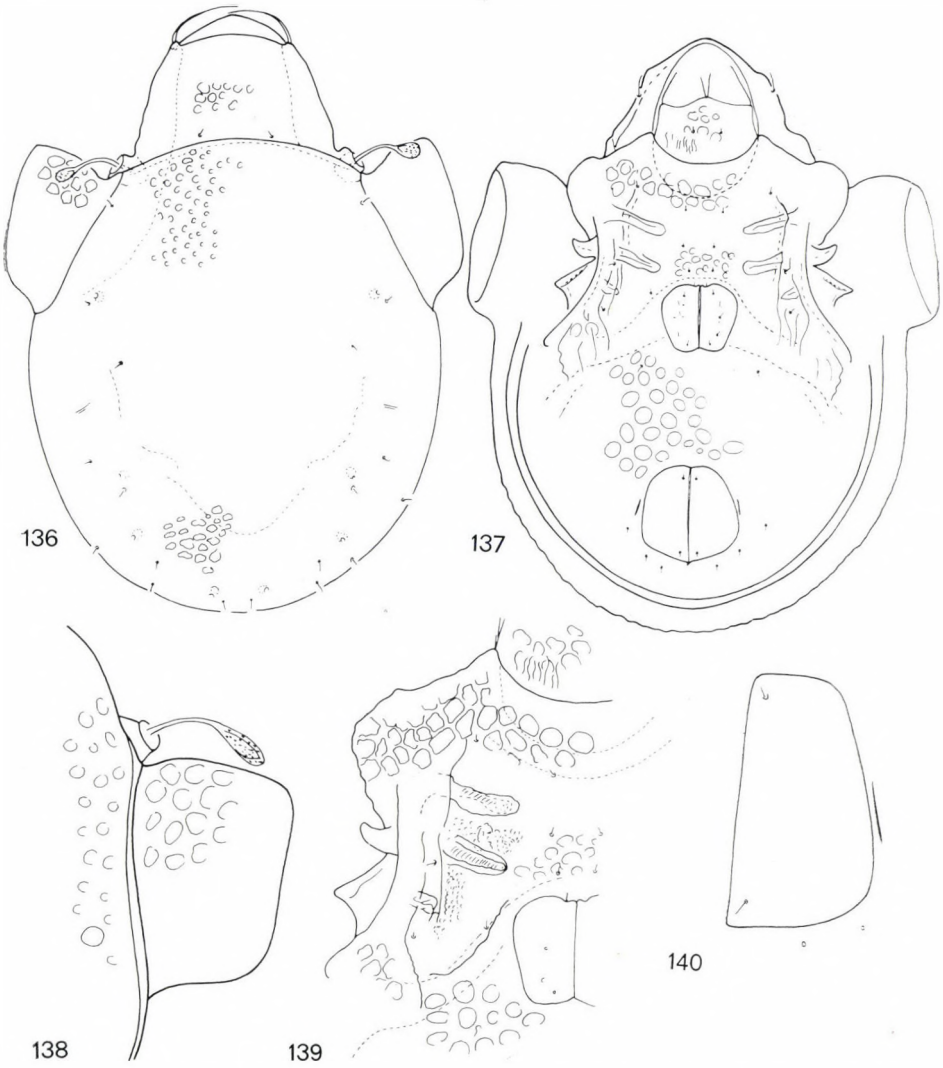
Dorsal side (Fig. 136): Lamellae with short cuspis, lamellar setae arising on them. Rostral setae short, originating laterally, interlamellar setae minute. Sensillus longer, its head smaller than in preceding two species. Inter-



Figs 133—135. *Afroleius minor* sp. n. — 133 = dorsal side, 134 = ventral side, 135 = latera side

lamellar surface with anteriorly stronger, posteriorly weaker polygonal reticulation consisting of large foveolae. Latter of notogaster excepting pteromorphal ones — differ in size; in anterior half of notogaster much smaller and far removed from each other, more so than those present on posterior part of notogaster or on pteromorphae.

V e n t r a l s i d e (Fig. 137): Ornamentation is very different. On mentum polygonal reticulation combined with rugae; middle part of epimeral region finely rugose, anteriorly and, forst of all, laterally polygonal sculpture well visible. Some larger rugae longitudinally also observable (Fig. 139). Ornamentation of anogenital region similar to that on notogastral surface. All epimeral and anogenital setae minute.



Figs 136—140. *Afroleius simplex* sp. n. — 136 = dorsal side, 137 = ventral side, 138 = shoulder region, 139 = epimeral region, 140 = anal plate

Material examined: Holotypus (896-HO-83): S.-Afr. 1; 11 paratypes: from the same sample. Holotypus and 6 paratypes (896-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 3 paratypes in the Transvaal Museum, Pretoria and 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

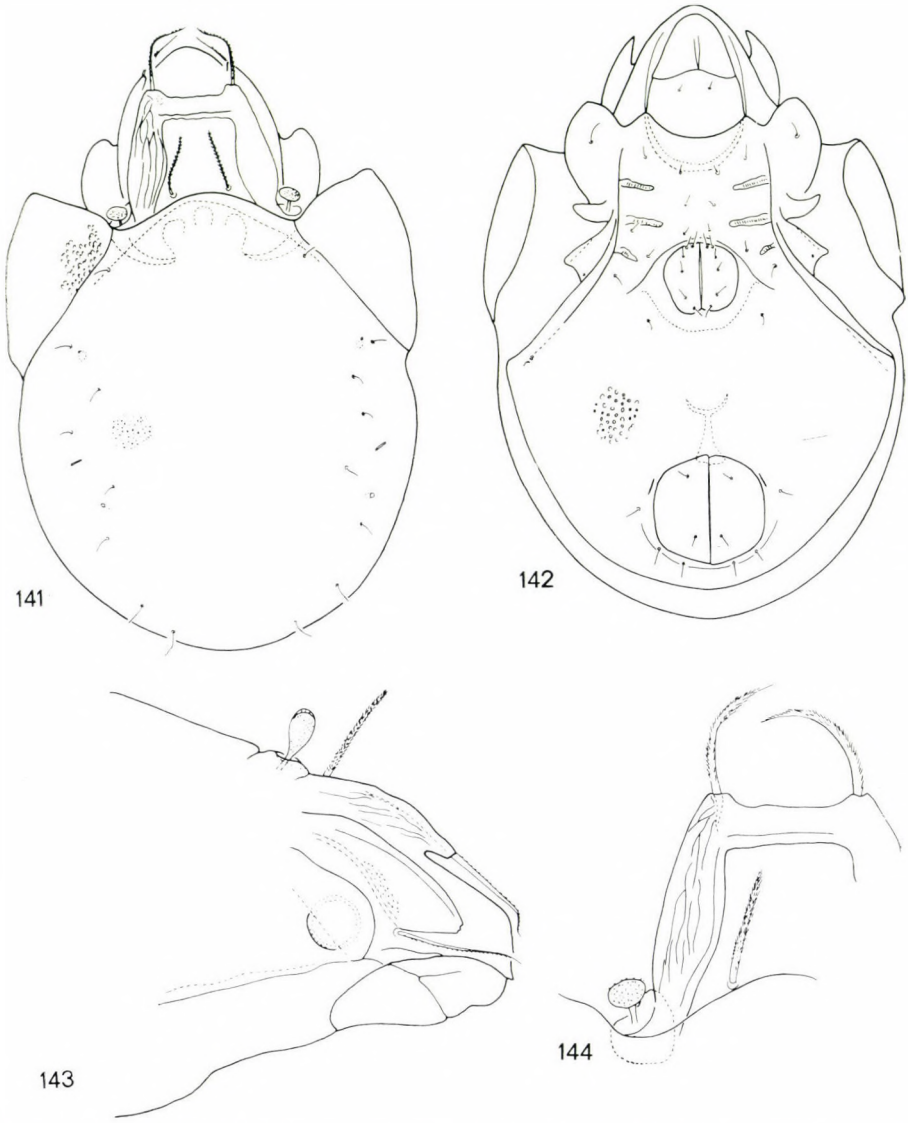
Remarks: The new species is well distinguished from the preceding two new species by the sculpture of body and the form of the lamellae.

CERATOZETIDAE JACOT, 1925

Africoribates maximus sp. n.

Measurements. Length: 671—707 μm, width: 419—444 μm.

D o r s a l s i d e (Fig. 141): Form of body, lamellae, pteromorphae well corresponding with generotype. Lamellae and translamella (Fig. 144) very broad, lamellar cuspis observable, or minute. Lamellar surface with longi-



Figs 141—144. *Africoribates maximus* sp. n. — 141 = dorsal side, 142 = ventral side, 143 = prodorsum from lateral view, 144 = lamellae

tudinal rugae. Sensillus short, interlamellar setae long, but stout well ciliated (Fig. 143). Notogastral surface, also pteromorpha evenly granulated. Notogastral setae comparatively long, curved.

Ventral side (Fig. 142): Entire surface evently granulated. All epimeral setae short, thick and well ciliated. Six pairs of genital, one pairs of aggenital and all anal setae thin, curved; adanal setae thicker than these rigid and straight.

Material examined: Holotypus (897-HO-83): Afr. 177; 10 paratypes (897-HO-80): from the same sample. Holotypus and 8 paratypes deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well characterized by its measurements (much larger than any *Africoribates* EVANS, 1953 taxa). It stands nearest to *A. ornatus* EVANS, 1953, however, the interlamellar setae are much longer than those of the latter one, the sculpture of pteromorphae without connected granulates, and the ventral surface evenly granulated, not striated, as in ornatus.

Ghilarovizetes africanus sp. n.

Measurements. Length: 853—902 μm, width: 631—664 μm.

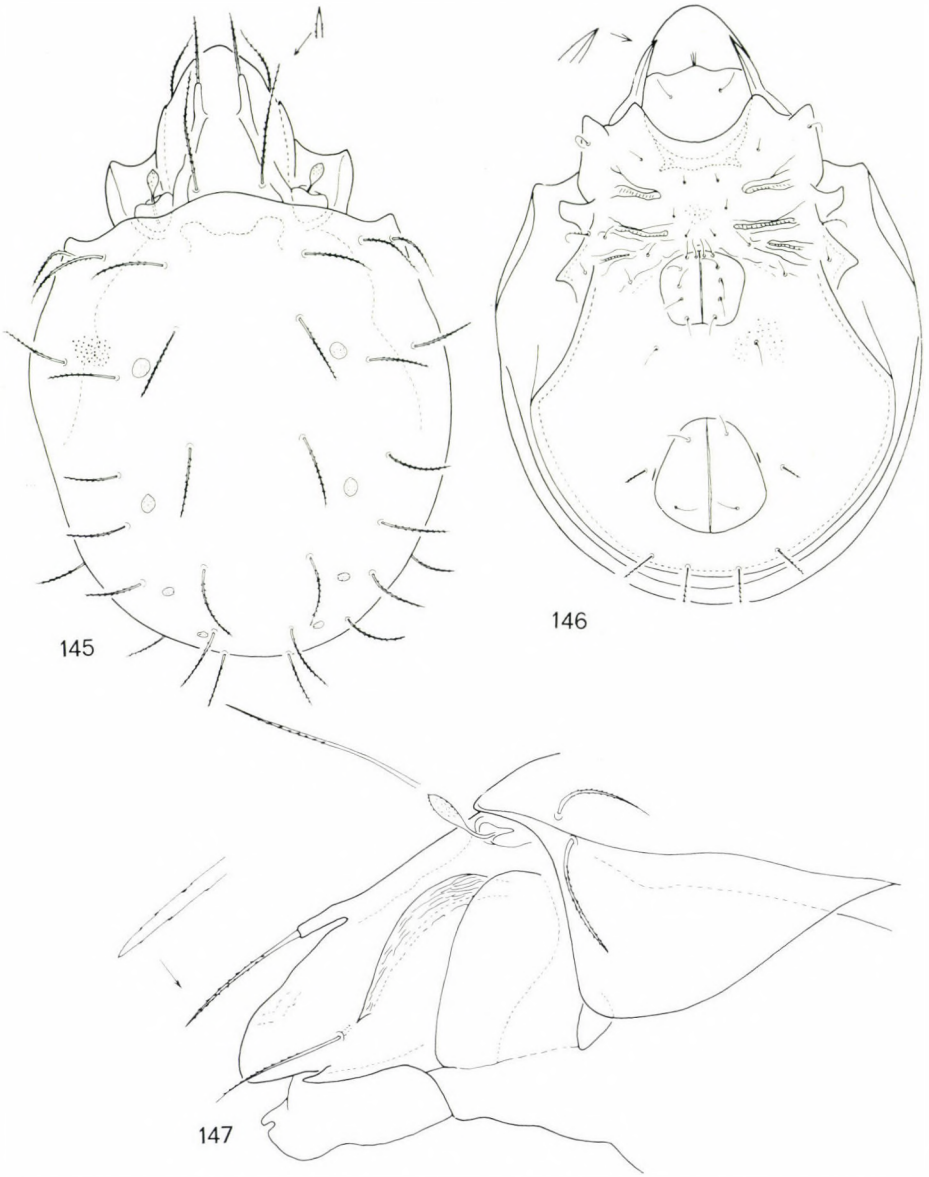
Dorsal side (Fig. 145): Rostrum widely rounded, without incision. Rostral setae thin, setiform, finely ciliated. Lamellae with well developed, comparatively long free cuspis, translamella absent. Lamellar setae strong, spiniform, interlamellar ones much longer, but similar to preceding ones, both pairs roughened. Tectum (Fig. 147) strongly curved, ending in a sharp cuspis far from rostral setae. Sensillus small, with lanceolate head, its surface finely barbed. Notogaster punctulate. Fifteen pairs of strong, long and barbed notogastral setae present. Four pairs of round, sometimes hardly visible areae porosae observable; *Aa*, A_1 and A_2 originating nearly in a longitudinal row, *Aa* far from lateral margin of notogaster.

Ventral side (Fig. 146): Strongly punctulate. Apodemes weakly developed. Epimeral setae simple and short. Six pairs of simple genital setae present, aggenital and anal setae thin, adanal setae slightly stronger, similar to notogastral one.

Legs: All legs tridactylous, heterodactylia strong.

Material examined: Holotypus (898-HO-83): Afr. 179; 3 paratypes: from the same sample. Holotypus and 2 paratypes (898-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: It is the first record of this genus in Africa. Until now this genus has included two species, both from the Soviet Union. The new species is distinguished from them by the long free cuspis and the much longer notogastral setae.

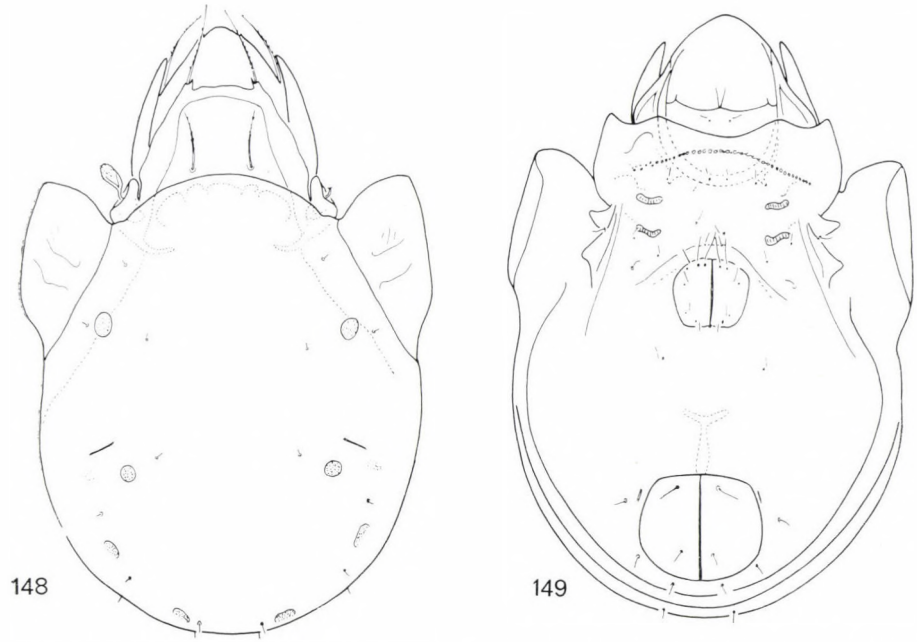


Figs 145—147. *Ghilarovizetes africanus* sp. n. — 145 = dorsal side, 146 = ventral side, 147 = prodorsum from lateral view

Kilimabates auriculatus sp. n.

Measurements. Length: 292—320 μm, width: 168—205 μm.

D o r s a l s i d e (Fig. 148): Rostrum (Fig. 153) divided by two thin incisions, between them rostrum straight anteriorly. Lamellae and trans-



Figs 148—149. *Kilimabates auriculatus* sp. n. — 148 = dorsal side, 149 = ventral side

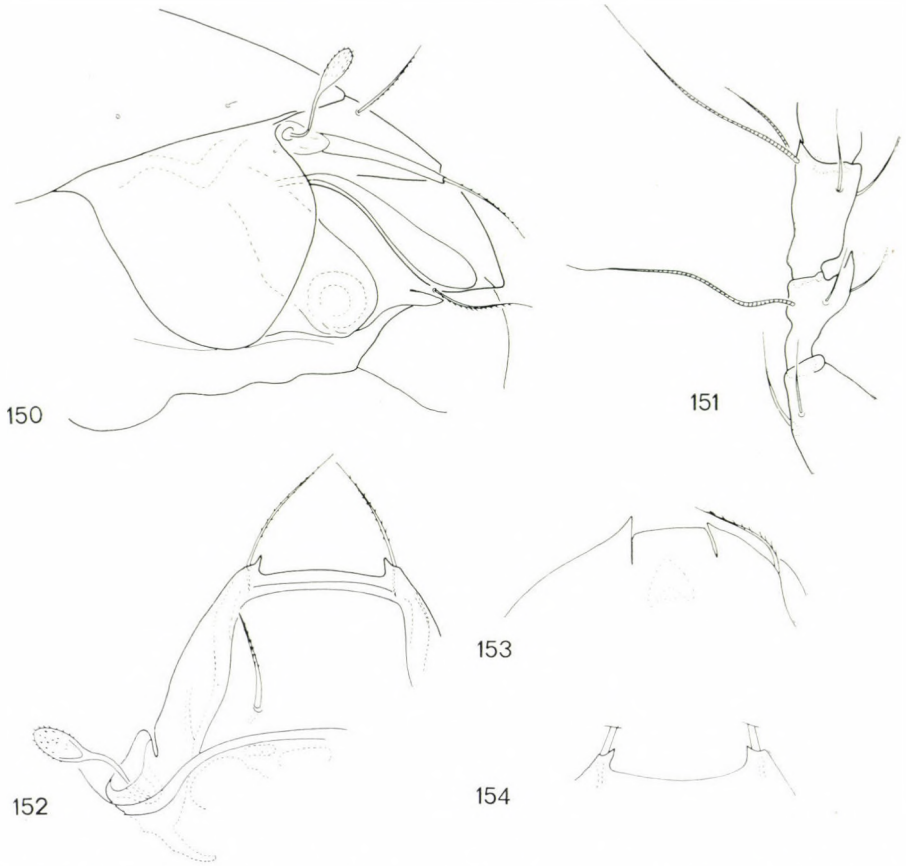
lamella (Fig. 154) well developed, lamellae with short cuspis, rounded exteriorly and with sharp tooth exteriorly. Rostral, lamellar and interlamellar setae nearly equal in length, all wall ciliated. Tectum (Fig. 150) rounded anteriorly, smooth. Genal teeth well separated. Sensillus short, its head fusiform, peduncle curved. Bothridium (Fig. 152) large, auriculate. Notogaster smooth, ten pairs of minute setae and four pairs of round areae porosae present.

V e n t r a l s i d e (Fig. 149): On anterior part of epimeral region a convex transversal line of granules, resembling a string of pearls. All epimeral setae minute. Six pairs of genital setae, among them the three anterior pairs much longer than the others. Adanal setae short, originating around anal opening, setae ad_3 in paraanal position.

L e g s : All legs with three claws, genu with a strong, sharp spur (Fig. 151).

M a t e r i a l e x a m i n e d : Holotypus (899-HO-83): Afr. 117; 17 paratypes: from the same sample. Holotypus and 15 paratypes (899-PO-83) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The new species is distinguished from the generotype by the shorter rostral apex and by the cuspis of lamellae.



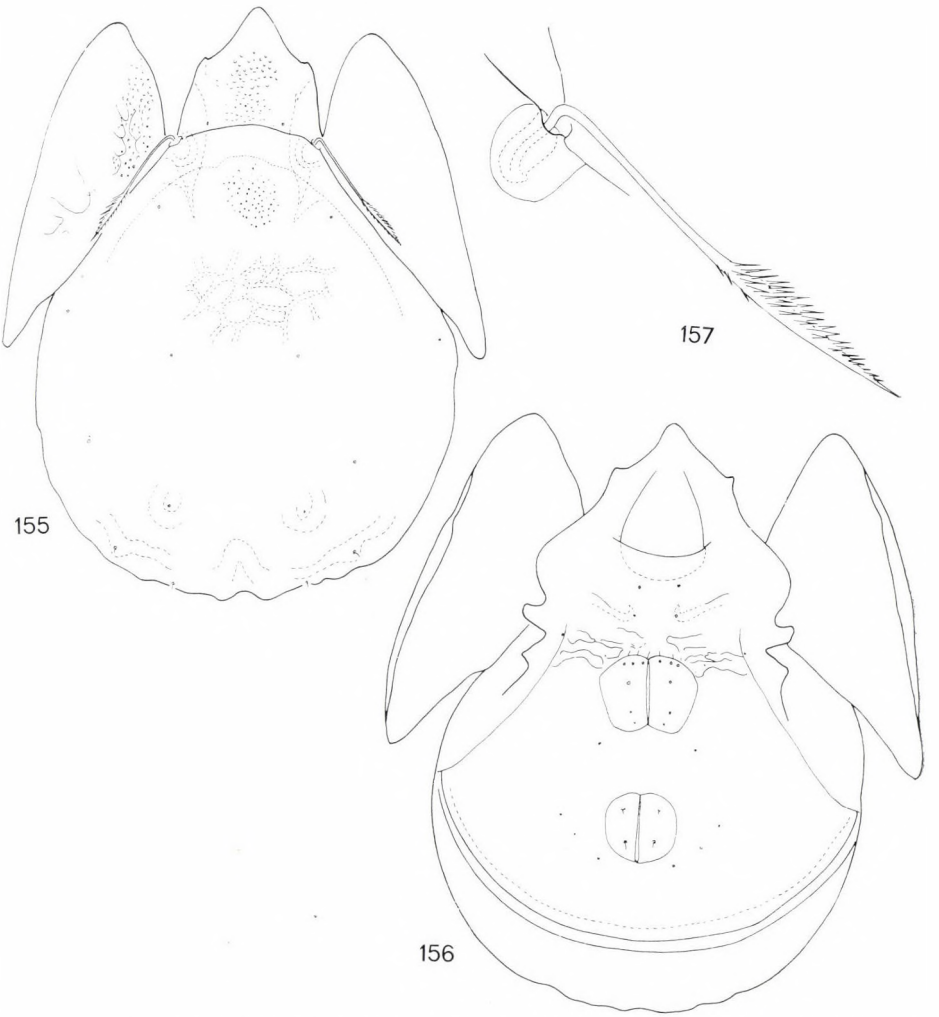
Figs 150—154. *Kilimabates auriculatus* sp. n. — 150 = prodorsum from lateral view, 151 = leg I, 152 = lamellar region, 153 = rostral region, 154 = cuspis of lamellae

GALUMNIDAE Jacot, 1925

Galumnella tanzanica sp. n.

Measurements. Length: 320—356 μm, width: 232—260 μm.

Dorsal side (Fig. 155): Prodorsum, notogaster and pteromorpha pitted, langest pits on the middle part of prodorsum, smallest on basal part of prodorsum and on notogaster. Irregular network-like structures hardly and rather indistinctly visible. Rostrum elongated but slightly rounded. Lamellar line normal, not strongly expanded from prodorsum. Sensillus (Fig. 157) long, directed posteriorly, with separated head: peduncle smooth, head well ciliated Notogastral setae minute hardly observable. Endpart of notogaster with some large rugae or elevations visible even under lower magnification. Dorsosejugal suture weakly convex.



Figs 155—157. *Galumnella tanzanica* sp. n. — 155 = dorsal side, 156 = ventral side, 157 = sensillus

Ventral side (Fig. 156): Whole surface (also genital and anal plates and mentum) irregularly pitted. All setae minute, hardly observable. Six pairs of genital, one pair of aggenital, two pairs of anal and three pairs of adanal setae present. Last three pairs originating in semicircular position.

Material examined: Holotypus (900-HO-83): Afr. 117; 12 paratypes: from the same sample. Holotypus and 10 paratypes (900-HO-83) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: On the ground of the sculpture, the new species stands nearest to *Galumnella punctipennis* Balogh, 1960, however, it is distinguished from it and from all other congeners by the form of the sensillus.

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Acta Zoologica Hungarica 30 (3—4), pp. 445—468 (1984)

BRACONIDAE (HYMENOPTERA) FROM MONGOLIA, X*

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(Received 13 September, 1983)

Taxonomical and faunistical data of sixty-seven Braconid species from Mongolia are given. Five species are new to science: *Bracon dissolutus* sp. n. ♀, *B. frutus* sp. n. ♀, *B. pertinax* sp. n. ♀♂, *B. rurrenus* sp. n. ♀ and *B. turolus* sp. n. ♀. Twenty-two species are new to the fauna of Mongolia. New synonym is *Bracon* (*Lucobracon*) *incitus* PAPP, 1971 = *B.* (*L.*) *subinfernalis* TOBIAS, 1972. New revised species-names are *B.* (*B.*) *pilosulus* SZÉPLIGETI, 1901, *B.* (*Glabrobracon*) *venustus* TELENGA, 1936 and *Isomecus mongolicus* (TELENGA, 1936). New name: *Bracon* (*Lucobracon*) *persimiloides* nom. n., is given to the homonym *B.* (*L.*) *persimilis* PAPP, 1971 nec TELENGA, 1936. With 24 figures.

1. List of species

BRACONINAE

Atanycolus denignator (LINNÉ, 1758) — Chövsgöl aimak: N von Somon Chatgal am SW-Ecke des Sees Chövsgöl nuur, 1650 m, 18. VII. 1968 (No. 1123), 1 ♀.

Distributed in the Palaearctic Region. New to the fauna of Mongolia.

Atanycolus initiator (FABRICIUS, 1793) — Zavchan aimak: 24 km O von Somon Songino, 2000 m, 12. VII. 1968 (No. 1095), 1 ♀.

Sporadic to frequent in the Palaearctic Region. New to the fauna of Mongolia.

Baryproctus turanicus TELENGA, 1936 — Bajanchongor aimak: Oase Echin gol, cc. 90 km NO von Grenzposten Caganbulag, 950 m, 27—28. VI. 1967 (No. 855), 10 ♀ + 8 ♂. — Mittelgobi aimak: 20 km S von Somon Delgerzogt, 1480 m, 13—14. VII. 1967 (No. 915), 6 ♀ + 4 ♂.

Described from Uzbeghistan (USSR); this is its second distributional datum. New to the fauna of Mongolia.

Bracon (Glabrobracon) atrator NEES, 1834 — Chovd aimak: 3 km N von Somon Uenč, im Tal des Flusses Uenč gol, 1450 m, 2—3. VII. 1966 (No. 614), 1 ♂. — Bulgan aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 24. VII. 1968 (No. 1145), 1 ♀.

Bracon (Foveobracon) biimpressus TELENGA, 1936 — Central aimak: Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1700—1900 m, 23—24. VII. 1967 (No. 926a), 2 ♀.

Antenna as long as body, with 39 joints. Metasoma yellow, first tergite black, further tergites medially with black macula of variable size.

Listed in Czechoslovakia, USSR (European part). New to the fauna of Mongolia.

Bracon (Lucobracon) brachypterus TOBIAS, 1959 — Südgobi aimak: Tachilga ul Gebirge, zwischen Somon Zogt-Ovoo und Somon Dalanzadgad, 68 km S von Zogt-Ovoo, cca 1550 m, 12. VI. 1967 (No. 792), 1 ♀.

* Ergebnisse der zoologischen Forschungen von Dr. Z. KASZAB in der Mongolei, Nr. 484.

Previously (PAPP, 1967a) I have reported its melanic form and gave it the name as var. *niger* PAPP. My female specimen at hand represents the light form. Antenna very short, hardly as long as head and mesosoma together, with 19 joints. Tergites 2—3 quadrate, i.e. about as long as wide behind. Ovipositor sheath shorter than metasoma.

Known from the USSR (Azerbaidzhan, Kazakhstan) and Mongolia.

Bracon (Glabrobracon) ciscaucasicus TELENGA, 1936 — Südgobi aimak: Tachilga ul Gebirge, zwischen Somon Zogt-Ovoo und Dalanzadgad, 68 km S von Zogt-Ovoo, 1550 m, 8. VII. 1967 (No. 900), 1 ♀.

Radial cell short, radial vein ending far before tip of wing; fore margin of radial cell slightly longer than stigma. Body black, tegula yellow. Otherwise similar to *B. osculator* NEES.

So far observed in the USSR (European part, Kazakhstan, Azerbaidzhan) and Mongolia.

Bracon (Glabrobracon) dissolutus sp. n.: see p. 456.

Bracon (Orthobracon) epitriptus MARSHALL, 1885 — Central aimak: cca 30 km O von Somon Nalajh, 1530 m, 14. VI. 1966 (No. 523), 1 ♀. — Bulgan aimak: zwischen Somon Chischig-Öndör und Somon Orchon, 23 km NNO von Chischig-Öndör, 1390 m, 15. VI. 1968 (No. 961), 1 ♂.

The female specimen from the locality No. 523 with somewhat darkened legs; joints of flagellum short, 1.3—1.2 times longer than broad.

Bracon (Lucobracon) erraticus WESMAEL, 1838 — Central aimak: Ulan-Baator, Nucht im Bogdo ul, 1600—1750 m, 10. VI. 1966 (No. 514), 1 ♀; Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1700—1900 m, 23—24. VII. 1967 (No. 926a), 1 ♀. — Bulgan aimak: 9 km O von Somon Abzaga, 1300 m, 23. VII. 1966 (No. 730), 1 ♂. — Chövsgöl aimak: 8 km N von Somon Burenchaan, am Fluss Delger mörön, 1450 m, 20. VI. 1968 (No. 990), 1 ♂; Alag Mort, 42 km NO vom Pass Chaldzan Sogotyn davaa, am Fluss Tesijn gol, 1900 m, 14. VII. 1968 (No. 1107), 1 ♀. — Uvs aimak: Sandgebiet Altan els, 35 km WNW von Somon Tes, 1400 m, 23. VI. 1968 (No. 1007), 1 ♂.

Widely distributed in the Palaearctic Region as far eastwards as Soviet Middle Asia. New to the fauna of Mongolia.

Bracon (Lucobracon) erraticus var. **superciliosus** (WESMAEL, 1838) — Central aimak: Ulan-Baator, Zaisan im Bogdo ul, 5 km S vom Zentrum, 1600 m, 6. VI. 1966 (No. 499), 1 ♀; Ulan-Baator, Nucht im Bogdo ul, 12 km SO vom Centrum, 1500—1600 m, 21. VII. 1967 (No. 931), 1 ♂. — Südgobi aimak: Nojon nuruu Gebirge, Grenzposten Ovot Chuural, 1500 m, 21. VI. 1967 (No. 829), 1 ♂. — Bulgan aimak: 7 km NW von Somon Chanžargalant, 1350 m, 16. VI. 1968 (No. 967), 1 ♀. — Chövsgöl aimak: 8 km N von Somon Burenchaan, am Fluss Delger mörön, 1450 m, 20. VI. 1968 (No. 990), 1 ♂.

Two females and two males from the localities No. 499, 829, 931 and 967 are small forms. Body usually 3.5—4.5 mm long, specimens at hand are but 2.5—2.8 mm (♀♀) and 2 mm (♂♂) long. Head 1.7—1.8 times (usually 1.7 times) broader than long. Antenna 22—26- (♀♀) and 21-jointed (♂♂).

The variety seems also to be distributed in the Palaearctic Region.

Bracon (Orthobracon) exhilarator NEES, 1834 — Central aimak: Ulan-Baator, Nucht im Bogdo ul, 12 km SO vom Centrum, 1650 m, 4. VI. 1966 (No. 494), 1 ♀; Ulan-Baator, Nucht im Bogdo ul, 1880—2000 m, 9. VI. 1966 (No. 508), 1 ♀; idem, 1600—1750 m, 10. VI. 1966 (No. 514), 1 ♀; Ulan-Baator, Zaisan im Bogdo ul Gebirge, 5 km S vom Centrum, 1600 m,

11. VI. 1968 (No. 942), 1 ♀. — Bulgan aimak: 7 km NW von Somon Chanžargalant, 1350 m, 16. VI. 1968 (No. 967), 1 ♀ + 1 ♂. — Chövsgöl aimak: 8 km N von Somon Burenchaan, am Fluss Delger mörön, 1450 m, 20. VI. 1968 (No. 990), 1 ♀.

Tergites 3—4(—5) with weak to very weak sculpture. Hind femur black, apically yellow. Medio-longitudinal carina of propodeum sometimes very feeble.

Reported first from Mongolia by me (PAPP, 1967a).

Bracon (Lucobracon) frutus sp. n.: see p. 458.

Bracon (Bracon) fulvipes NEES, 1834 — 1 ♀: Mongolia, Yellow Gobi, 1. IX. 1977, leg. G. MOLNÁR.

Bracon (Glabrobracon) ghobensis TOBIAS, 1972 — Südgobi aimak: Tachilga ul Gebirge, zwischen Somon Zogt-Ovoo und Dalanzadgad, 68 km S von Zogt-Ovoo, 1550 m, 8. VII. 1967 (No. 900), 2 ♀. — Uvs aimak: 10 km NW von Somon Naranbulag, 1350 m, 9. VII. 1968 (No. 1082), 1 ♀; 3 km NO Somon Öndörchangaj, Gebirge Chanchöchij ul, 2200 m, 11. VII. 1968 (No. 1091), 1 ♀.

Circular opening of mouth small, its horizontal diameter somewhat shorter than shortest distance between its rim and margin of eye. Radial cell variable in length, however, ending always far before tip of wing. Wings hyaline. Body 2—2.5 mm long.

Known only from Mongolia.

Bracon (Lucobracon) grandiceps THOMSON, 1892 — Central aimak: Ulan-Baator, Nucht im Bogdo ul, 12 km SO vom Centrum, 1650—1950 m, 4. VI. 1966 (No. 494), 1 ♀. — Zavchan aimak: Choit chunch, 26 km ONO vom See Telmen nuur, 2150 m, 13. VII. 1968 (No. 1104), 1 ♀.

Captured in several countries of Europe though nowhere frequent. First reported from Mongolia by me (PAPP, 1967a).

Bracon (Lucobracon) guttiger WESMAEL, 1838 — Chovd aimak: 3 km N von Somon Uenč, im Tal des Flusses Uenč gol, 1450 m, 2—3. VII. 1966 (No. 614), 2 ♀.

The two female specimens represent a light-coloured form. Metasoma and legs entirely (1 ♀) or partly (1 ♀) yellowish brown, tergites 2—6 of latter female with brown suffusion, and legs with brown to blackish pattern.

Distributed in Europe. New to the fauna of Mongolia.

Bracon (Orthobracon) immutator NEES, 1834 — Central aimak: Ulan-Baator, Nucht im Bogdo ul, 12 km SO vom Centrum, 1650 m, 4. VI. 1966 (No. 493), 1 ♀.

So far known only from Europe. New to the fauna of Mongolia.

Bracon (Lucobracon) incitus PAPP, 1971

Bracon (*Glabrobracon*) *incitus* PAPP, 1971, Annls hist.-nat. Mus. natn. hung., **63:** 346, ♀♂, locus typicus: "Čojbalsan aimak: 40 km E from Somon Tamzagbulag" in Mongolia. — Holotype in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 1903.

Bracon (*Lucobracon*) *subinfernalis* TOBIAS, 1972, Насекомые Монголии, **1:** 588, ♀♂, locus typicus: „Дзабханский аймак: 30 км ЗСЗ сомона Тэс, луговая растительность по саю в степы, 3—4. VII. 1968" in Mongolia, **syn. n.** — Holotype in the Zoological Institute, Leningrad.

The above synonymization is based on the comparison of the type-series of my species with the authentic female specimen of *B. subinfernalis* TOBIAS named by the author himself. — In my original description its arrangement in the subgenus *Glabrobracon* was a misprint not perceived by me. Hitherto

observed only in Mongolia. The female specimen from the locality No. 1113 is with yellow tegula, otherwise tegula dark brown to brown.

Localities — Central aimak: Ulan-Baator, Nucht im Bogdo ul, 1600—1750 m, 10. VI. 1966 (No. 514), 1 ♂. — Chövsgöl aimak: 3 km W von Somon Burenchaan, 1650 m, 16. VII. 1968 (No. 1113), 1 ♀.

Bracon (Bracon) intercessor Nees, 1834 — Central aimak: Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1700—1900 m, 23—24. VII. 1967 (No. 926a), 1 ♀; Ulan-Baator, Nucht in Bogdo ul, 12 km SO vom Centrum, 1500—1600 m, 21. VII. 1967 (No. 931), 1 ♂; 11 km OSO von Somon Bajanzogt, 1600 m, 13. VI. 1968 (No. 944), 1 ♀.

The female specimen from the locality No. 944 is a light form: head + mesosoma reddish yellow and only stemmaticum, metapleuron, propodeum and mesosternum black.

A Palaearctic species, frequent in Europe.

Bracon (Lucobracon) kaszabi Papp, 1967 — Chentej aimak: 7 km VO von Somon Mörön, 1200 m, 28—29. VII. 1965 (No. 319), 1 ♂. — Uvs aimak: 22 km WSW von Somon Zuungobi, 980 m, 26. VI. 1968 (No. 1018), 1 ♀.

Described from Mongolia; my report of its occurrence in Hungary was due to a misidentification (Papp, 1969a).

Bracon (Glabrobracon) kozlovi Telenga, 1936 — Chovd aimak: 3 km N von Somon Uenč, im Tal des Flusses Uenč, 1450 m, 2. VII. 1966 (No. 616), 1 ♀.

Bracon (Orthobracon) longicollis Wesmael, 1838 — Central aimak: Ulan-Baator, Nucht im Bogdo ul, 1600—1750 m, 10. VI. 1966 (No. 514), 1 ♂. — Zavchan aimak: Choit chunch, 26 km ONO vom See Telmen nuur, 2150 m, 13. VII. 1968 (No. 1102), 1 ♀.

Bracon (Lucobracon) longithorax Tobias, 1961 — Bulgan aimak: 30 km NNW von Somon Daschinčilen, 1200 m, 15. VI. 1968 (No. 959), 1 ♀.

My single female agrees with the original description (Tobias, 1961) excepting the following features: (1) discoidal cell 1.5 times longer than wide (*cu1* : *n. bas.* = 11 : 7); (2) proportional length of the three sections of the radial vein as *r1* : *r2* : *r3* = 13—12 : 26 : 43.

Hitherto known only from Krasnoyarsk (West Siberia). New to the fauna of Mongolia.

Bracon (Glabrobracon) marshalli Szépligeti, 1901 — Bulgan aimak: cca 20 km W von Somon Bajannuur (220 km W von Ulan-Baator), 1100 m, 18. VI. 1966 (No. 531), 1 ♀.

Very similar to *B.* (*G.*) *obscurator* Nees. The most important distinctive feature of *B. marshalli* against *B. obscurator* are as follows: (1) body somewhat more gracile, (2) ovipositor sheath somewhat shorter than metasoma, (3) radial vein only approaching tip of wing, (4) wings subhyaline to hyaline.

Together with *B. obscurator* supposedly distributed in the Palaearctic Region. New to the fauna of Mongolia.

Bracon (Lucobracon) meyeri Telenga, 1936 — Ostgobi aimak: 40 km NW von Chara-Eireg, 1150 m, 30. VI. 1963 (No. 62), 1 ♂ (listed previously under the name *B. transbaicalicus* Telenga; Papp, 1967a. — Central aimak: Ulan-Baator, Nucht im Bogdo ul, 1880 m, 9. VI. 1966 (No. 507), 1 ♀; 11 km S vom Pass Zosijn davaa (cca 90 km S von Ulan-Baator), 1650 m, 7. VI. 1967 (No. 771), 2 ♀; Tosgoni ovoo, 6—10 km N von Ulan-Baator, 1700 m, 7—8. VI. 1968 (No. 938), 2 ♀. — Bulgan aimak: 30 km NNW von Somon Daschinčilen, 1200 m, 15. VI. 1968 (No. 959), 3 ♀; Namnan ul Gebirge, 23 km NW von Somon Chutag, 1150 m, 17. VI. 1968 (No. 973), 1 ♀.

In my previous paper (PAPP, 1967a) I have misinterpreted this species and listed it under the name of *B. transbaicalicus* TELENGA.

Both TELENGA (1936) and TOBIAS (1976) characterized this species as black-coloured. Among my Mongolian specimens (from locality Nos 507, 771 959 and 973) the ground colour of body black and with more or less rusty to reddish pattern on head, mesosoma and tergite(s) 2(–3). Antenna with 35—40 joints.

Widely distributed in the USSR and Mongolia.

Bracon (Bracon) minutator (FABRICIUS, 1798) — Chovd aimak: 10 km SSW von Somon Bulgan, 1200 m, 4–5. VII. 1966 (No. 628), 1 ♀.

Tergites usually less rugose to almost smooth.

In the western Palaearctic Region frequent. New to the fauna of Mongolia.

Bracon (Lucobracon) mirus SZÉPLIGETI, 1901 — Bulgan aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 24. VII. 1968 (No. 1145), 1 ♀.

The Mongolian female is quite identical with the female holotype originating from Hungary. Also reported from Kazakhstan (USSR). New to the fauna of Mongolia.

Bracon (Glabrobracon) obscurator NEES, 1812 — Central aimak: Ulan-Baator-Nucht im Bogdo ul, 1600—1750 m, 10. VI. 1966 (No. 514), 1 ♂; SO von Somon Bajanzogt, 1600 m, 11. VI. 1966 (No. 519), 8 ♂; Tosgoni ovoo, 5–10 km N von Ulan-Baator, 1700—1900 m, 23–24. VII. 1967 (No. 926a), 2 ♂; 11 km OSO von Somon Bajanzogt, 1600 m, 13. VI. 1968 (No. 944), 1 ♂. — Archangaj aimak: Changaj Gebirge, 8 km W von Somon Urdtamir, 1620 m, 21. VII. 1966 (No. 724), 1 ♂. — Bulgan aimak: zwischen Somon Chischig-Öndör und Somon Orchon, 23 km NNO von Chischig-Öndör, 1390 m, 15. VI. 1968 (No. 961), 2 ♀. — Uvs aimak: 4 km OSO vom Pass Ulaan davaa, zwischen dem See Ürüg nuur und der Stadt Ulaangom, 1700 m, 6. VII. 1968 (No. 1072), 1 ♀.

Bracon (Glabrobracon) osculator NEES, 1812 — Central aimak: Ulan-Baator, Nucht im Bogdo ul, 1600—1750 m, 10. VI. 1966 (No. 514), 1 ♀; cca 30 km O von Somon Nalajh, 1530 m, 14. VI. 1966 (No. 523), 1 ♀; Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1500—1700 m, 19—20. VII. 1967 (No. 926), 1 ♀; idem, 1700—1900 m, 23—24. VII. 1967 (No. 926a), 1 ♀; idem, 1700 m, 7—8. VI. 1968 (No. 938), 1 ♀; Bogdo ul, Bugijn až achuj, 36 km SW von Ulan-Baator im Bogdo ul Gebirge, 1650 m, 10. VI. 1968 (No. 939), 1 ♂. — Bulgan aimak: 9 km O von Somon Abzaga, 1300 m, 23. VII. 1966 (No. 732), 1 ♀; zwischen Somon Chischig-Öndör und Somon Orchon, 23 km NNO von Chischig-Öndör, 1390 m, 15. VI. 1968 (No. 961), 1 ♀. — Chövsgöl aimak: 8 km W von Somon Burenchaan, am Fluss Delger mörön, 1450 m, 16. VII. 1968 (No. 1115), 1 ♀.

Two females from the localities Nos 926 and 926a with somewhat short radial cell.

Bracon (Glabrobracon) parvicornis THOMSON, 1892 (= *B. carbonarius* SZÉPLIGETI, 1901; PAPP, 1969b) — Uvs aimak: 22 km WSW von Somon Zuungobi, 980 m, 26. VI. 1968 (No. 1018), 1 ♂. — Central aimak: 25 km O von Somon Lun, 1200 m, 25. VII. 1968 (No. 1146), 1 ♀.

Antenna with 17 joints, penultimate flagellar joints 1.7 times as long as broad. Wings hyaline. Ovipositor sheath in lateral view three-fourths as long as metasoma.

Reported from Sweden, Poland, Hungary, Italy, USSR (Ukraine, Kazakhstan). New to the fauna of Mongolia.

Bracon (Lucobracon) persimilis TELENGA, 1936 nec PAPP, 1971 — Südgobi aimak: Nojon nuruu Gebirge, unweit von Dzun adu chudag, 34 km NO von Grenzposten Ovot Chuural, 1800 m, 20. VI. 1967 (No. 824), 1 ♀.

It seems enough reason to suppose that TOBIAS (1976) had synonymized this name with *B. nigriventris* WESMAEL, 1838, on the basis of a misinter-

pretation of the latter species. My identification is based on the original description and the key for the Palaearctic *Bracon* species (TELENGA, 1936); I did not see authentic specimen of *B. persimilis* TELENGA.

Described from Daghestan (USSR). New to the fauna of Mongolia.

Bracon (Lucobracon) persimiloides nom. n.

Bracon (*Glabrobracon*) *persimilis* TELENGA, 1936, Faune de l'URSS, V/2 (Hym.), Braconidae 1: 209, ♀.

Bracon (*Lucobracon*) *persimilis* PAPP, 1971 Annls hist.-nat. Mus. natn. hung., 63: 348, ♀♂, nom. occ.

My name *B. persimilis* is an evident junior homonym of *B. persimilis* TELENGA which I have overlook at its description (l.c.). The species was reported from Mongolia.

The two species, *B. persimiloides* nom. n. and *B. longithorax* TOBIAS, are very similar to each other, therefore difficult to distinguish them. The main features separating them are as follows:

B. persimiloides nom. n.	**B. longithorax** TOB.
1. Ovipositor sheath longer than metasoma.	1. Ovipositor sheath half as long as metasoma.
2. Head in dorsal view somewhat more rounded behind eye (see my Fig. 50, PAPP, 1971), latter distinctly longer than temple (22—20 : 13—14).	2. Head in dorsal view somewhat less rounded behind eye, latter less longer than temple (20 : 15).
3. *D* long, *cul* twice as long as *n. bas.*	3. *D* short, *cul* at most 1.5 times longer than *n. bas.*

Bracon (Glabrobracon) pertinax sp. n.: see p. 461.

Bracon (Orthobracon) picticornis WESMAEL, 1838 — Central aimak: Songino, 24 km SW von Ulan-Baator, 1300 m, 7. VI. 1966 (No. 504), 1 ♂.

Bracon (Glabrobracon) piger WESMAEL, 1838 — Bajanchongor aimak: Oase Echin gol, cca 90 km NO von Grenzposten Caganbulag, 950 m, 27—28. VI. 1967 (No. 855), 1 ♀ + 1 ♂.

Up to now listed from the western Palaearctic Region as far eastwards as Armenia, Azerbaidzhan, Daghestan and Kazakhstan in the USSR. New to the fauna of Mongolia.

Bracon (Bracon) pilosulus SZÉPLIGETI, 1901, sp. rev. — Čojbalsan aimak: 15 km N von Somon Galuut, 850 m, 17. VIII. 1965 (No. 433), 1 ♀; Oase Echin gol, cca 90 km NO von Grenzposten Caganbulag, 950 m, 27—29. VI. 1967 (No. 856), 1 ♀. — Mittelgobi aimak: 20 km S von Somon Delgerzogt, 1480 m, 13—14. VII. 1967 (No. 915), 1 ♀.

Very similar to *B.* (*B.*) *nigripedator* NEES, 1834, the main distinctive feature between the two species is the presence (*nigripedator*) or absence (*pilosulus*) of transverse furrow before the hind margin of tergites 3—6.

Supposedly distributed in the steppe-zone of the Palaearctic Region. Hitherto known only from Hungary. New to the fauna of Mongolia.

Bracon (Glabrobracon) prodigiosus PAPP, 1971 — Central aimak: Tosgoni ovoo, 5—10 km N von Ulan-Baator, in der Umgebung des Friedhofes, 1500—1600 m, 4. VI. 1967 (No. 766), 1 ♀; Tosgoni ovoo, 6—10 km N von Ulan-Baator, 1700 m, 4. VII. 1968 (No. 934), 1 ♀. — Südgobi aimak: 14 km SW von Somon Bajandalaj, 1450 m, 15. VI. 1967 (No. 803), 2 ♀ + 3 ♂. — Bajan-Ölgij aimak: im Tal des Flusses Chavcalyn gol, 25 km O von Somon Cagaannuur, 1850 m, 3. VII. 1968 (No. 1056), 1 ♂.

The female type-specimen represents the light form. The melanic form at hand is with more or less restricted reddish yellow colour to entirely black. In extreme form tegula also black. Antenna with 23—24 (♀♀) and 24—26 joints (♂♂). — So far known only from Mongolia.

Bracon (Lucobracon) rostratus TOBIAS, 1972 — Uvs aimak: Sandgebiet Altan els, 35 km WNW von Somon Tes, 1400 m, 23. VI. 1968 (No. 1007), 1 ♀.

The single Mongolian female deviates from the holotype (or the original description) in the following features: (1) antenna with 28 joints, (2) *n. bas.* almost twice as long as *n. rec.*, (3) hind femur 3.5 times longer than broad, (4) ovipositor sheath longer than metasoma, and shorter than mesosoma and metasoma together, (5) black colour of body more extended (head entirely black, mesosoma also black excepting reddish yellow pro-, mesonotum and tegula, tergites only laterally reddish yellow).

Bracon (Orthobracon) rurrenus sp. n.: see p. 463.

Bracon (Lucobracon) sphaerocephalus SZÉPLIGETI, 1901 — Čojbalsan aimak: 50 km SO von Čojbalsan, 700 m, 16. VIII. 1965 (No. 421), 1 ♂. — Archangaj aimak: Changaj Gebirge, 8 km W von Somon Urdtamir, 1620 m, 19. VI. 1966 (No. 540), 2 ♂; idem, 21. VII. 1966 (No. 724), 1 ♀. — Bulgan aimak: 9 km O von Somon Abzaga, 1300 m, 23. VII. 1966 (No. 732), 1 ♂. — Central aimak: 12 km S von Somon Bajanbaraat, 1380 m, 13. VII. 1967 (No. 918), 1 ♂; Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1700—1900 m, 23—24. VII. 1967 (No. 926a), 3 ♂; idem, 1600—1700 m, 4. VI. 1968 (No. 938), 4 ♂. — Chövsgöl aimak: zwischen Somon Cecerleg und Somon Bajan-ul, 65 km W von Cecerleg, 1700 m, 22. VI. 1968 (No. 1002), 1 ♀ + 1 ♂. — Uvs aimak: Sandgebiet Altan els, 35 km WNW von Somon Tes, 1400 m, 23. VI. 1968 (No. 1007), 2 ♀.

Second tergite with variable sculpture, almost smooth (at anterior middle with weak rugosity) to almost fully rugose. Body usually dark.

Observed in Hungary, Austria, Mongolia. Supposedly widely distributed in the steppe-zone of the Palaearctic Region.

Its synonymization with *B. nigriventris* WESMAEL is due to a misinterpretation (TOBIAS, 1976).

Bracon (Ceratobracon) stshegolevi TELENGA, 1933 — Uvs aimak: 10 km NW von Somon Naranbulag, 1350 m, 9. VII. 1968 (No. 1082), 1 ♂.

Widely distributed in the western half of the USSR. New to the fauna of Mongolia.

Bracon (Lucobracon) suchorukovi TELENGA, 1936 — Chovd aimak: Mongol Altaj Gebirge, cca 35 km N von Somon Uenč, 1750 m, 8. VII. 1966 (No. 646), 1 ♀. — Chövsgöl aimak: 8 km N von Somon Burenchaan, am Fluss Delger mörön, 1450 m, 20. VI. 1968 (No. 990), 1 ♀.

Antenna short, with 24 (1 ♀) and 27 (1 ♀) joints, flagellar segments slightly longer than broad to cubic. The female specimen from the locality No. 990 is a melanic form: body black with some reddish colour around eye, along notaulix, tegula and narrow margin of tergites.

It seems a frequent species from Austria to Kazakhstan and Tomsk in the USSR. New to the fauna of Mongolia.

Bracon (Lucobracon) turolus sp. n.: see p. 465.

Bracon (Rostrobracon) urinator (FABRICIUS, 1798) — Suchebaator aimak: 45 km N von Somon Erdenezagan, 900 m, 9. VIII. 1965 (No. 381), 1 ♂.

The single male represents a melanic form, i.e. body and legs black, tergites 1—5 very laterally reddish yellow.

Bracon (Glabrobracon) variator NEES, 1812 — Central aimak: SO von Somon Bajanzogt, 1600 m, 11. VI. 1966 (No. 519), 1 ♀ + 2 ♂; 12 km S von Somon Bajanbaraat, 1380 m, 13. VII. 1967 (No. 918), 1 ♂.

Bracon (Glabrobracon) variator var. **rotundulus** (SZÉPLIGETI, 1904) — Chovd aimak: 10 km SSW von Somon Bulgan, 1200 m, 4—5. VII. 1966 (No. 628), 1 ♀.

Flagellar joints 1.5 times longer than broad (that of the type hardly longer than broad). Antenna with 29 joints. Otherwise quite similar to the Hungarian representatives.

Bracon (Bracon) variegator SPINOLA, 1808 — Central aimak: Ulan-Baator, Nucht im Bogdo ul, 1880—2000 m, 9. VI. 1966 (No. 508), 1 ♂; SO von Somon Bajanzogt, 1600 m, 11. VI. 1966 (No. 519), 1 ♂; cca 30 km O von Somon Nalajch, 1530 m, 14. VI. 1966 (No. 523), 2 ♀; Nucht im Bogdo ul, 12 km SO vom Centrum, 1650 m, 3. VI. 1967 (No. 762), 1 ♂; Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1700—1900 m, 23—24. VII. 1967 (No. 926a), 1 ♀; idem, 1600—1700 m, 4. VI. 1968 (No. 934), 1 ♀; idem, 1700 m, 7—8. VI. 1968 (No. 938), 1 ♀; 11 km OSO von Somon Bajanzogt, 1600 m, 13. VI. 1968 (No. 944), 1 ♀. — Chovd aimak: Somon Uenč, im Flusstal Uenč gol, cca 2 km N vom Dorf, 1450 m, 7. VII. 1966 (No. 644), 1 ♂. — Südgobi aimak: Gurban Sajchan ul Gebirge, 15 km S von der Stadt Dalanzadgad, 1750 m, 13. VI. 1967 (No. 794), 1 ♀; Nojon Nuruu Gebirge, unweit von Dzun adu chudag, 34 km NO von Grenzposten Ovot Chuural, 1800 m, 20. VI. 1967 (No. 824), 1 ♀. — Bajanchongor aimak: Oase Echin gol, cca 90 km NO von Grenzposten Caganbulag, 950 m, 27—28. VI. 1967 (No. 855), 1 ♀. — Bajan-Ölgij aimak: im Tal des Flusses Chavcalyn gol, 25 km O von Somon Cagannuur, 1850 m, 3. VII. 1968 (No. 1056), 1 ♂.

Bracon (Glabrobracon) venustus TELENGA, 1936, spec. rev. — Central aimak: SO von Somon Bajanzogt, 1600 m, 11. VI. 1966 (No. 519), 2 ♀.

TOBIAS (1976) placed it in synonymy with the name *B. osculator* NEES. The specimens under the name *B. venustus* are very near and closely related to *B. osculator*, and they are distinguished by two features: 1. Head behind eyes contracted (*B. venustus*) — rounded (*B. osculator*); 2. Body reddish yellow (*B. venustus*) — black (*B. osculator*). According to the original description of *B. venustus*, colour of stigma is brown, that of my specimens from Mongolia is bright yellow. I consider the Mongolian specimens (together with the two females reported previously, PAPP, 1971) as an extremely light form of the species.

Glyptomorpha (Glyptomorpha) elector KOKUJEV, 1898 — Bajanchongor aimak: Oase Echin gol, cca 90 km NO von Grenzposten Caganbulag, 950 m, 27—29. VI. 1967 (No. 857), 1 ♀.

Frequent in the desert-semidesert zone of Asia. Described from Mongolia by KOKUJEV.

Glyptomorpha (Glabriolum) inscriptor (NEES, 1834) — Südgobi aimak: Gurban Sajchan ul Gebirge, 15 km S von der Stadt Dalanzadgad, 1750 m, 13. VI. 1967 (No. 794), 1 ♀.

Glyptomorpha (Glabriolum) tatarica (KOKUJEV, 1898) — Südgobi aimak: Nojon nuruu Gebirge, unweit von Dzun adu chudag, 34 km NO von Grenzposten Ovot Chuural, 1800 m, 20. VI. 1967 (No. 824), 1 ♀.

Fourth tergite smooth and shiny. Wings rather subfumous. — Distributed in the semiarid-arid zones of the Palaearctic Asia. Reported from Mongolia by TELENGA (1936).

Habrobracon (Habrobracon) breviradiatus TOBIAS, 1957 — B a j a n c h o n g o r a i m a k : Oase Dzun mod, cca 100 km S von Somon Schine žinst, 1300 m, 29. VI. 1967 (No. 869), 1 ♀.

So far known only from Turkmenia in the USSR. New to the fauna of Mongolia.

Habrobracon (Habrobracon) excisus TOBIAS, 1957 — S ü d g o b i a i m a k : zwischen Somon Sevrej und Dund gol ("alte" Somon Gurban-tes), 35 km SW von Sevrej, 1350 m, 18. VI. 1967 (No. 813), 1 ♂; SW-Rand des Sees Dund gol (am "alten" Somon Gurban-tes), 1300 m, 19. VI. 1967 (No. 819), 1 ♀.

This is the second report of its distribution in Mongolia (PAPP, 1967a). Reported also from Kazakhstan and the Ukraine in the USSR.

Habrobracon (Habrobracon) hebetor (SAY, 1836) — S ü d g o b i a i m a k : 14 km SW von Somon Bajandalaj, 1450 m, 15. VI. 1967 (No. 803), 2 ♂.

Habrobracon (Habrobracon) kopetdagi TOBIAS, 1957 — C e n t r a l a i m a k : Zuunchara, 1390 m, 7. VII. 1963 (No. 98), 1 ♂ (previously named by me as *H. radialis*, PAPP, 1967a). — S u c h e b a a t o r a i m a k : 45 km N von Somon Erdenzagan, 900 m, 9. VIII. 1965 (No. 381), 1 ♂. — C h e n t e j a i m a k : 10 km W von Somon Delgerchaan, 1250 m, 24. VIII. 1965 (No. 476), 1 ♂. — U v s a i m a k : zwischen dem See Örög nuur und der Stadt Ulaangom, 2—7 km OSO vom Pass Ulaan davaa (60—65 km NW von Ulaangom), 1690—1950 m, 28. VI. 1968 (No. 1032), 1 ♀. — C h ö v s g ö l a i m a k : Alag Mort, 42 km NO vom Pass Chaldzan Sogotyn davaa, am Fluss Tesijn gol, 1900 m, 14. VII. 1968 (No. 1107), 1 ♀.

My two female specimens again represent the dark form, similarly to the previous specimen reported (PAPP, 1971). Type-specimens with a pair of mediolongitudinal, faint and smooth ridges — my Mongolian specimens rather with a pair of polished streaks.

Distributed in the USSR (Turkmenia, Kazakhstan) and Mongolia.

Habrobracon (Ophthalmobracon) ophthalmicus (TELENGA, 1933) — S ü d g o b i a i m a k : 14 km SW von Somon Bajandalaj, 1450 m, 15. VI. 1967 (No. 803), 1 ♀ + 2 ♂; SW-Rand des Sees Dund gol (am "alten" Somon Gurban-tes), 1300 m, 19. VI. 1967 (No. 819), 1 ♀; 100 km W von der Grenzposten Ovot Chuural, 22 km W von Sahryn chudag, 1250 m, 22. VI. 1967 (No. 834), 1 ♂; Bajan zag, 20 km NO von Somon Bulgan, 1200 m, 6—7. VII. 1967 (No. 894), 1 ♂.

Its localities were listed in Armenia, Azerbaidzhan and Soviet Middle Asia in the USSR. New to the fauna of Mongolia.

Habrobracon (Habrobracon) radialis TELENGA, 1936 — C h e n t e j a i m a k : Candagan tal, 40 km O von Zargaltchaan, 1300 m, 28. VII. 1965 (No. 316), 3 ♂; 10 km W von Somon Delgerchaan, 1250 m, 24. VIII. 1965 (No. 476), 1 ♀ + 1 ♂. — S u c h e b a a t o r a i m a k : 44 km SSW von Baruun urt, 1050 m, 2—3. VIII. 1965 (No. 349), 1 ♂. — S ü d g o b i a i m a k : Gurban Sajchan ul Gebirge, 15 km S von der Stadt Dalanzadgad, 1750 m, 13. VI. 1967 (No. 794), 1 ♂.

Antenna of males with 23—28 joints (1 ♂: 23, 1 ♂: 24, 2 ♂: 26, 1 ♂: 28). Otherwise corresponding with the description.

Distributed in the USSR (Turkestan, Kazakhstan) and Mongolia.

Habrobracon (Habrobracon) simonovi KOKUJEV, 1914 — S ü d g o b i a i m a k : Gurban Sajchan ul Gebirge, 15 km S von der Stadt Dalanzadgad, 1750 m, 13. VI. 1967 (No. 794), 1 ♀.

Head, mesonotum and propodeum with fine to very fine reticulo-punctation. Mesopleuron with very fine reticulo-punctation to almost smooth, mesosternum smooth. Body mustard yellow with pale yellow pattern. Antenna with 19 joints.

Distributed in Uzbeghistan, Turkmenia in the USSR and China. New to the fauna of Mongolia.

Habrobracon (Habrobracon) vernalis SZÉPLIGETI, 1901 — Südgobi aimak: Sajchan ul Gebirge, 15 km S von der Stadt Dalanzadgad, 1750 m, 13. VI. 1967 (No. 794), 5 ♀ + 1 ♂; 14 km SW von Somon Bajandalaj, 1450 m, 15. VI. 1967 (No. 803), 2 ♂; SW-Rand des Sees Dund gol (am "alten" Somon Gurban tes), 1300 m, 19. VI. 1967 (No. 819), 1 ♂. — Bajanchongor aimak: Talyn Bilgech bulag, Quelle zwischen Tost ul und Cagan Bogd ul Gebirge, 47 km O vom Grenzposten Caganbulag, 1200 m, 23. VI. 1967 (No. 838), 1 ♀; Cagan Bogd ul Gebirge, cca am halben Weg zwischen der Quelle Talyn Bilgech bulag und Grenzposten Caganbulag, 25 km WSW von der Quelle, 1450 m, 24. VI. 1967 (No. 842), 1 ♂; Oase Echin gol, cca 90 km NO Grenzposten Caganbulag, 950 m, 27—28. VI. 1967 (No. 855), 2 ♀ + 2 ♂. — Bulgan aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 24. VII. 1968 (No. 1145), 1 ♂.

This species seems highly variable considering its sculpture and colour. Mesosoma either entirely smooth and shiny or with reticulo-punctation of variable strength. Body either almost fully black(ish) or with more or less yellow(ish), reddish yellow pattern. The extreme colour of body reddish yellow with a few black(ish) pattern and weak sculpture of mesosoma as it is shown in the Mongolian specimens. TOBIAS (1961) put the name *H. vernalis* in synonymy with *H. hebetor* (SAY). The main specific difference between the two species is linked to the length of antenna: (1) that of *H. vernalis* at least as long as head + mesosoma together, and flagellar joints each longer than broad; (2) that of *H. hebetor* shorter than head + mesosoma together, and each flagellar joints cubic.

Iphiaulax impostor (SCOPOLI, 1763) — Bajan-Ölgij aimak: im Tal des Flusses Chavcalyn gol, 25 km O von Somon Cagannuur, 1850 m, 3. VII. 1968 (No. 1058), 1 ♀.

Iphiaulax mactator (KLUG, 1817) — Chovd aimak: 10 km SSW von Somon Bulgan, 1200 m, 5. VII. 1966 (No. 630), 1 ♀.

Mesosoma reddish yellow with a pair of black spots on lateral lobes of mesonotum, mesosternum also black (var. *pictus* KAWALL, 1865). Body 7 mm long.

Distributed in the Palaearctic Region. New to the fauna of Mongolia.

Iphiaulax potanini KOKUJEV, 1898 — Uvs aimak: am Fluss Chöndlön gol, 32 km NW von der Stadt Ulaangom, 1200 m, 7. VII. 1968 (No. 1077), 1 ♀.

Described from Mongolia, reported from Turkmenia and Tadzhikistan in the USSR.

Ipobracon anuphrievi TOBIAS, 1973 — Central aimak: Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1700—1900 m, 23—24. VII. 1976 (No. 926a), 1 ♂.

My single male specimen runs to this name with the help of TOBIAS's and ABDINBEKOVA's key (1973). Flagellar joints gradually shortening, first segment not distinctly longer than second joint (cf. Fig. 13 in l.c.). Head in dorsal view slightly less contracted behind eye (cf. Fig. 11 in l.c.). Body 6.5 mm long.

Described from Vladivostok (Far East USSR). New to the fauna Mongolia.

Ipobracon extricator (NEES, 1834) — Bajan-Ölgij aimak: cca 20 km NNW von der Stadt Ölgij, 2100 m, 2. VII. 1968 (No. 1054), 1 ♂.

Hitherto known from Europe as far eastwards as Gorkiy in the European USSR. New to the fauna of Mongolia.

Ipobracon longulatus SHENEFELT, 1978 (= *Paravipio longulus* PAPP, 1967 nec *Ipobracon longulus* SZÉPLIGETI, 1904) — Südgobi aimak: Nojon nuruu Gebirge, unweit von Dzun adu chudag, 34 km NO von Grenzposten Ovot Chuural, 1800 m, 20. VI. 1967 (No. 824), 1 ♀. — Bulgan aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 14. VI. 1968 (No. 954), 1 ♀.

Described and so far known only from Mongolia.

Isomecus appellator (NEES, 1834) — Archangaj aimak: Changaj Gebirge, 8 km W von Somon Urdtamir, 1620 m, 21. VII. 1966 (No. 724), 1 ♂. — Südgobi aimak: Nojon nuruu Gebirge, unweit von Dzun adu chudag, 34 km NO von Grenzposten Ovot Chuural, 1800 m, 20. VI. 1967 (No. 824), 1 ♂. — Mittelgobi aimak: Delgerchangaj ul Gebirge, 6 km S von Somon Delgerchangaj, 1650 m, 11. VII. 1967 (No. 908), 1 ♀; 20 km S von Somon Delgerzogt, 1480 m, 13—14. VII. 1967 (No. 915), 4 ♀. — Central aimak: 12 km S von Somon Bajanbaraat, 1380 m, 13. VII. 1967 (No. 918), 2 ♀ + 3 ♂. — Uvs aimak: am Fluss Changilcagijn gol, 6 km SW von Somon Baruunturuun, 1350 m, 24. VI. 1968 (No. 1009), 1 ♀. — Bajan-Olgij aimak: im Tal des Flusses Chavcalyn gol, 25 km O von Somon Cagannuur, 1850 m, 3. VII. 1968 (No. 1056), 1 ♀.

1 ♀ from the locality No. 908, 4 ♀♀ from the locality No. 915 and 1 ♀ from the locality No. 918 represent the var. *curtistriolatus* PAPP, 1967. — Frequent to common in the steppe and semidesert zone of the Palaearctic Region. In Mongolia also frequent.

Isomecus mongolicus (TELENGA, 1936) sp. rev. — Südgobi aimak: Tachilga ul Gebirge, zwischen Somon Zogt-Ovoo und Dalanzadgad, 68 km S von Zogt-Ovoo, 1550 m, 8. VII. 1967 (No. 900), 2 ♀; 8 km NW von den Ruinen des Klosters Oldoch Chijd, 54 km NNW von Somon Zogt-Ovoo, 1350 m, 9. VII. 1967 (No. 904), 1 ♀; 20 km S von Somon Delgerzogt, 1480 m, 13—14. VII. 1967 (No. 915), 3 ♀. — Central aimak: 12 km S von Somon Bajanbaraat, 1380 m, 13. VII. 1967 (No. 918), 3 ♀; Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1700—1900 m, 23—24. VII. 1967 (No. 926a), 1 ♀. — Chövsgöl aimak: zwischen Somon Tosoncengel und Somon Ich-ul, 22 km O von Tosoncengel, 1150 m, 21. VII. 1968 (No. 1133), 1 ♀.

In my previous two papers (PAPP, 1967a, 1971) on the Mongolian Braconidae I relegated this taxon as a variety to the species *I. appellator* (NEES). After re-examining my specimens in question from Mongolia (together with others) I rectify my taxonomic arrangement and I consider it as a valid species closely related to *I. appellator*. The distinctive features between them are as follows:

I. mongolicus (TEL.)	**I. appellator** (NEES)
1. Second tergite as long as (or slightly to indistinctly shorter than) its hind width.	1. Second tergite one-quarter wider behind than long medially.
2. Tergites 2—3 smooth (at most close around median field of second tergite with very short striation).	2. Tergites 2—3 with longitudinal striation.

Frequent in Mongolia; listed also from Transbaikalia in the USSR.

Isomecus sareptanus (KAWALL, 1865) — Chovd aimak: 3 km N von Somon Uenč, im Tal des Flusses Uenč gol, 1450 m, 2—3. VII. 1966 (No. 614), 2 ♀ + 6 ♂; Mongol Altaj Gebirge, Uljasutajn gol, 45 km NNO von Somon Bulgan, 1400 m, 6. VII. 1966 (No. 637), 4 ♀; idem, 6—7. VII. 1966 (No. 638), 2 ♀ + 1 ♂; Somon Uenč, im Flusstal Uenč gol, cca 2 km N vom Dorf, 1450 m, 7. VII. 1966 (No. 644), 3 ♀ + 3 ♂. — Archangaj aimak: Chaalgsim chundi bei Somon Tövschruulech, 63 km O von Somon Urdtamir, 1500 m, 22. VII. 1966 (No. 727), 1 ♂. — Südgobi aimak: Gurban Sajchan ul Gebirge, 15 km S von der Stadt Dalanzadgad, cca 1750 m, 13. VI. 1967 (No. 794), 1 ♂; Tachialga ul Gebirge zwischen Somon Zogt-Ovoo und Dalanzadgad, 68 km S von Zogt-Ovoo, 1550 m, 8—9. VII. 1967 (No. 900), 1 ♀ + 1 ♂. — Mittelgobi aimak: Delgerchangaj ul Gebirge, 6 km S von Somon Delgerchangaj, 1650 m, 11. VII. 1967 (No. 908), 1 ♀ + 1 ♂; 20 km S von Somon Delgerzogt, 1480 m, 13—14. VII. 1967 (No. 915), 1 ♀. — Central aimak: 12 km S von Somon Bajanbaraat, 1380 m, 13. VII. 1967 (No. 918), 3 ♂. — Chövsgöl aimak:

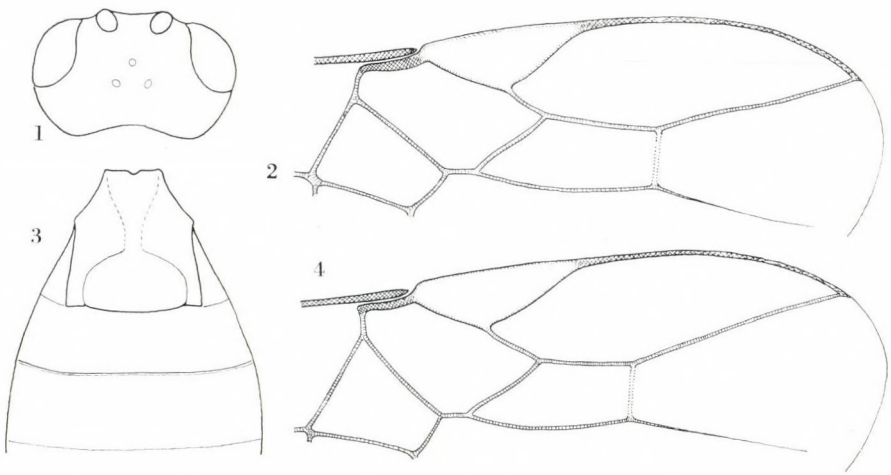
8 km N von Somon Burenchaan, am Fluss Delger mörön, 1450 m, 20. VI. 1968 (No. 990), 2 ♂; 3 km W von Somon Burenchaan, 1650 m, 16. VII. 1968 (No. 1113), 1 ♀ + 1 ♂; 8 km W von Somon Burenchaan, am Fluss Delger mörön, 1450 m, 16. VII. 1968 (No. 1115), 1 ♀. — Uvs aimak: Sandgebiet Altan els, 35 km WNW von Somon Tes, 1400 m, 23. VI. 1968 (No. 1007), 1 ♀ + 1 ♂; 22 km WSW von Somon Zuungobi, 980 m, 26. VI. 1968 (No. 1018), 1 ♂; Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (No. 1035), 1 ♀ + 1 ♂; idem, 5. VII. 1968 (No. 1066), 1 ♀; 2 km O vom Pass Ulaan davaa, zwischen dem See Örög nuur und der Stadt Ulaangom, 1950 m, 6. VII. 1968 (No. 1071), 1 ♀. — Bajan-Ölgij aimak: rechtes Ufer des Flusses Chovd gol bei der Stadt Olgij, 1750 m, 30. VI. 1968 (No. 1048), 1 ♀; im Tal des Flusses Chavcalyn gol, 25 km O von Somon Cagannuur, 1850 m, 3. VII. 1968 (No. 1056), 1 ♂.

1 ♀ + 1 ♂ from the locality No. 900 are small forms, namely ♀: 6 mm and ♂: 3.5 mm long. — Frequent to common in Mongolia.

2. Description of the new species

Bracon (Glabrobracon) dissolutus sp. n. ♀ (Figs 1—3)

2. Body 2.8 mm long. Head in dorsal view (Fig. 1) less transverse, 1.7—1.8 times broader than long, eye 1.7 times longer than temple, head behind eyes strongly rounded, occiput less excavated. Ocelli small, forming an equilateral triangle. Distance between two ocelli almost twice as long as diameter of an ocellus. OOL about twice as long as POL. Eye in lateral view 1.4 times higher than wide, and 2.5 times higher than length of cheek. In lateral view width of eye distinctly one-third longer than greatest width of temple. Face together with clypeus 1.5 times wider than high medially, inner margin of eyes slightly diverging towards oral part. Circular mouth opening of normal



Figs 1—3. *Bracon dissolutus* sp. n. ♀: 1 = head in dorsal view, 2 = distal part of right fore wing, 3 = tergites 1—3. — Fig. 4. *B. prodigiosus* Papp: distal part of right fore wing

size, its horizontal width equalling length of cheek. Head polished, face more or less finely to very finely granular, cheek densely rugulose. Antenna one-quarter shorter than body, with 25—28 joints. First flagellar joint 1.9—2 times longer than broad, further joints weakly attenuating so that penultimate joint distinctly twice longer than broad.

Mesosoma moderately elongated, in lateral view 1.5—1.6 times longer than high. Surface of mesosoma polished. Notaulix distinct, shallow. Prescutellar furrow narrow, shallow and with very fine crenulation. Hind femur in lateral view 3.5 times as long as broad. Hind tibia and tarsus of equal length.

Fore wing somewhat longer than body. Stigma (Fig. 2) thrice as long as wide, issuing radial vein (almost) from its middle, *r2* 2.3—2.5 times longer than *r1*, *r2* 1.2—1.3 times longer than *cuqu1*, *r3* 1.7—1.8 times longer than *r2* and approaching to reaching tip of wing. *D* with distally less converging *cu1* and *d*, *cu1* 1.3—1.4 times longer than *n. bas.* (Fig. 2).

Metasoma somewhat shorter than head + mesosoma together. First tergite (Fig. 3) somewhat longer than wide at hind, before spiracles strongly narrowing, behind spiracles very weakly broadening. Third tergite slightly to 1.2 times longer than second tergite, furrow between two tergites straight or faintly sinuate, with very fine crenulation. Tergites 1—7 polished, eventually (1 ♀ paratype from the locality No. 934) second tergite longitudinally rugulose. Ovipositor sheath in lateral view as long as metasoma; hypopygium not surpassing end of metasoma.

Body black. Mandible brownish yellow, clypeus and cheek reddish, palpi brownish, rostrum blackish brown. Antenna black. Tegula yellow. Legs brownish yellow to yellow, coxae 1—2 brownish, coxa 3 black apically yellowish, first trochanter of legs 2—3 blackish brown. Basal half to three-fourths of hind femur and eventually basal third to half of middle femur and hind tibia distally black. Tarsi 1—2 faintly fumous to fumous, tarsus 3 blackish fumous. Tergites 2—6 laterally yellow to reddish yellow, tergites 7—8 together with sternites yellow. Wings subhyaline. Stigma bright to dark yellow, venation with greyish-yellowish pigmentation.

♂ and host unknown.

Localities — 4 ♀ (1 ♀ holotype + 3 ♀♀ paratypes): "Mongolia, Central aimak: Tosgoni ovoo, 6—10 km N von Ulan-Baator, 1700 m, Exp. Dr. Z. Kaszab, 1968" (first label) — "Nr. 934, 4. VI. 1968" (second label). — 1 ♀ (paratype): "Mongolia, Central aimak: Tosgoni ovoo, 6—10 km N von Ulan-Baator, 1700 m, Exp. Dr. Z. Kaszab, 1968" (first label) — "Nr. 938, 7.—8. VI. 1968" (second label).

Holotype and 4 paratypes are deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 5401 (holotype), 5402—5405 (paratypes).

With Telenga's key (1936) the new species, *B.* (*G.*) *dissolutus*, runs to *B.* (*G.*) *ductor* Telenga, 1936 (USSR: Transbaikal), and on the basis of its original description the two species are distinguished by the features expounded in a tabular form:

B. dissolutus sp. n.	**B. ductor** TEL.
1. Body 2.8—3 mm long.	1. Body 4.5 mm long.
2. Furrow between tergites 2—3 straight (Fig. 3).	2. Furrow between tergites 2—3 bisinuate.
3. Ovipositor sheath in lateral view as long as metasoma.	3. Ovipositor sheath in lateral view distinctly shorter than metasoma.
4. *Cu2* relatively long; *r2* about 2.3—2.5 times longer than *r1*; *r3* 1.7—1.8 times longer than *r2* (Fig. 2).	4. *Cu2* relatively short; *r2* twice longer than *r1*; *r3* twice longer than *r2*.

B. (*G.*) *brevicalcaratus* TOBIAS, 1957 (USSR: Turkmenia, Kazakhstan) seems also related to the new species, and with the help of its original description the following differentiating features may be established between the two species:

B. dissolutus sp. n.	**B. brevicalcaratus** TOB.
1. Body 2.8—3 mm long.	1. Body 2.1 mm long.
2. Inner spur of hind tibia of usual length, almost half as long as basitarsus.	2. Inner spur of hind tibia very short, one-fifth as long as basitarsus.
3. *r3* 1.7—1.8 times longer than *r2*, approaching to reaching tip of wing.	3. *r3* 1.5—1.65 times longer than *r2*, ending before tip of wing.
4. Stigma bright to dark yellow.	4. Stigma dar brown.

My species, *B.* (*G.*) *prodigiosus* PAPP, 1971, from Mongolia clearly differs from the new species by the features as follows:

B. dissolutus sp. n.	**B. prodigiosus** PAPP
1. Mesosoma not stout, in lateral view 1.5—1.6 times longer than high.	1. Mesosoma stout, in lateral view 1.2(—1.3 times longer than high.
2. *D* with distally less converging *cu1* and *d*, *cu1* 1.3—1.4 times longer than *n. bas.*, *r1* issuing from (almost) middle of stigma, *r2* 1.2—1.3 times longer than *cuqu1* (Fig. 2).	2. *D* with distally more converging *cu1* and *d*, *cu1* and *n. bas.* about equal in length, *r1* issuing proximal from middle of stigma, *r2* as long as or slightly longer than *cuqu1* (Fig. 4).
3. Head in dorsal view 1.7—1.8 times broader than long (Fig. 1).	3. Head in dorsal view distinctly twice broader than long (see Fig. 52 in PAPP, 1971: 353).
4. Mesonotum and scutellum black.	4. Mesonotum and scutellum reddish yellow, former with three black maculae.

Bracon (Lucobracon) frutus sp. n. ♀ (Figs 5—9)

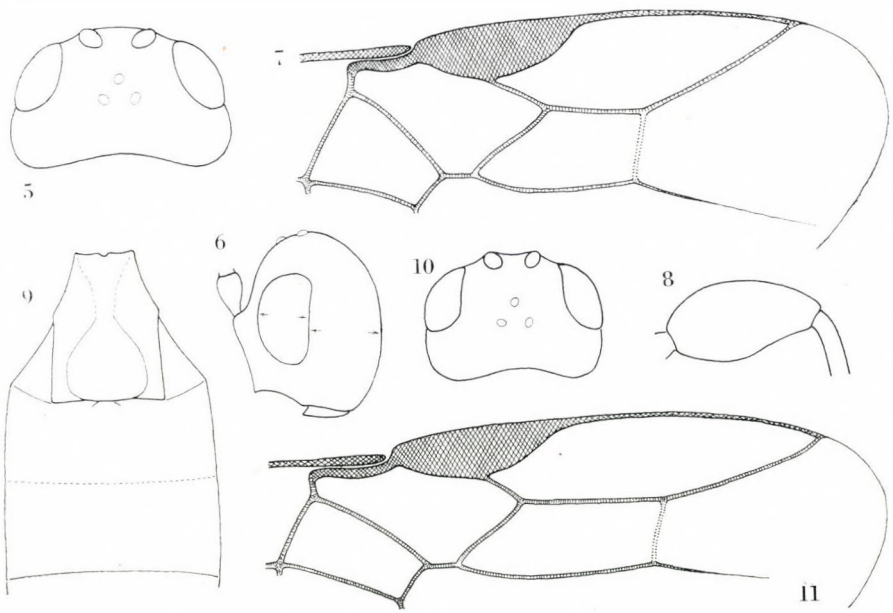
2. Body 5.5 mm long. Body and legs more or less evenly covered with light-coloured long hairs. Head in dorsal view (Fig. 5) 1.8 times broader than long, eye somewhat longer than temple, head behind eyes broadening, i.e. head between eyes slightly less as broad as between temples, occiput feebly excavated. Ocelli near to each other, distance between two ocelli about equal with greatest diameter of an ocellus. OOL nearly thrice as long as POL (Fig. 5). Eye in lateral view 1.8 times higher than wide, temple distinctly wider than eye (Fig. 6, see arrows). Face in frontal view twice wider than high medially, inner margin of eyes slightly diverging towards oral part. Circular mouth

opening large, its greatest width twice as long as shortest length of cheek. Rostrum short, maxillar palp about as long as height of eye. Head polished; clypeus uneven, cheek finely and densely granular. Antenna short, as long as head and thorax together, with 26 joints. First flagellar joint 1.4 times longer than broad, further joints gradually shortening so that middle joints subcubic to cubic, last 7—8 joints attenuating so that penultimate joint 1.5—1.6 times longer than broad.

Mesosoma in lateral view 1.4 times longer than high. Surface of mesosoma polished, mesonotum before prescutellar furrow with small and superficial punctures. Notaulix almost indistinct. Prescutellar furrow narrow and shallow, with very fine crenulation. Hind femur in lateral view (Fig. 8) unusually broad, twice as long as broad. Hind tarsus shorter than hind tibia.

Fore wing somewhat shorter than body. Stigma (Fig. 7) thrice as long as wide, emitting radial vein close before its middle, anterior margin of *R* about one-fifth greater than length of stigma. Radial vein ending before tip of wing, *r1* as long as width of stigma, *r2* 1.8 times longer than *r1*, *r3* faintly arched and 1.8 times longer than *r2*; *Cu2* wide and short, *r2* only somewhat longer than *cuqu2*, *cuqu1* equal with *r2* (Fig. 7). *N. bas.* as long *n. rec.* (Fig. 7).

Metasoma somewhat longer than head + mesosoma together. First tergite (Fig. 9) somewhat longer than wide at hind, before two spiracles strongly



Figs 5—9. *Bracon frutus* sp. n. ♀: 5 = head in dorsal view, 6 = head in lateral view, 7 = distal part of right fore wing, 8 = hind femur in lateral view, 9 = tergites 1—3. — Figs 10—11. *B. suchorukovi* TELENGA: 10 = head in dorsal view, 11 = distal part of right fore wing

narrowing, behind spiracles parallel-sided; scutum smooth, posteriorly more or less uneven. Second and third tergites equal in length, furrow between them almost indistinct, straight. Second and further tergites polished. Ovipositor sheath in lateral view only somewhat shorter than metasoma, moderately downcurved.

Body reddish yellow. Apex of mandible and rostrum blackish brown. Antenna dark brown, flagellar joints 1—4(—7) reddish (to darkening). Three spots of mesonotum, entire mesosternum, fore and hind margin of metanotum blackish brown. Pronotum dorsally and around lunule of propodeum darkening. Legs also reddish yellow. Hind coxa distally and dorsally, and base of hind femur brown to blackish brown. Sternites with lateral dark brown maculae. Wings hyaline to subhyaline. Stigma and veins with brown pigmentation.

♂ and host unknown.

Locality — 1 ♀ (holotype): "Mongolia, Südgobi aimak; Zöölön ul, 58 km WSW von Somon Bajandalaj, 1500 m, Exp. Dr. Z. Kaszab, 1967" (first label) — "Nr. 808, 16. VI. 1967" (second label).

Holotype is deposited in the Hungarian Natural History Museum, Budapest: Hym. Typ. No. 5400.

The new species is nearest to *B.* (*L.*) *incitus* Papp, 1971 (= *B. infernalis* Tobias, 1972) (Mongolia), they share in many respects common features, though the differences between them are of specific value:

B. frutus sp. n.	**B. incitus** Papp
1. Body 5.5 mm long.	1. Body 2.4—2.8 mm long.
2. Head in dorsal view 1.8 times broader than long, behind eyes distinctly broadening (Fig. 5).	2. Head in dorsal view 1.5 times broader than long, behind eyes rounded, not broadening.
3. Antenna 26-jointed.	3. Antenna 20—22-jointed.
4. Hind femur in lateral view twice as long as broad (Fig. 8).	4. Hind femur in lateral view thrice as long as broad.
5. *Cu2* wide, *r2* and *cuqu1* equal in length, *cuqu2* only somewhat shorter than *r2* (Fig. 7).	5. *Cu2* usual in size, *r2* longer than *cuqu1* and about twice as long as *cuqu2* (Fig. 5 in Tobias, 1972: 591).
6. Body and legs reddish yellow with few blackish spots on mesonotum, mesosternum and metanotum.	6. Body black, legs with light pattern.

With the help of Telenga's (1936) and Tobias's (1976) key *B.* (*L.*) *frutus* sp. n. runs to *B.* (*L.*) *infernalis* Telenga, 1936 (USSR); the specific distinction between the two species is tabulated below:

B. frutus sp. n. ♀	**B. infernalis** Tel. ♀♂
1. Body 5.5 mm long.	1. Body 3.6—4.5 mm long.
2. Antenna 26-jointed.	2. Antenna 32—40-jointed.
3. Head behind eyes broadening (Fig. 5).	3. Head behind eyes evenly contracted.
4. *Cu2* wide, *r2* only slightly longer than *cuqu2* (Fig. 7).	4. *Cu2* usual in size, *r2* distinctly longer than *cuqu2*.
5. Body reddish yellow with few blackish spots.	5. Body entirely black.

B. frutus sp. n.

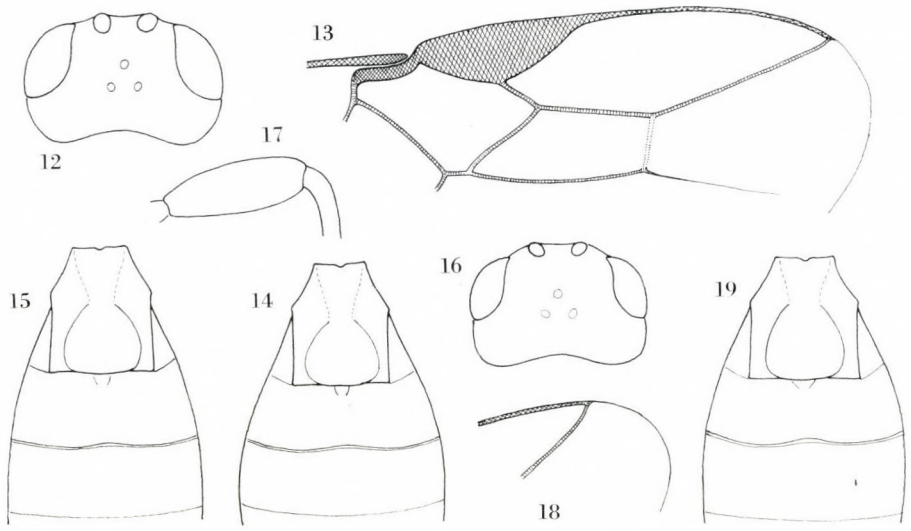
1. Head in dorsal view behind eyes broadening (Fig. 5).
2. *r2* as long as *cuqu1*, *cu1* 1.3 times longer than *n. bas. r3* 1.8 times longer than *r2*, *Cu2* short (Fig. 7).
3. Ovipositor sheath in lateral view somewhat shorter than metasoma.

B. suchorukovi TEL.

1. Head in dorsal view behind eyes not broadening (Fig. 10).
2. *r2* 1.6–1.7 times longer than *cuqu1*, *cu1* 1.9 times longer than *n. bas.*, *r3* 1.3–1.4 times longer than *r2*, *Cu2* long (Fig. 11).
3. Ovipositor sheath in lateral view distinctly as long as metasoma.

Bracon (Lucobracon) pertinax sp. n. ♀♂ (Figs 12—14)

♀. Body 2.8—3 mm long. Head in dorsal view (Fig. 12) less transverse, 1.7—1.75 times broader than long, eye 1.8—2 times longer than temple, head behind eyes rounded, occiput moderately excavated. Ocelli small, distance between two ocelli distinctly greater than diameter of an ocellus. OOL twice as long as POL. Eye in lateral view 1.5 times higher than wide, temple half as wide as eye. Cheek one-third as long as height of eye. Circular mouth opening 1.4—1.5 times wider than length of cheek. Face together with clypeus 1.5 times wider than high medially, inner margin of eye diverging towards oral part. Head polished, face uneven to smooth, antennal socket finely granular, cheek densely rugulose. Antenna shorter than body, with 25 joints. First flagellar joint twice as long as broad, further joints gradually shortening so



Figs 12—14. *Bracon pertinax* sp. n. ♀♂: 12 = head in dorsal view, 13 = distal part of right fore wing, 14 = tergites 1—3. — Fig. 15. *B. longicollis* WESMAEL: tergites 1—3. — Figs 16—19. *B. rurrenus* sp. n. ♀: 16 = head in dorsal view, 17 = third femur in lateral view, 18 = distal end of right fore wing, 19 = tergites 1—3

that penultimate joint 1.7 times as long as broad, flagellum indistinctly attenuating.

Mesosoma in lateral view 1.4 times longer than high. Surface of mesosoma polished. Notaulix distinct, shallow. Prescutellar furrow narrow, shallow, finely crenulated. Hind femur in lateral view 3.3—3.4 times longer than broad. Hind tibia and tarsus equal in length.

Fore wing as long as body. Stigma (Fig. 13) 3.1 times longer than wide, issuing radial vein slightly distally from its middle. *r2* thrice longer than *r1* and somewhat longer than *cuqu1*, *r3* about 1.5 times longer than *r2* and only approaching tip of wing (Fig. 13). *D* with distally moderately converging *cu1* and *d*, *n. bas.* 1.6—1.7 times as long as *n. rec.*

Metasoma longer than mesosoma and somewhat shorter than head + mesosoma together. First tergite (Fig. 14) somewhat longer than wide at hind, before spiracles narrowing, behind spiracles parallel-sided. Second tergite 3.2 times wider behind than long medially. Second and third tergite equal in length, furrow between them bisinuate and finely crenulated. First, tergite laterally rugose, scutum rugo-rugulose. Second tergite medially rather longitudinally rugulose, laterally uneven to smooth, shiny. Further tergite polished. Ovipositor sheath in lateral view half as long as metasoma.

Ground colour of body black, legs yellow. Mandible and clypeus yellow, former with brown apex. Oral part with palpi light to pale yellow. Cheek and temple below rusty. Antenna black. Tegula yellow. Second tergite yellow, only medially black(ish). Tergites 3—5 laterally yellow. End of hind tibia and tarsi darkening, otherwise legs yellow. Wings hyaline-subhyaline. Stigma with brownish, venation with yellowish brownish pigmentation.

♂. Similar to female. Body 2.1—2.5 mm long. Sculpture of second tergite more extended. Legs with more brownish pattern. Antenna longer than body, with 28 joints.

Host unknown.

Localities — 1 ♀ (holotype) + 2 ♂ (paratypes): "Mongolia, Central aimak, cca 30 km O von Somon Nalajh, 1530 m, Exp. Dr. Z. Kaszab, 1966" (first label). "Nr. 523, 14. VI. 1966" (second label). — 1 ♀ + 1 ♂ (paratypes): "Mongolia, Central aimak, SO von Somon Bajanzogt, 1600 m, Exp. Dr. Z. Kaszab, 1966" (first label). "Nr. 519, 11. VI. 1966" (second label). — 1 ♂ (allotype): "Mongolia, Central aimak, Ulan-Baator, Nucht im Bogdo-ul, 1880—2000 m, Exp. Dr. Z. Kaszab, 1966" (first label). "Nr. 508, 9. VI. 1966" (second label). — 1 ♂ (paratype): "Mongolia, Bulgan aimak, 7 km NW von Somon Chanzargalant, 1350 m, Exp. Dr. Z. Kaszab, 1968" (first label). "Nr. 967, 16. VI. 1968" (second label). — Totally 2 ♀♀ (1 ♀ holotype and 1 ♀ paratype) and 5 ♂♂ (1 ♂ allotype and 4 ♂♂ paratypes).

Holotype, allotype and 5 paratypes are deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 5406 (holotype), 5407 (allotype) and 5408—5412 (paratypes).

Closely related to *B.* (*L.*) *irkutensis* Telenga, 1936 (USSR: Irkutsk), the differences between the two species are restricted to a few features only.

B. pertinax sp. n.	**B. irkutensis** TEL.
1. Head in dorsal view less transverse, 1.7—1.75 times broader than long (Fig. 12).	1. Head in dorsal view strongly transverse.
2. Propodeum smooth and without keel.	2. Propodeum medially rugulose and here with a weak longitudinal keel.
3. Scape and pedicel black.	3. Scape and pedicel reddish yellow.
4. Tergites 6—8 black.	4. Tergites 6—8 reddish yellow.
5. Tegula yellow.	5. Tegula brown.

Very similar to *B.* (*O.*) *longicollis* WESMAEL, 1838 (Palaearctic Region), the distinctive features between them are difficult to recognize:

B. pertinax sp. n.	**B. longicollis** WESM.
1. Body, i.e. meso- and metasoma, less elongated, rather stout: mesosoma in lateral view 1.4 times as long as high.	1. Body, i.e. meso- and metasoma, elongated, mesosoma in lateral view distinctly 1.5 times as long as high.
2. Circular mouth opening 1.4—1.5 times wider than shortest length of cheek.	2. Circular mouth opening as wide as shortest length of cheek.
3. Propodeum smooth and shiny, and at most with a medio-longitudinal subcarina.	3. Propodeum almost entirely to at least medially rugose-rugulose, with a more or less distinct medio-longitudinal carina.
4. Second tergite 3—3.2 times wider behind than long medially (Fig. 14).	4. Second tergite 2.4—2.7 times wider behind than long medially (Fig. 15).

Bracon (Orthobracon) rurrenus sp. n. ♀ (Figs 16—19)

♀. Body 3.8 mm long. Head in dorsal view (Fig. 16) subcubic, almost 1.6 times broader than long, eye 1.4 times longer than temple, head behind eyes moderately rounded, occiput also moderately excavated. Ocelli small, distance between two ocelli somewhat longer than greatest diameter of an ocellus. OOL distinctly twice greater than POL (Fig. 16). Eye in lateral view 1.35 times higher than wide, and 2.3 times higher than length of cheek. In lateral view width of eye one-fifth greater than greatest width of temple. Face (together with clypeus) in frontal view 1.4 times wider than high medially, inner margin of eyes diverging towards oral part. Circular mouth opening usual in size, indistinctly wider than length of cheek. Head polished; face below scape uneven, clypeus rugulo-uneven, cheek densely rugulose, frons (or antennal socket) finely granular. Antenna as long as head, mesosoma and tergites 1—2, with 32 joints. First flagellar joint twice as long as broad, further joints gradually shortening and very feebly attenuating so that penultimate joint subcubic, 1.2 times longer than broad.

Mesosoma in lateral view 1.5 times longer than high. Surface of mesosoma polished. Notaulix moderately distinct, shallow. Prescutellar furrow shallow, with fine crenulation. Hind femur in lateral view 2.65 times as long as broad (Fig. 17). Hind tibia and tarsus equal in length.

Fore wing almost as long as body. Stigma thrice longer than wide, issuing radial vein from its middle. *r2* twice as long as *r1*, *r3* almost twice

as long as *r2* and only approaching tip of wing (Fig. 18); *r2* and *cuqu1* equal in length, *cuqu2* shorter than *r1*. *D* nearly parallel-sided (*cu1* and *d*), *n. bas.* one-quarter longer than *n. rec.*

Metasoma as long as bead+mesosoma together. First tergite (Fig. 19) indistinctly longer than wide at hind, before two spiracles strongly narrowing, behind spiracles very weakly broadening. Second tergite somewhat shorter than third tergite, second tergite distinctly three times wider behind than long medially, furrow between tergites 2—3 bisinuate (Fig. 19). First tergite smooth, its hind third rugose, second tergite medially rugo-rugulose and laterally weakening rugulose. Hind half of tergites 3—5 with weak though more or less confluent punctation, otherwise tergites smooth to polished. Ovipositor sheath in lateral view half as long as metasoma.

Body reddish yellow. Apex of mandible brown. Scape black, flagellum greyish black. Mesosternum, propodeum black, metapleuron black with a middle reddish macula, propodeum at its latero-marginal middle also with reddish macula. Scutum of first tergite black, its hind third reddish. Legs reddish yellow. Fifth segment of fore and middle tarsi blackish, distal end of hind tibia and hind tarsus black. Wings weakly brownish fumous, stigma and veins with brown pigmentation.

♂ and host unknown.

Locality — 1 ♀ (holotype): "Mongolia, C h o v d a i m a k, 3 km N von Somon Uenč, im Tal Uenč gol, 1450 m, Exp. Dr. Z. Kaszab, 1966" (first label). "Nr. 614, 2.—3. VII. 1966" (second label).

Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 5413.

A species, whose taxonomic affinity is difficult to recognize. Within the subgenus *Orthobracon* the new species seems nearest to *B.* (*O.*) *longigenis* Tobias, 1957 (USSR: Crimea, Krasnodarsk), on the basis of its original description the two species may be separated from each other by the following features:

B. (O.) rurrenus sp. n.	**B. (O.) longigenis** Tob.
1. Head in dorsal view subcubic, about 1.6 times broader than long; temple more than half as long as eye (Fig. 16).	1. Head in dorsal view transverse; temple half as long as eye.
2. Eye 2.3 times higher than length of cheek.	2. Eye 1.8—2 times higher than length of cheek.
3. Hind femur in lateral view 2.65 times as long as broad (Fig. 17).	3. Hind femur in lateral view 5 times as long as broad.
4. Second tergite somewhat shorter than third tergite.	4. Second tergite equal to somewhat longer than third tergite.
5. Propodeum entirely smooth.	5. Propodeum medially rugose.
6. Radial vein only approaching tip of wing (Fig. 18).	6. Radial vein reaching tip of wing.
7. Body and legs reddish yellow; mesosternum, propodeum and first tergite black.	7. Body and legs black with reddish yellow pattern.
8. Body 3.8 mm long.	8. Body 2.6—3 mm long.

With TELENGA's (1936) and TOBIAS's key (1976) *B. rurrenus* sp. n. runs to *B.* (*O.*) *kozak* TELENGA, 1936 (southern part of the European USSR, Precaucasus), the specific distinctions between them are tabulated below:

B. rurrenus sp. n.	**B. kozak** TEL.
1. Head in dorsal view subcubic, almost 1.6 times broader than long (Fig. 16).	1. Head in dorsal view transverse.
2. Radial vein only approaching tip of wing (Fig. 18).	2. Radial vein reaching tip of wing.
3. Notaulix shallow.	3. Notaulix deep.
4. Furrow between tergites 2—3 distinctly bisinuate (Fig. 19).	4. Furrow between tergites 2—3 faintly bisinuate.
5. Tergites 2—4 entirely reddish yellow.	5. Tergites 2—4 medially black.
6. Body 3.8 mm long.	6. Body 2.5—3 mm long.

B. (*O.*) *rurrenus* sp. n. resembles *B.* (*L.*) *ochraceus* SZÉPLIGETI, 1896 (Hungary, Yugoslavia, Iran, USSR: Azerbaidzhan), however, the two species are clearly differentiated by subgeneric and specific features:

B. rurrenus sp. n.	**B. ochraceus** SZÉPL.
1. Circular mouth opening indistinctly wider than length of cheek.	1. Circular mouth opening about twice wider than length of cheek.
2. Tergites 2—3 transverse, second tergite distinctly thrice wider behind than long medially. Furrow between tergites 2—3 distinctly bisinuate (Fig. 19).	2. Tergites 2—3 less transverse, second tergite 1.7—2 times wider behind than long medially. Furrow between tergites 2—3 weakly bisinuate, almost straight.
3. Ovipositor sheath half as long as metasoma.	3. Ovipositor sheath as long as metasoma + mesosoma.
4. Antenna 32-jointed.	4. Antenna 28-jointed.

Bracon (Lucobracon) turolus sp. n. ♀ (Figs 20—22)

♀. Body 3 mm long, somewhat elongated. Head in dorsal view (Fig. 20) subcubic, 1.5 times broader than long, eye about one-quarter longer than temple, head behind eyes moderately rounded, occiput less excavated. Ocelli small, distance between two ocelli twice as long as diameter of an ocellus. OOL twice as long as POL. Eye in lateral view one-third higher than wide, temple only somewhat less wide than eye. Cheek about one-third as long as height of eye. Circular mouth opening 1.5 times wider than length of cheek. Face together with clypeus 1.5 times wider than high medially, inner margin of eyes moderately diverging towards oral part. Head polished, cheek chagreened to granular. Antenna shorter than body, with 24 joints. First flagellar joint 2.5 times as long as broad, further joints gradually shortening so that penultimate joint 1.2 times as long as broad.

Mesosoma in lateral view distinctly 1.8 times longer than high. Notaulix almost indistinct. Prescutellar furrow shallow and narrow, finely crenulated. Mesosoma polished. Propodeum also polished, above orifice with radiating rugulae. Hind femur rather thick, 2.6—2.7 times as long as broad. Hind tarsus

slightly longer than hind tibia. First tarsal joint just as long as second and third joints together.

Fore wing somewhat shorter than body. Stigma (Fig. 21) 3.2—3.3 times as long as wide, issuing radial vein from its middle; *r1* as long as width of stigma, *r2* 2.75 times longer than *r1* and one-fifth longer than *cuqu1*, *r3* 1.68 times longer than *r2* and ending distinctly before tip of wing (Fig. 21). *D* wide, *cu1* 1.7 times as long as *n. bas.*, *cu1* and *d* faintly converging distally, *n. bas.* one-third longer than *n. rec.*

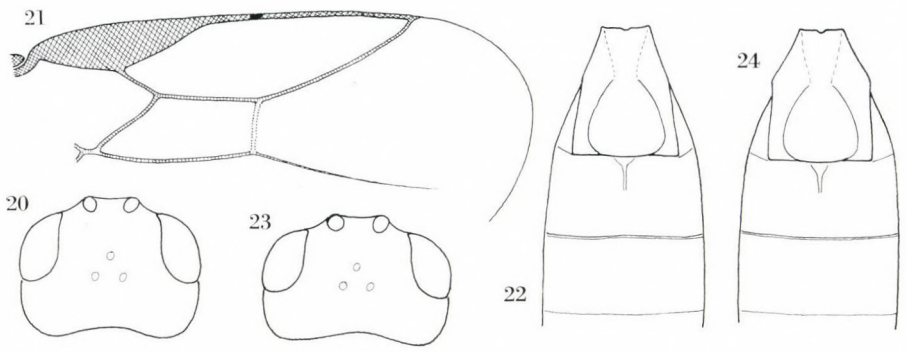
Metasoma as long as head and mesosoma together. First tergite somewhat longer than wide at hind, almost evenly, i.e. before spiracle slightly more, broadening posteriorly (Fig. 22), its surface smooth and shiny, behind and laterally uneven to rugulose. Further tergites transverse, tergites 2—3 equal in length and each 1.75 times wider at suture between tergites 2—3 than long medially (Fig. 22). Second tergite anteriorly with a medio-longitudinal subcarina, along it rugulose, otherwise smooth to polished, further tergites also polished. Ovipositor sheath as long as metasoma.

Head and mesosoma black, metasoma brownish black. Cheek, circular mouth opening and mandible brownish yellow. Palpi dark brown, antenna blackish. Temple with rusty suffusion. Tegula brownish yellow. Legs blackish brown; distal two-thirds of fore femur, fore tibia, apex of femora 2—3, proximal third of tibiae 2—3 light brown, tarsi light brown to brown. Tergites 2—3 with brown suffusion. Sternites rather brownish yellow. Wings subhyaline. Stigma and veins with brown pigmentation.

♂ and host unknown.

Locality — 1 ♀ (holotype): "Mongolia, C h o v d a i m a k, Mongol Altaj Gebirge, cca 45 km S von Somon Manchan, 2100 m, Exp. Dr. Z. Kaszab, 1966" (first label). "Nr. 657, 9. VII. 1966" (second label).

Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 5414.



Figs 20—22. *Bracon turolus* sp. n. ♀: 20 = head in dorsal view, 21 = distal part of right fore wing, 22 = tergites 1—3. — Figs 23—24. *B. kaszabi* Papp: 23 = head in dorsal view, 24 = tergites 1—3

Within the subgenus *Lucobracon* (FAHRINGER) TOBIAS the new species, *B.* (*L.*) *turolus*, belongs to the *jakuticus*-group owing to its transverse tergites 2—3. Closely related to *B.* (*L.*) *kaszabi* PAPP, 1967 (Mongolia), *B.* (*L.*) *jakuticus* TOBIAS, 1961 (USSR: Yakutsk), and *B.* (*L.*) *shestakoviellus* TOBIAS, 1957 (SE European part of the USSR). The specific distinction of the new species is hard to recognize and the differences from each species enumerated before are tabulated below:

B. turolus sp. n.	**B. kaszabi** PAPP
1. Head in dorsal view subcubic, 1.5 times broader than long, behind eyes less rounded (Fig. 20).	1. Head in dorsal view transverse, 1.7—1.8 times broader than long, behind eyes more rounded (Fig. 23).
2. Ovipositor sheath less long, i.e. as long as metasoma.	2. Ovipositor sheath long, i.e. as long as body.
3. Hind tarsus somewhat less long, first tarsal joint just as long as tarsal joints 2—3 together.	3. Hind tarsus longer, first tarsal joint (almost) as long as tarsal joints 2—4 together.
4. First tergite more narrowing postero-anteriorly (Fig. 22).	4. First tergite less narrowing postero-anteriorly, rather subquadratic (Fig. 24).

B. turolus sp. n.	**B. jakuticus** TOBIAS
1. Radial vein ending before tip of wing (Fig. 21).	1. Radial vein reaching tip of wing (Fig. 16 in TOBIAS, 1961: 667).
2. Head in dorsal view subcubic, 1.5 times broader than long, temple only somewhat shorter than eye (Fig. 20).	2. Head in dorsal view transverse, twice broader than long, eye also twice as long as temple.
3. Ovipositor sheath as long as entire metasoma.	3. Ovipositor sheath as long as half metasoma.

B. turolus sp. n.	**B. shestakoviellus** TOBIAS
1. Head in dorsal view subcubic, temple only somewhat shorter than eye (Fig. 20).	1. Head in dorsal view transverse, temple half as long as eye.
2. Antenna with 24 joints.	2. Antenna with 35 joints.
3. Radial vein ending before tip of wing (Fig. 21).	3. Radial vein reaching tip of wing.
4. Body together with legs dark coloured.	4. Body dark coloured with reddish yellow pattern, legs reddish yellow excepting dark coxae 2—3 and tarsus 3.
5. Body 3 mm long.	5. Body 3.8 mm long.

Acknowledgement. In identifying the Mongolian braconids DR. V. I. TOBIAS (Zoological Institute, Leningrad) was of great help to me both by lending to me comparative material and by controlling my named specimens. For his generous assistance I express my sincere thanks and gratitude.

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Acta Zoologica Hungarica 30 (3—4), pp. 469—479 (1984)

ISCHIOLEPTA LIOY (DIPTERA: SPHAEROCERIDAE): TWO NEW SPECIES AND TAXONOMICAL NOTES

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(Received 24 October, 1983)

Ischiolepta loebli sp. n. (North India) and *I. draskovitsae* sp. n. (North Korea) are described. *I. orientalis* (DE MEIJERE, 1908) is redescribed (recorded as new from Sri Lanka) and compared with *I. horrida* L. PAPP, 1973. Notes and new records are given for *I. oedopoda* L. PAPP, *I. pusilla* FALL. and *I. vaporariorum* HALIDAY. With 20 figures.

Specimens of the sphaerocerin genus *Ischiolepta* LIOY, 1864 are small-bodied flies with short hook-like bristles (without longer ones) and with blunt or pointed warts and tubercles on body and legs. Imagos are characterized by the features of the subfamily Sphaerocerinae (see PAPP, 1978) but differing from the other genera in the following points: mesonotum with wartless stropes, scutellum with 6—10 (in the majority of the species with 8) dentiform tubercles, medial vein of wings almost straight or its apex downcurving.

The taxonomy of its species had been scarce and obscurous but Prof. KE CHUNG KIM (Pennsylvania State University) made a revisional work on the type-materials of the European museums in the late sixties and in the early seventies. In the course of his studies he made excellent drawings on the male genitalia and selected lectotypes for *I. denticulata* (MEIGEN, 1830) [syn. *I. paracrenata* (DUDA, 1920)], *I. crenata* (MEIGEN, 1838), *I. micropyga* (DUDA, 1938), *I. nitida* (DUDA, 1920) and *I. vaporariorum* (HALIDAY, 1836). Unfortunately — as far as we know — his descriptions and drawings have not been published. (Professor KIM supplied us with xerox copies of his drawings, for which we should like to express our most sincere thanks also in this place.) The manuscript for the new Catalogue of Palaearctic Diptera (Vol. 10) for Sphaeroceridae was made in accordance with KIM's lectotype designations. As the results of our studies in the recent years in sphaerocerids, we found specimens of some new species and numerous new records of the species of *Ischiolepta* LIOY.

In the following, our terminology for the male genital parts is much different from that of KIM and COOK (1966), e.g. periandrium here means the same as that of GRIFFITHS's (1972), and not the periandrium of *Copromyza* in PAPP and ROHÁČEK, 1983 and in some other papers of the present authors. The names of genital structures are given in Figs 6, 8.

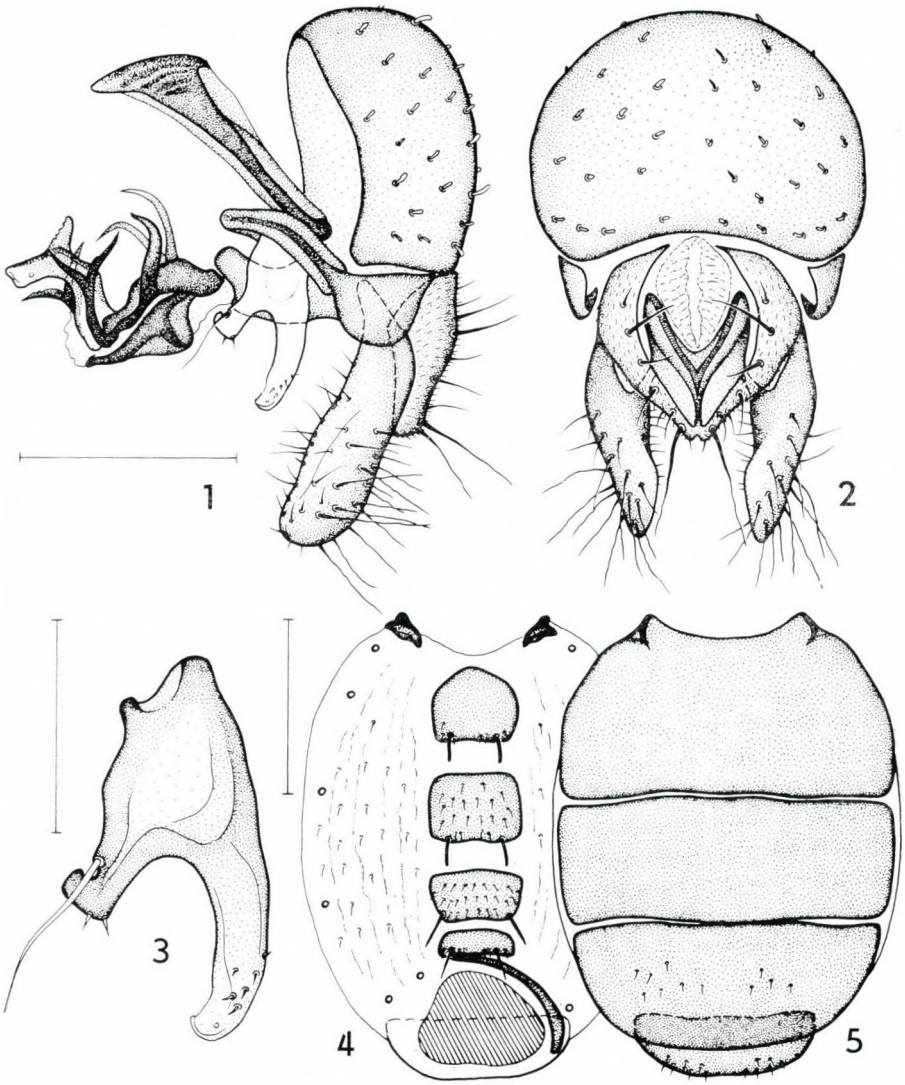
Ischiolepta loebli sp. n.

Measurements in mm: body length 2.14 (holotype), 2.26 (paratype ♂), 2.28—2.57 (paratype ♀♀); wings 2.00×0.76 (holotype), 2.11×0.81 (paratype ♂), 2.03×0.79—2.23×0.89 (paratype ♀♀); height of head 0.50, length of head 0.45.

Body and legs black, somewhat shining, knees and ventral surface of tarsi dark brown. Also antennae and facial plate black. Second antennal joint with a thick, 0.06 mm long bristle. Arista waxy, c. 0.60—0.65 mm long. Clypeus 0.12 mm high, eyes small bulging, longitudinal axis 0.25 mm, width 0.235 mm. Thorn below antennal foveae of male only 0.10 mm long and not extremely thick (0.012 mm). Prealar wart with a small blade-like bristle only, laterotergite with a tubercle of c. 0.045×0.03 mm. Acrostichal warts in four unarranged rows. Scutellar tubercles less thick as in *draskovitsae* sp. n. (see below), but lateral pair long (0.045 mm), with an incurving small thornlet each. Fore femora of paratype male 0.66 mm long, 0.17 mm wide, its hind femora 0.92 mm long and 0.17 mm wide. Hind tibial spur weak, only 0.05 mm long. Wings clear, veins light brown, costa somewhat darker. Apex of radial vein r_{4+5} upcurving, apex of *m* slightly downcurving, i.e. apices divergent. Intracrossvein section of *m* 0.45 mm, terminal section of *m* 0.91 mm, hind crossvein 0.12 mm, terminal section of *cu* 0.235 mm. Halteres yellow.

Male abdomen black shining (Figs 4, 5), oval in dorsal outline. Terga large, broad with wrinkled and rugose surface, T1 + 2 being the longest but T3 shorter than T4. Sterna much reduced and narrow. No relics of S1 preserved, S2 semicircular, S3 oblong and slightly transverse, S4 trapezoidal and more transverse, S5 short transverse but narrower than S4. S6 rather simple, narrowly stripe-shaped. S7 (not figured), on the contrary, long. Strong paired setae on S2 and S3 blunt, on S4 and S5 pointed. Genitalia (Figs 1—3). S8 relatively long, dish-shaped, carrying very reduced, flat and blunt setae. Hypandrium V-shaped, though medially not fused, with robust posterolateral parts. Periandrium ventrally fused with pseudocerci but dorsally not connected, each of its lateral parts bearing one longer and several short setae. Pseudocerci terminated by a long sinuate apical hair each. Intraperiandrial sclerite well developed and high. Aedeagal complex with long robust but simple phallophore (without epiphallus) and very distinctive distiphallus. Distiphallus armed by 2 pairs of proximal slender projections (the lateral pair curved inwards, the medial pair curved outwards), one pair of slender distal, apically forked projection and one unpaired, robust but paler pigmented, apical projection carrying a serrate dorsal process. Postgonite (Fig. 3) with dark pigmented anterior process bearing a long seta and about twice longer but paler pigmented posterior projection. Aedeagal apodeme with dorsoventrally flattened and very widened apex.

Holotype male: N. India: Uttar Pradesh, 2 km E from Dhanolti — 21. X. 1979, 2250 m, I. Löbl, No. 19. Paratypes: 1 ♂, 6 ♀: data same as for holotype. The type-series as minutia-



Figs 1—5. *Ischiolepta loebli* sp. n., paratype male; 1 = genitalia laterally, 2 = genitalia caudally (aedeagal complex omitted), 3 = postgonite, 4 = abdomen ventrally (genitalia and S7 omitted), 5 = abdomen dorsally. Scales: Figs 1, 2: 0.2 mm, Fig. 3: 0.1 mm, Figs 4, 5: 0.5 mm

pinned from alcohol. The holotype male and three female paratypes are deposited in the collection of Muséum d'Histoire Naturelle, Genève, the male paratype and two female paratypes are in the collection of the Zoological Department, Hungarian Natural History Museum, Budapest and one female paratype is in the collection of the Slezské Muzeum, Opava.

R e m a r k s. Superficially the new species resembles somewhat the European species *I. micropyga* (DUDA) in having shining black body, blackish brown fore coxae, pale halteres and reduced hind tibial spur but it differs

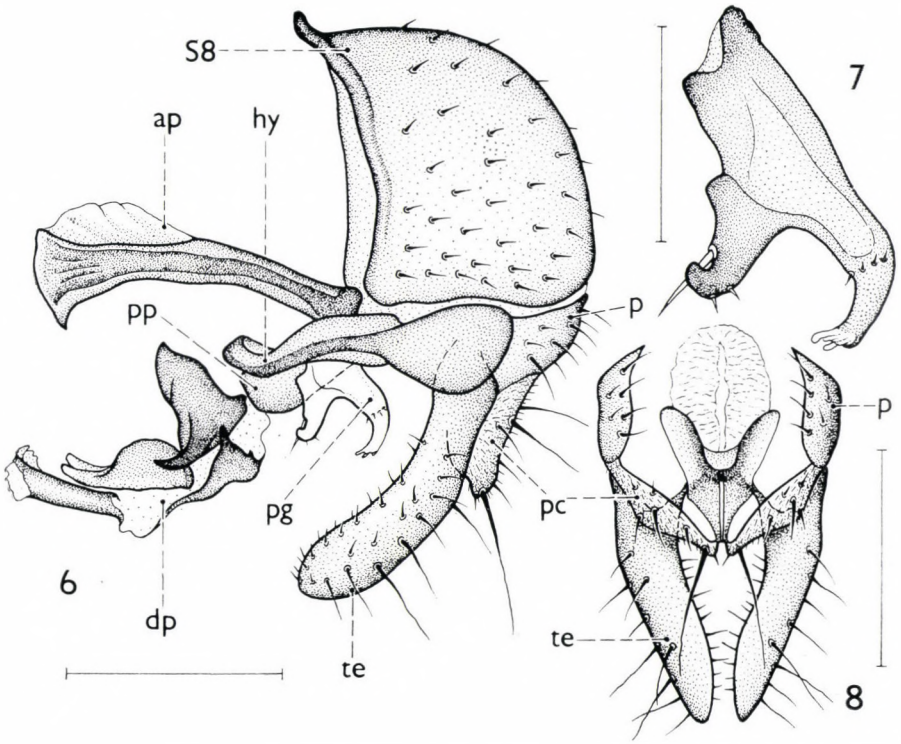
substantially from this species by the shape of sterna, by the shorter and simple telomere (internally without projection), pseudocercus with a long apical hair (Fig. 2) and completely dissimilar distiphallus armed by numerous projections and hooks.

Ischiolepta draskovitsae sp. n.

Measurements in mm: body length 2.50; wings 2.43 × 0.92; height of head 0.53; length of head 0.48 (all for the male holotype).

Body dark blackish brown, dusted, sternopleuron and anterior half of genae shining. Femora, trochanters and coxae ochreous, dorsal apical half of femora brown, tibiae and hind metatarsus brown, tarsi ochreous with brown apices. Antennae brown, first joint ochreous. Facial plate ochreous with some diffuse brown infuscation. Thorn below antennal foveae resembling a blade (0.095 mm long, 0.02 mm wide) with some weak bristles below it. Clypeus comparatively large, ± projecting, 0.157 mm high. Eyes bulging, longitudinal axis 0.32 mm, width 0.30 mm. Acrostichal warts in about 4 unarranged rows, wartless stripes beside them not regular, less than 0.05 mm wide. Scutellar thorns rather long (0.05 mm), lateral pair of thorns curved, 0.06 mm. Distinct prealar wart with a blunt thorn, laterotergite with a mamillar wart of 0.06 × 0.04 mm. Thorax ventrally with a pair of comparatively long (0.146 mm) bristles but sternopleura and coxae with some short hair-like bristles only. Fore femora thick, 0.69 mm long, 0.23 mm thick. Hind femora very thick (1.10 × 0.42 mm), hind metatarsus ventrally with 0.10 mm long bristles. Costa dark brown, other veins lighter brown. Apex of r_{4+5} upcurving, apex of m slightly downcurving, i.e. apices divergent. Intracrossvein section of m 0.47 mm, terminal section 1.10 mm, terminal section of cubital vein to wing margin, 0.33 mm long. Halteres wax yellow.

Male abdomen (Figs 6—8, 11—12). Terga almost black, sterna dark brown. T1 + 2 the largest tergum, T3 and T4 subequal in size and shape but T4 slightly larger (Fig. 12) and narrower; T5 much smaller. Sterna very narrow (Fig. 11) (in contrast to *I. horrida*), S2 subquadrate, S3 elongately oblong, S4 transversely oblong, S5 transverse and anteriorly with medial emargination. No remnants of S1 observed. Strong seta of pregenital sterna not blunt though not very acute. S6 rather short, consisting of 3 stripes (appendages). Genitalia (Figs 6—8): S8 very large and long, with anterior abruptly sclerotized ledge and covered by reduced and pointed setulae. Hypandrium robust as usual, particularly on the posterolateral parts; it is V-shaped but both arms are not firmly connected medially. Periandrium (Fig. 8) small divided into 2 lateral plates being dorsally widely separated from each other, and each bearing some 4 setae on posterior margin. Pseudocerci rather narrow



Figs 6—8. *Ischiolepta draskovitsae* sp. n., holotype male; 6 = genitalia laterally, 7 = postgonite, 8 = genitalia caudally (aedeagal complex and S8 omitted) (*ap*: aedeagal apodeme, *dp*: distiphallus, *hy*: hypandrium, *p*: periandrium, *pc*: pseudocercus, *pg*: postgonite, *pp*: phallophore, S8: 8th sternum, *te*: telomere). Scales: Figs 6, 8: 0.2 mm, Fig. 7: 0.1 mm

(Fig. 8), each with a very long apical hair-like seta besides short setulae and micropubescence. Intraperiandrial sclerite high and well developed. Telomeres (Figs 6, 8) long, slender, subapically slightly dilated with short setulae on anterior and with some longer, finely sinuate hairs on posterior margin. Aedeagal complex with long phallophore distinctly protruding posteriorly and forming a short, distally widened epiphallus. Distiphallus highly characteristic (Fig. 6), long with robust proximal dorsally protruding sclerite bearing a lateral hook, subterminally with a dorsal sclerite ending in a pair of pale finger-like projections and apically with a tube-like unpaired sclerite. Postgonite (Fig. 7) with a robust, dark pigmented anterior projection carrying a moderately long seta and with longer, more slender posterior projection terminated by fine, unpigmented, finger-like processes.

Holotype male: N. Korea, Kum Gan-san — 7 km W from Hotel Kum Gan — 11. VII. 1977, Draskovits-Dely (No. 358). The holotype is a minutia-pinned specimen deposited in the collection of the Zoological Department, Hungarian Natural History Museum, Budapest. Its abdomen with genitalia is preserved in a microvial with the specimen.

R e m a r k s. The new species resembles somewhat to *I. horrida* L. PAPP, 1973 (Mongolia) but it is distinctly bigger (one of the biggest species of the genus), has yet more thickened fore and hind male tibia, wider abdomen with narrower sterna, much longer S8 and very different genitalia (periandrium, pseudocerci with long setae, slender long telomeres, length and shape of telomere, postgonite). The species seems to be somewhat intermediate between *I. orientalis* and *horrida*, the former resembling by its preabdominal sclerites, the latter by the form of male femora and certain structures in the aedeagal complex.

We dedicate this new species to Mrs. Dr. ÁGNES DELY-DRASKOVITS, the excellent specialist of chloropids, who was one of the collectors of the type-specimen.

Ischiolepta orientalis (DE MEIJERE, 1908)

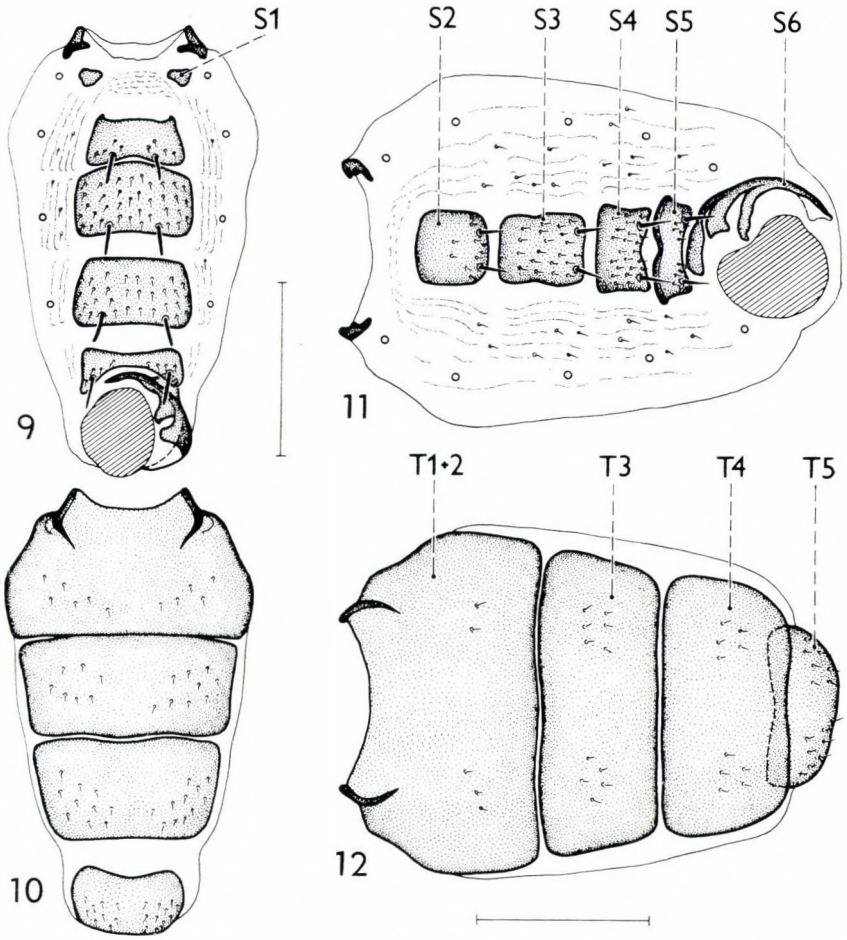
Sphaerocera orientalis DE MEIJERE, 1908: Tijdschr. Ent., **51:** 108. Type-locality: Java, Semarang. — Distr.: Indonesia (Java), India, Vietnam (PAPP, 1978), Sri Lanka (new), ? Japan (new).

Material studied: one male each from India and Vietnam (see PAPP, 1978); Sri Lanka: 2 ♂, 3 ♀: Ceylon, Centr. Prov., Rambukpath Oya, 10 mls NW Hatton, 18. III. 62. Loc. 153 — At light — Lund University Ceylon Expedition 1962 BRINCK—ANDERSSON—CEDERHOLM (removed from alcohol to minutia-pins); Japan: 1 ♀: Shikoku, Ehime Pref., Mt. Ischizuchi, 1400 m, 14. VIII. 1980, C. BESUCHET, No. 17b (Muséum d'Histoire Naturelle, Genève; removed from alcohol to minutia-pin): in poor condition, and because of its sex we were able to identify it but with some doubt.

Body length: 1.71—2.14 mm.

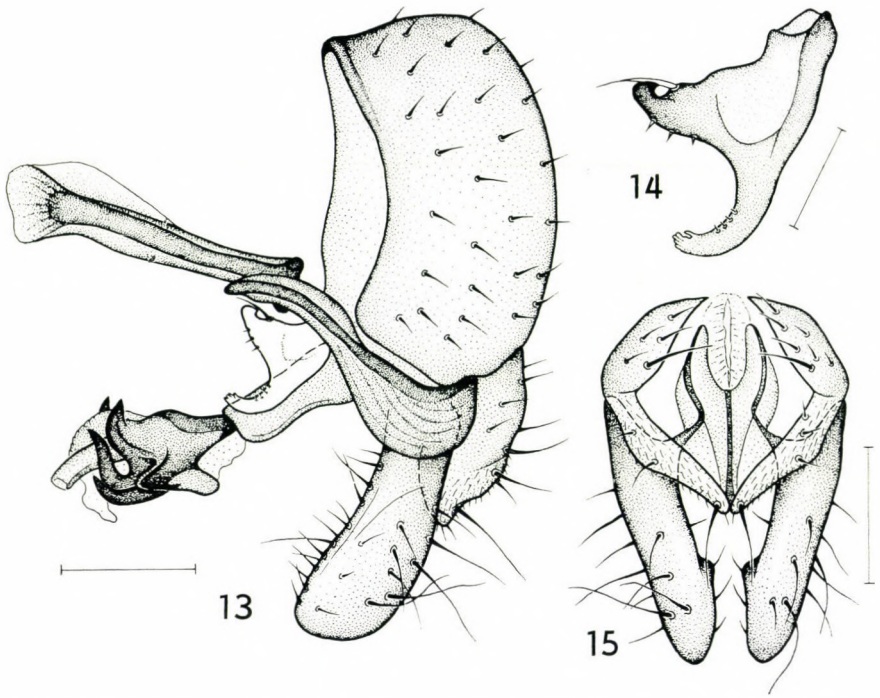
Male. Body subshining dark brown, legs ochreous with some light brown hue on dorsal half of femora and tibiae, also hind metatarsus and apical tarsomeres brownish. Head 0.46 mm high, 0.49 mm long. Antennae and facial plate ochreous, latter flattened. Arista 0.61 mm. A blunt thorn below antennal foveae 0.02 mm thick and 0.157 mm long. Third antennal joint globular. Four pairs of genal bristles on ventral margin (0.11 mm, 0.10 mm, 0.067 mm, 0.056 mm). Eyes round, longitudinal axis 0.30 mm, width 0.25 mm. Four rows of acrostichal warts, wartless pair of stripes c. 0.05 mm wide. Postalar wart-like thorn yellow and not strong. Ventral side of sternopleura with some scattered hairs only. Scutellum with 8 more or less symmetrically placed tubercles. Fore coxae swollen, yellow. Fore and hind femora swollen. Fore femora 0.64 mm long and 0.19 mm thick, hind femora 0.91 mm long and 0.22 mm thick. Middle and hind femora without ventral projections. Hind tibial spur 0.09 mm. Alar veins ochreous ± transparent, apices of r_{4+5} and *m* slightly divergent. Intracrossvein section of *m* 0.34 mm, terminal section 0.94 mm. Terminal section of *cu* to wing margin 0.30 mm. Halteres wax-yellow.

Male abdomen (Figs 16—20). Terga dark brown, sterna paler. Terga wide, covering almost the whole dorsal part of abdomen, T1 + 2 the largest, the subsequent becoming smaller and narrower. Sterna much reduced. S2 and



Figs 9—12. Abdomens of *Ischiolepta* males. Figs 9—10 = *I. horrida* L. PAPP, paratype male; 9 = ventral view (genitalia and S7 omitted), 10 = dorsal view; Figs 11—12 = *I. draskovitsae* sp. n., holotype male; 11 = ventral view, 12 = dorsal view (S1—S6: sterna, T1 + 2: syntergum 1 + 2, T3—T5: terga). Scales: 0.5 mm

S3 narrow and subquadrate, S4 and S5 short, transverse and wider (S5 the widest). S6 (Fig. 17) and S7 large and long so that the postabdomen is strongly downcurved. Strong setae on pregenital sterna with pointed apices and situated as in Fig. 17. Genitalia (Figs 18—20). S8 comparatively long, of usual dish-shaped form, covered with shorter but still pointed setae. Hypandrium robust, V-shaped but medially not coalesced, its lateral parts enlarged, as big as periandrium. Latter (Fig. 19) not connected dorsomedially, so forming two plates with about 3 longer and some small bristles. Pseudocercus relatively wide, finely haired with a long apical hair-like seta and several short setulae. Intraperiandrial sclerite well developed, ventrally connected with telomeres.



Figs 13—15. *Ischiolepta horrida* L. PAPP, paratype male; 13 = genitalia laterally, 14 = postgonite, 15 = genitalia caudally (aedeagal complex and S8 omitted). Scales: Figs 13, 15: 0.1 mm, Fig. 14: 0.05 mm

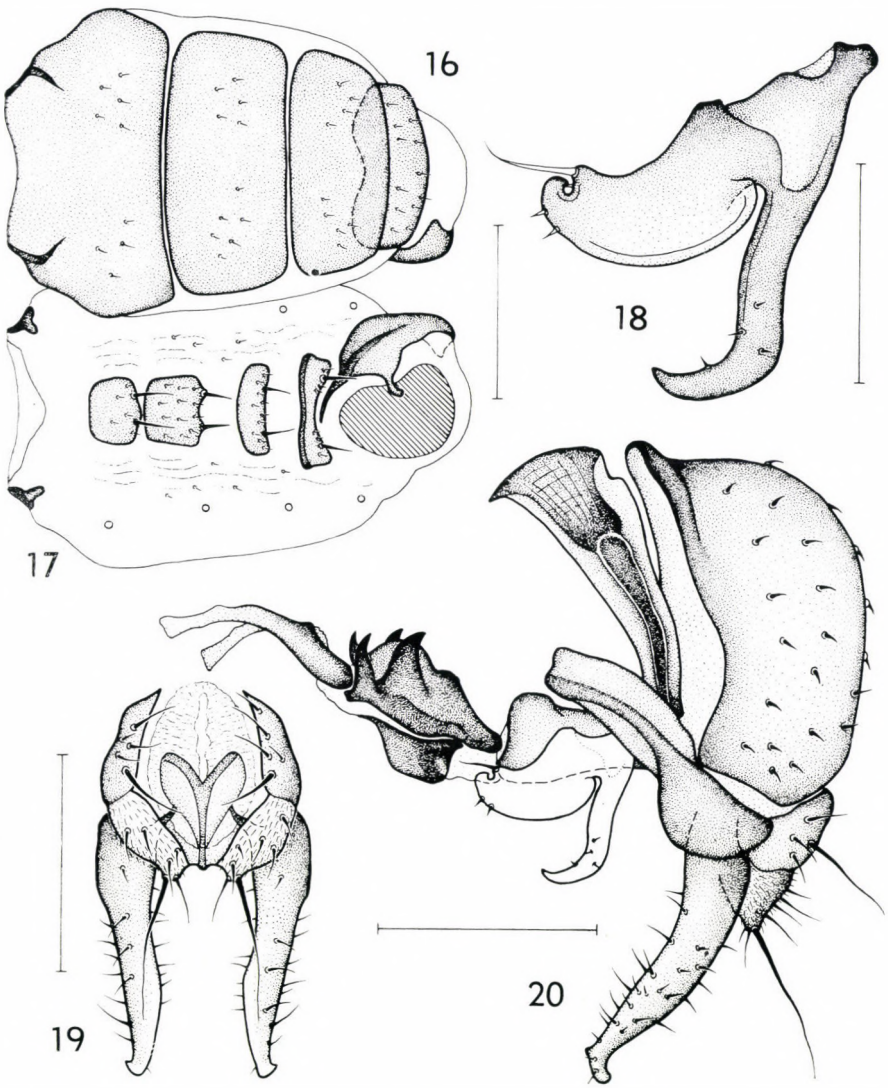
Telomere (Figs 19—20) very long and slender, slightly bent and with a characteristic boot-like (lateral view, Fig. 20) apex. Setosity of telomeres much reduced. Aedeagal complex with long and robust phallophore bearing a short and broad epiphallus. Distiphallus peculiar (Fig. 20), with 2 pairs of strong and dark hooks proximally and 2 slender, long and slightly bent projections distally. Postgonite (Fig. 18) very characteristic with voluminous flat anterior projection and with a slender, curved hook-like dark pigmented posterior one.

Sri Lanka females. Body characteristics largely as in males but their thorn below antennal foveae much weaker and femora less thick, fore femora 0.63 mm long and 0.18 mm wide, hind femora 0.875 mm long and 0.185 mm wide.

R e m a r k s. Regarding its male preabdominal sterna *I. orientalis* resembles most *I. draskovitsae* sp. n. but it differs from this species markedly by the highly characteristic telomere and aedeagal complex (postgonite, distiphallus). It is worth mentioning that *I. longispina* L. PAPP, 1973 seems closely related to *I. orientalis* on the basis of comparison of its holotype with Sri Lanka females but in lack of longispina males the true relationships cannot be judged.

Ischiolepta horrida L. PAPP, 1973

Male abdomen (Figs 9—10) much narrower than in *I. draskovitsae* sp. n., T1 + 2 the largest sclerite, the following terga becoming smaller terminally. Sterna, on the contrary, much wider than those of *I. draskovitsae*, moreover, also 2 small remnants of S1 clearly developed. Strong sternal setae with blunt



Figs 16—20. *Ischiolepta orientalis* (DE MEIJERE), a male from Vietnam; 16 = abdomen dorsally, 17 = abdomen ventrally (genitalia and S7 omitted), 18 = postgonite, 19 = genitalia caudally (aedeagal complex and S8 omitted), 20 = genitalia laterally. Scales: Figs 16, 17: 0.5 mm, Fig. 18: 0.1 mm, Figs 19, 20: 0.2 mm

apices and positioned as in Fig. 9. S6 with several flat lobes but generally narrow. Genitalia (Figs 13—15). S8 much shorter than that of *I. draskovitsae*, also its setulae are slightly longer. Hypandrium large, particularly its posterolateral parts, and its arms medially loosely connected forming so the usual V-shaped structure in thich the aedeagal complex is suspended. Periandrium divided into 2 lateral plates (Fig. 15) being dorsally less separated than those of *I. draskovitsae* and each carrying one longer and several short bristles. Pseudocerci narrow in caudal view, finely pubescent, each bearing a shorter apical hair-like seta. Intraperiandrial sclerite very large. Telomere much more robust than that of *I. draskovitsae* with thicker and longer setosity not mentioning the distinctive interior angle (corner) (Fig. 15) absent in *I. draskovitsae*. Aedeagal complex with long phallophore but epiphallus is only indicated forming a short broad process on its posterior part. Distiphallus very different from that of *I. draskovitsae*, much shorter and bearing 3 pairs of strongly sclerotized hook-like processes (best visible in dorsal view) and a short tube-like apical projection. Postgonite (Fig. 14) also dissimilar to that of *I. draskovitsae*, more delicate in construction and differing in shape as well as in armature.

Material studied: holotype and paratypes (Mongolia) in the collection of the Zoological Department, HNHM.

Ischiolepta oedopoda L. PAPP, 1972

New records: Hungary: 2 ♂: Pusztavacs, sertéstrágyáról (= on pig droppings), 1980. V. 14., leg. I. MÄKELÄ; 7 ♂, 2 ♀: Kiskunsági N. P., Kunfehértó, tóparti legelő (= pasture on shore), szamártrágya (= on donkey droppings), 1981. VIII. 19., leg. PAPP L. (HNHM); 2 ♂, 3 ♀: Kunfehértó env., on donkey droppings, 19. 8. 1981, J. ROHÁČEK leg. (coll. JRO); USSR: 1 ♂: Uzbekistan, Velky Cimgan Mt., near Taskent (Tashkent), VI. 1981, 1800 m, on horse excrement, K. RATAJ leg. (coll. Silesian Museum, Opava). Hitherto known from Hungary (Csévharaszt, type-locality), Caucasus, Mongolia and North Korea (PAPP, 1978).

Ischiolepta pusilla (FALLÉN, 1820)

New records: Czechoslovakia and Hungary: numerous specimens incl. males with black legs and swollen fore and hind femora from beneath cut grass, rotten hay, compost dung heaps etc. — Iran (leg. SENGLET, coll. Muséum d'Histoire Naturelle, Genève): Prov. Tehran: 1 ♂: Delichal, 24. VII. 1973, 35°40′ N/52°30′ E (body length 2.45 mm); Prov. Kermanshah: 1 ♀: Kenesht/Kermanshah, 3. VIII. 1973, 34°29′ N/47°09′ E grotte; Prov. Bakhtiyari: 1 ♂: route de Kuhrang, 17. VI. 1973, 32°23′ N/50°18′ E; 4 ♂: Kuhrang, 19. VI., 32°28′ N/50°08′ E (biggest male 2.60 mm long); Prov. Lorestan: 2 ♀: Azna, 23. VI. 1973, 33°28′ N/49°22′ E (females are not safely separable from those of *I. vaporariorum*).

Ischiolepta vaporariorum (HALIDAY, 1836)

The only male of *Ischiolepta* in PAPP's collectings in Afghanistan (Prov. Nangarhar, Bande Darunta, 590 m, 8. 5. 1974, L. PAPP, No. 86) was studied again incl. genitalia, and it was found that it belongs to *I. vaporariorum* and not to *I. pusilla* (FALL.) (body length 1.89 mm). We must admit that the majority of males with swollen femora in the *pusilla*-group belongs to *I. pusilla* and only the genital structures give a safe basis for the identification of both species.

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Acta Zoologica Hungarica 30 (3—4), pp. 481—491 (1984)

NEUE ARTEN UND UNTERARTEN AUS DER GATTUNG AMMOCONIA LEDERER, 1857 (LEPIDOPTERA: NOCTUIDAE)

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(Eingegangen am 14 November, 1983)

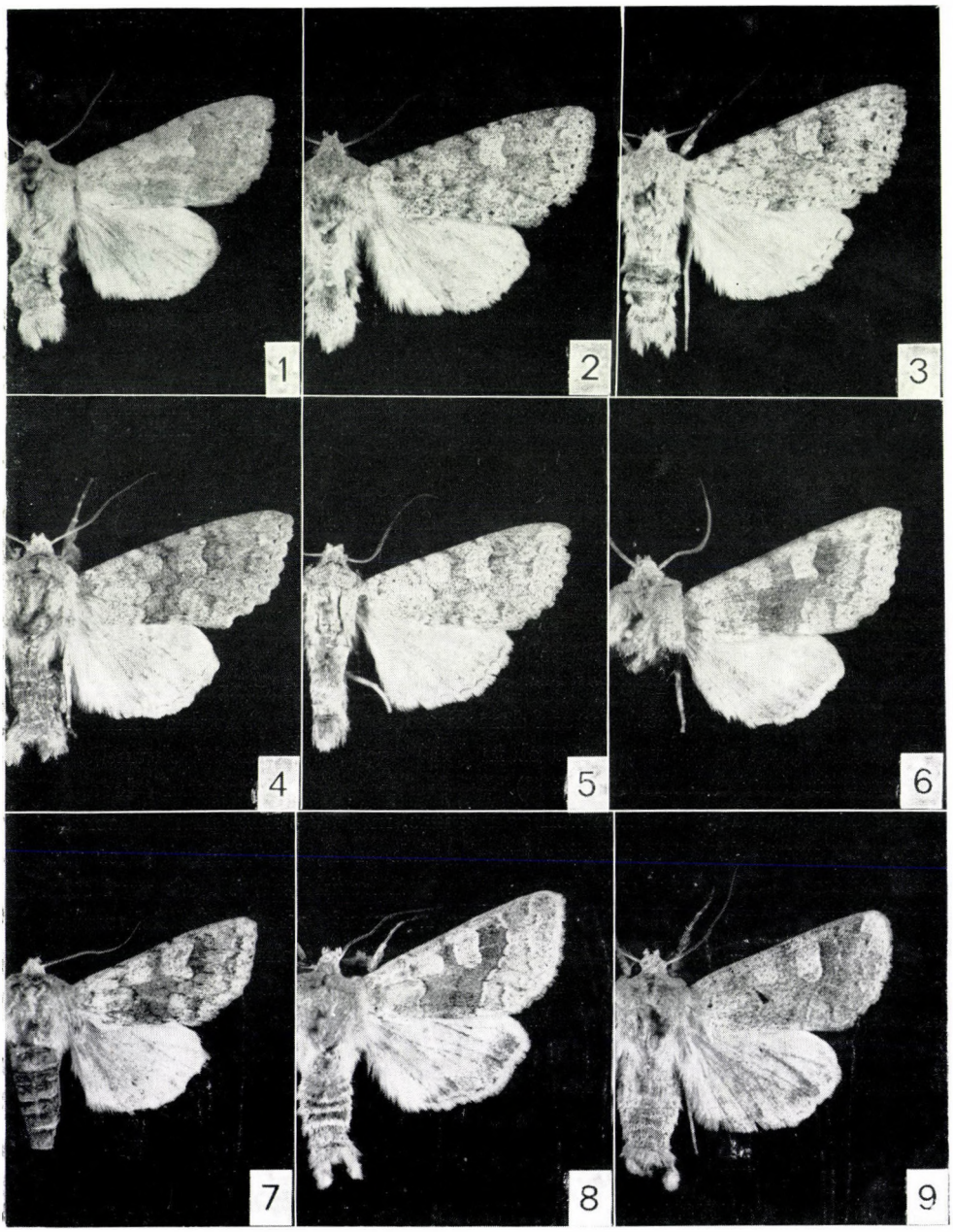
Description of two new species and three new subspecies; a discussion of some morphological and zoogeographical problems connected with the evolution of the genus.

Zur Gattung *Ammoconia* LEDERER, 1857 (Noctuinen Eur., 33: 97; Generotypus: *Noctua caecimacula* DENIS & SCHIFFERMÜLLER, 1775) gehören nach unseren bisherigen Kenntnissen zwei Arten: *A. caecimacula* (DENIS & SCHIFFERMÜLLER, 1775) und *A. senex* (GEYER, 1828). Die Struktur der männlichen Genitalien ist bei ihnen grundsätzlich identisch: Uncus kurz und gleichmäßig breit; die Valven breit, gebogen und deutlich dyssymmetrisch; Harpe kurz, plattenförmig, leicht gebogen; Clavus gut entwickelt, stark chitinisiert und deutlich dyssymmetrisch; auf dem distalen Teil des Sacculus befindet sich ein dreieckiger Vorsprung, der auch in der Regel dyssymmetrisch und auf der linken Seite (auf den Abb. rechts !) oft zurückgebildet ist. Der Aedoeagus ist mäßig lang, auf dem distalen Teil gekrümmt, meistens mit einem Büschel von dünnen Cornuti. Fultura inferior ist ziemlich groß, schildförmig; der untere Teil stärker chitinisiert, auf dem oberen Teil befinden sich oft zwei stärker chitinisierte Lappen. Die einzelnen Taxa lassen sich hauptsächlich aufgrund der unterschiedlichen Entwicklung der dyssymmetrischen Teile trennen. Die habituellen Unterschiede sind meistens nicht sehr auffällig und werden oft durch eine erhebliche individuelle Variabilität verdeckt. Dadurch ist verständlich, daß eine relative große Anzahl der Taxa in der sonst nicht artenreichen Gattung unbeschrieben geblieben ist.

Ammoconia caecimacula transcaucasica ssp. n.

Holotypus: ♂, UdSSR, Armenische SSR, Aragats-Gebirge, meteorologische Station bei Antarut, 1960 m, 27.—28. IX. 1983, leg. Z. VARGA (Lichtfang); Paratypoide: 4 ♂♂ mit gleichen Angaben, GU 1193, 1218, 1219 RONKAY (Abb. 1—4). Der Holotypus und zwei Paratypoide befinden sich in der Samml. von Z. VARGA (Debrecen), zwei Paratypoide in der Samml. des Naturwissenschaftlichen Museums, Budapest (NWMB).

Spannweite 39,5—41 mm, Vf.-Länge 18—19 mm. Grundfarbe des Körpers und der Vf. gräulich lehmgelb mit feiner dunkelbraunen Bestäubung.



Tafel I.

1 = *Ammoconia senex mediorhenana* FUCHS (♂, Frankfurt). — 2 = *A. senex senex* GEYER (♂, Bozen). — 3 = *A. senex senex* GEYER (♂, Dalmatia, Gravosa). — 4 = *A. senex wagneri* BOURSIN (Holotypus, ♂, Bulgaria, Slivno). — 5 = *A. senex victoris* ssp. n. (Holotypus, ♂, Akshehir, Sultan-Dagh). — 6 = *A. senex rjabovi* ssp. n. (Holotypus, ♂, Daghestan). — 7 = *A. anonyma* sp. n. (Holotypus, ♂, Armenia, Sevan). — 8 = *A. caecimacula transcaucasica* ssp. n. (Holotypus, ♂, Armenia, Aragats). — 9 = *A. caecimacula caecimacula* DEN. & SCHIFF. (♂, Bulgaria)

Die Querlinien sind vergleichsweise deutlich, Mittelfeld verdunkelt, Nieren- und Ringmakel heller, fein hell umrandet; Keilfleck reduziert. Hf. etwas heller, als der Körper, mit undeutlichem dunkleren Terminalband. Die neue Subspezies ist graziler, kurz- und spitzflügeliger, als die Stammform; auch mehr kontrastreich gefärbt. Auch die Grundfarbe ist bräunlicher und mehr glän-

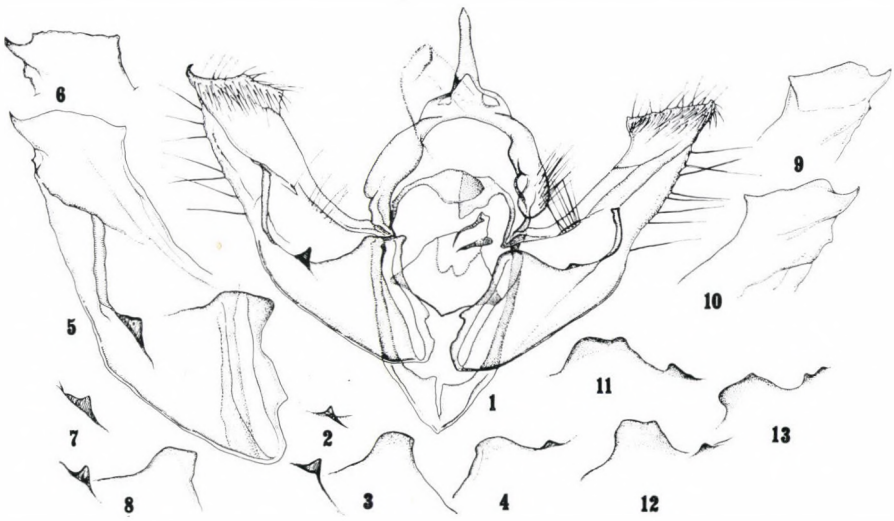


Abb. 1—13. 1—4 = *Ammoconia caecimacula transcaucasica* ssp. n. 1 = Totalbild, Paratypus, GU 1219; 2—3 = linke Clavus und Sacculusfortsatz, Paratypen, GU 1218 und 1193; 4 = rechte Clavus und Sacculusfortsatz, Paratypus, GU 1193. — 5—13 = *A. caecimacula caecimacula* Den. & Schiff. 5 = linke Valve, Bulgaria; 6 = linke Cucullus, München; 7—8 = linke Clavus und Sacculusfortsatz, München; 9—10 = rechte Cucullus, München und Bulgaria; 11—13 = rechte Clavus und Sacculusfortsatz, Bulgaria und München

zend, bei frischen Exemplaren fast bronzig schimmernd. Auffallend ist das Fehlen der schwarzen Schuppen an der Stelle des Keilflecks.

Auch in der männlichen Genitalarmatur lassen sich eine Reihe kleinerer Unterschiede feststellen. Die Valven sind schmäler und mehr dyssymmetrisch, die dreieckförmigen Sacculusfortsätze mehr zugespitzt, der Clavus schmäler und mehr dyssymmetrisch, als bei der Stammform. Auch die distale Aedoeagusspitze ist länger, gleichmäßiger ausgezogen (»hechtkopfförmig«). Die Unterschiede zwischen der neuen Subspezies bzw. der Stammform erreichen fast den Rang einer eigenen Art. Sie wird hier jedoch nicht als neue Art beschrieben, weil sich in den dargestellten Merkmalen auch eine gewisse Variabilität bei *A. caecimacula caecimacula* Den. & Schiff.-Exemplaren von verschiedenen Fundorten beobachten läßt (untersucht: Bayern, Umgb. München; Ungarn; Bulgarien, GU 904, 1217, 1222, 1223, 1224 Ronkay) (Abb. 5—13), bzw. da die neue Subspezies vollkommen allopatrisch verbreitet ist.

Ammoconia anonyma sp. n.

Holotypus: ♂, UdSSR, Armenische SSR, zwischen Sewan und Gagarin, ca 2000 m, 29. IX. 1982, Nr. 235, leg. MERKL et RONKAY (Lichtfang), GU 905 RONKAY; Paratypoide: ♂ mit gleichen Angaben, GU 788 RONKAY; 1 ♀ »Cerepasch, leg. VASSILININ«. Holotypus und ♂-Paratypoid befinden sich in der Samml. des NWMB, ♀-Paratypoid befindet sich in der Samml. des Zoologischen Institutes der Armenischen Akademie der Wissenschaften, Erewan (mit der Zettel: »*Ammoconia* nova sp., RJABOV«). Uns lag noch ein Exemplar der neuen Art mit folgenden Angaben vor: ♂, »Negram na Araxe, Armen.(ia), 13. X. (19)31, leg. RJABOV Abgb. BOURSIN: Rev. fr. Ent. X: 80, pl. II. fig. 8, 1944 avril. Das Exemplar befindet sich in der Sammlung des Naturhistorischen Museums in Wien, mit geklebtem Abdomen. Bei Genitaluntersuchung wurde festgestellt, daß das Tier fälschlicherweise das Abdomen einer *Ecbolemia misella* Pglr. (die auch im selben Gebiet und zu gleicher Zeit vorkommt!) trägt. Deshalb kann dies Exemplar nicht als Paratypoid der neuen Art betrachtet werden.

Spannweite 38—39 mm, Vf.-Länge 17—18 mm. Kopf und Thorax weißlichgrau, mit spärlicher blaugrauen Bestaubung. Fühler schwach gekämmt (♂) bzw. fadenförmig (♀). Vf.-Grundfarbe weißlichgrau, mit spärlicher dunkelgrauen Beschuppung. Basal- und Saumfeld hell, Mittelfeld und Umgb. der Wellenlinie dunkler. Die äußere Querlinie bei den Adern schwärzlich gezackt, sonst alle Zeichnungen undeutlich, doch infolge des Farbenkontrastes gut sichtbar. Nieren- und Ringmakel besonders groß, etwas unregelmäßig geformt; an der Stelle des Keilflecks, befindet sich eine kleinere Gruppe dunkler Schuppen. Wellenlinie dunkel braungrau, die Adern bei der Wellenlinie dunkelgrau beschuppt. Vf.-Fransen stimmen mit der Grundfarbe überein, an der Basis mit undeutlichen dunklen Fleckchen. Hf. weißlich, mit sehr spärlicher dunkleren Beschuppung, an der Fransenbasis mit undeutlichen dunkleren Strichen.

Die neue Art ist kleiner, graziler und mehr spitzflügelig, als *A. senex* GEYER, sonst — besonders in der Grundfarbe und Zeichnung — kommt letzterer recht nahe, macht aber durch die stärkere Farbkontraste doch einen ziemlich fremdartigen Eindruck.

Der Bau der männlichen Genitalien (Abb. 14—16) stimmt in großen Zügen mit jenen der *A. senex* überein, die sind aber in allen Teilen entschieden kleiner. Die Valven sind schmäler und weniger gebogen. Harpe relativ länger und mehr gerade, Clavus dyssymmetrisch, aber kleiner und weniger hervortretend, als bei *A. senex*. Auch die dreieckförmigen Sacculusfortsätze sind kleiner, auf der linken Seite rückgebildet. Aedoeagus relative kurz und plump, stark gebogen. Die einzelnen Subspezies der *A. senex* lassen sich aufgrund der männlichen Genitalien recht gut charakterisieren (s. unten), die Unterschiede der neuen Art stehen aber ca. mit einer Größenordnung höher.

Der Name der neuen Spezies deutet darauf hin, daß sie eigentlich schon früher von RJABOV entdeckt bzw. als neue Art erkannt wurde, blieb aber lange unbenannt. Auch BOURSIN konnte aufgrund des einzigen Männchens in Wien die neue Art nicht beschreiben; er schrieb (l. c.) über eine vermutliche neue Subspezies, die der *A. senex wagneri* BOURSIN recht nahe steht. Deshalb haben wir uns entschlossen, auch jene Formen der *A. senex* eingehender zu

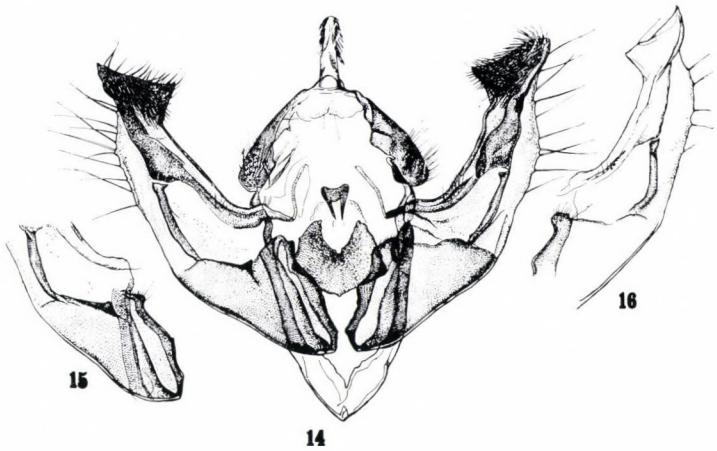


Abb. 14—16. *Ammoconia anonyma* sp. n. 14 = Totalbild, Holotypus, GU 905; 15 = linke Sacculus und Clavus, Paratypus, GU 788; 16 = rechte Valve, Paratypus, GU 788

untersuchen, die früher unter *A. senex wagneri* BOURSIN zusammengefaßt wurden. Es hat sich herausgestellt, daß die frühere *A. senex wagneri* BOURSIN sich in einige gut charakterisierbare Subspezies zerteilen läßt, die nachfolgend beschrieben werden.

Ammoconia senex wagneri BOURSIN, 1935 (Tafel I.: 4) (Redeskription)

Int. Ent. Zschr. Guben, **29:** 4—5 (Mythimna), Taf. Fig. 5
Holotypus: ♂, »Bulgaria, Slivno,* Barmuk, 11. X. 1933, coll. V. BARTHA; Type *O. senex wagneri* BOURSIN« (mit der Handschrift von BARTHA !). Abgb.: Int. Ent. Zschr. Guben, Tafel, Fig. 5. (Samml. NWMB), Paratypoide 2♂♂ ebd. (GU 910 RONKAY), 1 ♂ in der Samml. BOURSIN (Museum Karlsruhe).

Spannweite 43—44 mm, Vf.-Länge 18—19,5 mm. Grundfarbe des Körpers und der Vf. grau, mit rötlichbraunem Schimmer. Mittelfeld durch schwärzlichgraue Beschuppung verdunkelt. Die Makeln sind mit schwärzlichgrauen Schuppen umrandet. Mittelschatten stark ausgeprägt. Auch Hf. verdunkelt, dunkles Subterminalband gut sichtbar, auch auf der Us. Die ♂-Genitalien (Abb. 30) tragen mehrere wichtige Merkmale. Der Clavus ist vergleichsweise schmal und zugespitzt. Die Dyssymmetrie der Sacculusfortsätze stark ausgeprägt. Der Fortsatz auf der rechten Valve ist sehr stark, mit breiter Basis. Die Valven sind kurz und breit, von gedrungener Form; dadurch die Harpen stark gebogen (besonders auf der linken Valve). Diese Merkmale sind nur bei den Tieren aus dem östlichen Bulgarien (O-Flanke der Stara Planina) vorhanden, die allein als richtige *A. senex wagneri* BOURSIN aufgefaßt werden

* Richtig: Sliven.

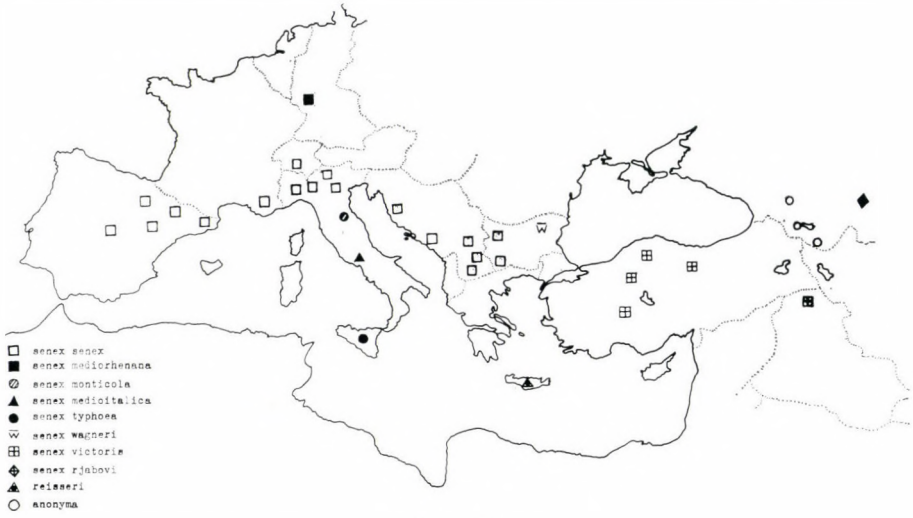
können. Die Exemplare aus der westlichen Balkanhalbinsel können provisorisch der nominotypischen Subspezies zugerechnet werden, während jene aus Kleinasien und Daghestan zu zwei anderen Subspezies gehören, die nachfolgend beschrieben werden.

Bemerkungen zur Verbreitung und Variabilität von *Ammoconia senex senex* GEYER (Karte 1).

Bei der Beschreibung der *A. senex wagneri* BOURSIN lagen BOURSINS freilich hauptsächlich *A. senex senex*-Exemplare aus S-Frankreich (f. *meridionalis* DANNEHL«) vor, die durchschnittlich als recht groß und hell gefarbt gelten. Die Exemplare aus dem S-Alpengebiet, aus Dalmatien, Jugoslawisch-Mazedonien und besonders aus West-Bulgarien sind jedoch kleiner (Spannweite 41—44,5 bzw. 38—41 mm), etwas schmal- und spitzflügeliger, aber mit sehr hellen Hf. praktisch ohne Subterminalband (Tafel I: 2, 3). Die ♂-Genitalien zeigen grundsätzlich für die nominotypische Subspezies charakteristischen Merkmale, mit gewisser individuellen Variabilität (Abb. 17—29), die durch eine Serienuntersuchung erfaßt wurde (GU 852, 853, 1225, 1226, 1227, 1235 RONKAY, 1953 VARGA).

Der Sacculusfortsatz auf der rechten Valve ist schmal und zugespitzt; auf der linken stumpf, höckerförmig, aber nicht vollkommen reduziert, wie es bei der nominotypischen Subspezies in der Regel der Fall ist. Der Aedoeagus ist schlanker und am distalen Teil weniger zugespitzt, als bei den südalpinen Exemplaren.

Die, der nominotypischen Subspezies nahestehenden Populationen sind auf der Balkanhalbinsel ziemlich weit, von Dalmatien durch Jugoslawisch-



Karte 1.

Die Verbreitung der *Ammoconia senex*-Gruppe

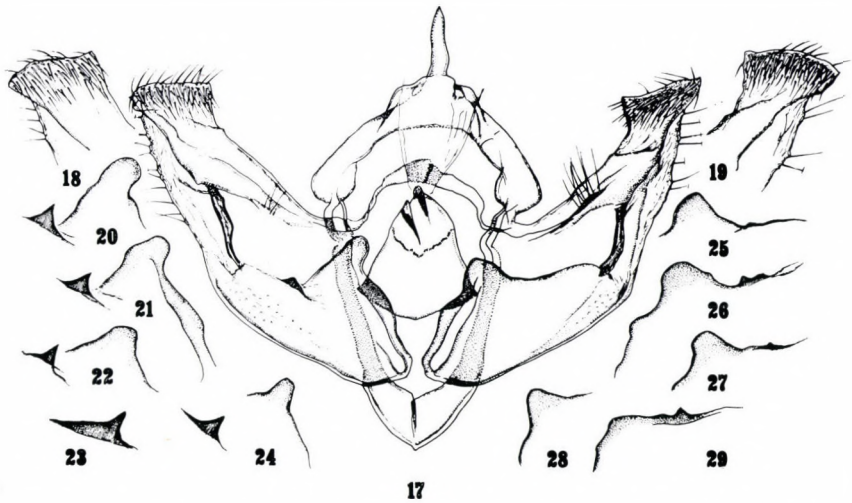


Abb. 17—29. *Ammoconia senex senex* GEYER. 17 = Totalbild, Bozen; 18 = linke Cucullus, Gall. mer.; 19 = rechte Cucullus, Gall. mer.; 20—24 = linke Clavus und Sacculusfortsatz, Gall. mer., Dalmatia, Drenovo, Bulgaria: Kostinbrod und Kresna; 25—29 = rechte Clavus und Sacculusfortsatz, Gall. mer., Dalmatia, Drenovo, Kresna, Kostinbrod

Mazedonien bis ins westliche Bulgarien (Umgb. Sofia: Kostinbrod, Kresna-Schlucht im Struma-Tal, Melnik) verbreitet. Dementsprechend ist auch die äußere Variabilität der Exemplare — sowohl in Größe, als auch in Flügelform — ziemlich breit. Auch die Variationsbreite der Genitalienmerkmale ist mit jener der nominotypischen Subspezies überlappend.

Ammoconia senex victoris ssp. n. (Tafel I: 5)

Holotypus: ♂, »Asia min. c., Anatolia c., Akshehir, Sultan Dagh, 1000 m, X. (19)34, coll. E. PFEIFFER, München« (aus der Samml. V. BARTHA, Samml. NWMB). Paratypoide: 1 ♂ mit gleichen Angaben; 2 ♂♂ Amasia, As. min. coll. V. BARTHA (Samml. NWMB), zahlreiche Exemplare aus Ankara, Kizilcahamam und Akshehir in den Sammlungen des Naturhist. Museums Wien, Zoologische Staatssamml. München und EVA VARTIAN, Wien. GU 793, 851 RONKAY, 2873 VARGA.

Spannweite: 39—41 mm, Vf.-Lange 18—20 mm. Grundfarbe des Körpers und der Vf. hellgrau mit sparlicher dunkelgrauen Bestaubung. Mittelfeld mäßig verdunkelt, mit undeutlichen Zeichnungen. Hf. hell, aber nicht reinweiß, sondern am Rand mit undeutlichem grauen Terminalband.

Die neue Subspezies kommt äußerlich der *A. senex wagneri* BOURSIN zweifellos am nächsten, kann aber durch eine Reihe der Merkmale getrennt werden. Die kleinasiatische Subspezies ist durchschnittlich noch kleiner, spitz- und schmalflügeliger, Mittelfeld und Hf. weniger verdunkelt, Us fast zeichnungslos.

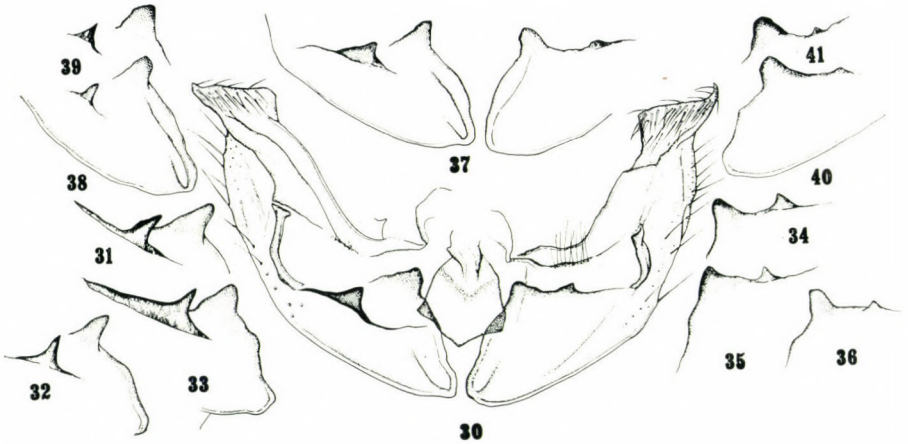


Abb. 30—41. 30 = *Ammoconia senex wagneri* BOURSIN (beide Valven und Fultura inferior, Paratypus). 31—37 = *A. senex victoris* ssp. n. — 31—33 = linke Clavus und Sacculusfortsatz, Paratypen, Ankara, GU 2873, Amasia, GU 851 und 793. 34—36 = rechte Clavus und Sacculusfortsatz, Paratypen, Ankara, GU 2873, Amasia, GU 793 und 851. 37 = beide Clavi und Sacculi, Irak, GU 901. — 38—41 = *A. senex rjabovi* ssp. n. — 38—39 = linke Clavus und Sacculusfortsatz, 38 = Paratypus, GU 2875, 39 = Holotypus, GU 1196; 40—41 = rechte Clavus und Sacculusfortsatz, 40 = Paratypus, GU 2875, 41 = Holotypus

Die wichtigsten subspezifischen Merkmale sind in den ♂-Genitalien vorhanden (Abb. 31—37). Clavus ist sehr lang ausgezogen und zugespitzt. Der Sacculusfortsatz ist auf der rechten Valve sehr groß, zugespitzt, aber auch von breiter Basis; auf der linken Valve kleiner, aber auch hier relativ gut entwickelt. Aedoeagus relativ schlank und lang, stark gekrümmt. Die untere Hälfte der Fultura inferior ist merklich stärker chitinisiert, als der obere Teil (dieses Merkmal ist für die östlichen *senex*-Rassen charakteristisch, aber kommt auch bei *A. anonyma* sp. n. vor). Die Verbreitung dieser östlichen *A. senex*-Subspezies ist noch unklar. Ein Einzelstück aus Irak (Zawita Dohuk, 1—3. XII. 1977, leg. TOPÁL & ZILAHY Samml. NWMB) kommt ihr sehr nahe, und deutet darauf hin, daß ihr Areal jenem der neuen *A. anonyma* südlich gürtelförmig umfaßt. Leider mangels entsprechenden Materials kann z. Z. noch nicht entschieden werden, ob eine Überlappung der Areale irgendwo (z. B. im westlichen oder südlichen Armenien) vorhanden ist oder nicht.

Die neue Subspezies ist dem verdienstvollen Forscher der balkanischen und kleinasiatischen Lepidopterenfauna, VIKTOR v. BARTHA gewidmet.

Ammoconia senex rjabovi ssp. n. (Tafel I: 6)

Holotypus: ♂, »Dagest(an), Dargin(skij) Distr(ikt), Chodzhal-machi, 25. IX. (1)932, coll. RJABOV. Staatssamml. München, ex coll. HÖRHAMMER« (Zoologische Staatssamml. München). GU 1196 RONKAY. Paratypoide: 3 ♂♂, vom selben Fundort, 23.25. IX. 932, in der Sammlung des Naturhistorischen Museums Wien. GU 2875 VARGA.

Spannweite: 44—45 mm, Vf.-Länge: 20,5—22 mm. Grundfarbe des Körpers und der Vf. hellgrau mit leichtem bräunlichen Schimmer. Die dunkle Bestäubung des Vf.-s ist im Mittelfeld und an der Wellenlinie ziemlich stark. Weil das Mittelfeld gleichmäßig verdunkelt ist, ist der Mittelschatten kaum sichtbar. Hf. stark verdunkelt, mit düsterem grauen Subterminalband, der auch der Hf.-Useite gut sichtbar ist.

Diese interessante neue Subspezies kommt zweifellos äußerlich der *A. senex wagneri* BOURSIN am nächsten, ist aber durchschnittlich etwas größer und spitzflügeliger, auch etwas mehr — und in anderer Verteilung — verdunkelt.

Die ♂-Genitalien der neuen Subspezies (Abb. 38—41) sind von der benachbarten *A. senex wagneri* BOURSIN und *victoris* ssp. n. deutlich verschieden. Der Clavus ist wesentlich kleiner, fast symmetrisch. Der Sacculusfortsatz ist beiderseits vorhanden, aber ziemlich klein und stumpf, auf der linken Seite reduziert. Uns liegt Material von dieser Subspezies nur aus Daghestan vor. Sie wird dem hervorragenden Lepidopteren-Forscher, M. A. RJABOV gewidmet.

Ammoconia reisseri sp. n.

Holotypus: ♂, Creta occ. 860 m, Askyphou, 7. X. 69., leg. H. REISSER (Samml. Naturhistorisches Museum, Wien). Paratypoide: ♂♂ vom selben Fundort und Datum, aber auch vom 24. X. 73 (Naturh. Mus. Wien und coll. VARTIAN, Wien). GU 2874 VARGA. 2 ♂♂, Creta mer., 850 m, Pevkos, 7. X. 1961; 1 ♂, Creta mer., 820 m, Pevkos, 11. X. 1966; 3 ♂♂, Creta or., 900 m, Psychro, 10. X. 1961; 1 ♂, 1 ♀ vom selben Fundort, 9. X. 1966; 2 ♂♂, 1 ♀, Creta or., 1000 m, Psychro, 9. X. 1961; 1 ♂, Creta or., 1100 m, Psychro, 8. X. 1966; 2 ♀♀, Creta, 330 m, Genni Gavé, 20. X. 1961 (in Samml. Museum für Naturkunde, Karlsruhe); 3 ♂♂, 1 ♀, Kreta, Vorisia 600 m, 13. X. 1982; 5 ♂♂ 1 ♀, Ost-Kreta, 3 km östl. Pefkos, 17. X. 1982; 3 ♂♂, 1 ♀, Kreta, Ida-Gebirge, 7 km W A;. Vavara; 14. X. 1982 (coll. HACKER); 4 ♂♂, 2 ♀♀, Ost-Kreta, 3 km S Maronia, 16. X. 1982) (coll. HACKER und NWMB); 7 ♂♂, 1 ♀, Kreta, Sisses, lichtfalle, 17., 24. X., 4., 7., 19. XI. 1977, 16., 26. X. 1978, Georginopolis, 13. X. 1972, leg. H. MALICKY (coll. NWMB, VARGA und MALICKY)

Spannweite: 44 mm, Vf.-Länge: 21 mm. Grundfarbe des Körpers und der Vf. bleigrau, die Behaarung auf die Dorsalseite des Kopfes und des Thorax etwas heller. Die Zeichnungen sind undeutlich. Mittelfeld schwärzlich verdunkelt, bei der Wellenlinie unscharfe schwarzgraue Flecken. Auch Hf. verdunkelt. Zellschlußfleck auch oben sichtbar. Subterminallinie grau, aber auch entlang den Hf.-Adern verdunkelt. Das Weibchen größer, dunkler, mehr bleigrau.

Das Tier sieht ungefähr so aus, wie ein mittelgroßes, robustes Exemplar der *A. senex wagneri* BOURSIN, ist aber mehr und gleichmäßiger verdunkelt. Auf den ersten Blick sind die dunklen Flecke an der Wellenlinie bzw. der dunkle Zellschlußfleck die auffallendsten, die von allen Subspezies der *A. senex* abweichen. Aufgrund des Habitus ist aber der enorme Unterschied der ♂♂-Genitalarmatur gar nicht zu ahnen.

Die ♂-Genitalien der neuen Art zeigen alle möglichen Extremen der Genitalstruktur, die überhaupt in der Gattung *Ammoconia* ausgebildet sein

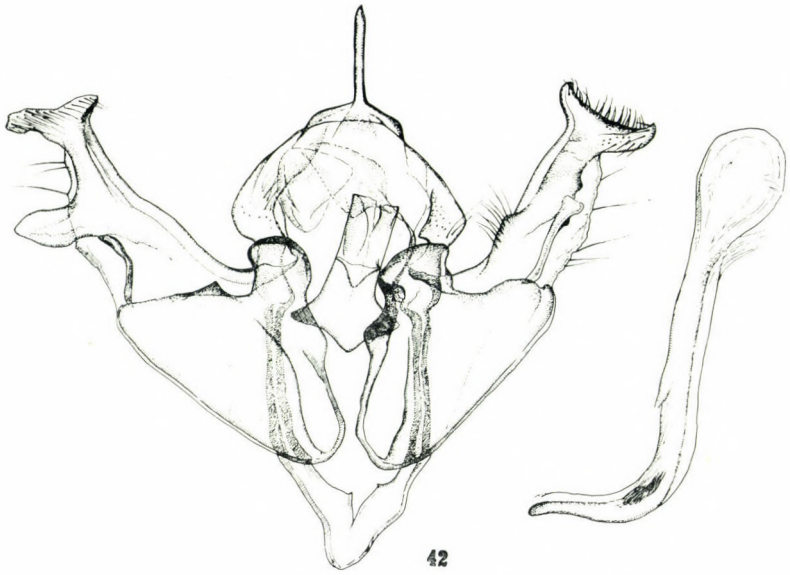


Abb. 42 = *Ammoconia reisseri* sp. n. Totalbild der Kopulationsapparat und Aedoeagus, Paratypus, Kreta, Askyphou, GU 2874

können (Abb. 42). Uncus länger und schmäler, als bei anderen bekannten *Ammoconia*. Clavus ist sehr groß, fast aufgeblasen, leicht dyssymmetrisch. Der Sacculusfortsatz ist nur auf der rechten Valve vorhanden, flach und stumpf. Die Valven sind extrem dyssymmetrisch, auf der rechten mit mächtigem, daumenförmigen Pollex. Auch die Harpen sind dyssymmetrisch, die linke stark und fast gerade, während die rechte schmal und gebogen ist. Der Aedoeagus ist extrem lang, schlank und fast senkrecht gekrümmt.

Die neue Art ist scheinbar ein autochtoner Endemit der Insel Kreta, welche aber auch von der südlichsten Spitze des Peloponnesos bekannt ist. Sie gilt auch als gutes Beispiel, daß sich die Veränderungen des Habitus bzw. der Genitalienmerkmale im Laufe der Artbildung garnicht synchron vollziehen.

Das Vorkommen der neuen Art (verkannt als *A. senex typhoea* Turati) wurde schon von Reisser (1962) veröffentlicht (Kreta c.: Psychro, Genni Gavé).

Die neue Art ist dem hervorragenden Wiener Lepidopterologen, Initiator der lepidopterologischen Erforschung von Kreta, Begründer der Serie Microlepidoptera Palaearctica, Hans Reisser gewidmet.

Als wichtigste Entwicklungstendenz gilt in der Gattung *Ammoconia* eine Dyssymmetrisierung der ursprünglich (plesiomorph) symmetrischen ♂-Genitalstruktur. Dieser Vorgang betrifft vor allem den Basalteil der Valven (Clavus und Sacculusfortsatz), weniger der distalen Teile (Harpe und Cucullus).

Ein asymmetrischer Pollex ist als extreme Erscheinung nur bei einer Art ausgebildet worden.

Durch das Maß der Dyssymmetrisierung können nicht nur die einzelnen Arten, sondern auch die Subspezies der beiden weit verbreiteten, polytypischen Art: *A. caecimacula* DENIS & SCHIFFERMÜLLER und *A. senex* GEYER gekennzeichnet werden. Ein Polymorphismus hinsichtlich der Dyssymmetrie innerhalb einer Subspezies bzw. Population konnte nur bei der sehr weit verbreiteten nominotypischen *senex* GEYER festgestellt werden. Es gibt kleinräumige, isolierte Gebiete, wo die Tendenz der Entstehung von Genitalienunterschiede besonders prägnant ist (*A. anonyma* und *caecimacula transcaucasica*: Armenien, *A. reisseri*: Kreta). Die beide, hier beschriebene neue Arten scheinen streng allopatrisch zu gelten und können als die sich am meisten abgespalteten Extreme der *Ammoconia senex*-Gruppe aufgefaßt werden, während die scheinbar mehr »konservative« *A. caecimacula* DEN. & SCHIFF. im Rahmen einer polytypischen Art geblieben ist.

Danksagung. Wir möchten Frau E. VARTIAN und S. A. VARDIKJAN, sowie den Herren W. DIERL, G. EBERT, H. HACKER, F. KASY, H. MALICKY, V. OGHANESJAN, W. SCHACHT und A. E. TERTERJAN für die Unterstützung unserer Untersuchungen in den Museen bzw. Sammlungen, für die wertvolle Hilfe während unserer Feldarbeit in Armenien bzw. für die Überlassung wertvollen Materials für unsere Untersuchungen verbindlichsten Dank aussprechen.

SCHRIFTTUM

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Acta Zoologica Hungarica 30 (3—4), pp. 493—510 (1984)

DESCRIPTION OF WATSONIUS PAPILLATUS SP. N. AND THE REVISION OF THE SUBFAMILY WATSONIINAE NÄSMARK, 1937 (TREMATODA: PARAMPHISTOMATA)

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(Received 10 November, 1983)

Revaluation of the subfamily Watsoniinae NÄSMARK, 1937 revealed that it comprises four genera: *Watsonius* STILES et GOLDBERGER, 1910; *Homalogaster* POIRIER, 1883; *Gastrodiscoides* PORTER, 1913 and *Skrjabinocladorchis* CHERTKOVA, 1959. The genus *Watsonius* includes five species: *W. watsoni* (CONYNGHAM, 1904) STILES et GOLDBERGER, 1910; *W. noci* (BARROIS, 1908) comb. n.; *W. macaci* KOBAYASHI, 1915; *W. deschiensi* PICK, 1951 and *W. papillatus* sp. n. The other genera of Watsoniinae are monotypic, including *Homalogaster paloniae* POIRIER, 1883; *Gastrodiscoides hominis* (LEWIS & MCCONNELL, 1876) LEIPER, 1913; *Skrjabinocladorchis jubilaricum* CHERTKOVA, 1959. Histomorphology of the muscular organs of the species are characterized and the subfamily, genera and species are redefined.

In examining NÄSMARK's amphistome collection (deposited at the Naturhistoriska Riksmuseet, Stockholm, Sweden) some slides were found labelled as "*Amphistoma papillatum*". Neither host nor locality data of this material were indicated in NÄSMARK's diary, still some information on it could be obtained from NÄSMARK's (1937) monograph. Accordingly, it was supposedly collected by ODHNER during the Swedish Sudan expedition of 1900—1901. NÄSMARK (1937) was of the opinion (p. 565) that this species was probably identical with COBBOLD's (1882) species, *Amphistoma papillatum*, described from Asian elephant.

COBBOLD's species, *Amphistoma papillatum* (now *Pfenderius papillatus*) has its own characteristic feature: the inner surface of the acetabulum is covered with papillae (Fig. 11) as given by COBBOLD (1882) in his paper. It seems to be obvious to me that NÄSMARK was aware of the actual differences existing between COBBOLD's species and "*Amphistoma papillatum*". It is asserted by the usage of the quotationmarks and the diverse types of pharynx and acetabulum (they are similar to the species of *Watsonius* and not to that of *P. papillatus*).

Of the fifteen subfamilies, in which the whole group of amphistomes was comprised (NÄSMARK, 1937), the subfamily Paramphistominae was investigated in full length. Preliminary notes were disclosed and types of muscular organs (pharynx, acetabulum) of certain species of the subfamilies of the rest were described without specific designation. Thus, the species "*Amphistoma*

papillatum" of NÄSMARK (1937) sunk into oblivion in subsequent taxonomic works (SKRJABIN, 1949; YAMAGUTI, 1958, 1971).

It is obvious, at the first sight, that "*Amphistomum papillatum*" of NÄSMARK (1937) differs from that of COBBOLD's (1882), and it belongs to the genus *Watsonius* representing a new species. The intention of this paper is to describe and survey the species of the subfamily Watsoniinae.

Material and methods

Study material of watsonids was obtained from the Naturhistorisches Museums, Vienna (NMV); Naturhistoriska Riksmuseet, Stockholm (NRS); National Parasite Collection, Maryland (NPCM); Muséum National d'Histoire Naturelle, Paris (MNHNP); Université du Droit et de la Santé, Lille (UDSL); Vses. Inst. Gelm. Skrjabina, Moscow (VIGIS); Usts. stat. vet. ustav, Praha (USVUP) and the writer's private (PS) collection.

The terminology used here has been adapted from NÄSMARK (1937), which is generally accepted in amphistome diagnosis. Sections were prepared be the usual methods. Measurements are in mm unless stated otherwise.

Results and discussion

Watsonius papillatus sp. n.

D e s c r i p t i o n. The body is conical, length 6.5—7.0; greatest width 2.0—2.2 before the level of acetabulum (Fig. 1); dorsoventral dimension is 2.0—2.2 (Fig. 2). Anterior extremity covered with papillae (40 μm) in several rows. Pharynx usually terminal 0.3—0.4 in length, *Pseudodiscus*-type (Fig. 3). Pharyngeal bulb 0.25; secondary pharyngeal sacs 0.45 in length.

The oesophagus with a strongly developed oesophageal thickening (0.9 by 0.35) (Fig. 4); caeca lateral, straight, terminating at the level of the acetabulum.

Testes are round or slightly lobed, situated one behind the other in the middle line of the body. Dorsoventral dimension of the anterior testis 0.5—0.52 in diameter; the posterior one 0.62—0.64 in diameter. There is no cirrus pouch. Pars musculosa and pars prostatica moderately developed (Fig. 5).

Ovary slightly oval, dorso-ventral dimension is 0.4—0.45, length 0.3—0.35. Ootype complex containing Mehlis's glands, common vitelline duct and Laurer's canal. Uterine coils found dorsally; at about the level of the anterior testis they run ventrally and reach the genital opening with a thin-walled metraterm. Vitellaria lateral and vitelline follicules are of medium size, commencing at the level of the intestine bifurcation and terminating at the middle of acetabulum. There are a few eggs in the uterus, size: 125—130 by 75—80 μm.

The genital opening is mid-ventral, beyond the bifurcation, *leydeni*-type, without circular and with moderately developed radial musculature. Diameter of genital opening: 0.5 (Fig. 5).

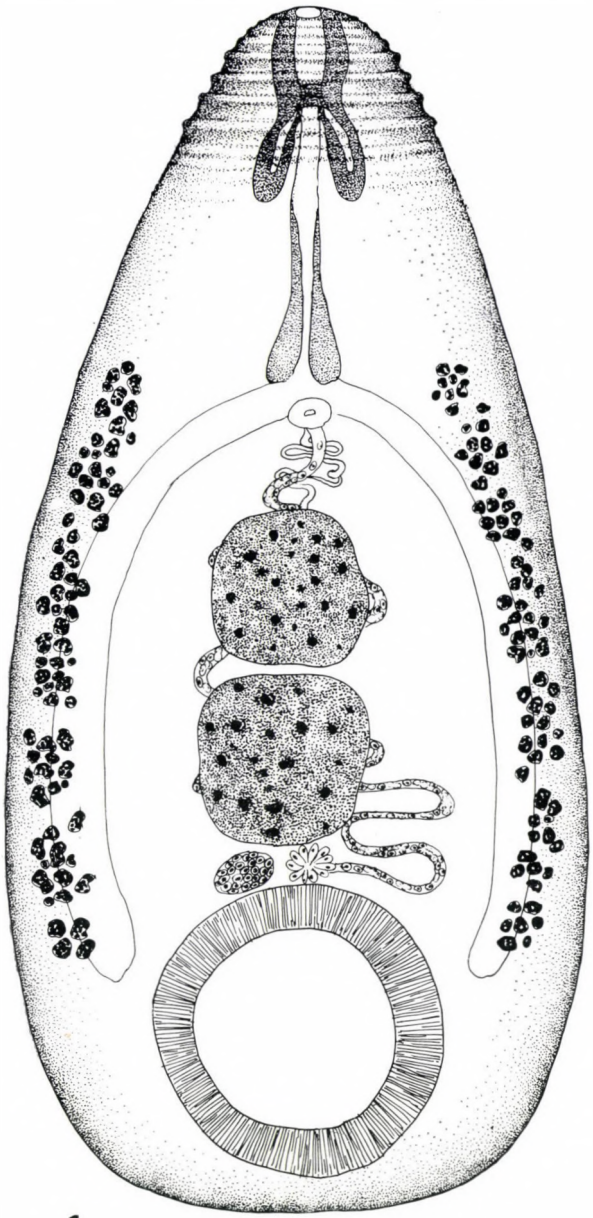

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Fig. 1. *Watsonius papillatus* sp. n., ventral view

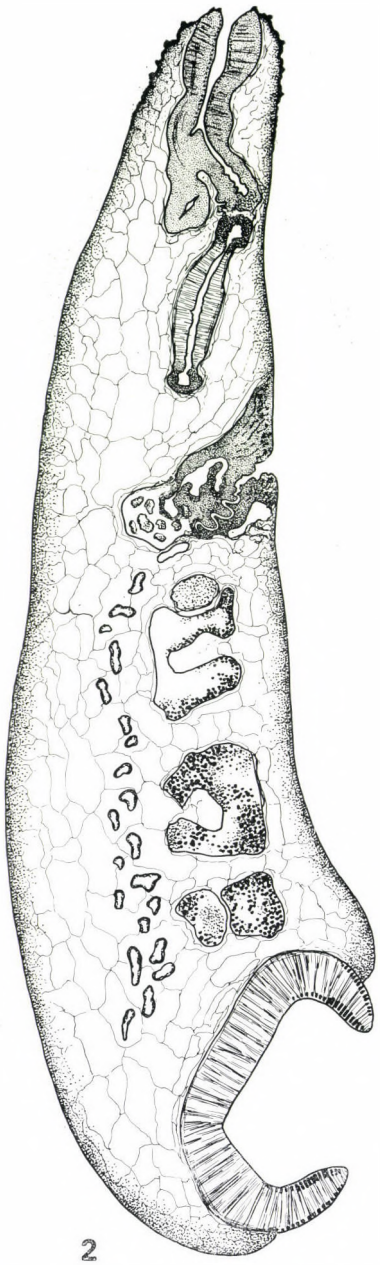
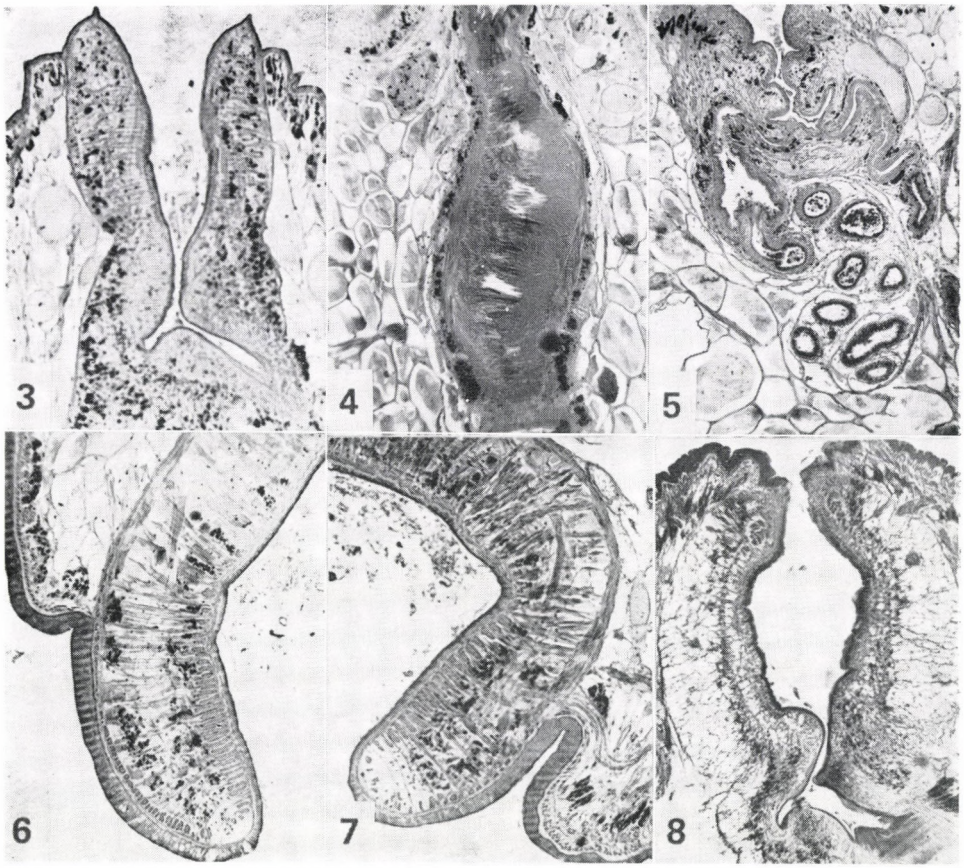


Fig. 2. *Watsonius papillatus* sp. n., median sagittal section



Figs 3—8. Median saggital sections of *Watsonius papillatus* sp. n.: 3 = pharynx, 4 = oesophagus, 5 = genital opening, 6 = acetabulum (dorsal half), 7 = ditto (ventral half), and 8 = pharynx of *W. deschiensi* PICK

Acetabulum ventro-terminal, *Watsonius*-type, circular muscle number in the muscle series are DE: 61—62, DI: 33—35, VE: 21—24, VI: 31—35 (Figs 6—7).

Excretory bladder spherical surrounded by the ovary, acetabulum and body wall. The excretory duct and Laurer's canal do not cross each other; the former one opens at 1.2, the latter 1.6 from the body end.

Host and locality are not precisely known. The specific name refers to the papillae found at the anterior extremity in several rows.

Relationships

The genus *Watsonius*, in the sense of this paper, comprises five species: *Watsonius watsoni* (CONYNGHAM, 1904) STILES & GOLDBERGER, 1910; *W. noci* (BARROIS, 1908) comb. n.; *W. macaci* KOBAYASHI, 1915; *W. deschiensi* PICK, 1951 and *W. papillatus* sp. n.

The newly described species differs from *W. watsoni* in the structure of the pharynx (the former has *Pseudodiscus*-type, the latter *Watsonius*-type) and measurements of the oesophageal bulb (the former one's bigger and the latter one's smaller). W. *papillatus* differs from *W. noci* in the diverse type of the genital opening (*noci*-type) and that of the acetabulum (*Pseudodiscus*-type) referring to the latter species. *W. papillatus* differs from *W. macaci* in length of caeca and the form and lobulation of testes (histomorphology of the muscular organs of the latter species is not yet known). *W. papillatus* differs from *W. deschiensis* in structure of the pharynx (the former has *Pseudodiscus*-, the latter *Gastrodiscus*-type) and of the genital opening (the former has no circular musculature, the latter possesses circular muscle elements) and in the measurements of the oesophageal bulb.

The scope of the subfamily Watsoniinae NÄSMARK, 1937. The following analysis aims to survey the scope of Watsoniinae, in the sense of the present paper, was based on the study of the topography and the structure of the reproductive organ system, histomorphology of the muscular organs of the species included. The notion represented by this paper was compared with the relevant literary data (mainly STILES et GOLDBERGER, 1910; NÄSMARK, 1937; SKRJABIN, 1949; DOLLFUS, 1963; PICK, 1951, 1964; PICK & DESCHIENS, 1947; YAMAGUTI, 1971).

The genus *Watsonius* was erected by STILES & GOLDBERGER, 1910 for the species *Amphistoma watsoni* CONYNGHAM, 1904 found in man in West Africa. Later KOBAYASHI (1915) described *W. macaci* from the Japanese monkey, *Macaca mulatta*. NÄSMARK (1937) raised the genus to subfamily (Watsoniinae) rank and in his "Preliminary Notes", referring to this subfamily, he indicated that it comprised one genus and 5—6 species but without making specific designation. PICK (1951) added the species, *W. deschiensi* recovered from *Mandrillus sphinx*, Guinea.

In examining NÄSMARK's material it was found to embrace three species: *W. watsoni*, *W. deschiensi* and *W. papillatus* sp. n. In the helminthological literature only two other amphistomes (*Amphistoma emarginatum* DIESING, 1839 and *Chiorchis noci* BARROIS, 1908) are known which, on the one hand, their morphology and on the other the final hosts (Primates) can be liable to suspicious to be watsonids (namely, watsonids have the morphological characters of their own and of the amphistomes only watsonids parasitizing Primates).

BARROIS (1908) described *Chiorchis noci* from *Macaca mulatta*, Vietnam. DOLLFUS (1950) tentatively transferred this species to the genus *Watsonius* and in his recent paper (DOLLFUS, 1963), re-examining and re-describing this species he assigned it again to the genus *Chiorchis*, proposing to set up for it the new subgenus, *Prochiorchis*. Histomorphological examinations of the muscular organs of BARROIS's original material revealed that *Chiorchis noci* is

characterized by the pharynx having pharyngeal bulb and secondary pharyngeal sacs, by genital opening having no cirrus pouch (DOLLFUS, 1963 although mentioned the presence of cirrus pouch; our examinations do not confirm it, but identified the pars prostatica), and by *Pseudodiscus*-type of acetabulum. At the same time, the species of *Chiorchis* possesses pharynx with primary pharyngeal sacs, genital opening with strongly developed cirrus pouch and *Cladorchis*-type of acetabulum.

On the basis of the similarity of BARROIS's species to that of *Watsonius* and the discrepancy to that of *Chiorchis*, it is evident that *C. noci* should be transferred to the genus *Watsonius*.

Amphistoma emarginatum was described by DIESING (1839) from *Callithrix noctivaga* on the basis of the material collected by NATTERER in Brazil. DIESING's description is very short and incomplete in the modern sense of amphistome diagnosis. Having examined the single specimen, deposited in the Vienna Museum, it was found that it is an immature form, and neither the structure of the pharynx nor the acetabulum is similar to that characteristic for watsonids. They are much more similar to the structure of muscular organs of amphistomes parasitizing reptiles. In spite of the primate host it should be placed in the genus to be classified further on.

Histomorphological examinations carried out on the genital openings of the available species of Watsoniinae have also revealed the lack of cirrus pouch contrary to NÄSMARK's (1937) opinion (p. 438, 548). This finding provided an opportunity for the revaluation of the scope of the subfamily Watsoniinae.

The guiding principle of the writer's idea is the generally accepted concept that the reproductive organ is one of the most conservative systems as the programme of the propagation, which is, among others, the prerequisite of the existence of a given species, requires a definitive structure of its own. Thus, it is subject to variability to a lesser degree than that of somatic ones and reflects phylogenetic relationship more reliably than the others do.

When we bear in mind the phylogenetic importance of the structure of the reproductive organ system to the morphological and habitual traits, with the knowledge of the structure of the genital openings of species, not known up to now in this context, it appears to be evident for the writer that the genera *Homalogater* POIRIER, 1883; *Gastrodiscoides* LEIPER, 1913 and *Skrjabinocladorchis* CHERTKOVA, 1959 should be included into the subfamily Watsoniinae (previously the genus *Homalogaster* was assigned to Gastrodiscidae (SKRJABIN, 1949), or Gastrodiscinae (NÄSMARK, 1937; YAMAGUTI, 1971); the genus *Gastrodiscoides* to Gastrodiscidae (SKRJABIN, 1949), or Gastrodiscinae (NÄSMARK, 1937; YAMAGUTI, 1971), and the genus *Skrjabinocladorchis* to Cladorchiinae (CHERTKOVA, 1959), or Skrjabinocladorchiinae (YAMAGUTI, 1971).

In characterizing the structure of the pharynx and the genital opening

of *Skrjabinocladorchis jubilaricum* CHERTKOVA (1959) the author did not follow NÄSMARK's (1937) nomenclature, and thus, both these organs were incompletely described. Instead of her complicated and misleading description of the pharynx it is much more profitable to say that it has a *Pseudodiscus*-type of pharynx (sensu NÄSMARK, 1937). The genital opening was also erroneously declared as having genital sucker. YAMAGUTI (1971) based the raising of this genus to subfamily rank (Skrjabinocladorchiinae) on CHERTKOVA's observations. If we disregard the misinterpretation of the structure of the muscular organs, then there is no sound basis for erecting a new subfamily, hence Skrjabinocladorchiinae should be regarded to be a synonym of Watsoniinae.

The above-cited authors (SKRJABIN, 1949; YAMAGUTI, 1971) (at the designation of the taxonomic position of these genera now allocated to Watsoniinae) have attributed much more importance to the gross-morphology than to the similarity in their reproductive organ system. The habitus of the species of the three genera (*Homalogaster*, *Gastrodiscoides* and *Skrjabinocladorchis*) is highly similar (flattened) to one another but this habitual congruence is rather the consequence of convergence than that of phylogenetic relationship. The habitat of the species of these genera is the posterior third of the alimentary tract of their definitive hosts (tropical African and Asian Primates, suids and ruminants) occupying very similar niches.

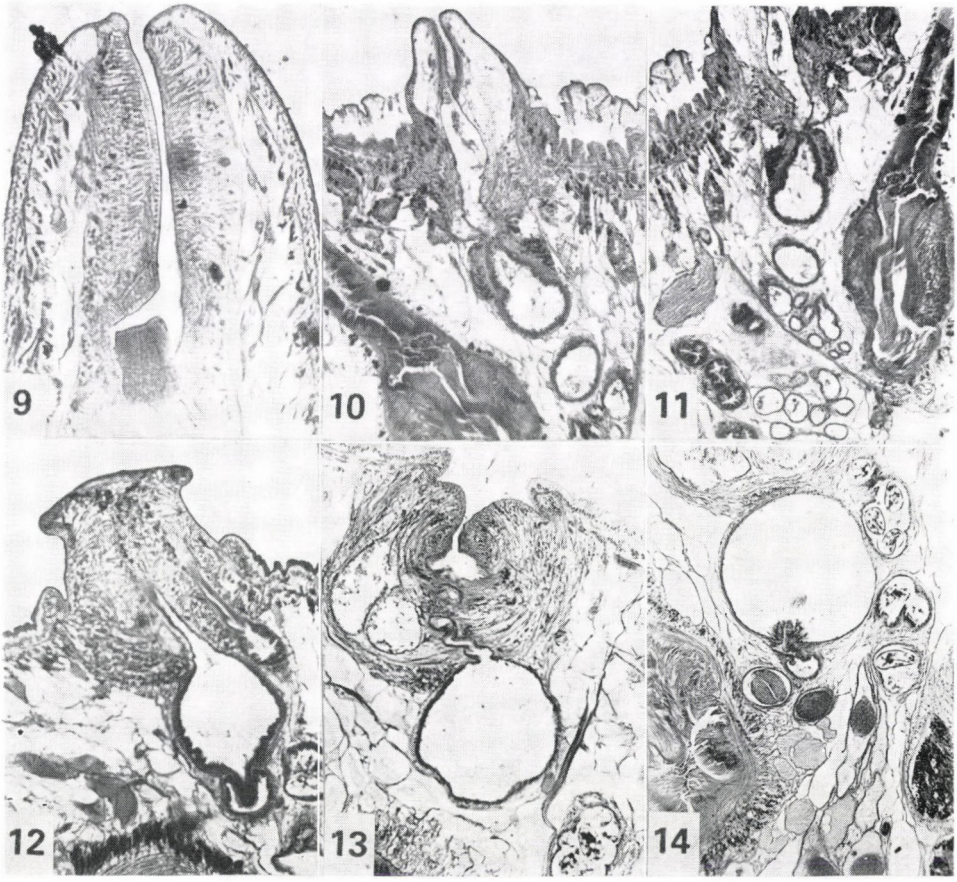
Representatives of the four genera, now included into the subfamily Watsoniinae agree in the topography of testes (tandem in position); structure of genital opening (without cirrus pouch); of pharynx (with pharyngeal bulb and secondary pharyngeal sacs) and of acetabulum (highly similar types).

Besides the importance of the structure of the muscular organs, special attention was paid to their construction in the course of this study; the results are briefly summarized below.

Histomorphology of the muscular organs

On the species, now assigned to the subfamily Watsoniinae, information was published on the structure of their muscular organs by NÄSMARK (1937) under the names *Watsonius* sp. Nos I, II, III, IV and *Amphistomum papillatum* which are now identical with the species: *W. watsoni*, *W. deschiensi* and *W. papillatus* sp. n. Types of pharynxes and acetabulum were described without typifying the genital openings.

In re-examining NÄSMARK's slides and those of the other species, now assigned to Watsoniinae (excepting *W. macaci* of which a whole mount was available) the following types of pharynxes [*Watsonius* — valid for *W. watsoni*, *G. hominis*; *Homalogaster* — valid for *H. paloniae*; *Pseudodiscus* — valid for *W. papillatus*, *S. jubilaricum*; *Gastrodiscus* — valid for *W. deschiensi* (Fig. 8), *W. noci* (Fig. 9)]; genital openings [*leydeni* — valid for *W. watsoni* (Figs 10—11), *W. papillatus*; *deschiensi* — valid for *W. deschiensi* (Figs 12—14);



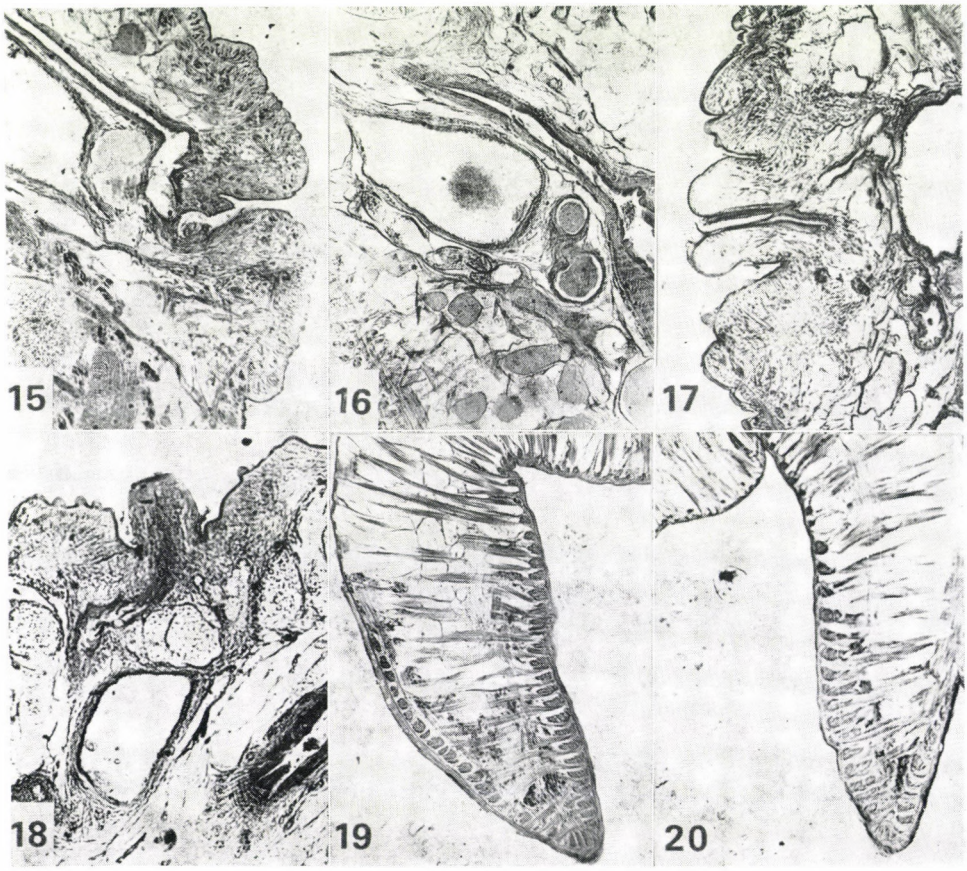
Figs 9—14. Median sagittal sections of species of Watsoniinae: 9 = pharynx of *W. noci* (BARROIS), 10 = genital opening of *W. watsoni* (CONYNGHAM), 11 = region of male reproductive end-part of *W. watsoni* (CONYNGHAM), 12 = genital opening of *W. deschiensi* PICK, 13 = genital opening ditto, and 14 = ditto, region of reproductive end-part

noci — valid for *W. noci* (Figs 15—16); *Parvipapillatum* — valid for *G. hominis* (Figs 17—18); *Homalogaster* — valid for *H. paloniae* (Fig. 23)] and acetabulum [*Watsonius*;— valid for *W. watsoni*, *W. papillatus*, *W. deschiensi* (Figs 19—20); *Pseudodiscus* — valid for *W. noci*; *Homalogaster* — valid for *H. paloniae*; *Gastrodiscoides* — valid for *G. hominis*] have been demonstrated. WILLMOTT & PESTER (1961) examining the structure of the male duct, among others, of *Homalogaster paloniae* and *Gastrodiscoides* hominis stated that these species have no true pars prostatica (due to the lack of prostatic cells). Hence they are of the opinion that the name "pars prostatica" does not seem applicable and they proposed instead "ciliated chamber". Our observations coincide with their findings not only in the said species (Figs 18, 24) but also in *W. noci*

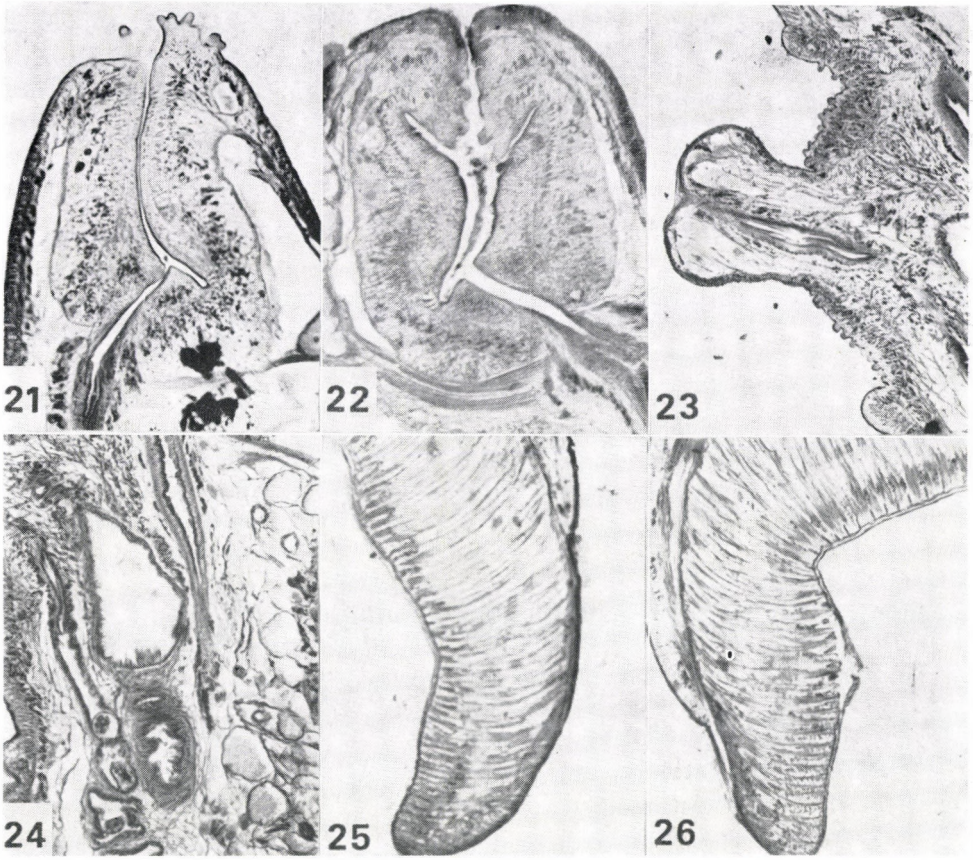
and *W. deschiensi* (Figs 14, 16). In *W. watsoni* and *W. papillatus*, however, have more or less developed prostatic cells (Figs 5, 11).

Of the above-mentioned types of muscular organs, some proved to be new which are characterized briefly, and in case of the earlier described ones, the reader is referred to NÄSMARK's (1937) monograph.

Homalogaster-type of pharynx (Figs 21—22). Pharyngeal bulb and secondary pharyngeal sacs are present. Middle circular layer moderately developed, anterior muscle units are the biggest, loosely lacked without forming an anterior sphincter. Inner circular layer poorly developed. There are some big papillae around the mouth opening. This type is similar to that of *Pseudodiscus* (NÄSMARK, 1937) and *Hawkesius* (SEY, 1984) but differs from them by having papillae around the mouth opening.



Figs 15—20. 15 = Genital opening of *Watsonius noci* (BARROIS), 16 = ditto, region of reproductive end-part, 17 = genital opening of *Gastrodiscoides hominis* (LEWIS et MCCONNELL), 18 = ditto, region of reproductive end-part, 19 = acetabulum (dorsal half) of *Watsonius deschiensi* PICK, and 20 = ditto, acetabulum (ventral half)



Figs 21—26. 21 = Pharynx of *Homalogaster paloniae* POIRIER, 22 = ditto, 23 = ditto, genital opening, 24 = ditto, region of reproductive end-part, 25 = ditto, acetabulum (dorsal half), and 26 = ditto, acetabulum (ventral half)

Homalogaster-type of genital opening (Figs 23 - 24). Cirrus pouch absent, genital papilla present, protruded, voluminous and stout. Tegumental papillae are found along the genital fold. There is a genital atrium and no circular musculature. This type stands nearest to that of *Parvipapillatum* (EDUARDO, 1982) and *noci* (present description) but differs from the *Parvipapillatum*-type by the bigger genital papilla and from the *noci*-type by the bigger genital papilla and the presence of the genital atrium.

Noci-type of genital opening (Figs 15 –16). Cirrus pouch absent, genital papilla present, small, retracted. Tegumental papillae arranged along the protruded genital fold. There is neither genital atrium nor circular musculature. Radial musculature is also absent. This type stands nearest to the *Parvipapillatum*-type but differs from it in having a big, protruded genital fold.

Deschiensi-type of genital opening (Figs 12 - 14). Cirrus pouch absent, genital papilla present, protruded or retracted, stout. Circular musculature

present, its units along the external margin of the genital papilla. Tegumental papillae absent. Of the types of genital openings furnished with genital papillae and sphincter papillae (*Ichikawai*, *Liorchis*, *Minutum*, *Wagandi*; NÄSMARK, 1937), the *deschiensi*-type emerges by the presence of the voluminous genital papilla and the arrangement of the circular muscle units. These latter two features distinguish it from the other types of the genital openings cited above indicating its closest similarity to this type.

Homalogaster-type of acetabulum (Figs 25—26). This type belongs to Group III (NÄSMARK, 1937). It is characterized by a weak longitudinal muscle layer placed along the marginal part of the acetabulum. Units of the circular muscle layers are as follows: DE: 30—32; DI: 32—34, VE: 14—16, VI: 39—40. Diameter is 2.0—2.2; thickness 9.36—0.42. Radial muscle fibres well developed.

Revaluation of the taxa

The systematics of the subfamily Watsoniinae, proposed in the present review, differs considerably from that of NÄSMARK's (1937), and, due to the discovery of the structure of the muscular organs of the species included, it is felt necessary to amend the characters of the subfamily and genera concerned.

D i a g n o s i s of Watsoniinae NÄSMARK, 1937.

Syn.: Skarjabinocladorchiinae YAMAGUTI, 1971

Paramphistomatoidea, Zygocotylidae. Body of different form: pyriform, oval, more or less flattened ventrally or divided into anterior conical and posterior discoidal or spherical portions. Ventral surface with or without numerous papillae. Pharynx with pharyngeal bulb and secondary pharyngeal sacs of different types, with differently developed circular muscle layers. Oesophagus moderately long with differently developed oesophageal bulb. Caeca straight, terminating at level of acetabulum or more anteriorly. Testes lobed or indented, tandem or oblique in middle third of body. Cirrus pouch absent. Genital opening at bifurcation, without sucker, different types, papillated or without papillae. Ovary posttesticular, intercaecal, near to acetabulum. Pars prostatica either with prostatic cells or ciliated chamber. Pars musculosa weakly developed. Laurer's canal opening anterior to excretory pore. Vitellaria extending in lateral fields from bifurcal zone to acetabulum or from level of anterior or posterior testis to acetabulum. Excretory pore posterior to vesicle. Acetabulum well or moderately developed, different types, terminal or subterminal. Intestinal parasites of mammals.

Key to genera of Watsoniinae

Body flattened, uniform or divided into two portions 2

— Body pyriform, flattened ventrally, convex dorsally not divided into two portions, lateral margins bent inwards ..... **Watsonius**

2. Body divided into two portions, anterior conical and posterior discoidal ..... **Gastrodiscoides**
— Body divided into two portions, anterior large and flat, ventrally papillated; posterior small and spherical ..... **Homalogaster**
— Body oval, not divided into two portions ..... **Skrjabinocladorchis**

Diagnosis of *Watsonius* STILES & GOLDBERGER, 1910. Zygocotylidae, Watsoniinae. Body pyriform, flattened ventrally, convex dorsally, lateral margins of body tending inwards. Pharynx with pharyngeal bulb and secondary pharyngeal sacs, of different types. Oesophagus moderately long with bulbus. Caeca straight, terminating at level of acetabulum or more anteriorly. Testes slightly or strongly lobed, tandem, intercaecal, in the middle of body. Seminal vesicle tubular, convoluted. Cirrus pouch absent. Genital opening at level of bifurcation, different types with or without circular musculature. Ovary preacetabular, submedian, pars prostatica with prostatic cells or ciliated chamber. Laurer's canal opening anterior to excretory pore. Uterus intercaecal, winding posterior and dorsal to testes. Vitellaria extending lateral to caeca from bifurcal zone to acetabulum. Excretory pore posterior to vesicle. Acetabulum ventral or ventroterminal, different types. Parasitic in intestine of primates.

Type species: *Watsonius watsoni* (CONYNGHAM, 1904), STILES & GOLDBERGER, 1910

Key to the species of Watsonius

1. Testes slightly lobed 2
— Testes strongly lobed, divided into 4—5 lobuli ..... **W. macaci**

2. Pharynx of *Watsonius*-type ..... **W. watsoni**
— Pharynx of *Pseudodiscus*-type ..... **W. papillatus**
— Pharynx of *Gastrodiscus*-type, genital opening of *noci*-type ..... **W. noci**
— Pharynx of *Gastrodiscus*-type, genital opening of *deschiensi*-type ..... **W. deschiensi**

Watsonius watsoni (CONYNGHAM, 1904) (Figs 10—11)

Syns: *Amphistoma watsoni* CONYNGHAM, 1904; *Cladorchis watsoni* SHIPLEY, 1905; *Gastrodiscus watsoni* VERDUN, 1905; *Paramphistomum watsoni* MANSON, 1908; *Pseudodiscus watsoni* FUKUI, 1929.
Type specimens: Not available for examination
Specimens examined: MNHNP (5 specimens), NRS (2 specimens)
Hosts: *Cercopithecus callitrichus*, *C. sabaeus*, *Homo sapiens*, *Macaca irus*, *Mandrillus sphinx*, *Papio papio*
Localities: Africa (West and East), Asia (Japan)

Diagnosis. Length 8—10, breadth 4—5. Length of pharynx with pharyngeal bulb and secondary pharyngeal sacs 1.2—1.5. Pharynx of *Watsonius*-, genital opening of *leydeni*-, acetabulum of *Watsonius*-type (DE: 38—40, DI: 36—38, VE: 16—18, VI: 34—36). Oesophagus 1.1, caeca terminating at level of acetabular zone. Testes slightly lobed, 1.2—1.5 by 0.8—0.9, situated tandem, intercaecal in the middle third of body. There is true pars prostatica

0.15 in length, pars musculosa weak with several convolutions. Ovary 0.2 in diameter. Vitellaria: in lateral fields from intestinal bifurcation to acetabular zone. Size of eggs: 120—130 by 75—80 μm.

Watsonius noci (BARROIS, 1908) comb. n. (Figs 9, 15—16)

Syns: *Chiorchis noci* BARROIS, 1908; *C.* (*Prochiorchis*) *noci* (BARROIS, 1908) DOLLFUS, 1963.
Type specimens: Not available for examination
Specimens examined: PC (5 paratypes)
Host: *Macaca mulatta*
Localities: Asia (Vietnam, Cambodia)

D i a g n o s i s. Length 8—10, breadth 3.5—5. Length of pharynx with pharyngeal bulb and secondary pharyngeal sacs 1.1—1.3. Pharynx of *Gastrodiscus*-, genital opening of *noci*-, acetabulum of *Pseudodiscus*-type (DE: 40—42, DI: 20—22, VE: 12—15, VI: 26—28). Oesophagus 1.2—1.4 in length, caeca short, terminating at level of posterior margin of posterior testis. Testes slightly lobed, tandem 1.1 by 0.9. There is no true pars prostatica, 0.43—0.45 in length, pars musculosa weak with some windings. Dimensions of ovary 0.55 by 0.3. Vitellaria: in lateral regions from prebifurcal region to acetabular zone. Size of eggs: 130—140 by 57—70 μm.

Watsonius macaci KOBAYASHI, 1915

Type specimens: Not available for examination
Specimen examined: USVUP (1 specimen, whole mount)
Host: *Macaca mulatta*
Locality: Asia (Japan)

D i a g n o s i s. Length 8—11.3, width 5—6.5. Length of pharynx together with pharyngeal bulb and secondary pharyngeal sacs 1.1—1.4. Oesophagus 1.6, caeca terminating at level of posterior margin of posterior testis. Testes strongly lobed, divided into 4—5 lobuli, intercaecal, in the middle third of body. Vitellaria: in lateral regions from intestinal bifurcation to level of ovary. Size of eggs: 120 by 60 μm.

Watsonius deschiensi PICK, 1951 (Figs 8, 12—14, 19—20)

Type specimens: Not available for examination
Specimens examined: MNHNP (6 wet specimens and 1 slide)
Hosts: *Mandrillus sphinx*, *Papio papio*
Locality: Africa (Guinea)

D i a g n o s i s. Length 5—8, breadth 2—4. Length of pharynx with pharyngeal bulb and secondary pharyngeal sacs 0.8—1.0; pharynx of *Gastrodiscus*-, genital opening of *deschiensi*-, acetabulum of *Watsonius*-type (DE:

30—32, DI: 37—39, VE: 11—13, VI: 31—33). Oesophagus 0.7—1.0 in length; caeca terminating at anterior margin of acetabulum. Testes slightly lobed, 0.6—0.9 by 0.9—1.0 in diameter, tandem, intercaecal, in the middle third of body. Dimensions of ovary 0.3 by 0.4. There is no true pars prostatica, 0.3 in length; pars musculosa short with some convolutions. Vitellaria: in lateral regions from bifurcation to acetabular zone. Size of eggs: 110—130 by 60—70 μm.

Remarks. DESCHIENS (1940), PICK & DESCHIENS (1947) and PICK (1951, 1964) published several case studies where pathological process was caused by watsonids in cercopithecid monkeys (*Mandrillus* = *Papio*) *sphinx* and *Papio papio*. Two species were mentioned in their papers and *W. watsoni* was mainly incriminated with those pathological effects. Description of the other species, *W. deschiensi* PICK, 1951 was seemingly based on the material found in the same monkey (*Mandrillus sphinx*) in which *W. watsoni* was also recovered (PICK & DESCHIENS, 1974; PICK, 1964).

W. deschiensi was incompletely described (PICK, 1951) without presenting either morphological details or the structure of the muscular organs or giving a figure. The diagnosis of this species, presented above, was seemingly based on DESCHIENS's and PICK's material and the principal features of its own have been revealed. In comparing the traits of *W. deschiensi* with those of the species (*W. watsoni*) mentioned and figured in the paper of PICK & DESCHIENS's (1947) and PICK's (1964) it was shown that these authors had worked with *W. deschiensi*, and not with *W. watsoni* as it was indicated by them.

Homalogaster, *Gastrodiscoides* and *Skrjabinocladorchis* are monotypic genera, their characterization coincides with that of the species they include.

Homalogaster POIRIER, 1883

Diagnosis. Zygocotylidae, Watsoniinae. Body divided into a large flat, ventrally papillated, anterior and a smaller, spherical or subcylindrical, posterior portions; 7.5—16.0 in length and 5—7 in width. Pharynx with pharyngeal bulb and secondary pharyngeal sacs, 1.1—1.4 in length, of *Homalogaster*-type. Oesophagus moderately long (1.6—1.8) with muscular bulb; caeca somewhat sinuous, terminating at acetabular zone. Testes large, lobed, tandem (0.7—0.9 by 1.2—1.4), occupying anterior intercaecal field. Cirrus pouch absent. Genital opening prebifurcal, of *Homalogaster*-type. Ovary between two caecal ends, 0.35—0.40 in diameter, near to acetabulum. Uterus winding in intercaecal field, posterior and dorsal to testes. There is no true pars prostatica (0.4—0.6 in length), pars musculosa straight 0.45—0.48 in length. Size of eggs: 120—130 by 60—80 μm. Vitellaria extending lateral to caeca from level of intestinal bifurcation to ovary zone. Laurer's canal opening anterior to excretory pore at level of ovary. Excretory vesicle dorsal to acetabulum, pore

postvesicular. Acetabulum ventroterminal, large, of *Homalogaster*-type (DE: 30—32, DI: 30—32, VE: 15—16, VI: 37—39). Parasitic in intestine, rarely in bile duct of ruminants.

Type and single species: *Homalogaster paloniae* POIRIER, 1883 (Figs 21—26)

Gastrodiscoides LEIPER, 1913

Syns: *H. poirieri* GIARD & BILLET, 1892; *H. philippiensis* STILES & GOLDBERGER, 1910; *H. taiwana* SUGIMOTO, 1914.
Type specimens: Not available for examination
Specimens examined: NPCM (2 specimens), PC (6 specimens)
Hosts: *Antilope cervicapra*, *Bos gaurus frontalis*, *B. primigenius taurus*, *Bubalus arnae bubalis*, *Capra aegargus hircus*, *Cervus unicolor*, *Kobus leche*, *Muntiacus muntjak*, *Ovis ammon aries*.
Localities: Asia (Burma, Cambodia, China, India, Indonesia, Japan, Malaysia, Pakistan, Philippines, Vietnam), Africa (locality not given)

D i a g n o s i s. Zygocotylidae, Watsoniinae. Anterior part of body conical, posterior portion discoidal, excavated ventrally; 8—14 in length and 5—8 width. Length of pharynx with pharyngeal bulb and secondary pharyngeal sacs 1.2—1.5, of *Watsonius*-type. Oesophagus 0.45—0.49 in length, with muscular bulb; caeca straight, terminating at acetabular zone. Testes large, lobed, tandem or oblique in the middle third of body (1.2—1.4 by 1.8—2.0; 2.3—2.5 by 3.0—3.2). Cirrus pouch absent. Genital opening prebifurcal, of *Parvipapillatum*-type. Ovary posttesticular, intercaecal, near centre of posterior portion, 0.43—0.46 in length. There is no true pars prostatica, 0.25—0.29 in length; pars musculosa very weakly developed. Size of eggs: 140—150 by 68—74 μm. Laurer's canal opening anterior to excretory pore. Uterus intercaecal, dorsal to testes. Vitella-ria extending in lateral fields of posterior portion from level of anterior or posterior testis to acetabular zone. Excretory vesicle anterior to acetabulum, pore at anterior margin of acetabulum. Acetabulum comparatively small, sub-terminal, of *Gastrodiscoides*-type (DE: 10—27, DI: 25—29, VE: 12—14, VI: 24—26). Parasitic in mammals.

Type and single species: *Gastrodiscoides hominis* (LEWIS & MCCONNAL, 1876) LEIPER, 1913 (Figs 17—18)

Syn.: *G. hominis* var. *suis* VARMA, 1954
Type specimens: Not available for examination
Specimens examined: PC (numerous specimens from monkey, pig, India)
Hosts: *Homo sapiens*, *Macaca irus*, *M. fascicularis*, *M. mulatta*, *Myocastor coypus*, *Ondatra zibethica*, *Rattus rattus*, *Sus crofa domestica*, *Tragulus napu*
Localities: Asia (Burma, Cambodia, India, Indonesia, Malaysia, Philippines, Thailand, Vietnam), Soviet Union (Volga estuary, Georgia, Moldavia)

R e m a r k s. VARMA (1954), comparing specimens deriving from human and swine *G. hominis*, found certain differences (size and disposition of testes

and general dimensions) between the two stocks and proposed to regard the form from swine to be a new variety: *G. hominis* var. *suis*. Examining both whole mounts and sections of *G. hominis*, collacted from pig in India, it was found that the morphological and topographical variability listed by VARMA (1954) occurred simultaneausly. Hence, the present writer considers this variety as a synonym of *G. hominis*.

Skrjabinocladorchis CHERTKOVA, 1959

D i a g n o s i s. Zygocotylidae, Watsoniinae. Body oval, dorsoventrally flattened, 8.2—9.4 in length and 4.9—6.5 in width. Pharynx with pharyngeal bulb and secondary pharyngeal sacs, 1.4—1.6 in length, of *Pseudodiscus*-type. Oesophagus short, 0.9—1.7 in length, with muscular bulb. Caeca wide, straight, terminating at acetabular zone. Testes lobed, 1.3—1.4 by 0.9—1.1 and 1.1—1.3 by 0.8—1.1, contiguously diagonal, in midregion of body. Cirrus pouch absent. Genital opening at intestinal bifurcation. Ovary small, 0.3—0.4 by 0.2—0.4 in diameter, almost median, between posterior testis and acetabulum. Vitellaria extending in lateral fields, from bifurcation to midlevel of acetabulum. Uterus in median field, dorsal to testes, size of eggs: 160—200 by 60—70 μm. Acetabulum large, ventroterminal. Parasitic in intestine of chimpanzee.

Type and single species: *Skrjabinocladorchis jubilaricim* (sic !) CHERTKOVA, 1959

Type specimens: VIGIS (holotype, whole mount; 2 paratypes)
Host: *Pan troglodytes*
Locality: Not known (Moscow Zoo)

R e m a r k s. Two wet specimens of this species were available for examination. They were, however, in poor condition and thus, it was possible to determine only the structure of the pharynx. Furthermore, it could also detected that the genital opening has no genital sucker.

Acknowledgements. The author wishes to express his gratitute to J.-L. ALBARET, Muséum National d'Histoire Naturelle, Paris; A. N. CHERTKOVA and I. V. VELICHKO, VIGIS, Moscow; S. DEBLOCK, Université du Droit et de la Santé, Lille; E. KRITSCHER, Naturhistorisches Museum, Vienna; J. R. LICHTENFELS, National Parasite Collection, Maryland; R. OLERÖD, Naturhistoriska Riksmuseet, Stockholm and D. ZAJICEK, Ustredni státni veterinárni ustav, Praha for making amphistome material available for examination.

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Acta Zoologica Hungarica 30 (3—4), pp. 511—521 (1984)

A REVISION OF THE INDO-AUSTRALIAN SPECIES OF THE GENUS AUCHENOMUS KARSCH, 1886 (DERMAPTERA : LABIIDAE)

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(Received 10 October, 1983)

The description of the known Indo-Australian species on the basis of external morphology, their systematic revision and the description of the male genital apparatus are given along with four new species: *Auchenomus bifurcus*, *A. rapidus*, *A. heros*, and *A. proprius* ssp. n.

The *Auchenomus* species separated by KARSCH are ranged in the subfamily Sparattinae. The species within this subfamily are especially characterized by their strongly flattened body. All species of the subfamily are distributed in the Neotropic Region, excepting the species of *Auchenomus* inhabiting mainly the Oriental Region and a small portion the Indo-Australian Region, while a single species is restricted to Malagasy. The elongated pronotum with a pair of long spines on its antero-lateral corner is the common feature of the species of this genus. This feature is so characteristic to this genus and deviating from all other Dermaptera that is would best be treated as a subfamily.

Auchenomus KARSCH, 1886

Berl. ent. Z., **30:** 89.

Very long, strongly depressed, narrow earwigs. General colour yellowish brown or yellowish red. Head flattened, postfrontal and coronal sutures well marked. Eyes comparatively small, shorter than length of head behind eyes. Antennae multisegmented. Pronotum characteristic, either longer or shorter; antero-lateral corner or angles with a pair of long piliform spines. Tegmina and wings well developed. Abdomen long, flattened, ultimate tergite broad, with or without a median longitudinal sulcus. Pygidium present or hidden. Male forceps various, symmetrical, female forceps contiguous, tapering. Male genitalia with well-developed external parameres; virga within genital lobe with basal sclerotised section.

D i s t r i b u t i o n : Malagasy, Oriental and Indo-Australian Regions.

Identification key to the Indo-Australian species

1 (2) Pygidium large, broad, and bifurcated, strongly flattened; posterior margin with two specific tubercles (Fig. 1). Male genitalia with comparatively large external parameres; virga within genital lobe with characteristic basal section, as in Fig. 2. Australian species **bifurcus** sp. n.

2 (1) Pygidium smaller or hidden. Not Australian species.

3 (10) Posterior margin of ultimate tergite with paired smaller or larger dentiform tubercles; directed backwards.

4 (5) Posterior margin of male ultimate tergite with two tubercles; forceps simple (Fig. 3). Male genitalia comparatively wide, virga within genital lobe with specific basal section, as in Fig. 4 **javanus** (BORMANS, 1883)

5 (4) Posterior margin of male ultimate tergite with four or six tubercles.

6 (9) Posterior margin of male ultimate tergite with four tubercles. Male forceps with or without denticles on inner margins.

7 (8) Male forceps with paired, characteristic denticles on inner margins (Fig. 6). Male genitalia very slender; virga long with specific basal section, as in Fig. 7 **rapidus** sp. n.

8 (7) Male forceps without denticles on inner margins (Fig. 8). Male genitalia unknown. Female forceps very similar to those of male, but inner margins serrated, as in Fig. 9 **pandani** HINCKS, 1960

9 (6) Posterior margin of male ultimate tergite with six tubercles (Fig. 10); forceps characteristic, inner margins with similar longer or shorter dentiform denticles **elongatulus** BRINDLE, 1970

10 (3) Posterior margin of ultimate tergite without paired dentiform tubercles.

11 (18) Pronotum slightly longer than broad.

12 (13) Posterior margin of pygidium straight. Male forceps simple, with a larger tooth basally, and a smaller one medially (Fig. 11) **insularis** BRINDLE, 1976

13 (12) Posterior margin of pygidium concave, as in Figs 13, 16 and 19.

14 (17) Male forceps with double basal denticles on inner margins, as in Figs 13 and 16. Male genitalia comparatively broad, larger, as in Figs 14 and 17.

15 (16) Basal denticles of male forceps larger; forceps depressed, oval in cross-section (Fig. 13). Male genitalia broad, as in Fig. 14. Female forceps with specific semicircular emargination at inner margins medially (Fig. 15) **forcipatus** RAMAMURTHI, 1967

16 (15) Basal denticles of male forceps smaller; forceps cylindrical in cross-section (Fig. 16). Male genitalia narrow, as in Fig. 17. Female forceps strongly trigonal in cross-section, without semicircular emargination at inner margins medially (Fig. 18) **heros** sp. n.

17 (14) Male forceps with a single basal denticle inner margins crenulate medially, and apically (Fig. 19). Male genitalia comparatively narrow, virga within genital lobe long, basal vesicle specific as in Fig. 20 **proprius** sp. n.

18 (11) Pronotum relatively short, about as long as wide, not of *Auchenomus*-type.

19 (20) Inner ventral margin of male forceps with a longitudinal ridge (Fig. 23); ventral part of female pygidium strongly projecting (Fig. 24) **variabilis egoloensis** BRINDLE, 1970

20 (19) Inner ventral margin of male forceps with a tooth at about midpoint (Figs 21 and 25); female pygidia with ventral part less projecting (Figs 22 and 26).

21 (22) Basal part of male forceps not produced into a large inner tooth (Fig. 21); ventral part of female pygidium not visible (Fig. 22) **variabilis variabilis** BRINDLE, 1970

22 (21) Basal part of male forceps with a large inner tooth (Fig. 25); ventral part of female pygidium projecting (Fig. 26) **variabilis guadalcanalensis** BRINDLE, 1970

Auchenomus bifurcus sp. n.

Male general colour lighter and darker red. Head, pronotum, tegmina and wings darker red, antennae, legs, abdomen and forceps lighter red. Head depressed; postfrontal and coronal sutures well marked. Eyes a little shorter than length of head behind eyes. Antennae 13-jointed (broken in holotype);

unicolour. First antennal joint long, about as long as distance between antennal bases; second quadrate, third long, a little longer than fourth. Pronotum longer than broad, and a little longer that head; lateral margins parallel-sided, posterior margin convex. Tegmina and wings fully developed, shining. Abdomen elongated, more or less parallel-sided. Ultimate tergite quadrate, smooth. Pygidum broad, large, as in Fig. 1. Forceps very long, strongly trigonal basally, and cylindrical apically. Inner margins with small, but well-marked tooth medially. Penultimate sternite simple. Male genitalia (Fig. 2) moderately large, central parameral plate broad, external paramere comparatively large, slightly broadened medially. Virga within genital lobe straight with a sclerotized section basally.

Female unknown.

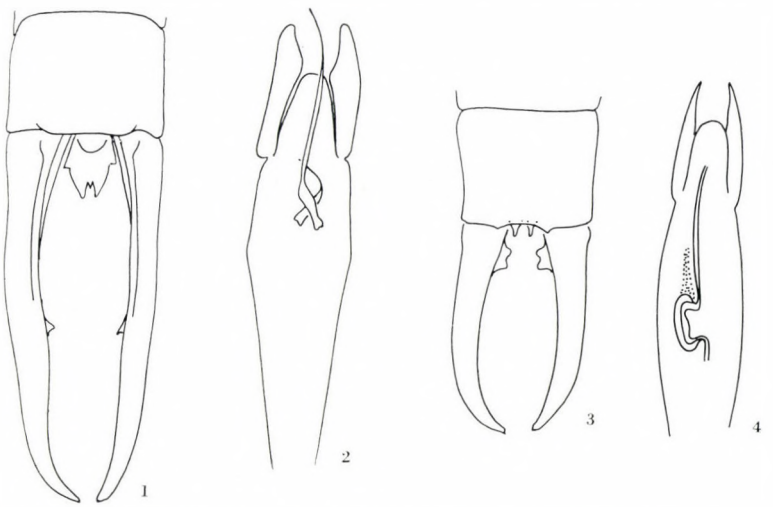
Length of body with forceps: 20.5 mm.

Holotype male: Australia: Queensland, Umg. Cairns, gen. prep. No. 805, det. Dr. H. STEINMANN. — Deposited in the Hungarian Natural History Museum, Budapest.

Auchenomus javanus (BORMANS, 1883)

Platylabia javana BORMANS, 1883, Ann. Soc. Ent. Belg., **27:** 65. — *Auchenomus javanus* (Bormans): BURR, Genera Insectorum, **122:** 59. — *Mecomera modiglianii* BORMANS, 1900, Ann. Mus. civ. Stor. nat., Genova, (2) **20:** 460.

Male tricolour: head, antennae, pronotum, tegmina, and wings dark brownish black, legs yellow, pronotum and forceps red. Head strongly depressed; postfrontal sutures well marked, coronal suture indistinct. First



Figs 1—4. 1 = Male ultimate tergite with forceps of *Auchenomus bifurcus* sp. n., and 2 = male genitalia. — 3 = Male ultimate tergite with forceps of *A. javanus* (BORMANS, 1883), and 4 = male genitalia

antennal joint more or less as long as distance between antennal bases, rest of joints smaller, a little conical. Eyes small, slightly shorter than length of head behind eyes. Pronotum longer than broad, lateral margins parallel-sided. Tegmina and wings shining, well developed. Abdomen flattened, more or less parallel-sided. Ultimate tergite broad, as long as wide; posterior margin with two dentiform spines. Pygidium hidden. Forceps (Fig. 3) simple, cylindrical in cross-section, with various, simple or double denticle on inner margin basally. Genitalia (Fig. 4) comparatively small, central paramere a little oval, external paramere simple, acute; virga within genital lobe normal, but basal section characteristic, strongly curved, as in Fig. 4.

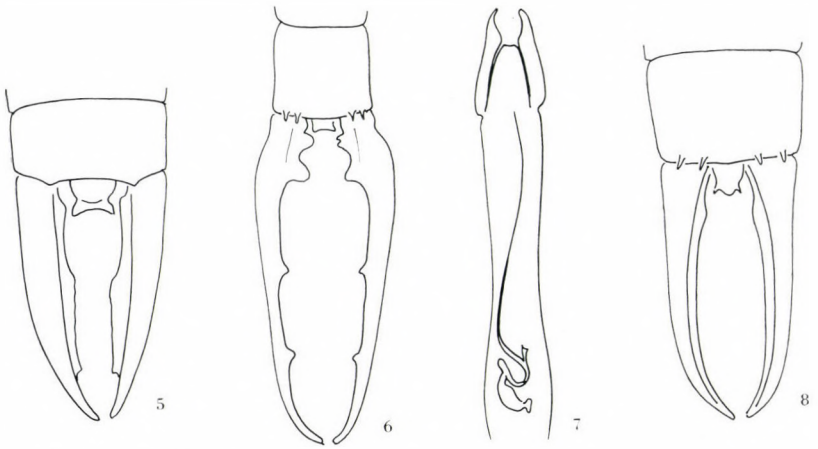
Female very similar to male, but legs shorter, light yellow, abdomen shorter and broader, ultimate tergite broader than long; forceps (Fig. 5) strongly trigonal, inner margins with specific flanges. Pygidum present, broad.

Length of body with forceps: in both sexes: 9.5—13 mm.

Distribution: Philippine Islands, Java, Kei Island, New Guinea.

Auchenomus rapidus sp. n.

Male very long, slender. General colour yellowish brown, except forceps, red. Head longer than broad; postfrontal suture long, coronal suture short, well marked. Eyes small, twice as long as length of head behind eyes. Antennae broken in holotype. Pronotum very long, about three times longer than broad; lateral margins parallel-sided, posterior margin rounded. Tegmina and wings fully developed. Abdomen slender, strongly depressed, a little expanded to last tergite. Ultimate tergite simple, smooth, but posterior margin with two



Figs 5—8. 5 = Female ultimate tergite with forceps of *Auchenomus javanus* (Bormans, 1883). — 6 = Male ultimate tergite and forceps of *A. rapidus* sp. n., and 7 = male genitalia. — 8 = Male ultimate tergite with forceps of *A. pandani* Hincks, 1960

pairs of spines. Pygidium small. Forceps (Fig. 6) very long, symmetrical, trigonal basally, cylindrical apically; inner margin with larger denticles basally, smaller teeth medially and apically. Genitalia (Fig. 7) slender, central paramere very long, narrow; external paramere comparatively small. Virga within genital lobe long, slender, basal section strongly sclerotized and curved.

Female unknown.

Length of body with forceps: 23 mm.

Holotype male: Solomon Islands: Bougainville, Kieta, gen. prep. No. 796, det. DR. H. STEINMANN. — Deposited in the Hungarian Natural History Museum, Budapest.

Auchenomus pandani HINCKS, 1960

Auchenomus pandani HINCKS, 1960, Proc. r. ent. Soc., London, (B) **29:** 157.

Male general colour yellowish brown, except abdomen with forceps, brownish red. Head very flattened; postfrontal sutures present, coronal suture absent. Eyes very small, strongly shorter than length of head behind eyes. Antennae 16-jointed; first joint yellow, long, a little longer than distance between antennal bases; second quadrate, third and rest brown, joints elongated, cylindrical. Pronotum of *Auchenomus*-type, lateral margins parallel-sided, posterior margin rounded; spines of pronotum at antero-lateral angles very long. Tegmina very long, wings fully developed. Abdomen more or less parallel-sided, or a little expanded medially. Ultimate tergite smooth, broad; posterior margin with two pairs of spines. Pygidium comparatively small, rounded at posterior margin. Forceps (Fig. 8) strongly trigonal in cross-section; simple, symmetrical. Male genitalia unknown to me.

Female very similar to male, but forceps (Fig. 9) with inner margins crenulate; pygidium with two small denticles.

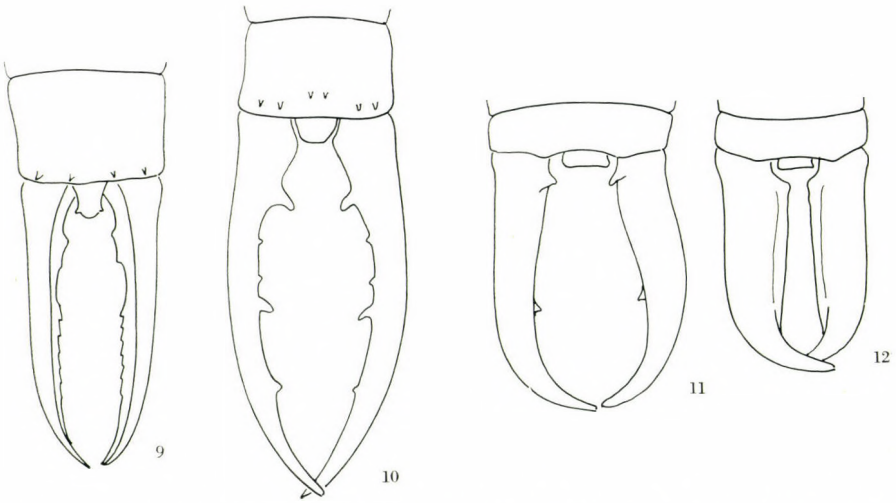
Length of body with forceps: in both sexes: 13—16 mm.

D i s t r i b u t i o n: New Guinea.

Auchenomus elongatulus BRINDLE, 1970

Auchenomus elongatulus BRINDLE, 1970, Pacific Insects, **12:** 665.

Male reddish yellow, tegmina and wings slightly darker; tips of antennal joints darker, last tergite dark brown medially. Head flat, depressed along sutures; narrowed posteriorly. Eyes small, shorter than length of head behind eyes. First antennal joint long, about as long as distance between antennal bases; second joint transverse, third four times as long as broad. Pronotum very narrow, twice as long as broad, in antero-lateral angles prominent, each with a long setiform spine. Tegmina long and slender, wing very long. Cuticle of head, pronotum, blabrous and coriaceous; tegmina and wings with cuticle



Figs 9—12. 9 = Female ultimate tergite with forceps of *Auchenomus pandani* HINCKS, 1960. — 10 = Male ultimate tergite with forceps of *A. elongatulus* BRINDLE, 1970. — 11 = Male ultimate tergite with forceps of *A. insularis* BRINDLE, 1976, and 12 = ditto, female

coriaceous, but with sparse, short stiff hairs. Abdomen parallel-sided, long, depressed. Ultimate tergite with three pairs of conical tubercles. Pygidium prominent. Forceps (Fig. 10) long, very slender, and with two inner teeth, relatively prominent, together with several very small teeth. Genitalia unknown.

Female unknown.

Length of body with forceps: 18.5 mm.

D i s t r i b u t i o n: Solomon Islands: Guadalcanal, Malaita.

Auchenomus insularis BRINDLE, 1976

Auchenomus insularis BRINDLE, 1976, Rec. S. Aust. Mus., **17:** 228.

Male reddish yellow to pale reddish brown, tegmina and wings somewhat darker; antennae pale yellow; legs dark yellow. Head broad, flat, posterior margin concave. Eyes small, about three times shorter than length of head behind eyes. First antennal joint about as long as distance between antennal bases; second joint transverse, third joint three times as long as broad. Pronotum longer than broad, lateral margins parallel-sided, straight, posterior margin convex. Tegmina and wings fully developed. Abdomen mainly parallel-sided, narrowed towards base, flat; ultimate tergite strongly transverse; pygidium broad. Forceps (Fig. 11) simple, with a dorso-median rounded tubercle, and with a ventro-median tooth beyond, last quarter of branch sharply curved medially. Genitalia unknown.

Female similar to male, branches of forceps (Fig. 12) shorter and broader, with a ventral inner flange, evently narrowed to distal third where each branch is more strongly narrowed forming a curved apex.

Length of body with forceps: male: 9—10.5 mm, female: 10.5—11.5 mm.

D i s t r i b u t i o n: New Hebrides: Espirito Santo.

Auchenomus forcipatus RAMAMURTHI, 1967

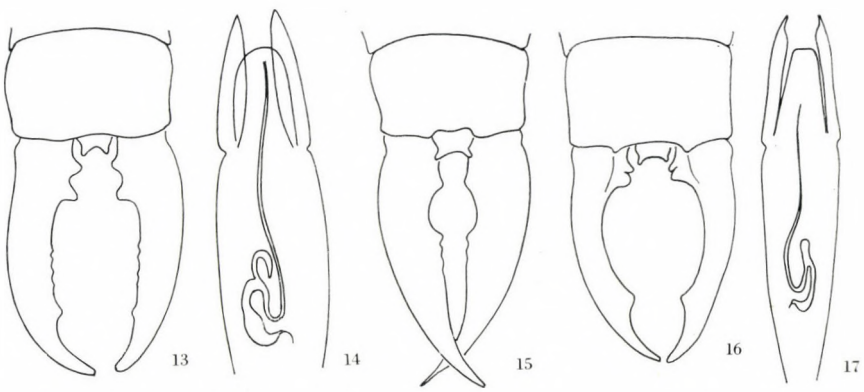
Auchenomus forcipatus RAMAMURTHI, 1967, Ent. Medd., **35:** 245.

Male general colour clear yellow, but wings dark brown, forceps orange. Head flattened, broadest across eyes, frons tumid with a slender longitudinal ridge near margin of eyes. Antennae 13-jointed; first narrow and constricted basally, expanded and parallel-sided beyond, second very small, third joint subequal. Pronotum longer than wide; sides truncate, posterior margin rounded. Tegmina one and-half times longer that pronotum; wings well developed. Abdomen expanded caudad, ultimate tergite large, broad. Pygidium prominent, transverse, declivent, posterior margin concave. Forceps (Fig. 13) broad at base, narrowed and arcuate behind, inner margin with a pair of large pyramidal tubercles. Genitalia (Fig. 14) comparatively large, central paramere oval, external parameres acute. Virga within genital lobe very long, basal section as in Fig. 14.

Female similar to male, but forceps not expanded basally (Fig. 15), with a semicircular emargination on inner margin medially. Pygidium unusually as in male.

Length of body with forceps: in both sexes: 10.5—13.5 mm.

D i s t r i b u t i o n: Bismarck Islands: New Britain and Lavongai.



Figs 13—17. 13 = Male ultimate tergite and forceps of *Auchenomus forcipatus* RAMAMURTHI, 1967, 14 = male genitalia, and 15 = female ultimate tergite and forceps. — 16 = Male ultimate tergite with forceps of *A. heros* sp. n., and 17 = male genitalia

Auchenomus heros sp. n.

Male general colour yellowish red to yellowish brown. Head very flattened, broad, posterior margin concave; postfrontal and coronal sutures present, but latter very short. Eyes small, two-and-half times shorter than length of head behind eyes. Antennae 16-jointed, joints slender and very long; first joint about as long as distance between antennal bases. Pronotum more or less twice as long as wide; lateral margins parallel-sided, posterior margin rounded. Tegmina and wings fully developed, long. Abdomen a little expanded to last tergite; ultimate tergite broad, posterior margin with two small tubercles at bases of forceps. Pygidium transverse, with two small denticles at posterior margin. Penultimate sternite simple, posterior margin rounded. Forceps (Fig. 16) comparatively short, trigonal basally, cylindrical medially and apically. Inner margins of branches with double tubercles basally, and a simple tooth apically. Genitalia (Fig. 17) moderately narrow, central paramere slender, external paramere with prominent apices. Virga within genital lobe long and slender, basal section characteristic.

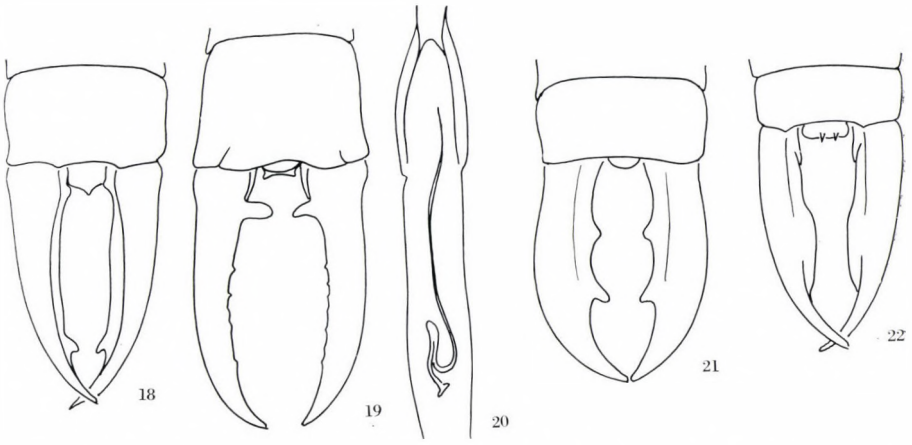
Female very similar to male, but branches of forceps with very long inner flange, as in Fig. 18.

Length of body with forceps: in both sexes: 11.5—12.5 mm.

Holotype male: New Guinea, Port Moresby, 1969, legit: Dr. J. Balogh, gen. prep. No. 268, det. Dr. H. Steinmann. Paratype female: ditto, 1 ex. — Deposited in the Hungarian Natural History Museum, Budapest.

Auchenomus proprius sp. n.

Male generally light yellowish brown, except apical part of tegmina, and wings, darker brownish black. Head flat, broad; posterior margin convex. Eyes normal, slightly shorter than length of head behind eyes. Antennae 10— (+ ?) jointed (broken in holotype), with very long joints. First joint a little longer than distance between antennal bases; second transverse, third joint about three times as long as wide, and rest a little longer than third. Pronotum slender, very long, of *Auchenomus*-type with lateral margins straight, and posterior margin rounded. Tegmina and wings fully developed, long. Abdomen more or less parallel-sided; ultimate tergite smooth, shining, broad; posterior margin without tubercles. Penultimate sternite specific, posterior margin with two more or less rounded emarginations; between these emarginations surface prominent. Pygidium broad, as in Fig. 19. Forceps specific, a little depressed basally; inner margins with a single, but very prominent, obtuse tooth basally, and crenulate medially and apically. Genitalia (Fig. 20) very slender; central paramere narrow, external parameres very narrow, and



Figs 18—22. 18 = Female ultimate tergite and forceps of *Auchenomus heros* sp. n. — 19 = Male ultimate tergite with forceps of *A. proprius* sp. n., and 20 = male genitalia. — 21 = Male, and 22 = female ultimate tergite with forceps of *A. variabilis* BRINDLE, 1970

with aciculated apices. Virga within genital lobe very long, basal section characteristic.

Female unknown.

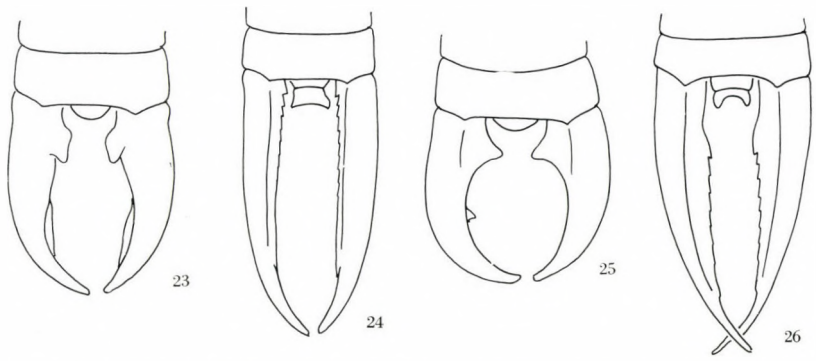
Length of body with forceps: 13 mm.

Holotype male: Nieuw-Guinea (New Guinea), Boven-Digoel, 150 km stroomop, VIII—IX, 1929, van Tanah Merah, legit: v. d. SLEEN, gen. prep. No. 806, det. DR. H. STEINMANN. — Deposited in the Instituut voor Taxonomische Zoölogie, Amsterdam.

Auchenomus variabilis BRINDLE, 1970

Auchenomus variabilis BRINDLE, 1970, Pacific Insects, **12:** 667.

Male blackish brown, anterior part of tegmina, pronotum, head, basal joints of antennae, legs, yellowish. Head broad, transverse, flat. Eyes very



Figs 23—26. 23 = Male, and 24 = female ultimate tergite with forceps of *Auchenomus variabilis egoloensis* BRINDLE, 1970. — 25 = Male, and 26 = female ultimate tergite with forceps of *A. variabilis guadalcanalensis* BRINDLE, 1970

small. First antennal joint long, as long as distance between antennal bases, second joint transverse, third joint twice as long as broad. Pronotum not of *Auchenomus*-type, more or less as long as broad, but antero-lateral angles with specific setiform spines. Tegmina and wings well developed. Abdomen relatively broad, depressed, parallel-sided; ultimate tergite very broad, simple; smooth. Penultimate sternite broad, widened distally. Pygidium small, broad. Forceps (Fig. 21) comparatively short, broad, trigonal basally, cylindrical distally, low irregular ridge of dorsal edge two teeth, ventral edge with a large tooth at about midpoint. Genitalia unknown.

Female similar to male, but forceps (Fig. 22) with each branch almost straight, and longer than those of male; inner ventral edge forming a narrow flange.

Length of body with forceps: in both sexes: 12 mm.

D i s t r i b u t i o n: Solomon Islands: Bougainville.

Auchenomus variabilis egoloensis BRINDLE, 1970

Auchenomus variabilis egoloensis BRINDLE, Pacific Insects, **12:** 667.

Male similar to typical form, but each branch of forceps (Fig. 23) with a large tooth basally, inner ventral tooth replaced by a longitudinal flange. Female forceps (Fig. 24) with ventral inner flange not ending in a tooth, and ventral part of pygidium strongly projecting.

Length of body with forceps: in both sexes: 12—13 mm.

D i s t r i b u t i o n: Solomon Islands: New Georgia Group, nr. Egolo.

Auchenomus variabilis guadalcanalensis BRINDLE, 1970

Auchenomus variabilis guadalcanalensis BRINDLE, 1970, Pacific Insects, **12:** 668.

Similar to typical form, but each branch of male forceps (Fig. 25) shorter and broad, with a large or very large basal tooth, one ventral inner tooth near to midpoint, and a small tooth beyond. Each branch of female forceps (Fig. 26) with inner flange ending in a tooth distally, ventral part of pygidium slightly projecting.

Length of body with forceps: in both sexes: 13 mm.

D i s t r i b u t i o n: Solomon Islands: Guadalcanal.

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Acta Zoologica Hungarica 30 (3—4), pp. 523—544 (1984)

INVESTIGATIONS IN THE "EUPITHECIA INEPTA-SACROSANCTA" AND THE "E. LASCIVA" GROUPS (LEPIDOPTERA: GEOMETRIDAE)*

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(Received 15 November, 1983)

Based on Höne's material from China, the description of 14 new species and 2 subspecies from NE China and one new species from Central China (*Eupithecia placida* sp. n., *placida batangi* ssp. n., *subplacida* sp. n., *laudabilis* sp. n., *exacerbata* sp. n., *caduca* sp. n., *avara* sp. n., *inopinata* sp. n., *sublasciva* sp. n., *ficta* sp. n., *depressa* sp. n., *depressa disiuncta* ssp. n., *laudenda* sp. n., *lunatica* sp. n., *nodosa* sp. n., *benigna* sp. n., *anteacta* sp. n. Remarks on the hitherto unknown female of *Eupithecia inepta* VOJNITS.

It is becoming increasingly clear by the study of the immense Chinese *Eupithecia* material, deposited mostly in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn, that, as regards this genus, South and Southeast China is an extremely rich center of specific development. Investigations made so far also show that this multiplicity is of a double character: on the one hand, groups of considerable differences and remoteness from one another had evolved, on the other hand, differentiation according to habitat within groups of distinct characteristics is also conspicuous.

In the course of study, the correct juxtaposition of the males and females representing a single species present a grave problem. I will therefore desist in the future from the description of species based only on females, be they even of a highly characteristic nature; their specific relegation must await a later phase of the current investigations.

A) THE "*EUPITHECIA INEPTA-SACROSANCTA*" GROUP

The male genitalia of the species constituting the group are characterized by a more or less marked sacculus, the characteristic cornuti in the aedoeagus of the majority of species, and the shape of sternite VIII with its two long brachiform extensions.

The species *E. intolerabilis* VOJNITS is known only by the female sex (see later), but it will provisionally be assigned to this group.

* Studies on Palaearctic Eupithecia-species XX.

Eupithecia inepta VOJNITS, 1979

Acta zool. hung., **25:** 208—209, Figs 19, 20.

Examined material: Li-kiang, North Yuennan, 27. 8.—8. 9. 1936, 3 ♂♂, 1 ♀, leg. H. HÖNE; A-tun-tse, North Yuennan, 26. 7.—17. 8. 1936, 2 ♀♀, leg. H. HÖNE.

R e m a r k s. On the basis of the specimens recently found it became clear that the female exemplar mentioned in the original description cannot be a representative of that species. In my opinion the three female specimens discussed below are the ones belonging to *E. inepta* VOJNITS; they are slightly bigger than the males (the alar expanse of the fore wings being 18 and 19 mm, respectively), but otherwise they agree, as to wing shape, colour and pattern, with the holotype male.

G e n i t a l i a. ♂: see the original description. *2*: bursa copulatrix rotund, spine field composed of minute signa, while those distinct from the field are rather robust. Both apophyses posteriori and anteriori short and thin. Lobi anales shaped like a grain or rice (Fig. 1).

Slides: Nos 13.020, 13.034, 13.065 (♂♂), 13.305, 13.354, 13.490 (♀♀), gen. prep. A. VOJNITS. The specific relegation of the female, published incorrectly as inepta (gen. prep. No. 11.467), is still problematic.

Eupithecia sacrosancta VOJNITS, 1979

Acta zool. hung., **25:** 206, Fig. 17.

R e m a r k. A male specimen, assigned to this species previously, represents in fact, according to some recent investigations, the species *E. subplacida* VOJNITS (see below).

Slide: No. 13.351 (♂), gen. prep. A. VOJNITS.

Eupithecia intolerabilis VOJNITS, 1981

Acta zool. hung., **27:** 423—425, Figs 42—45.

R e m a r k s. According to some recent studies, the male and female exemplars, assigned to the species in the original description cited above, cannot represent the two sexes of the taxon; since the holotype is the female, the specific relegation of the male became problematic. On the basis of a careful comparison of the male genitalia, the male paratype of *E. intolerabilis* VOJNITS represents, despite some minor differences, the species *E. inopinata* sp. n. described below.

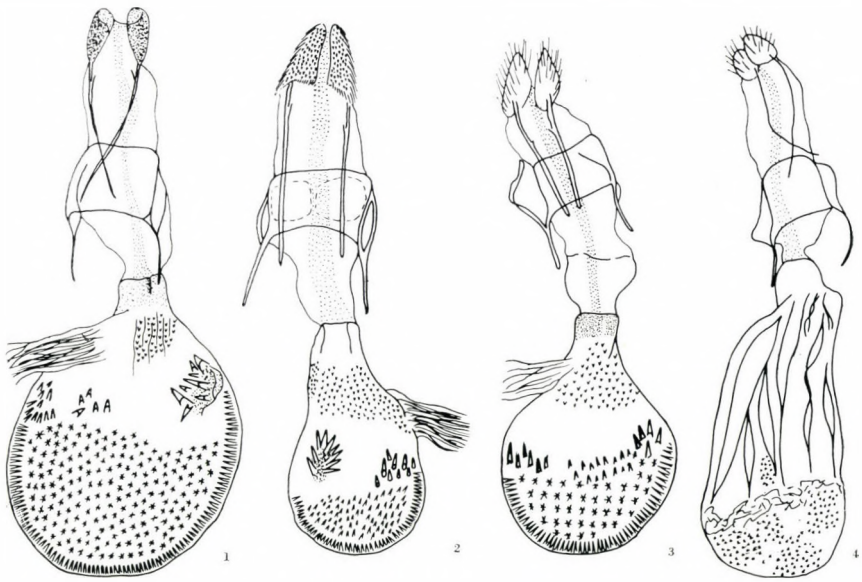
Slide: No. 13.237 (♂), gen. prep. A. VOJNITS.

Eupithecia placida sp. n.

(Derivation of specific name: placidus = pleasing).

D i a g n o s i s. Average alar expanse of male fore wings 19 mm, extreme values 18 and 20 mm (based on 14 specimens), that of female fore wings 19.5 mm, extreme values 18.5 and 20 mm (based on 8 specimens). Wings elongate. Costa of male fore wing arcuate at apex, apex proper pointed. Termen straight, tornus connecting termen and dorsum in a single wide arc. Hind wing long. Female wings slightly wider, apex of fore wing more obtuse, hind wing shorter. Basic colour of fore wing brown, more or less irrorated grey and rufous. Transverse stripes grey and fuscous, discal spot rounded, black. Hind wing lighter, in some specimens whitish. Underside of wings yellowish grey, pattern elements grey. Cilia medium long, striated fuscous and brownish yellow.

G e n i t a l i a. ♂: Uncus squat, valva wide, sacculus well developed. Aedoeagus with a larger and a smaller and thick cornutus, as well as a claviform, two lamellar and one clot-shaped chitinous formation. Lateral arms of sternite VIII long and narrow, base of sternite deeply incised (Figs 5, 13, 21). ♀: bursa copulatrix elongated, one-third its length padded with densely arranged signa; laterally with about 10 isolated large signa. Both apophyses posteriori and anteriori short and thin. Lobi anales elongated (Fig. 2).



Figs 1—4. 1 = Female genitalia of *Eupithecia inepta* VOJNITS. 2 = Female genitalia of *E. placida* sp. n. 3 = Female genitalia of *E. subplacida* sp. n. 4 = Female genitalia of *E. avara* sp. n.

Biology. First stages and foodplant unknown. The known specimens were captured from July to the first days of September.

Distribution. A SE Chinese species. Locus typicus: A-tun-tse, North Yuennan, 4000 m.

Specific differences. As compared to *E. sacrosancta* VOJNITS, 1979, the valva of the new species is longer, the uncus shorter and basally thicker, and the aedoeagus contains more chitinous formations.

Holotype ♂: "A-tun-tse (Nord Yunnan), Mittlere Höhe (ca. 4000 m) 16.8 1916, H. HÖNE" "gen. prep. No. 13.788 ♂". Paratypes: A-tun-tse, North Yuennan, 4000—4500 m, 7. 7.—5. 9. 1936, 13 ♂♂, 8 ♀♀, leg. H. HÖNE. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institute and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

Slides. Nos 13.273, 13.275, 13.277, 13.283, 13.296, 13.297, 13.310, 13.312, 13.335, 13.788, 13.789, 14.092, 14.093, 14.111 (♂♂), 12.985, 13.058, 13.318, 13.933, 13.946, 13.957, 14.058, 14.098 (♀♀), gen. prep. A. VOJNITS.

Eupithecia placida batangi ssp. n.

Diagnosis. Average expanse of male for wings 19 mm, extreme values 18 and 21 mm (based on 13 specimens). Wings elongated. Basic colour dark brown, pattern sharp. Underside of wings yellowish grey, irrorated with brown. Cilia striated fuscous and yellowish grey.

Genitalia. ♂: Aedoeagal cornuti longer and thinner (Figs 6, 14, 22) than in nominate subspecies. ♀ unknown.

Biology. First stages and foodplant unknown. The known specimens were captured in August—October.

Distribution. Known from Tibet. Locus typicus: Batang, 2800 m.

Subspecific differences. Basic colour more greyish, transverse stripes sharper, hind wing with a more expressed pattern than in nominate subspecies. Male genitalia differring only slightly. Flight period essentially later.

Holotype ♂: "Batang (Tibet). Im Tal des Yangtze (ca. 2800 m), 27.8 1936, H. HÖNE." "gen. prep. No. 13.796 ♂ DR. A. VOJNITS". Paratypes: Batang, Tibet, 2800—3100 m, 1. 8.—6. 10. 1936, 12 ♂♂, leg. H. HÖNE. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institute and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

Slides: Nos 13.796, 13.805, 13.806, 13.819, 13.838, 13.850, 13.879, 13.907, 13.912, 14.040, 14.042, 14.047 (♂♂), gen. prep. A. VOJNITS.

Eupithecia subplacida sp. n.

(Derivation of specific name: subplacidus = beside placida).

Diagnosis. Average expanse of male fore wings 19.5 mm, extreme values 17.5 and 21 mm (based on 51 specimens); female alar expanse 19.5 mm, extreme values 18.5 and 20 mm, respectively (based on 12 specimens). Wings

elongated. Basic colour of fore wings fuscous. Transverse lines sharp, angulate, yellowish and brown. Discal spot round, dark brown. Hind wing lighter, only termen and base darker. Transverse lines pale, discal spot hardly discernible. Underside of wings very light, whitish, pattern pale brown. Cilia medium long, striated brown and yellowish white.

G e n i t a l i a. ♂: Uncus short, stout, pointed, valva tapering, sacculus well expressed. Aedoeagus very short, thick, with one long and thin cornutus, and several smaller to larger chitinous formations of divers shape. Sternite VIII long, basally deeply excised, lateral arms very long (Figs 7, 15, 23). ♀: highly similar to those of *E. placida* VOJNITS, with certain differences in the location and proportions of the signa (Fig. 3).

B i o l o g y. First stages and foodplant unknown. The known specimens were captured from May till September, in two generations.

D i s t r i b u t i o n. A SE Chinese species. Locus typicus: Li-kiang, North Yuennan.

S p e c i f i c d i f f e r e n c e s. Resembling *Eupithecia placida* sp. n., but overall more brownish. The two species must be separated on the basis of genitalic configuration. Flight periods also slightly different.

Holotype ♂: "A-tun-tse (Nord Yünnan), Mittlere Höhe (ca. 4000 m), 17.8 1936. H. HÖNE" "gen. prep. No. 13.330 ♂ DR. A. VOJNITS". Paratypes: A-tun-tse, North Yuennan, 3000—4500 m, 14. 5.—6. 9. 1936, 50 ♂♂, 12 ♀♀, leg. H. HÖNE. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institution and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

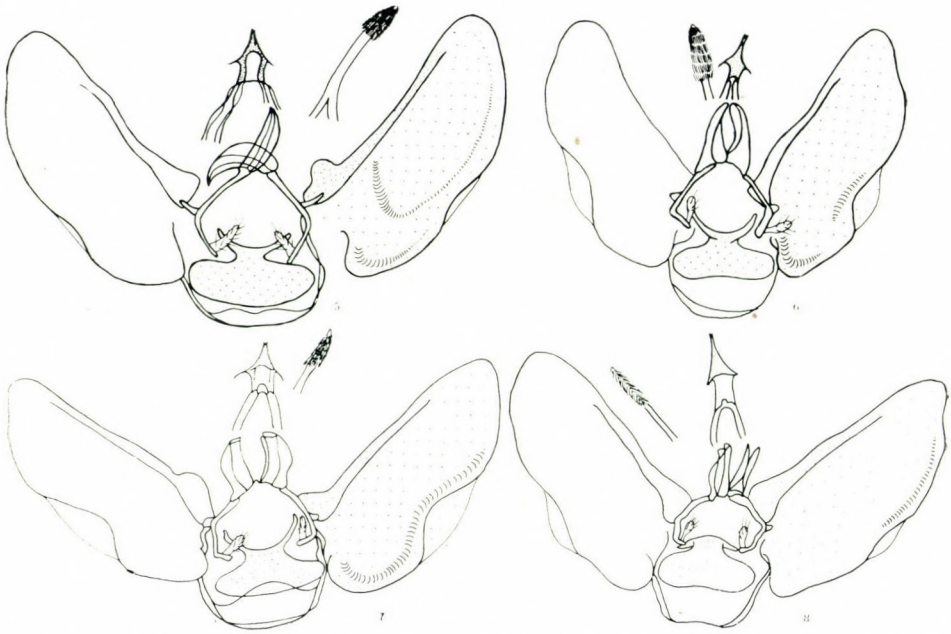
Slides: Nos 13.250, 13.254, 13.272, 13.274, 13.276, 13.278, 13.279, 13.281, 13.282, 13.286, 13.289, 13.290, 13.073, 13.078, 13.302, 13.310, 13.312. 13.314, 13.315, 13.324, 13.329, 13.330, 13.332, 13.336, 13.337, 13.340, 13.342, 13.345, 13.351, 13.353, 13.363, 13.939, 13.944, 13.951, 13.954, 13.959, 14.051, 14.055, 14.057, 14.060, 14.063, 14.064, 14.066, 14.069, 14.072, 14.091, 14.155, 14.158, 14.177 (♂♂), 13.303, 13.311, 13.325, 13.328, 13.934, 13.945, 13.947, 13.953, 14.052, 14.059, 14.157 (♀♀), gen. prep. A. VOJNITS.

Eupithecia laudabilis sp. n.

(Derivation of specific name: laudabilis = praiseworthy).

D i a g n o s i s. Alar expanse of fore wings of the two male specimens 21.5 and 22 mm. Fore wing elongate, hind wing short, a relatively large species. Costa and termen of fore wing arcuate, termen and dorsum describing a single large arc. Basic colour of fore wing yellowish brown, transverse stripes brown. Discal spot small, round, black. Hind wing light, whitish, transverse lines obsolete, discal spot minute. Underside of wings light greyish white, pattern elements pale grey. Cilia short, striated yellow and fuscous.

G e n i t a l i a. ♂: Uncus thin, long, valva short, both dorsum and ventrum sinuous, apex obtuse, sacculus small. Aedoeagus with a large, evenly bent cornutus and two smaller cornuti, and in addition two lamelliform formations and a chitinous clot. Sternite VIII with long and narrow lateral branches (Figs 8, 16, 24). ♀ unknown.



Figs 5—8. 5 = Male genitalia of *Eupithecia placida* sp. n. 6 = Male genitalia of *E. placida* ssp. *batangi* ssp. n. 7 = Male genitalia of *E. subplacida* sp. n. 8 = Male genitalia of *E. laudabilis* sp. n.

Biology. First stages and foodplant unknown. The type-specimens were captured in July and August.

Distribution. So far known from SE China only. Locus typicus: A-tun-tse, North Yuennan, 4000 m.

Specific differences. The configuration of the male genitalia refers the new species to the *placida* group, but the differences are unequivocal (shape of uncus and valva, aedoeagus). Externally the differences are conspicuous.

Holotype ♂: "A-tun-tse (Nord Yünnan), Mittlere Höhe (ca. 4000 m), 9.8 1936, H. HÖNE" "gen. prep. No. 14.159 ♂ DR. A. VOJNITS". Paratype: A-tun-tse, North Yuennan, 4000 m, 18. 7. 1936, 1 ♂, leg. H. HÖNE. Holotype and paratype deposited in the Hungarian Natural History Museum, Budapest.

Slides: Nos 14.088, 14.159 (♂♂), gen. prep. A. VOJNITS.

Eupithecia exacerbata sp. n.

(Derivation of specific name: exacerbatus = aggravated).

Diagnosis. Alar expanse of fore wings of the single male specimen 19.5 mm. Wings elongate. Termen and dorsum of fore wing slightly arcuate, tornus obtuse. Hind wing elongated. The specimen is rather worn. Fore wing

brown with yellowish transverse stripes, discal spot round, dark brown. Hind wing lighter, with densely decurrent transverse lines from terminal to median fields. Underside of wings brownish yellow, pattern elements pale brown. Cilia worn.

Genitalia. ♂: Uncus robust, long, valva very short, wide, apex rounded, sacculus small. Aedoeagus with a large and uncinate, and two smaller cornuti, a lamellate excrescence and a chitinous clot. Base of sternite VIII wide, excised, tapering posteriorad (Figs 11, 19, 27). ♀ unknown.

Biology. First stages and foodplant unknown. The holotype was captured in the beginning of July.

Distribution. A SE Chinese species. Locus typicus: A-tun-tse, North Yuennan.

Specific differences. The shape of the wings of the very worn specimen and the configuration of its genitalia refer to a relationship with the placida group, but the differences are also considerable. The shape of the valva and the armature of the aedoeagus are especially characteristic.

Holotype ♂: "A-tun-tse (Nord Yünnan), Mittlere Höhe (ca. 4000 m), 3.7 1936, H. HÖNE" "gen. prep. No. 14.058[2] [sic!] ♂ DR. A. VOJNITS". Holotype deposited in the Hungarian Natural History Museum, Budapest.
Slide: No. 14.058[2] (♂), gen. prep. A. VOJNITS.

Eupithecia caduca sp. n.

(Derivation of specific name: caducus = caducous, frail).

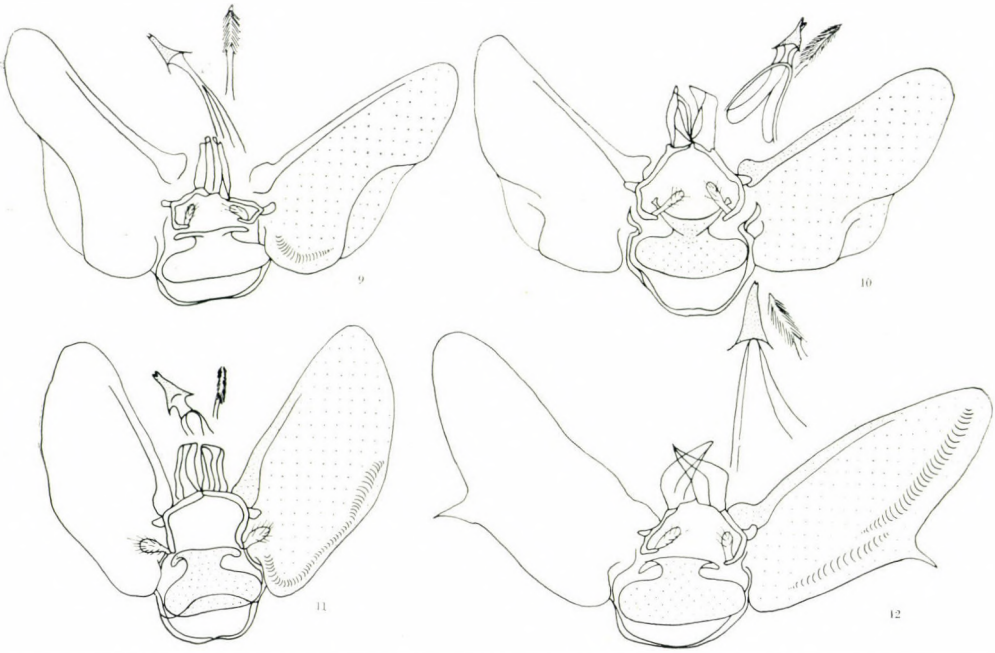
Diagnosis. Alar expanse of fore wings of the single known specimen 15.5 mm. Wings broad. Fore wing an isosceles triangle; both costa and termen arcuate, apex obtuse, tornus rounded. Hind wing round. Basic colour of fore wing fawnish, transverse stripes brown, discal spot round, black. Hind wing yellowish brown, transverse lines obsolete, discal spot minute. Underside of fore wing brown, hind wing brownish yellow, pattern distinct, transverse stripes brown and partly disintegrated into spots. Cilia short, striated brown and yellowish brown.

Genitalia. ♂: Valva short. Aedoeagus with a very large, thick, and a considerably smaller cornutus, also a lamelliform outgrowth and a chitinous clot. Sternite VIII with especially long lateral branches (Figs 9, 17, 25). ♀ unknown.

Biology. First stages and foodplant unknown. The holotype was collected in September.

Distribution. A SE Chinese species. Locus typicus: Li-kiang, North Yuennan.

Specific differences. The configuration of the genitalia refers the new species to the *placida* group. Externally, the rounded wings and the



Figs 9—12. 9 = Male genitalia of *Eupithecia caduca* sp. n. 10 = Male genitalia of *E. avara* sp. n. 11 = Male genitalia of *E. exacerbata* sp. n. 12 = Male genitalia of *E. inopinata* sp. n.

evenly sericeous brown coloration are rather characteristic. In the genitalia, the extraordinarily long arms of sternite VIII and the very large chitinous formations of the aedoeagus are also special features.

Holotype ♂: "Li-kiang (China). Provinz Nord-Yuennan, 8.9 1934, H. HÖNE." "gen. prep. No. 13.045 ♂ DR. A. VOJNITS." Holotype deposited in the Hungarian Natural History Museum, Budapest.

Slide: No. 13.045 (♂), gen. prep. A. VOJNITS.

Eupithecia avara sp. n.

(Derivation of specific name: avarus = avaricious).

D i a g n o s i s. Alar expanse of fore wings of the single male specimen 19 mm, that of the single female 20 mm. A medium-sized species. Wings broad. Basic colour of male fore wing yellowish brown, transverse stripes brown, discal spot slightly elongated, dark brown. Hind wing whitish, transverse lines obsolescent in middle of wing, discal spot minute. Pattern on underside of wings brown, sharply defined. Cilia long, striated dark brown and yellowish brown. Female darker brown, transverse lines finer. Discal spot narrower.

G e n i t a l i a. ♂: Uncus long and robust, valva short, sacculus shorter than in all preceding species. Aedoeagus with a chitinous clot, a long, arcuate

and excised lamelliform plate and a clavite chitinous outgrowth. Lateral arms of sternite VIII short (Figs 10, 18, 26). ♀: bursa copulatrix characteristically elongated, anterior fourth padded with minute signa, rest of bursa multiply rugulose. Both apophyses posteriori and anteriori short and narrow. Lobi anales rotund (Fig. 4).

Biology. First stages and foodplant unknown. Type-specimens captured at the turn of August—September.

Distribution. Found in SE China. Locus typicus: Li-kiang, North Yuennan.

Specific differences. As to external morphology, the new species differs from most members of the *Eupithecia placida* group by its broad wings and rounded apices; *E. caduca* sp. n., similar in these respects, is considerably smaller. Concerning the genitalia, the shape of the valva is different and the clavate cornutus in the aedoeagus is also highly characteristic. The female genitalia resemble those of *E. inopinata* sp. n.

Holotype ♂: "Li-kiang (China). Provinz Nord-Yuennan, 29.8 1934, H. HÖNE". "gen. prep. No. 13.059 DR. A. VOJNITS". Paratype: Li-kiang, North Yuennan, 2. 9. 1935, 1 ♀, leg. H. HÖNE. Holotype and paratype deposited in the Hungarian Natural History Museum, Budapest.

Slides: Nos 13.059 (♂), 14.191 (♀), gen. prep. A. VOJNITS.

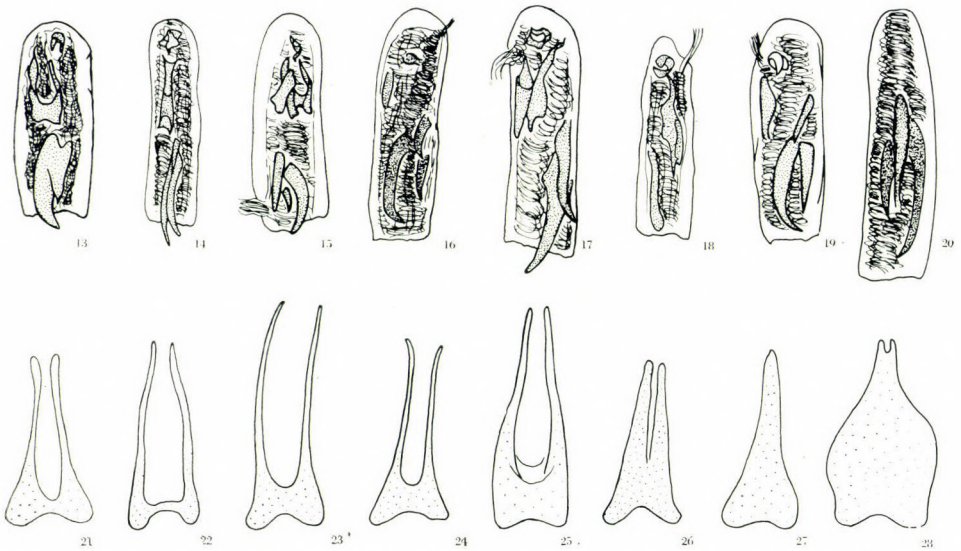
Eupithecia inopinata sp. n.

(Derivation of specific name: inopinatus = unexpected).

Diagnosis. Average alar expanse of male fore wing 18.5 mm, extreme values 17 and 19.5 mm (based on four specimens); that of three females 16.5, 17 and 17.5 mm. Wings moderately elongated. Fore wing shiny yellowish brown. Transverse stripes brown or yellowish. Discal spot round, dark brown, occasionally obsolete. Hind wing dark brown along inner margin, becoming lighter towards costa and termen. Transverse stripes sinuous, brown. Underside of wings yellowish grey, pattern elements fuscous. Cilia long, striated brown and greyish yellow.

Genitalia. ♂: Uncus long, narrow, valval sacculus terminating in a pointed appendage. Aedoeagus with a larger and a smaller, robust, slightly curved cornutus, as well as an elongated lamelliform, chitinous plate. Sternite VIII tapering, terminally lip-shaped (Figs 12, 20, 28). ♀: Bursa copulatrix round, very densely padded with signa. Ductus bursae heavily sclerotized, rugose. Apophyses posteriori and anteriori short and thin. Lobi anales rotund (Fig. 29).

Biology. First stages unknown. Type-specimens collected in August and the first days of September.



Figs 13—28. 13 = Aedoeagus of *Eupithecia placida* sp. n. 14 = Aedoeagus of *E. placida* ssp. *batangi* ssp. n. 15 = Aedoeagus of *E. subplacida* sp. n. 16 = Aedoeagus of *E. laudabilis* sp. n. 17 = Aedoeagus of *E. caduca* sp. n. 18 = Aedoeagus of *E. avara* sp. n. 19 = Aedoeagus of *E. exacerbata* sp. n. 20 = Aedoeagus of *E. inopinata* sp. n. 21 = Sternite VIII of *E. placida* sp. n. 22 = Sternite VIII of *E. placida* ssp. *batangi* ssp. n. 23 = Sternite VIII of *E. subplacida* sp. n. 24 = Sternite VIII of *E. laudabilis* sp. n. 25 = Sternite VIII of *E. caduca* sp. n. 26 = Sternite VIII of *E. avara* sp. n. 27 = Sternite VIII of *E. exacerbata* sp. n. 28 = Sternite VIII of *E. inopinata* sp. n.

Distribution. Found in SE China. Locus typicus: Li-kiang, North Yuennan.

Specific differences. The male sacculus, terminating in a pointed appendage, is highly characteristic. Species with more or less similar genitalic configurations are *E. infecta* VOJNITS, 1981; *E. studiosa* VOJNITS, 1979; *E. incohata* VOJNITS, 1979; *E. sola* VOJNITS, 1983; *E. incorrupta* VOJNITS, 1984, and *E. arenosa* VOJNITS, 1984. The genitalia of these congeners differ from the new species as follows:

infecta: dentiform apex of sacculus robust, auriculate, uncus thick, aedoeagus with chitinous grains, a short and arcuate cornutus and a field of minute cornuti, sternite VIII is rather similar, but with nearly parallel sides;
studiosa: dentiform appendage of sacculus thicker, aedoeagus terminally with many small cornuti, sternite VIII rather similar but wider;
incohata: dentiform appendage of sacculus small and thick, aedoeagus short and stout, with a pointed and straight cornutus and chitinous grains, sternite VIII elongate;
sola: dentiform appendage of sacculus thick, aedoeagus with two very long and thick cornuti, sternite VIII broad;
incorrupta: dentiform appendage of sacculus hardly projecting, aedoeagus short and stout with large cornuti, sternite VIII considerably tapering;
arenosa: dentiform appendage of sacculus wide and rounded, aedoeagus with a very long an a shorter cornutus, sternite VIII rather tapering

As to external morphological characters, the species under discussion might be separated as follows:

1 (4)	Wings wide, rounded.	
2 (3)	Termen of both fore and hind wings with white or whitish spots	**incohata** VOJNITS
3 (2)	No such spots present	**incorrupta** VOJNITS
4 (1)	Wings not so.	
5 (6)	Postmedian of fore wing a wide white band	**arenosa** VOJNITS
6 (5)	Postmedian not so.	
7 (8)	Fore wing brown with large brownish yellow spots	**sola** VOJNITS
8 (7)	Fore wing not so.	
9 (10)	Transverse stripes of fore wing sharply defined, dark brown	**studiosa** VOJNITS
10 (9)	Transverse stripes obsolescent, faint.	
11 (12)	Hind wing a uniform pale brown	**infecta** VOJNITS
12 (11)	Hind wing lightening towards costa.	
13 (14)	Fore wing with whitish spots in terminal field	**inopinata** sp. n.
14 (13)	No such spots present	**intolerabilis** VOJNITS

R e m a r k s. The paratype specimen of *E. intolerabilis* VOJNITS belongs, according to recent investigations, to the new species (see also there).

Holotype ♂: "Li-kiang (China). Provinz Nord-Yuennan, 1.9 1934, H. HÖNE." "gen. prep. No. 13.069 DR. A. VOJNITS." Paratypes: Li-kiang, North Yuennan, 7. 8.—3. 9. 1934, 4 ♂♂, 1 ♀, leg. H. HÖNE; A-tun-tse, North Yuennan, 18. 8. 1936, 1 ♂, leg. H. HÖNE. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institute and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

Slides: Nos 13.040, 13.042, 13.063, 13.237, 13.260, 13.306 (♂♂), 13.068 (♀), gen. prep. A. VOJNITS.

B) THE "*EUPITHECIA LASCIVA*" GROUP

The species assigned to this group are "related" mainly on the basis of the genitalic configuration. The most characteristic feature is the short obtusely rounded cone of an uncus, emitting a small, cylindrical apex. The aedoeagus is also cylindrical, rather short and stout with few chitinous excrescences. The base of sternite VIII is excised, it tapers anteriorad and dissolves into two robust branches.

Eupithecia lasciva VOJNITS, 1980

Acta zool. hung., **26:** 446—449, Figs 15, 16, 24.

Examined material: Tapaishan, Tsinling, 1700 m, 8. 8. 1936, 1 ♂, leg. H. HÖNE.

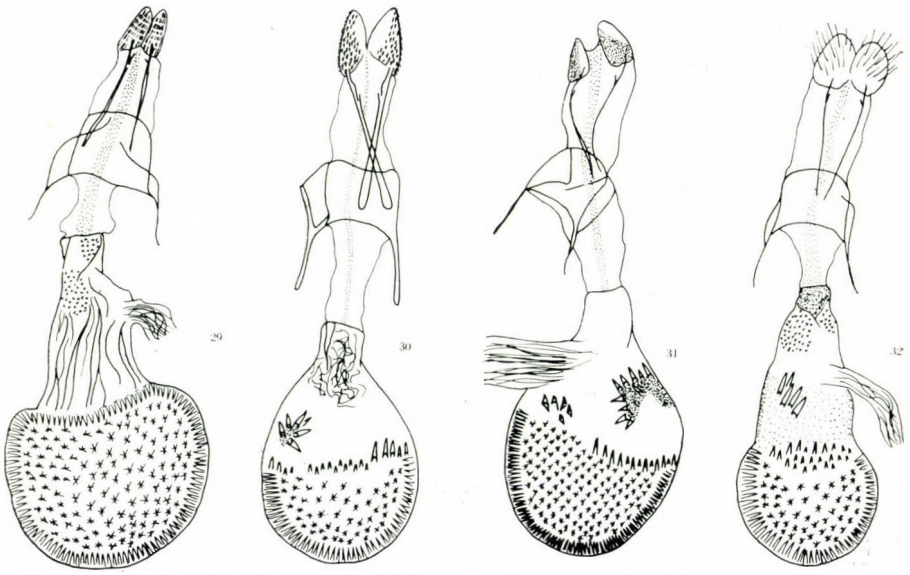
R e m a r k s. Eight exemplars of the paratype specimens mentioned in the diagnosis represent in fact *E. ficta* sp. n. (see later); the correction of the relevant data is made in the subsequent description.

Slide: No. 13.736 (♂), gen. prep. A. VOJNITS.

Eupithecia sublasciva sp. n.

(Derivation of specific name: sublascivus = near lascivious).

D i a g n o s i s. Average alar expanse of male fore wings 19 mm, extreme values: 18 and 21 mm, respectively (based on 21 specimens), that of two female exemplars 19.5 and 21.5 mm. A medium-sized species with elongated



Figs 29—32. 29 = Female genitalia of *Eupithecia inopinata* sp. n. 30 = Female genitalia of *E. sublasciva* sp. n. 31 = Female genitalia of *E. ficta* sp. n. 32 = Female genitalia of *E. depressa* sp. n.

wings. Basic colour of fore wings fuscous. Transverse stripes sharply angulate. Discal spot marked. Underside of wings evenly fuscous to brown, pattern elements sharply defined. Cilia medium long, brownish yellow.

Genitalia. ♂: Compared with *E. lasciva* VOJNITS, uncus longer, valva tapering, aedoeagus with bigger chitinous outgrowths, lateral arms of sternite VIII longer (Figs 33, 41, 49). ♀: Bursa copulatrix spherical, about its half padded with minute signa; large signa on steles about 5—6 in number (Fig. 30).

Biology. First stages and foodplant unknown. Most of the specimens were collected in August—September, but the single specimen from June speaks for a bivoltine species.

Distribution. Found in SE China. Locus typicus: A-tun-tse, North Yuennan, 4000 m.

Specific differences. Externally the new species differs remarkably from *E. lasciva* VOJNITS: it is essentially bigger, with elongated wings and a different basic colour. The genitalia, especially those of the males, are much more similar, though differences are also discernible (see characterization above).

Holotype ♂: "A-tun-tse (Nord Yünnan), Mittlere Höhe (ca. 4000 m), 11.8 1936, H. HÖNE" "gen. prep. No. 14.197 ♂ DR. A. VOJNITS". Paratypes: A-tun-tse, North Yuennan, 3500—4500 m, 27. 6. and 3. 8.—4. 9. 1936, 21 ♂♂, 2 ♀♀, leg. H. HÖNE. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institution and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

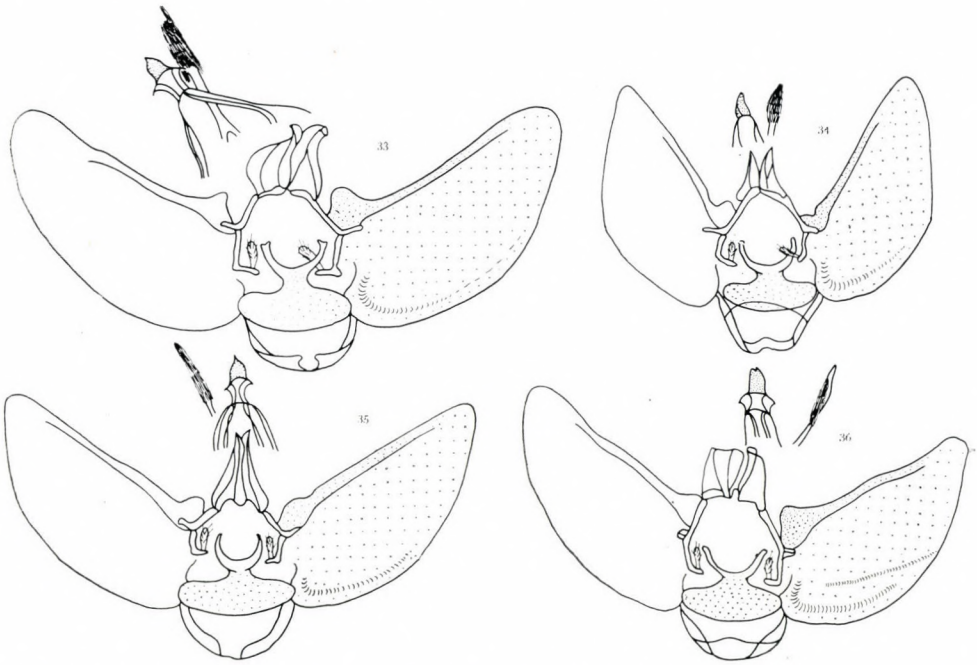
Slides: Nos 13.280, 13.298, 13.301, 13.304, 13.317, 13.320, 13.322, 13.327, 13.329, 13.331, 13.333, 13.749, 13.752, 13.756, 13.778, 13.781, 13.782, 13.918, 14.054, 14.156, 14.197 (♂♂), 13.284, 13.299 (♀♀), gen. prep. A. VOJNITS.

Eupithecia ficta sp. n.

(Derivation of specific name: fictus = fictitious).

D i a g n o s i s. Average alar expanse of male fore wings 20 mm, extreme values: 18 and 21 mm, respectively (based on 31 specimens); that of females 21.5 mm, extreme values: 19 and 22.5 mm, respectively (based on 34 specimens). Fore wing elongate, hind wing broad, long. Basic colour of fore wing fuscous, but yellowish in basal and median fields as well as along postmedian. Transverse stripes sharply defined. Discal spot black. Hind wing whitish. Underside of wings shiny brownish yellow, transverse stripes brown. Cilia medium long, striated brown to brownish yellow.

G e n i t a l i a. ♂: Compared to *E. sublasciva* sp. n., uncus long, valva wide, aedoeagus wide, short, with numerous chitinous formations, lateral arms of sternite VIII more robust (Figs 35, 42, 50); ♀: bursa copulatrix piriform, about its two-thirds padded with evenly distributed signa, and also some disjunct large signa present. Lobi anales elongate (Fig. 31).



Figs 33—36. 33 = Male genitalia of *Eupithecia sublasciva* sp. n. 34 = Male genitalia of *E. laudenda* sp. n. 35 = Male genitalia of *E. ficta* sp. n. 36 = Male genitalia of *E. depressa* ssp *disiuncta* ssp. n.

Biology. First stages and foodplant unknown. Type-specimens collected in June—October; presumably a bivoltine species.

Distribution. Known from Tibet. Locus typicus: Batang, 2800 m.

Specific differences. The new species differs from its preceding congeners by its grey coloration and sharply defined pattern. The configuration of the genitalia show only minor deviations.

Remarks. In an earlier paper (Acta zool. hung., 26: 446—449, Figs 15, 16, 24), two specimens (slide Nos 13.220, 13.222) have been incorrectly relegated to *E. lasciva* VOJNITS: they in fact represent the new species under discussion. The enumeration of the paratypes of *E. lasciva* VOJNITS must also be corrected: eight of them are to be assigned to the new species (Nos 12.198, 12.199, 12.201, 12.406, 12.408, 12.412, 12.414, 12.434).

Holotype ♂: "Batang (Tibet). Im Tal des Yangtze (ca. 2800 m), 27.8 1936, H. HÖNE." "gen. prep. No. 13.906 ♂ DR. A. VOJNITS". Paratypes: Batang, Tibet, 2800—3800 m, 10. 6.—6. 10. 1936, 30 ♂♂, 34 ♀♀, leg. H. HÖNE. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institution and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

Slides: Nos 12.198, 12.199, 12.201, 12.406, 12.408, 12.412, 12.414, 12.434, 13.220, 13.222, 13.792, 13.797, 13.798, 13.801, 13.804, 13.826, 13.845, 13.862, 13.876, 13.880, 13.884, 13.885, 13.886, 13.898, 13.899, 13.903, 13.904, 13.905, 13.906, 13.910 (♂♂), 13.299, 13.753, 13.790, 13.810, 13.814, 13.815, 13.817, 13.818, 13.846, 13.848, 13.849, 13.855, 13.857, 13.869, 13.872, 13.874, 13.875, 13.877, 13.887, 13.888, 13.890, 13.892, 13.893, 13.894, 13.897, 13.900, 13.902, 13.908, 14.039, 14.043, 14.046 (♀♀), gen. prep. A. VOJNITS.

Eupithecia depressa sp. n.

(Derivation of specific name: depressus = depressed).

Diagnosis. Average alar expanse of male fore wings 21 mm, extreme values: 18.5 and 21.5 mm, respectively (based on 20 specimens !), that of females 20 mm, extreme values: 17 and 22 mm, respectively (based on 5 specimens). Wings elongate. Fore wing dark rufous brown, median field with a conspicuous reddish yellow spot. Transverse stripes yellowish. Discal spot round, black. Hind wing light, whitish, along margin fuscous. Underside of fore wing fuscous, that of hind wing yellowish grey. Pattern elements grey. Cilia medium long, striated yellow and brown.

Genitalia. ♂: Uncus shorter than in *E. sublasciva* VOJNITS, valva considerably attenuating apicad. Aedoeagus with small chitinous outgrowths. Lateral arms of sternite VIII relatively short, base of sternite wide (Figs 37, 43, 51). ♀: Bursa copulatrix long, anterior rotund section densely padded with signa; laterally situated signa long, large, about ten in number. Lobi anales elongate (Fig. 32).

Biology. First stages and foodplant unknown. Flight period protracted from June to September: presumably a bivoltine species.

Distribution. Found in SE China. Locus typicus: A-tun-tse, North Yuennan, 4500 m.

S p e c i f i c d i f f e r e n c e s. Compared with *E. sublasciva* sp. n., apex of fore wings more acute, hind wings shorter, basic colour of wings different. Configuration of genitalia largely agreeing with that of *E. sublasciva* sp. n., but several details are different.

R e m a r k s. In an earlier paper (Acta zool. hung., 26: 446—449, Figs 15, 16, 24), a specimen (slide No. 13.027) has been assigned to *E. lasciva* VOJNITS, whereas it in fact represents the new species under discussion.

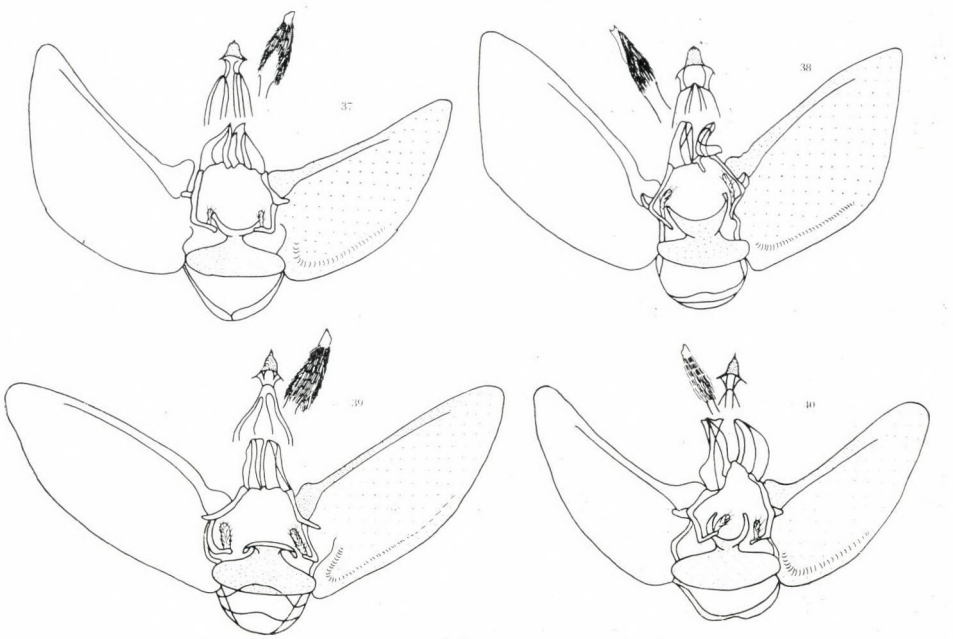
Holotype ♂: "A-tun-tse (Nord Yünnan). Obere Höhe (ca. 4500 m), 14.7 1936, H. HÖNE" "gen. prep. No. 12.153 ♂ DR. A. VOJNITS Budapest TTM". Paratypes: A-tun-tse, North Yuennan, 3500—4500 m, 13. 6.—2. 9. 1936, 18 ♂♂, 5 ♀♀, leg. H. HÖNE; Sung-Panting, 1 ♂, leg. STÖTZNER. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institute and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

Slides: Nos 12.133, 12.134, 12.152, 12.153, 12.154, 12.155, 12.157, 12.166, 12.168, 12.177, 12.184, 12.463, 12.505, 12.506, 12.530, 12.533, 13.937, 13.943, 13.950, 14.096, 14.937, 14.943, 14.950 (♂♂); 13.127, 13.326, 13.786, 13.922, 14.176 (♀♀), gen. prep. A. VOJNITS.

Eupithecia depressa disiuncta ssp. n.

(Derivation of subspecific name: disjunctus = separated).

D i a g n o s i s. Average alar expanse of male fore wing 17 mm, extreme values: 16 and 18.5 mm, respectively (based on 11 specimens); that of the



Figs 37—40. 37 = Male genitalia of *Eupithecia depressa* sp. n. 38 = Male genitalia of *E. nodosa* sp. n. 39 = Male genitalia of *E. lunatica* sp. n. 40 = Male genitalia of *E. benigna* sp. n.

two females 18 and 19 mm. Smaller than the nominate subspecies; coloration not rufous but greyish, transverse stripes sharply distinct.

G e n i t a l i a. ♂: Uncus longer than in nominate subspecies, valva more arcuate, chitinous outgrowths of aedoeagus larger, sternite VIII broader (Figs 36, 44, 52); ♀: shape of bursa copulatrix slightly different, lobi anales long (Fig. 57).

B i o l o g y. First stages and foodplant unknown. Type-specimens captured around the turn of August—September.

D i s t r i b u t i o n. Found in SE China. Locus typicus: Li-kiang, North Yuennan.

S u b s p e c i f i c d i f f e r e n c e s. Smaller than the nominate subspecies, wings (especially those of females) less elongate, median field of fore wing only occasionally (and then also hardly) rufous. The configuration of the genitalia display definite and unequivocal differences. The available data also show some difference in the flight period.

R e m a r k s. In an earlier paper (Acta zool. hung., 26: 446—449, Figs. 15, 16, 24) nine specimens (slide Nos 12.976, 12.978, 12.984, 13.028, 13.071 13.072, 13.161, 13.183) have been relegated to *E. lasciva* VOJNITS; according to the present investigations they represent *E. depressa* ssp. *disiuncta* ssp. n. and belong among the paratypes.

Holotype ♂: "Li-kiang (China). Provinz Nord-Yuennan. 1.9 1934, H. HÖNE." "gen prep. No. 13.787 ♂ DR. A. VOJNITS". Paratypes: Li-kiang, North Yuennan, 11. 8.—13. 9 1936, 10 ♂♂, 2 ♀♀, leg. H. HÖNE. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institute and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

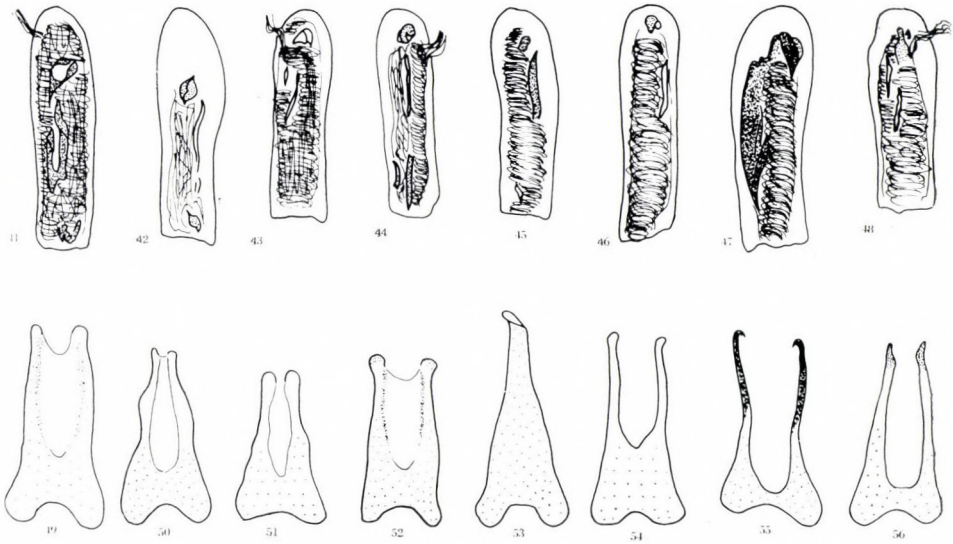
Slides: Nos 12.976, 12.978, 12.984, 13.028, 13.071, 13.072, 13.161, 13.169, 13.183, 13.256, 13.787 (♂♂); 13.344, 13.346 (♀♀); gen. prep. A. VOJNITS.

Eupithecia laudenda sp. n.

(Derivation of specific name: laudendus = praiseworthy).

D i a g n o s i s. Average alar expanse of male fore wings 17 mm, extreme values 16 and 20 mm, respectively (based on 6 specimens); that of the single female 19 mm. Fore wings elongate, costa and termen arcuate. Apex pointed. Tornus obtusely angulate. Hind wing short. Type-specimens rather worn. Discal spots minute, dark brown, costa of fore wing with some costal spots.

G e n i t a l i a. ♂: Uncus elongate, valva short, aedoeagus short and stout, with weakly sclerotized cornuti. Sternite VIII elongate, attenuating (Figs 34, 45, 53); ♀: bursa copulatrix piriform, signa densely arranged, small and thin, isolated signa robust. Both apophyses posteriori and anteriori medium long and thin. Lobi anales rotund (Fig. 58).



Figs 41—56. 41 = Aedoeagus of *Eupithecia sublasciva* sp. n. 42 = Aedoeagus of *E. laudenda* sp. n. 43 = Aedoeagus of *E. ficta* sp. n. 44 = Aedoeagus of *E. depressa* ssp. *disiuncta* ssp. n. 45 = Aedoeagus of *E. depressa* sp. n. 46 = Aedoeagus of *E. nodosa* sp. n. 47 = Aedoeagus of *E. lunatica* sp. n. 48 = Aedoeagus of *E. benigna* sp. n. 49 = Sternite VIII of *E. sublasciva* sp. n. 50 = Sternite VIII of *E. laudenda* sp. n. 51 = Sternite VIII of *E. ficta* sp. n. 52 = Sternite VIII of *E. depressa* ssp. *disiuncta* ssp. n. 53 = Sternite VIII of *E. depressa* sp. n. 54 = Sternite VIII of *E. nodosa* sp. n. 55 = Sternite VIII of *E. lunatica* sp. n. 56 = Sternite VIII of *E. benigna* sp. n.

Biology. First stages and foodplant unknown. All male type-specimens captured in the first week of August, the single female in the middle of September.

Distribution. A Tibetan species. Locus typicus: Batang, 3800 m.

Specific differences. Although every one of the available exemplars are rather worn, the costal spots of the fore wings are characteristic. The male genitalia deviate more from the *E. lasciva* type than those of the female.

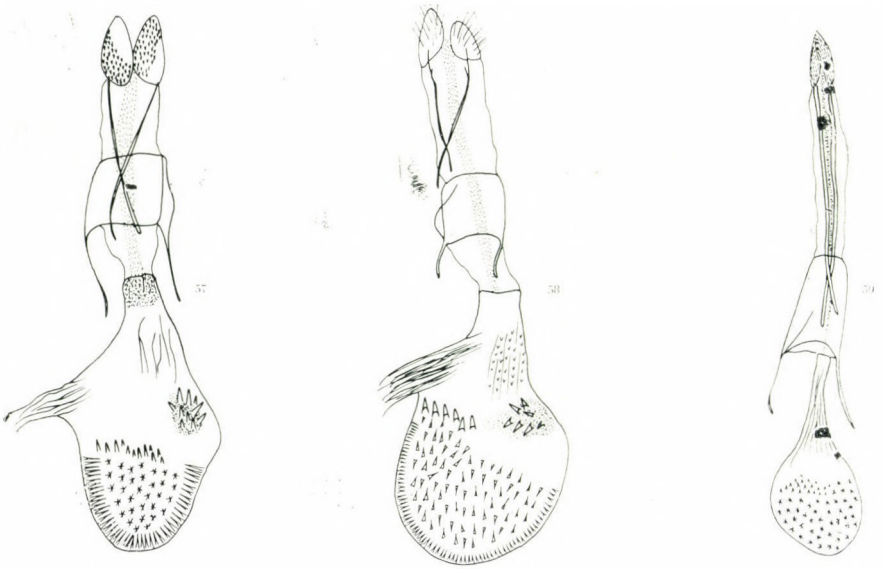
Holotype ♂: "Batang (Tibet). Untere Urwaldzone (ca. 3800 m), 4.8 1936, H. HÖNE." "gen. prep. No. 13.830 ♂ DR. A. VOJNITS". Paratypes: Batang, Tibet, 3800 m, 4. 8.—17. 9. 1936, 5 ♂♂, 1 ♀, leg. H. HÖNE. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institute and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

Slides: Nos 13.217, 13.225, 13.821, 13.829, 13.830, 13.836 (♂♂); 13.219 (♀); gen. prep. A. VOJNITS.

Eupithecia lunatica sp. n.

(Derivation of specific name: lunaticus = lunatic).

Diagnosis. Average alar expanse of male fore wings 20.5 mm, extreme values 19.5 and 21.5 mm, respectively (based on 5 specimens); that of



Figs 57—59. 57 = Female genitalia of *Eupithecia depressa* ssp. *disiuncta* ssp. n. 58 = Female genitalia of *E. laudenda* sp. n. 59 = Female genitalia of *E. lunatica* sp. n.

the single female 22 mm. Belonging among the larger-sized *Eupithecia* species. Fore wing an isosceles triangle. Costa and termen weakly arcuate, apex slightly pointed, tornus widely rounded. Hind wing short, angulate. Basic colour of fore wing yellowish brown, apical and terminal fields dark brown. Transverse stripes wide, doubled. Discal spot oval, dark brown. Hind wing yellowish brown, all transverse lines sinuous, densely arranged. Discal spot small, round, brown. Underside of fore wing shiny yellowish brown, that of hind wing yellowish white; pattern brown, well discernible. Cilia medium long, striated yellowish white and brown.

G e n i t a l i a. ♂: Uncus elongate, valva short, aedoeagus with long, thin chitinous cornuti. Sternite VIII with terminally widening lateral arms (Figs 39, 46, 54). ♀: bursa copulatrix spherical, its three-fifths padded with signa; ductus bursae thin, ribbed. Both apophyses posteriori and anteriori extraordinarily elongate; lobi anales similarly elongate (Fig. 59).

B i o l o g y. First stages and foodplant unknown. Type-specimens captured in July, within a short period.

D i s t r i b u t i o n. Found in S China. Locus typicus: A-tun-tse, North Yuennan, 4000 m.

S p e c i f i c d i f f e r e n c e s. A broad-winged species; *E. nodosa* sp. n. is similar in this respect, but the pattern is different. Besides the apparent deviations, the configuration of the male genitalia agrees with the basic type of the group, those of the female stand nearer to *Eupithecia benigna* sp. n.

Holotype ♂: "A-tun-tse (Nord Yünnan). Mittlere Höhe (ca. 4000 m), 5.7 1936, H. HÖNE" "gen. prep. No. 14.154 ♂ DR. A. VOJNITS". Paratypes: A-tun-tse, North Yuennan, 4000—4500 m, 5. 7.—17. 7. 1936, 4 ♂♂, 1 ♀, leg. H. HÖNE. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institute and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

Slides: Nos 13.744, 14.100, 14.116, 14.153, 14.154 (♂♂); 13.929 (♀); gen. prep. A. VOJNITS.

Eupithecia nodosa sp. n.

(Derivation of specific name: nodosus = knobbed).

D i a g n o s i s. Alar expanse of fore wings of the single male specimen 20 mm, that of the single female 21.5 mm. A large-sized, broad-winged species. Basic colour yellowish brown, hind wing only slightly lighter than fore wing. Costal and terminal fields a darker brown. Transverse stripes sharply angulate. Discal spot large, distinct, dark brown. Underside of wings uniformly shiny yellowish brown, that of hind wing only slightly lighter. Pattern brown. Cilia medium long, striated brownish white and brown.

G e n i t a l i a. ♂: Uncus long and robust, valva wide, apex slightly elongate. Aedoeagus stout, with three lamelliform chitinous cornuti. Lateral arms of sternite VIII uncinate (Figs 38, 47, 53); ♀: bursa copulatrix elongate, densely padded with signa. Both apophyses posteriori and anteriori extraordinarily long and relatively thin. Lobi anales small, elongate (Fig. 60).

B i o l o g y. First stages and foodplant unknown. The two type-specimens were captured by the end of August.

D i s t r i b u t i o n. Found in SE China. Locus typicus: A-tun-tse, North Yuennan, 4500 m.

S p e c i f i c d i f f f e r e n c e s. A large-sized, broad-winged species of marked appearance, thereby immediately distinguishable from its congeners in the group under discussion. The differences of the genitalia are also evident.

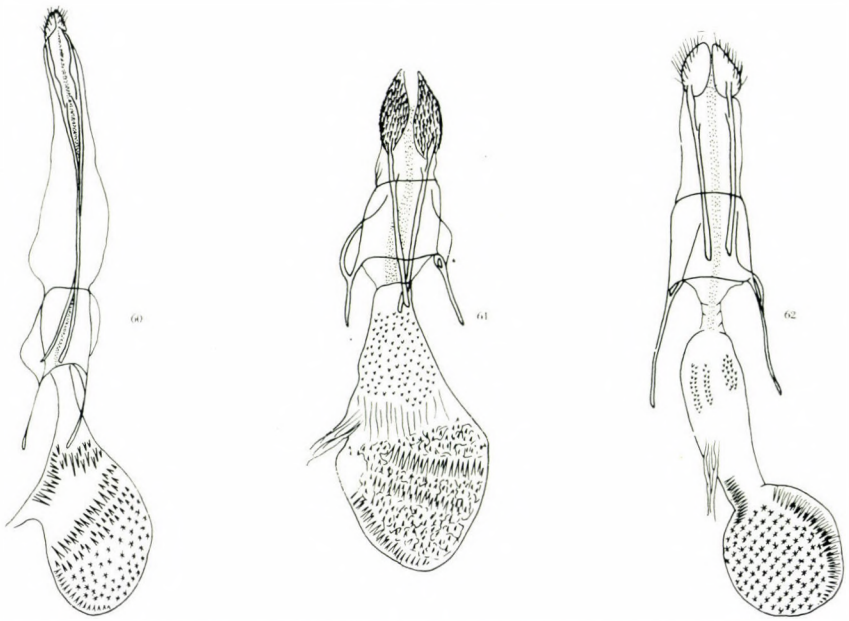
Holotype ♂: "A-tun-tse (Nord Yünnan). Obere Höhe (ca. 4500 m), 25.8 1936, H. HÖNE" "gen. prep. No. 14.180 ♂ DR. A. VOJNITS". Paratype: A-tun-tse, North Yuennan, 4000 m, 31. 8. 1936, 1 ♀, leg. H. HÖNE. Holotype and paratype deposited in the Hungarian Natural History Museum, Budapest.

Slides: Nos 14.180 (♂); 14.089 (♀); gen. prep. A. VOJNITS.

Eupithecia benigna sp. n.

(Derivation of specific name: benignus = gentle and mild).

D i a g n o s i s. Average alar expanse of male fore wings 18.5 mm, extreme values 16 and 20 mm, respectively (based on 12 specimens); that of the two female specimens 18 and 19 mm. Wings small, narrowly elongate. Costa and termen of fore wing only very slightly arcuate, apex pointed, tornus sharply defined. Hind wing angulate. Basic colour of fore wing brownish



Figs 60—62. 60 = Female genitalia of *Eupithecia nodosa* sp. n. 61 = Female genitalia of *E. benigna* sp. n. 62 = Female genitalia of *E. anteacta* sp. n.

yellow, apical and terminal fields, as well as along costa, brown. Transverse stripes obsolescent. Discal spot minute, brown. Hind wing somewhat lighter, transverse lines more densely arranged, discal spot minute. Underside of wings shiny, brownish yellow, pattern pale brown. Cilia short, striated brown and brownish yellow. Imagos with a sericeous sheen.

Genitalia. ♂: Uncus terminally elongate, valva resembling an orange slice, apex obtuse. Aedoeagus with a long, slender chitinous cornutus. Lateral arms of sternite VIII terminally widening (Figs 40, 48, 56); ♀: bursa copulatrix piriform, anteriorly padded with signa, posteriorly furrowed. Both apophyses posteriori and anteriori short and thick, terminally spatulate. Lobi anales very long (Fig. 61).

Biology. First stages and foodplant unknown. Type-specimens captured around the turn of July and August.

Distribution. Known from the southern part of Central China. Locus typicus: Mien-shan, Shansi, 2000 m.

Specific differences. A small and narrow-winged species; hind wing angulate; thereby differing from the related taxa. Though the male genitalia can be assigned to the basic type of the group, the differences are conspicuous; the female genitalia is fundamentally different.

Remarks. In an earlier paper (Acta zool. hung., **26**: 446—449, Figs 15, 16, 24), eight specimens have been relegated to *E. lasciva* VOJNITS, whereas

they (slides 13.191, 13.192, 13.194, 13.195, 13.196, 13.198, 13.199, 13.200) represent the new species described above.

Holotype ♂: "Mien-shan (Prov. Shansi). Obere Höhe (ca. 2000 m), 3.8 1937, H. HÖNE" "gen. prep. No. 13.194 ♂ DR. A. VOJNITS". Paratypes: 2. 7.—14. 8. 1937, 11 ♂♂, 2 ♀♀, all from Mien-shan, leg. H. HÖNE. Holotype deposited in the Hungarian Natural History Museum, Budapest, paratypes in the same institute and in the Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

Slides: Nos 13.192, 13.193, 13.194, 13.195, 13.196, 13.198, 13.199, 13.200, 13.203, 13.740 (♂♂); 13.191, 13.199, 13.201, 13.202 (♀♀); gen. prep. A. VOJNITS.

Eupithecia anteacta sp. n.

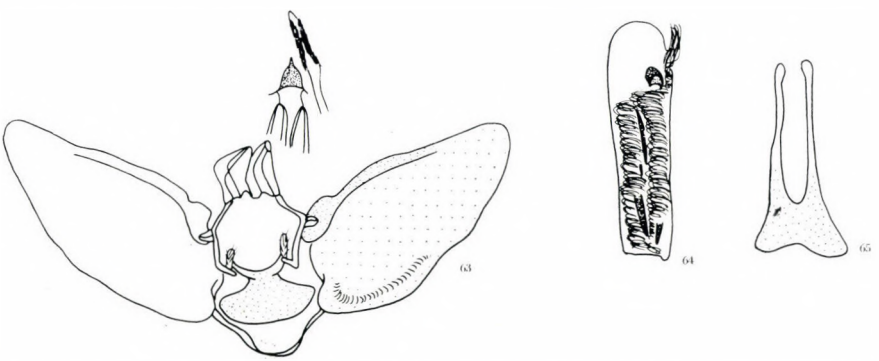
(Derivation of specific name: anteactus = as the preceeding one).

D i a g n o s i s. Alar expanse of fore wing of the single male specimen 21.5 mm, that of the single female 22.5 mm. A large-sized species. Fore wing an isosceles triangle, both costa and termen arcuate; apex angulate, tornus rounded. Hind wing round, wide. Basic colour of fore wing an evenly shiny brown, transverse stripes obsolete, discal spot dark brown. Hind wing lighter, darker in terminal field. Underside of wings pale shiny brown, transverse stripes hardly discernible, discal spots well visible. Cilia medium long, shiny brown.

G e n i t a l i a. ♂: Uncus relatively long, valva short, ventrum elongate. Aedoeagus with thin, long cornuti. Sternite VIII very long, basally deeply excised (Figs 63—65); ♀: bursa copulatrix small, rotund, densely padded with signa. Ductus bursae very long. Both apophyses posteriori and anteriori long and wide. Lobi anales small (Fig. 62).

B i o l o g y. First stages and foodplant unknown. Type-specimens captured in the middle of August and the first half of September.

D i s t r i b u t i o n. Found in SE China. Locus typicus: A-tun-tse, North Yuennan, 4000 m.



Figs 63—65. 63 = Male genitalia of *Eupithecia anteacta* sp. n. 64 = Aedoeagus of *E. anteacta* sp. n. 65 = Sternite VIII of *E. anteacta* sp. n.

Specific differences. The new species differs from its congeners in the group primarily by the nearly patternless wings. The male genitalia are characterizable by the long uncus, the sinous ventrum, and the long lateral arms of sternite VIII. The female genitalia are very characteristic.

Holotype ♂: "A-tun-tse (Nord Yünnan). Mittlere Höhe (ca. 4000 m), 15.8 1936, H. HÖNE" "gen. prep. No. 14.099 ♂ DR. A. VOJNITS". Paratype: Li-kiang, North Yuennan, 9. 9. 1934, 1 ♀, leg. H. HÖNE. Holotype and paratype deposited in the Hungarian Natural History Museum, Budapest.

Slides: Nos 14.099 (♂); 13.768 (♀); gen. prep. A. VOJNITS.

Acknowledgements. The study of the collection was made possible by the grant of a stipend for over a year by the Humboldt Foundation. I am deeply obliged for this support, as also for the extensive help given by Prof. DR. G. NOBIS, Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn.

Acta Zoologica Hungarica 30 (3—4), pp. 545—550 (1984)

THE EUROPEAN GENERA OF NEMATINAE (HYMENOPTERA: SYMPHYTA, TENTHREDINIDAE)

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(Received 15 November, 1983)

A concise key to the genera of European Nematinae and notes on the subfamily are given.

One of the most difficult groups of sawflies, as will doubtless many students admit, is the subfamily of Nematinae. There are several examples for one author or another to describe a number of nematine species in one year only to draw them in as synonyms a few years afterwards. This somewhat indicates that the representatives of this group are highly variable and are perhaps coming to the acme of their phylogenetic evolution having many an external morphological characteristic still in the making. This is why the assessment of their true value becomes extremely difficult.

A broad outline of the subfamily Nematinae was given by HELLÉN (1960) and a few years ago by ZOMBORI (1979). Still basically I followed the order of treatment of genera as discussed by BENSON (1958), incorporating the new genera described since then (BENSON, 1960; KONTUNIEMI, 1966; WONG, 1967, 1969).

The species belonging here are mostly small or at most medium-sized, 3—11 mm long, of highly varied shape, from very plump to cigar-shaped. Also their colour may be from light yellow or green to black. One of their most important characteristics is the undivided radial cell in the fore wing. The subcosta is straight throughout, while the basal vein with the first recurrent vein usually strongly converge towards the pterostigma. Hind wing with cubital and discoidal cells closed. Prepectus is always present, though occasionally hard to distinguish from rest of mesepisternum. In rare cases wings may be somewhat reduced, not reaching the apex of abdomen. Antenna with nine joints. (Though *Decanematus* MALAISE, 1931, from East Siberia and North America has 10 antennal joints.)

The larvae are mostly feeding freely on the leaves of their host-plants, some develop within galls, others roll back the edge of leaves and feed within this tube. A number of species cause serious damage for forestry.

The members of Nematinae are almost exclusively confined to the Northern hemisphere with nearly 40 valid genera, of which 17, belonging in two tribes are found in Europe.

Key to genera

1 (6) The first (1*m-cu*) and the second (2*m-cu*) recurrent veins of the fore wing meeting second (1*RS*) and third cubital cell (2*RS*), respectively. Distance between the apical point of meeting of the basal vein (*M*) on subcosta (*Sc*) and cubital vein is about the same or shorter than that between cubital vein (*Cu*) and pterostigma. Prepectus is very weakly developed, usually present in the form of a narrow sclerite separated from mesepisternum by a very thin prepectal suture. Anal cell (*A*) widely constricted in the middle to form two closed cells. Wings always fully developed.

2 (3) Antenna of male pectinate, at least flagellar joints 1—3 with long apical projections. Antenna of female short, without projections but bilaterally flattened, so much so that each of the first three flagellar joints not more than three times longer than broad. Cerci of female elongated reaching further back than apex of sawsheath. — Type-species: *Tenthredo difformis* PANZER, 1799 **Cladius** ILLIGER, 1807

3 (2) Antenna of male normal, flagellar joints, at most, somewhat swollen apically, but without long projections. Antenna of female long and mostly cylindrical, thus flagellar joints at least four times longer than broad. Cerci of female short, frequently not reaching as far as apex of sawsheath.

4 (5) Abdomen mostly black. Basitarsus of hind leg long, about the combined length of the three following tarsal joints. Clypeus broadly emarginate on front margin. Claws with either a small or a large inner tooth (= *Stevensia* BRULLÉ, 1846). — Type-species: *Priophorus pilicornis* DAHLBOM, 1835 **Priophorus** DAHLBOM, 1835

5 (4) Abdomen yellow. Basitarsus of hind leg short, about the combined length of the two following tarsal joints. Clypeus deeply excised on front margin. Claws with a large inner tooth.—Type-species: *Nematus grandis* LEPELETIER, 1823 **Trichiocampus** HARTIG, 1837

6 (1) The first and the second recurrent veins of the fore wing both meeting third cubital cell. Distance between the apical point of meeting of the basal vein on subcosta and cubital vein is always greater that that between cubital vein and pterostigma. Prepectus is clearly perceptible, prepectal suture distinct. Anal cell variable, either widely constricted in the middle or basal loop is wanting, only a stub of vein present. Wings either fully developed or abbreviated, not reaching apex of abdomen.

7 (10) Anal cell of fore wing widely constricted in the middle to form two cells: a closed basal loop and an apical fusiform cell.

8 (9) Tarsal claws simple. Costal vein clavate at its apex. Sawsheath in

dorsal view dilated towards its apex, where it is bisinuate, leaving a small point in the middle (= *Marlattia* ASHMEAD, 1898). — Type-species: *Nematus pectoralis* LEPELETIER, 1823

Anoplonyx MARLATT, 1896

9 (8) Tarsal claws with a large tooth on the inner margin. Costal vein not clavate at its apex. Sawsheath in dorsal view simple, clearly tapering to a point at apex (= *Leptopus* HARTIG, 1837, nec MAYER, 1835; *Erasminus* GISTEL, 1848; *Camponiscus* NEWMAN, 1869). — Type-species: *Nematus* (*Leptopus*) *hypogastricus* HARTIG, 1837

Platycampus SCHIÖDTE, 1839

10 (7) Anal cell of fore wing with only a stub of vein, thus basal loop open, only apical fusiform cell intact.

11 (16) Apex of costal vein of fore wing so strongly swollen as to almost obliterate apical portion of costal cell. Clypeus normally subtruncate on front margin, at most emarginate to about one-third length of clypeus. Tarsal claws various, though mostly with a small inner tooth.

12 (13) Tarsal claws wide at base, bifid at apex (inner tooth longer than end tooth) and in addition with a large basal lobe. Clypeus subtruncate on front margin. Antenna of male serrate below, bilaterally compressed, so that first flagellar joint only four times longer than broad (= *Stauronema* BENSON, 1948, nec SOLLAS, 1877). — Type-species: *Nematus compressicornis* FABRICIUS, 1804 **Stauronematus** BENSON, 1953

13 (12) Tarsal claws normal, not widened at base, may be simple with a small inner tooth, or sub-bifid (inner tooth never longer than end tooth), but always without a basal lobe. Clypeus either subtruncate or emarginate in the middle on front margin. Antenna not particularly flattened, as a rule setiform, comprising simple joints.

14 (15) Sawsheath in dorsal view most peculiarly shaped by having two deep incisions on either side of middle, leaving an apical digitiform process medially (cf. BENSON, 1958, p. 172). Scopa clothing dorso-apical part of sawsheath. Saw narrow and heavily sclerotized. Penis valve of male cymbiform, dorsal margin concave in lateral view, apex always pointed. — Type-species: *Tenthredo ambiguus* FALLÉN, 1808

Sharliphora WONG, 1969

15 (14) Sawsheath in dorsal view various, but never with a digitiform process medially. Scopa clothing apical or ventro-apical part of sawsheath. Saw broad and only weakly sclerotized. Penis valve highly variable, but most frequently dorsal margin convex in lateral view, apex either blunt or pointed (= *Diphadnus* HARTIG, 1837; *Lygaeonematus* KONOW, 1890; *Micronematus* KONOW, 1890; *Gymnonychus* MARLATT, 1896; *Neotomostethus* MACGILLIVRAY, 1908; *Pristiphora* subg. *Sala* ROSS, 1937, nec WALKER, 1867; *Pristiphora* subg. *Lygaeophora* LINDQVIST,

1952; *Pristiphora* subg. *Lygaeotus* LINDQVIST, 1952). — Type-species: *Pteronus testaceus* JURINE, 1807 **Pristiphora** LATREILLE, 1810

16 (11) Apex of costal vein of fore wing not strongly swollen, apical portion of costal cell broad. Clypeus normally deeply excised on front margin to a depth of at least one-third length of clypeus. Tarsal claws variable, but usually with an inner tooth that may either be long or short.

17 (20) Frons between antennal sockets only weakly convex, frontal crest wanting. Inner orbit in dorsal view almost flat. Emargination of clypeus on front margin shallow.

18 (19) Facial area just outside antennal socket deeply excavated. Tarsal claws with large inner tooth close to end tooth; two teeth subtending an acute angle. Head usually parallel behind eyes. Clypeus narrowly emarginate in the middle on front margin (= *Pontoprista* MALAISE, 1921). — Type-species: *Nematus fallax* LEPELETIER, 1823

Amauronematus KONOW, 1890

19 (18) Facial area just outside antennal socket shallowly excavated. Tarsal claws with large inner tooth far removed from end tooth; two teeth enclosing a semicircular inner margin. Head contracted and rounded behind eyes. Clypeus broadly emarginate in the middle on front margin. — Type-species: *Pachynematus dentatus* LINDQVIST, 1937

Eitelius KONTUNIEMI, 1966

20 (17) Frons between antennal sockets strongly convex, angularly produced into a frontal crest. Inner orbit in dorsal view often convex. Emargination of clypeus on front margin variable.

21 (22) At least apical one-third of hind tibia and hind basitarsus expanded, phylliform. Tibia of at least middle and hind legs marked with white basally. — Type-species: *Tenthredo septentrionalis* LINNÉ, 1758

Croesus LEACH, 1817

22 (21) Apex of hind tibia and hind basitarsus normally developed, not phylliform. Tibia of middle and hind legs most frequently without any white basally.

23 (24) Second and third cubital cells in fore wing about the same length. Plump species with yellow pterostigma that is strongly infuscate basally. Sawsheath very broad at base. Eighth abdominal tergite of males apically produced but without a clearly separable projection medially. — Type-species: *Tenthredo abdominalis* PANZER, 1799

Nematinus ROHWER, 1911

24 (23) Second and third cubital cells in fore wing unequal, latter much shorter. Habitus variable, frequently slender with variously coloured pterostigma, but when latter yellow then without strong basal infuscation. Sawsheath normally developed. Eighth abdominal tergite of males with clearly perceptible apical projection medially.

25 (30) Small species, length below 5 mm. Malar space shorter than distance between antennal sockets. Hind tibial spurs unequal and shorter than apical width of corresponding tibia. Pterostigma frequently infuscate apically.

26 (27) Second cubital cross-vein (*2rm*) missing, thus second cubital cell much elongated. Black, gracile species. Pterostigma usually dark, lighter only at base. Sawsheath very short, much shorter than basal plate. Tarsal claws bifid or inner margin with only a small tooth (= *Nematus* subg. *Cryptocampus* HARTIG, 1837). — Type-species: *Euura gallae* NEWMAN, 1837 **Euura** NEWMAN, 1837

27 (26) Second cubital cross-vein (*2rm*) present, second and third closed cubital cells subequal. Body usually extensively coloured with yellow. Pterostigma pale throughout. Sawsheath subequal to basal plate. Tarsal claws bifid, never with small inner tooth.

28 (29) Sawsheath short, in lateral view emarginated along lower margin, and apex often produced into a sharp point, while its length always shorter than hind femur. Fourth tarsal joint of hind tarsus peculiarly developed, strongly transverse (cf. BENSON, 1960, p. 60). Inner spur of fore tibia long, often more than half as long as corresponding basitarsus. — Type-species: *Nematus leucaspis* TISCHBEIN, 1846

Phyllocolpa BENSON, 1960

29 (28) Sawsheath long, in lateral view evenly rounded along lower margin and frequently with a blunt apex, whole length subequal to or longer than hind femur. Fourth tarsal joint of hind tarsus normal, at least 1.5 times longer than wide (cf. BENSON, 1960, p. 60). Inner spur of fore tibia short, not surpassing half length of corresponding basitarsus. — Type-species: *Nematus gallicola* STEPHENS, 1835

Pontania O. COSTA, 1859

30 (25) Larger species, length usually over 5 mm. Malar space frequently longer than distance between antennal sockets. Hind tibial spurs unequal and longer than apical width of corresponding tibia. Pterostigma of various colour, but never darker at apex than at base.

31 (32) Claw of hind tarsus with long inner tooth, two teeth subtending an acute angle. Inner tooth always longer than its own basal breadth (= *Hypolaepus* KIRBY, 1882; *Holcocneme* KONOW, 1890; *Pteronidea* ROHWER, 1911). — Type-species: *Tenthredo* (*Nematus*) *lucida* PANZER, 1801 **Nematus** PANZER, 1801

32 (31) Claw of hind tarsus always with a very short inner tooth, two teeth far removed from each other and enclosing a large semicircular inner margin. Inner tooth especially in males, not longer than its own basal breadth. — Type-species: *Nematus capreae* PANZER, 1799

Pachynematus KONOW, 1890

The genera show the following tribal distribution:

Cladiini
Cladius ILLIGER, 1807
Priophorus DAHLBOM, 1835
Trichiocampus HARTIG, 1837

Nematini
Amauronematus KONOW, 1890
Anoplonyx MARLATT, 1896
Croesus LEACH, 1817
Eitelius KONTUNIEMI, 1966
Euura NEWMAN, 1837
Nematinus ROHWER, 1911
Nematus PANZER, 1801
Pachynematus KONOW, 1890
Phyllocolpa BENSON, 1960
Platycampus SCHIÖDTE, 1839
Pontania O. COSTA 1859
Pristiphora LATREILLE, 1810
Sharliphora WONG, 1969
Stauronematus BENSON, 1953

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Date of publication: November 1984
PRINTED IN HUNGARY
Akadémiai Kiadó és Nyomda, Budapest

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