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ADIUVANTIBUS

L. GOZMÁNY, T. JERMY, Z. KASZAB, S. MAHUNKA,
L. MÓCZÁR, Á. SOÓS, G. SZELÉNYI, Z. VARGA

REDIGIT

J. BALOGH

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Professor János Balogh 70 years old



On the occasion of his 70th birthday his friends, colleagues and the Hungarian zoologists whole-heartedly greet Professor Dr. János Balogh, member of the Hungarian Academy of Sciences. János Balogh is a leading figure of Hungarian zoology in the research of zoocenology, soil zoology but more especially in the study of Oribatid taxonomy.

Still as a young man he devoted himself to zoology. While a university student he was already deeply involved in the research of Arachnoidea and scarcely passing his twentieth birhtday he published his first scientific papers on tropical spiders. As a student of Professor Endre Dudich, the teacher of us all, his doctoral thesis was the first to discuss zoocenological problems in Hungary: "A Sashegy pókfaunája" (The spider fauna of Sashegy). He deeply delved into his theme founding a new school for this special field of research. The acme of this period was his famous work: "A zoocönológia alapjai" (The bases of zoocenology) published in Hungarian and German: "Lebensgemeinschaften der Landtiere", giving an impetus to this field of science well broadening it at international level.

As a university student his other interest was the Oribatids of Hungary, later to be extended over to world level. He has always been attached to this group of arthropods, writing several syntheses of which the greatest was "The Oribatids of the World" (1972). Today with his erstwhile student Dr. Sándor Mahunka jointly he is compiling a series of monographs (The soil mites of the World) the first volume of which will be: "Primitive Oribatids of the Palaearctic Region".

He is a paramount figure in the organization of soil zoological investigations. He brought together a team of the best specialists to elaborate the most important soil animals, the results of which, especially the role of Oligochaeta in the life of the soil, led to international recognition. His ever active organizing work much promoted the taxonomical investigations of Nematoda, Oligochaeta, Collembola, Diplopoda, Chilopoda, Acari, etc. which he always subjected to the realization that without a procound knowledge of the species composition soil zoology and zoocenology cannot be fompetently cultivated.

János Balogh is not only a significant theoretician mind but also a field worker. Besides his investigation of the Hungarian fauna and his general soil fauna

researches, since 1962 there has not been a year without his travelling to the tropics. His first expedition led him to Brazzaville-Congo together with one of his young students of the Hungarian Natural History Museum. After three months he brought back a huge quantity of material, the great majority of which had already been worked up; the results include several hundred species new to science. This expedition was followed by many others covering all the five continents: North, Central and South Americas (from Brazil to the Tierra del Fuego), East Africa, Sri Lanka, Papua New Guinea, New Caledonia, Australia, New Zealand, etc. The scientific evaluation of these vast materials will take yet decades to complete.

János Balogh is not only a scientist but also a significant organizer of science who has gained ever-lasting merit in the improvement of Hungarian zoology. For several years he was the president of the Zoological Committee of the Hungarian Academy of Sciences, for two cycles was the president of the Biological Section of the Hungarian Academy of Sciences and that of the Zoological Section of the Hungarian Biological Society. He is also honorary member of several scientific organizations; in fact he is there where he can promote Hungarian zoology on the whole.

The scientific career of János Balogh has been unbroken. Although as a young man he found himself one of a forlorn generation and had to start profession as unpaid assistant lecturer striving to keep himself up by other means. He worked in the Zoological Department of the Hungarian Natural History Museum after 1945, later at the Biological Institute at Tihany and at the Zoosystematic Institute of the Eötvös Loránd University as an adjunct, then a reader and since 1964 a full professor. For his scientific achievements in 1963 he was awarded the Kossuth Prize, in 1965 he became corresponding member of the Hungarian Academy of Sciences, and in 1973 he gained full membership.

We all of us wish János Balogh many prosperous years to come, vigour and good health to complete all those plans that he yet is so ambitious to carry out for the benefit of Hungarian and universal zoology.

Budapest, 19th February, 1983.

Zoological Committee of the
Hungarian Academy of Sciences

ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
XXIX. 1–3 1983 p. 1–79

A PARTIAL REVISION OF THE OPPIIDAE GRANDJEAN, 1954 (ACARI: ORIBATEI)

J. BALOGH

(Received 15 July, 1982)

Author endeavours to make a provisory system for the adequately described species and genera of the family Oppiidae. Eleven morphological features used in current descriptions provide a combination of 25 artificial subfamilies. The so far described 64 Oppiidae genera considered to be valid are characterized briefly by the combination of the selected eleven features. 48 new genera are erected on the basis of feature combinations of similar value. The 112 genera are characterized in codified tables, in identification keys as well as in short diagnoses. The 25 subfamilies are also characterized in identification keys.

1. Introduction

1. The Oppiidae belong to the most common Oribatid mites both as far as specimen and specific numbers are concerned. So far approximately 500 species have been described; the great majority of them in the last 25 years. Owing to this fact, the various authors used identical techniques, consequently their descriptions on the whole are comparable with one another. This circumstance is important, because in older times the type material of Oribatids were preserved on permanent slides. Thus prepared specimens after a time suffered injuries or crashed and thereby were inadequate for redescription. When making revision of old materials the loaning of types frequently presents unsurmountable difficulties. Consequently, the original description of species becomes of greater value than in the case of those species whose redescription has been made on the basis of original type material.

2. The number of described Oppiid species is exponentially increasing year by year and today almost unsurveyable. The great majority of the species has been described as *Oppia* sensu lato. Many newly erected genera entirely lack the differential diagnosis, thus their relation to one another is not at all lucid. Part of the species, mostly those described before 1958, has been rather inadequately characterized, these are unsuitable for comparison. Both the larvae and the nymphs are entirely unknown in the great majority of the species. The difficulties are made even graver that in the recent collections many new species come again forward. In this situation it is now inevitable to even provisorily systematize the supraspecific categories of the family.

This work will be carried out herewith partly on the basis of species descriptions and partly by studying original Oribatid material.

3. Recent Oribatological literature may be divided into two groups. In one, the species of a taxon, e.g. genus, are treated in a small area or a country. In discussing the species such new characteristics are expounded and used which had not been in current use earlier. Consequently, the taxonomic results are valid only for those 10—15 species investigated by the author, the rest of the related species thereby devalued to the level of species incertae sedis. I consider this method even ethically wrong, since the works of earlier authors are left out of consideration. In the other group, represented for example by S. WOAS: Zur Taxonomie und Phylogenie der Hermanniidae Sellnick, 1928 (Acari, Oribatei) the so-called "Merkmalsbündel" method is followed. The author in his cited work is very convincing in that that descriptions of different quality and of different depth may be compared with one another and synthesis could be made. In my opinion this is the future road for Oribatidology.

4. In my present work I follow the method of S. WOAS, but in a very moderate way. I chose only 11 such morphological features, the presence or absence of which or the combination of the two appear suitable to separate species-combinations, subgenera and genera. In addition to the 11 morphological characteristics where possible I use further one or several features whose presence is especially characterizing for a special species-group. By the help of these 11 or 12 morphological features I wish to consequently characterize the so far described genera, subgenera or species-groups, or to separate yet new supraspecific units.

5. In complying with the opinion of many a zoologist, I also hold the view that independently from the human mind only one concrete category is existing, and that is the species. Supraspecific units like species-group, subgenus, genus, subfamily, etc. are mere abstractions, which we concocted mostly for the reason to easily orientate ourselves in the vast number of species. Thus, also in Oribatidology today the supraspecific units of Oribatid mites bear no more significance than that. There are so many yet undescribed species that no phylogenetic synthesis can be made, nor even a reliable zoogeographical picture can be drawn. I wish that my colleagues in Oribatidology take my endeavour as only a tool in using the literature and grouping the species of Oppiidae.

6. It directly follows from the above that provisorily I do not wish to differentiate between a species-group, a subgenus or a genus. In case these categories may well be characterized by the combination of features I include them both in my code-table and in my identification key under the subgeneric or generic name given by the authors. When such a well characterizable group does not have a name, I give a generic rank to it. It might well happen

in the future that one or two of my generic names will be considered only a subgenus or only a species, time will tell. I believe that though the entire nomenclatorial problem involved is important but has a far less important impact than a clear and quick way of identification of a species.

7. My subfamily categories here are less artificial units than the genera and subgenera. But I believe that my genera grouped under one subfamily bear more relation to one another than one genus in one subfamily with an other one in an other subfamily. Perhaps the only exception from this rule is the subfamily Cycloppiinae, since all the genera belonging here, though exhibiting most versatile morphological characters, are related to one another by a single feature: the number of genital setae (G = 4). It seems most likely that this subfamily will have to be further divided. Some specialists may well think that the number of my supraspecific units is unusually high, but I wish here to make reference to two facts. One is that it is for sure that the world Oppiidae are very inadequately known today, and that after a full exploration of this fauna the number of species will most likely be multiplied several times. This will of course bring with itself a much higher number of supraspecific taxa, too. The other is that those Oribatidologists who are working on bigger European, or world materials will be compelled to erect many new supraspecific categories when elaborating the family Oppiidae (HAMMER, WALLWORK, AOKI, SUBIAS, etc.).

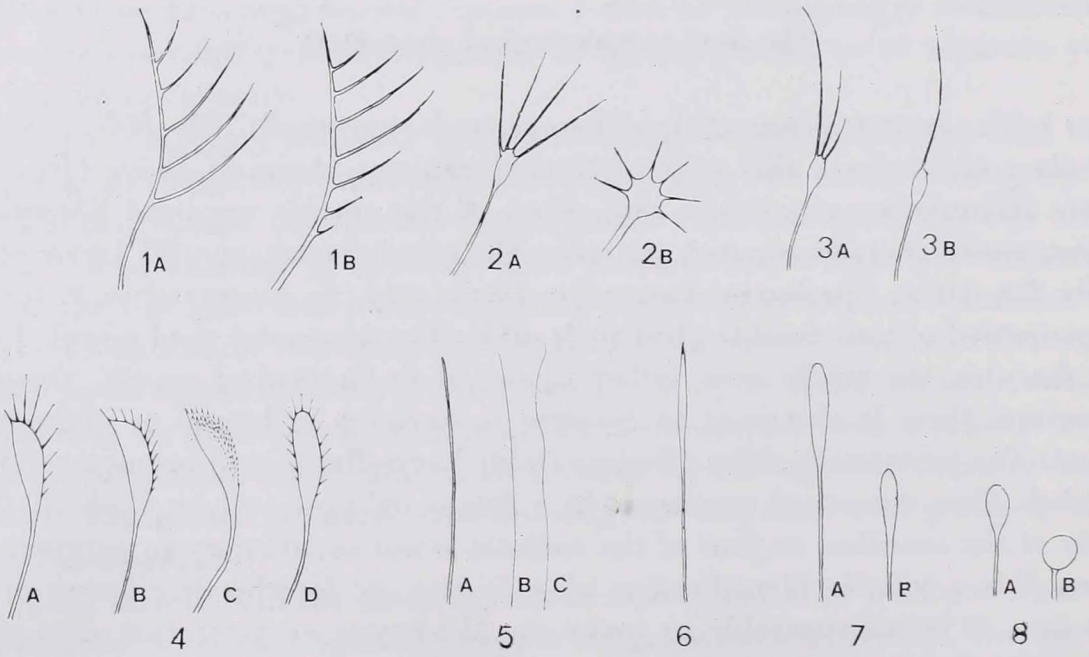
The used morphological characters

1. The great majority of Oppiidae species is very small: 200—300 microns, or only a little above this value: 300—500 microns. Animals above 600 and below 200 microns are rather rare. Most of the species are light brown in colour; easily transilluminated and after the usual treatment with lactic acid ready for study. Specimens warmed in lactic acid, or preserved in it for a longer period of time tend to shed their setae. The hereunder used morphological features are readly seen either in dorsal or in ventral aspect, though sometimes there is also need to examine a specimen in lateral or in frontal aspect. The permanent slides (Berlese-fluid, Faure-fluid, etc.) are not recommended. Thus conserved specimens in a few years' time will be crashed; the study of the sensillus, or that of the rostrum is not satisfactory in permanent slides. For a reliable identification of a species, or for the description of a new one, it is indispensable to make an Abbé-type or projection drawing. A fundamental requirement is to have a dorsal and a ventral drawing and a highly magnified picture of the sensillus, occasionally even from two directions. Sometimes a frontal picture of the rostrum is useful; finally, the detailed and exact description of the chaetotaxy of the genital and anal regions are

wanted. Without the listed drawing and features most of the *Oppia* species are wellnigh unrecognizable.

2. The present contribution uses the following 11 characteristics: Prodorsum: the presence, the absence and the shape of costula (1). The type of sensillus (2). The relative distance (ratio of *in-le-ro*) of interlamellar, lamellar and rostral setae (3). The type of rostrum (4). Notogaster: the presence or absence of crista (5). The presence or absence of seta *ta* (6). The number of notogastral setae (7). Ventral side: the number of genital setae (G) (8). The position of pori *iad* (9). The position of seta ad_1 (10). The position of seta ad_3 (11). In my codified Table 1 make reference to all by one number, only occasionally do I make exceptions. The case of presence—absence is marked by 1 or 0. As the first step in identification I would strongly suggest to carefully code these 11 features on the margin of a paper. If the codified numbers are written the same way as they are placed in the table, then by pulling the paper from above to below mechanically and very quickly we can select the identical number combination that makes reference to the generic whereabouts of the species in question.

3 Prodorsal characteristics: The costula is a chitinized keel or lath on the surface of the prodorsum. Its presence or absence is readily seen in the greatest majority of the cases. In dubious cases I figure the genus in question in both theses of the identification key. The sensillus (Figs 1—8) is highly varied



Figs 1—8. Types of sensillus. 1A—B = pectinate, 2A—B = radiate, 3A—B = hetero-radiate, 4A—B = fusiform and unilaterally ciliate, 4C = fusiform and unilaterally aciculate, 4D = fusiform and bilaterally ciliate, 5A = bacilliform, 5B = setiform, 5C = flagellate, 6 = lanceolate, 7A = fusiform with long stalk, 7B = fusiform with short stalk, 8A = capitate with long stalk, 8B = capitate with short stalk

in the family Oppiidae, from among the possible shapes of course several reiterated that may be grouped as follows: 1. Pectinate: setiform or bacilliform stalk with similar branches unilaterally (when the stalk is slightly fusiform, it is a transition to point 4: Fusiform, unilaterally ciliate). 2. Radiate: fusiform head with radiate branches. 3. Asymmetrically radiate or hetero-radiate: fusiform head with radiate, but branches of different lengths (the branches occasionally may be reduced and as a final stage only a single long branch remains). 4. Fusiform, unilaterally ciliate or fusiform bilaterally ciliate: the branches are short cilia. 5. Bacilliform, setiform or flagelliform: stick-like, hair-like or flagellate sensillus with cilia or without them. 6. Lanceolate: Thickening towards the end, then gradually apicate. (Transitions may occur towards the setiform, in exceptional cases to the fusiform.) 7. Fusiform: Gradually becoming thick towards the apex, but apex rounded. (Transitions may be towards the setiform or the lanceolate.) 8. Capitate: Either long or short stalk with suddenly widening, occasionally with a ball-like head. Rostrum (Fig. 12) may have one or two incisions, accordingly has two or three apices; in other cases entire and rounded. (The incision occasionally very small, in such cases apparent only in frontal view.) Rostrum in subapical position may have an inverted V-like fenestrate spot. This may be taken also as if the two incisions have fused. The position of the lamellar seta in relation to the interlamellar and rostral ones may be of two types: either closer to seta *in* or to seta *ro*. The former configuration is more frequent. In dorsal aspect sometimes appearing in half way between the two (in such cases I marked it by an asterisk). (However, in lateral view it is well discernible when the insertion point of seta *le* on the prodorsal surface is closer to seta *in* than to seta *ro* !)

4. The characteristics of the notogaster: Crista appears on the front of the notogaster mostly as a chitinized lath running forward. But we also call any kind of chitinized formation which adorns the dorsosejugal suture on the borderline between prodorsum and notogaster. This may be a recurrent chitinous crest (*Perspicuoppia*) or a pair of pointed processes directed anteriorad (*Oxyoppia*), or a pair of longitudinal lines (*Machuella*). The presence or absence of setae *ta* is always readily observable; likewise no problem is presented in the counting of 9 or more number of notogastral setae. Some problem is presented by the fact the SUBIAS described *Anomaloppia* as having 11 notogastral setae. It is quite possible that such forms are present also among the already described genera. In such case the erroneously identified seta *ta* is somewhat more backwards and the real seta *ta* is represented by only its insertion point in front.

5. The characteristics of the ventral side: It is of paramount importance to exactly establish the number of genital setae. For this operation a well transilluminated specimen is indispensible and a microscope with high resolving power. Most of the species belongs to the G = 5 group; less to group G = 4.

Pori *iad* (Fig. 9) are adanal in position when they are closer to the anal plate being parallelly placed with its margin; they are apoanal when removed from it and oblique in position. Seta ad_1 (Fig. 10) postanal when originating behind anal plate; adanal in position when it is above an imaginary line touching horizontally the hind margin of the anal plate, in fact originating laterally in relation to anal plate. Seta ad_3 (Fig. 11) preanal in position when it is inserted above the imaginary line the front margin of the anal plate; adanal when inserted below it.

6. I tried to select the above described 11 characteristics in such a way to be applicable to even the older descriptions and figures; however, in some cases my endeavours were unfruitful. Grave problems have been encountered in descriptions not figuring the number of genital setae. Consequently, these species could not be fitted into these keys, not even could I establish their true generic status. Various other reasons also hindered the establishment of generic statuses of otherwise adequately described species. These problems remained yet unsolved, and I shall return back to these in a later publication. Still I believe that the described viewpoints will be suitable for the establish-

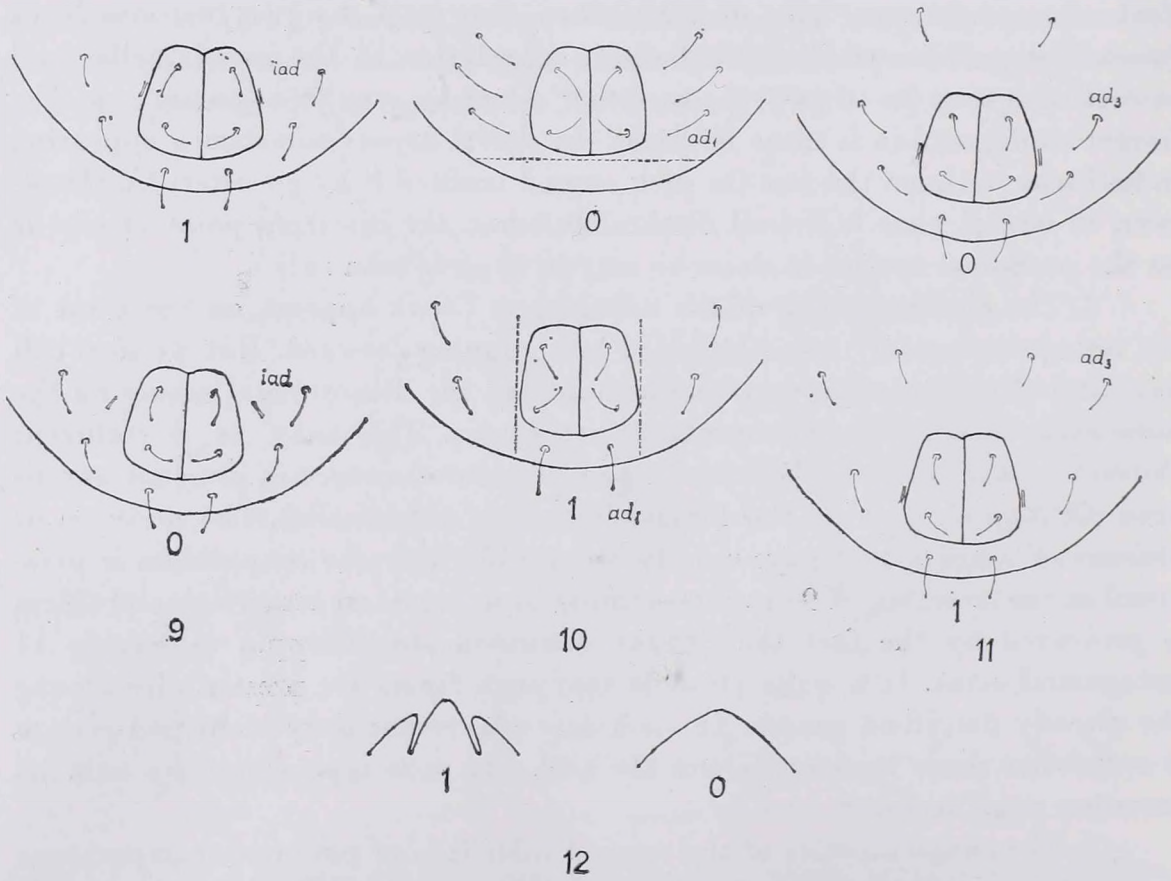


Fig. 9. Pori *iad* in adanal (1), pori *iad* in apoanal (0) position — Fig. 10. Seta ad_1 in adanal (0), ad_1 in postanal (1) position — Fig. 11. Seta ad_3 in adanal (0), ad_3 in postanal (1) position — Fig. 12. Rostrum incised (1), rostrum not incised (0)

ment of the generic status of future species. This has been my governing principle: the ranking of future species of the family Oppiidae.

7. Every Oppiidae genus reveals the list of species which according to my opinion belongs to it. In case I am not certain about its true belonging I put a question mark before the name of the species. I reject even the thought of compiling the literature since all the pertaining articles would make up far too long a list. After the name of the author and the year in the great majority of the cases it is quite easy to find the respective reference. I am preparing in collaboration with S. MAHUNKA a comprehensive work, which will contain both the here excluded species and the list of the references too. The appearance of this work is expected to be out in about three years time.

Subfamilies and Genera

1. **Borhidiinae** subfam. n.
   1. *Borhidia* BALOGH et MAHUNKA, 1974
2. **Cuneoppiinae** subfam. n.
   1. *Cuneoppia* BALOGH et MAHUNKA, 1969
3. **Chaviniinae** subfam. n.
   1. *Chavinia* HAMMER, 1961
4. **Enantioppiinae** subfam. n.
   1. *Enantoppia* BALOGH et MAHUNKA, 1969
5. **Lyroppiinae** subfam. n.
   1. *Lyroppia* BALOGH, 1961
   2. *Rioppia* BALOGH et MAHUNKA, 1977
6. **Quadroppiinae** subfam. n.
   1. *Quadroppia* JACOT, 1939
7. **Hexoppiinae** subfam. n.
   1. *Hexoppia* BALOGH, 1958
8. **Granuloppiinae** subfam. n.
   1. *Granuloppia* BALOGH, 1958
   2. *Macrosoma* HAMMER, 1979
   3. *Senectoppia* AOKI, 1977
9. **Oppiellinae** subfam. n.
   1. *Belloppia* HAMMER, 1968
   2. *Berniniella* gen. n.
   3. *Cosmoppia* gen. n.
   4. *Elaphoppia* gen. n.
   5. *Hypogeoppia* SUBIAS, 1982
   6. *Mahunkella* gen. n.
   7. *Microppia* gen. n.
   8. *Miroppia* HAMMER, 1968
   9. *Moritziella* gen. n.
   10. *Neostrinatina* MAHUNKA, 1979
   11. *Neotrichoppia* SUBIAS et ITURRONDOBEITIA, 1980
   12. *Oppiella* JACOT, 1937
   13. *Oxyoppia* BALOGH et MAHUNKA, 1969
   14. *Perspicuoppia* PÉREZ-IÑIGO, 1971
   15. *Ptiloppia* gen. n.
   16. *Rhinoppia* gen. n.
   17. *Sacculoppia* BALOGH et MAHUNKA, 1968
   18. *Tripiloppia* HAMMER, 1968
10. **Papillonotinnae** subfam. n.
    1. *Papillonotus* WALLWORK, 1961
11. **Mystroppiinae** subfam. n.
    1. *Acroppia* gen. n.
    2. *Corynoppia* gen. n.
    3. *Mystroppia* BALOGH, 1959
    4. *Stachyoppia* BALOGH, 1961
    5. *Striatoppia* BALOGH, 1958
12. **Teratoppiinae** subfam. n.
    1. *Teratoppia* BALOGH, 1959
    2. *Teratoppiella* gen. n.
13. **Tectoppiinae** subfam. n.
    1. *Tectoppia* WALLWORK, 1961
14. **Sternoppiinae** BALOGH et MAHUNKA, 1969
    1. *Sternoppia* BALOGH et MAHUNKA, 1968
15. **Acroppiinae** subfam. n.
    1. *Acroppia* HAMMER, 1977
    2. *Austroppia* gen. n.
    3. *Brachioppia* HAMMER, 1961
    4. *Ctenoppia* gen. n.
    5. *Hammerella* gen. n.
    6. *Kokoppia* gen. n.
    7. *Mimoppia* gen. n.
    8. *Pletzenoppia* gen. n.
    9. *Porrhoppia* BALOGH, 1970
    10. *Ramuloppia* BALOGH, 1961
    11. *Wallworkella* gen. n.
16. **Lanceoppiinae** subfam. n.
    1. *Convergoppia* gen. n.
    2. *Hamoppia* HAMMER, 1968
    3. *Lanceoppia* HAMMER, 1962
    4. *Loboppia* gen. n.
    5. *Setoppia* gen. n.
    6. *Setuloppia* gen. n.
    7. *Trematoppia* BALOGH, 1962
17. **Globoppiinae** subfam. n.
    1. *Aeroppia* HAMMER, 1961
    2. *Heteroppia* BALOGH, 1970
    3. *Globoppia* HAMMER, 1962

4. *Membranoppia* HAMMER, 1968
5. *Otoppia* gen. n.

18. **Machuellinae** subfam. n.
1. *Machuella* HAMMER, 1961

19. **Trizetinae** EWING, 1917
1. *Trizetes* BERLESE, 1904

20. **Pulchroppiinae** subfam. n.
1. *Alcioppia* gen. n.
2. *Brachioppiella* HAMMER, 1962
3. *Cryptoppia* CSISZÁR, 1961
4. *Furculoppia* gen. n.
5. *Gittella* HAMMER, 1961
6. *Octoppia* BALOGH et MAHUNKA, 1969
7. *Pulchroppia* HAMMER, 1979

21. **Amerioppiinae** subfam. n.
1. *Amerioppia* HAMMER, 1961
2. *Erioppia* gen. n.
3. *Oligoppia* gen. n.

22. **Multioppiinae** subfam. n.
1. *Anomaloppia* SUBIAS, 1978
2. *Cheloppia* HAMMER, 1971
3. *Congoppia* gen. n.
4. *Cubaoppia* gen. n.
5. *Graptoppia* gen. n.
6. *Insculptoppia* SUBIAS, 1980
7. *Multioppia* HAMMER, 1961
8. *Pulchroppiella* gen. n.
9. *Ramusella* HAMMER, 1962
10. *Rectoppia* SUBIAS, 1980
11. *Uroppia* gen. n.

23. **Oppiinae** GRANDJEAN, 1954
1. *Cilioppia* gen. n.
2. *Daedaloppia* HAUSER et MAHUNKA, 1983
3. *Fusuloppia* gen. n.
4. *Niloppia* gen. n.
5. *Oppia* C. L. KOCH, 1836
6. *Trapezoppia* BALOGH et MAHUNKA 1969

24. **Basiloppiinae** subfam. n.
1. *Basiloppia* gen. n.
2. *Condyloppia* gen. n.
3. *Drepanoppia* gen. n.
4. *Goyoppia* gen. n.
5. *Karenella* HAMMER, 1962
6. *Polyoppia* HAMMER, 1968

25. **Cycloppiinae** subfam. n.
1. *Acutoppia* gen. n.
2. *Aethioppia* gen. n.
3. *Brassoppia* gen. n.
4. *Cycloppia* gen. n.
5. *Discoppia* gen. n.
6. *Gressittoppia* gen. n.
7. *Helioppia* gen. n.
8. *Laminoppia* HAMMER, 1968
9. *Subiasella* gen. n.
10. *Operculoppia* HAMMER, 1968
11. *Paroppia* HAMMER, 1968
12. *Plaesioppia* gen. n.
13. *Processoppia* gen. n.
14. *Rhaphoppia* gen. n.
15. *Solenoppia* HAMMER, 1968
16. *Stenoppia* gen. n.
17. *Xenoppia* MAHUNKA, 1982

Identification key of subfamilies

1 (8) Notogastral setae at least partly fusiform, dilated, foliated.
2 (3) Three pairs of notogastral setae thick, long, ciliated; remaining ones short, setiform. G = 6, N = 10; setae *ta* present. Crista and costula present. Pori *iad* in adanal position 7. **Hexoppiinae** subfam. n.
3 (2) Combination of characters different.
4 (5) Seven pairs of long, fusiform notogastral setae. Prodorsum with long, lamelliform costula; Notogaster with long, tuberculate crista. G = 5, N = 10; setae *ta* present 1. **Borhidiinae** subfam. n.
5 (4) Combination of characters different.
6 (7) Apodemata 4 straight. Genital plates in epimeres 3 + 4, before of apodemata 4. Prodorsum with long, lamelliform costula; crista represented by two cuneiform processes; opposite to posterior part of bothrydia and a median process on dorsosejugal suture. G = 5, N = 10, notogastral setae papilliform. Pori *iad* in adanal position 10. **Papillonotinae** subfam. n.
7 (6) Apodemata 4 more or less arcuate. Genital plates outside of epimeres 3 + 4, behind of apodemata 4. G = 4, 5 or 6. N = 10; notogastral setae at least partly foliate, spoon-like, dilated or phylliform costula mostly present, crista present or absent. Rostrum never incised. Pori *iad* mostly in adanal position. Setae *le* always nearer to setae *in* than to setae *ro* 11. **Mystroppiinae** subfam. n.
8 (1) Notogastral setae setiform.
9 (30) Six pairs of genital setae present.
10 (11) Two chitinous plates in epimeral region with incrassate, plumose setae. Sensillus pectinate, with ramified branches. Setae ad_1 in adanal position as are pori *iad*. Rostrum not incised 14. **Sternoppiinae** (BALOGH et MAHUNKA, 1969)

	Number of subfamily and genus, generic name	Number of setae G	Costula present: 1 absent: 0	Crista present: 1 absent: 0	Type of sensillus 1—8	Setae *ta* present: 1 absent: 0	Number of setae N	Pori *iad* adanal: 1 apoanal: 0	Setae ad_3 preanal: 1 adanal: 0	Setae ad_1 postanal: 1 adanal: 0	Rostrum incised: 1 not: 0	Setae *le* nearer to *in*: 1 nearer to *ro*: 0
		1	2	3	4	5	6	7	8	9	10	11
1.1	*Borhidia* B. et M., 1974	5	1	1	8	1	10		0	1	0	0
2.1	*Cuneoppia* B. et M., 1969	6	1	1	7	1	10	0	1	1	1	1
3.1	*Chavinia* HAM., 1961	6	1	0	7	1	10	0	1	1	0	1
4.1	*Enatioppia* B. et M., 1969	6	1	1	4	1	10	0	1	1	0	1
5.2	*Rioppia* B. et M., 1977	6	1	1	3	1	10	1	1	1	0	1
6.1	*Quadroppia* JAC., 1939	5	1	1	8	1	10	1	0	1	0	1
5.1	*Lyroppia* BAL., 1961	6	1	1	4	1	10	1	0	1	0	1
7.1	*Hexoppia* BAL., 1958	6	1	1	7	1	10	1	1	1	0	0
8.1	*Granuloppia* BAL., 1958	6	1	1	5, 6	1, 0	9, 10	1	1	0	0, x*	0, x
8.3	*Senectoppia* AOKI, 1977	6	1	1	5, 6	1	10	1	1	0	0	1
8.2	*Macrosoma* HAM., 1979	6	1	1	6	0	9	1	1	0	x	1
9.12	*Oppiella* JAC., 1937	5	1	0, 1	4	1	10	1	1	1	0	1
9.1	*Belloppia* HAM., 1968	5	1	1	8	1	10	1	1	1	1	1
9.8	*Miroppia* HAM., 1968	5	1	1	8	1	8	1	1	1	1	1
9.3	*Cosmoppia* gen. n.	5	1	1	4, 6	1	10	1	1	1	1	1
9.15	*Ptiloppia* gen. n.	5	1	0	5	1	8	1	1	1	1	1
9.5	*Hypogeoppia* SUB., 1982	5	1	1	4, 8	1	10				1	1
9.4	*Elaphoppia* gen. n.	5	1	0	5	1	7	1	1	0	0	1
9.14	*Perspicuoppia* P.-I., 1971	5	1	1	4	1	10	1	1	1	0	1
9.11	*Neotrichoppia* SUB. et It., 1980	5	1	0	4	1	10	1	1	1	0	1
9.13	*Oxyoppia* B. et M., 1969	5	1	1	4	1	10	0	1	1	0	1
9.10	*Neostrinatina* MAH., 1979	5	1	1	5	1	13	1	1	1	0	1
9.17	*Sacculoppia* B. et M., 1968	5	1	1	4	1	10	0	1	1	0	1
9.6	*Mahunkella* gen. n.	5	1	0	1	1	12	1	1	1	0	1
9.7	*Microppia* gen. n.	5	0	0, 1	8	1	10	1	1	1	0	1, x
9.2	*Berniniella* gen. n.	4	1	1	2	1	10	1	1	1	1	1
9.9	*Moritziella* gen. n.	4	1	1	4, 7	1	10	1	1	1	0	1
9.18	*Tripiloppia* HAM., 1968	4	1	0, 1	1	1	10	1	1	1	1	1
9.16	*Rhinoppia* gen. n.	4	1	1	4	1	10				1	1
11.2	*Corynoppia* gen. n.	5	0	0	4	1	10	1	1	1	0	1
10.1	*Papillonotus* WALLW., 1961	5	1	1	4	1	10	1	0, 1	1	0	0, 1
11.1	*Acroppia* gen. n.	6	1	1	4	1	10	0	1	1	0	1
11.3	*Mystroppia* BAL., 1959	5	1	0	4	1, 0	10, 9	1	1	0	0	1
11.5	*Striatoppia* BAL., 1958	5	1	1	4	1	10	1	1	1	0	1
11.4	*Stachyoppia* BAL., 1961	4	1	1	4	1	10	1	1	1	0	1
12.1	*Teratoppia* BAL., 1959	6	0	0	5	1, 0	10, 9	1	1	0	0	1, x
12.2	*Teratoppiella* gen. n.	6	0	0	1	1, 0	10, 9	0	1	0	x	0

* character uncertain

	Number of subfamily and genus, generic name	Number of setae G	Costula present: 1 absent: 0	Crista present: 1 absent: 0	Type of sensillus 1–8	Setae *ta* present: 1 absent: 0	Number of setae N	Pori *iad* adanal: 1 apoanal: 0	Setae ad_3 preanal: 1 adanal: 0	Setae ad_1 postanal: 1 adanal: 0	Rostrum incised: 1 not: 0	Setae *le* nearer to *in*: 1 nearer to *ro*: 0
		1	2	3	4	5	6	7	8	9	10	11
13.1	*Tectoppia* WALLW., 1961	6	0	0	7	1	10	0	0	0	x	1
14.1	*Sternoppia* B. et M., 1969	6	1	0	1, 4	1, 0	10, 9	1	0	0	0	1
15.1	*Arcoppia* HAM., 1977	6	1	0	3	1	10	1	1	1	1	1, x
15.2	*Austroppia* gen. n.	6	1	0	4	0, 1	10, 9	0	1	1	1	1
15.3	*Brachioppia* HAM., 1961	6	1	0	4	0	9	0	1	0, 1	0	1, 0
15.4	*Ctenoppia* gen. n.	6	0	0	5	0	9	0	0	1	0	1
15.5	*Hammerella* gen. n.	6	0	1	4	0	9	1	1	0	x	1
15.6	*Kokoppia* gen. n.	6	0, 1	0	1	1, 0	10, 9	0	1	1	0	1
15.7	*Mimoppia* gen. n.	6	1	0	1	1	10	1		0	1	
15.8	*Pletzenoppia* gen. n.	6	0	0	4	0, 1	10, 9	0	1	1	0	x, 1
15.9	*Porrhoppia* BAL., 1970	6	0	0	1	1	10	1	1	1	0	0
15.10	*Ramuloppia* BAL., 1961	6	0	0	1	1	10	0	1	0	1	1
15.11	*Wallworkella* gen. n.	6	1	0	1	1	10	1	1	1	1	1, x
16.5	*Setoppia* gen. n.	6	0	0	5	0, 1	10, 9	0	0	1	0	1
16.6	*Setuloppia* gen. n.	6	1	0	5	1	10	0	1	1	0, x	1
16.7	*Trematoppia* BAL., 1962	6	0	0	5	1	10	0	1	1	0	1
16.1	*Convergoppia* gen. n.	6	1	0	5	0	9	0	0	1	0	1
16.2	*Hamoppia* HAM., 1968	6	0, 1	0	6	1	10	0	1	1	x	x
16.3	*Lanceoppia* HAM., 1962	6	0, 1	0	6	0, 1	10, 9	0	1	1	0	1, 0
16.4	*Loboppia* gen. n.	6	0	0	6	1	10	0	0	1	0	1
17.1	*Aeroppia* HAM., 1961	6	0	0	8	1	13	1	0	1	0	0
17.2	*Heteroppia* BAL., 1970	6	0	0	8	1	7	1	1, 0	0	0	0
17.3	*Globoppia* HAM., 1962	6	0	0	7, 8	1	10	0	0	1	0, x	1
17.4	*Membranoppia* HAM., 1968	6	1	0	8	0	9	0	1	1	0	1
17.5	*Otoppia* gen. n.	6	0	0	7	0	9	0	1	1	0	1
18.1	*Machuella* HAM., 1961	5	0	1, 0	7, 8	1	10	1	0	0	0	0
19.1	*Trizetes* BERL., 1904	5	0	0	1	1	10	0	1	1	0	1
20.6	*Octoppia* B. et M., 1969	5	0	0	1	0, 1	8	1	0	1	0	0
20.7	*Pulchroppia* HAM., 1979	5	0	0	1	0	9, 12	0, 1	1	1	0	1
20.4	*Furculoppia* gen. n.	5	0	0	1	0	12	1	1	1	0	1
20.3	*Cryptoppia* CSISZ., 1961	5	0	0	1	1	10	0	1	1	0	x
20.5	*Gittella* HAM., 1961	5	0	0	1	0	13	0	1	1	0	1
20.2	*Brachioppiella* HAM., 1962	5	1, 0	0	1, 4	1, 0	9, 10	0	1	1	0, x	1
20.1	*Alcioppia* gen. n.	5	0	0	1	1	10	1	1	1	1	x
21.1	*Amerioppia* HAM., 1961	5	0	0	7	1, 0	9, 10	1	1, 0	1	0	
21.2	*Erioppia* gen. n.	5	0	0	7	1	13	1	1	1	0	
21.3	*Oligoppia* gen. n.	5	0	0	7	1	7	1	1	1	0	
23.5	*Oppia* C. L. KOCH, 1836	5	0	0	7	0	9	1	0	1	0	0

23.1	*Cilioppia* gen. n.	5	0	0	5, 6	1	10	1	1, 0	1	0	0
23.2	*Daedaloppia* H. et M. 1983	5	0	0	5	0	9	1	0	1	0	0
23.3	*Fusuloppia* gen. n.	5	0	0	6	0	12	1	0	1	0	0
23.4	*Niloppia* gen. n.	5	0	0	5	1	12	1	1	1	0	0
23.6	*Trapezoppia* B. et M., 1969	5	0	0	5	0	9	0	1	0	0	1
24.1	*Basiloppia* gen. n.	5	0	0	7	0	6	1	0	1	0	1
24.6	*Polyoppia* HAM., 1968	5	0	0	6	1	13	0	1	1	0	1
24.5	*Karenella* HAM., 1962	5	0	0	6	0	9	1	1	1	0	1
24.3	*Drepanoppia* gen. n.	5	0	0	6	0	9	0	1	1	0	1
24.4	*Goyoppia* gen. n.	5	0	0	6	0	9				0	1
24.2	*Condyloppia* gen. n.	5	1	0	7	0	9	? 1	1	1	0	1
22.7	*Multioppia* HAM., 1961	5	0	0	1, 4	0	12	1	1	1	0	1
22.9	*Ramusella* HAM., 1962	5	0	0	4	0	9	1	1	1	0	1
22.6	*Insculptoppia* SUB., 1980	5	0	0	1, 4	0	9	1	1	1	0	x
22.10	*Rectoppia* SUB., 1980	5	0	0	4	0	9	1	1	1	0	1
22.11	*Uroppia* gen. n.	5	0	0	4	1	10	1	1	1	0	x
22.2	*Cheloppia* HAM., 1971	5	1	? 1	4	0	9	1	1	1	0	1
22.3	*Congoppia* gen. n.	5	0	0	4	1	10	1	1	1	0	1
22.4	*Cubaoppia* gen. n.	5	0	0	4	1	10	1	1	0	0	1
22.8	*Pulchroppiella* gen. n.	5	0	0	4	0	12	0	1	1	0	x
22.1	*Anomaloppia* SUB., 1981	5	0	0	4	0	10	1	1	1	0	1
22.5	*Graptoppia* gen. n.	5	? 1	0	4	0	9	1	1	1	0	1
25.6	*Gressittoppia* gen. n.	4	0	0	1	1	10	0	1	1	0	1
25.12	*Plaesioppia* gen. n.	4	1	0	1	0	9	0	1	1	1	x
25.16	*Stenoppia* gen. n.	4	? 1	0	4	1	10	0, 1	1	1	0	1
25.15	*Solenoppia* HAM., 1968	4	1	0	4	1	9, 10	0	1	1	0	x
25.5	*Discoppia* gen. n.	4	0	0	4	1	10	1	1	1	0	1
25.7	*Helioppia* gen. n.	4	0	0	2	1	10	1	1	1	1	1
25.13	*Processoppia* gen. n.	4	1	0	5	1	10				0	0
25.8	*Laminoppia* HAM., 1968	4	1	0	5	1	10	0	0	1	0	0
25.10	*Operculoppia* HAM., 1968	4	0	0	8	1	10	0	1	1	x	1
25.14	*Rhaphoppia* gen. n.	4	1	0	6, 7	0	9	0	1	1	0	1
25.11	*Paroppia* HAM., 1968	4	0	0	5	0	9	1	1	1	0	1
25.4	*Cycloppia* gen. n.	4	0	0	6, 7	0	9	0	1	1	0	x, 1
25.17	*Xenoppia* MAH., 1982	4	0	0	6	? 0	? 12	? 1	1	1	0	1
25.2	*Aethioppia* gen. n.	4	0	0	5	0	9	1	1	1	0	x, 0
25.1	*Acutoppia* gen. n.	4	1	0	6	0	9	0	1	1	0	0
25.9	*Subiasella* gen. n.	4	1, 0	1, 0	8	0	10, 9	? 0	1	1	0	1
25.3	*Brassoppia* gen. n.	4	1, 0	0	1	1	10	0	1	1	0	1

11 (10) Combination of characters different.
12 (21) Prodorsum with costula or with some kind of sculpture: with granulation, or with irregular wrinkles, excrescences, or with 3 large hollows; mostly combined with different types of cristae.
13 (14) Costulae Λ-shaped, apically jointed, situated adjacent to conically projecting dorsosejugal suture. Setae *le* originating near to dorsosejugal suture. Crista present. N = 10. Pori *iad* in apoanal position 2. **Cuneoppiinae** subfam. n.
14 (13) Combination of characters different.
15 (16) Prodorsum with irregular wrinkles and excrescences. Costulae disappearing. Crista with a flat, elevated part between two oval hollows. N = 10. Two pairs of enantiophyses at anterior margin of genital plates. Apodemata 4 absent. Pori *iad* in apoanal position 4. **Enantioppiinae** subfam. n.
16 (15) Combination of characters different.
17 (18) Prodorsum with 3 large hollows, bordered by chitinous edges. Setae *le* on a translamellar lath. N = 10. Pori *iad* in apoanal position. Crista absent 3. **Chaviniinae** subfam. n.
18 (17) Combination of characters different.
19 (20) Setae ad_1 in postanal, ad_3 in adanal position. Prodorsum not granulate or rugose. Notogaster either with long, linear crista, or with a longitudinal elevation, limited by long, parallel cristae 5. **Lyroppiinae** subfam. n.
20 (19) Setae ad_1 in adanal, ad_3 in preanal position. Prodorsum granulate or rugose. Crista reduced, each represented only by a small tubercle, opposite to bothrydia 8. **Granuloppiinae** subfam. n.
21 (12) Prodorsum in interlamellar and lamellar region smooth, neither with granulation nor with wrinkles. Costula always absent, excepting some thin, evanescent lamellar lines or translamellar lines, or ∩-shaped crests of costulae.
22 (23) Apodemata 4 absent. Legs with apophyses. Setae ad_1 in adanal, ad_3 in preanal position. N = 9—10 12. **Teratoppiinae** subfam. n.
23 (22) Apodemata 4 present. Legs without apophyses.
24 (25) Three pairs of notogastral setae (*ta*, *te*, *ms*) very long. Epimeres 3 + 4 long, oblique. Setae ad_1, ad_2 and ad_3 in adanal position. Anal plates large: longer than distance between genital and anal plates. N = 10. Pori *iad* in apoanal position 13. **Tectoppiinae** subfam. n.
25 (24) Combination of characters different.
26 (27) Sensillus pectinate, radiate, asymmetrically radiate, or fusiform and ciliate. (The asymmetrically radiate type exceptionally only with a single, long branch) 15. **Arcoppiinae** subfam. n.
27 (26) Sensillus setiform, flagelliform, lanceolate, fusiform or capitate, but the fusiform or capitate head never ciliate.
28 (29) Sensillus setiform, filiform, flagellate or lanceolate 16. **Lanceoppiinae** subfam. n.
29 (28) Sensillus either with short, or with long stalk, and with fusiform or capitate head 17. **Globoppiinae** subfam. n.
30 (9) Four or 5 pairs of genital setae present.
31 (36) Four pairs genital setae present.
32 (33) Notogastral setae dilated, unilaterally densely ciliate (*Stachyoppia* BALOGH, 1961) 11. **Mystroppiinae** subfam. n. (part.)
33 (32) Notogastral setae setiform.
34 (35) Costula, crista and setae *ta* present 9. **Oppiellinae** subfam. n. (part.)
35 (34) At least one of these characters absent 25. **Cycloppiinae** subfam. n.
36 (31) Five pairs of genital setae present.
37 (38) Epimeral setae long, directed toward the centre of epimeral region: constituting a basket, within a thick layer of excretion. Pori *iad* in adanal position. Setae ad_1 in adanal position, but somewhat posteriorad; setae ad_3 in anal or preanal position. Chelicerae small, resembling peloptoid 18. **Machuellinae** subfam. n.
38 (37) Epimeral setae normal.
39 (40) Prodursum long, with acuminated rostrum. Long, triangular, expanded part between prodorsum and notogaster. Epimeres 3 + 4 much longer than epimeres 1 and 2 together. Chelicerae long, peloptoid 19. **Trizentinae** EWING, 1917
40 (39) Combination of characters different.
41 (44) Costula, crista and setae *ta* present.
42 (43) Costulae long, converging, connected by translamella; setae *le* on apical half of prodorsum. Two pairs of conspicuous cristae present. Notogaster circular 6. **Quadroppiinae** subfam. n.

43 (42) Costulae short, reduced, sometimes disappearing; setae *le* on basal half of prodorsum. Cristae short or absent. Setae *ta* mostly as long as or longer than rest of notogastral setae — 9. **Oppiellinae** subfam. n.
44 (41) Costula and/or crista absent; setae *ta* mostly absent.
45 (46) Sensillus pectinate, exceptionally fusiform and unilaterally ciliate (*Brachioppiella* HAMMER, 1962) — 20. **Pulchroppiinae** subfam. n.
46 (45) Sensillus never pectinate [some exceptions: *Multioppia glabra* MIHELČIĆ, *M. gracilis* HAMMER, *Insculptoppia insculpta* (PAOLI)].
47 (48) Setae *in* absent. Sensillus fusiform — 21. **Amerioppiinae** subfam. n.
48 (47) Setae *in* present.
49 (50) Sensillus fusiform and unilaterally ciliate — 22. **Multioppiinae** subfam. n.
50 (49) Sensillus flagelliform, setiform, lanceolate or capitate, but never fusiform and unilaterally ciliate.
51 (52) Setae *le* nearer to setae *ro* than to setae *in* — 23. **Oppiinae** GRANDJEAN, 1954
52 (51) Setae *le* nearer to setae *in* then to setae *ro* — 24. **Basiloppiinae** subfam. n.

Oppiidae with 6 pairs of genital setae

1 (44) Prodorsum with costula.
2 (19) Notogaster with crista.
3 (6) Notogaster heterotrichous.
4 (5) Three pairs of notogastral setae thick, long, ciliate, remaining ones short, setiform — Central Africa — **Hexoppia** BALOGH, 1958
5 (4) Eight pairs of notogastral setae foliate; 2 pairs (*ta* and p_1) setiform — Africa, S. America — **Acroppia** gen. n.
6 (3) Notogaster homotrichous
7 (12) Setae ad_1 in adanal position.
8 (9) Dorsosejugal suture absent. — Japan — **Senectoppia** AOKI, 1977
9 (8) Dorsosejugal suture present.
10 (11) Notogaster with longitudinal furrows and ribs. — Java — **Macrosoma** HAMMER, 1979
11 (10) Notogaster without longitudinal furrows and ribs, mostly granulated. — Africa — **Granuloppia** BALOGH, 1958
12 (7) Setae ad_1 in postanal position.
13 (14) Lamellar setae originating near to dorsosejugal suture. — S. America — **Cuneoppia** BALOGH et MAHUNKA, 1969
14 (13) Lamellar setae originating far from dorsosejugal suture.
15 (16) Prodorsum with irregular wrinkles and excrescences. Posterior part of epimeral region with 1 pair of enantiophyses. — S. America — **Enantioppia** BALOGH et MAHUNKA, 1969
16 (15) Prodorsum without irregular wrinkles and excrescences.
17 (18) Apodemata 4 with 1 pair of enantiophyses. Setae ad_3 in preanal position. Distance between genital and anal plates twice longer than length of genital plates. — Brasil — **Rioppia** BALOGH et MAHUNKA, 1977
18 (17) Apodemata 4 without enantiophyses. Setae ad_3 in adanal position. Distance between genital and anal plates only a little longer than length of genital 6 plates. — Africa
19 (2) Notogaster without crista.
20 (23) Setae ad_1 in adanal position.
21 (22) Rostrum not incised. Two chitinous plates in epimeral region. — S. America — **Sternoppia** BALOGH et MAHUNKA, 1969
22 (21) Rostrum incised. Without chitinous plates in epimeral region. — W. Africa — **Mimoppia** gen. n.
23 (20) Setae ad_1 in postanal position.
24 (25) Prodorsum with 3 large hollows. — S. America — **Chavinia** HAMMER, 1961
25 (24) Prodorsum without 3 large hollows.
26 (31) Rostrum incised.
27 (28) Sensillus pectinate, with 4—5 branches. Lamellae and translamella U-shaped. — Africa — **Wallworkella** gen. n.
28 (27) Sensillus never pectinate.
29 (30) Sensillus fusiform, unilaterally ciliated. Pori *iad* in apoanal position. — S. Chile, Macquarie Is. — **Austroppia** gen. n.

30 (29) Sensillus radiate, with 1—6 branches. Branches often asymmetrically reduced to 3, 2 or 1 branches. Pori *iad* in adanal position — Circumtropic
Arcoppia HAMMER, 1977
31 (26) Rostrum not incised.
32 (33) Sensillus pectinate. — S. Africa, S. America **Kokoppia** gen. n.
33 (32) Sensillus not pectinate.
34 (35) Sensillus fusiform, unilaterally ciliated. — Patagonia, New Zealand
Pletzenoppia gen. n.
35 (34) Sensillus not fusiform and unilaterally ciliated.
36 (39) Sensillus setiform.
37 (38) Costulae well developed, convergent. Sensillus setiform, smooth. Setae *ta* absent. — New Zealand **Convergoppia** gen. n.
38 (37) Costulae reduced. Sensillus setiform, with very fine cilia. Setae *ta* present. — New Zealand, Queensland **Setuloppia** gen. n.
39 (36) Sensillus never setiform: fusiform without cilia, either lanceolate, or capitate.
40 (41) Sensillus lanceolate. — S. America, Java Queensland **Lanceoppia** HAMMER, 1962
41 (40) Sensillus either fusiform or capitate.
42 (43) Bothrydium with a narrow membrane-bridge. — New Zealand
Membranoppia HAMMER, 1968
43 (42) Bothrydium without membrane-bridge. — New Zealand, Subantarctic Is.
Globoppia HAMMER, 1962
44 (1) Prodorsum without costula.
45 (58) Setae ad_1 in adanal position.
46 (53) Sensillus pectinate or radiate.
47 (48) Sensillus radiate, with 4—5 branches. — S. America **Brachioppia** HAMMER, 1961
48 (47) Sensillus pectinate, with 4—12 branches.
49 (50) Apodemata 4 absent. Legs long, with apophyses. — Tropical Africa, S. America
Teratoppiella gen. n.
50 (49) Apodemata 4 present. Legs normal.
51 (52) Sensillus arcuate; proximal with 6 long, distal with 4 very short branches. Pori *iad* in apoanal position. — W. Africa **Ramuloppia** BALOGH, 1961
52 (51) Sensillus not arcuate; proximal with 4 long, distal with 2 shorter branches. Pori *iad* in adanal position. — Java **Hammerella** gen. n.
53 (46) Sensillus never pectinate or radiate.
54 (55) Apodemata 4 absent. Legs long, with apophyses. — Tropical Africa, S. America
Teratoppia BALOGH, 1959
55 (54) Apodemata 4 present. Legs normal.
56 (57) Sensillus capitate, with short stalk. 7 pairs of notogastral setae: 4 pairs very long (*ta*, *te*, *ms*, r_2), 1 pair (p_1) thick, air-filled, 2 pairs (p_2, p_3) very short, setiform. — Ceylon, Fiji **Heteroppia** BALOGH, 1970
57 (56) Sensillus slightly fusiform, with long stalk. 3 pairs of notogastral setae much longer than the other (*ti*, *te*, *ms*); no thick, air-filled hairs on the posterior part of notogaster. — Tropical Africa **Tectoppia** WALLWORK, 1961
58 (45) Setae ad_1 in postanal position.
59 (64) Sensillus pectinate.
60 (61) Epimeres 3 + 4 very long: as long as epimeres 1 and 2 together. Setae *le* nearer to setae *ro* than to setae *in*. — Ceylon **Porrhoppia** BALOGH, 1970
61 (60) Epimeres 3 + 4 normal. Setae *le* on half way, or nearer to setae *in* than to setae *ro*.
62 (63) Notogaster without longer setae. Sensillus with 4—5 branches; branches towards to apical gradually becoming shorter. — S. Africa **Kokoppia** gen. n.
63 (62) Notogaster with 2 pairs of very long setae (*te*, *ti*). Sensillus with 7—11 branches, proximal 2—4 much shorter than 5—7. — Queensland **Ctenoppia** gen. n.
64 (59) Sensillus not pectinate.
65 (66) Sensillus slightly fusiform, unilaterally ciliate. — S. Africa **Pletzenoppia** gen. n.
66 (65) Sensillus never fusiform and unilaterally ciliate.
67 (74) Sensillus either capitate with short stalk, or fusiform, never ciliate.
68 (69) 13 pairs of notogastral setae; 1 pair thick airfilled setae (p_1) in posteromarginal position. Sensillus small, capitate, with very short stalk. — S. America
Aeroppia HAMMER, 1961
69 (68) 9—10 pairs of notogastral setae; no air-filled posteromarginal (p_1) setae.
70 (71) Pedotecta 2 protruding, extremely large. Notogastral setae very short, evanescent. — Madagascar **Otoppia** gen. n.
71 (70) Pedotecta 2 normal. Notogastral setae never reduced.

72 (73) Bothrydium with a narrow membrane-bridge. — New Zealand
Membranoppia HAMMER, 1968
73 (72) Bothrydium without narrow membrane-bridge. — New Zealand, Subantarctic Is.
Globoppia HAMMER, 1962
74 (67) Sensillus bacilliform filiform, setiform of lanceolate.
75 (76) Two membraneous lobes in front of rostral setae covering tip of rostrum. Sensillus slightly lanceolate. — New Zealand **Loboppia** gen. n.
76 (75) Rostrum without membranous lobes.
77 (78) Behind proximal part of femora 2 a small hook present. — New Zealand
Hamoppia HAMMER, 1968
78 (77) No hook behind proximal part of femora 2.
79 (80) There are 3 longitudinal lines in the shoulder region (resembling *Striatoppia* !). Legs with chitinous crests. — Madagascar **Trematoppia** BALOGH, 1962
80 (79) Notogaster without longitudinal lines in the shoulder region. Legs without chitinous crests.
81 (82) Sensillus setiform and ciliated. — Queensland **Setoppia** gen. n.
82 (81) Sensillus lanceolate, smooth or finely granulated. — Cosmopolitan (?)
Lanceoppia HAMMER, 1962

Oppiidae with 5 pairs of genital setae*

1 (48) Prodorsum with costula.
2 (41) Setae *ta* present.
3 (10) Notogastral setae at least partly fusiform, foliate, dilated.
4 (5) Notogaster with very long crista. 7 pairs of notogastral setae and interlamellar setae thick, long, fusiform. Sensillus fusiform, with short stalk. — Cuba
Borhidia BALOGH et MAHUNKA, 1974
5 (4) Notogaster without long crista. Notogastral and interlamellar setae never long and fusiform.
6 (7) Apodemata 4 straight. Genital plates in epimeres 3 + 4, before apodemata 4. Costulae very long, reaching rostral region. — W. Africa
Papillonotus WALLWORK, 1961
7 (6) Apodemata 4 arched. Genital plates outside of epimeres 3 + 4, behind apodemata 4.
8 (9) Notogaster with granular structure. — Europe **Mystroppia** BALOGH, 1959
9 (8) Notogaster with fine parallel or radiating lines. — N. America, Circumtropic
Striatoppia BALOGH, 1958
10 (3) Notogastral setae setiform.
11 (12) Crista strongly developed, extending posteriorad at least to 1/3 to 2/3 of notogastral length. Notogaster circular; mostly small species, 120—200 μm. — Cosmopolitan
Quadroppia JACOT, 1939
12 (11) Crista weakly developed, never extending to 1/3 of notogastral length. Mostly bigger species, over 200 μm.
13 (24) Rostrum incised, tripartite.
14 (15) Sensillus setiform, long; with long cilia. Setae *ta* very short. — New Zealand
Ptiloppia gen. n.
15 (14) Sensillus bacilliform, fusiform or capitate.
16 (17) Rostral setae located very near to each other on the median tuberculum of rostrum. — Mediterranean, Europe **Cosmoppia** gen. n.
17 (16) Rostral setae removed far from each other and never on the median part of rostrum.
18 (19) Setae *in* and *ta* extraordinarily long, much longer than remaining setae. — New Zealand **Miroppia** HAMMER, 1968
19 (18) Setae *in* and *ta* of normal length.
20 (21) Dorsosejugal suture interrupted medially. — Europe **Hypogeoppia** SUBIAS, 1981
21 (20) Dorsosejugal suture entire, not interrupted medially.
22 (23) Sensillus either fusiform and unilaterally ciliated, or capitate with short cilia. — Cosmopolitan **Opiella** JACOT, 1937 (part.)
23 (22) Sensillus capitate, smooth. — New Zealand **Beloppia** HAMMER, 1968
24 (13) Rostrum not incised.
25 (30) Sensillus pectinate.
26 (27) Sensillus very long, nearly as long as prodorsum; with 5 branches. Setae *in*, *ti* and *ms* very long; setae *ta* small; remaining notogastral setae very short or absent. — Madagascar **Elaphoppia** gen. n.

* The genus *Microppia* gen. n. is missing!

27 (26) Sensillus shorter; with 7—20 branches. 12—13 pairs of nearly equally long notogastral setae.
28 (29) Sensillus with 7 branches. Setae *in* and *le* short. — Brazil **Mahunkella** gen. n.
29 (28) Sensillus with 18—20, relatively short branches. Setae *in* and *le* longer. — Guatemala **Neostrinatina** MAHUNKA, 1979
30 (25) Sensillus slightly fusiform, mostly unilaterally ciliated.
31 (32) 14—16 pairs of aggenital setae. — Spain **Neotrichoppia** SUBIAS et ITURRONDOBEITIA, 1980
32 (31) One pair of aggenital setae.
33 (34) Notogaster without crista. — Cosmopolitan **Oppiella** JACOT, 1937 (part.)
34 (33) Notogaster with crista: e.i. either with recurrent chitinous crests on notogaster, or with a pair of pointed processes directed anteriorad on dorsosejugal suture.
35 (38) Dorsosejugal suture with a pair of pointed processes directed anteriorad.
36 (37) Posterior part of notogaster with a pair of peculiar, cap-shaped, chitinous excrescences. — S. America **Sacculoppia** BALOGH et MAHUNKA, 1968
37 (36) Posterior part of notogaster without such chitinous excrescences. — Cosmopolitan? **Oxyoppia** BALOGH et MAHUNKA, 1969
38 (35) Crista normal: i.e. recurrent crests or lines on notogaster.
39 (40) Crista strongly developed; extending posteriorad to setae *te*. — Spain **Perspicuoppia** PÉREZ-IÑIGO, 1971
40 (39) Crista weakly developed, not extending posteriorad to setae *te*. — Cosmopolitan **Opiella** JACOT, 1937 (part.)
41 (2) Setae *ta* absent.
42 (43) Sensillus very long, nearly as long as breadth of prodorsum; slightly fusiform, with short cilia. On apodemata sejugal each with 2 chitinous tubercles. — Java **Condyloppia** gen. n.
43 (42) Sensillus shorter; no chitinous tubercles on apodemata sejugal.
44 (45) Sensillus pectinate, with 2—6 branches. Pori *iad* in apoanal position. — Chile, New Zealand **Brachioppiella** HAMMER, 1962
45 (44) Sensillus fusiform, with short cilia.
46 (47) End of notogastral setae slightly dilated. U-shaped chitinous structure in interlamellar region. Rostrum very broad, hyaloid. Chelicerae small, suctorial in type. — Fiji **Cheloppia** HAMMER, 1971
47 (46) End of notogastral setae not dilated. No U-shaped chitinous structure in interlamellar region. Rostrum not hyaloid, chelicerae normal. — Europe **Graptoppia** gen. n.
48 (1) Prodorsum without costula.
49 (50) Epimeral setae extremely long, directed inwards. Notogaster with a linear crista. — Cosmopolitan **Machuella** HAMMER, 1961
50 (49) Extremely long epimeral setae and linear crista absent.
51 (52) Prodorsum elongated, with very short setae. Chelicerae peloptoid. Epimeres 3 + 4 much longer than epimeres 1 and 2 together. — Mediterranean **Trizetes** BERLESE, 1904
52 (51) Combination of characters different.
53 (72) Sensillus pectinate.
54 (55) Apodemata 4 absent. Sensillus with arcuated branches. 12 (13) of 9 (10) pairs of notogastral setae; setae *ta* mostly present. Ventral side reticulate. — Cosmopolitan **Pulchroppia** HAMMER, 1979
55 (54) Apodemata 4 present.
56 (57) Four pairs of notogastral setae very long; setae *p* short; remaining setae not visible. — S. America **Octoppia** BALOGH et MAHUNKA, 1969
57 (56) Notogastral setae approximately of the same length.
58 (63) 12 pairs of notogastral setae present.
59 (60) Pori *iad* in apoanal position. Sensillus with 6—7 branches. — Peru **Gittella** HAMMER, 1961
60 (59) Pori *iad* in adanal position. Sensillus — apart from the first and last very short branches! — with 3—4 branches.
61 (62) Branches of sensillus with secondary branches. Rostral setae removed far from each other, arcuated. — Europe **Furculoppia** gen. n.
62 (61) Branches of sensillus without secondary branches. Rostral setae geniculate. — Cosmopolitan **Multioppia** HAMMER, 1961 (part.)
63 (58) 9—10 pairs of notogastral setae present.
64 (67) Pori *iad* in apoanal position.

65 (66) Apodemata 4 fused behind genital plates, thus genital plates located in epimeres 3 + 4, before apodemata 4. Posterior part of notogaster granulated. Setae *ta* well developed. — Indonesia **Cryptoppia** CSISZÁR, 1961

66 (65) Apodemata 4 fused before genital plates, thus genital plates located outside of epimeres 3 + 4, behind apodemata 4. Posterior part of notogaster not granulated. Setae *ta* absent. — Chile, New Zealand **Brachioppiella** HAMMER, 1962

67 (64) Pori *iad* in adanal position.

68 (69) Branches 1 and 2 of sensillus of the same length as branches 3—6. Rostrum with a round excision. — Mexico **Alcioppia** gen. n.

69 (68) Branches 1—2 or 1—3 of sensillus much shorter than branches 3—6 or 4—6.

70 (71) Rostral setae slightly arcuated. — Cosmopolitan **Insculptoppia** SUBIAS, 1980

71 (70) Rostral setae geniculate. — Cosmopolitan **Ramusella** HAMMER, 1962 s. str.

72 (53) Sensillus never pectinate, exceptionally long, setiform, with 15—18 fairly long cilia.

73 (78) Interlamellar setae absent.

74 (75) 13 pairs of notogastral setae; setae *ta* very short. — Tropical Africa **Oligoppia** gen. n.

75 (74) 10, 9 or less number of pairs of notogastral setae.

76 (77) Seven pairs of notogastral setae: 4 pairs very long, almost flagellate (*ti*, *te*, *ms*, r_2); setae p_1 short, p_2 and p_3 very short; r_1 and r_3 absent. Sensillus long, apically slightly dilated. Sensillus nearly as long as breadth of prodorsum. — Samoa **Erioppia** gen. n.

77 (76) Nine or 10 pairs of notogastral setae. Combination of characters different from those above. — Cosmopolitan **Amerioppia** HAMMER, 1961

78 (73) Interlamellar setae present.

79 (96) Sensillus fusiform, unilaterally ciliated.

80 (83) 12 pairs of notogastral setae present.

81 (82) Apodemata 4 absent. Pori *iad* in apoanal position. — Spain **Pulchroppiella** gen. n.

82 (81) Apodemata 4 present. Pori *iad* in adanal position. — Cosmopolitan **Multioppia** HAMMER, 1961

83 (80) 10 or 9 pairs of notogastral setae present.

84 (85) Setae ad_1 in adanal position; ad_2 and ad_3 in preanal position. Setae *ta* present. Epimeral region with complicated chitinous structures. — Cuba **Cubaoppia** gen. n.

85 (84) Setae ad_1 in postanal position; ad_2 in adanal position.

86 (87) Setae ad_3 nearer to each other than ad_2. Pori *iad* in adanal position; near to the anterior margin of anal plates. — Congo **Congoppia** gen. n.

87 (86) Setae ad_2 nearer to each other than ad_3.

88 (89) Setae ad_3 near to apodemata 4, far ahead; setae *p* near to each other. — Ghana **Uroppia** gen. n.

89 (88) Setae ad_3 never near to apodemata 3; setae *p* not near to each other.

90 (91) Notogaster with 10 pairs of setae + with the insertion point of setae *ta*: i.e. 11 pairs of notogastral setae present. — Canary Is. **Anomaloppia** SUBIAS, 1978

91 (90) Notogaster with 9 pairs of setae + with the insertion point of setae *ta*: i.e. 10 pairs of notogastral setae present.

92 (93) Rostral setae geniculate. — Cosmopolitan **Ramusella** HAMMER, 1962 s. str.

93 (92) Rostral setae never geniculate; straight, or arcuated.

94 (95) Rostral setae very near to each other and arcuated outward. — Cosmopolitan **Rectoppia** SUBIAS, 1980

95 (94) Rostral setae not very near to each other and arcuated inwards. — Cosmopolitan **Insculptoppia** SUBIAS, 1980

96 (79) Sensillus never fusiform and unilaterally ciliated: may be flagellate, filiform, setiform, lanceolate, capitate or exceptionally fusiform but not ciliated unilaterally.

97 (108) Lamellar setae nearer to rostral setae than to interlamellar setae.

98 (101) 12 pairs of notogastral setae present.

99 (100) Sensillus slightly fusiform, with lanceolate end. Epimeral setae partly long. — Madagascar **Fusuloppia** gen. n.

100 (99) Sensillus filiform, shortly ciliated. Epimeral setae short. — Egypt **Niloppia** gen. n.

101 (98) Nine or 10 pairs of notogastral setae present.

102 (103) Setae *ta* present. Sensillus either filiform and densely ciliated, or slightly fusiform and densely ciliated. — Cosmopolitan (?) **Cilioppia** gen. n.

103 (102) Setae *ta* absent.

104 (105) Two pairs of notogastral setae (*te* and *ti*) very long, ciliated, the others very short. — Greece **Daedaloppia** HAUSER et MAHUNKA, 1983

105 (104) Either more than 2 pairs of notogastral setae long, or no remarkable difference exists between notogastral setae.
106 (107) Setae ad_1 in adanal position. Pori *iad* in apoanal position. Sensillus long flagellate, with 15—18 fairly long cilia. — S. America **Trapezoppia** BALOGH et MAHUNKA, 1969
107 (106) Setae ad_1 in postanal position. Pori *iad* in adanal position. Sensillus setiform or slightly fusiform. — Cosmopolitan **Oppia** C. L. KOCH, 1836
108 (97) Lamellar setae nearer to interlamellar setae than to rostral setae, or in half way between the two.
109 (110) 12—13 pairs of notogastral setae. Setae *ta* very short, but present. — New Zealand **Polyoppia** HAMMER, 1968
110 (109) Nine or less number of pairs of notogastral setae present.
111 (114) Three pairs of notogastral setae very long, others short.
112 (113) Setae rostrales near to each other: distance between insertion points shorter than half length of setae *ro*. Setae *in* very small, hardly visible. Notogaster ovate. — Madagascar **Goyoppia** gen. n.
113 (112) Setae rostrales far from each other: distance between insertion points nearly as long as length of setae *ro*. Setae *in* well visible. Notogaster circular. — Queensland **Basiloppia** gen. n.
114 (111) At least 6 pairs of notogastral setae of the same length; only setae *p* may be shorter.
115 (116) Pori *iad* in apoanal position. Sensillus slightly fusiform, with a long, setiform tip. — S. Africa **Drepanoppia** gen. n.
116 (115) Pori *iad* in adanal position. Sensillus different.
117 (118) Apodemata sejugal each with 2 chitinous tubercles. Sensillus very long, nearly as long as breadth of prodorsum. Setae *in* long; longer than distance between their insertion point. — Java **Condyloppia** gen. n.
118 (117) Apodemata sejugal without chitinous tubercles. Sensillus shorter. Setae *in* short; much shorter than distance between their insertion points. — Cosmopolitan **Karenella** HAMMER, 1962

Oppiidae with 4 pairs of genital setae

1 (2) Setae *in*, *le* and notogastral setae dilated, fusiform, unilaterally aciculate. — Tropical Africa **Stachyoppia** BALOGH, 1961
2 (1) Setae *in*, *le* and notogastral setae never fusiform.
3 (28) Prodorsum with costula.
4 (21) Setae *ta* present.
5 (10) Rostrum incised, tripartite.
6 (7) Three pairs of aggenital setae present. Sensillus pectinate. — New Zealand, Australia **Tripiloppia** HAMMER, 1968
7 (6) One pair of aggenital setae present.
8 (9) Sensillus fusiform, radiate, or exceptionally fusiform and unilaterally ciliated. Costula medium long, reaching setae *le*. — Europe, Chile **Berniniella** gen. n.
9 (8) Sensillus fusiform, unilaterally, ciliated. Costula reduced to a tuberculum, near to interlamellar setae. — Europe **Rhinoppia** gen. n.
10 (5) Rostrum not incised.
11 (12) Setae *ta* as long as setae *te*. Costulae before setae *le* without a translamellar connection. — Europe **Moritziella** gen. n.
12 (11) Setae *ta* shorter than setae *te*. Costulae near to setae *le* with a translamellar connection.
13 (14) Sensillus bacilliform or setiform. All femora with broad lamina. — New Zealand **Laminoppia** HAMMER, 1968
14 (13) Sensillus lanceolate, fusiform or pectinate. Femora without lamina.
15 (16) Sensillus lanceolate. Femora with a process below with setae. — New Zealand **Processoppia** gen. n.
16 (15) Sensillus fusiform or pectinate. Femora without process.
17 (18) Sensillus pectinate. — Australia **Brassoppia** gen. n.
18 (17) Sensillus fusiform, ciliated.
19 (20) Pori *iad* in adanal position. Solenidia normal. — Europa, S. Africa, S. America **Stenoppia** gen. n. (part.)
20 (19) Pori *iad* in apoanal position. Solenidia of tibia and tarsi I and II short and thick. — New Zealand **Solenoppia** HAMMER, 1968
21 (4) Setae *ta* absent.

22 (23) Rostrum incised, tripartite. Sensillus pectinate. — Chile **Plaesioppia** gen. n.
23 (22) Rostrum not incised. Sensillus not pectinate.
24 (25) Bothrydium with a lid. — New Zealand **Acutoppia** gen. n.
25 (24) Bothrydium without lid.
26 (27) Sensillus setiform, smooth. — New Zealand **Rhaphoppia** gen. n.
27 (26) Sensillus fusiform, unilaterally ciliated. — Chile, New Zealand, S. Africa, Antarctis **Gressittoppia** gen. n.
28 (3) Prodorsum without costula.
29 (34) Setae *ta* present.
30 (31) Rostrum with 2 blunt incisions; nasiform in the middle. Sensillus disciform, with 6—7 radiate branches. — Tropical Africa **Helioppia** gen. n.
31 (30) Rostrum without blunt incisions and nasiform process.
32 (33) Notogaster long ovate. Sensillus capitate or fusiform, with a short stalk. — Cosmopolitan **Subiasella** gen. n.
33 (32) Notogaster circular, with straight dorsosejugal suture. Sensillus disciform, with marginal cilia. Setae ad_3 in preanal position, near to each other. — Malaysia **Discoppia** gen. n.
34 (29) Setae *ta* absent.
35 (36) Tibia I with a long process above. — New Zealand **Paroppia** HAMMER, 1968
36 (35) Tibia I without process above.
37 (38) Chelicerae suctobelboid, deuced. — Ethiopia **Xenoppia** MAHUNKA, 1982
38 (37) Chelicerae normal.
39 (40) Bothrydium with a lid. Sensillus capitate with a short stalk. — New Zealand **Operculoppia** HAMMER, 1968
40 (39) Bothrydium without lid. Sensillus not capitate with a short stalk.
41 (42) Pori *iad* in adanal position. Notogastral setae very short. Notogaster ovate. — Madagascar, E. Africa **Aethioppia** gen. n.
42 (41) Pori *iad* in apoanal position. Notogastral setae medium long. Notogaster almost circular. — Japan, New Guinea **Cycloppia** gen. n.

1. **Borhidiinae** subfam. n.

1. *Borhidia* BALOGH et MAHUNKA, 1974

BALOGH et MAHUNKA, 1974, p. 14, f. 10.

Prodorsum: with long, lamelliform costula. Sensillus elongate-capitate. Rostrum not incised. Setae *le* nearer to setae *ro*, than to setae *in*. Posterior margin of prodorsum with a chitinous lath, bearing at each end a reclinate tubercle.

Notogaster: with a long crista, joining with a tubercle to that of prodorsum. Setae *ta* present. 10 pairs of notogastral setae. Setae *ta*, *te*, *ti*, *ms*, r_1, r_2, r_3 long, incrassate spathulate; setae p_1, p_2, p_3 small, setiform.

Ventral: epimeres 3 + 4 concave backwards. 5 pairs of genital setae. Pori *iad* absent or undetectable. Setae ad_1 in postanal, ad_3 in preanal position.

Type species: *Borhidia cubana* BALOGH et MAHUNKA, 1974. — Cuba

2. **Cuneoppinae** subfam. n.

1. *Cuneoppia* BALOGH et MAHUNKA, 1969

BALOGH et MAHUNKA, 1969, p. 9, f. 23—26.

Prodorsum: costulae apically jointed. Horseshoe-shaped, situated adjacent to conically projecting dorsosejugal suture. Setae *in* near to bothrydium

represented only by alveoli. Setae *le* originating near to dorsosejugal suture. Sensillus capitate, with truncated end. Rostrum not incised.

Notogaster: with a short crista. Setae *ta* present. 10 pairs of rigid, apically granulated notogastral setae.

Ventral: pori *iad* oblique, in apoanal position. Setae ad_1 and ad_2 in postanal, ad_3 in adanal position.

Type-species: *Cuneoppia laticeps* BALOGH et MAHUNKA, 1969 — Bolivia
Cuneoppia dogmai COPUS RAROS, 1979 — Philippines

3. **Chaviniinae** subfam. n.

1. *Chavinia* HAMMER, 1961

HAMMER, 1961, p. 68, f. 58.

Prodorsum: 3 large hollows on prodorsum, bordered by chitinous edges. Setae *le* on a translamellar lath, nearer to setae *in*, than to setae *ro*. Sensillus slightly fusiform. Rostrum not incised.

Notogaster: without crista. Setae *ta* present; shorter than setae *te* and *ti*. 10 pairs of simple, setiform notogastral setae. Setae p_1, p_2, p_3 much shorter, than the others.

Ventral: pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Chavinia paradoxa* HAMMER, 1961 — Peru

4. **Enantioppiinae** subfam. n.

1. *Enantioppia* BALOGH et MAHUNKA, 1969

BALOGH et MAHUNKA, 1969, p. 52, f. 40—41.

Prodorsum: with irregular wrinkles and excrescences. Costulae insignificant, disappearing. Setae *le* nearer to setae *in*, than to setae *ro*. Sensillus fusiform, unilaterally ciliated.

Notogaster: anterior margin strongly chitinized medially, with a flat elevated part between two oval hollows. Setae *ta* present, as long as setae *te* and *ti*. 10 pairs of simple, setiform notogastral setae.

Ventral: two pairs of enantiophyses, aligned with anterior margin of genital plates. Apodemata 4 absent. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_2 in preanal position. Ventral setae ciliated.

Type-species: *Enantioppia multituberculata* BALOGH et MAHUNKA, 1969 — Bolivia

5. Lyroppiinae subfam. n.

1. *Lyroppia* Balogh, 1961

Balogh, 1961, p. 3, f. 1—3.

Prodorsum: with long, lyriform costula. Sensillus fusiform, long, unilaterally and densely aciculated. Setae *le* and *ro* extremely short, setae *in* evanescent. Rostrum not incised.

Notogaster: anterior part with longitudinal elevation, limited by long, parallel cristae; median part of elevation mostly with a large rotundato-triangular areola. Setae *ta* present (?). 10 pairs of extremely short and thin notogastral setae.

Ventral: G = 6. Apodemata 4 concave backwards. Pori *iad* in adanal position. Ad_3 in postanal, ad_1 in adanal position.

Type-species: *Lyroppia scutigera* Balogh, 1961 — Congo
Lyroppia anareolata Balogh et Mahunka, 1981 — Paraguay
Lyroppia neotropica Balogh et Mahunka, 1973 — Cuba
Lyroppia similis Balogh et Mahunka, 1981 — Bolivia

2. *Rioppia* Balogh et Mahunka, 1977

Balogh et Mahunka, 1977, p. 258, f. 8.

Prodorsum: with short, linear and convergent costulae. Sensillus short, clavate, with 4—5 radiate branches. Setae *in*, *le* and *ro* short, ciliate. Rostrum not incised.

Notogaster: with long, linear cristae. Setae *ta* present. 10 pairs of short, rigid, apically ciliated notogastral setae. Pori *iad*, *im* and *ip* protruding.

Ventral: G = 6. Epimeres 3 + 4 small; apodemata 4 each with one pair of enantiophysis. Pori *iad* adanal, short, situated on front margin of anal plates. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Rioppia nodulifera* Balogh et Mahunka, 1977 — Brazil

6. Quadroppiinae subfam. n.

1. *Quadroppia* Jacot, 1939

Jacot, 1939, p. 323.

Prodorsum: costulae trapeziform, with a translamellar line connected anteriorly. Sensillus short, capitate. Rostrum broad, not incised. Setae *le*, *in* and *ro* very small.

Notogaster: crista strongly developed, extending posteriorad at least to 1/3 to 2/3 of notogastral length. Setae *ta* present. 9 pairs of very small notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position, very short. Setae ad_1 in postanal, setae ad_3 in adanal position.

Type-species: *Notaspis quadricarinata* MICHAEL, 1885 — Cosmopolitan
Oppia circumita HAMMER, 1961 — Peru, New Zealand
Quadroppia cristata BALOGH et MAHUNKA, 1980 — Cuba
Quadroppia michaeli MAHUNKA, 1977 — Greece
Quadroppia monstruosa HAMMER, 1980 — Java
Quadroppia skookumchucki JACOT, 1939 — USA

7. **Hexoppiinae** subfam. n.

1. *Hexoppia* BALOGH, 1958

BALOGH, 1958, p. 12.

Prodorsum: with well developed costulae. Sensillus long, with slightly fusiform head. Setae *in*, *le* and *ro* very small, simple. Rostrum not incised.

Notogaster: crista strongly developed, bifurcate posteriorad. Setae *ta* extremely thin, hardly visible. 10 pairs of notogastral setae. 3 pairs of notogastral setae (*ti*, *ms*, r_2) thick, long, ciliate, remaining ones very short, setiform.

Ventral: G = 6. Pori *iad* in adanal position, situated on front margin of anal plates. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Hexoppia heterotricha* BALOGH, 1958 — Congo

8. **Granuloppiinae** subfam. n.

1. *Granuloppia* BALOGH, 1958

BALOGH, 1958, p. 12.

Prodorsum: mostly finely granulate; costulae near to each other, slightly convergent. Sensillus setiform of lanceolate, long. Rostrum not incised. Setae *in*, *le* and *ro* medium long, or long.

Notogaster: crista reduced, represented only by a small tubercle each, opposite to bothrydia. Setae *ta* present (exceptionally absent?). 10 (or 9?) pairs of long notogastral setae. Notogaster granulated or polygonate-granulated.

Ventral: G = 6. Apodemata 4 disappearing. Setae ad_1 in adanal, ad_2 and ad_3 in preanal position. Ad_3 nearer to each other, than ad_2 and ad_1.

Type-species: *Granuloppia congoensis* BALOGH, 1958 — Congo
Granuloppia conflata MAHUNKA, 1974 — Cameroon
Granuloppia ghanensis WALLWORK, 1961 — Ghana
Granuloppia kamerunensis MAHUNKA, 1974 — Cameroon
Granuloppia major BALOGH, 1958 — Congo
Granuloppia major var. *nuda* WALLWORK, 1961 — Ghana

2. *Macrosoma* HAMMER, 1979

HAMMER, 1979, p. 34, f. 54.

Prodorsum: short costulae, connected with translamellar line. Sensillus clavate, finely ciliate. Setae *in*, *le* and *ro* medium long, finely ciliate. Prodorsum with granulation. Rostrum not incised.

Notogaster: crista reduced, only two small tubercles, each opposite to bothrydia, present. Setae *ta* absent. 9 pairs of notogastral setae: setae *ti*, *te*, *ms*, r_1, r_2, r_3 long and finely ciliate, setae p_1, p_2, p_3 shorter. Dark, irregular, indefinite, longitudinal ribs in the medial part of notogaster.

Ventral: G = 6. Pori *iad* near to posterior end of anal plates, in adanal position. Setae ad_1 in adanal, setae ad_3 in preanal position. Setae ad_2 and ad_3 nearer to each other, than setae ad_2.

Type-species: *Macrosoma rugosa* HAMMER, 1979 — Java
Dameosoma multisulcatum BERLESE, 1913 — Java

3. *Senectoppia* AOKI, 1977

AOKI, 1977, p. 47, f. 15—20.

Prodorsum: rugose, with linear, disappearing costulae. Dorsosejugal suture absent. Sensillus long, setiform, unilaterally ciliated. Setae *in*, *le* and *ro* well developed, finely granulate. Rostrum not incised.

Notogaster: crista reduced, represented only by small tubercle each, opposite to bothrydia. Setae *ta* present, small. 10 pairs of notogastral setae: setae *te*, *ti*, *ms*, r_2 long, finely ciliate, remaining ones short and fine. Notogaster rugose.

Ventral: pori *iad* adanal. Setae ad_1 in adanal, setae ad_3 in preanal position. Apodemata 4 disappearing.

Type-species: *Senectoppia rugosa* AOKI, 1977 — Japan

9. **Oppiellinae** subfam. n.

1. *Belloppia* HAMMER, 1968

HAMMER, 1968, p. 15, f. 14—16.

Prodorsum: costula medium long, reaching setae *le*. Sensillus capitate. Rostrum incised, tripartite. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista complicated, there is a narrow arch medially, originating at setae *ta*; each with a chitinous process laterally, opposite to bothrydium. Setae *ta* present, as long as setae *ti* and *te*. 10 pairs of short, simple notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Belloppia wallworki* HAMMER, 1968 — New Zealand
Belloppia evansi HAMMER, 1968 — New Zealand
Belloppia shealsi HAMMER, 1968 — New Zealand

2. **Berniniella** gen. n.

Prodorsum: costula medium long, reaching lamellar region. Sensillus fusiform or capitate, with radiate branches, or exceptionally fusiform and unilaterally ciliate. Rostrum tripartite. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: short, linear crista near to setae *ta*. Setae *ta* present; as long as setae *ti* and *te*. 10 pairs of notogastral setae.

Ventral: G = 4. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Oppia aeoliana* BERNINI, 1973 — Mediterranean
Dameosoma bicarinata PAOLI, 1908 — Europe
Oppia hauseri MAHUNKA, 1974 — Greece
? *Oppiella volcanensis* HAMMER, 1962 — Chile

3. **Cosmoppia** gen. n.

Prodorsum: short, converging costulae, sensillus long, lanceolate or slightly fusiform. Rostrum incised, tripartite; median lobus as a small tubercle, bearing two rostral setae. Setae *le* much nearer to setae *in* than to setae *ro*.

Notogaster: no typical crista; represented only by two carinae, originating on dorsosejugal suture, directed forward to basis of interlamellar setae. Setae *ta* present, much shorter than setae *te* and *ti*. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Eremaeus ornatus* OUDEMANS, 1900 — Europe
Oppia ornata longipilosa KUNST, 1957 — Europe
Oppia ornata peloponesiaca MAHUNKA, 1974 — Greece
Oppia ornata tunisiaca MAHUNKA, 1980 — Tunisia
? *Oppia tricarinatoides* H. DUB., 1966 — USSR

4. **Elaphoppia** gen. n.

Prodorsum: costulae short, converging, reaching setae *le*. Sensillus very long, setiform, with 5 branches. Rostrum not incised. Setae *le* represented only by alveoli; setae *in* very long.

Notogaster: setae *ta* present, but extremely short. Setae *ti* and *ms* very long; remaining ones very short or absent.

Ventral: G = 5. Pori *iad* in adanal positions. Setae ad_1 in adanal, setae ad_3 in preanal position. Anal plates extremely large; longer than distance between genital and anal plates.

Type-species: *Oppia quadripilosa* BALOGH, 1960 — Madagascar

5. **Hypogeoppia** SUBIAS, 1982

SUBIAS, 1982, p. 58, f. I, 1—3.

Prodorsum: costulae short, arched. Sensillus fusiform or capitate with short cilia. Rostrum incised.

Notogaster: dorsosejugal suture interrupted medially. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae p_1 in postanal, p_3 in preanal position.

Type-species: *Dameosoma hypogaeum* PAOLI, 1908 — Europe

? *Oppia jahnae* SELLNICK, 1961 — Austria

? *Oppia sigma* STRENZKE, 1951 — Europe

? *Oppia sigma conjuncta* STRENZKE, 1951 — Europe

Hypogeoppia terricola SUBIAS, 1982 — Europe

6. **Mahunkella** gen. n.

Prodorsum: costulae lyriform, converging, bearing setae *le*. Sensillue pectinate, with 7 branches. Rostrum not incised. Setae *le* much nearer to setas *in* than to setae *ro*.

Notogaster: crista disappearing, each represented only by a small knob. Setae *ta* present. 12 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* adanal. Setae ad_1 in postanal position, but fairly lateral. Setae ad_3 in preanal position.

Type-species: *Oppiella transitoria* BALOGH et MAHUNKA, 1977 — Brazil

7. **Microppia** gen. n.

Prodorsum: costula absent. Sensillus short, capitate. Rostrum not incised. Setae *le* in half way, or nearer to setae *ro* than to setae *in*.

Notogaster: crista disappearing; each represented only by a short chitinous-line, originating from dorsosejugal suture, inside of setae *in*. 10 pairs of notogastral setae; setae *ta* present.

Ventral: G = 5. Pori *iad* adanal. Setae p_1 in postanal, setae p_3 in preanal position.

Type-species: *Dameosoma minus* PAOLI, 1908 — Cosmopolitan

Oppia minutissima SELLNICK, 1950 — Europe, Peru

8. *Miroppia* HAMMER, 1968

HAMMER, 1968, p. 18, f. 17.

Prodorsum: costulae only chitinous lines. Sensillus short, capitate. Rostrum incised, tripartite. Setae *le* absent; setae *in* extremely long.

Notogaster: crista represented by a broad arch, originating near to setae *te*. Setae *ta* extremely long, much longer than setae *te* and *to*. 8 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Miroppia zealandica* HAMMER, 1968 — New Zealand

9. **Moritziella** gen. n.

Prodorsum: complicated, short costulae, extending to setae *le*. Sensillus fusiform, unilaterally ciliate. Rostrum not incised.

Notogaster: crista represented only by a short chitinous line, outside of setae *ta*. Setae *ta* present, as a long as setae *te* and *ti*. 10 pairs of short notogastral setae.

Ventral: G = 4. Pori *iad* in adanal position. Setae p_1 in postanal, setae p_3 in preanal position.

Type-species: *Oppia keilbachi* MORITZ, 1969 — Europe
Oppia doris PÉREZ-IÑIGO, 1972 — Spain

10. *Neostrinatina* MAHUNKA, 1979

MAHUNKA, 1979, p. 134, f. 5—6.

Prodorsum: costulae short, bifurcate chitinous laths, between bothrydia and setae *le*. Sensillus long, setiform, with 18—20, relatively short branches. Rostrum not incised. Setae *le* much nearer to setae *in* than to setae *ro*. Setae of prodorsum long, ciliated.

Notogaster: crista represented by two cuneiform processes, opposite to posterior part of bothrydia (like *Oxyoppia*!). Setae *ta* present. 13 pairs of long, ciliate notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae p_1 in postanal, setae p_3 in preanal position. Epimeral and ventral setae long, ciliate.

Type-species: *Neostrinatina mixoppia* MAHUNKA, 1979 — Guatemala

11. *Neotrichoppia* SUBIAS et ITURRONDOBEITIA, 1980

SUBIAS et ITURRONDOBEITIA, 1980, p. 205, f. 1—3.

Prodorsum: costulae very short; setae *in* and *le* near to each other. Sensillus slightly fusiform, unilaterally ciliate (transition from fusiform-ciliate to pectinate), short. Rostrum not incised.

Notogaster: crista absent. Setae *ta* present. 10 pairs of setiform notogastral setae.

Ventral: G = 5. 14—16 pairs of aggenital setae. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Neotrichoppia pseudoconfinis* SUBIAS et ITURRONDOBEITIA, 1980 — Spain

12. *Oppiella* JACOT, 1937

JACOT, 1937, p. 356.

Prodorsum: costulae short, convergent. Sensillus fusiform. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista present or absent. Setae *ta* present. 10 pairs of short, simple notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Eremaeus novus* OUDEMANS, 1902 (= *Dameosoma corrugatum* BERLESE, 1904) — Cosmopolitan?

Dameosoma confinis PAOLI, 1908 — Europe
Oppiella dubia HAMMER, 1968 — New Zealand, Chile
Eremaeus neerlandicus OUDEMANS, 1900 — Europe
Oppia translamellata WILLMANN, 1925 — Europe
Dameosoma unicarinata PAOLI, 1908 — Europe
Oppia washburni HAMMER, 1952 — N. Canada
? *Oppia clavigera* HAMMER, 1952 — N. Canada

13. *Oxyoppia* BALOGH et MAHUNKA, 1969

BALOGH et MAHUNKA, 1969, p. 269, f. 23.

Prodorsum: costulae straight, converging, connected by a translamellar line. Sensillus fusiform, ciliate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista represented by two cuneiform processes, opposite to posterior part of bothrydia. Setae *ta* present. 10 pairs of short, simple notogastral setae.

Ventral: pori *iad* oblique, in apoanal position. Setae p_1 in postanal, setae p_3 in preanal position.

Type-species: *Oppia spinosa* HAMMER, 1958

Oppia africanus EVANS, 1953 — Kilimandjaro
Oppia bituberculata BALOGH, 1958 — Congo
Oxyoppia cristata HAMMER, 1977 — Pakistan
Oxyoppia cubana BALOGH et MAHUNKA, 1980 — Cuba
Oxyoppia europaea MAHUNKA, 1982 — Hungary

Oxyoppia mastax BALOGH et MAHUNKA, 1977 — Bolivia
Oxyoppia pilosa BALOGH et MAHUNKA, 1981 — Paraguay
Oppia saskai BALOGH, 1961 — E. Africa
Oppia scalifera HAMMER, 1958 — Argentina
Oppia suramericana HAMMER, 1958 — Argentina, Bolivia, New Zealand
? *Oppiella polynesia* HAMMER, 1972 — Tahiti

14. *Perspicuoppia* PÉREZ-IÑIGO, 1971

PÉREZ-IÑIGO, 1971, p. 315, f. 50—52.

Prodorsum: costulae complicated; extending from dorsosejugal suture to setae *le*. Sensillus fusiform, ciliate. Rostrum not incised.

Notogaster: crista strongly developed, appearing as two pairs of chitinous laths. Setae *ta* present. 10 pairs of short, simple notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae p_1 in postanal, setae p_3 in preanal position.

Type-species: *Oppia perspicua* MIHELČIĆ, 1956 — Europe
Perspicuoppia minidentata SUBIAS, 1977 — Spain

15. **Ptiloppia** gen. n.

Prodorsum: short, complicated costulae, extending to setae *le*. Sensillus long, setiform, with long cilia. Rostrum incised, tripartite; median lobe broad. Setae *le* much nearer to setae *in* than to setae *ro*.

Notogaster: crista reduced. Setae *ta* extremely small. 8 pairs of detectable notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Oppiella bullanovae* HAMMER, 1968 — New Zealand

16. **Rhinoppia** gen. n.

Prodorsum: costula reduced to a tubercle, near to interlamellar setae, directed backwards. Setae *le* nearer to setae *in* than to setae *ro*. Rostrum incised; median lobe prominent, like a naso. Sensillus fusiform, unilaterally ciliate.

Notogaster: crista represented by a flat arch, extending from setae *ta* to setae *ta*. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 4. (No other information!)

Type-species: *Oppia nasuta* MORITZ, 1965 — Europe

17. *Sacculoppia* Balogh et Mahunka, 1968

Balogh et Mahunka, 1968, p. 324, f. 12—13.

Prodorsum: costulae straight, converging. Sensillus setiform, ciliate. Setae *le* nearer to setae *in* than to setae *ro*. Rostrum not incised.

Notogaster: crista represented by two cuneiform processes, opposite to posterior part of bothrydia. Setae *ta* present. 10 pairs of notogastral setae. Posterior part of notogaster with a pair peculiar, cap-shaped, chitinous excrescences.

Ventral: G = 5. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Sacculoppia singularis* Balogh et Mahunka, 1968 — S. America

18. *Tripiloppia* Hammer, 1968

Hammer, 1968, p. 10, f. 2—6.

Prodorsum: short, complicated costulae, extending to setae *le*. Sensillus pectinate. Rostrum incised, tripartite. Setae *le* much nearer to setae *in* than to setae *ro*. Setae *le* mostly very short, evanescent.

Notogaster: crista disappearing, like a flat arch, or absent. 10 pairs of notogastral setae. Setae *ta* present. Notogastral setae short.

Ventral: G = 4. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position. 3 pairs of adanal setae.

Type-species: *Tripiloppia aokii* Hammer, 1968 — New Zealand
Tripiloppia dalenii Hammer, 1968 — New Zealand
Tripiloppia forsslundi Hammer, 1968 — New Zealand
Tripiloppia subiasi Balogh, 1981 — Queensland
Tripiloppia tarraswahlbergi Hammer, 1968 — New Zealand
Tripiloppia tragardhi Hammer, 1968 — New Zealand

10. **Papillonotinae** subfam. n.

Papillonotus Wallwork, 1961

Wallwork, 1961, p. 347, f. 4—5.

Prodorsum: costulae present, with small, spathulate setae *in* and *le*. Sensillus fusiform, with aciculated head. Rostrum not incised. Setae *le* in half way, or much nearer to setae *ro* than to setae *in*.

Notogaster: crista represented by two cuneiform processes, opposite to posterior part of bothrydia. Setae *ta* present. 10 pairs of small, spathulate notogastral setae. Dorsosejugal suture with a median process. Notogaster with granulate cerotegument.

Ventral: apodemata 4 straight. Genital plates in epimeres 3 + 4, before of apodemata 4. G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Papillonotus maculatus* WALLWORK, 1961 — Ghana
Papillonotus granulosus WALLWORK, 1961 — Ghana

11. Mystroppiinae subfam. n.

1. Acroppia gen. n.

Prodorsum: costulae parallel, evanescent. Sensillus fusiform, densely aciculated. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Prodorsum finely granulated.

Notogaster: crista represented by two cuneiform processes, opposite to posterior part of bothrydia. Setae *ta* present. 10 pairs of notogastral setae. Setae *ta* setiform, smooth, remaining notogastral setae slightly fusiform, unilaterally aciculate.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Stachyoppia processigera* BALOGH et MAHUNKA, 1967 — Congo
Stachyoppia translamellata BALOGH et MAHUNKA, 1966 — Congo
Stachyoppia amazonica BALOGH et MAHUNKA, 1969 — Amazonia

2. Corynoppia gen. n.

Prodorsum: costula absent. Sensillus slightly fusiform, unilaterally aciculated. Rostrum not incised. Setae *in* foliate or spathulate, nearer to setae *in* than to setae *ro*. Prodorsum punctulate.

Notogaster: crista absent. Setae *ta* extremely short. 10 pairs of notogastral setae. Setae *ta* tiny, setiform, remaining notogastral setae foliate, aciculate.

Ventral: G = 5. Pori *iad* adanal. Setae ad_1 postanal, but fairly lateral Setae ad_3 preanal. Setae ad_1 foliate, ad_2 and ad_3 setiform.

Type-species: *Stachyoppia kosarovi* JELEVA, 1962 — Europe
Stachyoppia kosarovi matritensis PÉREZ-IÑIGO, 1967 — Mediterranean

3. *Mystroppia* BALOGH, 1959

BALOGH, 1959, p. 33, f. 7—9.

Prodorsum: complicated costulae; two or more short, longitudinal crests each in the interlamellar region; three long, parallel ribs extending from setae *in* to setae *ro*. Setae *in* setiform, very small; setae *le* and *ro* foliate, spoon-like.

Sensillus fusiform, unilaterally aciculate. Rostrum not incised. Setae *le* much nearer to setae *in* than to setae *ro*.

Notogaster: crista absent (only a short line outside of setae *ta*). Setae *ta* present, spathulate, short. 10 pairs of notogastral setae; excepting setae *ta* broadly foliate, spoon-like. Notogaster with rough granulation.

Ventral: G = 5. Pori *iad* adanal. Setae ad_1 in adanal, setae ad_3 in preanal position. Setae ad_1 and ad_2 foliate, setae ad_3 setiform.

Type-species: *Mystroppia sellnicki* BALOGH, 1959 — Europe
Mystroppia dallaii BERNINI, 1973 — Mediterranean
Mystroppia rethejumi KRIVOLUTZKIJ, 1971 — USSR

4. *Stachyoppia* BALOGH, 1961

BALOGH, 1961, p. 5, f. 4—5.

Prodorsum: two pairs of costulae; inner pair in the interlamellar area is parallel and shorter; the outer pair near to bothrydia is convergent and longer, ending at setae *le*. Sensillus slightly fusiform, unilaterally aciculate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Setae *in* and *le* spathulate.

Notogaster: crista represented by two blunt cuneiform processes, each bearing small setiform setae *ta*. 10 pairs of notogastral setae. Notogastral setae (excepting setae *ta*!) dilated, unilaterally densely ciliate.

Ventral: G = 4. Pori *iad* adanal. Setae ad_1 in postanal, setae ad_3 in preanal position. Setae ad_1 and ad_2 dilated, unilaterally ciliate.

Type-species: *Stachyoppia muscicola* BALOGH, 1961 — E. Africa

5. *Striatoppia* BALOGH, 1958

BALOGH, 1958, p. 16.

Prodorsum: complicated costulae present. Sensillus slightly fusiform, unilaterally aciculated; exceptionally smooth. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent, or reduced to a short line or to a small tubercle. Notogaster undulate-striated. Setae *ta* present. 10 pairs of notogastral setae. Notogastral setae lanceolate, dilated, or foliate; setae *ta* somewhat less so than remaining setae.

Ventral: G = 5. Pori *iad* adanal. Setae ad_1 in postanal, setae ad_3 in preanal position. 3—4 pairs of epimeral setae and setae ad_1 and ad_2 mostly dilated.

Type-species: *Striatoppia machadoi* BALOGH, 1958 — Congo
Striatoppia baloghi MAHUNKA, 1974 — Cameroon
Striatoppia breviclava MAHUNKA, 1982 — Ethiopia
Opiella foliosa JACOT, 1937 — N. America
Striatoppia hammeni MAHUNKA, 1977 — SE. Asia

Striatoppia lanceolata HAMMER, 1972 — Tahiti
Striatoppia madagascarensis BALOGH, 1960 — Madagascar
Striatoppia margaritata MAHUNKA, 1969 — Tanzania
Striatoppia margaritifera BALOGH et MAHUNKA, 1966 — Congo
Striatoppia multilineata CORPUZ-RAROS, 1979 — Philippines
Opiella niliaca POPP, 1960 — Egypt
Striatoppia opuntiseta BALOGH et MAHUNKA, 1968 — Indonesia, Tahiti
Striatoppia papillata BALOGH et MAHUNKA, 1966 — Congo
Striatoppia tribuliforme BALOGH et MAHUNKA, 1981 — S. America
Oppiella stipularis JACOT, 1973 — N. America

12. **Teratoppiinae** subfam. n.

1. *Teratoppia* BALOGH, 1959

BALOGH, 1959, p. 98, f. 16—18.

Prodorsum: costulae absent. Sensillus bacilliform, apically finely ciliate. Rostrum not incised. Setae *le* in half way, or nearer to setae *in* than to setae *ro*. Legs strong, with apophyses.

Notogaster: crista absent. Setae *ta* present or absent. 10 or 9 pairs of notogastral setae. Setae *ms*, r_1, r_2, r_3, p_1, p_2, p_3 on posterior part of notogaster.

Ventral: apodemata 4 absent. G = 6. Pori *iad* in adanal position. Setae ad_1 in adanal, setae ad_2 and ad_3 in preanal position.

Type-species: *Teratoppia calcarata* BALOGH, 1959 — Congo
Teratoppia ciliata WALLWORK, 1961 — Ghana
Teratoppia minor WALLWORK, 1961 — Ghana
Teratoppia reducta BALOGH et MAHUNKA, 1969 — S. America
Teratoppia uspiensis PÉREZ-IÑIGO et BAGGIO, 1980 — Brasil

2. **Teratoppiella** gen. n.

Prodorsum: costulae absent. Sensillus pectinate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Legs with apophyses.

Notogaster: crista absent. Setae *ta* present or absent. 10 or 9 pairs of small, simple notogastral setae.

Ventral: apodemata 4 absent. Pori *iad* in apoanal position. Setae ad_1 in adanal, setae ad_2 and ad_3 in preanal position.

Type-species: *Teratoppia brevipectinata* BALOGH et MAHUNKA, 1978 — Chile
Teratoppia pluripectinata BALOGH et MAHUNKA, 1978 (pro *Teratoppia pectinata* BALOGH et MAHUNKA, 1969, nec *Teratoppia pectinata* BALOGH, 1961)
Teratoppia pectinata BALOGH, 1961 — E. Africa

13. Tectoppiinae subfam. n.

1. *Tectoppia* WALLWORK, 1961

WALLWORK, 1961, p. 343, f. 1—3.

Prodorsum: costula absent. Sensillus bacilliform, with slightly fusiform head. Rostrum not incised. Setae *le* in half way between setae *in* and *ro*.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae. Setae *ti*, *te* and *ms* very long, remaining ones short.

Ventral: G = 6. Epimeres 3 + 4 long, oblique. Pori *iad* in apoanal position. Setae ad_1, ad_2 and ad_3 in adanal position. Anal plates large, longer than distance between genital and anal plates.

Type-species: *Tectoppia nigricans* WALLWORK, 1961 — Ghana

Tectoppia longisetosa MAHUNKA, 1974 — Cameroon

14. Sternoppiinae BALOGH et MAHUNKA, 1969

1. *Sternoppia* BALOGH et MAHUNKA, 1968
(= *Synoppia* BALOGH et MAHUNKA, 1969)

BALOGH et MAHUNKA, 1968, p. 56, f. 48—49.
BALOGH et MAHUNKA, 1969, p. 56, f. 48—49.

Prodorsum: costulae parallel, extending from setae *in* to setae *la*, or a little farther. Sensillus pectinate, with ramified branches. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present or absent. 10 or 9 pairs of notogastral setae.

Ventral: G = 6. Two chitinous plates in epimeral region, with incrassate, plumose setae. Crista absent. Pori *iad* in adanal position. Setae ad_1 in adanal, setae ad_3 hardly in preanal and in rather lateral position. Ventral plate very broad.

Type-species: *Sternoppia mirabilis* BALOGH et MAHUNKA, 1968 — S. America

Sternoppia boliviana BALOGH et MAHUNKA, 1969 — Bolivia
Sternoppia incisa BALOGH et MAHUNKA, 1969 — Bolivia
Sternoppia minor BALOGH et MAHUNKA, 1980 — Cuba
Synoppia quadriseta BALOGH et MAHUNKA, 1969 — S. America
Sternoppia reticulata BALOGH et MAHUNKA, 1969 — S. America
Sternoppia sphaerodendron BALOGH et MAHUNKA, 1979 — Cuba
Sternoppia vicina BALOGH et MAHUNKA, 1980 — Cuba

15. **Arcoppiinae** subfam. n.

1. *Arcoppia* HAMMER, 1977

HAMMER, 1977, p. 32, f. 21.

Prodorsum: costula horseshoe-shaped. Sensillus radiate, with 1—6 branches. Branches often asymmetrically reduced to 3, 2 or 1 branches. Rostrum tripartite or not incised (?). Setae *le* in half way, or nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Arcoppia brachyramosa* HAMMER, 1977 — NW. Pakistan
Dameosoma arcuale BERLESE, 1913 — Java
Dameosoma arcualis var. *robustior* BERLESE, 1913 — Java, Vietnam
Oppia arcualis sinensis MAHUNKA, 1976 — Hong-Kong
Oppia corniculifera MAHUNKA, 1978 — Mauritius
Dameosoma dissimile BERLESE, 1905 — Java
Oppia fenestralis WALLWORK, 1961 — Ghana
Oppia gilva WALLWORK, 1961 — Ghana
Oppia grucheti MAHUNKA, 1978 — Réunion
Arcoppia longisetosa BALOGH, 1982 — Queensland
Oppia rugosa MAHUNKA, 1973 — Rhodesia
Oppia serrulata BALOGH et MAHUNKA, 1980 — Cuba
Oppia tripartita HAMMER, 1961 — Peru
Arcoppia varia HAMMER, 1980 — Java
Oppia winkleri HAMMER, 1968 — New Zealand
Arcoppia vittata HAMMER, 1980 — Java
? *Oppia angolensis* BALOGH, 1961 — Congo
? *Oppia angolensis radiata* WALLWORK, 1961 — Ghana
? *Oppia viperea* AOKI, 1959 — Japan

2. **Austroppia** gen. n.

Prodorsum: costula present as lamellar and translamellar lines. Sensillus fusiform, with 4—5 short cilia. Rostrum tripartite. Setae *le* in half way between setae *in* and *ro*.

Notogaster: crista absent. Setae *ta* absent, or present. 10 or 9 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal setae ad_3 in preanal position.

Type-species: *Oppia magellanis* HAMMER, 1962 — Chile
Notaspis crozetensis RICHTERS, 1907 — Macquarie Is.
Brachioppiella petrohuensis HAMMER, 1962 — Chile

3. *Brachioppia* HAMMER, 1961

HAMMER, 1961, p. 51, f. 42.

Prodorsum: costulae disappearing, hardly visible, or absent. Sensillus pectinate, with slightly incrassate stem, or asymmetrically radiate. (Sensillus transition between the pectinate and the radiate type!) Rostrum not incised. Setae *le* nearer to setae *in* the to setae *ro*.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in adanal, exceptionally in postanal (?), setae ad_3 in preanal position.

Type-species: *Brachioppia cuscensis* HAMMER, 1961 — Peru

Brachioppia cajamarcensis HAMMER, 1961 — Peru

Oppia deliciosa HAMMER, 1961 — Peru, Paraguay

Oppia guarani BALOGH et MAHUNKA, 1981 — Paraguay

Oppia pseudocostulata BALOGH et MAHUNKA, 1969 — S. America

4. **Ctenoppia** gen. n.

Prodorsum: costulae absent. Sensillus long, with 8—12 short branches. Rostrum not incised. Setae *le* much nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae; setae *ti* and *te* long, ciliate, much longer than the others.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 hardly in preanal position.

Type-species: *Oppia variopectinata* BALOGH et MAHUNKA, 1975 — Queensland

Oppia eupectinata BALOGH et MAHUNKA, 1975 — Queensland

5. **Hammerella** gen. n.

Prodorsum: costula absent. Sensillus pectinate. Rostrum tripartite (?). Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista reduced; each represented by two chitinous tubercles opposite to posterior margin of bothrydium. Setae *ta* absent. 9 pairs of notogastral setae: *te*, *ti*, *ms*, r_2 and r_3 in a longitudinal row; setae r_1, p_1, p_2 and p_3 caudal, near to each other.

Ventral: G = 6. Pori *iad* in adanal position. Setae ad_1 in adanal, setae ad_2 in preanal position.

Type-species: *Brachioppiella gracilis* HAMMER 1979 — NW. Pakistan

6. **Kokoppia** gen. n.

Prodorsum: costula absent or present. Sensillus pectinate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* absent or present. 9 or 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in adanal position.

Type-species: *Brachioppia longisetosa* KOK, 1967 — S. Africa

Oppia euramosa BALOGH et MAHUNKA, 1969 — S. America

7. **Mimoppia** gen. n.

Prodorsum: costula horseshoe-shaped. Sensillus pectinate; branches apically shortened. Setae *le* about in half way between setae *in* and setae *ro*. Rostrum tripartite.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in adanal position. Setae ad_1 in adanal, setae ad_3 in preanal position.

Type-species: *Oppia tenuiseta* WALLWORK, 1961 — Ghana

8. **Pletzenoppia** gen. n.

Prodorsum: crista absent. Sensillus fusiform, unilaterally ciliate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* absent or present. 9 or 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Oppia pletzenae* KOK, 1967 — S. Africa

? *Oppia inclinata* HAMMER, 1962 — Patagonia

9. *Porrhoppia* BALOGH, 1970

BALOGH, 1970, p. 50, f. 31—32.

Prodorsum: costula absent. Sensillus pectinate. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in adanal position. Epimeres 3 + 4 very long, as long as ventral plate.

Type-species: *Porrhoppia crux* BALOGH, 1970 — Ceylon

10. *Ramuloppia* BALOGH, 1961

BALOGH, 1961, p. 280, t. 17, f. 13—14.

Prodorsum: costula absent. Sensillus pectinate. Rostrum bipartite, only with one incision. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position, far lateral from anal plate. Setae ad_1 in adanal, setae ad_3 in preanal position. Epimeral setae with long cilia.

Type-species: *Oppia ramiseta* BALOGH, 1959 — Congo

11. **Wallworkella** gen. n.

Prodorsum: costula horseshoe-shaped. Sensillus pectinate; branches basally shortened. Rostrum tripartite. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in adanal position.

Type-species: *Oppia trimucronata* WALLWORK, 1961 — Ghana
Oppia machadoi BALOGH, 1958 — Congo

16. **Lanceoppiinae** subfam. n.

1. **Convergoppia** gen. n.

Prodorsum: costulae present, extending from bothrydia, converging to setae *le*; setae *le* at the end of costulae. Sensillus setiform. Setae *le* nearer to seta *in* than to setae *ro*. Rostrum not incised.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in adanal position.

Type-species: *Oppia pletzeni* HAMMER, 1968 — New Zealand

2. *Hamoppia* HAMMER, 1968

HAMMER, 1968, p. 28, f. 30.

Prodorsum: linear costulae present. Sensillus setiform, apically finely dilated. Rostrum not incised (?). Behind proximal part of femora II a small hook present.

Notogaster: crista absent. Setae *ta* extremely small. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Hamoppia lionsi* HAMMER, 1968 — New Zealand
Hamoppia thamdrupi HAMMER, 1968 — New Zealand

3. *Lanceoppia* HAMMER, 1962

HAMMER, 1962, p. 42, f. 4.
Lancetoppia HAMMER, 1968; 32.

Prodorsum: costula absent or present. Sensillus lanceolate. Rostrum not incised.

Notogaster: crista absent. Setae *ta* present or absent. Notogastral setae 10 or 9 pairs.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Lanceoppia hexapili* HAMMER, 1962 — Chile
Lanceoppia angustopili HAMMER, 1962 — Chile
Lancetoppia banksi HAMMER, 1968 — New Zealand
Lancetoppia becki HAMMER, 1968 — New Zealand
Lancetoppia berlesei HAMMER, 1968 — New Zealand
Lancetoppia bertheti HAMMER, 1968 — New Zealand
Oppia bicristata HAMMER, 1962 — Patagonia
Oppia binodosa HAMMER, 1962 — Chile
Lancetoppia csiszarae HAMMER, 1968 — New Zealand
Lancetoppia ewingi HAMMER, 1968 — New Zealand
Oppia feideri HAMMER, 1968 — New Zealand
Oppia haarlovi HAMMER, 1968 — New Zealand
Lancetoppia jacoti HAMMER, 1968 — New Zealand
Lancetoppia knuellei HAMMER, 1968 — New Zealand
Oppia lancearia BALOGH et MAHUNKA, 1975 — Queensland
Lancetoppia luxtoni HAMMER, 1968 — New Zealand
Lancetoppia mahunkai HAMMER, 1968 — New Zealand
Lancetoppia markeli HAMMER, 1968 — New Zealand
Lancetoppia menkei HAMMER, 1968 — New Zealand
Oppia microlancearia BALOGH et MAHUNKA, 1975 — Queensland
Oppia microtricha BALOGH et MAHUNKA, 1975 — Queensland
Oppia microtrichoides BALOGH et MAHUNKA, 1975 — Queensland
Oppia perezinigoi HAMMER, 1968 — New Zealand
Lancetoppia piffli HAMMER, 1968 — New Zealand
Lancetoppia poppi HAMMER, 1968 — New Zealand
Lancetoppia ramsayi HAMMER, 1968 — New Zealand
Lancetoppia rigidiseta HAMMER, 1968 — New Zealand
Lancetoppia schusteri HAMMER, 1968 — New Zealand
Lancetoppia schweizeri HAMMER, 1968 — New Zealand
Lancetoppia sellnicki HAMMER, 1968 — New Zealand
Lancetoppia seydi HAMMER, 1968 — New Zealand
Oppia stigmata HAMMER, 1980 — Java

Lancetoppia strenzkei HAMMER, 1968 — New Zealand
Lancetoppia thori HAMMER, 1968 — New Zealand
Lancetoppia vanderhammeni HAMMER, 1968 — New Zealand
Lancetoppia vaneki HAMMER, 1968 — New Zealand
Lancetoppia willmanni HAMMER, 1968 — New Zealand
Lancetoppia woodringi HAMMER, 1968 — New Zealand

4. **Loboppia** gen. n.

Prodorsum: costula absent. Sensillus lanceolate. Rostrum not incised, rostrum with two membranous lobes at tip. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* very short, but present. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in adanal position.

Type-species: *Oppia covarrubiasi* HAMMER, 1968 — New Zealand

5. **Setoppia** gen. n.

Prodorsum: costula absent. Sensillus setiform, sparsely ciliate. Rostrum not incised. Setae *le* somewhat nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present or absent. 10 or 9 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Oppia toeroeki* BALOGH, 1982 — Queensland
Oppia antennata BALOGH et MAHUNKA, 1966 — S. Africa
Oppia compressa BALOGH et MAHUNKA, 1975 — Queensland
Oppia fortis BALOGH et MAHUNKA, 1966 — S. Africa
Tectoppia karinae MAHUNKA, 1973 — Rhodesia
Oppia longisetosa BALOGH et MAHUNKA, 1975 — Queensland
Oppia quattor KOK, 1967 — S. Africa

6. **Setuloppia** gen. n.

Prodorsum: short, horseshoe-shaped costula, bearing setae *le*. Sensillus setiform, sparsely ciliate. Rostrum not incised. Setae *le* much nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Oppia newelli* HAMMER, 1968 — New Zealand

7. *Trematoppia* Balogh, 1962

Balogh, 1962, p. 133, f. 23—25.

Prodorsum: costula absent. Sensillus long, setiform. Rostrum not incised. Setae *in* evanescent.

Notogaster: crista absent. Some longitudinal lines, each originating at setae *ta* on notogaster. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Seta ad_1 in postanal, ad_3 in preanal position.

Type-species: *Trematoppia cristipes* Balogh, 1962 — Madagascar

17. Globoppiinae subfam. n.

1. *Aeroppia* Hammer, 1961

Hammer, 1961, p. 65, f. 1—2.

Prodorsum: costula absent. Sensillus capitate, with short stalk. Rostrum not incised. Setae *le* in half way, or nearer to setae *ro* than to setae *in*.

Notogaster: crista absent. Setae *ta* present. 13 pairs of notogastral setae. Setae p_1 dilated, air-filled.

Ventral: G = 6. Pori *iad* in adanal position. Setae ad_1 in postanal position, dilated, air-filled. Setae ad_3 in adanal position.

Type-species: *Aeroppia peruensis* Hammer, 1961 — Peru
Aeroppia clavatum Higgins, 1966 — Br. Guyana
Aeroppia columbiana Hammer, 1961 — Columbia
Aeroppia insularis Higgins, 1966 — Dominica
Dameosoma vacuum Berlese, 1888 — Brasil

2. *Heteroppia* Balogh, 1970

Balogh, 1970, p. 48, f. 29—30.

Prodorsum: costula absent. Sensillus capitate, with short stalk. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*. Setae of prodorsum very long.

Notogaster: crista absent. Setae *ta* present (?). 7 pairs of notogastral setae: 4 pairs very long (*ta*, *te*, *ms*, r_2), 1 pair thick, air-filled.

Ventral: G = 6. Pori *iad* in adanal position. Setae ad_1 in adanal, setae ad_3 in adanal position.

Type-species: *Heteroppia globigera* Balogh, 1970 — Ceylon
Globoppia (*Aeroppia*) *pauciseta* Hammer, 1971 — Fiji

3. *Globoppia* HAMMER, 1962

HAMMER, 1962, p. 44, f. 34.

Prodorsum: costula absent. Sensillus capitate, either with shorter, or longer stalk. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Ad_1 in postanal, ad_3 in adanal or preanal position.

Type-species: *Globoppia intermedia* HAMMER, 1962 — Chile

Oppia argentinensis BALOGH et CSISZÁR, 1963 — Argentina
Globoppia campbellensis WALLWORK, 1964 — Campbel Is.
Globoppia gressitti WALLWORK, 1964 — Campbell Is.
Oppia heterotricha BALOGH et MAHUNKA, 1969 — S. America
Oppia kovacsi BALOGH et CSISZÁR, 1963 — Argentina
Oppia loxolineata WALLWORK, 1965 — Shetland Is.
Oppia loxolineata longipilosa COVARRUBIAS, 1968 — Antarctic
Globoppia maior HAMMER, 1962 — Chile
Globoppia minor HAMMER, 1962 — Chile
Globoppia nidicola HAMMER, 1968 — New Zealand
Oppia patagonica MAHUNKA, 1980 — Argentina
Oppia pseudocorrugata MAHUNKA, 1980 — Argentina
Oppia tuxeni HAMMER, 1968 — New Zealand
Oppia ventrolaminata HAMMER, 1962 — Patagonia
Globoppia wallworki MAHUNKA, 1980 — Argentina

4. *Membranoppia* HAMMER, 1968

HAMMER, 1968, p. 25, f. 25.

Prodorsum: costula present. Sensillus capitate, with short stalk. Rostrum not incised. Setae *le* in half way, or nearer to setae *in* than to setae *ro*. Bothrydium with a narrow membranous bridge.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-sepecies: *Membranoppia karppineni* HAMMER, 1968 — New Zealand (= *krivoluzkii* HAMMER, 1968 — New Zealand)

Membranoppia sitnikovae HAMMER, 1968 — New Zealand

5. **Otoppia** gen. n.

Prodorsum: costulae absent. Sensillus long, with dilated head. Rostrum not incised. Pedotecta 2 large, protruding.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of extremely short, evanencent notogastral setae.

Ventral: G = 6. Pori *iad* in apoanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Oppia midas* BALOGH, 1962 — Madagascar

18. Machuellinae subfam. n.

1. *Machuella* HAMMER, 1961

HAMMER, 1961, p. 70, f. 59.

Prodorsum: costula absent. Sensillus fusiform, or capitate with long stalk. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*.

Notogaster: crista represented by a simple or double (or exceptionally multiplied !) line. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: epimeral setae long, directed toward centre of epimeral region; constituting a basket, within a thick layer of excretion. G = 5. Pori *iad* in adanal position. Setae ad_1 in adanal position, but somewhat posteriorad; setae ad_3 in adanal or preanal position. Chelicerae small, resembling peloptoid.

Type-species: *Machuella ventrisetosa* HAMMER, 1961

Machuella africana MAHUNKA, 1978 — Réunion
Machuella capitata KULIJEV, 1967 — Caucasus
Machuella draconis HAMMER, 1961 — Italy
Machuella lineata HAMMER, 1973 — Samoa
Machuella pyriformis HAMMER, 1968 — New Zealand
Machuella ventrisetosa var. *plicata* HAMMER, 1980 — Java
Machuella ventrisetosa var. *robusta* HAMMER, 1971 — Fiji
Machuella zehntneri MAHUNKA, 1977 — SE. Asia

19. Trizetinae EWING, 1971

1. *Trizetes* BERLESE, 1904

BERLESE, 1904, p. 26.

Prodorsum: costula absent. Prodorsum long, acuminated. Sensillus pectinate, with 3—4 short branches. Setae *in*, *le* and *ro* extremely short. Rostrum acute, long, not incised. Setae *le* much nearer to setae *in* than to setae *ro*.

Notogaster: long triangular expanded part between prodorsum and notogaster. Crista absent. Setae *ta* present. 10 pairs of short notogastral setae. Dorsosejugal suture straight.

Ventral: G = 5. Pori *iad* in apoanal position (?). Setae ad_1 in postanal, setae ad_3 in preanal position. Genital and anal plates short: anal plates twice or thrice shorter than interspace between genital and anal plates. Epimeres 3 + 4 much longer than epimeres 1 and 2 together. Chelicerae long, peloptoid.

Type-species: *Trizetes pyramidalis* BERLESE, 1904. — Mediterranean

20. Pulchroppiinae subfam. n.

1. Alcioppia gen. n.

Prodorsum: costula absent (but sharp lamellar and translamellar lines may be present!). Sensillus pectinate, with long branches. Rostrum with a round excision. Setae *le* nearer to setae *in* than to setae *ro*. Rostral geniculate.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in adanal, or nearly preanal position.

Type-species: *Oppia hippy* MAHUNKA, 1982 — Mexico

2. *Brachioppiella* HAMMER, 1962

HAMMER, 1962, p. 47, f. 38.

Prodorsum: costula present or absent. Sensillus pectinate or radiate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present or absent. 10 or 9 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Brachioppiella periculosa* HAMMER, 1962 — Chile
Oppia biseriata BALOGH et MAHUNKA, 1975 — Queensland
Brachioppia hartensteini HAMMER, 1968 — New Zealand
Brachioppia higginsi HAMMER, 1968 — New Zealand
Brachioppiella rajskii HAMMER, 1968 — New Zealand
Brachioppiella triramosa HAMMER, 1962 — Chile
Brachioppia walkeri HAMMER, 1968 — New Zealand

3. *Cryptoppia* CSISZÁR, 1961

CSISZÁR, 1961, p. 35, f. 15—16.

Prodorsum: costula absent. Sensillus pectinate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae. Posterior part of notogaster granulated.

Ventral: G = 5. Apodemata 4 fused behing genital plates; thus genital plates located in epimeres 3 + 4, before apodemata 4. Pori *iad* in apoanal position, very short. Setae ad_1 in postanal, but in somewhat adanal position; setae ad_3 in preanal position. Ventral plate granulated.

Type-species: *Cryptoppia elongata* CSISZÁR, 1961 — Indonesia

4. **Furculoppia** gen. n.

Prodorsum: costula absent. Sensillus pectinate with secondary ramified branches. Rostrum not incised. Setae *le* in half way between setae *in* and setae *ro*.

Prodorsum: crista absent. Setae *ta* absent. 12 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Oppia furcata* KUNST, 1957 — Bulgaria

5. *Gittella* HAMMER, 1961

HAMMER, 1961, p. 63, f. 56.

Prodorsum: costula absent. Sensillus pectinate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Prodorsum partly punctulated.

Notogaster: crista absent. Setae *ta* absent. 12 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in apoanal position. Setae ad_1 postanal, but somewhat in adanal, setae ad_3 on preanal position. Ventral plate punctulated.

Type-species: *Gittella punctata* HAMMER, 1961 — Peru

6. *Octoppia* BALOGH et MAHUNKA, 1969

BALOGH et MAHUNKA, 1969, p. 10, f. 29—30.

Prodorsum: costula absent. Sensillus pectinate. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*. Setae *ro* near to each other.

Notogaster: crista absent. Setae *ta* present. 8 pairs of notogastral setae: setae *te*, *ti*, *ms*, r_3 very long, setae *ta*, p_1, p_2, p_3 short. Notogaster circular.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in adanal, or somewhat in preanal position.

Type-species: *Octoppia irmayi* BALOGH et MAHUNKA, 1969 — S. America

7. *Pulchroppia* HAMMER, 1979

HAMMER, 1979, p. 33, f. 51.

Prodorsum: costula absent. Sensillus pectinate with arched branches. Rostrum not incised. Setae *le* much nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present or absent. 13—12, or 10—9 of notogastral setae.

Ventral: G = 5. Apodemata 4 absent. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position. Ventral plate with obsolete polygonal structure.

Type-species: *Pulchroppia elegans* HAMMER, 1980 — Java

Multioppia amazonica BALOGH et MAHUNKA, 1969 — S. America
Multioppia berndhauseri MAHUNKA, 1978 — Mauritius
Multioppia gyoergyi BALOGH et MAHUNKA, 1969 — S. America
Brachioppiella malapectinata CORPUS-RAROS, 1979 — Philippines
Multioppia pectinata AOKI, 1967 — Thailand
Brachioppia pendula BALOGH, 1970 — Ceylon
Multioppia schauenbergi MAHUNKA, 1978 — Réunion
Pulchroppia similis HAMMER, 1980 — Java
Multioppia vietnamica **nom. n.** (pro *Multioppia pectinata* BALOGH et MAHUNKA, 1967, nec AOKI, 1967 !)

? *Multioppia graeca* MAHUNKA, 1977 — Greece
? *Multioppia maxima* BALOGH et MAHUNKA, 1981 — S. America

21. **Amerioppiinae** subfam. n.

1. *Amerioppia* HAMMER, 1961

HAMMER, 1961, p. 54, f. 46.

Prodorsum: costula absent. Sensillus slightly fusiform, or lanceolate. Rostrum not incised. Setae *in* absent. Setae *ro* near to each other, exceptionally geniculate.

Notogaster: crista absent. Setae *ta* present or absent. 10 or 9 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Amerioppia rudentigera* HAMMER, 1961

Amerioppia africana KOK, 1967 — S. Africa
Amerioppia ankae MAHUNKA, 1973 — Rhodesia
Amerioppia asiatica HAMMER, 1977 — NW. Pakistan
Oppia barrancensis HAMMER, 1961 — Peru
Oppia barrancensis paraguayensis BALOGH et MAHUNKA, 1981 — Paraguay
Amerioppia chavinensis HAMMER, 1961 — Peru
Amerioppia chilensis HAMMER, 1962 — Chile
Amerioppia decemsetosa HAMMER, 1973 — Samoa

Oppia deficiens BALOGH, 1959 — Congo
Oppia deficiens var. *circumciliata* BALOGH, 1959 — Congo
Oppia deficiens lamellata WALLWORK, 1961 — Ghana
Amerioppia flagellata HAMMER, 1975 — Pakistan
Amerioppia hexapilis HAMMER, 1961 — Peru
Amerioppia interrogata MAHUNKA, 1976 — Hong-Kong
Amerioppia javensis HAMMER, 1980 — Java
Oppia lanceolata HAMMER, 1958 — Argentina
Amerioppia longiclava HAMMER, 1962 — Patagonia, New Zealand
Oppia longicoma HAMMER, 1958 — Argentina
Amerioppia minima HAMMER, 1961 — Peru
Oppia meruensis BALOGH, 1961 — E. Africa
Oppia minuta (EWING) WOOLEY, 1957 — USA
Oppia nagyi MAHUNKA, 1969 — Tanzania
Oppia notata HAMMER, 1958 — Bolivia
Amerioppia paripilis HAMMER, 1961 — Peru
Amerioppia pectigera HAMMER, 1961 — Peru
Oppia rotunda HAMMER, 1958 — Bolivia
Amerioppia similis COVARRUBIAS, 1967 — Chile
Oppia trichosa HAMMER, 1958 — Bolivia
Amerioppia trichosoides HAMMER, 1961 — Peru
Amerioppia ventrosquamosa HAMMER, 1980 — Java
Amerioppia vicina HAMMER, 1971 — Fiji
Amerioppia wooleyi HAMMER, 1968 — New Zealand, Fiji

2. **Erioppia** gen. n.

Prodorsum, costula absent. Sensillus fusiform. Rostrum not incised. Setae *in* absent. Setae *ro* near to each other.

Notogaster: crista absent. Setae *ta* present. 13 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal psition.

Type-species: *Multioppia problematica* BALOGH, 1966 — E. Africa

3. **Oligoppia** gen. n.

Prodorsum: costula absent. Sensillus bacilliform. Rostrum not incised. Setae *ro* near to each other.

Notogaster: crista absent. Setae *ta* absent. 7 pairs of notogastral setae: *ti*, *te*, *ms*, r_2 very long, flagelliform, setae p_1, p_2, p_3 short.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in adanal position.

Type-species: *Amerioppia octocoma* HAMMER, 1973 — Samoa

22. **Multioppiinae** subfam. n.

1. *Anomaloppia* SUBIAS, 1978

SUBIAS, 1978, p. 569, f. 1—3.

Prodorsum: costula absent. Sensillus fusiform, unilaterally ciliate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* absent. 10 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Anomaloppia canariensis* SUBIAS, 1978 — Canary Is.

2. *Cheloppia* HAMMER, 1971

HAMMER, 1971, p. 27, f. 30.

Prodorsum: costula present as lamellar and translamellar line. Sensillus fusiform, with 5 fairly long branches (transition between the pectinate and the fusiform and ciliate type!). Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. U-shaped chitinous structure in interlamellar region. Rostrum very broad, hyaloid. Chelicerae enormously long, with small, suctorial type chewing part.

Notogaster: crista represented by two small, cuneiform processes, opposite to posterior part of bothrydia. Setae *ta* absent. 9 pairs of notogastral setae; end of setae slightly dilated.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Cheloppia hyalina* HAMMER, 1971 — Fiji

3. **Congoppia** gen. n.

Prodorsum: costula absent. Sensillus fusiform, unilaterally ciliates. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Setae *ro* near to each other, parallel.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position at the anterior part of anal plates. Setae ad_1 in postanal, setae ad_3 in preanal position. Setae ad_3 near to each other, nearer than setae ad_2.

Type-species: *Oppia deboissezoni* BALOGH et MAHUNKA, 1966 — Congo

4. **Cubaoppia** gen. n.

Prodorsum: costula absent. Sensillus fusiform, unilaterally ciliate and with very long, flagelliform end. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Setae *ro* far from each other.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position, very short. Setae ad_1 in adanal, setae ad_2 and ad_3 in preanal position. Epimeral region with complicated chitinous structure.

Type-species: *Oppia fusisetosa* BALOGH et MAHUNKA, 1980 — Cuba

5. **Graptoppia** gen. n.

Prodorsum: costulae present as lamellar and translamellar line. Sensillus fusiform, short, unilaterally ciliate. Rostrum not incised. Setae *le* nearer to setae *in* than to seta *ro*. Setae *ro* far from each other.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of very short notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Dameosoma foveolatum* PAOLI, 1908 (sensu BERNINI, 1969) — Europe

6. *Insculptoppia* SUBIAS, 1980

SUBIAS, 1980, p. 295, f. 7—8.

Prodorsum: costula absent. Sensillus pectinate or fusiform and unilaterally ciliate. Rostrum not incised. Setae *le* in half way between setae *in* and *ro*. Setae *ro* far from each other, not geniculate.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Dameosoma insculpta* PAOLI, 1908 — Europe

Oppia berninii PÉREZ-IÑIGO, 1975 — Europe
Notaspis clavipectinata MICHAEL, 1885 — Europe
Lohmannia elliptica BERLESE, 1908 — Europe
Oppia fusiformis WALLWORK, 1961 — Ghana
Oppia merimna BALOGH et MAHUNKA, 1977 — Brasil
Oppia soror BALOGH, 1958 — Congo
Brachioppia suciui HAMMER, 1968 — New Zealand
Oppia sundensis HAMMER, 1979 — Java
? *Dameosoma alces* JACOT, 1934 — Hawaii
? *Oppia parva* KOK, 1967 — S. Africa

7. *Multioppia* HAMMER, 1961

HAMMER, 1961, p. 61, f. 54.

Prodorsum: costula absent. Sensillus pectinate or fusiform, unilaterally ciliate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Setae *ro* geniculate, or arched conspicuously inwards.

Notogaster: crista absent. Setae *ta* absent. 12 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Multioppia radiata* HAMMER, 1961 — Peru

Multioppia australis HAMMER, 1962 — Chile
Multioppia excisa MORITZ, 1971 — Europe
Oppia glabra MIHELČIĆ, 1971 — Europe
Multioppia gracilis HAMMER, 1972 — Tahiti
Multioppia laniseta MORITZ, 1965 — Europe
Multioppia neglecta PÉREZ-IÑIGO, 1969 — Spain
Multioppia pakistanensis HAMMER, 1977 — NW. Pakistan
Multioppia stellifera HAMMER, 1961 — Peru
Multioppia trembleyi MAHUNKA, 1977 — Seychelles
Multioppia wilsoni AOKI, 1964 — Laysan Is.

8. **Pulchroppiella** gen. n.

Prodorsum: costula absent. Sensillus fusiform, unilaterally ciliate. Rostrum not incised. Setae *le* in half way between setae *in* and *ro*.

Notogaster: crista absent. Setae *ta* absent. 12 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in apoanal position, oblique. Setae ad_1 in postanal, ad_3 in preanal position. Apodemata 4 absent (lacking as in *Pulchroppia* !).

Type-species: *Oppia plurisetosa* MIHELČIĆ, 1956 — Europe

9. *Ramusella* HAMMER, 1962

HAMMER, 1962, p. 50, f. 42.

Prodorsum: costula absent. Sensillus pectinate. Rostrum not incised. Setae *le* in half way, or nearer to setae *in* than to setae *ro*. Setae *ro* near to each other and geniculate.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Ramusella puertomonttensis* HAMMER, 1962 — Chile

Oppia assimilis MIHELČIĆ, 1950 — Europe
Oppia chulumaniensis HAMMER, 1958 — Argentina
Oppia chulumaniensis var. *curtipilus* HAMMER, 1971 — Fiji

Oppia lyroseta WALLWORK, 1964 — Tchad
Oppia sengbuschi HAMMER, 1968 — New Zealand, Japan
Ramusella tasetata SUBIAS, 1980 — NW. Pakistan (nom. nov. pro *R. puertomonttensis* HAMMER, 1977 nec 1967 !)
Ramusella translamellata SUBIAS, 1980 — Spain

10. *Rectoppia* SUBIAS, 1980

SUBIAS, 1980, p. 304.

Prodorsum: costula absent. Sensillus fusiform, unilaterally ciliate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Setae *ro* straight, or slightly curved outwards, diverging at ends.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Dameosoma fasciatum* PAOLI, 1908 — Europe
Oppia mihelcici PÉREZ-IÑIGO, 1964 — Europe, NW. Pakistan
Oppia radiata BALOGH, 1961 — E. Africa
Ramusella (*Rectoppia*) *rhinina* SUBIAS, 1982 — Spain
Oppia sahariensis HAMMER, 1975 — Sahara
? *Oppia cordobensis* BALOGH et MAHUNKA, 1968 — S. America
? *Oppia incisiva* BALOGH et MAHUNKA, 1980 — Cuba
? *Oppia pocsi* BALOGH et MAHUNKA, 1967 — Vietnam

11. **Uroppia** gen. n.

Prodorsum: costula absent (only a translamellar line between setae *le* !). Sensillus fusiform, unilaterally ciliated with long cilia. Rostrum not incised. Setae *le* in half way between setae *in* and *ro*. Setae *ro* near to each other.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae. Setae p_1, p_2, p_3 near each other.

Ventral: G = 5. Pori *iad* in apoanal position, oblique. Setae ad_1 in postanal, setae ad_3 in preanal position. Setae ad_3 near to apodemata 4, far ahead. Anal and adanal setae somewhat thick, ciliate.

Type-species: *Oppia akusiensis* WALLWORK, 1961 — Ghana

23. Oppiinae GRANDJEAN, 1953

1. **Cilioppia** gen. n.

Prodorsum: costula absent. Sensillus setiform, filiform, or slightly lanceolate, always finely ciliate. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*. Setae *ex* long.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal or in adanal position.

Type-species: *Oppia kuehnelti* CSISZÁR, 1961 (= *yodai* AOKI, 1965 — Thailand) — Indonesia

Oppia africana KOK, 1967 — S. Africa
Oppia arciqiaconneae BERNINI, 1973 — Europe
Dameosoma elongatum PAOLI, 1908 — Europe
Oppia heterosa WALLWORK, 1964 — Tchad
Oppia pilosella BALOGH, 1959 — Congo
Dameosoma ultraciliata JACOT, 1934 — Hawaii
Oppia varians WALLWORK, 1961 — Ghana
Oppia yodai AOKI, 1965. — Japan

2. *Daedaloppia* HAUSER et MAHUNKA, 1983

HAUSER et MAHUNKA, 1983.

Prodorsum: costula absent. Sensillus setiform, very long, as long as prodorsum, sparsely ciliate. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*. Setae *ex* long.

Notogaster: crista absent. Setae *ta* absent, 9 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in adanal position.

Type-species: *Daedaloppia* sp. — Greece

3. **Fusuloppia** gen. n.

Prodorsum: costula absent. Sensillus fusiform, sparsely ciliate. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*. Setae *ex* long.

Notogaster: crista absent. Setae *ta* absent. 12 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in adanal position.

Type-species: *Oppia simplex* BALOGH, 1962 — Madagascar
Oppia fusuligera BALOGH, 1957 — E. Africa

4. **Niloppia** gen. n.

Prodorsum: costula absent. Sensillus long, flagelliform, densely ciliate. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*. Setae *ex* long. Setae *la* and setae *ro* near to each other.

Notogaster: crista absent. Setae *ta* present. 12 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in adanal, or somewhat in preanal position.

Type-species: *Oppia sticta* POPP, 1960 — Egypt

5. *Oppia* C. L. Koch, 1836

C .L. Koch, 1836, p. 3, f. 9—10.

Prodorsum: costula absent. Sensillus slightly fusiform, finely granulated. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*. Setae *ex* fairly long.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in adanal, or somewhat in preanal position.

Type-species: *Oppia concolor* C. L. Koch, 1836 — Europe
Lasiobelba insignis Balogh, 1970 — N. Guinea
Lasiobelba remota Aoki, 1959 — Japan
Oppia speciosa Golosova, 1973 — USSR
Lasiobelba vietnamica [nom. nov. pro ? *Oppia remota* (Aoki, 1959), sensu Balogh et Mahunka, 1967 — Vietnam)]

6. *Trapezoppia* Balogh et Mahunka, 1969

Balogh et Mahunka, 1969, p. 53, f. 44—45.

Prodorsum: costula absent. Sensillus long, flagelliform, ciliate. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*. Setae *ex* long.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in apoanal position, in level with anterior border of genital plates. Setae ad_1 in adanal, setae ad_3 in preanal position. Apodemata 4 absent.

Type-species: *Trapezoppia longipectinata* Balogh et Mahunka, 1969 — S. America

24. **Basiloppiinae** subfam. n.

1. **Basiloppia** gen. n.

Prodorsum: costula absent. Sensillus fusiform. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*, or in half way.

Notogaster: crista absent. Setae *ta* absent. 6 pairs of notogastral setae. 3 pairs of notogastral setae very long, 3 pairs very short.

Ventral: G = 5. Pori *iad* in apoanal position. Setae ad_1 in postanal, ad_3 in adanal position.

Type-species: *Oppia hexatricha* Balogh et Mahunka, 1974 — Queensland

2. **Condyloppia** gen. n.

Prodorsum: costula evanescent, only cuspides visible. Sensillus slightly fusiform, long, nearly as long as prodorsum, sparsely ciliate. Rostrum not incised. Setae *le* much nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae long, bacilliform, finely ciliate.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in adanal, or somewhat in preanal position. Apodemata sejugal each with 2 tubercles.

Type-species: *Oppia condylifer* HAMMER, 1980 — Java

3. **Drepanoppia** gen. n.

Prodorsum: costula absent. Sensillus lanceolate, with a long and pointed tip. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in apoanal position, long. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Oppia falxa* KOK, 1967 — S. Africa

4. **Goyoppia** gen. n.

Prodorsum: costula absent. Sensillus long, slightly fusiform. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Setae *ro* near to each other.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae. Setae *te*, *ms*, r_1 very long, remaining ones extremely short.

Ventral: G = 5. No other information.

Type-species: *Oppia sexpilosa* BALOGH, 1960 — Madagascar

5. *Karenella* HAMMER, 1962

HAMMER, 1962, p. 40, f. 30.

Prodorsum: costula absent. Two prominent chitinous processes in interlamellar region. Sensillus lanceolate or slightly fusiform. Rostrum not incised.

Notogaster: crista absent. Setae *ta* very thin, but present. 10 pairs of short notogastral setae.

Ventral: G = 5. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Karenella lobata* HAMMER, 1962 — Chile

Oppia acuta CSISZÁR, 1961 — Indonesia

Dameosoma elongatum PAOLI, 1908 — Europe

Oppia lanceoseta BALOGH, 1959 — Congo

Oppia lanceosetoides HAMMER, 1971 — Fiji

6. *Polyoppia* HAMMER, 1968

HAMMER, 1968, p. 9, f. 1.

Prodorsum: costula absent. Two pairs of condyli each on the posterior margin of prodorsum. Sensillus setiform, or slightly lanceolate. Rostrum not incised.

Notogaster: crista absent. Setae *ta* present, but very thin. 13 pairs of notogastral setae.

Ventral: G = 5. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Polyoppia baloghi* HAMMER, 1968 — New Zealand

25. Cycloppiinae subfam. n.

1. Acutoppia gen. n.

Prodorsum: costula present as a horseshoe-shaped, narrow chitinous line. Sensillus short, lanceolate. Rostrum not incised. Setae *le* in half way between setae *in* and setae *ro*. Bothrydium with a lid.

Notogaster: crista absent. Setae *ta* absent. 9 pair of short notogastral setae.

Ventral: G = 4. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Operculoppia crassiseta* HAMMER, 1968 — New Zealand
Operculoppia jelevae HAMMER, 1968 — New Zealand

2. Aethioppia gen. n.

Prodorsum: costula absent. Sensillus bacilliform, long. Rostrum not incised. Setae *le* in half way between setae *in* and setae *ro*, or nearer to setae *ro* than to setae *in*.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae reduced only to their alveoli, or extremely short, evanescent.

Ventral: G = 4. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Oppia bacilligera* BALOGH, 1962 — E. Africa
Oppia spinipes BALOGH, 1962 — Madagascar

3. Brassoppia gen. n.

Prodorsum: costula present as an evanescent lamellar line and clear translamellar line. Sensillus pectinate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* extremely small, but present. 10 pairs of notogastral setae.

Ventral: G = 4. Pori *iad* in apoanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Oppia brassi* BALOGH, 1981 — Queensland

4. **Cycloppia** gen. n.

Prodorsum: costula absent (evanescent apical parts only!). Sensillus lanceolate or slightly fusiform. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae. Notogaster circular.

Ventral: G = 4. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Lanceoppia simplex* SUZUKI, 1973 — Japan

Oppia szentirmayi BALOGH, 1970 — New Guinea

5. **Discoppia** gen. n.

Prodorsum: costula absent. Sensillus fusiform, but with a short stalk and an extraordinarily dilated head; unilaterally ciliate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Setae *ro* parallel, near to each other.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae.

Ventral: G = 4. Pori *iad* in adanal position, very short. Setae ad_1 in postanal, setae ad_3 in preanal position, near to each other, in front of anal plates.

Type-species: *Oppia limae* BALOGH et MAHUNKA, 1974 — Malaisia

6. **Gressittoppia** gen. n.

Prodorsum: costula absent (evanescent lamellar lines only!). Sensillus pectinate, short, with short branches too. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of short notogastral setae.

Ventral: G = 4. Pori *iad* in apoanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Brachioppia moresonensis* HAMMER, 1967

Oppia baderi HAMMER, 1968 — New Zealand

Brachioppia orkneyensis KOK, 1967 — S. Orkney Is.

Oppia pepitensis HAMMER, 1962 — Chile

Oppia pepitensis brevipectinata COVARRUBIAS, 1968 — Antarctis

7. **Helioppia** gen. n.

Prodorsum: costula absent. Sensillus fusiform, with 5—6 radiate branches. Rostrum with two blunt incisions; nasiform medially. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista absent. Setae *ta* present. 10 pairs of short notogastral setae.

Ventral: G = 4. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Oppia sol* BALOGH, 1959 — Congo

8. *Laminoppia* HAMMER, 1968

HAMMER, 1968, p. 30, f. 32.

Prodorsum: costula present, horseshoe-shaped. Sensillus filiform, arched. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*.

Notogaster: crista absent. Setae *ta* present. 10 pairs of very short notogastral setae. Notogaster circular.

Ventral: G = 4. Pori *iad* in apoanal position. Setae ad_1 in postanal, setae ad_3 in adanal position. First and second pair of anal setae near to each other. Anal plates with arched chitinous crest.

Type-species: *Laminoppia blocki* HAMMER, 1968 — New Zealand

9. **Subiasella** gen. n.

Prodorsum: costula absent or present (exceptionally as a translamellar line, with short lamellar line too!). Sensillus capitate, with a short stalk. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*.

Notogaster: crista represented only by a short line and exceptionally by a small chitinous tubercle, or absent. Setae *ta* present or absent. 10 or 9 pairs of short notogastral setae. Notogaster elongated.

Ventral: G = 4. Pori *iad* in apoanal position (always?). Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Oppia exiguus* HAMMER, 1971 — Fiji, Samoa
Oppia minus cylindrica PÉREZ-IÑIGO, 1971 — Spain
Oppia quadrimaculata EVANS, 1952 — Europe
Oppia sigmella GOLOSOVA, 1970 — Europe
? *Oppia tenuis* HAMMER, 1958 — Argentina

10. *Operculoppia* HAMMER, 1968

HAMMER, 1968, p. 22, f. 22.

Prodorsum: costula absent. Sensillus capitate, with a short stalk. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Bothrydium with a lid.

Notogaster: crista absent. Setae *ta* extremely short, evanescent. 10 pairs of notogastral setae.

Ventral: G = 4. Pori *iad* in apoanal position. Setae ad_1 in postanal, ad_3 in adanal position.

Type-species: *Operculoppia kunsti* HAMMER, 1968 — New Zealand

11. *Paroppia* HAMMER, 1968

HAMMER, 1968, p. 19, f. 18.

Prodorsum: costula absent. Sensillus lanceolate, long. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*. Setae *ro* near to each other, arcuated inwards.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of long notogastral setae.

Ventral: G = 4. Pori *iad* in adanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Paroppia lebruni* HAMMER, 1968 — New Zealanad

12. **Plaesioppia** gen. n.

Prodorsum: costula as an evanescent translamellar and lamellar line. Sensillus pectinate. Rostrum incised. Setae *le* in half way between setae *in* and setae *ro*.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 4. Pori *iad* in apoanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Brachioppiella peullaensis* HAMMER, 1962 — Chile

13. **Processoppia** gen. n.

Prodorsum: costula present, horseshoe-shaped. Sensillus lanceolate. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*. Femora below with a process with setae.

Notogaster: crista absent. Setae *ta* present, but very short. 10 pairs of notogastral setae.

Ventral: G = 4. No other information.

Type-species: *Oppia oudemansi* HAMMER, 1968 — New Zealand

14. **Rhaphoppia** gen. n.

Prodorsum: costula present, horseshoe-shaped. Sensillus lanceolate, long. Rostrum not incised. Setae *le* nearer to setae *ro* than to setae *in*.

Notogaster: crista absent. Setae *ta* absent. 9 pairs of notogastral setae.

Ventral: G = 4. Pori *iad* in apoanal position. Setae ad_1 in postanal, ad_3 in preanal position.

Type-species: *Oppia mihelcici* HAMMER, 1968 — New Zealand

15. *Solenoppia* HAMMER, 1968

HAMMER, 1968, p. 20, f. 19.

Prodorsum: costula evanescent, horseshoe-shaped. Two small hooks in interlamellar region. Sensillus fusiform, unilaterally ciliate. Rostrum not incised. Setae *le* in half way between setae *in* and *ro*.

Notogaster: crista absent. Dorsosejugal suture parabolical. Setae *ta* absent, or present. 9 or 10 notogastral setae.

Ventral: G = 4. Pori *iad* in apoanal position. Setae ad_1 in postanal, ad_3 in preanal position. Solenidia of tibia and tarsi I and II short and thick.

Type-species: *Solenoppia grandjeani* HAMMER, 1968 — New Zealand
Solenoppia taberlyi HAMMER, 1968 — New Zealand
Solenoppia travei HAMMER, 1968 — New Zealand

16. **Stenoppia** gen. n.

Prodorsum: apical part of lamellar costulae and translamellar part present. Sensillus fusiform, unilaterally ciliate. Rostrum not incised. Setae *le* nearer to setae *in* than to setae *ro*, originating on translamellar line.

Notogaster: crista absent. Setae *ta* present. 10 pairs of notogastral setae. Notogaster punctulated.

Ventral: G = 4. Pori *iad* in adanal position. Setae ad_1 in postanal, setae ad_3 in preanal position.

Type-species: *Oppia heterotricha* BERNINI, 1969 — Europe
Oppia angusta HAMMER, 1962 — Chile
Brachioppia qurthlambae KOK, 1967 — S. Africa
Oppia multicorrugata HAMMER, 1962 — Chile

17. *Xenoppia* MAHUNKA, 1982

MAHUNKA, 1982, p. 322, f. 91—95.

Prodorsum: costula absent. Sensillus slightly fusiform, smooth. Setae *le* nearer to setae *in* than to setae *ro*. Rostrum not incised. Chelicerae suctobelboid, reduced.

Notogaster: crista absent. Setae *ta* absent. 12 pairs of notogastral setae.

Ventral: G = 4. Pori *iad* in adanal position (?). Setae ad_1 in postanal, ad_3 in preanal position. Apodemate 4 absent.

Type-species: *Xenoppia brevipila* MAHUNKA, 1982 — Ethiopia

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EXPLANATION OF TABLES

Table 1

1-1 = *Borhidia cubana* BALOGH et MAHUNKA, 1974. 2-1 = *Cuneoppia laticeps* BALOGH et MAHUNKA, 1969. 3-1 = *Chavinia paradoxa* HAMMER, 1961. 4-1 = *Enantioppia multituberculata* BALOGH et MAHUNKA, 1969. 5-1 = *Lyroppia scutigera* BALOGH, 1961. 5-2 = *Rioppia nodulifera* BALOGH et MAHUNKA, 1977

Table 2

6-1 = *Quadroppia quadricarinata* (MIHAEL, 1885). 7-1 = *Hexoppia heterotricha* BALOGH, 1958. 8-1 = *Granuloppia maior* BALOGH var. *nuda* WALLWORK, 1961. 8-2 = *Macrosoma rugosa* HAMMER, 1979. 8-3 = *Senectoppia rugosa* AOKI, 1977. 9-1 = *Belloppia wallworki* HAMMER, 1968

Table 3

9-2 = *Berniniella aeoliana* (BERNINI, 1973). 9-3 = *Cosmoppia longipilosa* (KUNST, 1957). 9-4 = *Elaphoppia quadripilosa* (BALOGH, 1960). 9-5 = *Hypogeoppia terricola* SUBIAS, 1982. 9-6 = *Mahunkella transitoria* (BALOGH et MAHUNKA, 1977). 9-7 = *Microppia minus* (PAOLI, 1908)

Table 4

9-8 = *Miroppia zealandica* HAMMER, 1968. 9-9 = *Moritziella keilbachi* MORITZ, 1969. 9-10 = *Neostrinatina mixoppia* MAHUNKA, 1979. 9-11 = *Neotrichoppia pseudoconfinis* SUBIAS, 1980. 9-12 = *Oppiella unicarinata* (PAOLI, 1908). 9-13 = *Oxyoppia pilosa* BALOGH et MAHUNKA, 1981

Table 5

9-14 = *Perspicuoppia perspicua* (MIHELČIĆ, 1956). 9-15 = *Ptiloppia bullanovae* (HAMMER, 1968). 9-16 = *Rhinoppia nasuta* (MORITZ, 1965). 9-17 = *Sacculoppia singularis* BALOGH et MAHUNKA, 1968. 9-18 = *Tripiloppia hammeri*, BALOGH, 1982. 10-1 = *Papillonotus maculatus* WALLWORK, 1961

Table 6

11-1 = *Acroppia processigera* (BALOGH et MAHUNKA, 1967). 11-2 = *Corynoppia kosarovi matritensis* (PÉREZ-IÑIGO, 1967). 11-3 = *Mystroppia dallai* BERNINI, 1973. 11-4 = *Stachyoppia muscicola* BALOGH, 1960. 11-5 = *Striatoppia baloghi* MAHUNKA, 1974. 12-1 = *Teratoppia calcarata* BALOGH, 1959

Table 7

12-2 = *Teratoppiella brevipectinata* (BALOGH et MAHUNKA, 1978). 13-1 = *Tectoppia nigricans* WALLWORK, 1961. 14-1 = *Sternoppia mirabilis* BALOGH et MAHUNKA, 1968. 15-1 = *Arcoppia longisetosa* BALOGH, 1982. 15-2 = *Austroppia magellanis* (HAMMER, 1962). 15-3 = *Brachioppia cuscensis* HAMMER, 1961

Table 8

15-4 = *Ctenoppia variopectinata* (BALOGH et MAHUNKA, 1975). 15-5 = *Hammerella gracilis* (HAMMER, 1979). 15-6 = *Kokoppia longisetosa* (KOK, 1967). 15-7 = *Mimoppia tenuiseta* (WALLWORK, 1961). 15-8 = *Pletzenoppia pletzenae* (KOK, 1967). 15-9 = *Porrhoppia crux* BALOGH, 1970

Table 9

15-10 = *Ramuloppia ramiseta* (BALOGH, 1959). 15-11 = *Wallworkella trimucronata* (WALLWORK, 1961). 16-1 = *Convergoppia pletzeni* (HAMMER, 1968). 16-2 = *Hamoppia lionsi* HAMMER, 1968. 16-3 = *Lanceoppia hexapili* HAMMER, 1962. 16-4 = *Loboppia covarrubiasi* (HAMMER, 1968)

Table 10

16-5 = *Setoppia toeroeki* BALOGH, 1982. 16-6 = *Setuloppia newelli* (HAMMER, 1968). 16-7 = *Trematoppia cristipes* BALOGH, 1962. 17-1 = *Aeroppia peruensis* HAMMER, 1961. 17-2 = *Heteroppia globigera* BALOGH, 1970. 17-3 = *Globoppia gressitti* WALLWORK, 1964

Table 11

17-4 = *Membranoppia karppineni* HAMMER, 1968. 17-5 = *Otoppia midas* (BALOGH, 1962). 18-1 = *Machuella pyriformis* HAMMER, 1968. 19-1 = *Trizetes pyramidalis* BERLESE, 1904. 20-1 = *Alcyoppia hippy* (MAHUNKA, 1982). 20-2 = *Brachioppiella periculosa* HAMMER, 1962

Table 12

20-3 = *Cryptoppia elongata* CSISZÁR, 1961. 20-4 = *Furculoppia furcata* (KUNST, 1957). 20-5 = *Gittella punctata* HAMMER, 1961. 20-6 = *Octoppia irmayi* BALOGH et MAHUNKA, 1969. 20-7 = *Pulchroppia similis* HAMMER, 1980. 21-1 = *Amerioppia decemsetosa* HAMMER, 1973

Table 13

21-2 = *Erioppia problematica* (BALOGH, 1966). 21-3 = *Oligoppia octocoma* (HAMMER, 1973). 22-1 = *Anomaloppia canariensis* SUBIAS, 1978. 22-2 = *Cheloppia hyalina* HAMMER, 1971. 22-3 = *Congoppia deboissezoni* (BALOGH et MAHUNKA, 1966). 22-4 = *Cubaoppia fusisetosa* (BALOGH et MAHUNKA, 1980)

Table 14

22-5 = *Graptoppia foveolata* (PAOLI, 1908). 22-6 = *Insculptoppia insculpta* (PAOLI, 1908) 22-7 = *Multioppia laniseta* MORITZ, 1965. 22-8 = *Pulchroppiella plurisetosa* (MIHELČIĆ, 1956) 22-9 = *Ramusella assimilis* (MIHELČIĆ, 1956). 22-10 = *Rectoppia fasciata* (PAOLI, 1908)

Table 15

22-11 = *Uroppia akusiensis* (WALLWORK, 1961). 23-1 = *Cilioppia yodai* (AOKI, 1965). 23-2 = *Daedaloppia* sp. HAUSER et MAHUNKA, 1983. 23-3 = *Fusuloppia simplex* BALOGH, 1962. 23-4 = *Niloppia sticta* (POPP, 1960). 23-5 = *Oppia concolor* C. L. KOCH, 1836

Table 16

23-6 = *Trapezoppia longipectinata* BALOGH et MAHUNKA, 1969. 24-1 = *Basiloppia hexatricha* (BALOGH et MAHUNKA, 1974). 24-2 = *Condyloppia condylifer* (HAMMER, 1980). 24-3 = *Drepanoppia falxa* (KOK, 1967). 24-4 = *Goyoppia sexpilosa* (BALOGH, 1960). 24-5 = *Karenella lobata* HAMMER, 1962

Table 17

24-6 = *Polyoppia baloghi* HAMMER, 1968. 25-1 = *Acutoppia crassiseta* (HAMMER, 1968). 25-2 = *Aethioppia bacilligera* (BALOGH, 1962). 25-3 = *Brassoppia brassi* (BALOGH, 1981). 25-4 = *Cycloppia simplex* (SUZUKI, 1970). 25-5 = *Discoppia limae* (BALOGH et MAHUNKA, 1974)

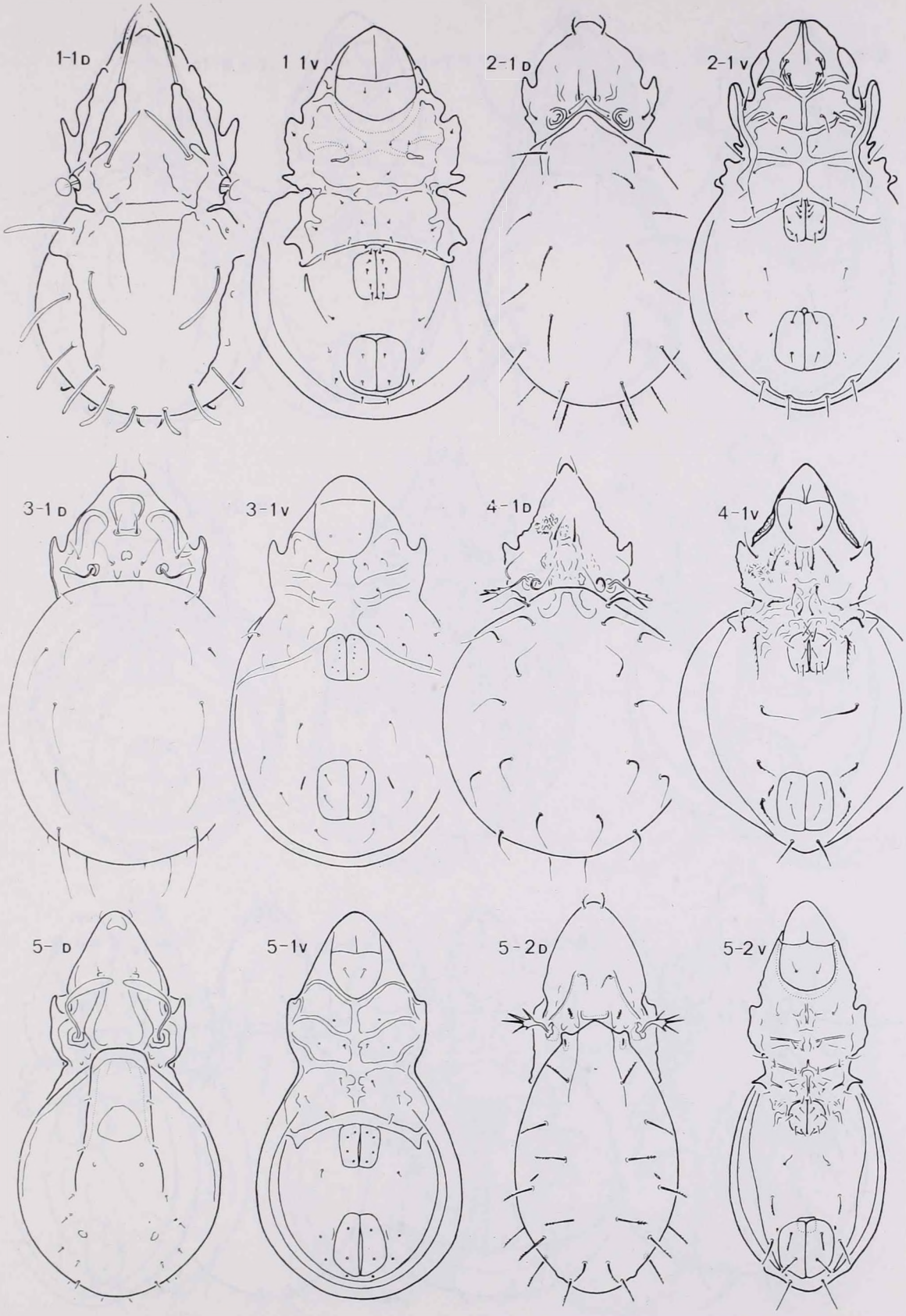
Table 18

25-6 = *Gressittoppia moresonensis* (KOK, 1967). 25-7 = *Helioppia sol* (BALOGH, 1959). 25-8 = *Laminoppia blocki* HAMMER, 1968. 25-9 = *Subiasella exigua* (HAMMER, 1971). 25-10 = *Operculoppia kunsti* HAMMER, 1968. 25-11 = *Paroppia lebruni* HAMMER, 1968

Table 19

25-12 = *Plaesioppia peullaensis* (HAMMER, 1962). 25-13 = *Processoppia oudemansi* (HAMMER, 1968). 25-14 = *Rhaphoppia mihelcici* (HAMMER, 1968). 25-15 = *Solenoppia grandjeani* HAMMER, 1968. 25-16 = *Stenoppia heterotricha* (BERNINI, 1969). 25-17 = *Xenoppia brevipila* MAHUNKA, 1982

Table 1



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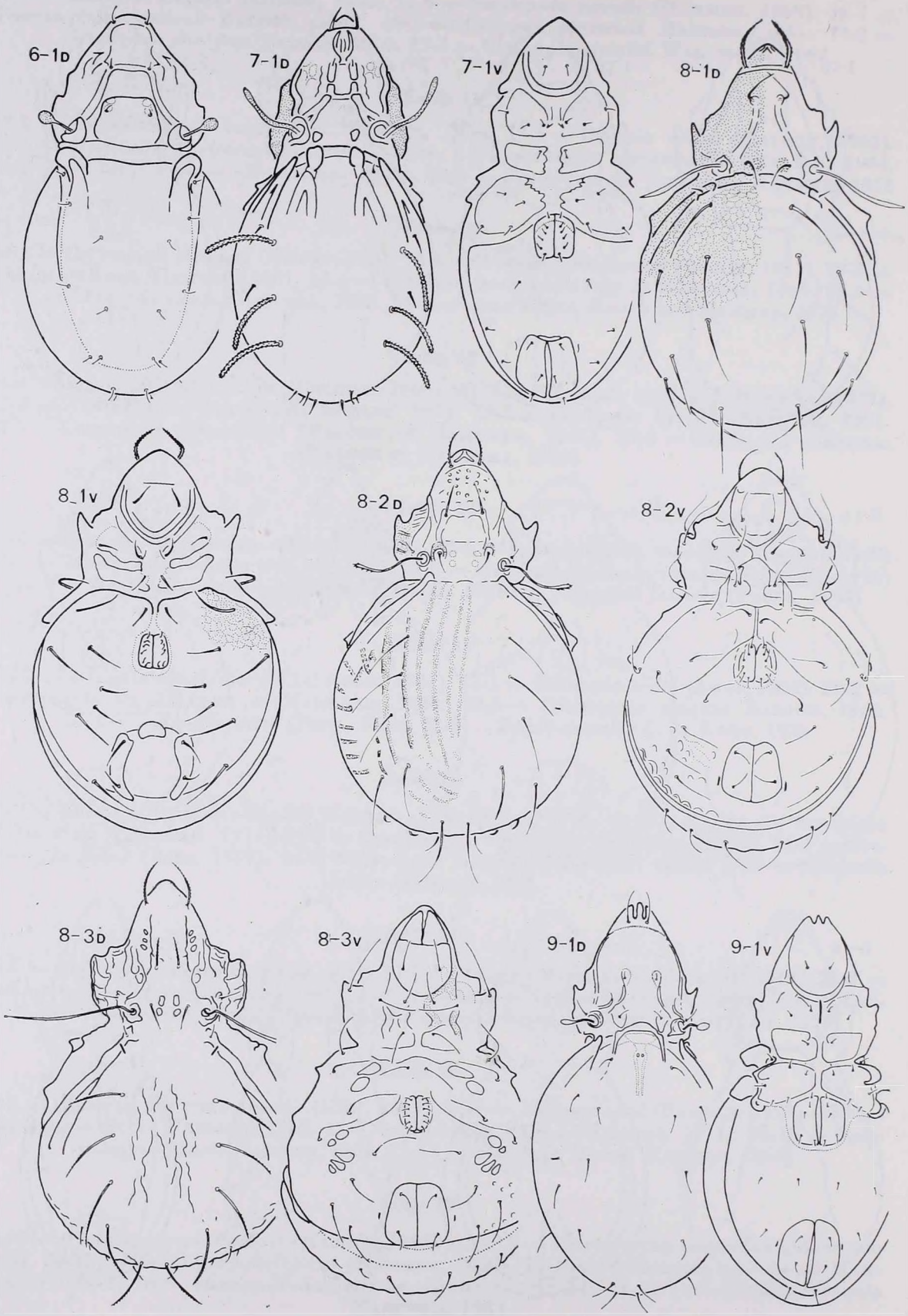

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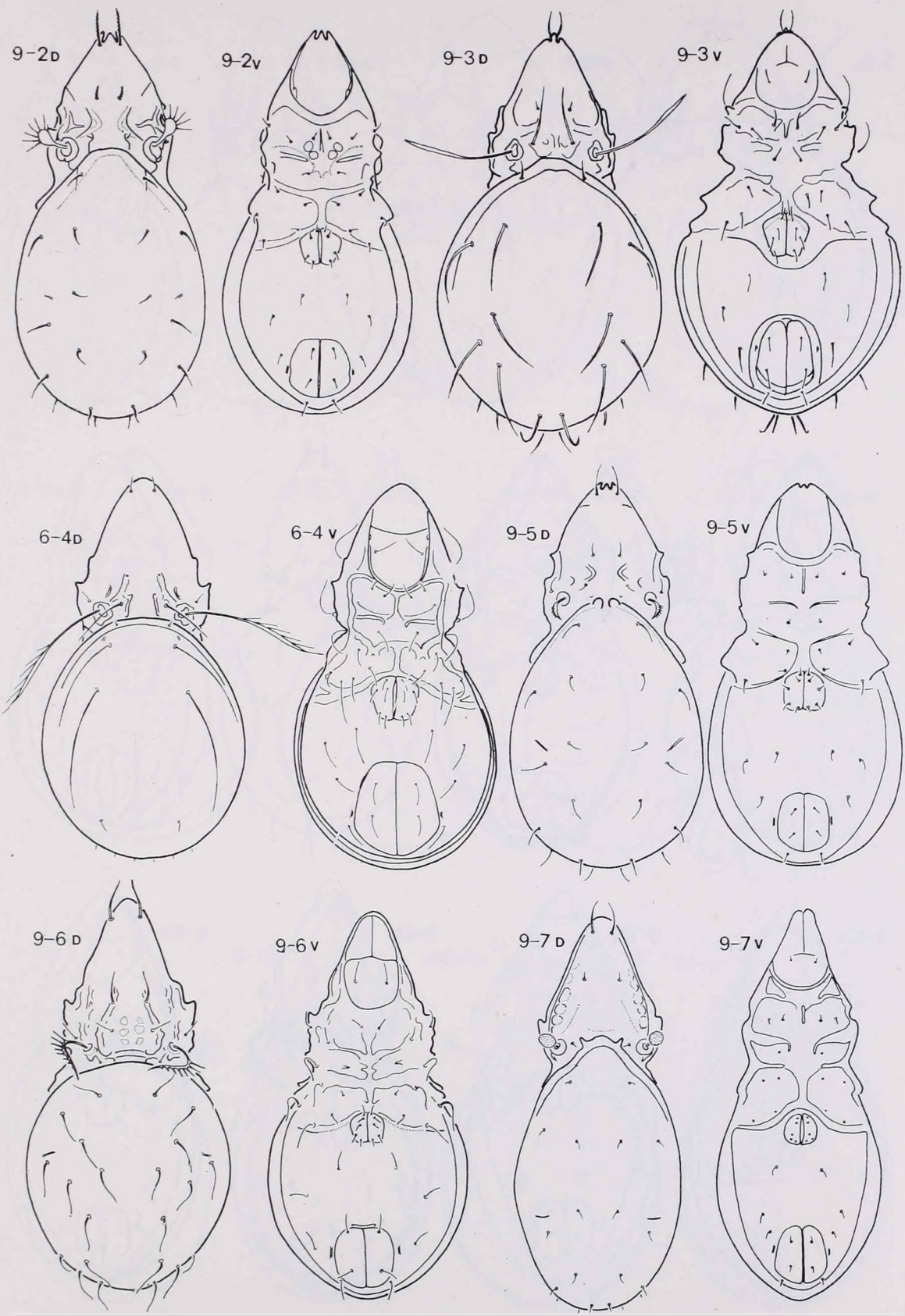

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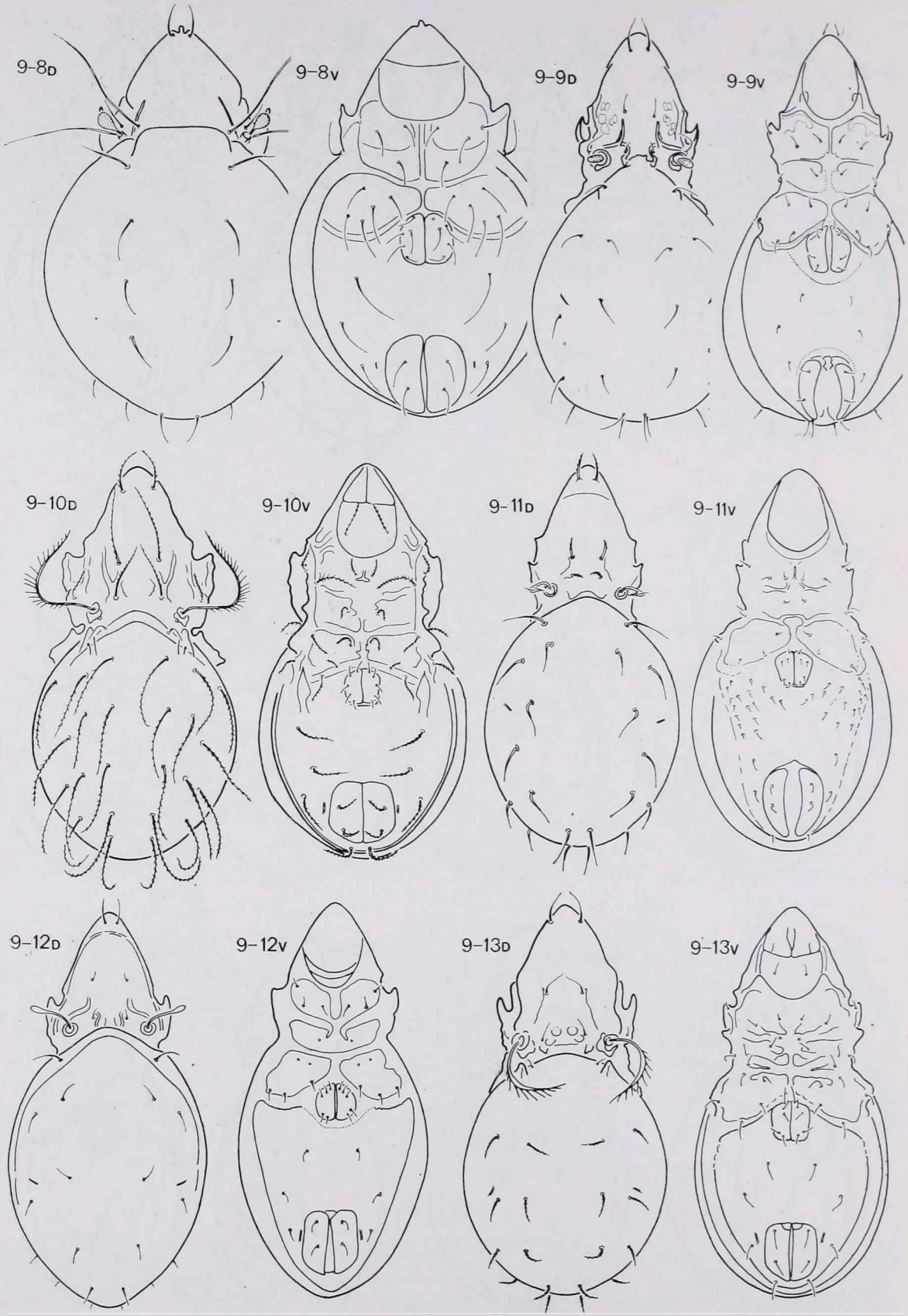

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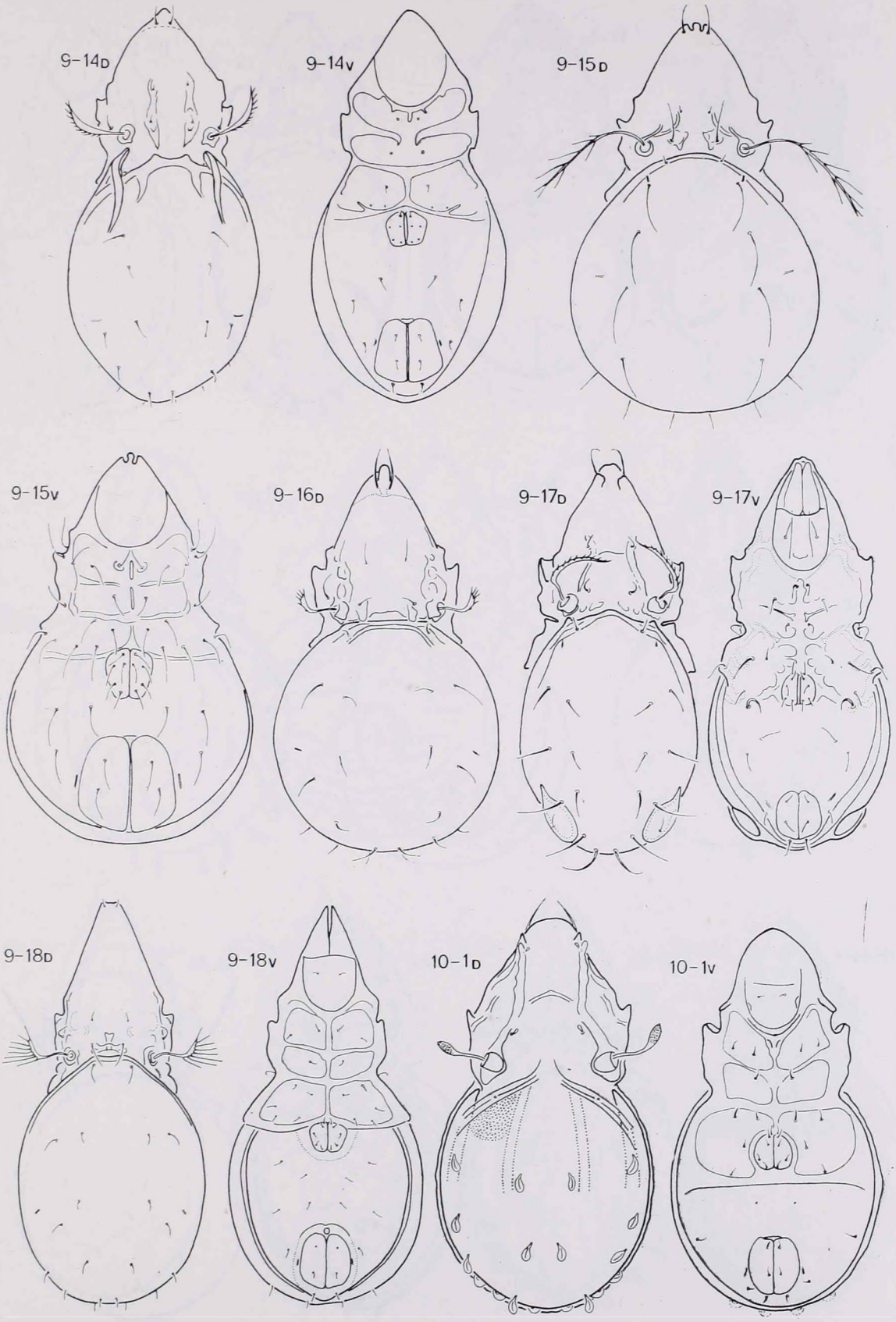

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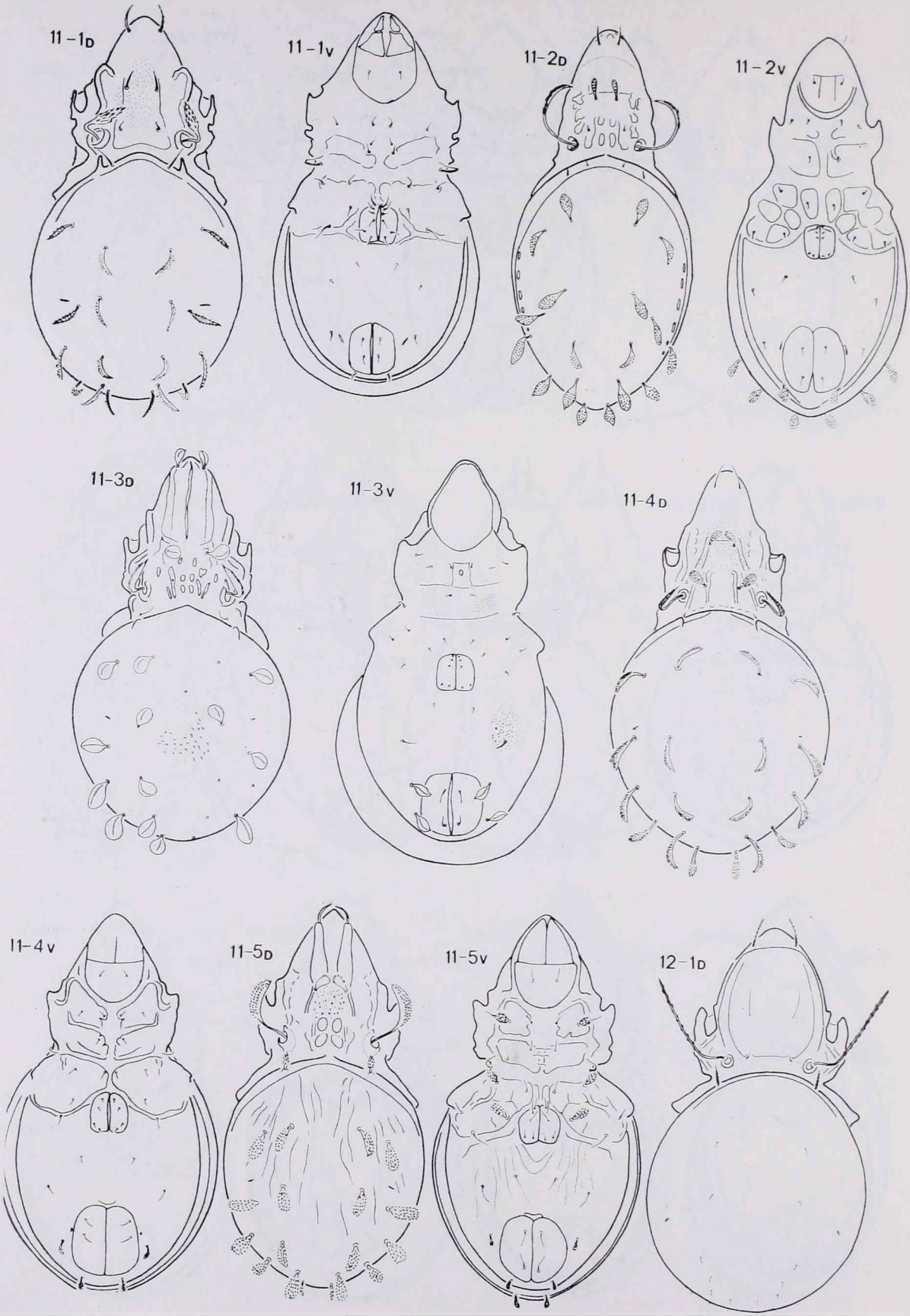

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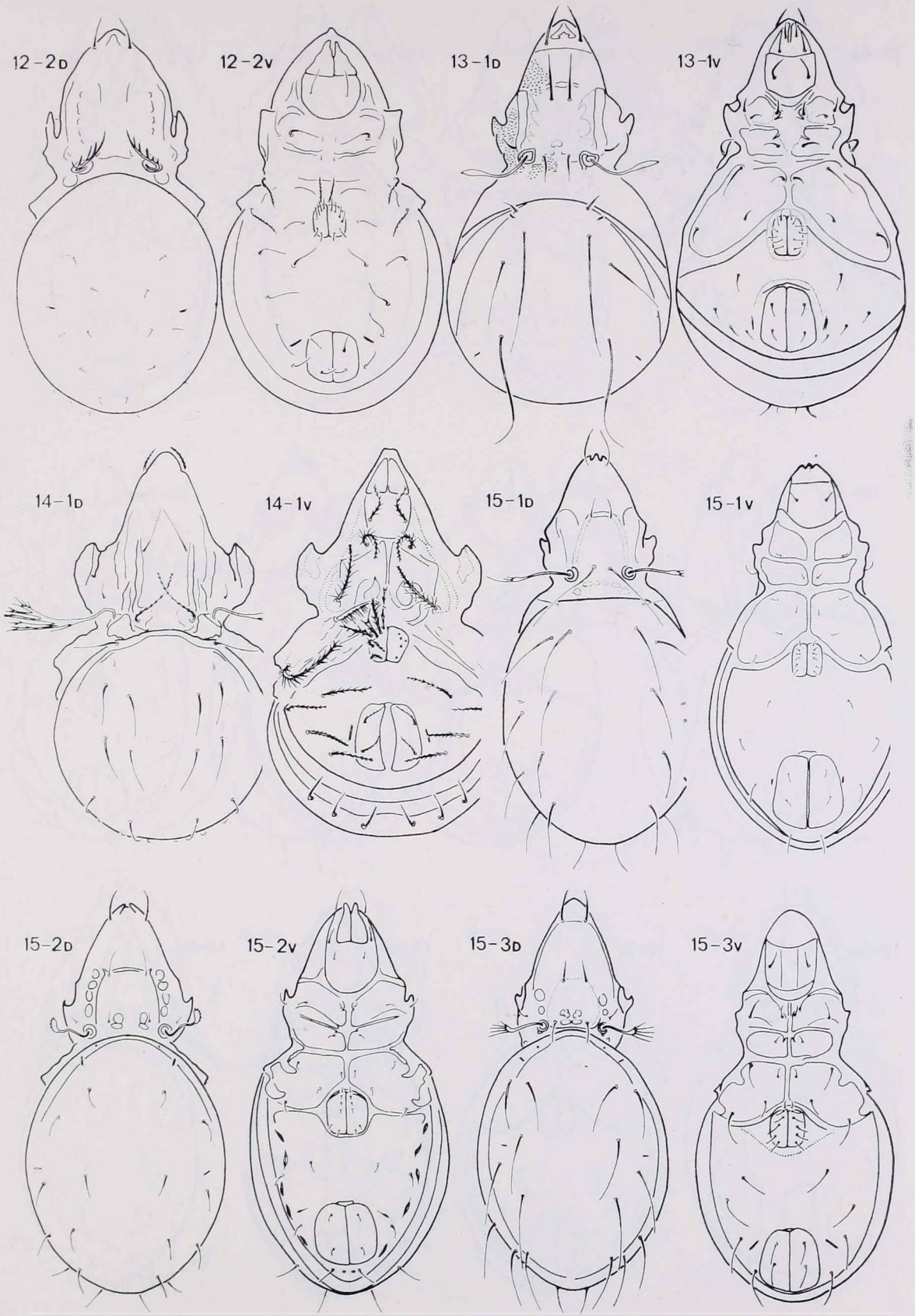

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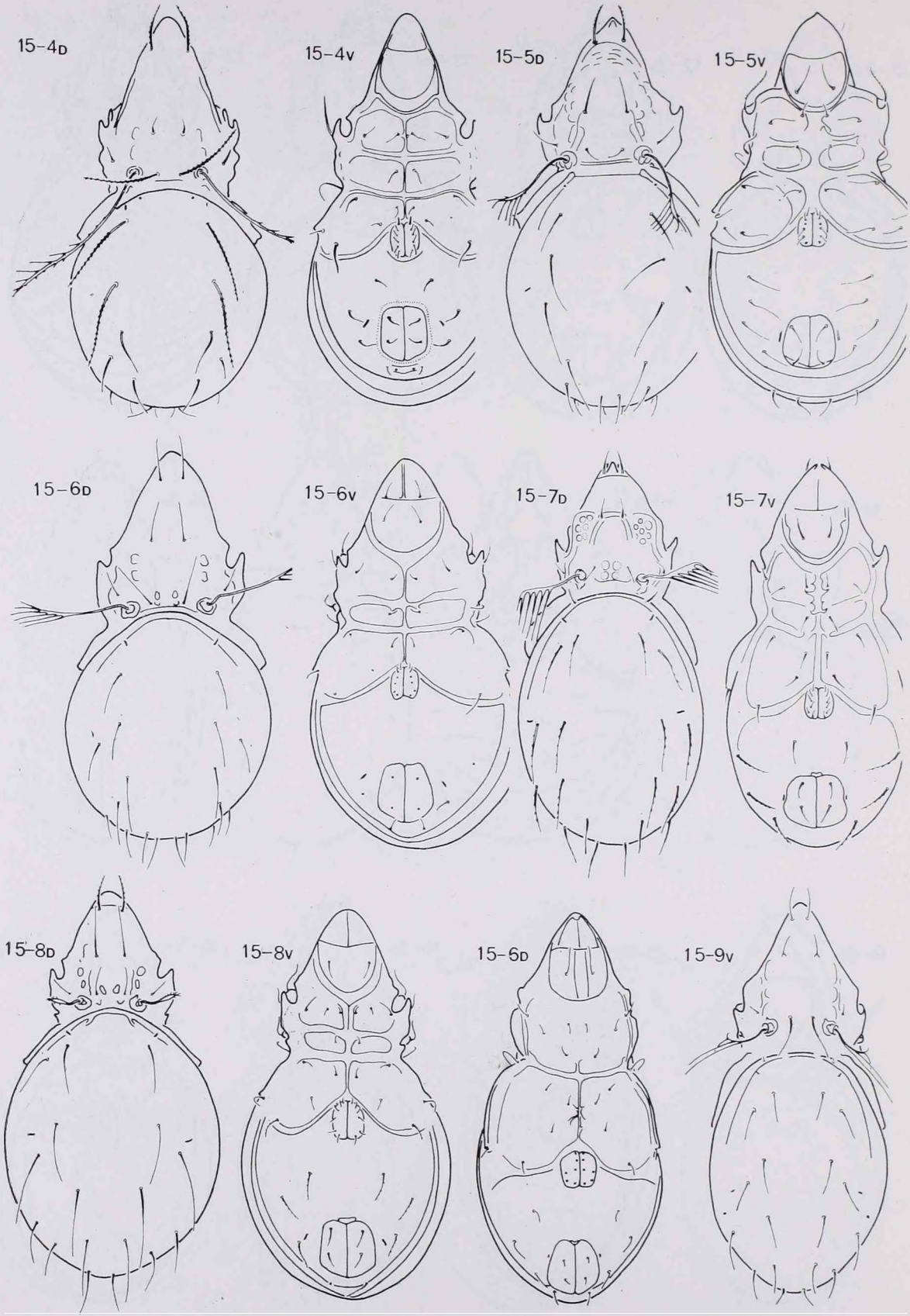

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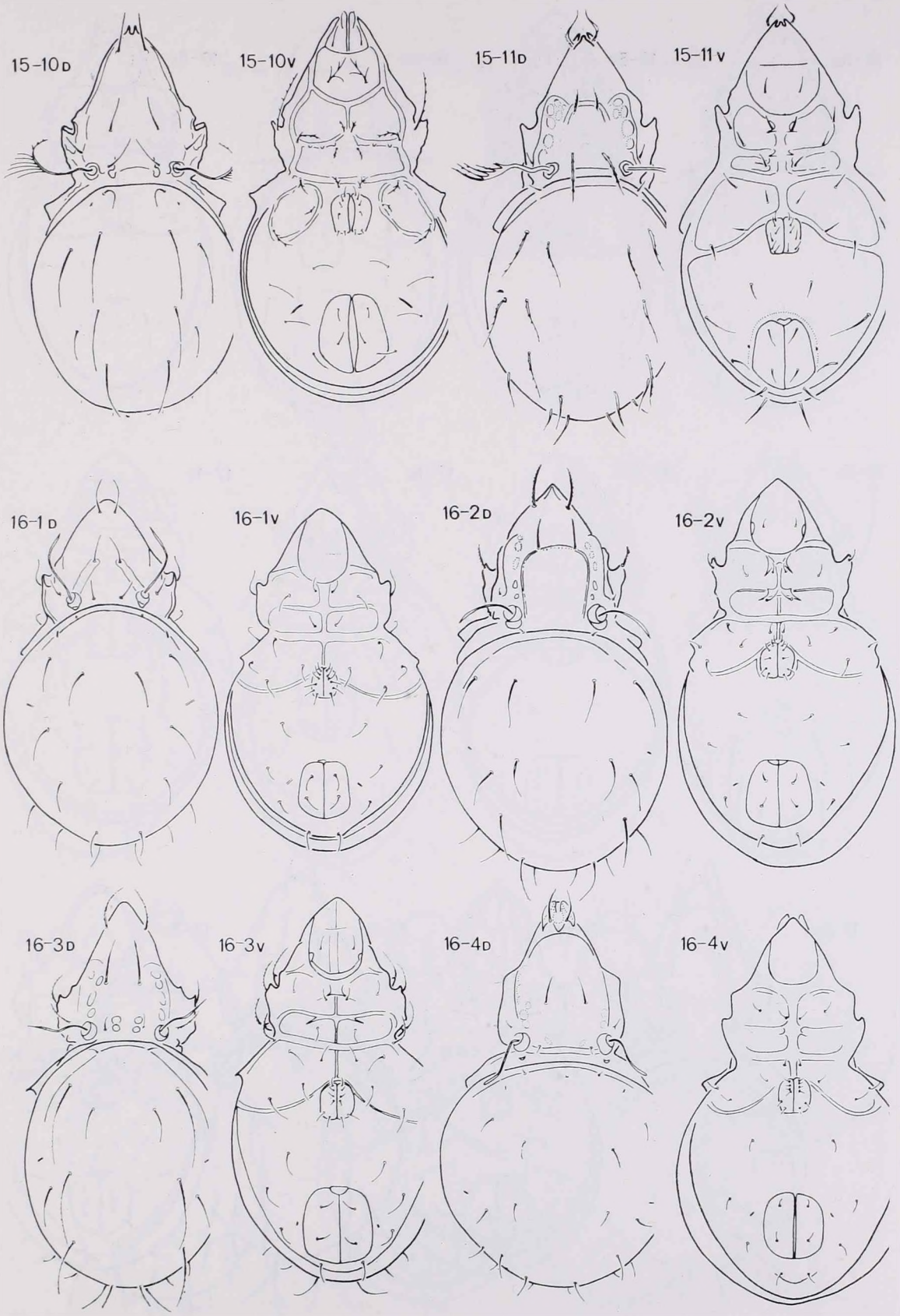
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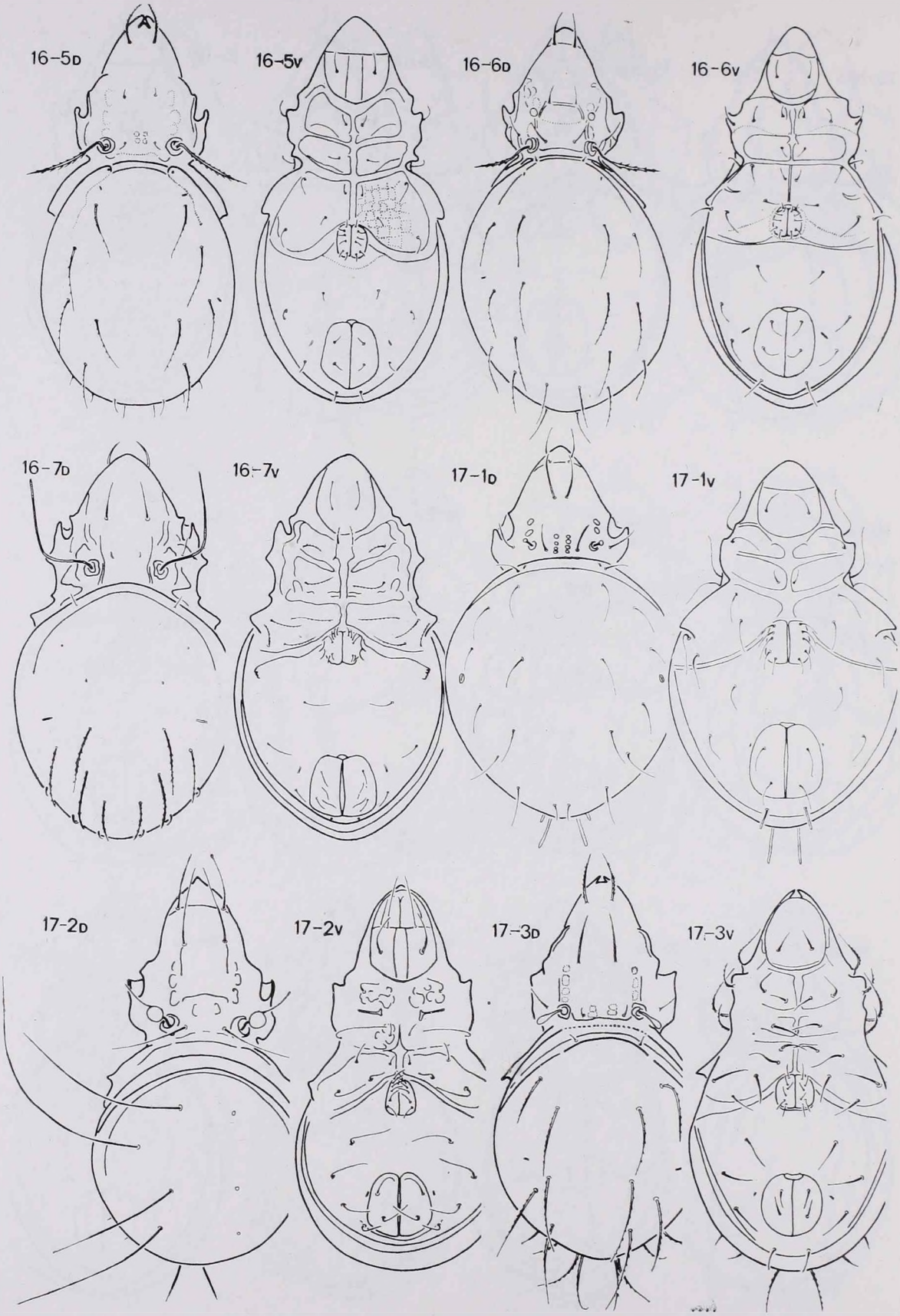

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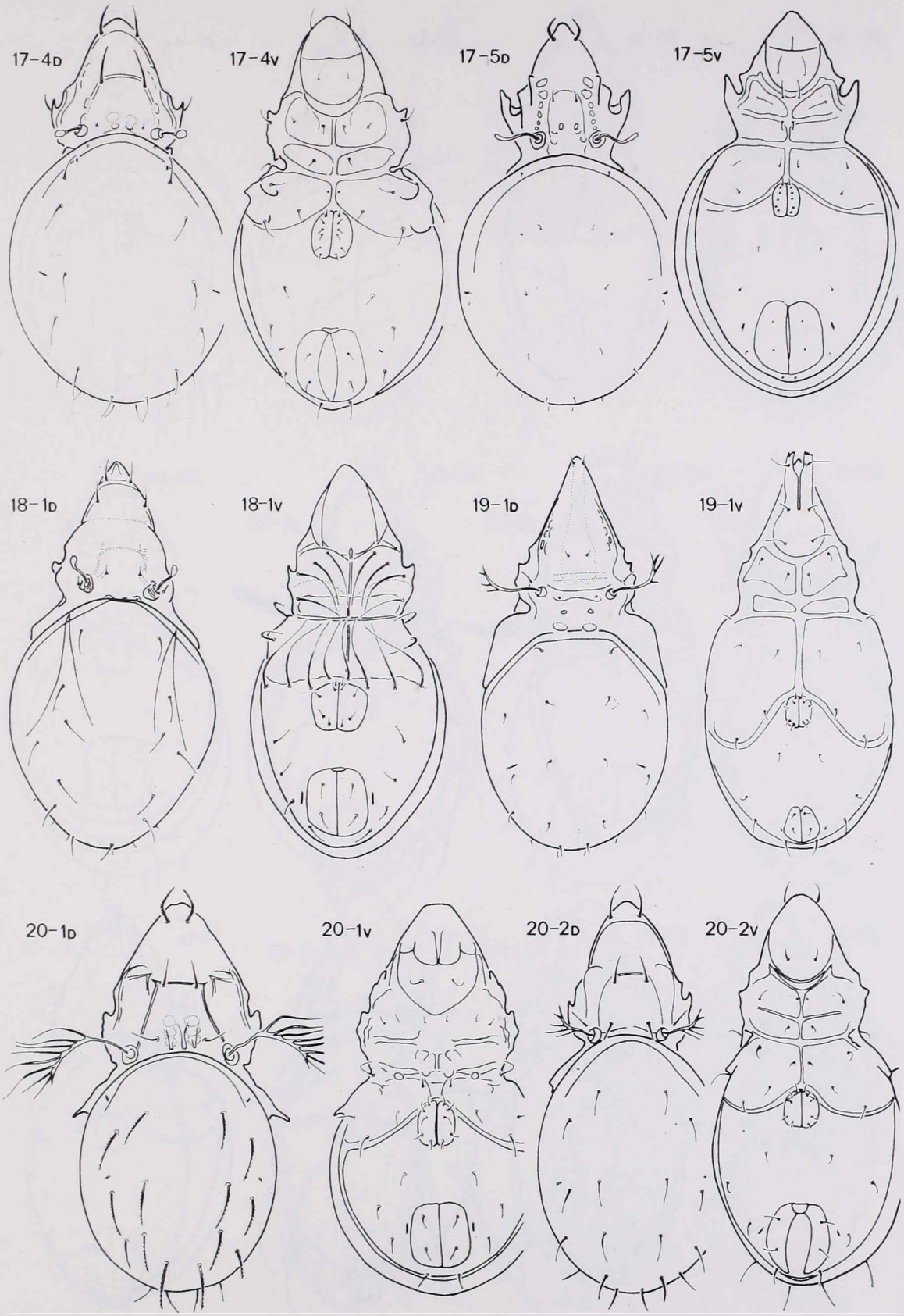


Table 12

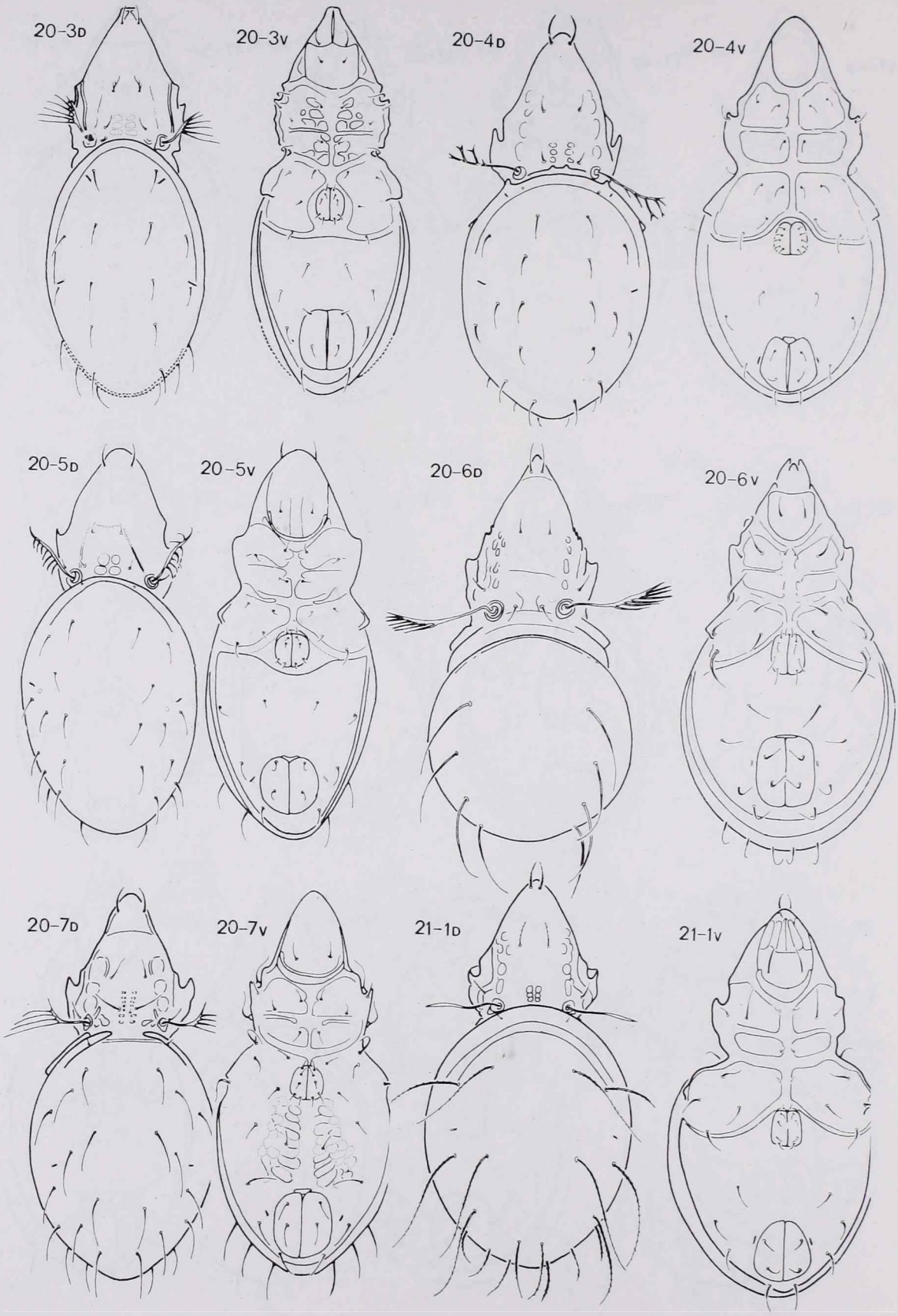
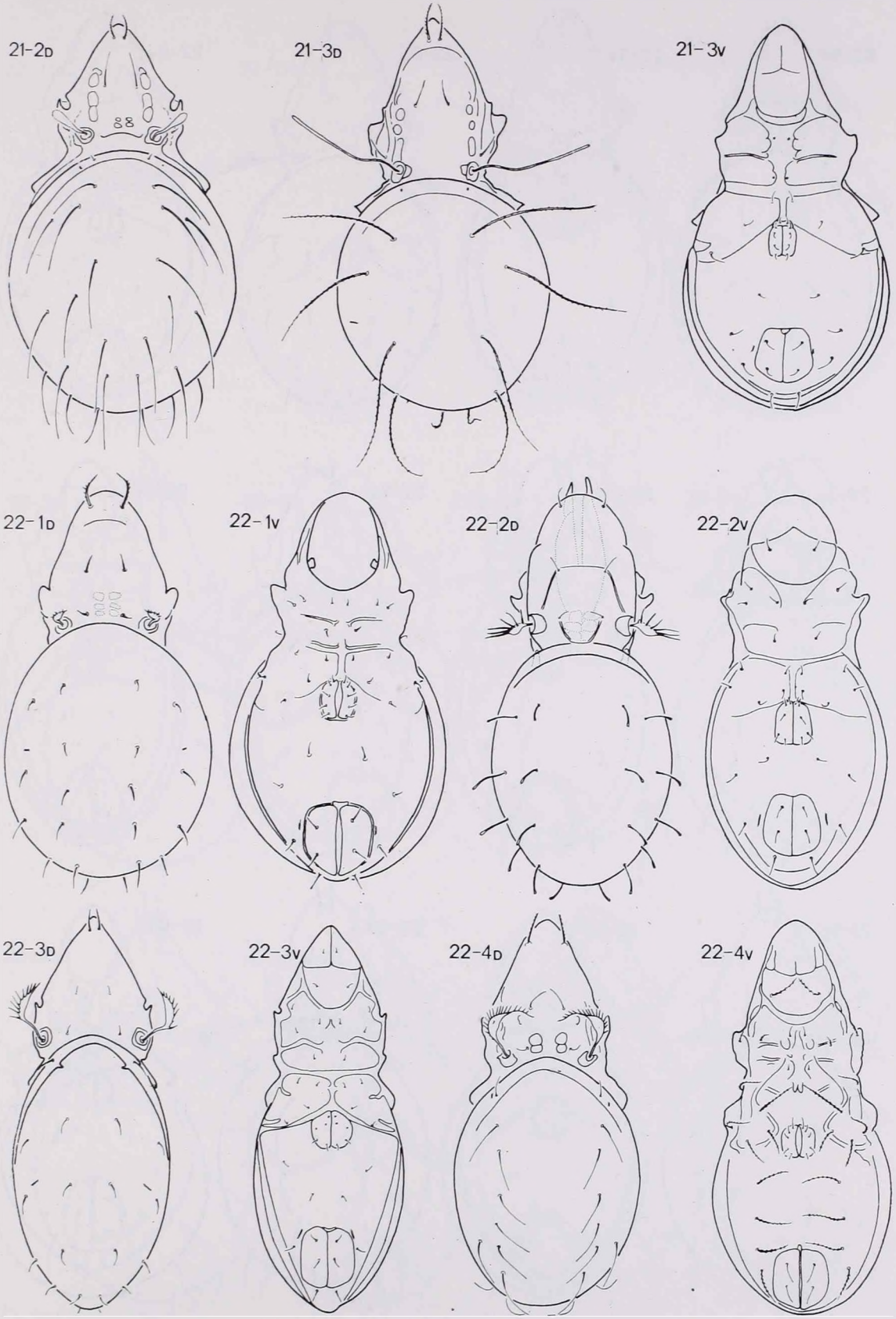


Table 13



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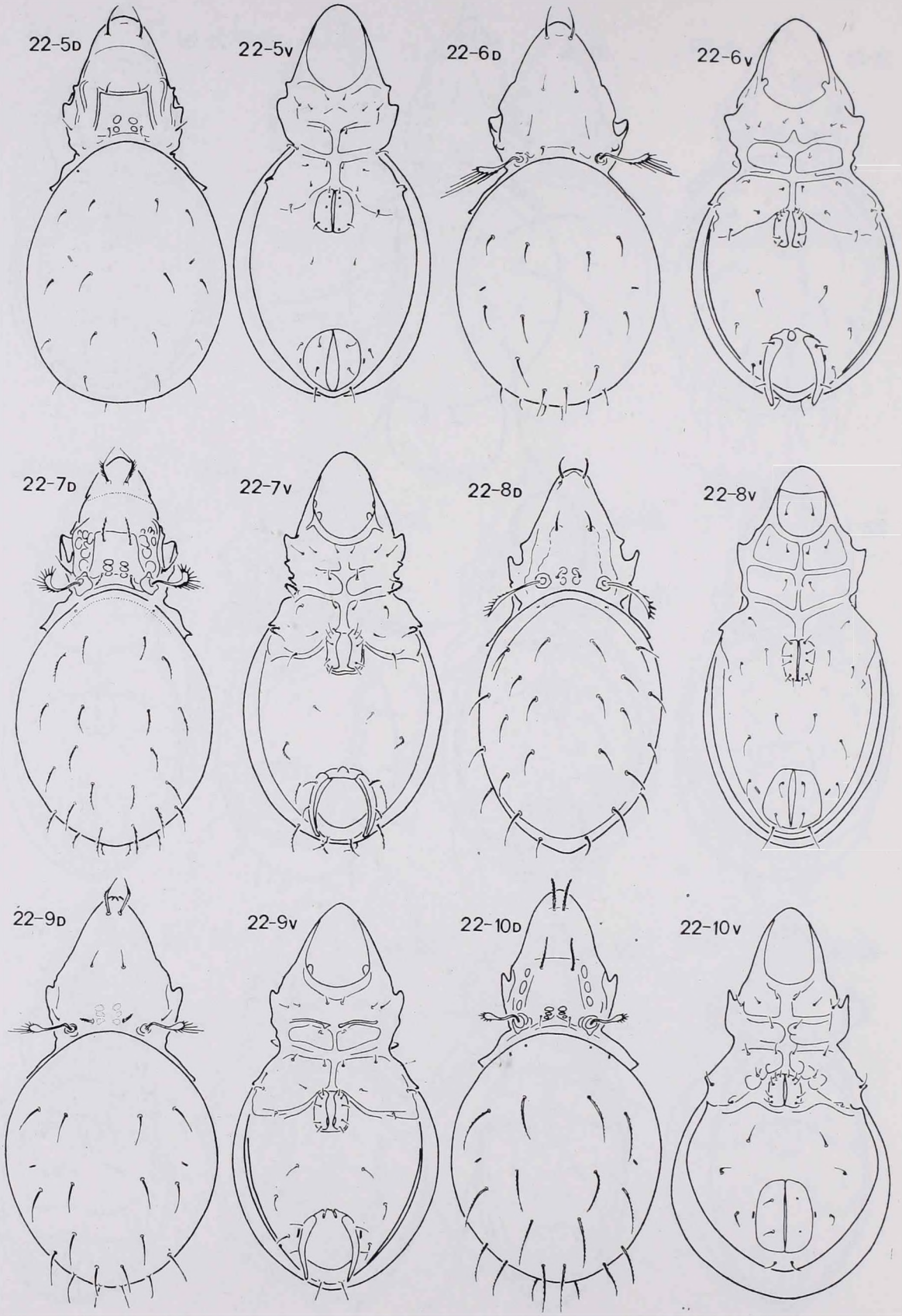
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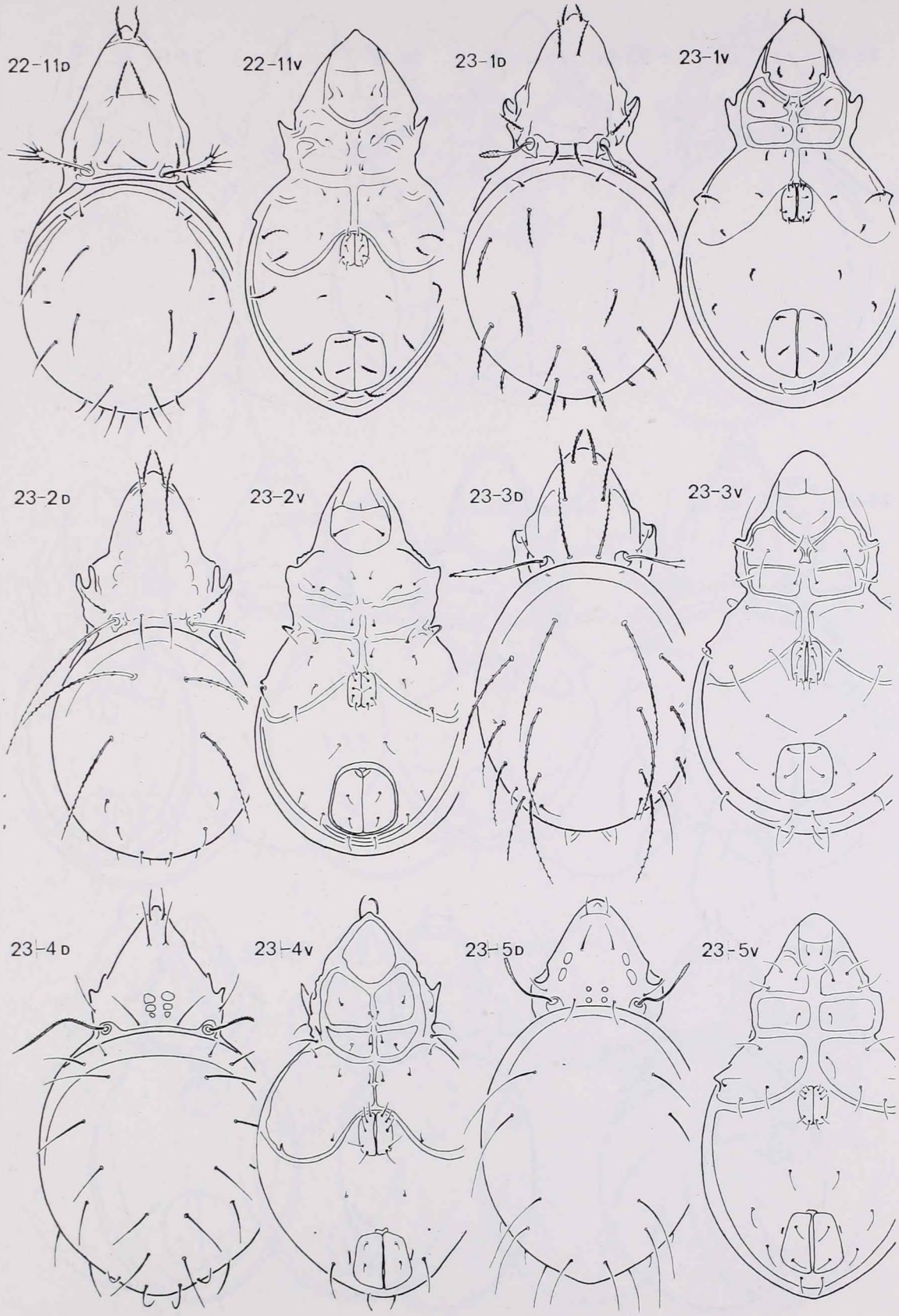
22-10V

Table 15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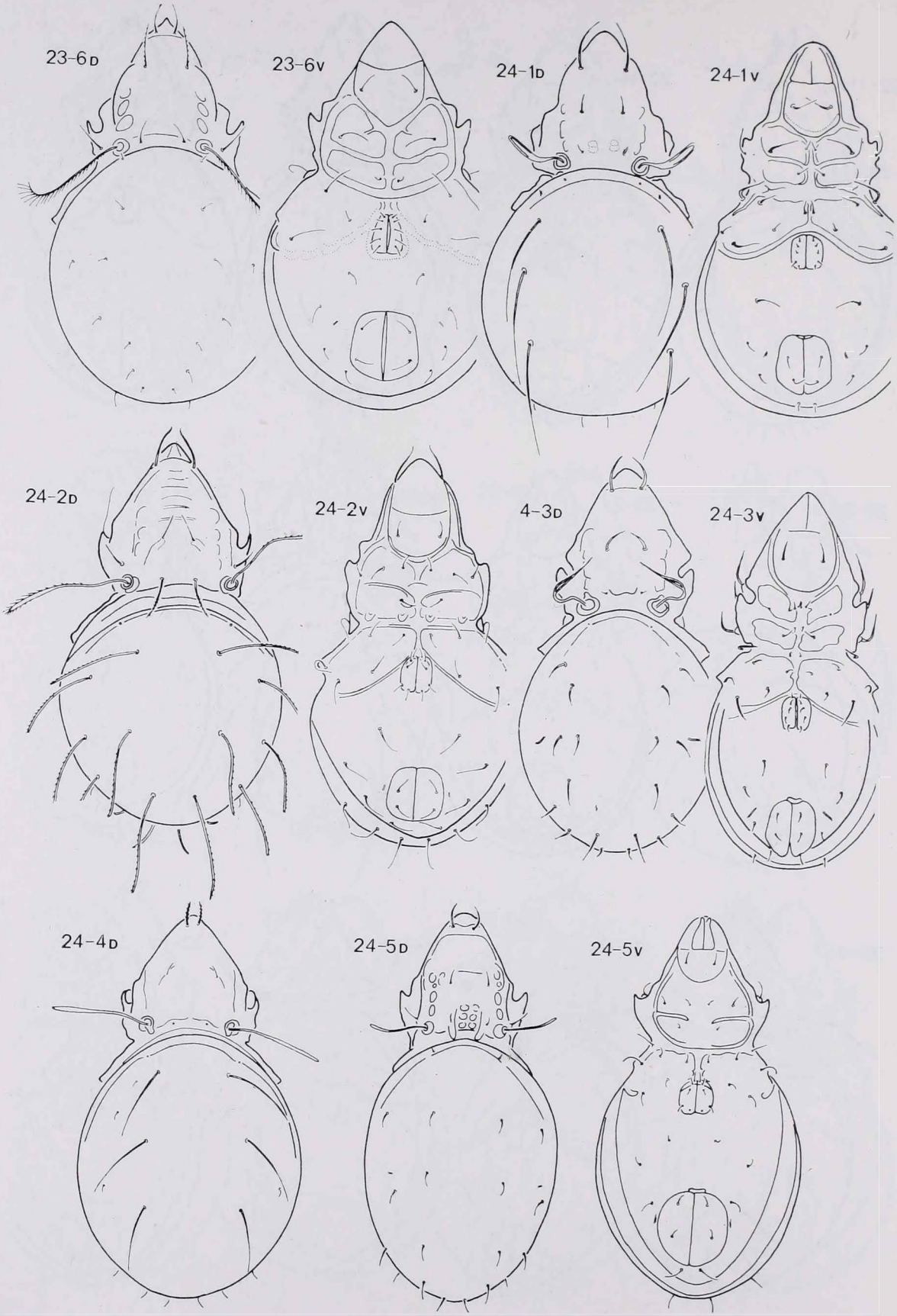

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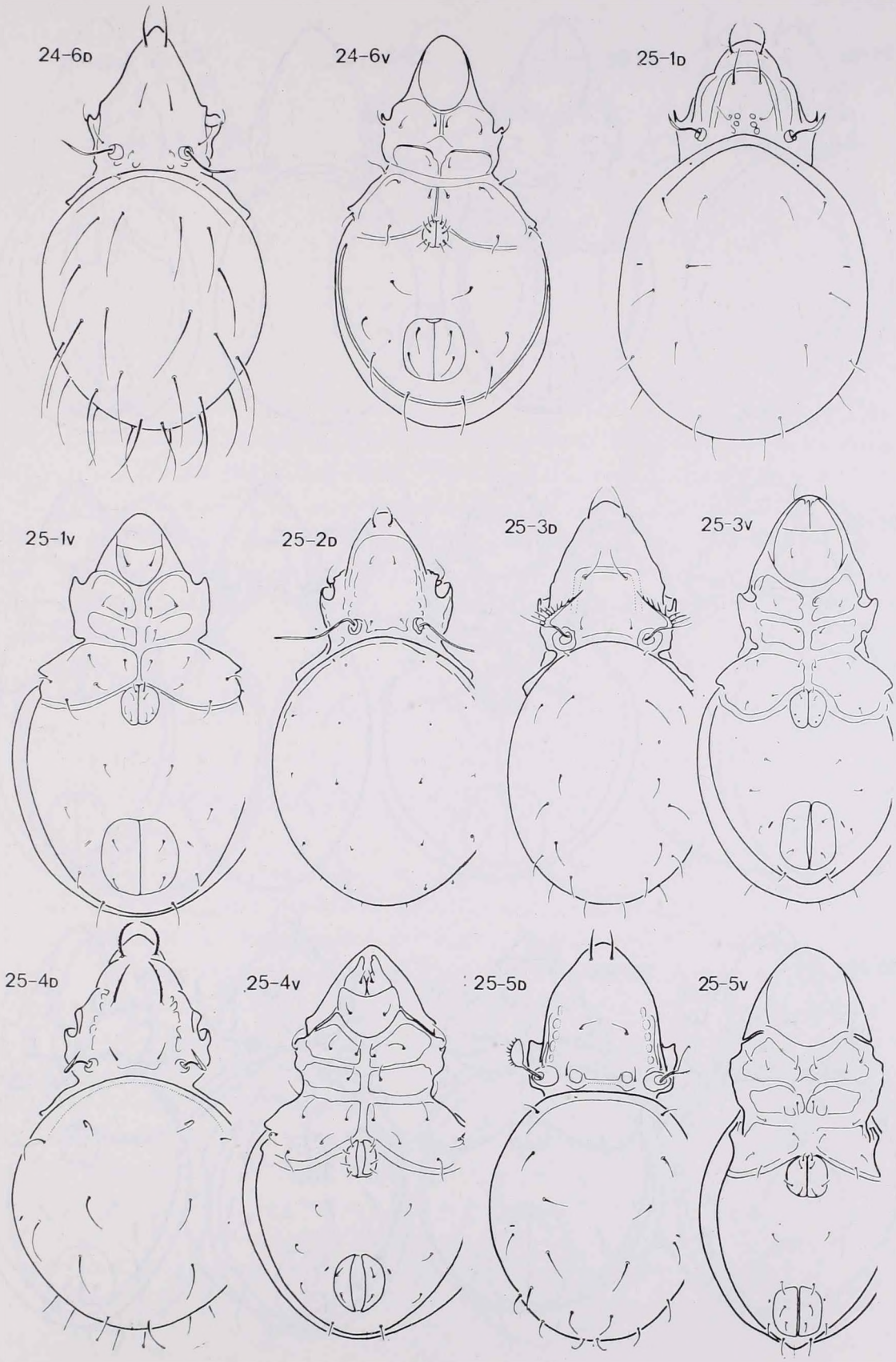

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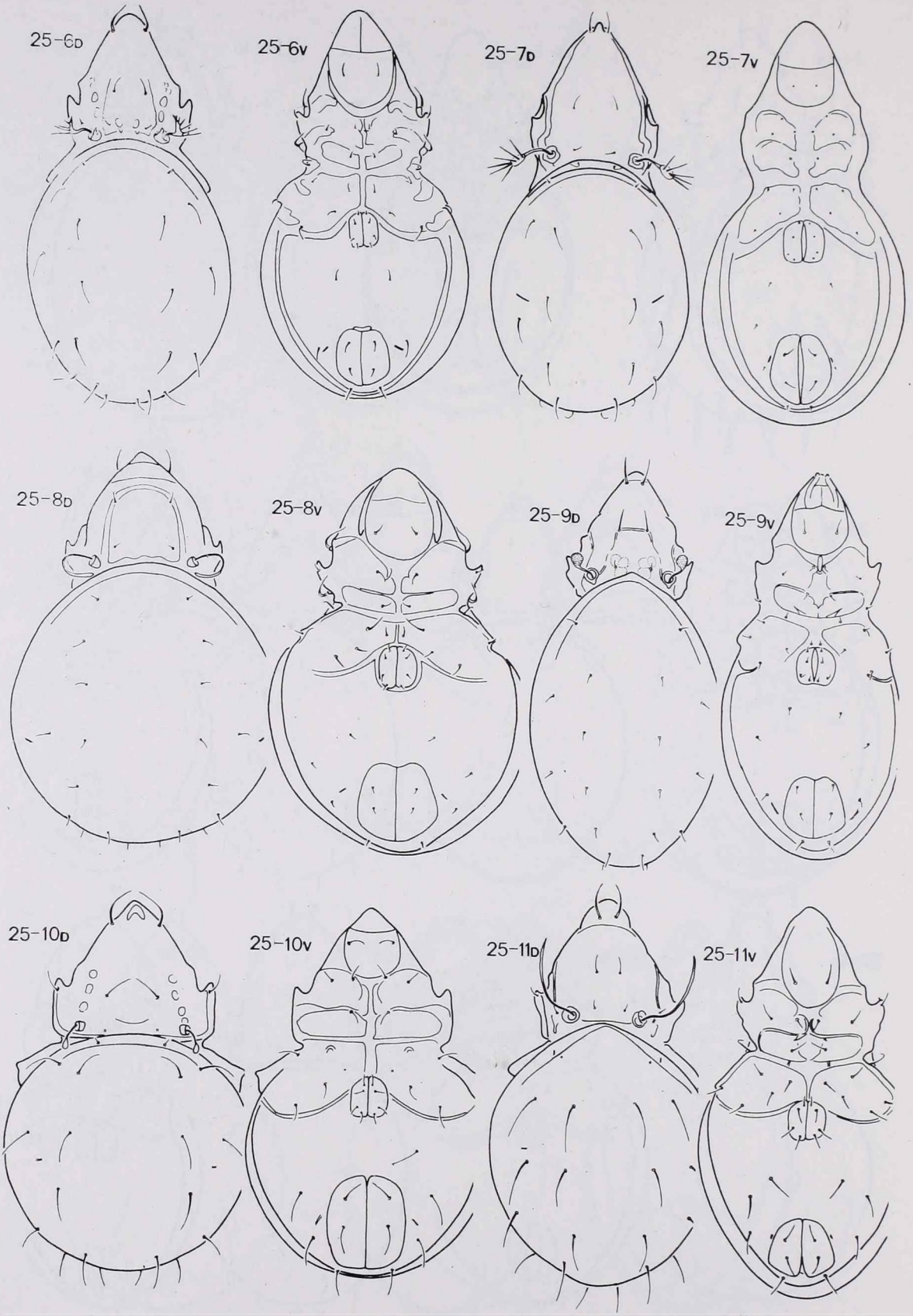
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25-9V
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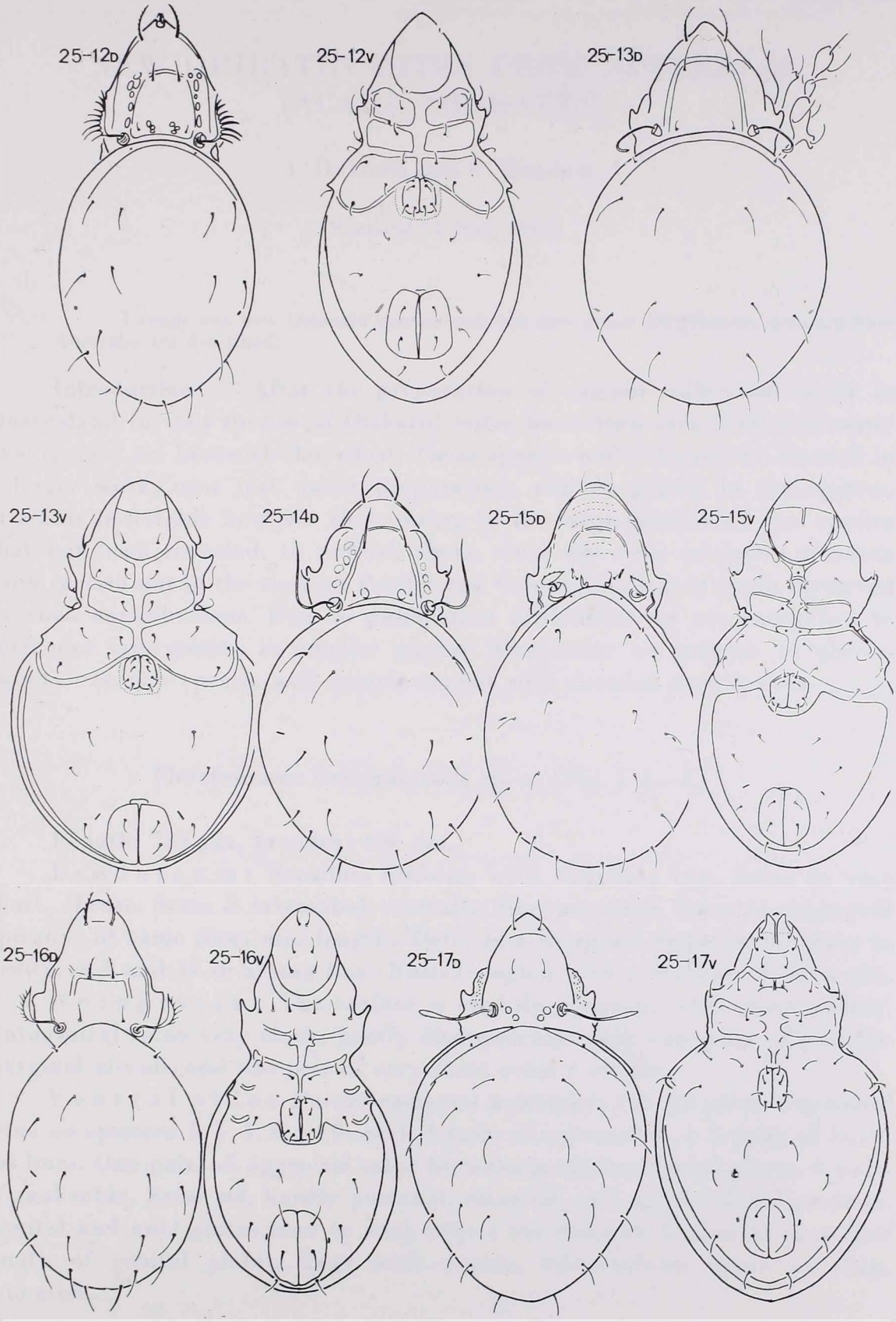
25-11D
25-11V

Table 19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NEW ORIBATID MITES FROM AUSTRALIA (ACARI: ORIBATEI)

J. Balogh and P. Balogh

(Received 15 May, 1982)

Twenty-one new Oribatid species and one new genus (*Sagittazetes* gen. n.) from Australia are described.

Introduction — After the preparation of various collections made in Queensland further species of Oribatid mites have been identified and many new species are herewith described. These species will critically be treated in a larger work, now just under preparation, and be placed in the system. It seems inevitable however that, owing to the large number of new species that has been revealed, to publish them, since the very intensive research work carried out in the western Pacific and Oriental regions is much furthered by such contributions. Due to publication difficulties we are compelled to surrender information in smaller papers. Hereunder we propose to discuss twenty-one new species well complemented with detailed descriptions.

Plateremaeus novemsetosus sp. n. (Fig. 1 A—C)

Length: 784 μm, breadth: 490 μm.

P r o d o r s u m : Sensillus filiform, with flagellate typ. Setae *in* very short, obtuse. Setae *le* originated ventrally, fine. arcuated. Setae *ro* originated apically, of same form and length. There is a marginal chitinization near to peditecta I and II in zigzag line. Rostral region with a reversed V-form slit.

N o t o g a s t e r : The surface is slightly concave, with sharp border. Notogastral setae very short, partly disappearing: only two pairs of posteromarginal alveoli, and one pair of very short setae *r* visible.

V e n t r a l s i d e : Partial epimeral neotrichy; 16—22 pairs of epimeral setae on epimera 3 + 4. G = 9: each 4 pairs of external, 2 + 3 pairs of internal lines. One pair of aggenital setae between genital and anal plates. 6 pairs of anal setae. Setae ad_1 hardly postanal, setae ad_2 and ad_3 in adanal position. Genital and anal plates near to each other; the distance is shorter than half length of genital plates. Legs with cripsin, tridactylous; claws on long, thin stick.

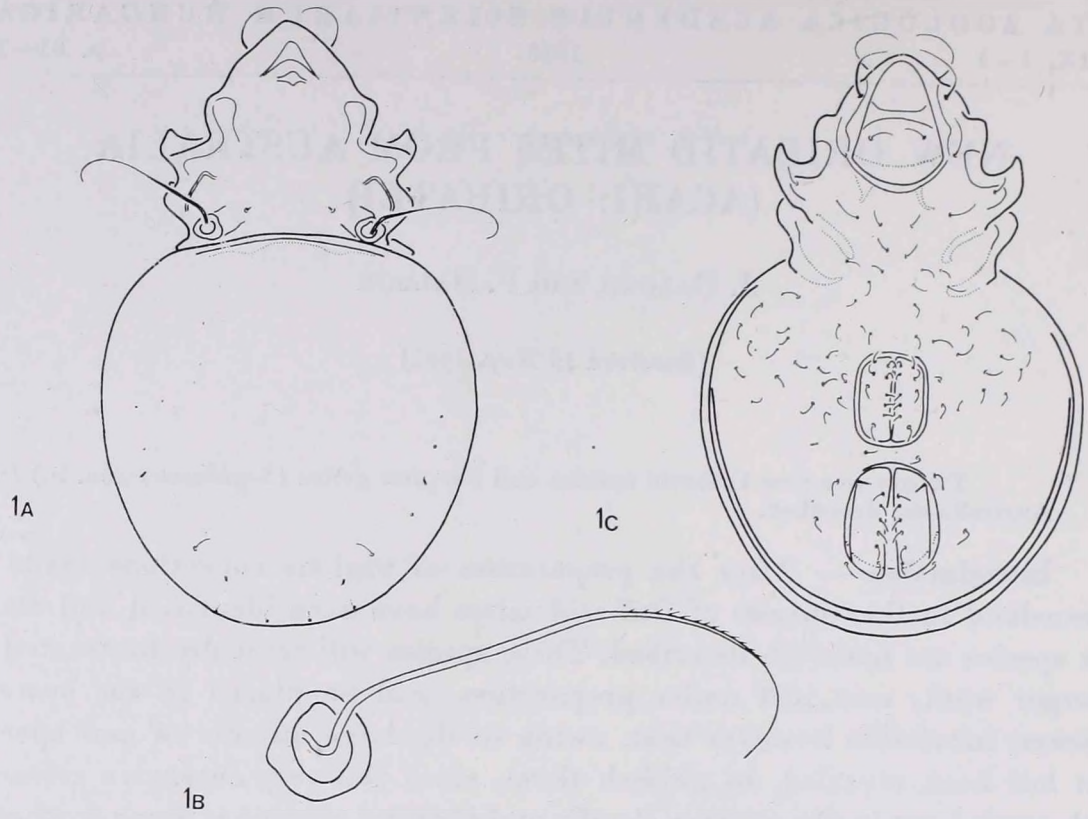

Fig. 1. A—C. *Plateremaeus novemsetosus* sp. n. A = dorsal side, B = sensillus, C = ventral side

Remarks: 5 + 4 pairs of genital setae, 6 pairs of anal setae, 1 pair of aggenital setae, 3 pairs of adanal setae combined with considerable epimeral neotrichy present only on this species.

Material examined: Iron Range, N. Qld. 26. V—8. VI. 1971, G. B. MONTEITH, ex leaf litter; tropical rainforest; 1 holotype, 2 paratypes.

Eutegaeus mensarosi sp. n. (Fig. 2 A—C)

Length: 572—670 μm, breadth: 388—449 μm.

Prodorsum: Sensillus bacilliform, apically not dilated. Setae *in* extremely long, flagelliform, longer than prodorsum. Setae *le* short, flagelliform, originating near to lamellar cuspis. Setae *ro* short, flagelliform. Lamellae dilated apically; cuspides sharp.

Notogaster: There is a long, dilated, protruding humeral extension each on the shoulder. Notogaster rotundate, dorsosejugal suture straight. 8 pairs of notogastral setae: setae p_1 long, straight, sharp, p_2 and p_3 very short and thin; the remaining 5 pairs of notogastral setae long and flagellate.

Ventral side: Mouth parts suctorial. 6 pairs of genital setae. Aggenital setae invisible. 2 pairs of anal, 3 pairs of adanal setae; setae ad_1 and ad_2 in postanal, ad_3 in adanal position. Pori *iad* in apoanal and preanal position, very far from anal plates.

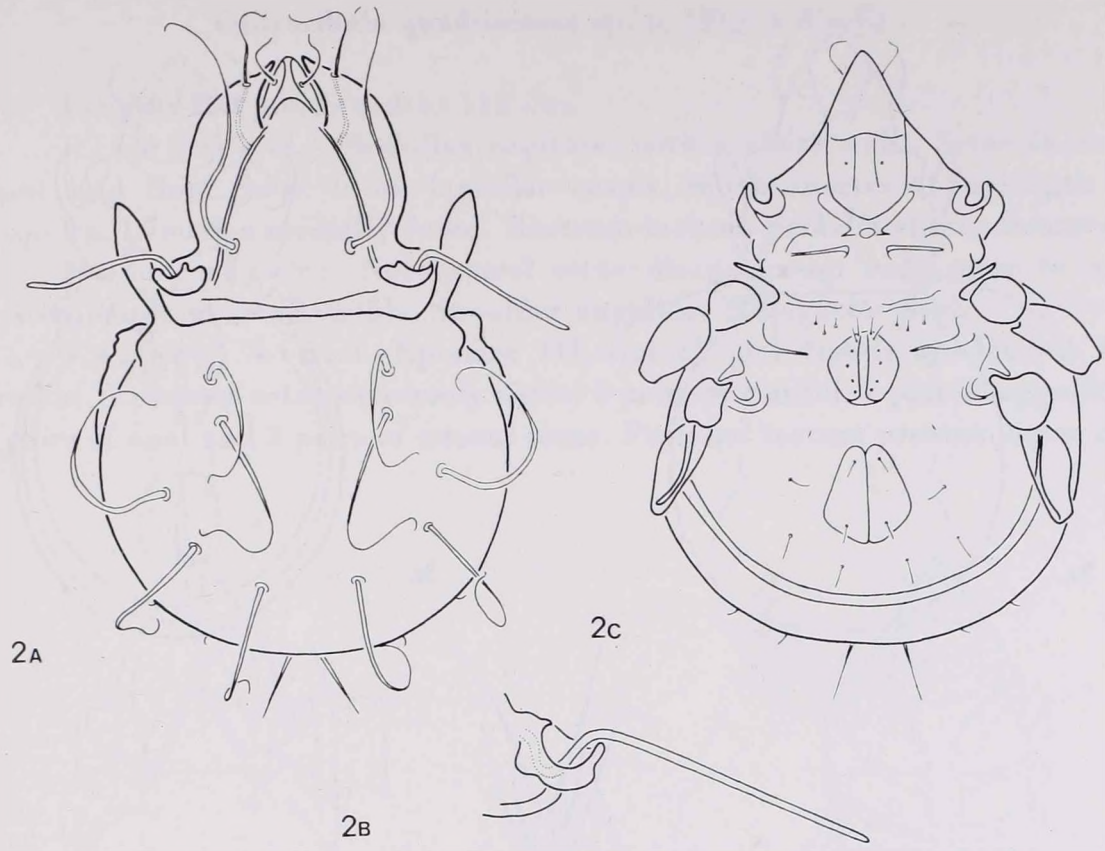

Fig. 2. A—C. *Eutegaeus mensarosi* sp. n. A = dorsal side, B = sensillus, C = ventral side

R e m a r k s : *Eutegaeus mensarosi* sp. n. is the first representative of the genus in Australia. The distribution of the *Eutegaeus* species is peculiar: 5 species occur in New Zealand. 2 in Papua New Guinea, 1 in Patagonia, 1 in Juan Fernandez, 1 in Tahiti. The distribution — with the exception of 2 oceanic islands — follows that of the *Nothofagus*-forest region. *Eutegaeus mensarosi* sp. n. is a unique species with flagellate setae *in* and setae notogastrales.

M a t e r i a l e x a m i n e d : Point Lookout, 5000', via Ebor, N.S.W. 23. IV. 1973, I. NAUMANN, ex *Nothofagus moorei* litter, temperate rainforest; 1 holotype, 16 paratypes. Nightcop Ra., 2500', via Dunoon N.S.W. 6. V. 1973. I. NAUMANN, ex rainforest leaf litter and soil; subtropical rainforest; 2 paratypes.

We dedicate the new species to DR. A. MENSÁROS, Perth, W.A., for his extensive help during our investigations in the scientific exploration of the area.

Hymenobelba domahidyi sp. n. (Fig. 3 A—D)

Length: 645—735 μm, breadth: 351—408 μm.

P r o d o r s u m : Sensillus setiform, arcuate, sharp. Setae *in* short, each like a knife. Setae *le* near to rostral region; originating near to each other, long, setiform. Setae *ro* far lateral, of same length and form as setae *le*. Pedotecta II very long, auriculate.

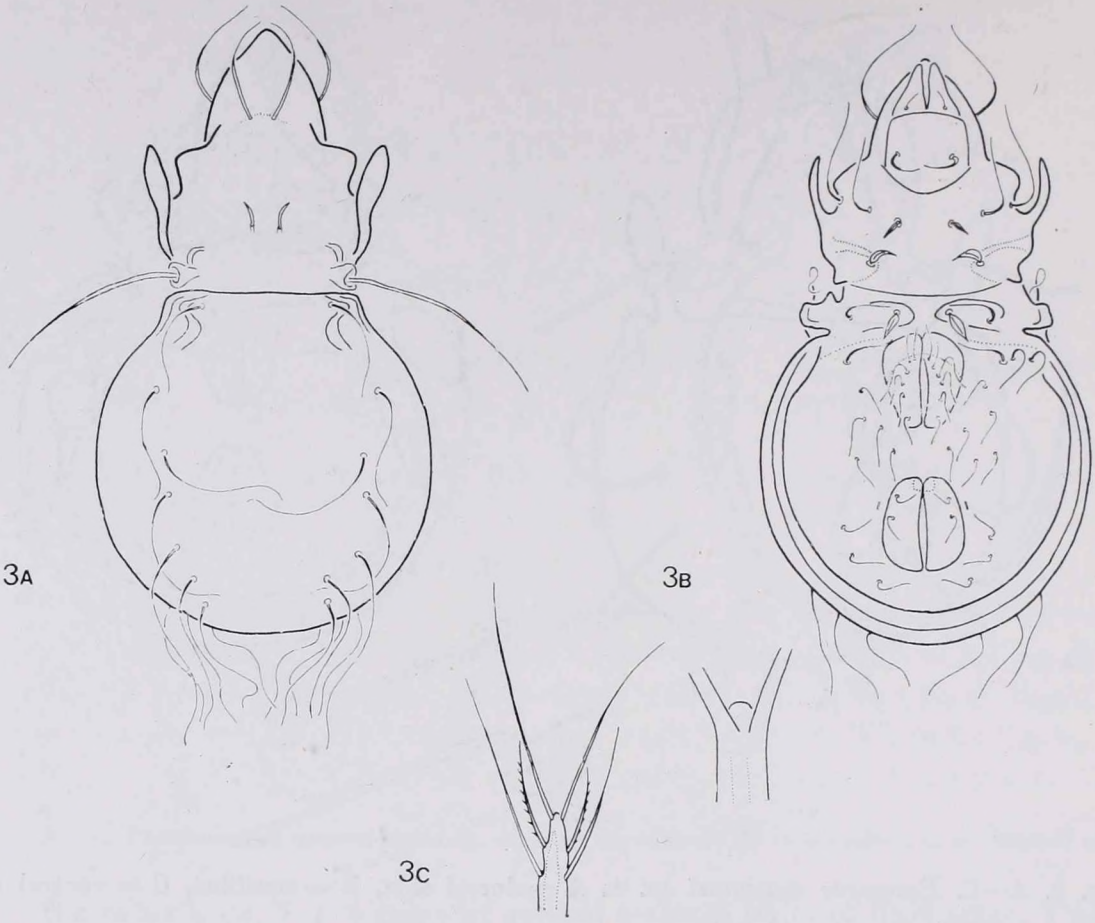

Fig. 3. A—D. *Hymenobelba domahidyi* sp. n. A = dorsal side, B = ventral side, C = tarsus I,

N o t o g a s t e r : Dorsosejugal suture straight; shoulder angulate. Out of setae *ta* each an S-Form crista. 10 pairs of long, flagellate notogastral setae: *ta*, *te*, *ti*, *ms*, r_3, r_2 and r_1 in arched, longitudinal row. Setae *p* in posteromarginal position, near to each other. Legs I without claws; with two very long apical setae.

V e n t r a l s i d e : 3 pairs of short, foliate epimeral setae; remaining setae flagellate, long or very long. 6 pairs of long, flagellate genital setae. 4 or 5 pairs of setae in aggenital region. 2 pairs of long anal setae, originating in anterior half of anal plates. 3 pairs of adanal setae: ad_1 in postanal, ad_2 and ad_3 in adanal position, but in posterior half on adanal region. Pori *iad* adanal.

R e m a r k s : Only one species: *Hymenobelba coarctata* BALOGH et MAHUNKA, 1966 (South Africa) has foliate setae *in*, buth the 3 pairs of foliate epimeral setae are unique in the new species.

M a t e r i a l e x a m i n e d : Point Lookout, 5000', via Ebor, N.S.W. 23. IV. 1973, I. NAUMANN, ex *Nothofagus moorei* litter, temperate rainforest; 1 holotype, 1 paratype; Bulburin State Forest, 2000', Via Many Peaks, Qld. 1. IV. 1972, G. B. MONTEITH, ex leaf litter, subtropical rainforest, 8 paratypes; Nightcop Ra , 2500', via Dunoon. N.S.W. 6. V. 1973, I. NAUMANN, ex rainforest leaf litter and soil; subtropical rainforest; 2 paratypes.

We dedicate the new species to DR. A. DOMAHIDY, Perth, W.A., for his friendly help during our scientific exploration of the Perth area.

Cultroribula quadrisetosa sp. n. (Fig. 4 A—C)

Length: 208 μm, breadth: 118 μm.

P r o d o r s u m : Sensillus capitate, with a short stalk. Setae *in* very short and thin. Setae *le* on lamellar cuspis, much shorter than length of cuspides. Lamellae medially fused. Rostrum incised. Setae *ro* short, divergent.

N o t o g a s t e r : Notogastral setae disappearing; only setae *ta* and posteromarginal setae visible. Shoulder angulate. Notogaster oval.

V e n t r a l s i d e : Epimera III and IV not fused; apodemata III present. Epimeral setae extremely short. 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal and 3 pairs of adanal setae. Postanal tectum present. Setae ad_1

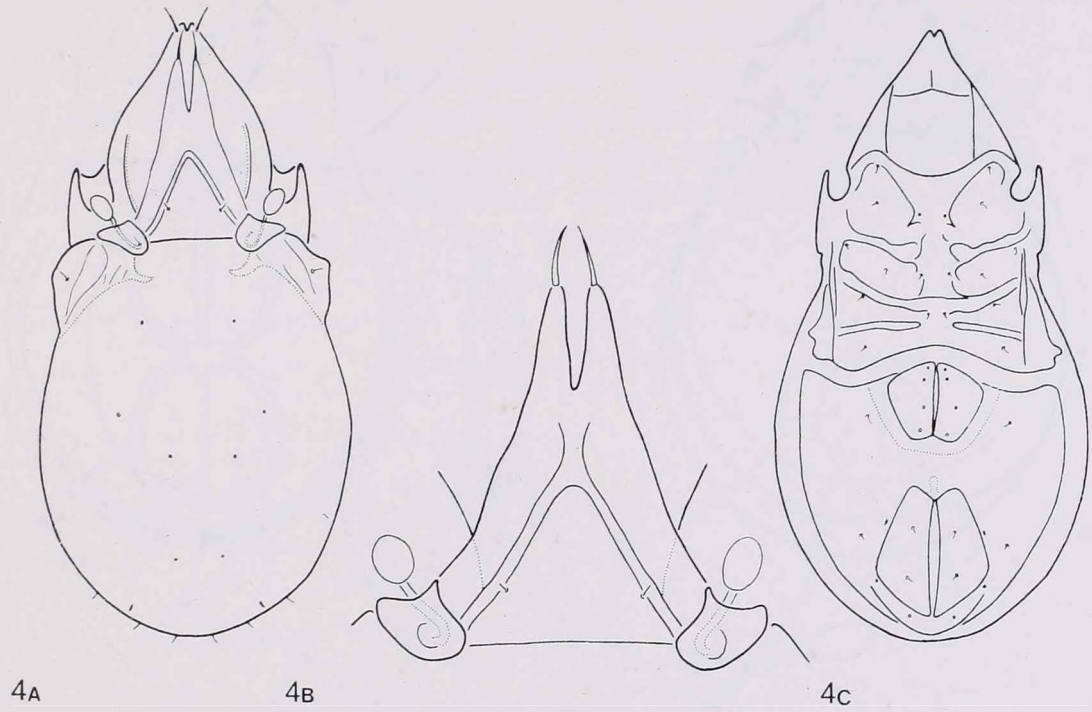

Fig. 4. A—C. *Cultroribula quadrisetosa* sp. n. A = dorsal side, B = lamellae, C = ventral side

in postanal, ad_2 and ad_3 in adanal position. Pori *iad* adanal. Genital plates shorter than anal plates. Genital and anal plates far from each orther: distance about half length of genital plates.

R e m a r k s : Only *Cultroribula elongata* FUJIKAWA, 1972 (Japan) has 1. four pairs of genital setae, 2. knitted lamellae, 3. separated genital and anal plates, 4. short, fusiform sensillus. *Cultroribula quadrisetosa* sp. n. has much shorter, capitate sensillus and reduced, or extremely short notogastral setae.

M a t e r i a l e x a m i n e d : Yabbra State Forest, 1600', via Urbenville, N.S.W. 1. IV. 1973, I. NAUMANN, ex leaf litter and soil, subtropical rainforest; 1 holotype, 1 paratype.

Cultroribula quinquesetosa sp. n. (Fig. 5 A—C)

Length 244 μm, breadth: 167 μm.

P r o d o r s u m : Sensillus fusiform or capitate, with a long stalk. Setae *in* short. Setae *le* on lamellar cuspis; longer than length of cuspides. Lamellae medially not fused. Rostrum incised. Setae *ro* medium long, parallel.

N o t o g a s t e r : Notogastral setae absent with the exception of shoulder setae (setae *ta*?). Shoulder rotundate. Notogaster circulate.

V e n t r a l s i d e : Epimera III + IV fused; apodemata III absent. Epimeral setae extremely short. 5 pairs of genital setae. Aggenital setae

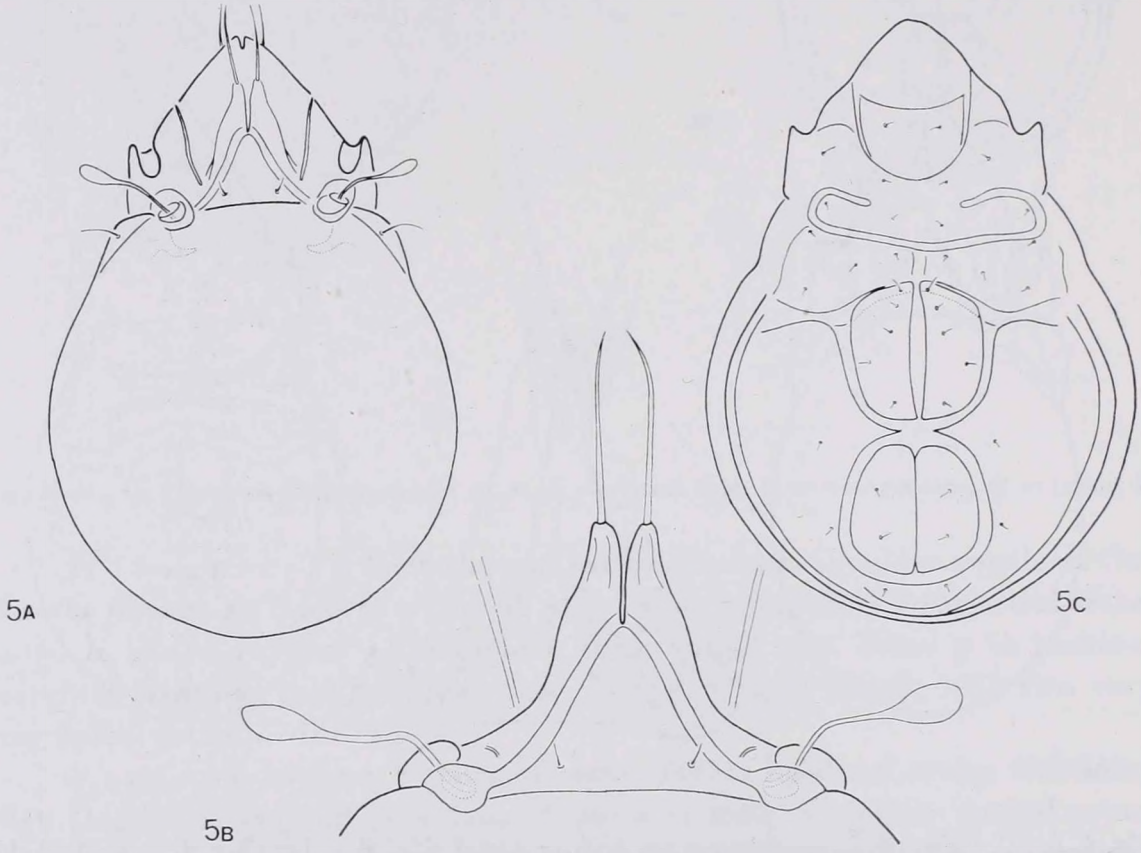

Fig. 5. A—C. *Cultroribula quinquesetosa* sp. n. A = dorsal side, B = lamellae, C = ventral side

absent (?). 2 pairs of anal, 3 pairs of adanal setae. Setae ad_1 in postanal, ad_2 and ad_3 in adanal position. Postanal tectum present. Pori *iad* not visible. Genital and anal plates near to each other: chitinous frames contiguous.

R e m a r k s : There is a characteristic species-group having 5 genital setae and large, hardly separate genital and anal plates. All the species of this group have notogastral setae; *C. quinquesetosa* sp. n. is depilated.

M a t e r i a l e x a m i n e d : Yabbra State Forest, 1600', via Urbenville, N.S.W. 1. IV. 1973. I. NAUMANN, ex leaf litter and soil, subtropical rainforest; 1 holotype.

Pseudoceratoppia mariannae sp. n. (Fig. 6: A—C)

Length: 743—776 μm, breadth: 523 μm.

P r o d o r s u m : Sensillus setiform, ciliate. Setae *in* extremely long, as long as prodorsum, or longer. Lamellae narrow; with long cuspis. Setae *le* on tip of cuspis; medium long. Setae *ro* dorsal on rostrum; latter pointed. Tutorium long, straight, with pointed cuspis.

N o t o g a s t e r : Only 4 pairs of longer notogastral setae, on posteromarginal region of notogaster. The interior pair is the longest. Notogaster circulate. Prodorsal and notogastral setae sparsely ciliate.

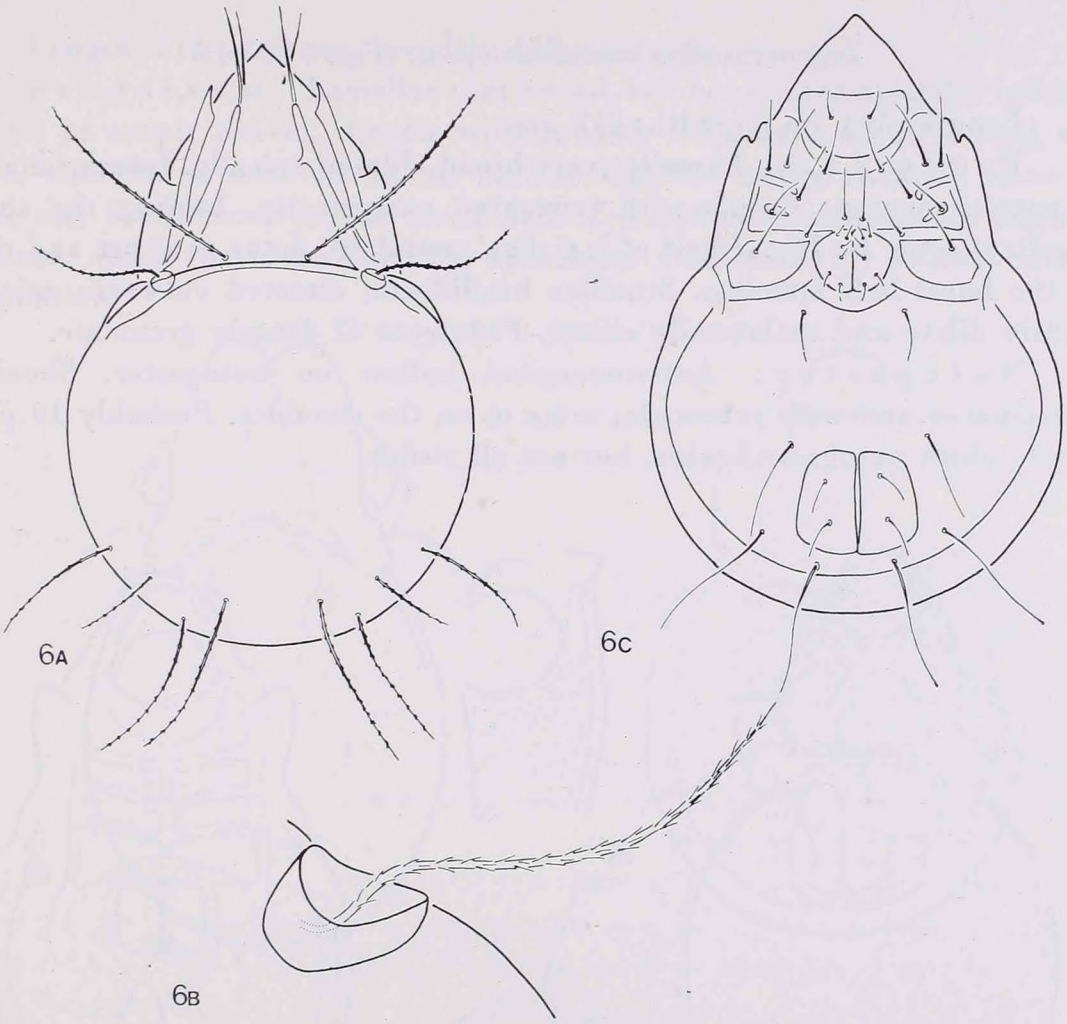

Fig 6 A—C. *Pseudoceratoppia mariannae* sp. n. A = dorsal side, B = sensillus, C = ventral side

V e n t r a l s i d e : Epimeral setae fairly long, directed forward. Genital plates included between epimera III + IV. 6 pairs of genital setae. 1 pairs of aggenital setae in postgenital position. 2 pairs of long anal, 3 pairs of very long adanal setae. Setae ad_1 in postanal, ad_3 in preanal position. Pori *iad* not visible.

Remarks: The genus *Pseudoceratoppia* HAMMER, 1967 includes five species, all from New Zealand. Only one species: *P. sexsetosa* HAMMER, 1968 has 3 pairs of long posteromarginal setae. *P. mariannae* sp. n. has 4 pairs of long posteromarginal setae and the adanal setae are much longer than those of *P. sexsetosa* HAMMER, 1968.

Material examined: Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973. D. G. GOSSMAN, ex leaf litter, subtropical rainforest, 1 holotype, 1 paratype; Barrington Tops, 5000', via Salisbury, N.S.W. 10. II. 1965, G. B. MONTEITH, temperate rainforest, ex *Nothofagus moorei* leaf litter, 18 paratypes.

We dedicate this new species to Mrs. M. DOMAHIDY, Perth, W.A., for her personal help extended during our collecting trips in the Perth area.

Tegeocranellus concavus sp. n. (Fig. 7 A—D)

Length: 343 μm, breadth: 212 μm.

Prodorsum: Lamellae very broad, dilated apically. Interior margin of cuspis concave. Cuspis with truncated exterior tip, bearing the short, flagellate setae *le*. Distal half of lamellae granulate. Setae *in* short and thin, on the basal half lamellae. Sensillus bacilliform, directed outward; apically slightly dilate and unilaterally ciliate. Pedotecta II densely granulate.

Notogaster: Anteromarginal hollow on notogaster. Shoulder emarginated and with tubercula; setae *ta* on the shoulder. Probably 10 pairs of very short notogastral setae, but not all visible.

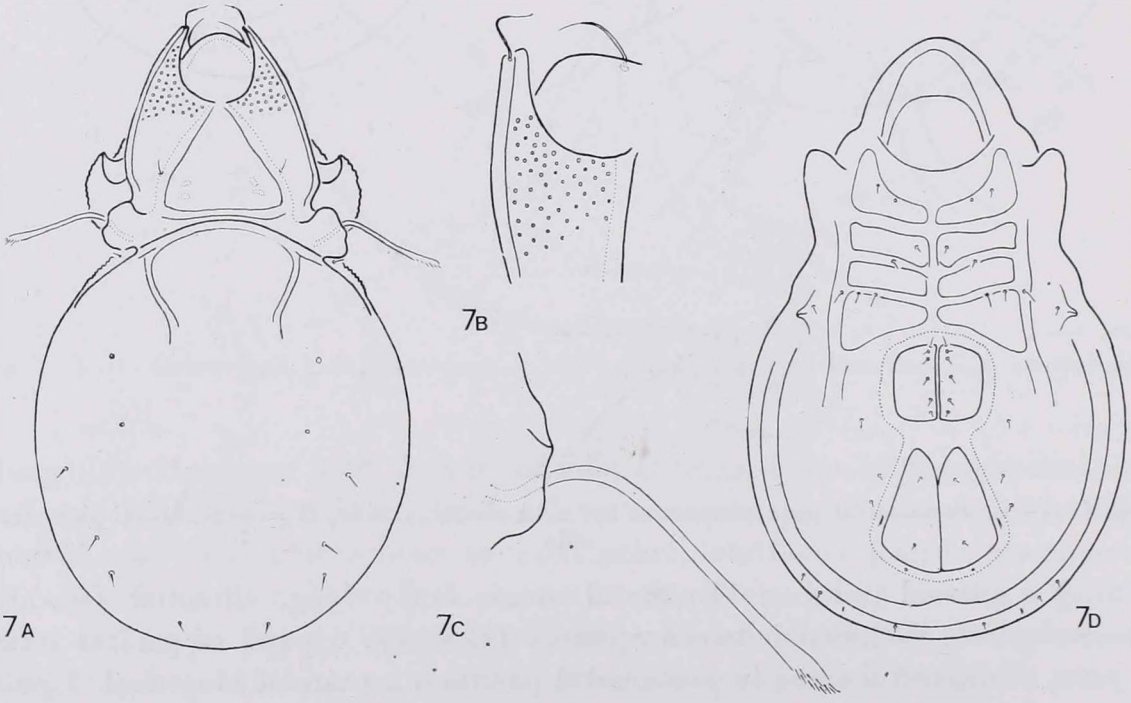

Fig. 7. A—D. *Tegeocranellus concavus* sp. n. A = dorsal side, B = apical part of lamella, C = sensillus, D = ventral side

Ventral side: 6 pairs of very small genital, 1 pair of aggenital setae. Genital setae in longitudinal row, aggenital setae almost in postgenital position. Two pairs of anal, 3 pairs of adanal setae. Setae ad_1 in postanal, ad_2 and ad_3 in adanal position. Pori *iad* adanal, but in posterior half of anal plates.

Remarks: There are four *Tegocranellus* species, none of them has concave interior margin of cuspis.

Material examined: Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973. D. G. GROSSMAN, ex leaf litter, subtropical rainforest; 1 holotype, 37 paratypes.

Tegeocranellus convexus sp. n. (Figs 8 A—E)

Length: 212—269 μm, breadth: 163—171 μm.

Prodorsum: Lamellae very broad, but not dilated apically. Interior margin of cuspis convex. Cuspis with broadly rotundate apex, bearing the short, bacilliform setae *le*. Distal half of lamellae not granulate. Setae *in* short and bacilliform, on the basal half of lamellae. Sensillus with slightly fusiform apical part, unilaterally spinulate. Pedotecta II without dense granulation.

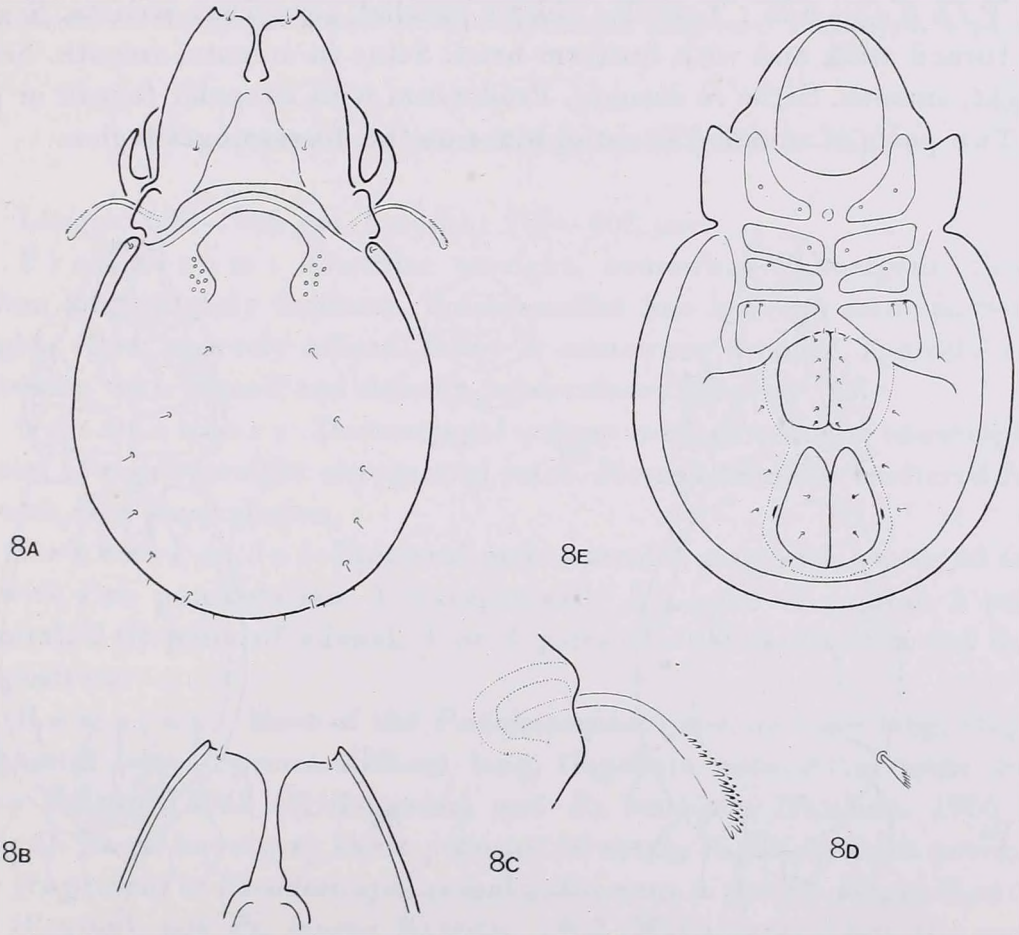

Fig. 8. A—E. *Tegeocranellus convexus* sp. n. A = dorsal side, B = apical part of lamellae, C = sensillus, D = hair *ms*, E = ventral side

N o t o g a s t e r : Anteromarginal hollow on notogaster. Exterior margin of hollow with several foveoli. Shoulder emarginated, but without tubercula, bearing setae *ta*. 10 pairs of short, fusiform, unilaterally ciliate notogastral setae.

V e n t r a l s i d e : 6 pairs of very short genital, 1 pair of aggenital, 3 pairs of adanal, 2 pairs of anal setae. Setae ad_1 in postanal, ad_2 and ad_3 in adanal position. Pori *iad* adanal, in posterior half of anal plates.

R e m a r k s : *Tegocranellus convexus* sp. n. is the unique species of the genus 1. with exteriorly emarginate lamellae, 2. with foveoli out of medial hollow at dorsosejugal suture and 3. with short, penicillate notogastral setae.

M a t e r i a l e x a m i n e d : Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973, D. G. GROSSMAN, ex leaf litter, subtropical rainforest, 1 holotype; Yabbra State Forest, 1600', via Urbenville, N.S.W. 1. IV. 1973. I. NAUMANN, ex leaf litter and soil, subtropical rainforest, 3 paratypes.

Pseudotocepheus asymmetricus sp. n. (Fig. 9 A—C)

Length: 559—755 μm, breadth: 245—339 μm.

P r o d o r s u m : Costulae almost parallel, somewhat arcuate. Sensillus with turned stalk and with fusiform head. Setae *in* arcuate, smooth. Setae *le* straight, smooth. Setae *ro* arcuate. Prodorsum with irregular foveoli or punctuli. Two pairs of rounded enantiophyses at the dorsosejugal region.

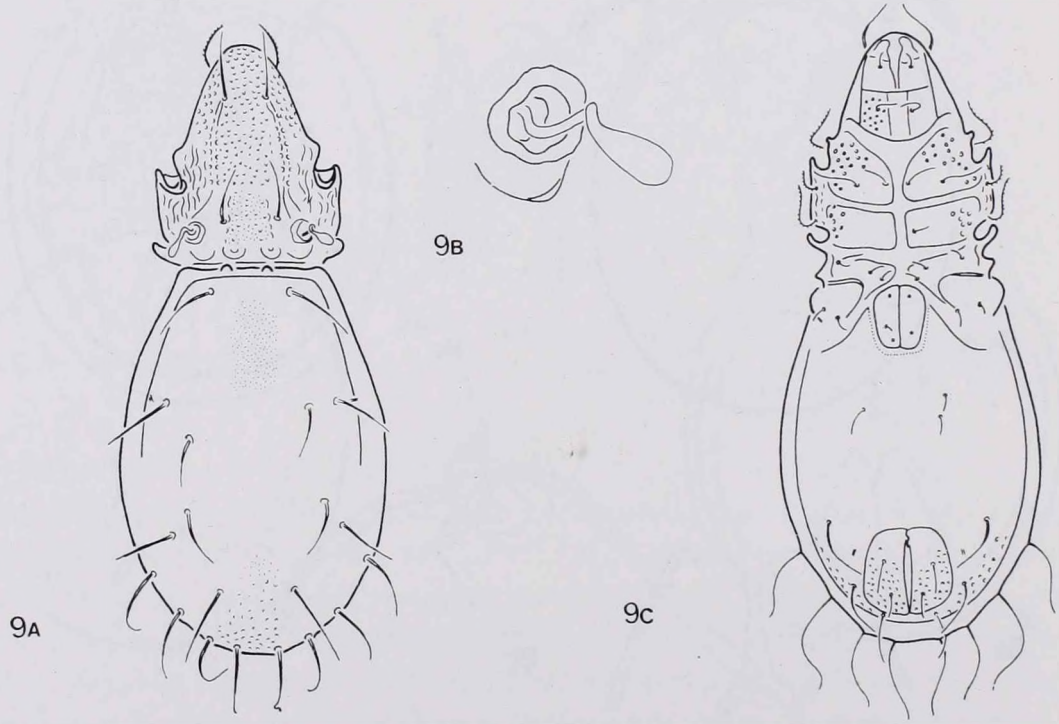

Fig. 9. A—C. *Pseudotocepheus asymmetricus* sp. n. A = dorsal side, B = sensillus, C = ventral side

N o t o g a s t e r : Dorsosejugal suture straight. Ten pairs of short, arcuate, smooth notogastral setae. Notogaster with small foveoli, or punctulate. Setae *in*, *ti*, *ms*, r_2, r_3 originating asymmetrically.

V e n t r a l s i d e : Epimeral region with foveoli. 3 (exceptionally 2) pairs of genital, 1 (exceptionally 2 !) pair of aggenital, 3 pairs of adanal, 2 pairs of anal setae. Setae ad_3 in preanal position. Pori *iad* apoanal, between setae ad_2 and ad_3. Ventral and anal plates with small foveoli. Setae epimerales and generally the ventral setae have a tendency of asymmetric position.

R e m a r k s : There are four species of *Pseudotocepheus* with relatively short, capitate head. *Ps. vicarius* BALOGH et MAHUNKA, 1978 (Queensland) has much longer, flagellate notogastral setae with quite different position (see the position of setae *te* and *ti* !); *Ps. szentivanyorum* BALOGH et MAHUNKA, 1978 (Queensland) has longer notogastral and shorter adanal setae; *Ps. foveolatus* HAMMER, 1966 (New Zealand) has much longer, flagellate notogastral, interlamellar and lamellar setae; ? *Pseudotocepheus radiatus* HAMMER, 1973 (Samoa) with different notogastral setal position and setae ad_3 are less remote from each other, than setae ad_2 !

M a t e r i a l e x a m i n e d : Point Lookout, 5000', via Ebor, N.S.W. 23. IV. 1973. I. NAUMANN, ex *Nothofagus moorei* litter, temperature rainforest; 1 holotype, 6 paratypes.

Pseudotocepheus monteithi sp. n. (Fig. 10 A—C)

Length: 698—906 μm, breadth: 273—408 μm.

P r o d o r s u m : Costulae straight, somewhat convergent. Sensillus medium long, slightly fusiform. Translamellar line between setae *le*. Setae *in* straight, rigid, sparsely ciliate. Setae *le* somewhat arcuate, sparsely ciliate. Prodorsum with foveoli and densely tuberculate laterally.

N o t o g a s t e r : Dorsosejugal suture with 3 pairs of enantiophyses. 10 pairs of rigid, straight notogastral setae. Notogaster with scattered foveoli and with fine punctulation.

V e n t r a l s i d e : Epimeral and ventral region with scattered foveoli and with fine punctulation. 3 (exceptionally 2 !) pairs of genital, 2 pairs of aggenital, 2 (!) pairs of adanal, 1 or 3 pairs of anal setae. Pori *iad* in apoanal position.

R e m a r k s : Most of the *Pseudotocepheus* species have long, flagellate notogastral setae. Species without long, flagellate notogastral setae are *Ps. longus* BALOGH, 1962 (Madagascar) and *Ps. curtiseta* HAMMER, 1966 (New Zealand). These have very short notogastral setae. Rigid, straight notogastral setae are present in *Pseudotocepheus mahunkai* **nom. n.** pro *Ps. longus* MAHUNKA, 1973 (Ceylon), not *Ps. longus* BALOGH, 1962 (Madagascar); but the costulae are rather more marginal and the sensillus near to apex is finely ciliate.

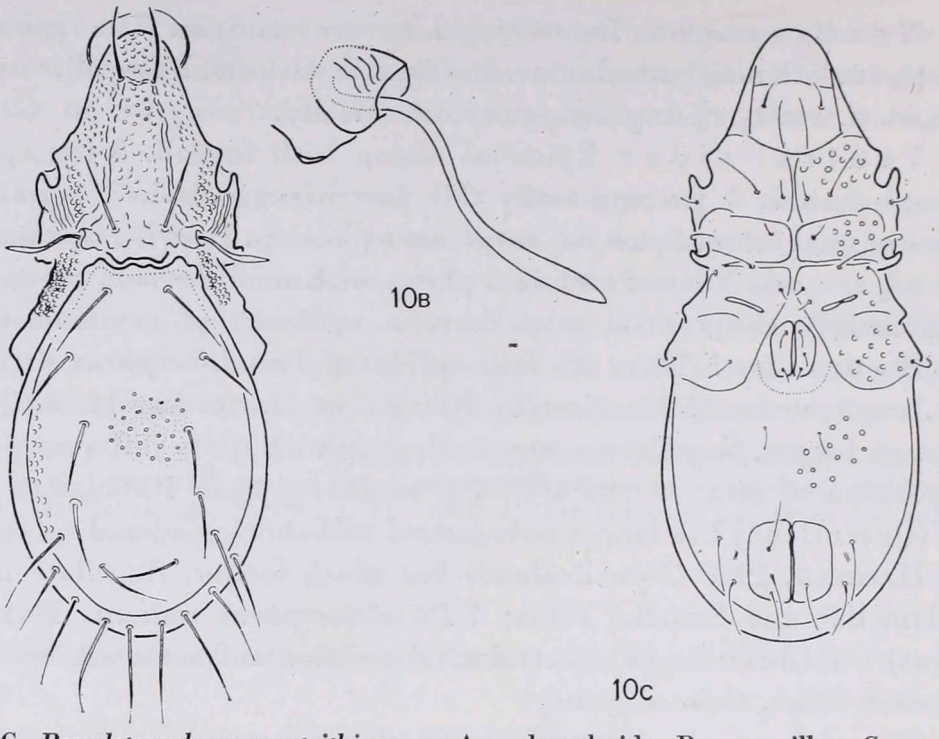

Fig. 10. A—C. *Pseudotocepheus monteithi* sp. n. A = dorsal side, B = sensillus, C = ventral side

Material examined: Point Lookout, 5000', via Ebor., N.S.W. 23. IV. 1973, I. NAUMANN, ex *Nothofagus moorei* litter, temperate rainforest, 1 holotype, 9 paratypes.

We dedicate the new species to DR. G. M. MONTEITH, Brisbane, Qld, for the valuable material originating from Queensland and N.S. Wales.

Arcoppia waterhousei sp. n. (Fig. 11 A—C)

Length: 273—302 μm, breadth: 139—167 μm.

Prodorsum: Sensillus with 3 branches; latter gradually becoming shorter: the first (longest) branch longer than sensillus; the third one only half of first. Setae *in* and *le* very short, setae *ro* three times longer.

Notogaster: 10 pairs of short notogastral setae. Setae *ta* much shorter than the remaining setae.

Ventral side: All setae very short. Setae ad_3 in half way between setae *ag* and ad_2.

Remarks: Sensillus with three branches is present in *A. arcualis* (BERLESE, 1913) sensu HAMMEN, 1979, but setae *le* originating behind the translamellar line; *A. arcualis* (BERLESE, 1913) sensu BALOGH et MAHUNKA, 1967 (Vietnam) has longer *in* and *le* setae, and the notogastral setae are longer, finely ciliate; *Arcoppia cronus* (JACOT, 1934) (Hawai) has longer in setae; *Arcoppia fenestralis* (WALLWORK, 1961) has much longer *in* setae and notogastral setae.

Material examined: Viangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973. D. G. GROSSMAN, ex leaf litter subtropical rainforest; 1 holotype, 2 paratypes.

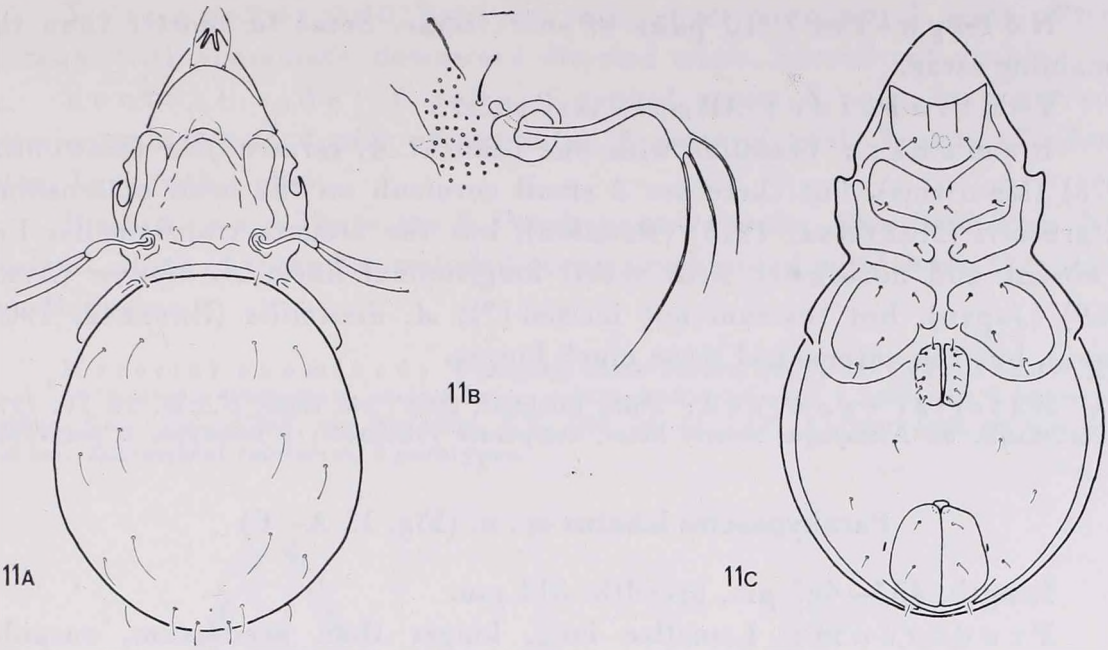

Fig. 11. A—C. *Arcoppia waterhousei* sp. n. A = dorsal side, B = sensillus, C = ventral side

We dedicate the new species to D. F. WATERHOUSE, D. S. CSIRO, substantially helping all our investigations during the Australian route.

Arcoppia incerta sp. n. (Fig. 12 A—C)

Length: 457—469 μm, breadth: 245—273 μm.

P r o d o r s u m : Sensillus with one branch. Setae *in* as long as or longer than setae *ro*. Setae *le* shorter, than setae *in*.

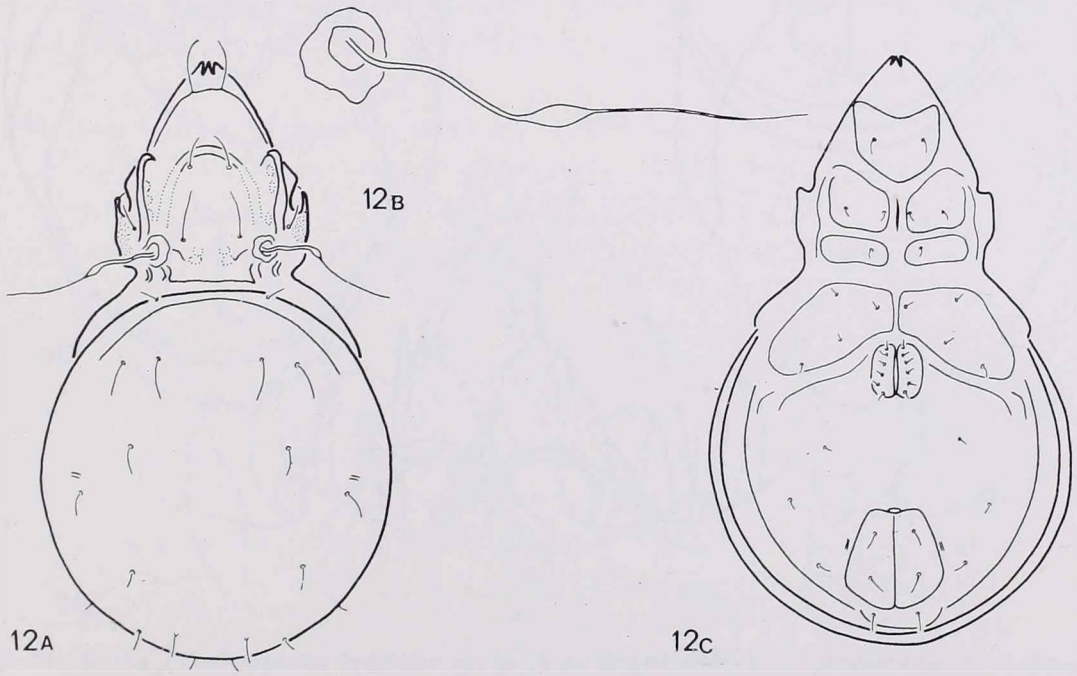

Fig. 12. A—C. *Arcoppia incerta* sp. n. A = dorsal side, B = sensillus, C = ventral side

Notogaster: 10 pairs of short setae. Setae *ta* shorter than the remaining setae.

Ventral side: All setae very short.

Remarks: Sensillus with one branch: *A. corniculifera* (MAHUNKA, 1978) (Mauritius), but there are 2 small corniculi on the head of sensillus; *A. grucheti* (MAHUNKA, 1978) (Réunion), but the arcuate translamellar line is absent and notogaster with short, longitudinal lines; *A. viperea* (AOKI, 1959) (Japan), but rostrum not incised (?); *A. dissimilis* (BERLESE, 1905) (Java), but the notogastral setae much longer.

Material examined: Point Lookout, 5000', via Ebor, N.S.W. 23. IV. 1973. I. NAUMANN, ex *Nothofagus moorei* litter, temperate rainforest; 1 holotype, 2 paratypes.

Parahypozetes lobatus sp. n. (Fig. 13 A—C)

Length: 457—465 μm, breadth: 314 μm.

Prodorsum: Lamellae long, longer than prodorsum, cuspides broadly rounded, interior borders covering each other. Setae *in* short, thin; setae *le* bacilliform, long, basal half covered by cuspis, setae *ro* bacilliform, converging. Sensillus with fusiform, aciculated head.

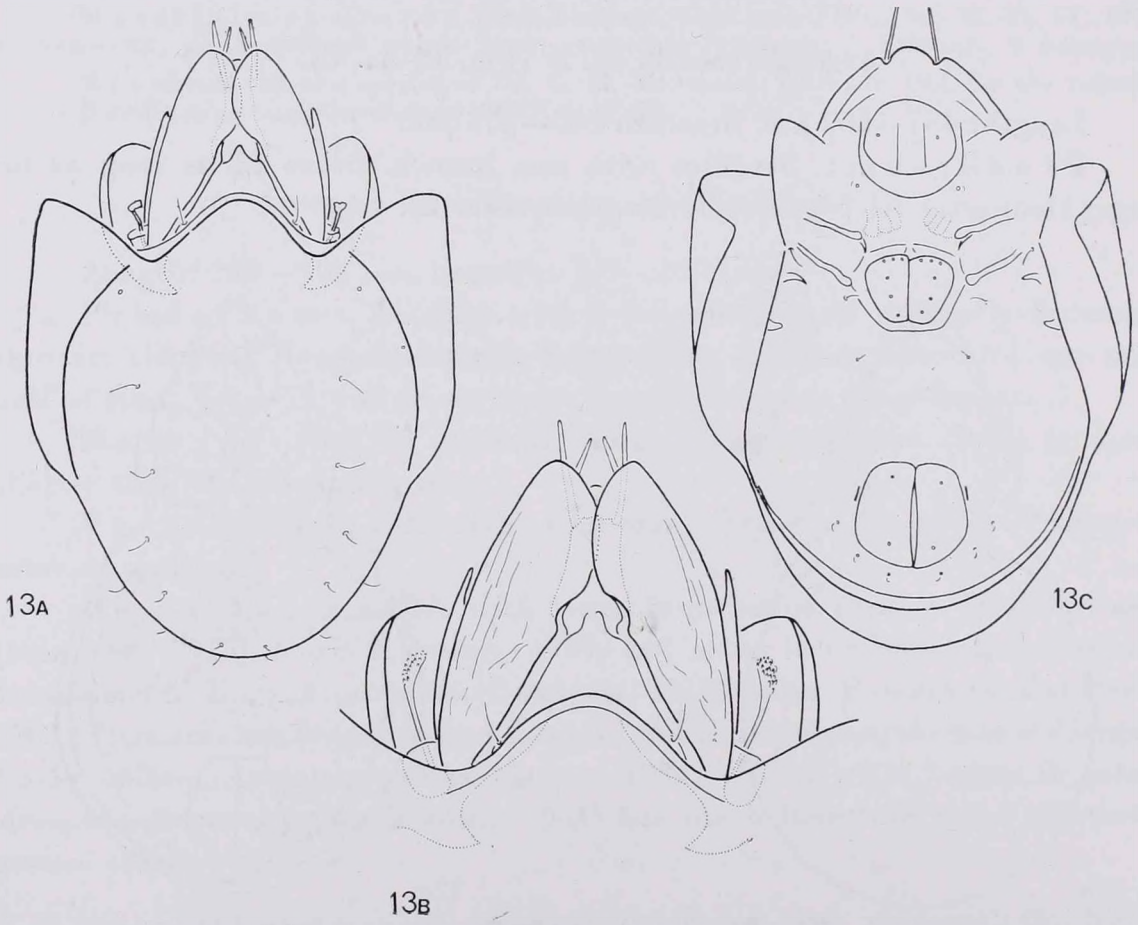

Fig. 13. A—C. *Parahypozetes lobatus* sp. n. A = dorsal side, B = prodorsum, C = ventral side

Notogaster: 10 pairs of thin, short notogastral setae. Pteromorphae with acuminate, downward directed angle. Sacculi not visible.

Ventral side: 6 pairs of genital setae: 3 pairs in transverse, anteromarginal row. 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Legs with 1 claw.

Remarks: There are 8 *Parahypozetes* species, described from New Zealand. None of these has rounded cuspis combinated with short, thin interlamellar setae.

Material examined: Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973. D. G. GROSSMAN, ex leaf litter, subtropical rainforest; 1 holotype, 2 paratypes; Balfour Ra., 1250—1500', via Benarkin, S.E. Qld. 25. II. 1973. I. NAUMANN, ex leaf litter and soil, subtropical rainforest, 9 paratypes.

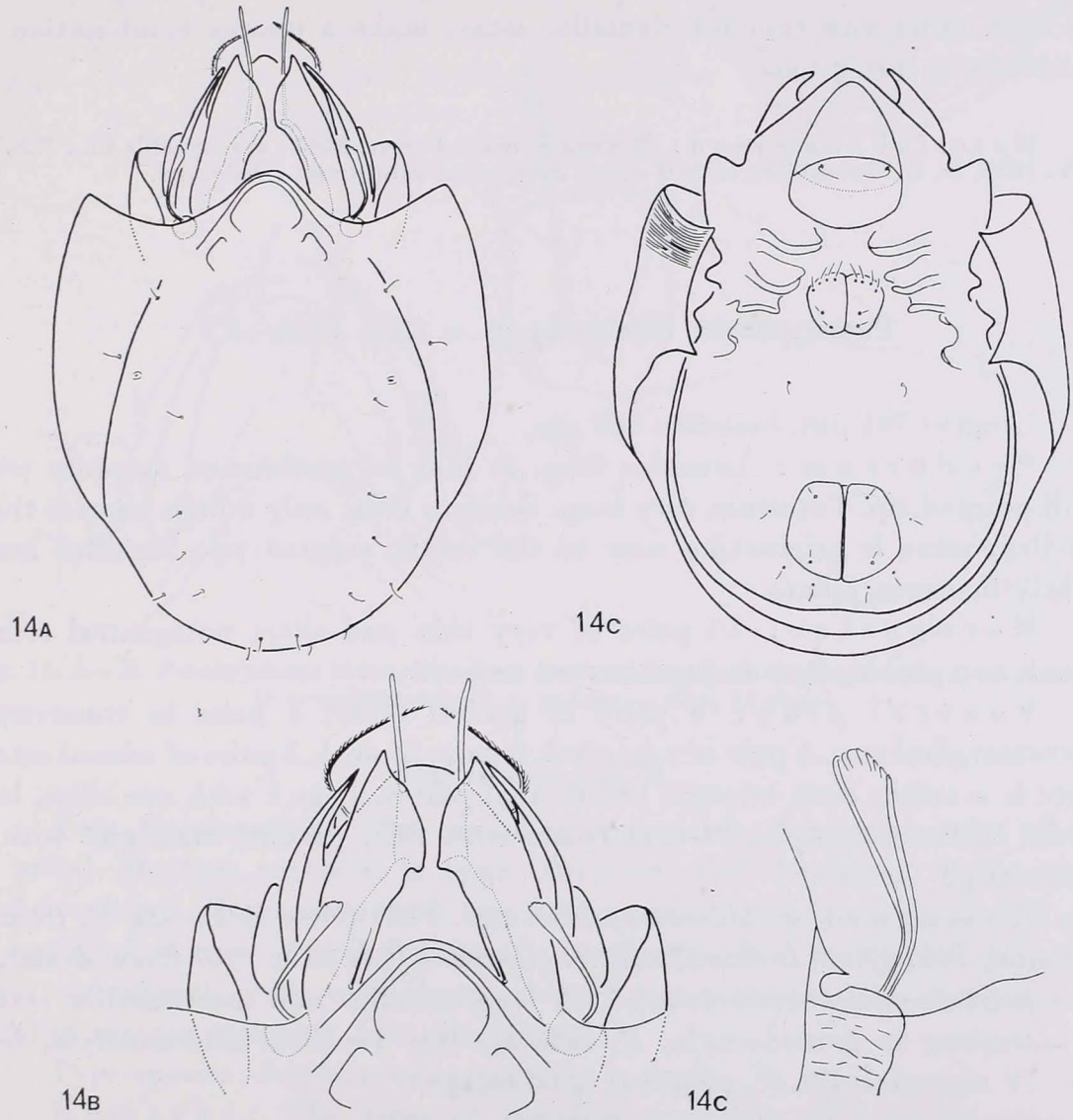

Fig. 14. A—C. *Parahypozetes breviseta* sp. n. A = dorsal side, B = prodorsum, C = sensillus, D = ventral side

Parahypozetes breviseta sp. n. (Fig. 14 A—D)

Length: 551 μm, breadth: 493 μm.

P r o d o r s u m : Lamellae long, longer than prodorsum, cuspides with pointed tip and oblique inner margin. Tutorium extremely long, pointed. Setae *in* thin, short. Setae *le* long, bacilliform, setae *ro* arcuate. Sensillus with gradually dilated head.

N o t o g a s t e r : 10 pairs of thin, short notogastral setae. Sacculi not visible. Dorsosejugal suture very prominently arched.

V e n t r a l s i d e : 6 pairs of genital setae, 4 pairs in transverse, anteromarginal row. 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae; all very short. Legs with 1 claw. Pteromorphae ventrally with 2 tips.

R e m a r k s : Pointed cuspis combined with extremely long tutorium and with short and thin interlamellar setae, make a unique combination of characters in this genus.

M a t e r i a l e x a m i n e d : Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973, D. G. GROSSMAN, ex leaf litter, subtropical rainforest; 1 holotype.

Parahypozetes bidactylus sp. n. (Fig. 15 A—E)

Length: 761 μm, breadth: 482 μm.

P r o d o r s u m : Lamellae long, as long as prodorsum, cuspides with small pointed tip. Tutorium very long. Setae *in* long, only a little shorter than lamellae, setae *le* originating near to the small, pointed tip. Sensillus long, slightly fusiform, ciliate.

N o t o g a s t e r : 10 pairs of very thin and short notogastral setae. Sacculi not visible. Dorsosejugal suture arched.

V e n t r a l s i d e : 6 pairs of genital setae; 3 pairs in transverse, anteromarginal row. 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. There is a small, dark triangle before anal plates. Legs I with one claw, legs II—IV bi-heterodactyle. Pteromorphae with fine, parallel lines and with a pointed tip.

R e m a r k s : *P. bidentatus* HAMMER, 1967 (New Zealand), *P. lobatus* HAMMER, 1967 (New Zealand) and *P. giganteus* HAMMER, 1967 (New Zealand) have pointed cuspis combinated with long sensillus and interlamellar setae. *P. bidentatus* is monodactyle, *P. lobatus*: legs I—II bi-heterodactyle, legs III—IV monodactyle, *P. giganteus* is tridactyle.

M a t e r i a l e x a m i n e d : Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973, D. G. GROSSMAN, ex leaf litter, subtropical rainforest, 1 holotype.

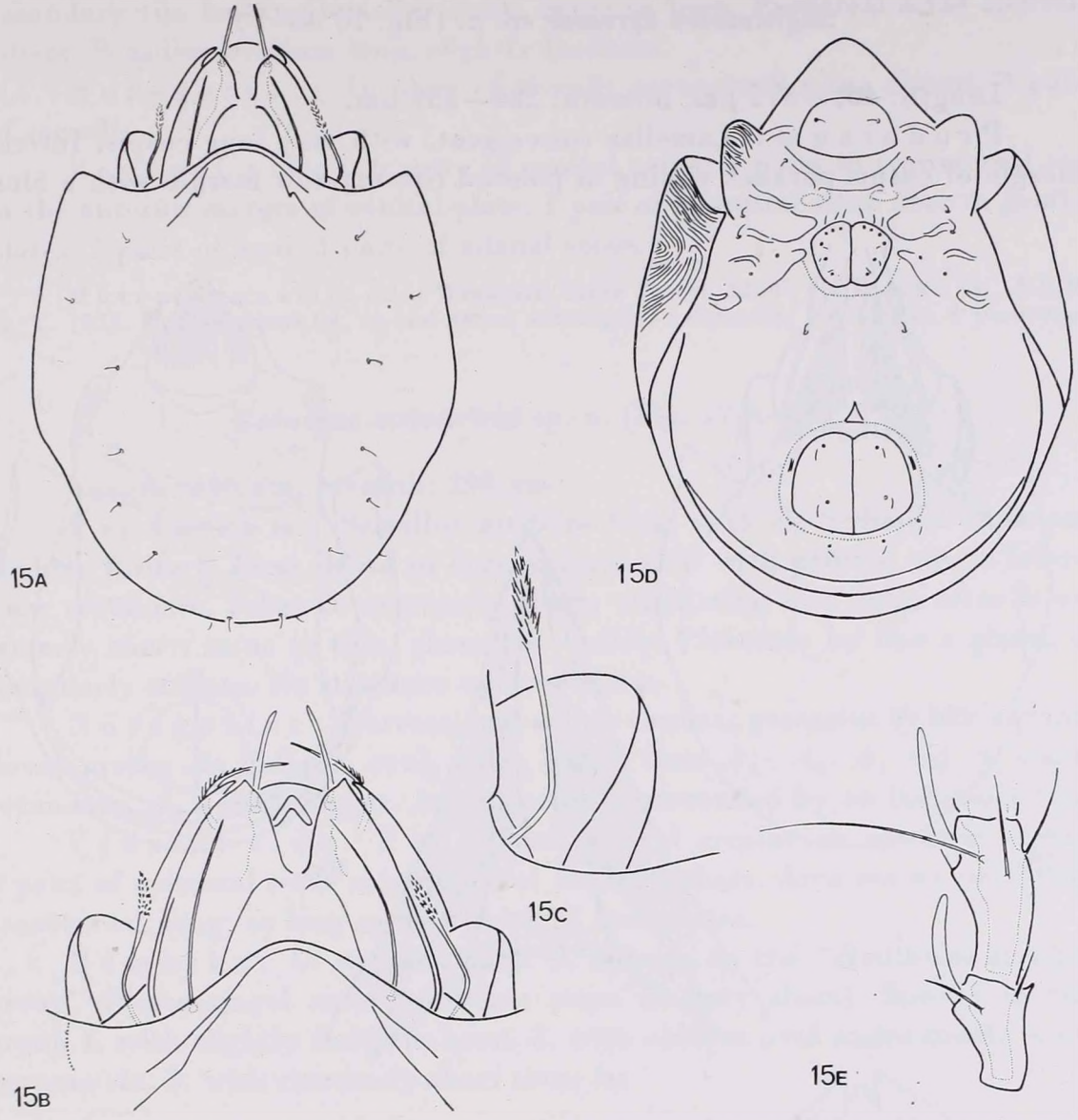

Fig. 15. A—E. *Parahypozetes bidactylus* sp. n. A = dorsal side, B = prodorsum, C = sensillus, D = ventral side, E = patella + tibia II above

Sagittazetes gen. n.

Fam. Ceratozetidae. Pteromorphae immovable. Notogaster with sacculi (3 pairs). Mentum suctorial in type. Tutorium well developed. Pedotecta I well developed. Rostrum incised. Custodium present. 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal setae. Pori *iad* adanal. Lamellae long, convergent, with very sharp, pointed inner cuspis. Lamellar setae on exterior margin of cuspis. Lamellae lineate.

Type-species: *Sagittazetes agressor* sp. n.

Remarks: The form of lamellae resembles that of *Cuspidozetes* HAMMER, 1962 (Patagonia), but the type of mentum, the sacculi, the number of genital setae, etc., are quite different.

Sagittazetes agressor sp. n. (Fig. 16 A—F)

Length: 461—572 μm, breadth: 286—339 μm.

P r o d o r s u m : Lamellae convergent, with very long cuspis. Interior margin of cuspis parallel, ending in pointed tip; exterior margin with a blunt

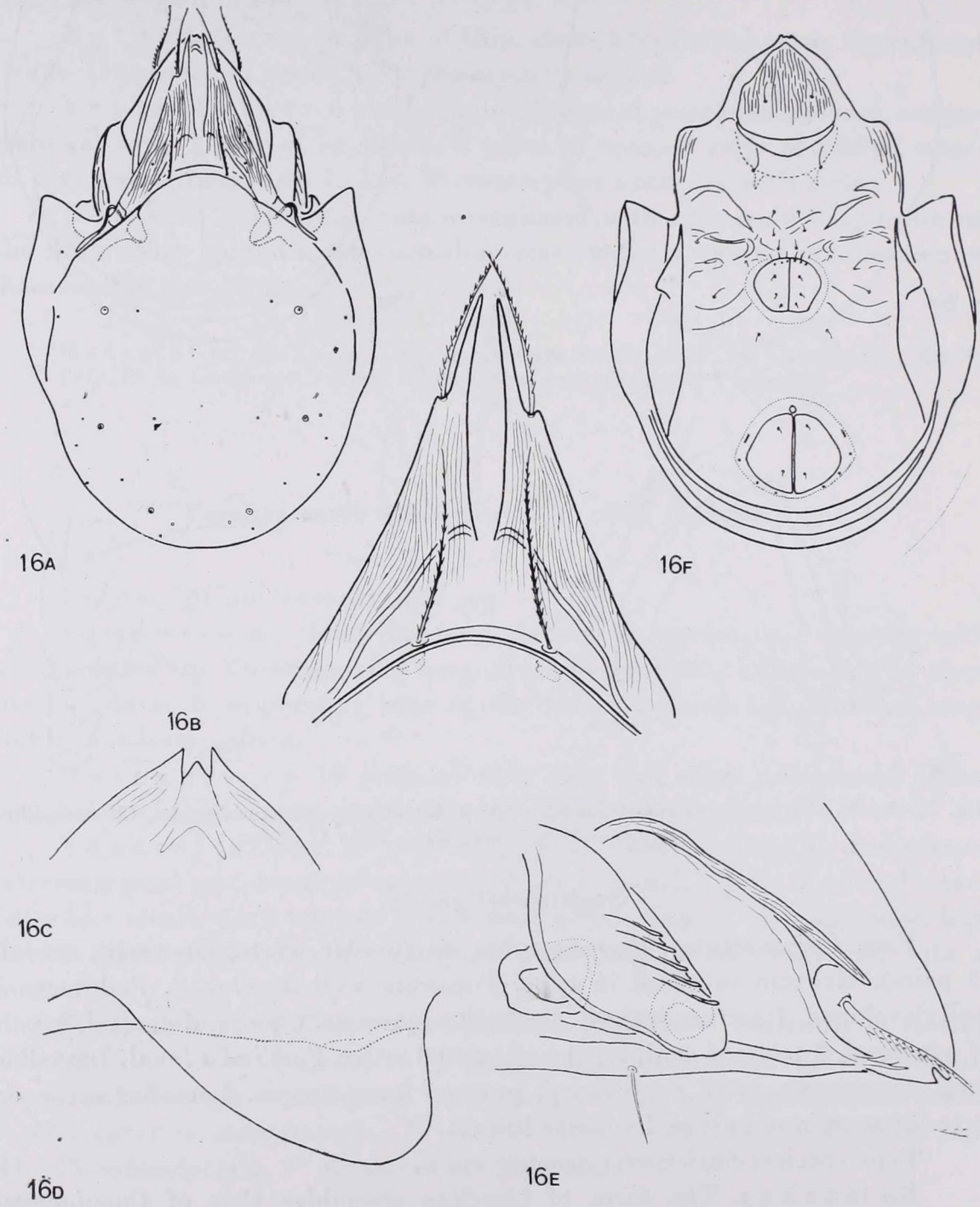

Fig. 16. A—F. *Sagittazetes agressor* gen. n., sp. n. A = dorsal side, B = lamellae, C = rostrum from the front and above, D = pteromorpha, lateral view, E = prodorsum lateral, F = ventral side

secondary tip, bearing lamellar setae. Setae *in* long. Prodorsal setae sparsely ciliate. Sensillus medium long, slightly fusiform.

N o t o g a s t e r : 10 pairs of alveoli; notogastral setae absent. 3 pairs of sacculi.

V e n t r a l s i d e : 6 pairs of genital setae; 3 pairs in transversal row at the anterior margin of genital plate. 1 pair of aggenital setae near to genital plates. 2 pairs of anal, 3 pairs of adanal setae.

M a t e r i a l e x a m i n e d : Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973. D. G. GROSSMAN, ex leaf litter, subtropical rainforest; 1 holotype, 6 paratypes.

Galumna strinovichi sp. n. (Fig. 17 A—E)

Length: 396 μm, breadth: 298 μm.

P r o d o r s u m : Sensillus medium long, with an S-shaped stalk and slightly fusiform head. Head in dorsoventral view with pointed tip, in lateral view rotundate. Setae *in* extremely short, originating in a ring; setae *le* extremely short; setae *ro* thin, short but visible. Processus by like a gland, or irregularly stellate. No structure on prodorsum.

N o t o g a s t e r : Dorsosejugal suture convex; processus *hy* like a gland. Areae prosae *Aa* oblique, oval, twice bigger than A_1—A_3. A_1 and A_2 small, rotundate, A_3 a little bigger. Areae porosae surrounded by an indistinct ring.

V e n t r a l s i d e : 3 or 4 pairs of oval areolae on epimeral region. 2 pairs of epimeral setae existing. Pori *iad* very short. Area porosa postanalis transversal, long: as long as half width of anal plates.

R e m a r k s : *G. strinovichi* sp. n. belongs to the "*dimidiatae-curtipili* group" (dorsosejugal suture present; setae *in* very short). Species in this group 1. with slightly fusiform head, 2. with oblique oval or rotundate areae porosae *Aa*, 3. with extremely short setae *le*:

1. *G. flabellifera* HAMMER, 1958: but dorsosejugal suture straight and sensillus dilated and ciliated,
2. *G. scripta* BALOGH et MAHUNKA, 1966 (Congo): but notogaster with linea sculpture, and sensillus dilated and ciliated;
3. *G. rugosa* HAMMER, 1968 (New Zealand): but prodorsum with linear sculpture and dorsosejugal suture straight;
4. *G. fijiensis* HAMMER, 1973 (Fiji): but setae rostrales absent and sensillus with capitate head;
5. *G. comparabilis* ENGELBRECHT, 1958 (South Africa): but sensillus ciliated and linea *L* not arched at apical part.

M a t e r i a l e x a m i n e d : Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973, O. G. GROSSMAN, ex leaf litter, subtropical rainforest; 1 holotype, 8 paratypes.

We dedicate this new species to Mr. L. STRINOVICH, Atherton, Qld., extensively helping the organization and collecting during our Australian route of expeditions.

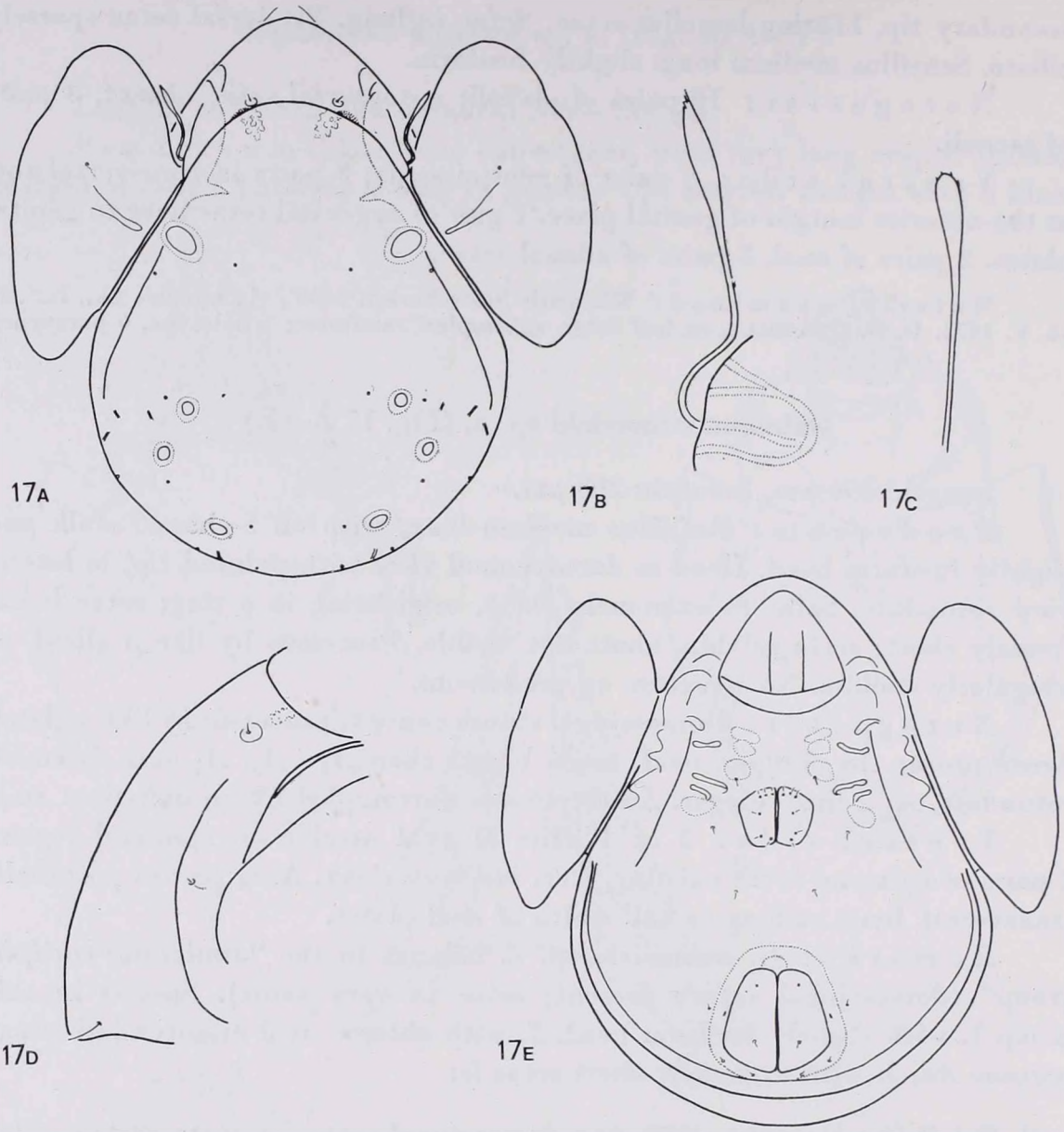

Fig. 17. A—E. *Galumna strinovichi* sp. n. A = dorsal side, B = sensillus, C = sensillus lateral, D = prodorsum lateral, E = ventral side

Galumna szentivanyorum sp. n. (Fig. 18 A—E)

Length: 694 μm, breadth: 506 μm.

P r o d o r s u m : Sensillus setiform, long, directed outwards, finely ciliate. Setae *in* absent, setae *le* extremely short, setae *ro* absent. Areae porosae dorsosejugales oval. Prodorsum with fine and dense longitudinal lines.

N o t o g a s t e r : Processus *hy* like a flame. Areae porosae *Aa* long, transversal, like a lying *L*, area porosae A_1—A_3 large; A_1 rotundate, A_2 long oval, A_3 much longer.

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

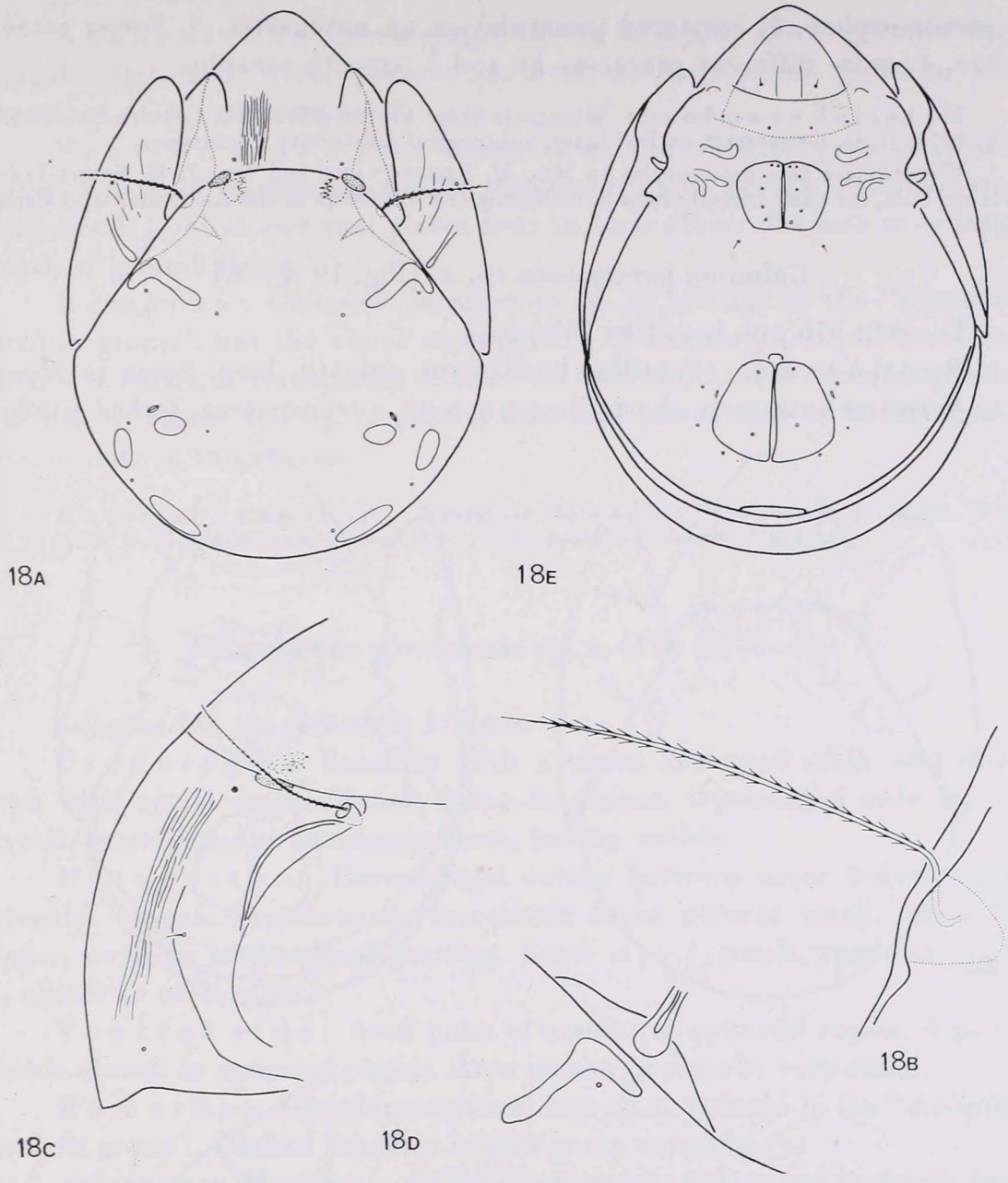

Fig. 18. A—E. *Galumna szentivanyorum* sp. n. A = dorsal side, B = sensillus, C = prodorsum lateral, D = area porosa Aa lateral, E = ventral side

V e n t r a l s i d e : 2 pairs of visible epimeral setae. 2 pairs of anteromarginal genital setae. Genital and anal setae reduced, represented only by their alveoli. Area porosa postanalis transversal, large, as long as half width of anal plates.

R e m a r k s : *G. szentivanyorum* sp. n. belongs to the "*dimidiatae-curtipili* group". Only one species exists in this group 1. with setiform sensillus, 2. with lying *L*-shaped *Aa*, and 3. with fine and dense longitudinal lines-*G. mariae* Balogh, 1961 (East Africa), but this species has 1. linear structure

on pteromorphae, 2. scattered punctulation on notogaster, 3. longer setae *le* and *ro*, 4. quite different processus *hy* and 5. smooth sensillus.

Material examined: Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973, D. G. GROSSMAN, ex leaf litter, subtropical rainforest; 1 holotype.

We dedicate this new species to Mrs. M. SZENT-IVÁNY and DR. J. H. SZENT-IVÁNY, Adelaide, S.A., for their friendly help in collecting the soil fauna in the Australian and Papuan Region.

Galumna parviporosa sp. n. (Fig. 19 A—E)

Length: 376 μm, breadth: 257 μm.

Prodorsum: Sensillus bacilliform, smooth, long. Setae *in* absent, setae *le* and *ro* extremely short. Rostrum with a transparent, forked window.

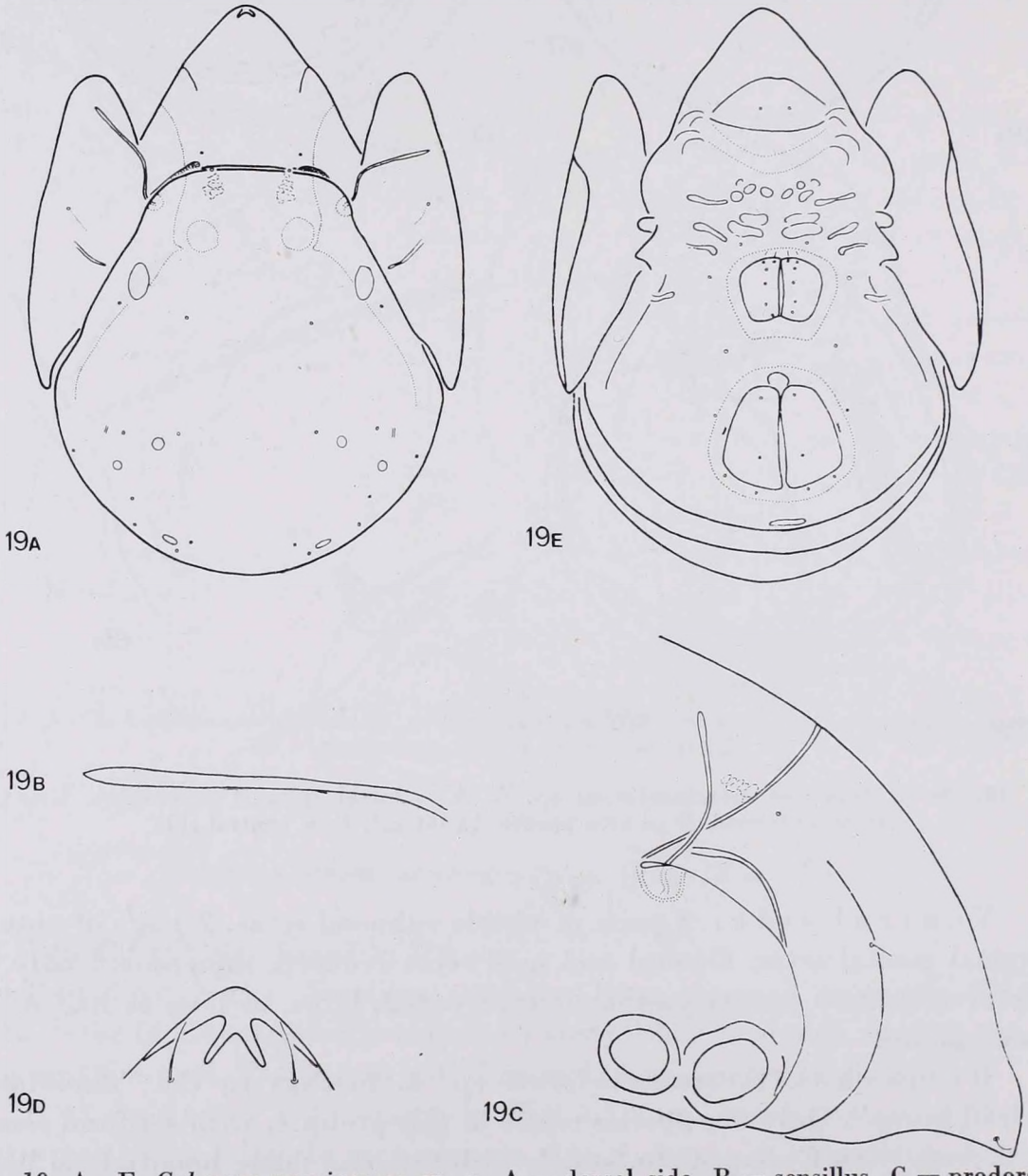

Fig. 19. A—E. *Galumna parviporosa* sp. n. A = dorsal side, B = sensillus, C = prodorsum lateral, D = rostrum from the front and above, E = ventral side

N o t o g a s t e r : Dorsosejugal suture straight. Areae porosae dorsosejugales flattened. Areae porosae *Aa* oval, in longitudinal position. Areae porosae A_1—A_3 small, rounded.

V e n t r a l s i d e : Each 4 areolae in the anterior part of epimeral region, 2 pairs of transversal areolae backwards. Area porosa postanalis small, transversal. Genital and anal plates near to each other: distance is as long as length of genital plates.

R e m a r k s : *Galumna parviporosa* sp. n. belongs to the "*dimidiatae-curtipili* group", but the above combination of characters, i.e. 1. bacilliform, smooth sensillus, 2. transparent window on rostrum, 3. oval *Aa* in longitudinal position, 4. small A_1—A_3, 5. genital and anal plates near to each other are present only in this species.

M a t e r i a l e x a m i n e d : Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973, D. G. GROSSMAN, ex leaf litter, subtropical rainforest; 1 holotype.

Allogalumna plowmanae sp. n. (Fig. 20 A—D)

Length: 261 μm, breadth: 171 μm.

P r o d o r s u m : Sensillus with a short, S-shaped stalk and dilated head with apical denticulation. Setae *in* absent, represented only by their alveoli, setae *le* and *ro* extremely short, hardly visible.

N o t o g a s t e r : Dorsosejugal suture between areae porosae dorsosejugales absent. Processus *hy* amoeboid. Areae porosae small. *Aa* a little bigger, oval, in longitudinal position. Setae A_1—A_3 small, rounded, A_1 and A_2 nearer to each other.

V e n t r a l s i d e : 4—5 pairs of areolae in epimeral region. 4 pairs of visible alveoli in epimeral region. Area porosa postanalis very small.

R e m a r k s : *Allogalumna plowmanae* sp. n. belongs to the "*dimidiatae-curtipili* group". Dialted sensillus in this group exists in

1. *A. microporosa* MAHUNKA, 1979 (Guatemala), but it has a much longer sensillus and extremely small areae porosae,
2. *A. upoluensis* HAMMER, 1973 (Samoa), but it has rounded, capitate head on sensillus and very big *Aa*,
3. *A. borhidii* BALOGH et MAHUNKA, 1979 (Cuba), but it has well-visible setae *le* and *ro*,
4. *A. multesima* GRANDJEAN, 1957 (Antillas), but it has much longer sensillus stalk, larger area porosa postanalis, visible setae *in*.

M a t e r i a l e x a m i n e d : Wiangarie State Forest, 2400', via Lynch's Ck., N.S.W. 14. V. 1973. D. G. GROSSMAN, ex leaf litter, subtropical rainforest, 1 holotype, 1 paratype.

We dedicate the new species to Miss C. PLOWMAN, Brisbane, Qld., investigator of the Queensland soil fauna.

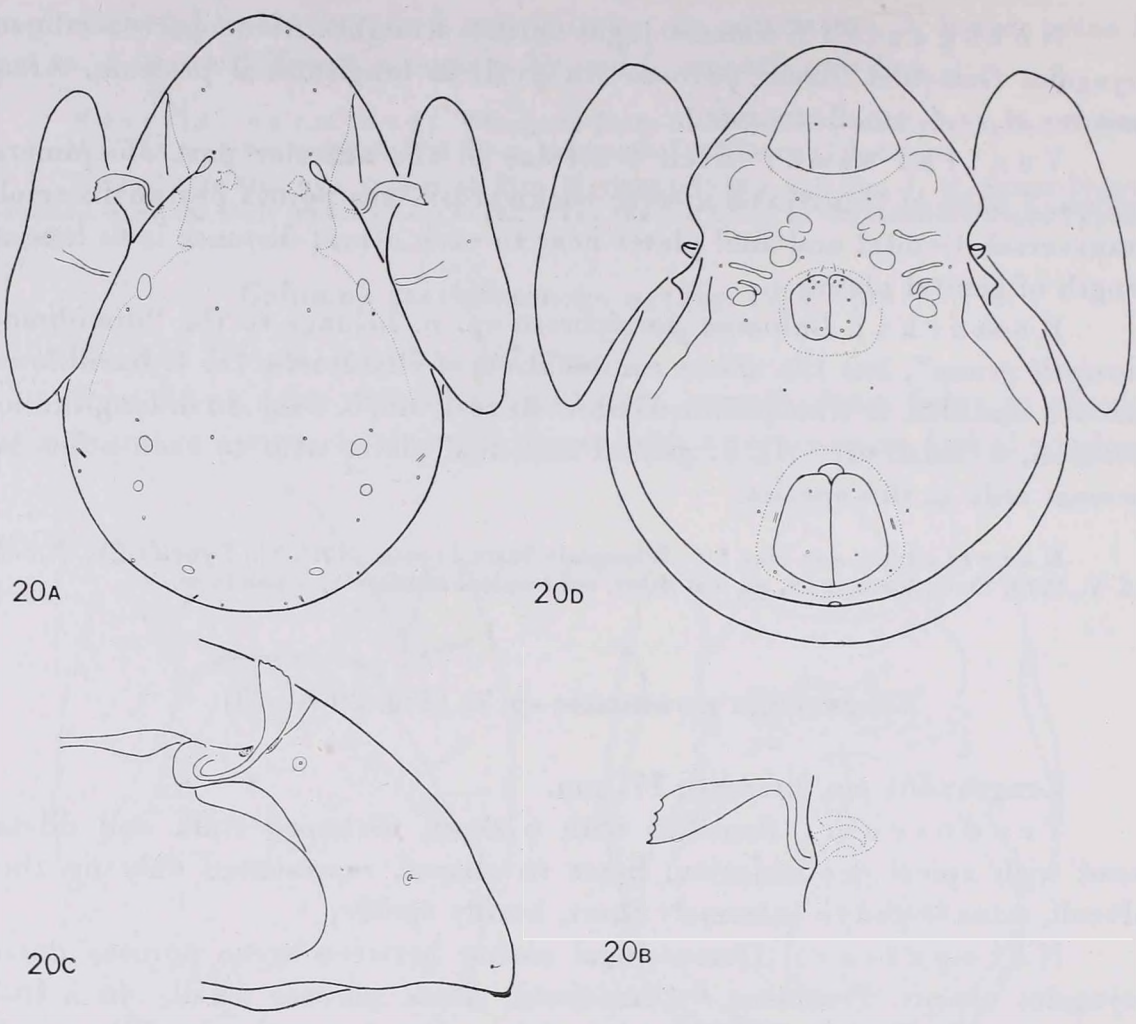

Fig. 20. A—D. *Allogalumna plowmanae* sp. n. A = dorsal side, B = sensillus, C = prodorsum lateral, D = ventral side

Allogalumna dilatata sp. n. (Fig. 21 A—D)

Length: 290 μm, breadth: 212 μm.

P r o d o r s u m : Sensillus with an S-shaped stalk and dilated head: the broadest part of sensillus nearly its apex. Setae *in* and *le* absent, represented only by their alveoli. Setae *ro* short, but discernible.

N o t o g a s t e r : Dorsosejugal suture between areae porosae dorsosejugales absent. Processus *hy* on the same level than areae porosae dorsosejugales; small, rounded. Areae porosae *Aa*, A_1—A_3 round, *Aa* the largest, A_1 smaller, A_2 and A_3 small, surrounded by a ring.

V e n t r a l s i d e : Each 3—4 areolae in two groups on the epimeral region. Genital and anal plates surrounded by an indistinct frame. Area porosa postanalis transversal, ribbon-like.

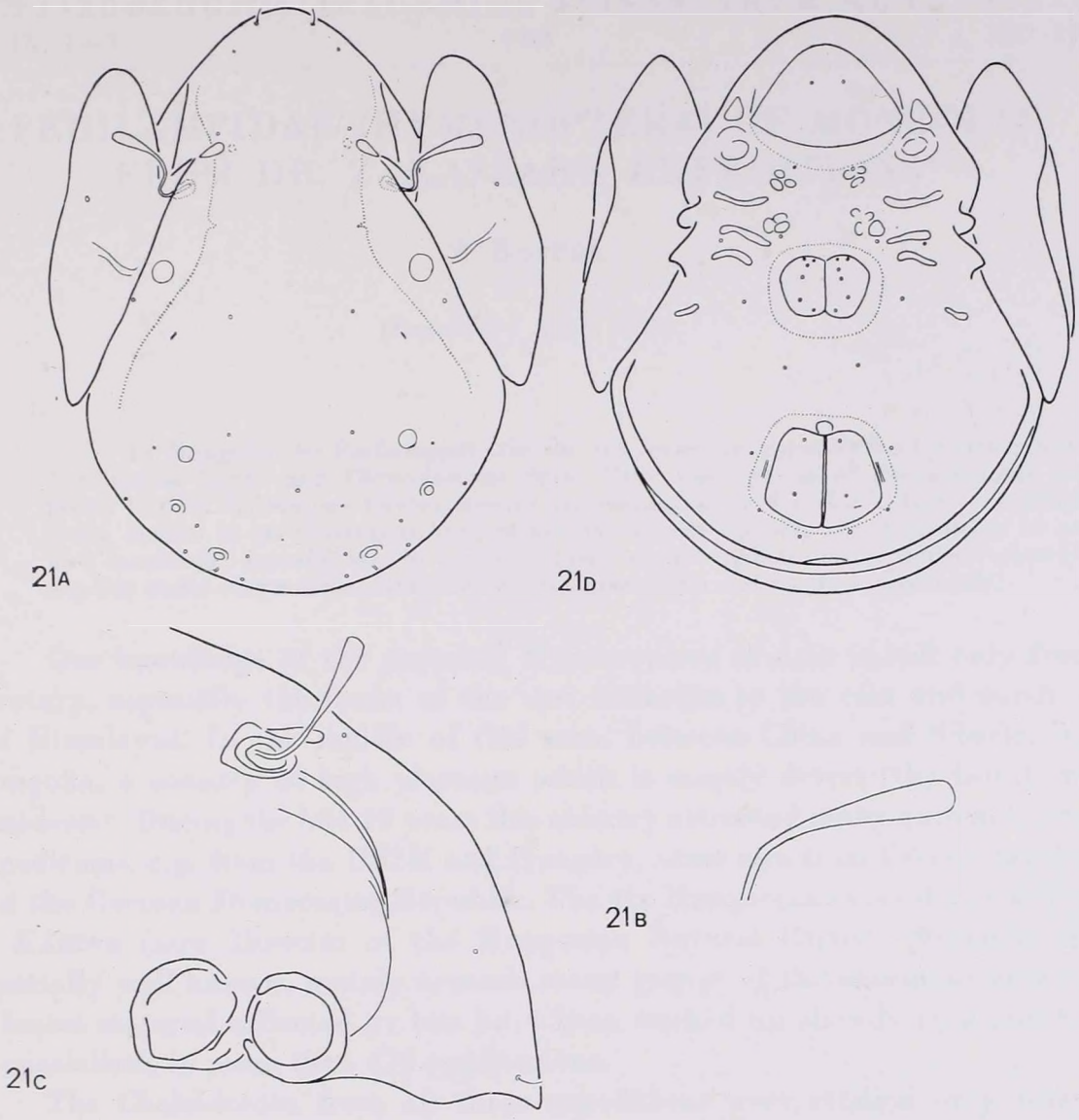

Fig. 21. A—D. *Allogalumna dilatata* sp. n. A = dorsal side, B = sensillus, C = prodorsum lateral

Remarks: *Allogalumna dilatata* sp. n. is a unique species in the "*dimidiatae-curtipili* group" by having gradually dilated sensillus-head to the apex.

Material examined: Yabbra State Forest, 1600', via Urbenville, N.S.W. 1. IV. 1973. I. NAUMANN, ex leaf litter and soil, subtropical rainforest; 1 holotype.

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PERILAMPIDAE (HYMENOPTERA) OF MONGOLIA, FROM DR. Z. KASZAB'S EXPEDITIONS*

Z. Bouček

(Received 1 April, 1982)

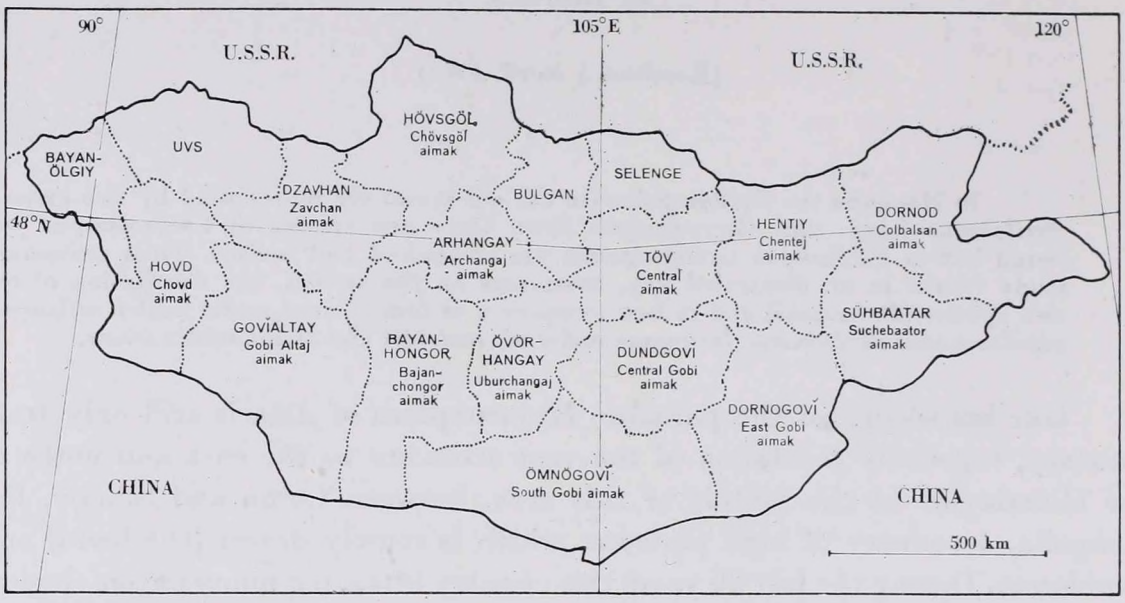
In Mongolia the Perilampidae (in the old sense) are represented by two genera: *Perilampus* Latr. and *Chrysolampus* Spin. Only one species of *Chrysolampus* was found but in *Perilampus* twelve species are recognised and revised. Their taxonomic study results in an illustrated key, comments on the species, the description of one new species (*P. kaszabi*) and in new synonymy of four names: *scaber* under *ruficornis*, *nigellus* under *chrysonotus*, *lacunosus* under *aureoviridis* and *orcula* under *tristis*.

Our knowledge of the parasitic Hymenoptera of Asia is still only fragmentary, especially the fauna of the vast stretches to the east and north of the Himalayas. In the middle of this area, between China and Siberia, lies Mongolia, a country of high plateaux which is mostly desert (the Gobi) and semidesert. During the last 20 years this country attracted many entomological expeditions, e.g. from the USSR and Hungary, some also from Czechoslovakia and the German Democratic Republik. The six Hungarian expeditions of Dr. Z. Kaszab (now Director of the Hungarian Natural History Museum) are especially well known, mainly because many groups of the enormous amount of insect material collected by him have been worked up already by a number of specialists, in more then 470 publications.

The Chalcidoidea from all these expeditions were studied only where the specialists were available and so the published results cover only few groups, mainly the Encyrtidae, Eurytomidae, some Torymidae, Tetracampidae, Eulophidae and Pteromalidae (partly in the Russian serial Insects of Mongolia, vols 1—7, 1972—1980). These studies are interesting for several reasons. Because of the geographical position of Mongolia the improved knowledge of the fauna brings also better understanding of more general aspects of insect distribution, especially in relation to the better known fauna of Europe and to some extent also that of the Oriental region. Having studied the European chalcids for about 40 years and most recently also some groups of the Indian chalcids I find the comparison of these faunas with the Mongolian fauna very useful, especially because still relatively little is known about China.

* Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei. Nr. 472.

I experienced difficulty in finding maps detailed enough to locate the places in which the material was collected. Another difficulty arose from different transliterations of Mongolian local names (and their changes). Therefore I am including a map indicating at least the present administrative districts (aimaks) of Mongolia, with both the current English transliteration of their names (as e.g. in the most recent edition of the Times Atlas) and the



Map of Mongolia with borders of the administrative districts (aimaks). The present English transliteration of the names given in CAPITALS and below the transliteration as used on the labels of the material

spelling used by Dr. Kaszab. In the text the local names are spelt the same way as on the labels of the material, except that the German words are translated into English. The numbers in brackets refer to the descriptions of the localities by Kaszab (1963—1968).

My present first contribution to the investigation of the Mongolian chalcids deals with Perilampidae, in the sense as the family had been generally understood until recently, mainly because the more recent changes in higher classification are not yet stabilised. Namely, the two genera involved, *Perilampus* and *Chrysolampus* might be placed in Perilampidae and Pteromalidae, respectively, or both in Pteromalidae. A generic key to Perilampinae was published by Bouček in 1978, to Chrysolampinae in 1972.

Genus **Perilampus** Latreille

During the study I had to re-examine the European species and actually revise the Mongolian ones, with a key, although they cannot be regarded as unknown. Nikolskaya (1952) mentioned among her 24 species (of the USSR)

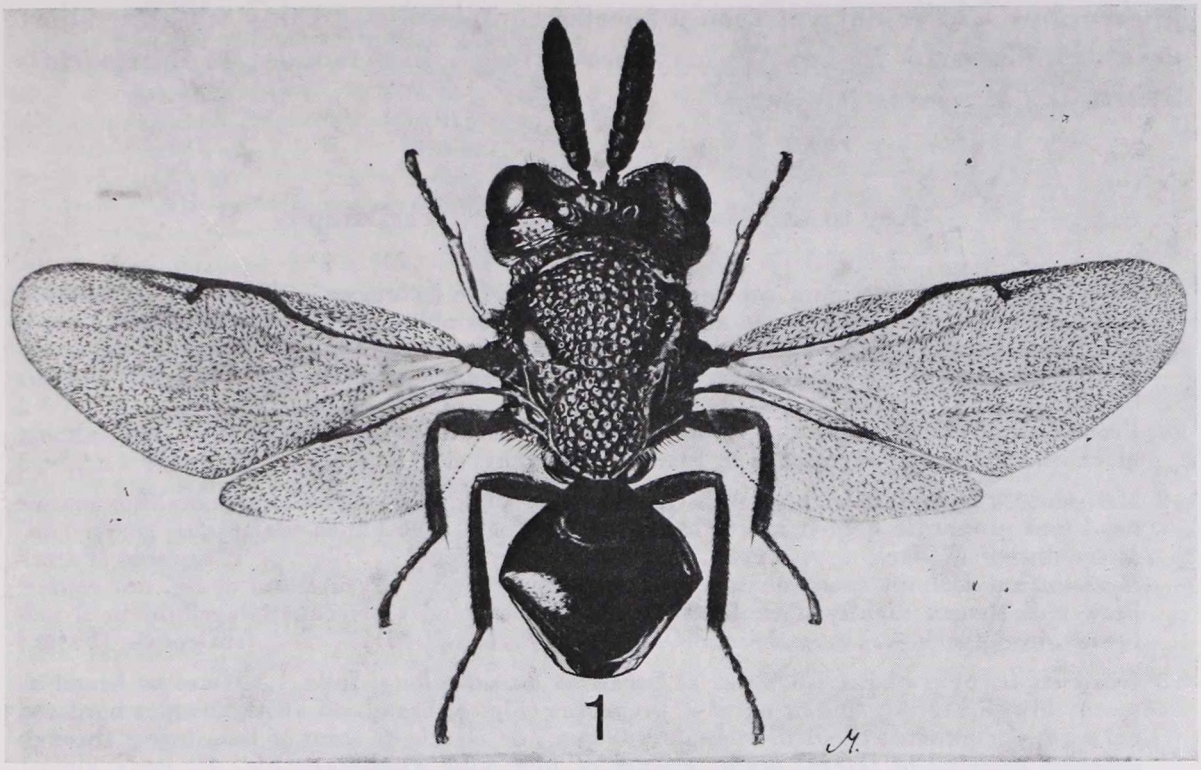


Fig. 1. *Perilampus ruficornis* (FABR.), ♂, a photograph of a drawing by J. MEDUNA

seven from Mongolia: *Perilampus nola* NIK., *nigellus* NIK., *noemi* NIK., *nitens* WALK., *lacunosus* NIK., *orcula* NIK. and *laevifrons* DALM. Two other of her species, *P. prasinus* and *P. scaber* came from North China; yet another two, *P. tristis* MAYR and *P. ruficornis* (F.) (as *violaceus*) were stated to occur both in Europe and in the Far East (= Maritime or Ussuri) Province of the USSR, and a further four species were found in Central Asia: *P. umbo* NIK., *aeneus* (ROSSI) (as *italicus*), *kim* NIK. and *eximius* MASI. I was able to clarify the status of most of these species in personal contact with the late DR. NIKOLSKAYA. Soon after the publication of my key to the Czechoslovak species (BOUČEK, 1956), in which I suggested some possible synonymy, she wrote to me that *nigellus* NIK. was the same as *chrysonotus* FÖRST. and *scaber* NIK. the same as *ruficornis* (F.), but that *pupulus* NIK. was different from *intermedius* BČK. In 1968 I saw her type material in Leningrad and made notes which became useful for this paper. Now all her seven Mongolian species have been recognised in the present material, but three change names. From the species known from the adjacent or remote countries a further four species are included and also one described here as new. Otherwise I included in the key only *P. ruficornis* (F.). Two other, possibly also Mongolian species, viz. *P. prasinus* NIK. and *P. kim* NIK., remain unknown to me. According to my notes *P. prasinus*, described from "North China", should belong to the species with large prepectus (as in Fig. 2) that is bordered also anteriorly by a punctate

groove, but I have not yet seen a species completely agreeing with the short description. As to *P. kim*, it may prove to be just females of *aureoviridis* STEPH. (= *lacunosus* NIK.).

Key to the Mongolian species of Perilampus

1 Frons on either side with a conspicuous swollen ridge (stronger in ♂ than in ♀) running from narrow space between median and lateral ocellus obliquely towards lower eye margin (Fig. 14), body of conspicuous metallic colours; prepectus broad but without punctate groove along anterior margin; scutellum with polygonal puncturation, virtually without interspaces 2

— Frons without such ridges or, if these slightly indicated (*tristis* MAYR) then body almost black and prepectus narrow (as in Fig. 12); different 3

2 Mesoscutum in middle with smooth transverse tubercle: puncturation of scutellum coarse, head and pronotum golden red to cupreous, rest of thorax bluish violaceous, gaster cupreous, antennae black ..... 1. **auratus** (PANZ.)

— Mesoscutum without such tubercle (Fig. 1); puncturation of scutellum dense, not coarse, head and thorax mainly dark bluish green, gaster blue violaceous; flagellum in ♀ yellowish, in ♂ black ..... 2. **ruficornis** (FABR.)

3 Head stout, only about 1.8 times as broad as dorsally long, fully 1.2 times as broad as mesoscutum (Fig. 3); thorax narrow, prepectus (Fig. 2) broad, on all three sides bordered by a row of puncta; ocelli in triangle, median one clearly in front of line drawn through anterior margins of lateral ocelli; stigma of fore wing knob-like (Fig. 4); body almost black, 2.8—3.5 mm ..... 3. **cephalotes** BČK.

— Head not so stout, at least about twice as broad as long, usually less than 1.2 times as broad as mesoscutum; body mostly with distinct metallic gloss and other characters also partly different 4

4 Prepectus relatively large (Figs 5, 8), its anterior side usually bordered by a groove (sometimes punctate), its smooth central triangle broad; interstices on thorax always distinct and shiny 5

— Prepectus different from alternate, mostly much smaller (Figs 9, 11, 12), but if of medium size then interstices on thorax very narrow 6

5 Size 3—5 mm; breadth of face between eyes 1.5—1.6 times the length (maximum diameter) of one eye; malar groove long (Fig. 7); thorax dorsally bluish to green, rarely bright green, interstices at most about a third the breadth of puncta; lower margin of clypeus broadly emarginate (Fig. 6); antennae black, in ♂ flagellum unusually thickened ..... 4. **nitens** WALK.

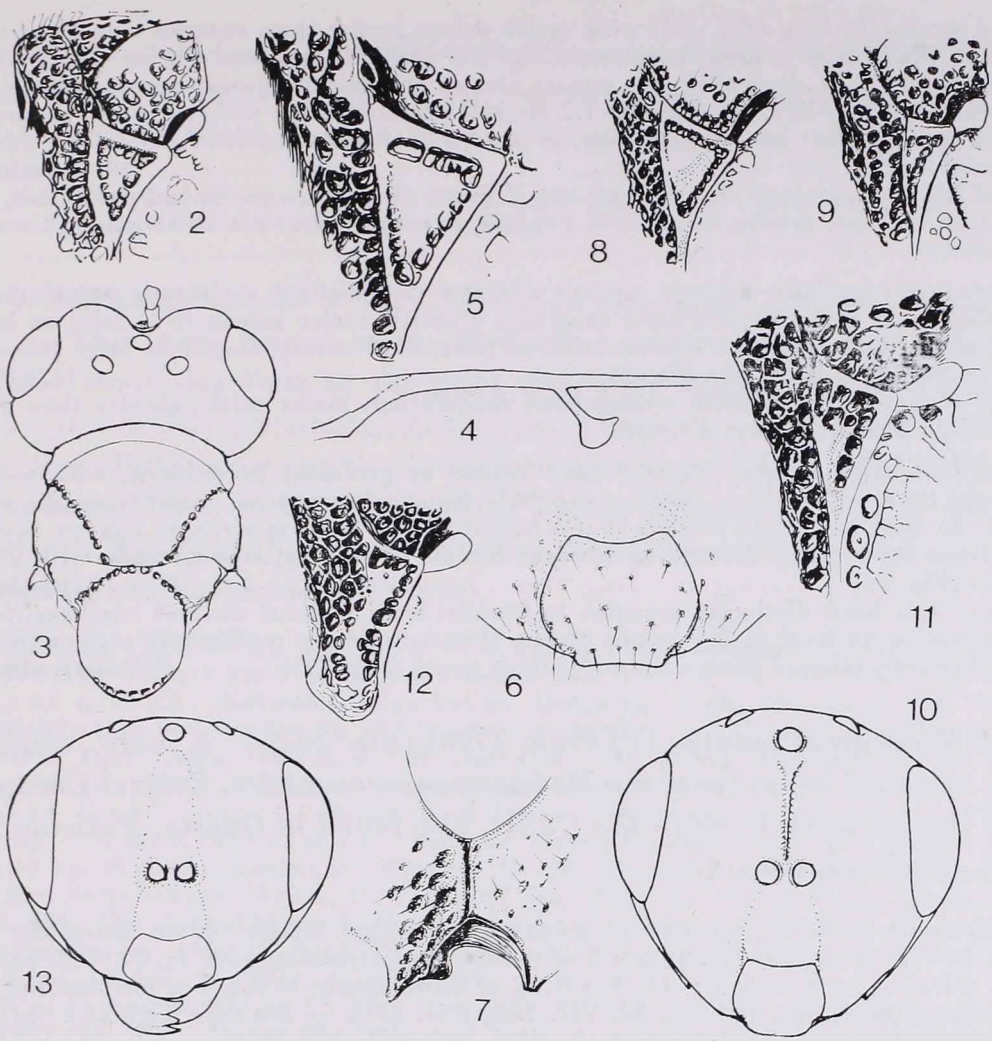
— Size less then 2.8 mm; breadth of face about 1.3 times the length of eye, malar groove short (Fig. 24); dorsum of thorax golden green to cupreous, shiny interstices generally at least half as broad as puncta; clypeal margin truncate; ♀ flagellum mainly yellow, in ♂ black but not very stout ..... 5. **umbo** NIK.

6 Prepectus even in its lower part distinctly separated from the punctate side of pronotum, either by a raised smooth strip or smooth edge-like ridge (Figs 9, 11) 7

— Prepectus with the punctate row or groove along its posterior margin deepening downwards and continuing across the indistinct pronotal border towards ventral end of pronotal panel (Fig. 12); lower margin of clypeus always produced, arcuate (Figs 13, 22) (*tristis*-group) 10

7 Head in facial view relatively long, less than 1.15 times as broad as high (Fig. 10), with rather long malar groove (Fig. 19); prepectus very narrow and extended ventrad (Fig. 9); lower margin of clypeus produced, breadth of clypeus less than its distance from eye, supraclypeal area higher than broad (Fig. 10); thorax with sparse puncturation, smooth interspaces usually more than half as broad as puncta; dorsal punctate thorax elongate at least 1.2 times as long as broad ..... 6. **chrysonotus** FÖRST.

— Head much more transverse, malar groove distinctly shorter than in alternate, clypeus broader, often otherwise; prepectus not so elongate, interstices on thorax much narrower 8



Figs 2—13. Mongolian *Perilampus*. 2—4. *P. cephalotes* Bčk. 2 = anterior side of thorax with prepectus; 3 = head and thorax dorsally (♀); 4 = venation of fore wing. — 5—7. *P. nitens* Walk. 5 = prepectus region; 6 = clypeus region; 7 = malar (subocular) area with peristomal cavity. — 8. *P. umbo* Nik., prepectus region. — 9—10. *P. chrysonotus* Först., prepectus region, and head in facial view. — 11. *P. noemi* Nik., prepectus region. — 12. *P. tristis* Mayr, side of pronotum fused with prepectus. — 13. *P. intermedius* Bčk., ♀, head in facial view

8 Lower margin of clypeus arcuately produced (Fig. 15), lower face in ♀ even at the short malar groove without any coarse punctures (with few in ♂, usually); prepectus small, its central impunctate area strongly reduced (Fig. 11); head in dorsal view fully 2.2—2.3 times as broad as dorsally long, in facial view genae strongly converging; in ♂ scape hardly broadened in apical third and only there minutely punctulate ..... 7. **noemi** Nik.

— Clypeal margin truncate or emarginate; lower face on sides with puncta and rugosity, prepectus not large but always with distinct smooth and convex central part; head dorsally less strongly transverse; in ♂ scape triangularly expanding, its ventral surface swollen and punctulate except in basal third (Figs 16, 17) 9

9 In both sexes clypeal margin truncate (Fig. 18) and supraclypeal area only slightly transverse, its sides subparallel though only in lower part more clearly delimited, even in ♂ without unusual facial cavities; hind margin of first tergite only very shallowly emarginate ..... 8. **laevifrons** Dalm.

— Clypeal margin broadly emarginate, in ♂ face on either side of supraclypeal area with large suboval cavity (Fig. 16); in ♀ no such cavities, supraclypeal area much more transverse than in alternate, yet poorly defined, as if its side depressions were arching outwards at clypeus, hind margin of first tergite fairly deeply emarginate ..... 9. **aureoviridis** Steph.

10 Head unusually long (Fig. 22), with malar sulcus longer than anterior side of peristomal cavity; whole face unusually convex (Fig. 23) and rather densely hairy (hairs very long in ♂, shorter in ♀), deep piliferous puncta also on clypeus and down to malar sulcus, supraclypeal area boss-like; head about 1.2 times as broad as the rather narrow thorax; in ♂ flagellum and most of legs yellowish, in ♀ partly infuscate; apex of gaster in ♀ unusually acuminate (Fig. 20) ..... 10. **kaszabi** sp. n.
— Head less elongate and less convex and if pilose then hairs on central parts thin, rather short and sparse, arising from small punctures; malar sulcus rather short, ♀ gaster never acuminate 11

11 Lower face especially between clypeus and eye with distinct coriaceous reticulation contrasting with shiny supraclypeal area and clypeus; malar sulcus in ♀ fully as long as, in ♂ slightly shorter than anterior side of peristomal cavity, flagellum in ♂ yellow, in ♀ partly infuscate; body metallic green ..... 11. **nola** Nik.
— Sides of face shiny, without conspicuous reticulation, malar sulcus shorter than anterior side of peristomal cavity; different 12

12 Thorax blackish to very slightly dark bronze or greenish; head black, with weak but distinct rounded swellings running obliquely from between ocelli towards middle of inner orbit, so that in a cross-section at 2/3 height of eye frons is strongly convex near orbit but from there flatly descending towards middle of scrobes; stigmal knob with angulate uncus (Fig. 26) ..... 12. **tristis** Mayr
— Thorax and head distinctly greenish to bronze; head without distinct swellings, frons in cross-section at level of 2/3 height of eye almost regularly moderately convex in middle of either side, stigmal knob without distinct uncus (Fig. 27) ..... 13. **intermedius** Bčk.

1. **Perilampus auratus** (Panzer, 1798) (Fig. 14). — A very distinctive species recorded so far from the Mediterranean countries, Central Europe and east to the southern Urals in the USSR, also found in Quetta, Pakistan (new record). Host unknown.

Mongolia (5 ♀ 1 ♂). Central aimak: Kerulen, Njalga Somon, Burgastin Chosu, 1200 m, 3. VII. 1963 (No. 77); 16 km S of Somon Öndörschireet, 1500 m, 24. VII. 1966 (No. 739). — Chentej aimak: 150 km ENE of Öndörchaan, 10 km S of Kerulen and 10 km N of Somon Tumuncogt, 1000 m, 30. VII. 1965 (No. 331). — Suchebaator aimak: 44 km SSW of Naruun Urt, 1050 m, 2—3. VIII. 1965 (No. 349, 353).

2. **Perilampus ruficornis** (Fabricius, 1793) (= *P. scaber* Nikolskaya, 1952) **syn. n.** (Fig. 1). — Widely distributed from Britain to the southern Ural and to Transcaucasia and recorded by Nikolskaya (1952) from the Maritime Province (Ussuri) of the USSR and (as *scaber*) from North China, but not yet known from Mongolia. Parasite of tachinid flies in various Lepidoptera.

3. **Perilampus cephalotes** Bouček, 1956 (Figs 2—4). — Originally described from Czechoslovakia but apparently widely distributed in various Mediterranean countries where it was reared from *Raphidia* sp. (Neuropteroidea), as a hyperparasite via *Nemeritis* sp., Ichneumonidae.

With the discovery of *P. cephalotes* in the Mongolian material a question arose whether it was not identical with some eastern species of Nikolskaya (1952). She did not know the importance of the shape of the prepectus but did mention some other important characters, including the distinct stigmal uncus in the fore wing of certain species. However, relying on my notes, I find that only *P. prasinus* Nik. has a similar large prepectus, but in that

species the stigmal knob is rounded, the clypeus is longer than broad and the punctation of the thorax is rather shallow and coarse. She compared *prasinus* with *chrysonotus* which has a very narrow prepectus and much longer head.

Mongolia (2 ♀). Chovd aimak: Mongol Altaj Mts., Uljasutajn Gol, 45 km NNE of Somon Bulgan, 1400 m, 6. VII. 1966 (No. 637).

4. **Perilampus nitens** WALKER, 1834 (= *P. selectus* WALKER, 1874) (Figs 5—7). — This is the largest of the Mongolian species, up to 5 mm long, with unusually stout flagellum in the male and with relatively long malar space (Fig. 7). It is widely distributed in the more temperate zone of the Palaearctic region, from Britain apparently throughout Europe and West Siberia, Mongolia (NIKOLSKAYA, 1952) to the Khabarovsk region in the Far East of the USSR (Amurland; WALKER, 1874, as *P. selectus*). A hyperparasite in pupae of various Lepidoptera via Tachinidae (Diptera).

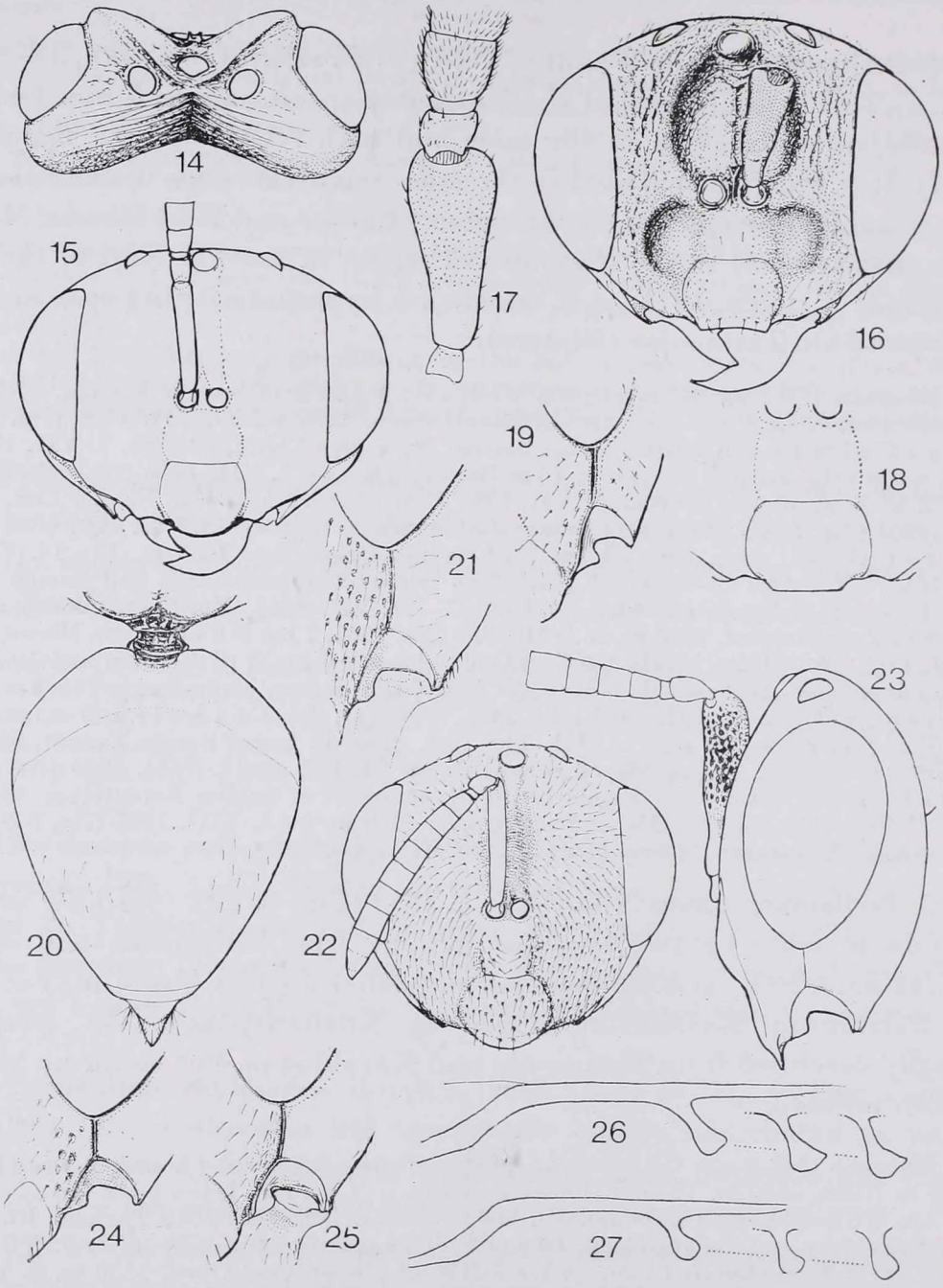
Mongolia (78 ♀ 26 ♂). Bulgan aimak: 9 km E of Somon Abzaga, 1300 m, 23. VII. 1966 (No. 732); 4 km S of Somon Daschinčilen, 1200 m, 23. VII. 1966 (No. 735). — Central aimak: Kerulen, Njalga Somon, Burgastin Chosu, 1200 m, 3. VII. 1963 (No. 77), Borulčin tala, cca 100 km SE of Ulan-Baator, 1400 m, 5. VII. 1963 (No. 90), Boro Gol, 20 km E of Zuun Chara, 1400 m, 9. VII. 1963 (No. 106); 12 km W of Somon Lun, 1300 m, 3. VII. 1964 (No. 258); 12 km S of Somon Bajanbaraat, 1380 m, 13. VII. 1967 (No. 918). — Central Gobi aimak: 20 km S of Somon Delgercogt, 1480 m, 13—14. VII. 1967 (No. 915). — Chentej aimak: between Somon Cenchermandal and Somon Žargaltchaan, 10 km E of Cenchermandal, 1400 m, 27—28. VII. 1965 (No. 311); Čandajan Valley, 40 km E of Žargaltchaan, 1300 m, 28. VII. 1965 (No. 316); 7 km NE of Somon Mörön, 1200 m, 29. VII. 1965 (No. 319); 150 km ENE of Öndörchaan, 10 km S of Kerulen and 10 km N of Somon Tumuncogt, 1000 m, 30. VII. 1965 (No. 331); Somon Tumuncogt, 160 km ENE of Öndörchaan, 1000 m, 31. VII. 1965 (No. 338). — East (= Čojbalsan) aimak: 80 km NW of Čojbalsan, 700 m, 17. VIII. 1965 (No. 429); 15 km of Somon Galuut, 850 m, 17. VIII. 1965 (No. 443); 20 km SW of Somon Bajan Ul, 820 m, 18. VIII. 1965 (No. 444). — Suchebaator aimak: Chadatin-Bulan, 60 km N of Somon Bajanterem, 950 m, 31. VII. 1965 (No. 340); 44 km SSW of Baruun Urt, 1050 m, 2—3. VIII. 1965 (No. 349); 45 km N of Somon Erdenecagan, 900 m, 9. VIII. 1965 (No. 381).

5. **Perilampus umbo** NIKOLSKAYA, 1952 (Figs 8, 24). — I base my interpretation of *umbo* on two syntypes coming from Turkmenia and southern Kazakhstan, USSR, and another specimen identified by NIKOLSKAYA, coming from Balamurun, Kazakhstan, 1952, leg. KOZHANCHIKOV. The species was originally described from Turkmenia and Kazakhstan, but so far no lectotype has been selected.

Mongolia (5 ♀, 1 ♂). Chovd aimak: Toroo, Žargalant Chajrchan, cca 50 km SE of Char us Nuur, 1300 m, 12. VII. 1966 (No. 675). — Central Gobi aimak: Zöölön Ul, 58 km WSW of Somon Bajandalaj, 1500 m, 16. VI. 1967 (No. 808); Tachilga Ul, between Somon Cogt-ovoo and Dalanzadgad, 68 km S of Cogt-Ovoo, cca 1550 m, 8. VII. 1967 (No. 900); 28 km NW of Oldoch Chijd, 54 km NNW of Somon Cogt-Ovoo, 1350 m, 9. VII. 1967 (No. 904); Mts Delgerchangaj Ul, 6 km S of Somon Delgerchangaj, 1650 m, 11. VII. 1967 (No. 909).

6. **Perilampus chrysonotus** FÖRSTER, 1859 (= *P. nigellus* NIKOLSKAYA, 1952) **syn. n.** (Figs 9, 10, 19). — As mentioned above NIKOLSKAYA confirmed my suggestion (1956) that her *P. nigellus* is conspecific with *chrysonotus*.

The species is evidently widely distributed on dry grasslands in Europe and, as *nigellus*, was already reported from Mongolia by NIKOLSKAYA (1952). No host record known yet.



Figs 14—27. Mongolian *Perilampus*. 14. *P. auratus* (PANZ.), ♀, head dorsally. — 15. *P. noemi* NIK., ♀, head in facial view. — 16. *P. aureoviridis* STEPH., ♂, head in facial view. — 17—18. *P. laevifrons* DALM., base of ♂ antenna, and lower face of ♀. — 19. *P. chrysonotus* FÖRST., ♀, malar area. — 20—23. *P. kaszabi* sp. n.: 20 = ♀, gaster; 21 = malar area, ♀; 22 = head of ♀ in facial view; 23 = head of ♂ in lateral view. — 24. *P. umbo* NIK., ♀, malar area. 25—26. *P. tristis* MAYR, malar area (♀), and venation of fore wing with variation of stigmal vein (in other specimens). — 27. *P. intermedius* BČK., venation with variation of stigmal vein

Mongolia (2 ♀). Chentej aimak: between Somon Cenchermandal and Somon Žargeltchaan, 1400 m, 27—28. VII. 1965 (No. 311); 7 km NE of Somon Mörön, 1200 m, 28—29. VII. 1965 (No. 319).

7. **Perilampus noemi** Nikolskaya, 1952 (Figs 11, 15). — This species was originally described from "Central Asia and Mongolia" and so far no lectotype has been selected. I base my interpretation on two female syntypes received years ago from Nikolskaya. They come from the Kondara Valley in Tadzhikistan and one of them agrees perfectly with the Mongolian specimens, as they are mentioned in the key, the other has some shallow but relatively broad piliferous punctures on lower face near to the malar groove and the gena behind the groove flat and striate, and the orbital groove behind the eye delimited by a blunt but distinct carina. However, I find that these features are usually present in the males and even in females are apparently within the range of intraspecific variation. In the males the size is 2.5—2.9 mm, the body darker green, on the head mostly bluish, the scape in the distal half only very slightly broadened and with very fine punctulation, clypeal margin truncate. In the females size 1.8—2.5 mm, the body squat, with distinct bright metallic green to cupreous gloss, including the head. The head seen dorsally is 2.2—2.35 times as broad as long (stout), in facial view broadly transversely oval (about 1.3 : 1), with the malar groove distinctly shorter than the anterior part of the margin of peristomal cavity. The produced part of the clypeal margin is only slightly broader than its distance from the angular beginning of the peristonal cavity.

Mongolia (17 ♀ 3 ♂). Gobi Altaj aimak: Zachuj Gobi, 10 km N of Chatan Chajrchan Mts, 1150 m, 27. VI. 1966 (No. 591). — Bajanchongor aimak: Oasis Echin Gol, cca 90 km NE of border post Caganbulag, 950 m, 27—28. VI. 1967 (No. 855); Cagan Bogd Ul, between Bilgech Bulag and border post Caganbulag, 25 km WSW of source area, 1450 m, 24. VI. 1967 (No. 842).

8. **Perilampus laevifrons** Dalman, 1822 (Figs 17, 18). — The *laevifrons* species-group is discussed under *P. aureoviridis* below. As a result of an extensive study, involving all European accessible material of the group, I have now no doubt that the material from Mongolia mentioned here belongs to *laevifrons*. The range of variation is rather restricted, in the males with a similar ratio of the widened scape as in *aureoviridis*. From the latter species *laevifrons* can be separated by the characters given in the key.

The species was mentioned from Mongolia by Nikolskaya (1952), but her list of hosts is most probably erroneous, being based on previous misidentifications. *P. laevifrons*, widely distributed in Europe and apparently in the northern parts of Asia, seems to develop as a hyperparasite in cocoons of Chrysopidae.

Mongolia (30 ♀ 24 ♂). Chovd aimak: 10 km SSW of Somon Bulgan, 1200 m, 4—5. VII. 1966 (No. 628); Uenč Gol Valley, 2 km N of Somon Uenč, 1450 m, 7. VII. 1966

(No. 643). — Archangaj aimak: 20 km N of Charchorin, 1640 m, 1. VII. 1964 (No. 235); Changaj Mts, 8 km W of Somon Urdtamir, 1620 m, 21. VII. 1966 (No. 724). — Bajanchongor aimak: Oasis Echin Gol, cca 90 km NE of border post Caganbulag, 950 m, 27—28. VI. 1967 (No. 855). — Bulgan aimak: 5 km E of Somon Abzaga, 1400 m, 2. VII. 1964 (No. 251); 9 km E of Somon Abzaga, 1300 m, 22—23. VII. 1966 (No. 792, 732). — Central aimak: Boro Gol, 20 km E of Zuun-Chara, 1400 m, 9. VII. 1963 (No. 106); Zuun Chara, Duusch ul, 1100 m, 8. VII. 1964 (No. 284); Ulaan Chodag, 16 km S of Somon Öndörschireet, 1500 m, 24. VII. 1966 (No. 739); Tosgoni Ovoo, 5—10 km N of Ulan-Baator, 1500—1700 m, 19—20., 23—24. VII. 1967 (No. 926). — Chentej aimak: 7 km NE of Somon Mörön, 1200 m, 28—29. VII. 1965 (No. 319); 150 km ENE of Öndörchaan, 10 km S of Kerulen and 10 km N of Somon Tumuncogt, 1000 m, 30. VII. 1965 (No. 331). — Sukhebaator aimak: 44 km SSW of Baruun Urt, 2—3. VIII. 1965 (No. 349, 353).

9. **Perilampus aureoviridis** Stephens (in Walker, 1833) (= *P. lacunosus* Nikolskaya, 1952) **syn. n.** (Fig. 16). — *P. lacunosus* was described briefly in a key from material coming from "the European Part of USSR, Central Asia, Siberia and Mongolia". No lectotype has been selected so far. My interpretation is based on a male syntype from northern Kazakhstan, Kokchetav region, Borovsk forestry (12. VI. 1932, leg. V. Popov), on my notes made in Leningrad in 1968 and on the published information. There has been some controversy about the identity of *lacunosus*. It was treated (in absence of any evidence on *aureoviridis*) as a valid species by Bouček (1956), Szczepański (1959) and by Trjapitzin (1978), but as a sibling species or a form of "the *laevifrons* aggregate or complex" by Kerrich (1958), which was questioned by Graham (1970). Graham found that who different species aggregates were involved, one including *aureoviridis* and *lacunosus*, the other with *laevifrons* and *masculinus* Bouček. However, he could not reach a definite conclusion in the *lacunosus-aureoviridis* problem because of lack of enough material.

I have now re-examined the question of validity of the two names comparing the available European and Mongolian material. I could confirm that the females offer hardly any difference, but there are some useful characters in the males. The Mongolian males have the suboval facial cavities (on either side of the supraclypeal area) deeper and slightly larger, clearly bordering on the upper corners of clypeus and reaching about level with centres of antennal sockets. Further, their scapes are slightly more expanded, being only 2.15—2.55 times as long as broad (in ventral view, radicula not included); then the eyes are relatively larger, so that the breadth of face between eyes is mostly 1.15—1.17 times greater than the maximum diameter (length) of eye, the index varying in odd specimens from 1.13—1.24. The parascrobal areas (and genae with temples) are sometimes rather shiny, with some longitudinal rugosity present only near to the orbits, but in many specimens this rugosity and raised longitudinal striation as strong as in the European males. The emargination of the lower clypeal margin is always conspicuous, although sometimes deeper, sometimes shallower. On the other hand the five European males have the facial cavities slightly weaker, yet the sculpture on the parascrobal areas and temples fairly strongly rugose to striate (strongest in the

two British males mentioned by GRAHAM, 1970), the scapes slightly less expanded, 2.65—2.90 times as long as broad, and the frons 1.19—1.28 times as broad as eye long. The Kazakh syntype of *lacunosus* groups clearly rather with the European (*aureoviridis*) males, having the scape index 2.45, the slightly weaker cavities but more rugose sculpture, yet its frons is 1.32 times the eye length. The analysis of the present material suggests that, although the variation is noticeable, it is not convincingly correlated with geographical proveniance and in my view the whole material belongs to one species, by priority called *aureoviridis*. The author of this name is STEPHENS, in WALKER, because WALKER expressedly stated that he was quoting a description by STEPHENS, not only his manuscript name. The single extant female "type" of *aureoviridis* (as mentioned by KERRICH, 1958 and by GRAHAM, 1970), lacking the pronotum, is here designated as lectotype (No. 5-2890). No host record is available so far but the morphological similarity to *laevifrons* suggests that also *aureoviridis* develops as a hyperparasite in Chrysopidae (or some related Neuroptera).

Mongolia (88 ♀ 95 ♂). Chovd aimak: Toroo, Žargalant Chajrchan Mts, cca 50 km SE of Lake Char us Nuur, 1300 m, 12. VII. 1966 (No. 675). — Archangaj aimak: Chaalgsim Chundi near Somon Tövschruulech, 63 km E of Somon Urdtamir, 1500 m, 22. VII. 1966 (No. 727). — Bulgan aimak: 9 km E of Somon Abzaga, 1300 m, 23. VII. 1966 (No. 732); 4 km S of Somon Daschinčilen, 1200 m, 23. VII. 1966 (No. 735). — Uburchangaj aimak: Arc Bogd Ul, cca 20 km S of Somon Chovd, 1760 m, 22. VI. 1964 (No. 170). — South Gobi aimak: 14 km SW of Somon Bajandalaj, 1450 m, 15. VI. 1967 (No. 803); Tachilga Ul Mts., between Somon Cogt-Ovoo and Dalanzadgad, 68 km S of Cogt-Ovoo, cca 1550 m, 8. VII. 1967 (No. 900). — Central aimak: Kerulen, Njalga Somon, Burgastin Chosu, 1200 m, 3. VII. 1963 (No. 77); Boro Gol, 20 km E of Zuun-Chara, 1400 m, 9. VII. 1963 (No. 106); 12 km W of Somon Lun, 1300 m, 3. VII. 1964 (No. 258); Zuun-Chara, 850 m, 8. VII. 1964 (No. 281); Zuun-Chara, Duusch Ul, 1100 m, 8. VII. 1964 (No. 284); Kerulen, 45 km E of Somon Bajandelger, 1400 m, 26. VII. 1965 (No. 304); Ulaan Chodag, 16 km S of Somon Öndörschireet, 1500 m, 24. VII. 1966 (No. 739); 12 km S of Somon Bajanbaraat, 1380 m, 13—14. VII. 1967 (No. 918); 11 km S of Zosijn davaa (cca 90 km S of Ulan-Baator), 1650 m, 15. VII. 1967 (No. 921); 12 km SE of Ulan-Baator, 1500—1600 m, 21. VII. 1967 (No. 931). — Central Gobi aimak: 8 km NW of Oldoch Chijd, 54 km NNW of Somon Cogt-Ovoo, 1350 m, 9. VII. 1967 (No. 904); Delgerchangaj Ul Mts, 6 km S of Somon Delgerchangaj, 1650 m, 11. VII. 1967 (No. 908); 20 km S of Somon Delgercogt, 1480 m, 13—14. VII. 1967 (No. 915). — Chentej aimak: Čandagan Valley, 40 km E of Žargaltchaan, 1300 m, 28. VII. 1965 (No. 316); 7 km NE of Somon Mörön, 1200 m, 28—29. VII. 1965 (No. 319); 150 km ENE of Öndörchaan, 10 km S of Kerulen and 10 km N of Somon Tumuncogt, 1000 m, 30. VII. 1965 (No. 331); Somon Tumuncogt, 160 km ENE of Öndörchaan, 1000 m, 31. VII. 1965 (No. 338); 10 km W of Somon Delgerchaan, 1250 m, 24. VIII. 1965 (No. 476). — East Gobi aimak: 40 km NW of Chara-Eireg, 1150 m, 30. VI. 1963 (No. 62). — East (= Čojbalsan) aimak: 40 km E of Somon Tamcagbulag, 600 m, 11. VIII. 1965 (No. 389); between Somon Chalchingol and Chamardavaa Ul, 600 m, 12. VIII. 1965 (No. 398); Chamardavaa Ul, 80 km SE of Somon Chalchingol, 600 m, 13. VIII. 1965 (No. 401); ibid., 700 m, 13. VIII. 1965 (No. 405); 80 km NW of Čojbalsan, 700 m, 17. VIII. 1965 (No. 429); 15 km N of Somon Galuut, 850 m, 17. VIII. 1965 (No. 433); 20 km SW of Somon Bajan-Uul, 820 m, 18. VIII. 1965 (No. 444). — Suchebaator aimak: Chadatin-Bulan, 60 km N of Somon Bajanterem, 950 m, 31. VII. 1965 (No. 340); 44 km SSW of Baruun Urt, 1050 m, 2—3. VIII. 1965 (No. 349, 353); Bajan Gol, 85 km NE of Somon Dariganga, 1100 m, 8. VIII. 1965 (No. 377).

10. **Perilampus kaszabi** sp. n. (Figs 20—23)

♀ 2.1—2.6 mm. Bright green to bronze green, head slightly darker than thorax, gaster black; flagella, knees, ends of tibiae and whole tarsi testaceous, scapes (and sometimes partly tibiae) dark testaceous with metallic tinge. Wings subhyaline.

Head in dorsal view 2.2 times as broad as long (stout) and 1.2 times as broad as mesoscutum; in facial view only 1.12—1.14 times as broad as high. Ocelli in low triangle, line through front margins of lateral ones only slightly intersecting back of median ocellus. Frons without swellings; inner orbits slightly diverging downwards. Scrobes unusually shallow and narrow, only about 0.6 as broad as the convex parascrobal area, this in lower part slightly rising towards the convex and elongate supraclypeal area. Clypeus convex, its smooth lower margin strongly produced, arcuate (Fig. 22). Gena behind long malar groove smooth but with distinct sparse piliferous punctures. Relative measurements: head breadth 66, dorsal length 30, height 59, frons 43, distance between lower margin of clypeus and toruli 27, subequal to distance between median ocellus and toruli; OOL 10, POL 15, eye 32 : 20, malar groove 10, scape 25, flagellum plus pedicel 49. Flagellum slender, hardly clavate, middle segments subquadrate, each with two rows of sensilla.

Thorax: punctate dorsum about 1.27 times as long as broad. Anterior margin of pronotal collar smooth, without teeth; lateral panel strongly narrowing at ventral end and posteriorly completely fused with prepectus, only in dorsal third a sharp edge indicating separation, prepectus narrow, with posterior row of puncta deepening downward, impunctate part small and with traces of microscopic sculpture, alutaceous in lower part. Punctation of dorsum shallow and not very coarse, medially interspaces smooth and up to half as broad as puncta, laterally narrower and with reticulation on margins of puncta. Impunctate parts of scapulae narrowing caudad. Scutellum very convex, about 1.1 times as long as broad, anterior and posterior ends narrowly rounded, sides slightly diverging; ridge underneath (and along) apical rim very fine. Propodeum with submedian areas with traces of very low and very fine raised reticulation. Fore wing pilosity extremely short, on dorsal surface absent from basal third; veins in ratio: marginal 19, postmarginal 10, stigmal 5; stigmal knob rounded.

Gaster unusual: oval acuminate (Fig. 20), not very high. Fused dorsal margin of first tergite rather strongly arcuate. Second tergite about as long as broad, smooth, with few thin short hairs laterally in middle of length. Petiole hardly visible, its dorsum linear. Hypopygium ending in anterior quarter, hence sheaths rather long, but barely showing at apex.

♂ 1.6—1.9 mm. Legs except coxae testaceous, hind femur darker, with green gloss. Facial pilosity still longer and more conspicuous than in ♀. Antenna

yellowish except for the scape swelling; flagellum with pedicel combined 0.9 times as long as head broad. Scape constricted in basal quarter, beyond that increasingly swollen and very distinctly (not minutely) punctured, not flattened ventrally (Fig. 23). Gaster small, lozenge-like; petiole with dorsal part smooth, strongly transverse, its sides converging forwards, and with a narrow conical neck anteriorly.

Holotype ♀: Mongolia, South Gobi aimak: Zöölön Ul Mts, 58 km WSW of Somon Bajandalaj, 1500 m, 16. VI. 1967 (No. 808), leg. Z. Kaszab (in Hungarian Natural History Museum, Budapest). Paratypes 1 ♀ 1 ♂ as holotype. — Bajanchongor aimak, 3 ♀ 5 ♂: source area of Talyn Bilgech Bulag, 47 km E of border post Caganbulag, 1200 m, 23. VI. 1967 (Nr. 838).

This distinctive species is named in honour of Dr. Z. Kaszab in recognition of his great contribution to the investigation of the Mongolian fauna.

11. **Perilampus nola** Nikolskaya, 1952. — Described from "Bashkiria, N. Kazakhstan, West Siberia, Mongolia" and no lectotype designated yet. My interpretation is based on syntypes coming from the Orenburg province (S. Ural, USSR) and there is no doubt about the identity of the material, but *P. nola* seems to be very close to the North American *P. gahani* Smulyan. A secondary parasite of some smaller Lepidoptera, via their ichneumonid parasites.

Mongolian (3 ♀ 3 ♂). Bajanchongor aimak: source area of Talyn Bilgech Bulag, 47 km E of border post Caganbulag, 1200 m, 23. VI. 1967 (No. 838). — South Gobi aimak: Gurban Sajchan Ul Mts, 15 km S of Dalanzadgad, 1750 m, 13. VI. 1967 (No. 794); SW bank of salt lake Dund Gol (old Somon Gurban-Tes), 1300 m, 19. VI. 1967 (No. 819). — East Gobi aimak: 40 km NW of Chara-Eireg, 1150 m, 30. VI. 1963 (No. 62). Some more specimens, without further data, were collected after 1920 by Andersson.

12. **Perilampus tristis** Mayr, 1905 (= *P. orcula* Nikolskaya, 1952) **syn. n.** (Figs 12, 25, 26). — According to my notes on Nikolskaya's types made 1968 in Leningrad both *P. orcula* Nik. and *P. pupulus* Nik. belong to the *tristis*-group (see key couplet 6 above). Nikolskaya's description of *orcula*, from Mongolia, fits *tristis* very well but she put it as a different species because of the slightly distinct metallic tinge on the thorax. I noted then that *orcula* was most probably the same as *tristis*, which I find confirmed by the study of the present material. The southern and eastern specimens have this metallic tinge often noticeable, though weak.

Widely distributed in the Palaearctic region and in eastern North America; in the Oriental region replaced mainly by *P. microgastri* Ferrière. Hyperparasitic in many smaller Lepidoptera via their ichneumonid and especially braconid primary parasites.

Mongolia (4 ♀ 4 ♂). Archangaj aimak: Changaj Mts, 8 km W of Somon Urdtamir, 1620 m, 21. VII. 1966 (No. 724). — South Gobi aimak: Gurban Sajchan Ul, 15 km S of Dalanzadgad, 1750 m, 13. VI. 1967 (No. 794); Gurban Sajchan Ul, 30 km S of Somon Bulgan, 1700 m, 20. VI. 1964 (No. 157). — Central aimak: Boro Gol, 20 km E of Zuun-Chara, 1400 m, 9. VII. 1963 (No. 106); Zuun-Chara, Duusch Ul, 1100 m, 8. VII.

1964 (No. 284). — Chentej aimak: 150 km ENE of Öndörchaan, 10 km S of Kerulen and 10 km N of Somon Tumuncogt, 1000 m, 30. VII. 1965 (No. 331). — Suchebaator aimak: 44 km SSW of Baruun Urt, 1050 m, 2—3. VIII. 1965 (No. 349).

13. **Perilampus intermedius** BOUČEK, 1956 (Figs 13, 27). — As already mentioned in the Introduction I thought that this species might be the same as *P. pupulus* of NIKOLSKAYA, but she regarded them as different. I have had no opportunity recently to compare the types and have to leave the question open. *P. pupulus* was described from "the South of the European USSR" (NIKOLSKAYA, 1952: 196), *P. intermedius* from Czechoslovakia and Germany and since found in several other European countries. I have now no doubt that the Mongolian material is conspecific with *intermedius*.

So far no host record is known but judging by the taxonomic relationship *P. intermedius* should be a hyperparasite of Lepidopreta in a similar way to *P. tristis* and *P. microgastri*.

Mongolia (17 ♀ 3 ♂). Gobi Altaj aimak: between Beger Nuur and Somon Beger, 1400 m, 25—26. VI. 1966 (No. 578). — Bajanchongor aimak: source area of Talyn Bilgech Bulag, 47 km of border post Caganbulag, 1200 m, 23. VI. 1967 (No. 838); Cagan Bogd Ul between Talyn Bilgech Bulag and Caganbulag, 1450 m, 24. VI. 1967 (No. 824); Oasis Echin Gol, cca 90 km NE of border post Caganbulag, 950 m, 27—28. VI. 1967 (No. 855). — South Gobi aimak: Gurban Sajchan Ul, 15 km S of Dalanzadgad, 1750 m, 13. VI. 1967 (No. 794). — Central aimak: 12 km S of Somon Bajanbaraat, 1380 m, 13. VII. 1967 (No. 918). — Chentej aimak: Čandagan Valley, 40 km E of Somon Žargalatchaan, 1300 m, 28. VII. 1965 (No. 316). — Suchebaator aimak: 44 km SSW of Baruun Urt, 1050 m, 2—3. VIII. 1965 (No. 349).

Genus **Chrysolampus** SPINOLA

Only one species found in the material.

Chrysolampus thenae (WALKER, 1848) (= *Perilampus obscurus* WALKER, 1874). — In my view this synonymy is correct; it was established by KERRICH (1958: 83). *Elatus thenae* WALKER was originally described from a single specimen from England, as stated by WALKER himself (1848: 104, as "a"), hence the male specimen is the holotype (BM Hym. Type 5-1685). The single extant female type of *P. obscurus* from Amurland (= Khabarovsk region) is here designated as lectotype (BM Hym. 5-396). It was originally described as a male, but recognised as female by KERRICH (1958).

The species is apparently widely distributed, but largely unknown in many parts of USSR, especially Central Asia and Siberia. Reared once from *Meligethes pedicularius* PAYK. (Nitidulidae).

Mongolia (17 ♀). Archangaj aimak: Chaalgsim Chundi near Somon Tövschruulech, 63 km E of Somon Urdtamir, 1500 m, 22. VII. 1966 (No. 727). — Central aimak: Kerulen, Njalga Somon Burgastin Chosu, 1200 m, 3. VII. 1963 (No. 77); Zuun-Chara, 850 m, 8. VII. 1964 (No. 281).

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CONTRIBUTIONS TO THE MILLIPEDE FAUNA OF VIETNAM (DIPLOPODA) 1. CHORDEUMATIDA

S. I. GOLOVATCH

(Received 1 April, 1982)

The description of a new species: *Nepalella vietnamica* sp. n. is given.

In general, representatives of the millipede order Chordeumatida have long been known to exist in Indochina, in Vietnam in particular (ATTEMS, 1938), but none has hitherto been described. The more exciting it was to find among the extensive material from Vietnam belonging to the Hungarian Natural History Museum, Budapest and kindly sent to the author for identification, a few adult specimens from this order. They all happened to belong to a single species described herein as new to science. Besides, this discovery is of considerable zoogeographic and taxonomic interest, since it provides some new ideas on the relationships of the Asian chordeumatid fauna.

For the opportunity to study these materials, I wish to express my sincerest thanks to Drs Z. KASZAB and S. MAHUNKA (Budapest). Two paratypes are retained in the author's collection for a subsequent deposition in the Zoological Institute of the USSR Academy of Sciences, Leningrad, while all the other types, including the holotype, have been returned to the Hungarian Natural History Museum, Budapest.

Nepalella vietnamica sp. n. (Figs 1—6)

Localities: Vietnam, Prov. Yen bai, Chay River valley, Luc yen, 300 m, beaten from bushes at forest edge, 1 ♂ (dissected and depicted), 2 ♀♀ — 1. XII. 1971 (No. 177). — Same locality, 3 ♂♂ (including holotype), 6 ♀♀ (1 ♂, 1 ♀ — Coll. GOLOVATCH) — 5. XII. 1971 (No. 238), leg. TOPÁL-MATSKÁSI.

Holotype male, together with the 9 paratypes deposited in the Hungarian Natural History Museum, Budapest.

Diagnosis: Well distinguishable from the two hitherto known species of the genus, *N. khumbua* and *N. thodunga*, both from the Nepal Himalayas (SHEAR 1979), by certain details of the structure of the posterior gonopod coxites, by the lack of coxal processes on male leg-pairs 10 and 11, etc.

Description: Size similar in both sexes, 10 to 12 mm long and 1.2 to 1.5 mm wide. Male holotype 11 mm long and 1.4 mm wide. Colour brown, dorsally marble black-brown; paranotal lateral swellings, sides, ventrum, antennae, and dorsal axial suture light; legs light brown or whitish. 30 body rings.

About 20 black ocelli in a round-triangular ocular field from both sides of head. Antennae very long and slender, without peculiarities. Head and cheeks densely pubescent. Gnathochilarium ordinary, without promentum; laminae linguales with 3 to 4 basal and short and 3 longer medio-distal setae, latter being arranged in a longitudinal row.

Body rings without lateral keels or true paranota, their place being occupied by relatively small lateral swellings, which become visible from collum and go on as far backward as to the 26th ring to come to naught further on. All terga except telson with 3 + 3 long sharp macrochaetae situated on distinct tubercles. On mid-body metazonite chaetae forming two triangles with obtuse angle of ca. 105° each. Medial chaetae situated a little (ca. 1.2 times) closer to respective lateral ones than to axial suture. Longest chaeta (posterolateral) ca. 3/16 as long as width of mid-body metazonite. Shortest chaeta (medial) reaching axial suture. Both lateral chaetae of mid-body ring ca. 2.4 times closer to each other than to medial one.

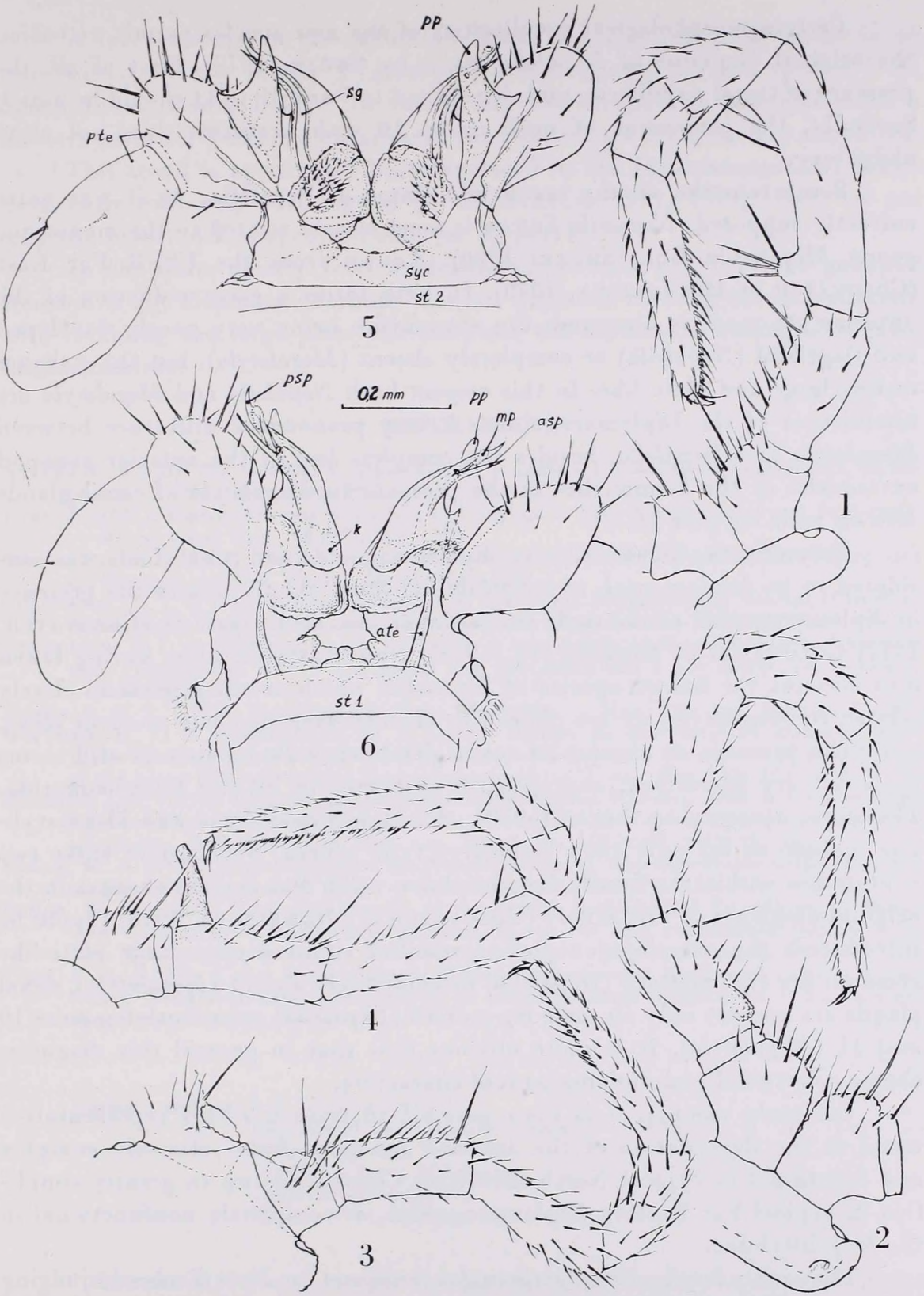
Legs long and slender, only leg-pairs 1 and 2 somewhat reduced. Claw basally with an additional dorsal spine and a long ventral flagellar seta exceeding beyond claw proper.

♂. — Frons somewhat flatter than in females. Leg-pairs 3 to 7 enlarged, especially pairs 6 and 7. Pairs 4 to 6 with a medio-proximal femoral projection crowned with a bunch of long hairs each. Pair 7 with a papillar medio-proximal prefemoral swelling. Pair 10 with coxal glands, without coxal processes. Pair 11 without coxal glands or processes, but provided with a long inner proximal prefemoral process. Tarsal papillae present, expressed different on different leg-pairs; especially well developed on pair 6, nearly absent on pair 7.

Gonopods rather simple. Anterior ones nonfunctional, represented by a large plate-like sternum (*st1*) surmounted with a pair of flagellar coxites vz. telopodites (*ate*). Posterior gonopods crassate, coxites complex, telopodites (*pte*) 2-jointed and greatly enlarged. Coxites basally forming a syncoxite (*syc*) situated on a plate-like sternum (*st2*). Colpocoxites divided into 2 main branches posterior of which (*pp*) is triangular and shield-like, and anterior one antero-basally with a round swelling (*k*), distally trifid [*asp* and *psp* are spines, but *mp* is shorter and forming the orifice of a seminal groove (*sg*) of each colpocoxite]. Posteriorly each coxite with a membraneous sack covered with setae, but lacking any flagelloids.

♀. — Frons more convex, legs without modifications. Vulvae with high operculum each.

Remarks: The discovery of *Nepalella vietnamica* sp. n. in Vietnam extends the range of the genus far eastward, resulting in the same Oriento-Himalayan distributional pattern already known in several other groups of millipedes (Attems, 1938; Hoffman et Burkhalter, 1978).



Figs 1—6. *Nepalella vietnamica* sp. n., ♂ paratype (No. 177): 1—4 = leg-pairs 6, 7, 10 and 11, respectively; 5—6 = gonopods (aboral and oral views, respectively); *st1* = sternum of anterior gonopods, *ate* = their coxite vz. telopodite, *st2* = sternum of posterior gonopods, *syc* = syncoxite, *pte* = their telopodite, *k* = antero-basal swelling, *pp* = posterior branch of colpocoxite, *asp* = anterior spine, *mp* = medial subbranch, *psp* = posterior spine, *sg* = seminal groove of colpocoxite

Certain morphological peculiarities of the new species permit extension the original diagnosis of *Nepalella* given by SHEAR (1979). First of all, the presence of tarsal papillae on male leg-pairs 4 to 7 and 10 to 11 should be noted. Secondly, the armament of male coxae 10 with processes does not seem obligatory.

Some remarks on the taxonomic status of Nepalella. As it was quite correctly supposed, *Nepalella* SHEAR is most closely related to the monotypic genus *Megalotyla* GOL. (SHEAR, 1980), known from the USSR Far East (GOLOVATCH et MIKHALJOVA, 1978). In both forms a great reduction of the anterior gonopods is observed, the extremities being very poorly developed and flagelloid (*Nepalella*) or completely absent (*Megalotyla*), but the sternum resting large and plate-like. In this respect both *Nepalella* and *Megalotyla* are reminiscent of the Diplomaragnidae. A very pronounced difference between *Megalotyla* and *Nepalella*, besides the complete loss of the anterior gonopod extremities in the former, lies in the presence in *Megalotyla* of coxal glands also on male leg-pair 11.

Formerly the hiatus between diplomaragnoids and conotyloids was considered to be fundamental, of superfamilial rank, chiefly due to the presence in diplomaragnoids of the male coxal glands also on leg-pair 11 (GOLOVATCH, 1977; GOLOVATCH et MIKHALJOVA, 1978). Now, however, after having taken into account the known species of *Nepalella*, which are in general so closely related to *Megalotyla*, we are obliged to change somewhat our previous ideas.

The presence or absence of coxal glands on male leg-pair 11 still seems to be a very important, suprageneric character in all the Chordeumatida. Therefore, contrary to SHEAR (1980), although Nepalellinae and Megalotylinae include so far only their respective type genera, we consider these two subfamilies within the family Megalotylidae valid. But certain changes in the original diagnosis of this family (GOLOVATCH et MIKHALJOVA, 1978) should be introduced: the anterior gonopod extremities situated on a large plate-like sternum are rudimentary (*Nepalella*) or completely absent (*Megalotyla*), coxal glands are present only on male leg-pair 10 (*Nepalella*) or on both leg-pairs 10 and 11 (*Megalotyla*). It is quite obvious now that in general this diagnosis shares conotyloid and diplomaragnoid characters.

Curiously enough, it is even possible to trace a rather representative trend in the degradation of the anterior gonopods from relatively complex and functional in typical North American Conotylidae up to greatly simplified in typical Far Eastern Diplomaragnidae, or completely nonfunctional in the Megalotylidae.

Thus, the family Schedotrigonidae endemic to New Zealand, judging from its recent revision (MAURIÈS, 1978) is distinguishable by the anterior gonopod extremities somewhat simplified and easily derivable from the conotyloid type. The sternum is plate-like, with a trace of medial projection.

A further stage in the reduction of the anterior gonopods seems to be represented by the family Pygmaeosomatidae known by one species from South India (CARL, 1941).* In this group the sternum is provided with a massive inverted-T-shaped outgrowth, the extremities being further simplified.

This trend is apparently best expressed in the Diplomaragnidae, which have their own stages of regress (s. GOLOVATCH, 1977, 1979). Here we see only the inverted-T-shaped sternum (or its part?).

In the quite closely related Megalotylidae such shape of the gonopod sternum is not displayed. Perhaps this is a different trend in the degradation, with retaining the large plate-like sternum, the maximum among all known Chordeumatida.

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* HOFFMAN (1979) may be right in supposing that *Pygmaeosoma* CARL is a junior subjective synonym of *Henderosonula* POCOCK, but this first should be proved. Besides, another genus, namely *Typhlopygmaeosoma* from a cave in northern India, was placed within the Pygmaeosomatidae (TURK, 1972), but judging from the incomplete original description of *Typhlopygmaeosoma*, especially of its what was believed to be posterior gonopods, we doubt whether this placement was justified.

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SYNONYMIE INDOAUSTRALISCHER UND NEOTROPISCHER TENEBRIONIDEN (COLEOPTERA)

Z. KASZAB

(Eingegangen am 8. April 1982)

Synonymization of 11 genera and 8 species, furthermore new combinations of 98 species with citations of original description: *Anobriomaia* KASZAB, 1941 (= *Foochounus* PIC, 1921); *Chrysomaia* KULZER, 1952 (= *Augolesthus* MOTSCHULSKY, 1872); *Dictysomorphus* PIC, 1921 (= *Ceropria* LAPORTE & BRULLÉ, 1831); *Espitomorphus* PIC, 1921 (= *Camarimena* MOTSCHULSKY, 1863); *Klapperichia* KASZAB, 1954 (= *Tenebriocephalon* PIC, 1925); *Obriomaia* GEBIEN, 1927 (= *Tetragonomenes* CHEVROLAT, 1878); *Polytropus* KIRSCH, 1866 (= *Chaetillus* PASCOE, 1860); *Pseudochariotheca* PIC, 1934 (= *Steneucyrtus* FAIRMAIRE, 1896); *Rhicnodes* FAIRMAIRE, 1892 (= *Chaetillus* PASCOE, 1860); *Spinogauromaia* PIC, 1922 (= *Spinoderosphaerus* PIC, 1922); *Sundon* PIC, 1923 (= *Eucyrtus* PASCOE, 1866). Synonymized species: *Androsus spectabilis* KASZAB, 1980 [= *Chariotheca* (= *Androsus*) *adonis* (PIC, 1927)]; *Cyclobiomorphus malaccanus* PIC, 1916 (= *Cyclobiomorphus undulatus* PIC, 1916); *Ischnodactylus pictipennis* GEBIEN, 1927 (= *Cyclobiomorphus undulatus* PIC, 1916); *Klapperichia mirabilis* KASZAB, 1954 (= *Tenebriocephalon thoracicum* PIC, 1925); *Lyprops sinensis* MARSEUL, 1876 [= *Anaedus* (= *Luprops*) *orientalis* (MOTSCHULSKY, 1868)]; *Neomida atra* MOTSCHULSKY, 1873 [= *Crypticus* (= *Platydema*) *detersum* (WALKER, 1858)]; *Neomida subsericea* MOTSCHULSKY, 1873 (= *Platydema europaeum* LAPORTE & BRULLÉ, 1831); *Spinogauromaia rufescens* PIC, 1922 (= *Spinoderosphaerus brevicornis* PIC, 1922). New name: *Tetragonomenes pici* nom. n. for *Chariotheca* (= *Tetragonomenes*) *viridipennis* (PIC, 1928), nec *Obriomaia* (= *Tetragonomenes*) *viridipennis* (GEBIEN, 1927).

Im Jahre 1981 hatte ich Gelegenheit, im Museum Paris die Sammlungen von M. PIC, L. FAIRMAIRE und anderer Autoren studieren zu können. Für die Erlaubnis zu meinen Studien und die freundliche Hilfe möchte ich auch an dieser Stelle Herrn Professor J. CARAJON, Direktor der Entomologischen Abteilung und Herrn CL. GIRARD, Kustos der Tenebrionidensammlung, meinen innigsten Dank aussprechen.

Es ist allgemein bekannt, daß PIC und FAIRMAIRE sehr produktive Autoren waren und Tausende von Tenebrioniden beschrieben haben. Weder FAIRMAIRE noch PIC haben jemals eine zusammenfassende Revision mitgeteilt, sondern nur Einzelbeschreibungen aller Gebiete, vor allem aus der tropischen Welt. Das indomalayische Gebiet ist sehr reich an Tenebrioniden und wenigstens 70% aller Arten stammen von diesen zwei Autoren. M. PIC und auch L. FAIRMAIRE waren beide gute Kenner dieser Fauna, sie haben größtenteils die Zugehörigkeit der neubeschriebenen Arten richtig erkannt und die Katalogen, vor allem der Katalog der Tenebrioniden von H. GEBIEN (1938–1944) die von ihnen beschriebenen Arten meist in solcher weise aufgenommen, wohin sie beschrieben waren. GEBIEN selbst hat in seinem Katalog manche

Änderung durchgeführt, dann folgten die Arbeiten von KULZER, wo auch manche Formen richtiggestellt wurden. Im großen und ganzen sind noch immer viele Unklarheiten geblieben, weil die meist sehr kurzen Diagnosen zu wenig Anhaltspunkte geben, die Tiere richtig zu erkennen. Eine gewisse Ordnung in der Systematik zu schaffen, erschwert auch der Mangel einer Klärung des Tenebrionidensystems, d. h., die Gattungsgrenzen der meisten tropischen Formen sind nicht genug bekannt und ohne eine gründliche Studie aller beschriebenen Arten, welche aber nur durch Typenuntersuchungen durchgeführt werden kann, bleibt es auch in Zukunft aussichtslos.

Ich habe meinen Aufenthalt in Paris dazu genutzt und versucht, manche synonymischen Probleme zu lösen. Die folgende Synonymliste enthält die Resultate meiner Arbeit, in welcher ich bei Vorhandensein der Originaltypen die falsche Aufstellung von Gattungen, Arten und die falsche Einordnung der Arten gleich feststellen konnte. Auf diese Weise fallen 11 Gattungen und 8 Arten in Synonymie und 98 Arten sind combinatio nova, d. h. die Gattungszugehörigkeit muß verändert werden.

Die Klärung der Synonymie soll unbedingt weiter geführt werden, um im System der Tenebrioniden Ordnung haben zu können. Es ist noch ein Glück, daß die Tenebrioniden-Typen im allgemeinen nicht sehr verstreut sind, man findet sie — vorwiegend die orientalischen Arten — meist im Museum Paris, im British Museum sowie im Museum GEORG FREY, außerdem auch ziemlich viele im Ungarischen Naturwissenschaftlichen Museum.

1. M. PIC beschrieb die Gattung *Tenebriocephalon*, 1925 in die Nähe der Gattung *Tenebrio* LINNAEUS, 1758 aufgrund zweier Arten: *T. piceum* PIC, 1925 mit der Varietät var. *rufum* PIC und *T. thoracicum* PIC, 1925; beide aus China. Die Beschreibung ist — wie die Beschreibungen bei PIC im allgemeinen — nicht ausführlich genug, um die Gattung wiederzuerkennen. Als ich in Paris im Jahre 1981 die Sammlung PIC studierte, fand ich die diesbezüglichen Typen und konnte gleich feststellen, daß ich dieselbe Gattung — leider später als PIC — unter dem Namen *Klapperichia* KASZAB, 1954 in die Tribus Ceratanisini beschrieben hatte. Die Gattung enthält das auffallende Merkmal am Abdomen, und zwar gibt es am 3. und 4. Segment keine Gelenkshaut, außerdem hat sie eine sehr primitiv aussehende Skulptur und Form. Meine Gattung und Art ist synonym mit *Tenebriocephalon thoracicum* PIC, 1925. Die Synonymie und Zitate lauten:

Klapperichia KASZAB, 1954: Annls hist.-nat. Mus. natn. hung. (S. N.), **5:** 249, **syn. n.**,
= **Tenebriocephalon** PIC, 1925: Mélang. exot.-ent., **44:** 10.

Klapperichia mirabilis KASZAB, 1954: l.c.: 250, Fig. 1, aus Fukien, **syn. n.**,
= **Tenebriocephalon thoracicum** PIC, 1925: Mélang. exot.-ent., **44:** 10.

2. L. FAIRMAIRE beschrieb zwei Arten unter dem Namen *Eucyrtus* (*Platycrepis*). Sie gehören aber in die Gattung *Gauromaia* PASCOE, 1866. Die Synonymie lautet:

Eucyrtus (*Platycrepis*) *alternicolor* FAIRMAIRE, 1893: Notes Leyden Mus., **15:** 35 aus Sumatra,
= **Gauromaia alternicolor** (FAIRMAIRE, 1893), **comb. n.**

Eucyrtus (*Platycrepis*) *giganteus* FAIRMAIRE, 1893: Notes Leyden Mus., **15:** 34 aus Sumatra,
= **Gauromaia gigantea** (FAIRMAIRE, 1893), **comb. n.**

3. In die Gattung *Eucyrtus* PASCOE, 1866 beschrieb L. FAIRMAIRE und M. PIC mehrere Arten, welche zu anderen Gattungen gehören. Es sind nach den Typen folgende:

Eucyrtus corinthus FAIRMAIRE, 1888: Annls Soc. ent. Fr., (6) **8:** 359 aus Tonkin,
= **Simalura corinthus** (FAIRMAIRE, 1888), **comb. n.**

Eucyrtus corinthius v. *Josephi* PIC, 1929: Mélang. exot.-ent., **54:** 30 aus Tonkin,
= **Simalura corinthus** v. **josephi** (PIC, 1929), **comb. n.**

Eucyrtus Le Moulti PIC, 1929: Mélang. exot.-ent., **54:** 29 aus Java,
= **Simalura lemoulti** (PIC, 1929), **comb. n.**

Eucyrtus punctato-lineatus FAIRMAIRE, 1885: C. R. Soc. ent. Belg.: CIX aus Sumatra/Borneo,
= **Phaedis punctatolineatus** (FAIRMAIRE, 1885), **comb. n.**

Eucyrtus cyaneithorax PIC, 1928: Mélang. exot.-ent., **52:** 9 aus Borneo,
= **Strongylium cyaneithorax** (PIC, 1928), **comb. n.**

Eucyrtus testaceipes FAIRMAIRE, 1896: Notes Leyden Mus., **18:** 107 aus Nias,
= **Tetragonomenes testaceipes** (FAIRMAIRE, 1896), **comb. n.**

Eucyrtus viridans FAIRMAIRE, 1898: Annls Soc. ent. Fr., **67:** 393 aus Celebes,
= **Tetragonomenes viridans** (FAIRMAIRE, 1898), **comb. n.**

Eucyrtus malanganus PIC, 1928: Mélang. exot.-ent., **52:** 8 aus Java,
= **Tetragonomenes malanganus** (PIC, 1928), **comb. n.**

Eucyrtus purpureofasciatus PIC, 1925: Mélang. exot.-ent., **43:** 9 aus Kina-Balu,
= **Augolesthus purpureofasciatus** (PIC, 1925), **comb. n.**

Eucyrtus violaceofasciatus PIC, 1925: Mélang. exot.-ent., **43:** 9 aus Java,
= **Augolesthus violaceofasciatus** (PIC, 1925), **comb. n.**

Eucyrtus pulcher PIC, 1927: Mélang. exot.-ent., **49:** 19 aus Than Moi,
= **Augolesthus pulcher** (PIC, 1927), **comb. n.**

4. In der Gattung *Hemicera* LAPORTE & BRULLÉ, 1831 sind folgende Arten nicht richtig eingeordnet:

Hemicera hanoiensis PIC, 1926: Bull. Mus. natn. hist. nat. Paris, **1926:** 359 aus Hanoi,
= **Simalura hanoiensis** (PIC, 1926), **comb. n.**

Hemicera humeralis PIC, 1921: Mélang. exot.-ent., **34:** 30 aus Nias,
= **Simalura humeralis** (PIC, 1921), **comb. n.**

Hemicera humeralis v. *semiaenea* PIC, 1921: Mélang. exot.-ent., **34:** 30 aus Borneo,
= **Simalura humeralis** v. **semiaenea** (PIC, 1921), **comb. n.**

Hemicera subovata PIC, 1929: Mélang. exot.-ent., **54:** 29 aus Annam,
= **Tetraphyllus subovatus** (PIC, 1929), **comb. n.**

5. M. PIC beschrieb im Jahre 1921 eine Gattung unter dem Namen *Dictysomorphus* und stellt sie neben die Cnodalonini-Gattung *Hemicera* LAPORTE & BRULLÉ, 1831; er vegleicht die Körperform auch noch mit der der *Amarygmus* DALMAN (Amarygmini). PIC hielt sie für monotypisch, als er die einzige Art: *dentaticornis* aus Borneo beschrieben hat. Ich konnte die Type

untersuchen und stellte fest, daß sie nichts anderes als eine *Ceropria* LAPORTE & BRULLÉ, 1831 (Diaperini) ist. Ob die Art mit einer schon aus Borneo beschriebenen Art identisch ist, konnte ich nicht entscheiden. Synonymie:

Dictysomorphus PIC, 1921: Mélang. exot.-ent., **34:** 24 (Cnodalonini) **syn. n.,**
= **Ceropria** LAPORTE & BRULLÉ, 1831 (Diaperini)

Dictysomorphus dentaticornis PIC, 1921: Mélang. exot.-ent., **34:** 24 aus Borneo,
= **Ceropria dentaticornis** (PIC, 1921), **comb. n.**.

6. In die Gattung *Simalura* GEBIEN, 1914 beschrieb M. PIC eine Art, welche nicht hierher gehört, namentlich

Simalura distinctithorax PIC, 1925: Mélang. exot.-ent., **43:** 8 aus Borneo,
= **Pseudonautes distinctithorax** (PIC, 1925), **comb. n.**

7. M. PIC beschrieb die Gattung *Sundon* im Jahre 1923 mit einer Art *atricorne*. Aufgrund der Typenuntersuchung ist aber *Sundon* nichts anderes als *Eucyrtus*. Die Synonymie lautet:

Sundon PIC, 1923: Mélang. exot.-ent., **39:** 18, **syn. n.,**
= **Eucyrtus** PASCOE, 1866.

Sundon atricorne PIC, 1923: Mélang. exot.-ent., **39:** 19 aus Java,
= **Eucyrtus atricornis** (PIC, 1923), **comb. n.**

8. In die Gattung *Gauromaia* PASCOE, 1866 beschrieb M. PIC eine Art, *magniceps*, welche nichts anderes ist als eine *Phaedis*-Art. Synonymie:

Gauromaia magniceps PIC, 1927: Mélang. exot.-ent., **48:** 17 aus Indes Méridionales,
= **Phaedis magniceps** (PIC, 1927), **comb. n.**

9. M. PIC beschrieb eine Gattung unter dem Namen *Spinogauromaia* PIC, 1922 mit einer Art: *rufescens* PIC, 1922 aus Tonkin als eine Cnodalonini und *Spinoderosphaerus* PIC, 1922 ebenfalls mit einer Art: *brevicornis* PIC, 1922 aus Tonkin als eine Tenebrionini. Beide Gattungen und Arten sind aber völlig identisch. Deshalb entsteht folgende Synonymie:

Spinogauromaia PIC, 1922: L'Échange, **38:** 23, **syn. n.,**
= **Spinoderosphaerus** PIC, 1922: Mélang. exot.-ent., **37:** 26.

Spinogauromaia rufescens PIC, 1922: L'Échange, **38:** 23 aus Tonkin, **syn. n.,**
= **Spinoderosphaerus brevicornis** PIC, 1922: Mélang. exot.-ent., **37:** 26 aus Tonkin.

10. H. GEBIEN beschrieb die Gattung *Obriomaia*, 1927 aufgrund von *Eucyrtus subcostatus* FAIRMAIRE, 1893, außerdem noch folgende, als *Eucyrtus* beschriebene Arten: *picicornis* FAIRMAIRE, 1893 aus Borneo, *femoralis* FAIRMAIRE, 1896 aus Sumatra, *lateralis* GEBIEN, 1914 aus Simalur, *auripennis* GEBIEN, 1921 von den Philippinen, *crenatus* GEBIEN, 1921 von den Philippinen, *excellens* GEBIEN, 1913 von den Philippinen, *clypealis* GEBIEN, 1913 von den Philippinen und *Thesilea rugifrons* FAIRMAIRE, 1882 aus Sumatra sowie zwei neue Arten: *cyanea* und *viridipennis* aus Sumatra, außerdem beschrieb

H. KULZER im Jahre 1951 weitere 5 neue Arten (*puerilis* aus Bangkey bei Borneo, *tibialis* von Island Samar, *ocularis* aus Australien, *intercoxalis* aus Australien und *colorata* von den Philippinen); weiters beschrieb ich selbst hierher gehörende Arten (*planiuscula* aus Vietnam, *rufipes*, *srilankae* und *ceylonica* aus Sri Lanka, *palpalis* aus Formosa, *rufiventris* aus Amami, *borneensis* aus Kinabalu) und auch NAKANE eine Art (*pseudorufiventris* aus Taiwan). Es stellte sich aber heraus, daß eine von CHEVROLAT als Diaperini beschriebene Gattung, namentlich *Tetragonomenes* mit *Obriomaia* identisch ist. Deshalb ändert sich die Synonymie folgenderweise:

Obriomaia GEBIEN, 1927: Suppl. Ent., **15:** 45, **syn. n.**,
= **Tetragonomenes** CHEVROLAT, 1878: C. R. Soc. ent. Belg.: CLII. (Gattungstypus: *Tetragonomenes semiviridis* CHEVROLAT, 1878, l.c.: CLII, aus Molukken), Cnodalonini.

Eucyrtus subcostatus FAIRMAIRE, 1893: Notes Leyden Mus., **15:** 44 aus Borneo,
= **Tetragonomenes subcostatus** (FAIRMAIRE, 1893), **comb. n.**

Eucyrtus picicornis FAIRMAIRE, 1893: Notes Leyden Mus., **15:** 46 aus Borneo,
= **Tetragonomenes picicornis** (FAIRMAIRE, 1893), **comb. n.**

Eucyrtus femoralis FAIRMAIRE, 1896: Notes Leyden Mus., **18:** 108 aus Sumatra,
= **Tetragonomenes femoralis** (FAIRMAIRE, 1896), **comb. n.**

Eucyrtus lateralis GEBIEN, 1914: Notes Leyden Mus., **36:** 69 aus Simalur,
= **Tetragonomenes lateralis** (GEBIEN, 1914), **comb. n.**

Eucyrtus auripennis GEBIEN, 1921: Philipp. J. Sci., **19** (4): 465 von den Philippinen,
= **Tetragonomenes auripennis** (GEBIEN, 1921), **comb. n.**

Eucyrtus crenatus GEBIEN, 1921: Philipp. J. Sci., **19** (4): 467 von den Philippinen,
= **Tetragonomenes crenatus** (GEBIEN, 1921), **comb. n.**

Eucyrtus excellens GEBIEN, 1913: Philipp. J. Sci., **8** (5—6 D): 417 von den Philippinen,
= **Tetragonomenes excellens** (GEBIEN, 1913), **comb. n.**

Eucyrtus clypealis GEBIEN, 1913: Philipp. J. Sci., **8** (5—6 D): 415 von den Philippinen,
= **Tetragonomenes clypealis** (GEBIEN, 1913), **comb. n.**

Thesilea rugifrons FAIRMAIRE, 1882: Notes Leyden Mus., **4:** 238 aus Sumatra,
= **Tetragonomenes rugifrons** (FAIRMAIRE, 1882), **comb. n.**

Obriomaia cyanea GEBIEN, 1927: Suppl. Ent., **15:** 46 aus Sumatra,
= **Tetragonomenes cyaneus** (GEBIEN, 1927), **comb. n.**

Obriomaia viridipennis GEBIEN, 1927: Suppl. Ent., **15:** 46 aus Sumatra,
= **Tetragonomenes viridipennis** (GEBIEN, 1927), **comb. n.**

Obriomaia puerilis KULZER, 1951: Ent. Arb. Mus. Georg Frey, **2** (2): 464 aus Bangkey,
= **Tetragonomenes puerilis** (KULZER, 1951), **comb. n.**

Obriomaia tibialis KULZER, 1951: Ent. Arb. Mus. Georg Frey, **2** (2): 466 aus Island Samar,
= **Tetragonomenes tibialis** (KULZER, 1951), **comb. n.**

Obriomaia ocularis KULZER, 1951: Ent. Arb. Mus. Georg Frey, **2** (2): 467 aus Queensland,
= **Tetragonomenes ocularis** (KULZER, 1951), **comb. n.**

Obriomaia intercoxalis KULZER, 1951: Ent. Arb. Mus. Georg Frey, **2** (2): 467 aus Queensland,
= **Tetragonomenes intercoxalis** (KULZER, 1951), **comb. n.**

Obriomaia colorata KULZER, 1951: Ent. Arb. Mus. Georg Frey, **2** (2), 470 von den Philippinen,
= **Tetragonomenes coloratus** (KULZER, 1951), **comb. n.**

Obriomaia palpalis KASZAB, 1941: Stettin. ent. Ztg, **102:** 64 aus Taiwan,
= **Tetragonomenes palpalis** (KASZAB, 1941), **comb. n.**

Obriomaia rufiventris KASZAB, 1964: Ent. Revue Japan, **17** (1): 4 aus Amami,
= **Tetragonomenes rufiventris** (KASZAB, 1964), **comb. n.**

Obriomaia borneensis KASZAB, 1977: Annls hist.-nat. Mus. natn. hung., **69:** 129 aus Kinabalu,
= **Tetragonomenes borneensis** (KASZAB, 1977), **comb. n.**

Obriomaia rufipes KASZAB, 1980: Acta zool. hung., **26** (2): 313 aus Sri Lanka,
= **Tetragonomenes rufipes** (KASZAB, 1980), **comb. n.**

Obriomaia srilankae KASZAB, 1980: Acta zool. hung., **26** (2): 312 aus Sri Lanka,
= **Tetragonomenes srilankae** (KASZAB, 1980), **comb. n.**

Obriomaia ceylonica KASZAB, 1980: Acta zool. hung., **26** (2): 311 aus Sri Lanka,
= **Tetragonomenes ceylonicus** (KASZAB, 1980), **comb. n.**

Obriomaia planiuscula KASZAB, 1980: Annls hist.-nat. Mus. natn. hung., **72:** 212 aus Vietnam,
= **Tetragonomenes planiusculus** (KASZAB, 1980), **comb. n.**

Obriomaia subcostata excellens KASZAB, 1980: Annls hist.-nat. Mus. natn. hung., **72:** 213 aus Vietnam,
= **Tetragonomenes subcostatus excellens** (KASZAB, 1980), **comb. n.**

Obriomaia palpaloides NAKANE, 1963: Fragm. Col., **6:** 28 aus Tokara,
= **Tetragonomenes palpalis palpaloides** (NAKANE, 1963), **comb. n., stat. n.**

Obriomaia semiviolacea NAKANE, 1968: Fragm. Col., **20:** 80 aus Amami,
= **Tetragonomenes semiviolaceus** (NAKANE, 1968), **comb. n.**

Obriomaia pseudorufiventris MASUMOTO, 1981: Elytra, **9** (1): 46 aus Taiwan,
= **Tetragonomenes pseudorufiventris** (MASUMOTO, 1981), **comb. n.**

11. Die Gattung *Anobriomaia* KASZAB, 1941 ist mit *Foochounus* PIC, 1921 synonym, die Änderungen soll folgenderweise durchgeführt werden:

Anobriomaia KASZAB, 1941: Stettin. ent. Ztg, **102:** 45, **syn. n.**,
= **Foochounus** PIC, 1921: Mélang. exot.-ent., **34:** 22 (Gattungstypus: *compressipennis* PIC, 1922, l.c.: 22, aus China).

Anobriomaia sulcata KASZAB, 1941: Stettin. ent. Ztg, **102:** 68 aus Taiwan,
= **Foochounus sulcatus** (KASZAB, 1941), **comb. n.**

Anobriomaia assamica KASZAB, 1965: Misc. Zool. Barcelona, **2** (1): 127 aus Assam,
= **Foochounus assamicus** (KASZAB, 1965), **comb. n.**

Anobriomaia thoracica KASZAB, 1965: Annls hist.-nat. Mus. natn. hung., **57:** 292 aus Vietnam
= **Foochounus thoracicus** (KASZAB, 1965), **comb. n.**

12. H. KULZER beschrieb im Jahre 1952 eine Cnodalonini-Gattung unter dem Namen *Chrysomaia* und stellt hierher auch die von L. FAIRMAIRE als *Eucyrtus* beschriebenen Arten *carbunculus* aus Sumatra und *protensus* aus Singapur, ferner beschrieb er noch weitere vier neue Arten: *elegans* aus Sumatra, *lata* aus Borneo, *borneensis* aus Borneo und *violacea* ebenfalls aus Borneo. Die Gattung ist aber mit *Augolesthus* MOTSCHULSKY, 1872 synonym, welche Gattung MOTSCHULSKY als eine Tenebrionini aufgrund einer Art: *purpureofasciatus* aus »Indes orientales« beschrieb, deshalb muß man die Synonymie folgenderweise ändern:

Chrysomaia KULZER, 1952: Ent. Arb. Mus. Georg Frey, **3** (2): 755, **syn. n.**,
= **Augolesthus** MOTSCHULSKY, 1872: Bull. Soc. imp. nat. Moscou, **45** (3): 26.

Eucyrtus carbunculus FAIRMAIRE, 1885: C. R. Soc. ent. Belg., CIX aus Sumatra,
= **Augolesthus carbunculus** (FAIRMAIRE, 1885), **comb. n.**

Eucyrtus protensus FAIRMAIRE, 1893: Notes Leyden Mus., **15:** 44 aus Singapur,
= **Augolesthus protensus** (FAIRMAIRE, 1893), **comb. n.**

Chrysomaia elegans KULZER, 1952: Ent. Arb. Mus. Georg Frey, **3** (2): 757 aus Sumatra,
= **Augolesthus elegans** (KULZER, 1952), **comb. n.**

Chrysomaia lata KULZER, 1952: Ent. Arb. Mus. Georg Frey, **3** (2): 759 aus Borneo,
= **Augolesthus latus** (KULZER, 1952), **comb. n.**

Chrysomaia borneensis KULZER, 1952: Ent. Arb. Mus. Georg Frey, **3** (2): 760 aus Borneo,
= **Augolesthus borneensis** (KULZER, 1952), **comb. n.**

Chrysomaia violacea KULZER, 1952: Ent. Arb. Mus. Georg Frey, **3** (2): 762 aus Borneo,
= **Augolesthus violaceus** (KULZER, 1952), **comb. n.**

13. Die Gattung *Chariotheca* PASCOE, 1860 enthält eine Menge papuanischer Arten. PIC beschrieb hierzu 23 Arten aus der orientalischen Region, welche zu fünf verschiedenen Gattungen gehören, gar keine aber zur Gattung *Chariotheca*. Diese Tatsache stört das Verbreitungsbild der Gattung *Chariotheca* und verändert auch die Artzusammensetzung anderer Gattungen, weil ohne das Wissen, daß eine Anzahl nicht an richtiger Stelle beschrieben ist, manche Gattungen unübersehbar macht. Die Synonymie zeigt folgendes Bild:

Chariotheca Adonis PIC, 1927: Mélang. exot.-ent., **49:** 18 aus Chapa (Vietnam),
= **Androsus adonis** (PIC, 1927), **comb. n.**,
= *Androsus spectabilis* KASZAB, 1980: Annls hist.-nat. Mus. natn. hung., **72:** 212, **syn. n.**

Chariotheca curta PIC, 1928: Mélang. exot.-ent., **52:** 8 aus Sumatra,
= **Androsus curtus** (PIC, 1928), **comb. n.**

Chariotheca sinensis PIC, 1934: Mélang. exot.-ent., **64:** 33 aus China, Szechuan,
= **Androsus sinensis** (PIC, 1934), **comb. n.**

Chariotheca arcuatipes PIC, 1927: Bull. Soc. linn. Lyon, **6:** 6 aus Banguey,
= **Plamius arcuatipes** (PIC, 1927), **comb. n.**

Chariotheca atra PIC, 1925: Mélang. exot.-ent., **44:** 5 aus Java,
= **Plamius ater** (PIC, 1925), **comb. n.**

Chariotheca atricolor PIC, 1925: Mélang. exot.-ent., **44:** 4 aus Java,
= **Plamius atricolor** (PIC, 1925), **comb. n.**

Chariotheca cyanea PIC, 1928: Mélang. exot.-ent., **52:** 8 aus Borneo,
= **Plamius cyaneus** (PIC, 1928), **comb. n.**

Chariotheca metallica PIC, 1925: Mélang. exot.-ent., **44:** 5 aus Java,
= **Plamius metallicus** (PIC, 1925), **comb. n.**

Chariotheca pilipes PIC, 1927: Bull. Soc. linn. Lyon, **6:** 6 aus Sumatra,
= **Plamius pilipes** (PIC, 1927), **comb. n.**

Chariotheca rufoaenea PIC, 1925: Mélang. exot.-ent., **43:** 10 aus Banguey,
= **Plamius rufoaeneus** (PIC, 1925), **comb. n.**

Chariotheca subconvexa PIC, 1926: Mélang. exot.-ent., **47:** 28 aus Java,
= **Planius subconvexus** (PIC, 1926), **comb. n.**

Chariotheca testaceicornis PIC, 1925: Mélang. exot.-ent., **43:** 9 aus »Indes Mér.«,
= **Plamius testaceicornis** (PIC, 1925), **comb. n.**

Chariotheca thuyenensis PIC, 1926: Mélang. exot.-ent., **47:** 27 aus Tonkin,
= **Plamius thuyenensis** (PIC, 1926), **comb. n.**

Chariotheca bruneiensis PIC, 1925: Mélang. exot.-ent., **44:** 4 aus Borneo,
= **Tetragonomenes bruneiensis** (PIC, 1925), **comb. n.**

Chariotheca bruneiensis v. *violaceicolor* PIC, 1925: l.c.: 4 aus Borneo,
= **Tetragonomenes bruneiensis** v. **violaceicolor** (PIC, 1925), **comb. n.**

Chariotheca longula PIC, 1925: Mélang. exot.-ent., **44:** 4 aus Tonkin,
= **Tetragonomenes longulus** (PIC, 1925), **comb. n.**

Chariotheca rufimembris PIC, 1925: Mélang. exot.-ent., **43:** 10 aus Malakka,
= **Tetragonomenes rufimembris** (PIC, 1925), **comb. n.**

Chariotheca rufitarsis PIC, 1925: Mélang. exot.-ent., **43:** 10 aus Tonkin,
= **Tetragonomenes rufitarsis** (PIC, 1925), **comb. n.**

Chariotheca semicaerulea PIC, 1925: Mélang. exot.-ent., **44:** 4 aus Chochinchine,
= **Tetragonomenes semicaeruleus** (PIC, 1925), **comb. n.**

Chariotheca semipurpurea PIC, 1925: Mélang. exot.-ent., **43:** 10 aus Nias,
= **Tetragonomenes semipurpureus** (PIC, 1925), **comb. n.**

Chariotheca viridipennis PIC, 1928: Mélang. exot.-ent., **52:** 7 aus Tonkin,
= **Tetragonomenes viridipennis** (PIC, 1928), **comb. n.**, nom. praeoccup., nec *Obriomaia viridipennis* GEBIEN, 1927 = *Tetragonomenes viridipennis* (GEBIEN, 1927),
= **Tetragonomenes pici** nom. n. für *Chariotheca viridipennis* PIC, 1928.

Chariotheca Whanesi PIC, 1928: Mélang. exot.-ent., **52:** 8 aus Borneo,
= **Pseudandrosus whanesi** (PIC, 1928), **comb. n.**

Chariotheca neomedina FAIRMAIRE, 1881: Le Naturaliste, **3:** 373 aus Viti Insel,
= **Sciophagus neomedinus** (FAIRMAIRE, 1881), **comb. n.**

14. M. PIC beschrieb die Gattung *Pseudochariotheca* im Jahre 1934, welche nach Typenuntersuchungen mit der Gattung *Steneucyrtus* FAIRMAIRE, 1896 synonym ist. Die Änderungen in der Synonymie soll folgenderweise durchgeführt werden:

Pseudochariotheca PIC, 1934: Mélang. exot.-ent., **64:** 32, **syn. n.**,
= **Steneucyrtus** FAIRMAIRE, 1896: Annls Soc. ent. Belg., **40:** 31 (Gattungstypus: *pexicollis* FAIRMAIRE, 1896: l.c.: 31 aus Indien).

Pseudochariotheca angulatipes PIC, 1927: Mélang. exot.-ent., **49:** 18 aus Annam (Gattungstypus),
= **Steneucyrtus angulatipes** (PIC, 1927), **comb. n.**

Pseudochariotheca dalatensis PIC, 1930: Bull. Soc. ent. Fr., **1930:** 76 aus Annam,
= **Steneucyrtus dalatensis** (PIC, 1930), **comb. n.**

Pseudochariotheca hanoiensis PIC, 1928: Mélang. exot.-ent., **51:** 24 aus Tonkin,
= **Steneucyrtus hanoiensis** (PIC, 1928), **comb. n.**

Pseudochariotheca major PIC, 1934: Mélang. exot.-ent., **64:** 33 aus China,
= **Steneucyrtus major** (PIC, 1934), **comb. n.**

Pseudochariotheca minutissima PIC, 1934: Mélang. exot.-ent., **64:** 32 aus Tonkin,
= **Steneucyrtus minutissimus** (PIC, 1934), **comb. n.**

15. Was M. PIC unter dem Namen *Steneocyrtus forticornis* beschrieben hat, gehört nicht zur Gattung:

Steneucyrtus forticornis PIC, 1922: Mélang. exot.-ent., **35:** 21 aus Tonkin,
= **Eucyrtus forticornis** (PIC, 1922), **comb. n.**

16. M. PIC beschrieb eine Cnodalonini-Gattung unter dem Namen *Espitomorphus*. Diese ist mit *Camarimena* synonym. Die Änderungen sollen folgenderweise durchgeführt werden:

Espitomorphus PIC, 1921: Mélang. exot.-ent., **34:** 24, **syn. n.**,
= **Camarimena** MOTSCHULSKY, 1863: Bull. Soc. Imp. nat. Moscou, **36** (2): 473 (Gattungstypus: *ovicauda* MOTSCHULSKY, 1863 aus Ceylon).

Espitomorphus multicolor PIC, 1921: Mélang. exot.-ent., **34:** 25 aus Java,
= **Camarimena multicolor** (PIC, 1921), **comb. n.**

Espitomorphus multicolor v. *cyaneipennis* PIC, 1921: Mélang. exot.-ent., **34:** 25 aus Java,
= **Camarimena multicolor** v. **cyaneipennis** (PIC, 1921), **comb. n.**

17. V. MOTSCHULSKY beschrieb eine Art unter dem Namen *Anaedus ? orientalis* im Jahre 1868. Anhand der Type habe ich festgestellt, daß sie ein *Luprops* HOPE, 1833 ist:

Anaedus ? orientalis MOTSCHULSKY, 1868: Bull. Soc. Imp. nat. Moscou, **41** (3): 195 aus »Mongolie«,
= **Luprops orientalis** (MOTSCHULSKY, 1868), **comb. n.**,
= *Luprops sinensis* MARSEUL, 1876: Annls Soc. ent. Fr., (5) **6**: 126, **syn. n.** aus China und Japan; der von MOTSCHULSKY angegebene Fundort: »Mongolie« ist falsch.

18. V. MOTSCHULSKY beschrieb unter dem Namen *Neomida subsericea* im Jahre 1873 aus Syrien eine Art, welche bis jetzt unbekannt geblieben ist. Ich untersuchte die Type und stellte fest, daß sie synonym ist:

Neomida subsericea MOTSCHULSKY, 1873: Bull. Soc. Imp. nat. Moscou, **46—47** (1): 478, **syn. n.**,
= **Platydema europaeum** LAPORTE & BRULLÉ, 1831.

19. Gleichfalls beschrieb V. MOTSCHULSKY auch die Art *Neomida atra*, welche aus Spanien beschrieben ist. Im Katalog GEBIEN (1940: 406) findet man die Art als Synonym zu *Platydema europaeum* LAPORTE & BRULLÉ, 1831. Bei Untersuchung der Type ergibt sich aber, daß sie mit falschem Fundort versehen ist und synonym mit *Platydema detersum* WALKER, 1858 ist. Die Synonymie ist deshalb folgende:

Neomida atra MOTSCHULSKY, 1873: Bull. Soc. Imp. nat. Moscou, **46—47** (1): 477, **syn. n.**,
= **Platydema detersum** (WALKER, 1858).

20. M. PIC hat die Gattung *Cyclobiomorphus* im Jahre 1916 aufgrund zweier Arten beschrieben: *malaccanus* und *undulatus*. Anhand der Typen stellt sich heraus, daß sie synonym sind:

Cyclobiomorphus malaccanus PIC, 1916: Mélang. exot.-ent., **19**: 2 (♂), **syn. n.** aus Malakka,
= **Cyclobiomorphus undulatus** PIC, 1916: l.c.: 2 (♂) aus Sumatra.
Hierher gehört auch eine Art von GEBIEN:

Ischnodactylus pictipennis GEBIEN, 1927: Philipp. J. Sci., **27** (3): 446 aus Malakka, **syn. n.**
= **Cyclobiomorphus undulatus** PIC, 1916.

21. Unter dem Gattungsnamen *Diaclina* JACQUELIN DU VAL, findet man im GEBIEN-Katalog (1940: 781) drei Arten von M. PIC, welche in dieser Gattung fremd sind. Die Synonymie ist folgende:

Alphitobius laticollis PIC, 1923: Mélang. exot.-ent., **40**: 23 aus Tonkin,
= **Palembus laticollis** (PIC, 1923), **comb. n.**

Alphitobius testaceicornis PIC, 1923: Mélang. exot.-ent., **40**: 23 aus Fidschi,
= **Sciophagus testaceicornis** (PIC, 1923), **comb. n.**

Alphitobius recticollis PIC, 1923: Mélang. exot.-ent., **40**: 24 aus Borneo,
= **Cneocnemis recticollis** (PIC, 1923), **comb. n.**

22. Bei der Untersuchung der FAIRMAIRE'schen Typen der Gattung *Rhicnodes* ergab sich, daß die Gattung mit der früher beschriebene *Chaetillus*

identisch ist. Sie gehört, wie GEBIEN in seinem Katalog richtig erkannt hat, in die Tribus Lupropini. Es ist aber auch in der Tribus der Apocryphini eine Gattung, namentlich *Polytropus*, welche nicht von diesen Gattungen unterschieden werden kann, daher ist sie mit ihr synonym. Die Synonymie ergibt folgendes Bild:

Rhicnodes FAIRMAIRE, 1892: Annls Soc. ent. Fr., **61:** 87, **syn. n.** (Gattungstypus: *asper* FAIRMAIRE, 1892),
= **Chaetillus** PASCOE, 1860: J. Ent., **1:** 122 (Gattungstypus: *anthicoides* PASCOE, 1860 aus Amazonas).

Polytropus KIRSCH, 1866: Berl. ent. Ztg, **10:** 201, **syn. n.** (Gattungstypus: *laenoides* KIRSCH, 1866 aus Bogota),
= **Chaetillus** PASCOE, 1860, J. Ent., **1:** 112.

Rhicnodes asper FAIRMAIRE, 1892: Annls Soc. ent. Fr., **61:** 87 aus Venezuela,
= **Chaetillus asper** (FAIRMAIRE, 1892), **comb. n.**

Rhicnodes parcegranulatus FAIRMAIRE, 1892: Annls Soc. ent. Fr., **61:** 88 aus Venezuela,
= **Chaetillus parcegranulatus** (FAIRMAIRE, 1892), **comb. n.**

Rhicnodes Simonis FAIRMAIRE, 1892: Annls Soc. ent. Fr., **61:** 88 aus Venezuela,
= **Chaetillus simonis** (FAIRMAIRE, 1892), **comb. n.**

Rhicnodes striatopunctatus FAIRMAIRE, 1892: Annls Soc. ent. Fr., **61:** 88 aus Venezuela,
= **Chaetillus striatopunctatus** (FAIRMAIRE, 1892), **comb. n.**

Rhicnodes anthicoides (PASCOE, 1860), sensu ARDOIN: Bull. Soc. ent. Fr., **1969**: 126,
= **Chaetillus anthicoides** PASCOE, 1860, **comb. n.**

Polytropus laenoides KIRSCH, 1866: Berl. ent. Ztg, **10:** 201 aus Bogota,
= **Chaetillus laenoides** (KIRSCH, 1866), **comb. n.**

Polytropus tuberculatus KIRSCH, 1866: Berl. ent. Ztg, **10:** 201 aus Bogota,
= **Chaetillus tuberculatus** (KIRSCH, 1866), **comb. n.**

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GEBIEN, H. (1938—1944): Katalog der Tenebrioniden, Teil II. — Mitt. münch. ent. Ges., **28** (1), 1938: 49—80; **28** (2), 1938: 283—314; **28** (3), 1938: 397—428; **29** (2—3), 1939: 443—474; **29** (4), 1939: 739—770; **30** (1), 1940: 405—436; **30** (2), 1940: 755—786; **30** (3), 1940: 1061—1092; **31** (1), 1941: 331—362; **31** (2), 1941: 803—834; **31** (3), 1941: 1131—1146; **32** (1), 1942: 308—346; **32** (2), 1942: 729—760; **33** (1), 1943: 399—430; **33** (2—3), 1943: 895—926; **34** (2), 1944: 497—555 [370—899].

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KULZER, H. (1952): Siebenter Beitrag zur Kenntnis der Tenebrioniden (Col.). Einige neue Gattungen und Arten der Tribus Cnodalonini aus dem Nachlaß von H. Gebien in coll. G. Frey. — Ent. Arb. Mus. Georg Frey, **3** (2): 719—764, Taf. I—II.

KULZER, H. (1954): Achter Beitrag zur Kenntnis der Tenebrioniden (Col.). — Ent. Arb. Mus. Georg Frey, **5** (1): 20—73, Abb. 1—4, Taf. V—VII.

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NEW AND LITTLE KNOWN SCALE-INSECT SPECIES FROM YUGOSLAVIA (HOMOPTERA: COCCOIDEA)

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Collections of scale insects in Yugoslavia have provided 52 species. Among them three (*Balanococcus mediterraneus* sp. n., *Gregoporia istriensis* sp. n., *Rhizococcus evelinae* sp. n.) proved to be new to science and 15 new to the fauna of Yugoslavia. The occurrence of the genus *Gregoporia* DANZIG, 1979, the boreal species *Parafairmairia gracilis* GREEN, 1916 and *Trionymus radicum* NEWSTEAD, 1895 from the south of Yugoslavia, are all zoogeographically interesting findings.

The scale-insect fauna of Yugoslavia is scantily known. There has not been yet any comprehensive work published until now, except that of BACHMANN (1953), surveying only the Diaspididae family. Other important works have only regional value, like SCHMIDT's papers (1956, 1973) about the scale-insect fauna of Croatia and that of ATANASOV (1959) concerning Macedonia. Several authors have collected some species new to the Yugoslavian fauna. For example, ZAK-OGAZA (1967) reports several new species among the 25 collected. On the basis of literature data, one may get the impression that the scale-insect fauna of Yugoslavia is rich, heterogenous and far from being adequately investigated.

Our collections were made at two occasions, in 1977 and 1981. The dry material and the majority of slides are in the collection of the Research Institute for Plant Protection (Budapest), the holotype in the Zoological Department of the Hungarian Natural History Museum (Budapest) and the paratypes in the Zoological Institute of the Academy of Sciences (Leningrad). The species new to the Yugoslavian fauna are marked with an asterisk.*

The level of infestation is marked as F (on a scale of 0 to 4) (KOZÁR et al., 1979). Dead species at the time of collection are marked with M, the rest was collected as live material, infested with parasites with P, if we could not determine the instars of larvae we used the letter L. The identification numbers referring to KOZÁR's collection are given in parentheses.

1. Ortheziidae

1. **Orthezia urticae** (LINNAEUS, 1758) — *Euphorbia* sp., 24. 6. 1981, Portoroz, ♀, L, F = 1 (1543). — *Plantago* sp., 7. 5. 1977, Plitvice, ♀, F = 1 (720).

2. **Ortheziola signoreti** (HALLER, 1880) — Musci, 27. 6. 1981, Motovun, ♀, F = 1 (1566).

2. Margarodidae

3. **Icerya purchasi** (MASKELL, 1878) — *Rosmarinus* sp., 23. 6. 1981, Portoroz, ♀, F = 1 (1531).

3. Pseudococcidae

4. **Antonina purpurea** (SIGNORET, 1875) — *Agropyron repens*, 25. 6. 1981, Portoroz, ♀ (black), L_1 (violet). — *Agropyron* sp., 27. 6. 1981, Buja, ♀, ♂, F = 1 (1607) (Leg.: DR. T. JERMY).

*5. **Atrococcus achillea** (KIRITSHENKO, 1936) — *Inula germanica* (on roots), 25. 6. 1981, Portoroz, ♀, F = 1 (1553). It is known from Hungary to the Far East (USSR).

6. Balanococcus mediterraneus sp. n. (Fig. 1)

Type material: The holotype, adult female, on *Poa pratensis* (in the leaf sheath), Portoroz, 24. 6. 1981, by F. KOZÁR (KOZÁR's collection No. 1538), deposited in the Zoological Department of the Hungarian Natural History Museum (Budapest): the paratypes, 5 slides with 5 females and some dry material with the same date deposited in the Research Institute for Plant Protection (Budapest) and 1 female (on slide) in the Zoological Institute of the Academy of Sciences (Leningrad).

Description of adult female. Mounted specimens elongate, with parallel sides, 3—4 mm long and 1—1.5 mm wide. Antennae 6-segmented, 240—250 μm long. Eyes circular. Labium 70 μm long, the stylet loop shorter than labium. Legs small and strong, the anterior 360—380 μm, the median 420 μm and the posterior 450—460 μm long. Posterior coxae with a few big translucent pores, especially around the base. Circuli 2 in number, oval, in medium size (60 μm in diameter), the posterior somewhat bigger than anterior one. Ostioles developed, with 1—3 trilocular pores on each lip. Anal lobes are not protruding. Cerarii on anal lobes only, each with a pair of strong, conical setae accompanied by 1—3 auxiliary setae and 1—2 trilocular pores. Anal ring with two rows of big, oval pores and six 110—130 μm long setae. Dorsal and ventral surface with numerous long setae. Spiracles with 2—5 trilocular pores, some of them in atrium. No other trilocular pores, five-locular pores not. Multilocular pores with an even distribution, more numerous around body and on the last 3 sternites. Tubular ducts short, with large oral collar occupying slightly less than half of the total length of duct. On the last segments of abdomen in two sizes. Tubular ducts interspread with multilocular pores around the margin and form transverse rows on abdominal segments, a few scattered on the whole dorsum.

The eggs are cream in colour.

B. mediterraneus sp. n. is probably a close relative to *B. boratynskii* WILLIAMS, 1962, but strongly differs from all known species by the absence of trilocular pores on all body surfaces, by presence of multilocular pores on central part of dorsum and venter and by some other smaller differences.

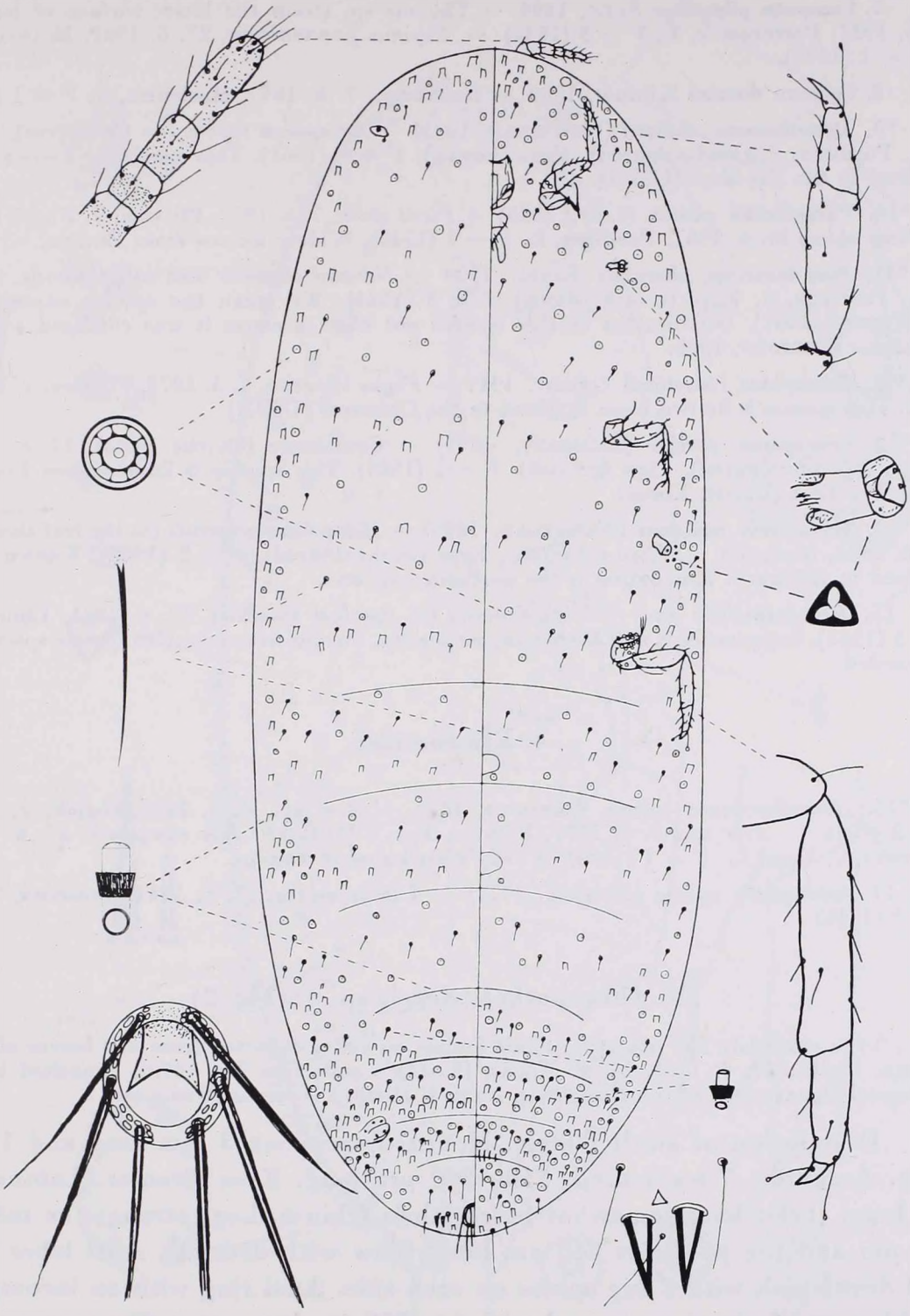

Fig. 1. *Balanococcus mediterraneus* sp. n. female (holotype)

We named this species *B. mediterraneus*, because it is the first species of this genus from the Mediterraneum.

7. **Ceroputo pilosellae** SULC, 1898 — *Thymus* sp. (from the lower surface of leaves), 24. 6. 1981, Portoroz, ♀, L, F = 3 (1539). — *Thymus pannonicum*, 27. 6. 1981, Motovun, ♀, L, F = 1 (1570).

8. **Coccura comari** KÜNOW, 1880 — *Rubus* sp., 7. 6. 1977, Maslenica, ♀, F = 1 (721).

*9. **Dysmicoccus walkeri** (NEWSTEAD, 1891) — *Agropyron repens* (on the leaves), 25. 6. 1981, Portoroz, ♀, (lead-coloured), Eggs (brown), F = 1 (1561). This species is known from England to the Far East (USSR).

*10. **Paroudablis piceae** (LÖW, 1883) — *Picea abies*, 7. 5. 1977, Plitvice, ♀, F = 2 (715). — *Picea abies*, 25. 6. 1981, Portoroz, L, F = 1 (1548). Widely known from Europe.

*11. **Pseudococcus obscurus** ESSIG, 1909 — *Nerium oleander* and other woods, 24. 6. 1981, Portoroz, ♀, Eggs (cream colour), F = 3 (1544). We mean the species name sensu MACKENZIE (1967). Distribution of this species not clear because it was confused with *P. maritimus* EHRHORN, 1900.

*12. **Trionymus newsteadi** GREEN, 1917 — *Fagus silvatica*, 7. 5. 1977, Plitvice, ♀, F = 1 (713). This species is known from England to the Caucasus (USSR).

*13. **Trionymus perrisi** (SIGNORET, 1875) — Gramineae (on the roots), 27. 6. 1981, Lipica, ♀ (lead-coloured), Eggs (greyish), F = 1 (1580). This species is known from England to the Far East (USSR, Korea).

*14. **Trionymus radicum** (NEWSTEAD, 1895) — *Heliotricha pratensis* (in the leaf sheaths), 27. 6. 1981, Motovun, ♀, (lead-coloured), Eggs (lead-coloured), F = 2 (1565). Known from England to Hungary. This datum is the southernmost one.

15. *Pseudococcidae* sp. — *Stipa joannis* (in the leaf sheaths), 27. 6. 1981, Lipica, L, F = 1 (1581). Supposedly it is a *Mirococcopsis* species, but for determination female specimens are needed.

4. Eriococcidae

*16. **Acanthococcus aceris** SIGNORET, 1875 — *Acer* sp., 4. 5. 1977, Osijek, ♀, Eggs, F = 2 (709). — *Acer* sp., 7. 5. 1977, Plitvice, F = 4 (714). — *Acer campestre*, 27. 6. 1981, Motovun, ♀, Eggs, L_1, F = 1 (1569). Widely distributed in Europe.

17. **Gossyparia spuria** (MODEER, 1778) — *Ulmus minor*, 27. 6. 1981, Motovun, ♀, L_1, F = 2 (1568).

18. Gregoporia istriensis sp. n. (Fig. 2)

Type material: The holotype, adult female on slide, collected from dry leaves of Gramineae, Lipica, 27. 6. 1981, by F. KOZÁR (KOZÁR's collection No. 1579), deposited in the Zoological Department of the Hungarian Natural History Museum (Budapest).

Description of adult female. Mounted specimen 3 mm long and 1 mm wide. Antennae 7-segmented, 250—260 μm long. Eyes circular. Labium 80 μm long, stylet loop somewhat longer than labium. Legs strong; the median 620 μm and the posterior 640 μm long. Claw with denticle. Anal lobes very well developed, with 2 big spines on each side. Anal ring with an incomplete double row of round pores and with ten 120 μm long setae. On venter there are long slender setae, dorsum with small scattered spines. On the margin of dorsum big spines arranged in a line. On the VIIIth segment 6, on VIIth 6, on the Vth 5, on the IVth and others 6 on each. On the margin of abdomen the spines with cutting end. Spiraculars with two to three 5-locular pores. Tubular ducts numerous on all dorsal and ventral surfaces. The microtubular ducts in

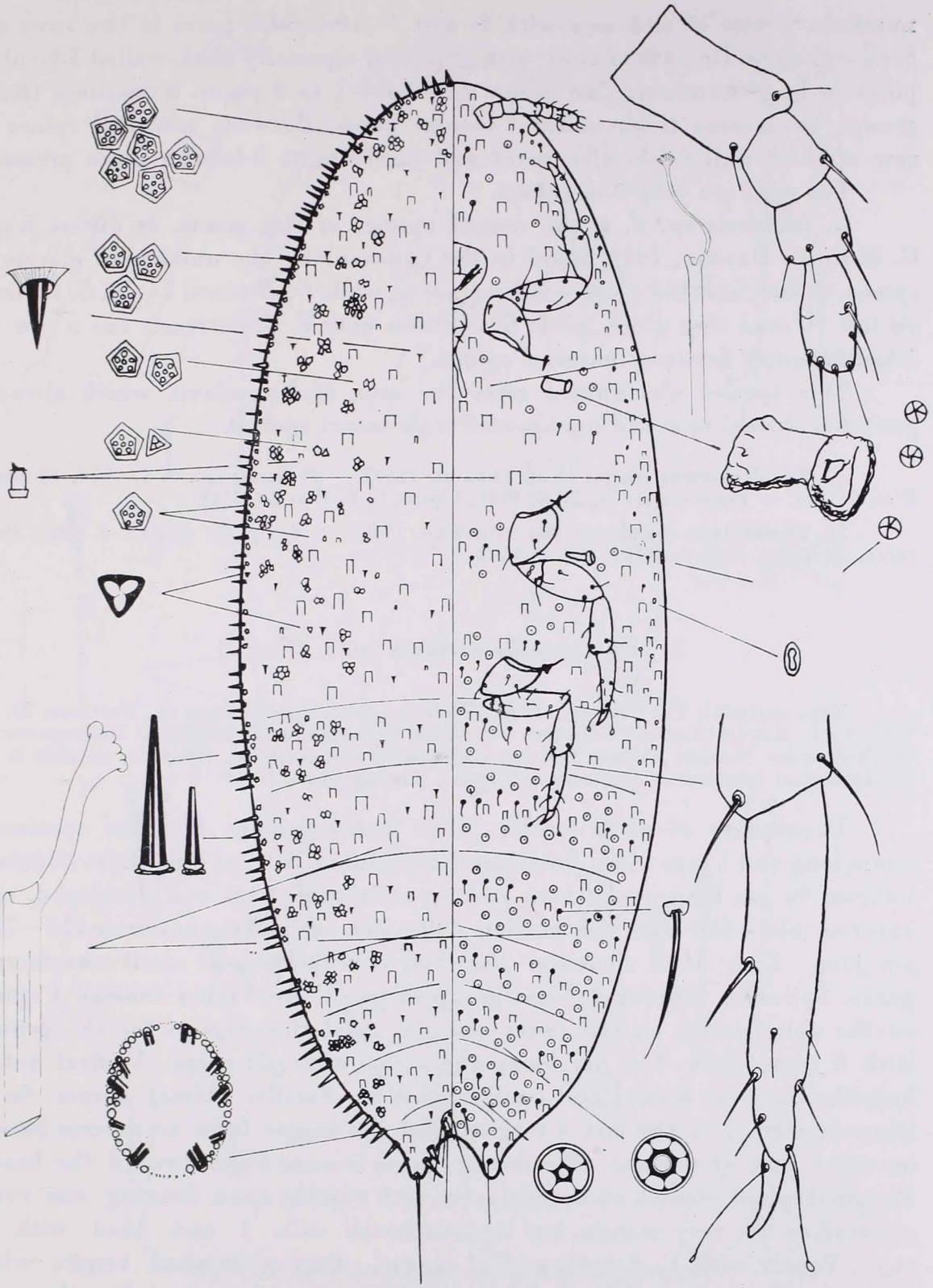

Fig. 2. *Gregoporia istriensis* sp. n. female (holotype)

low numbers on the dorsum and some on the venter margin. Body margin with minute disc pores. Venter of thorax with scattered 5-locular pores in low

numbers, venter of abdomen with 5- and 7—10-locular pores in two rows on each segments. Dorsum of body with groups of especially thick-walled 5-locular pores in large numbers. One group may have 1 to 9 pores. Sometimes these groups have some thick-walled 3-locular pores. Between marginal spines a row of thick-walled 5-locular pores and rarely some 3-locular pores present.

The eggs are yellow in colour.

G. istriensis sp. n. is the second species of this genus. It differs from *G. distincta* DANZIG, 1979 found in the Caucasus by the number of marginal spines. *G. istriensis* has 5—6 on all segments, while *G. distincta* 7—10. *G. istriensis* has 10 anal ring setae, while *G. distincta* only 8. *G. istriensis* has a row of 5-locular pores between marginal spines.

This species was named after the area of Yugoslavia which already provided several new and unexpected scale-insect species.

19. **Pseudochermes fraxini** (KALTENBACH, 1860) — *Fraxinus* sp., 7. 5. 1977, Plitvice, F = 3 (716). — *Fraxinus ornus*, 27. 6. 1981, Lipica, ♀, L, F = 2 (1576).

20. **Rhizococcus cynodontis** (KRITISHENKO, 1940) — *Agropyron* sp., 25. 6. 1981, Portoroz, ♀ (violet), Eggs (yellow), F = 2 (1552).

21. **Rhizococcus evelinae** sp. n. (Fig. 3)

Type material: The holotype, adult female on slide, from *Bromus* sp., Portoroz, 25. 4. 1981, by F. KOZÁR (KOZÁR's collection No. 1562), deposited in the Zoological Department of the Hungarian Natural History Museum (Budapest); the paratype, 1 female, on slide is in the Zoological Institute of Academy of Sciences (Leningrad).

Description of adult female. Alive female yellow. Mounted specimen 3 mm long and 1 mm wide. Antennae 7-segmented, 310 μm long. Eyes circular. Labium 90 μm long, stylet loop as long as labium. Legs well developed, the anterior 650—660 μm, the median 690—700 μm and the posterior 710—720 μm long. Claw with denticle. Posterior coxa with some small translucent pores. Spiracles without definite group of pores. Anal lobes conical, 1 spine on the outer and 2 on the inner margin. Anal ring typical for the genus, with 8 setae (120—130 μm long) and a row of round pores. Ventral setae hair-like, forming groups and transverse rows. Smaller dorsal spines form transverse rows on the last 4 tergites and the bigger form transverse bands on other part of dorsum. The dorsal spines become bigger toward the head. Marginal spines conical, on the abdomen with cutting apex, forming one row, situated on the very margin, but cephalothorax with 2 and head with 3 rows. Venter with 1—3 submarginal spines. Each abdominal tergite with 4—5 marginal spines. Big tubular ducts numerous on dorsum and on the venter margin, smaller tubular ducts numerous on whole venter. Microtubular ducts in great numbers on all dorsum. 5-locular pores distributed at the spiracles, the posterior part of cephalothorax and forming rows on the first

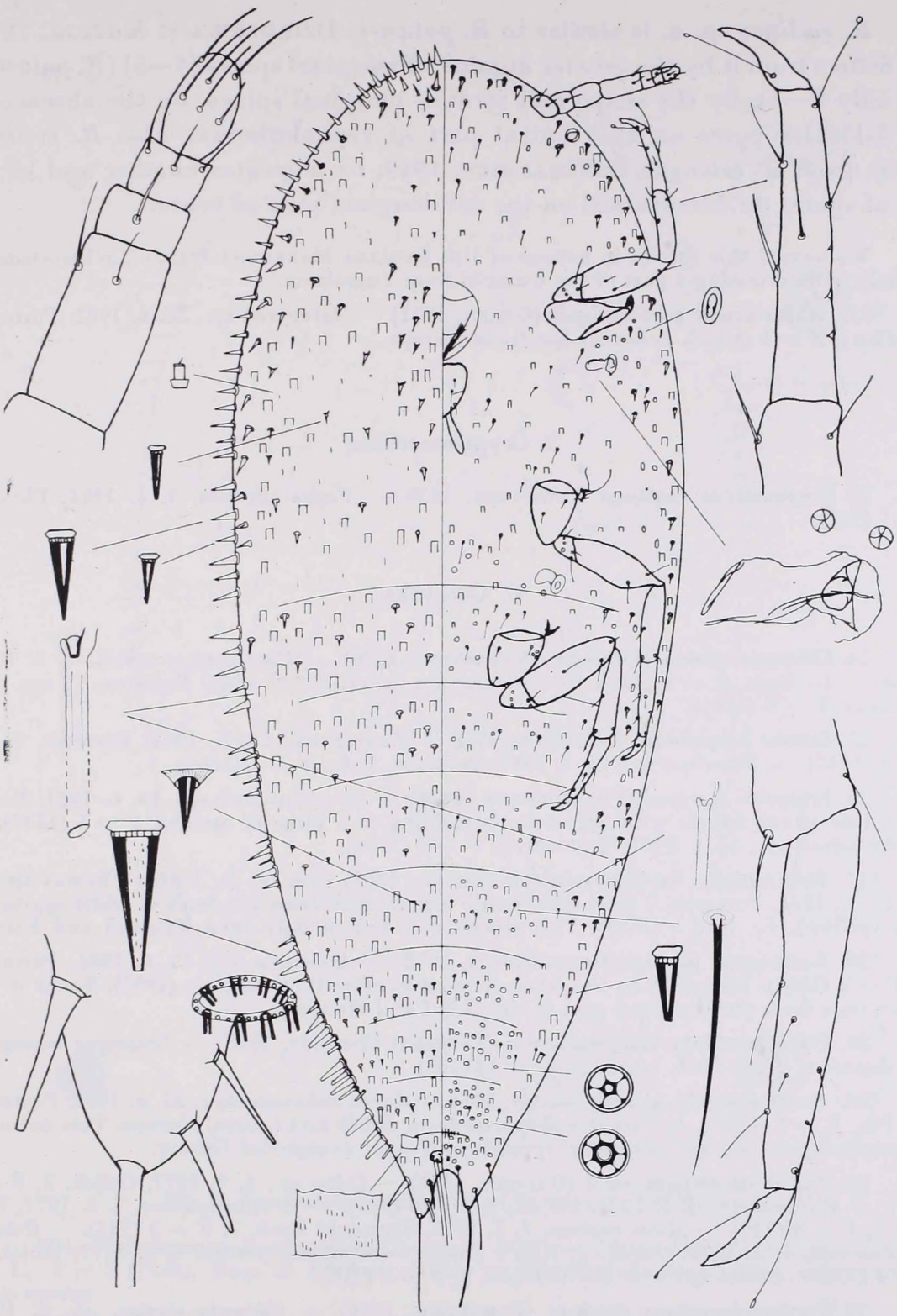

Fig. 3. *Rhizococcus evelinae* sp. n. female (holotype)

two anterior sternites. Other sternites with 5-locular pores, altogether with 7-locular pores forming bands, the number is increasing on posterior sternites. Minute disc pores form a submarginal row on the venter of body.

R. evelinae sp. n. is similar to *R. palustris* DZIEDZICKA et KOTEJA, 1971, but differs from it by the greater number of marginal spines (4—5) (*R. palustris* has only 2—3), by the shape and form of marginal spines, by the absence of the 5-locular pores on the central part of cephalothorax. Also *R. evelinae* differs from *R. oblongus* BORCHSENIUS, 1949, by a greater number and larger size of spines on dorsum and on the submarginal part of venter.

We named this species in honour of DR. EVELINA MARKOVNA DANZIG, acknowledging her help in determining a part of the material from Yugoslavia.

*22. **Rhizococcus pseudinsignis** (GREEN, 1921) — *Agropyron* sp., 25. 6. 1981, Portoroz, ♀ (yellow), F = 1 (1552). Frequent species in Europe.

5. Cryptococcidae

23. **Cryptococcus fagisuga** LINDINGER, 1936 — *Fagus silvatica*, 7. 5. 1981, Plitvice, F = 1 (713).

6. Coccidae

24. **Chloropulvinaria floccifera** (WESTWOOD, 1870) — *Pittosporium tobira*, 7. 5. 1977, Zadar, ♀, L, Eggs, F = 1 (728). — *Pittosporium tobira*, 27. 6. 1981, Portoroz, ♀, egg sack with eggs, F = 4 (1564).

25. **Coccus hesperidum** LINNAEUS, 1758 — *Laurus* sp., 25. 6. 1981, Portoroz, ♀, L_1, F = 1 (1547). — *Teucrium* sp., 25. 6. 1981, Portoroz, ♀, L_1, F = 1 (1560).

26. **Eriopeltis festucae** (FONSCOLOMBE, 1834) — *Brachypodium* sp., 24. 6. 1981, Portoroz, ♀ (the young female with egg sacks resembling to a piece of cotton), F = 1 (1537). — *Brachypodium* sp., 25. 6. 1981, Portoroz, ♀, F = 3 (1554).

*27. **Exaeretopus formiceticola** (NEWSTEAD, 1894) (Fig. 4) — Under *Thymus* sp., in soil, 25. 6. 1981, Portoroz, ♀ (red) (the female is protruded from the front of white egg-sack), Eggs (yellow), L_1, F = 1 (1559). This species was known only from England and France.

*28. **Lecanopsis porifera** BORCHSENIUS, 1952 — *Agropyron* sp., 25. 6. 1981, Portoroz, L_1, F = 2 (1549). Identified on the basis of nymphs after BORCHSENIUS (1957). So far it was known only from the European part of the USSR and Hungary.

29. **Palaeolecanium bituberculatum** (TARGIONI-TOZZETTI, 1868) — *Crataegus monogyna* var. *denudata*, 27. 6. 1981, Lipica, ♀, F = 2 (1573).

*30. **Parafairmairia gracilis** GREEN, 1916 — *Carex melanostachya*, 25. 6. 1981, Portoroz, M♀, PL_2, F = 1 (1558). At first it was known from North and Central Europe. This datum is the southernmost one for this boreal species; so it is an unexpected finding.

31. **Parthenolecanium corni** (BOUCHÉ, 1844) — *Celtis* sp., 4. 5. 1977, Osijek, ♀, F = 1 (707). — *Platanus* sp., 4. 5. 1977, Osijek, ♀, F = 2 (705). — *Prunus spinosa*, 7. 5. 1977, Plitvice, ♀, F = 3 (719). — *Ribes nigrum*, 7. 5. 1977, Slavonski Brod, ♀, F = 3 (711). — *Robinia pseudoacacia*, 4. 5. 1977, Osijek, ♀, F = 2 (706). — *Sophora japonica*, 4. 5. 1977, Osijek, ♀, F = 1 (708). — *Tilia* sp., 4. 5. 1977, Osijek, ♀, F = 1 (710).

32. **Parthenolecanium persicae** (FABRICIUS, 1776) — *Clematis vitalba*, 25. 6. 1981, Portoroz, M♀, L_1, F = 2 (1563). — *Cytisus hirsutus leucotrichus*, 25. 6. 1981, Portoroz, M♀, L_1, F = 1 (1551).

*33. **Parthenolecanium rufulum** COCKERELL, 1903 — *Quercus pubescens*, 27. 6. 1981, Lipica, M♀, L_1, F = 2 (1574). — *Quercus* sp., 30. 6. 1981, Juki, M♀, F = 1 (1608) (Leg.: DR. T. JERMY). Widely distributed in Europe. Data of SCHMIDT (1956) on *Eulecanium coryli* may partly refer to this species.

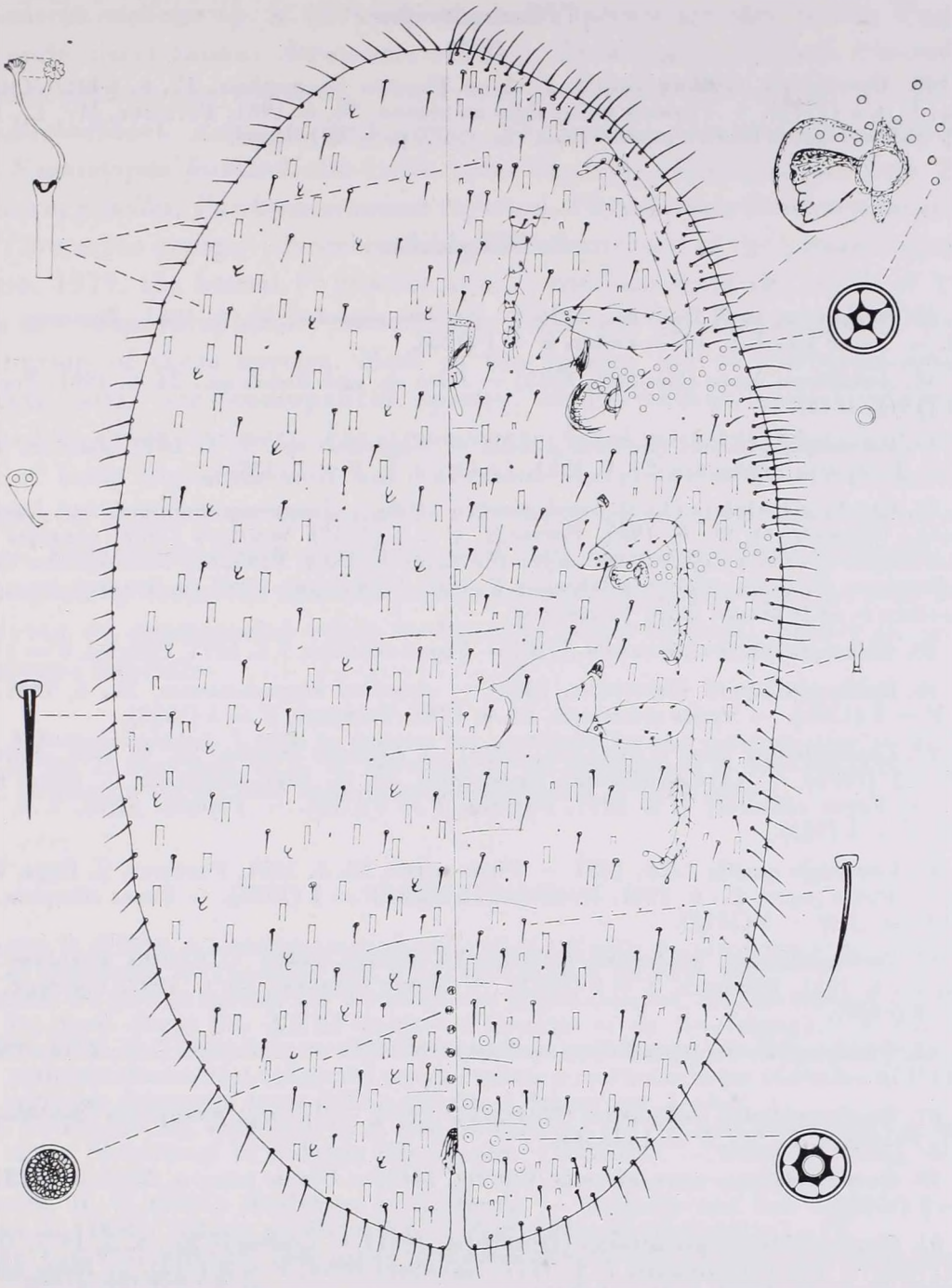

Fig. 4. *Exaeretopus formiceticola* (NEWSTEAD, 1894) female

*34. **Physokermes hemicryphus** (DALMAN, 1825) — *Picea abies*, 25. 6. 1981, Portoroz, ♀, L_1, F = 2 (1548). Data of SCHMIDT (1956) on *Physokermes abietis* may refer partly to this species.

35. **Saissetia oleae** (BERNARD, 1782) — *Nerium oleander*, 7. 5. 1977, Zadar, F = 2 (727). — *Nerium oleander*, 25. 6. 1981, Portoroz, ♀, F = 4 (1546). — *Olea europeae*, 23. 6. 1981, Portoroz, M♀, F = 1 (1532). — *Yucca* sp., 7. 5. 1977, Zadar, F = 1 (726).

36. **Pulvinaria betulae** (LINNAEUS, 1758) — *Salix* sp., 7. 5. 1977, Plitivice, ♀, F = 1 (717).

37. **Sphaerolecanium prunastri** (FONSCOLOMBE, 1834) — *Prunus cerasifera* var. *atropurpurea*, 4. 5. 1977, Osijek, ♀, F = 4 (703).

7. Cerococcidae

*38. **Cerococcus cycliger** GOUX, 1932 — *Thymus pannonicus*, 27. 6. 1981, Motovun, M♀, L_1, F = 1 (1570). — *Thymus pulegioides montanus*, 25. 6. 1981, Portoroz, M♀, L_1, F = 3 (1556). This species is known mostly from the south part of Europe.

8. Diaspididae

39. **Aspidiotus nerii** BOUCHÉ, 1833 — *Nerium oleander*, 23. 6. 1981, Portoroz, F = 1 (1533). — *Yucca* sp., 7. 5. 1977, Zadar, F = 1 (726).

40. **Aulacaspis rosae** (BOUCHÉ, 1833) — *Rosa* sp. and *Rubus* sp., 24. 6. 1981, Portoroz, F = 1 (1541, 1542).

41. **Carulaspis juniperi** (BOUCHÉ, 1851) — *Cupressus* sp., 7. 5. 1977, Bastica, F = 1 (722). — *Juniperus communis*, 27. 6. 1981, Lipica, ♀, L, F = 1 (1575).

42. **Carulaspis minima** (TARGIONI-TOZZETTI, 1868) — *Juniperus communis* and *Juniperus virginiana* (altogether), 25. 6. 1981, Portoroz, F = 1 (1545). SCHMIDT (1956) consider these two *Carulaspis* species as synonyms under the name *C. visci*. Probably both species were in her collections. It is questionable whether *C. visci* (SCHRANK, 1781) (in modern interpretation) occurs in or is absent from Yugoslavia.

43. **Chinaspis salicis** (LINNAEUS, 1758) — *Fagus silvatica*, 7. 5. 1977, Plitvice, F = 3 (718).

44. **Epidiaspis leperii** (SIGNORET, 1869) — *Aesculus hippocastanum*, 24. 6. 1981, Portoroz, F = 2 (1536). — *Pyrus communis*, 24. 6. 1981, Portoroz, F = 3 (1535).

45. **Lepidosaphes ulmi** (LINNAEUS, 1758) — *Clematis vitalba*, 25. 6. 1981, Portoroz, M♀, F = 1 (1563). — *Cytisus hirsutus leucotrichus*, 25. 6. 1981, Portoroz, ♀, Eggs, F = 1 (1551). — *Fagus silvatica*, 7. 5. 1977, Plitvice, F = 3 (713). — *Populus nigra*, 7. 6. 1977, Bastica, F = 3 (723).

46. **Leucaspis pusilla** LÖW, 1883 — *Pinus nigra*, 23. 6. 1981, Portoroz, ♀, Eggs, F = 3 (1530). — *Pinus nigra*, 27. 6. 1981, Motovun, ♀, Eggs, F = 2 (1572). — *Pinus silvestris*, 26. 6. 1981, Lipica, ♀, F = 2 (1578).

47. **Pseudaulacaspis pentagona** (TARGIONI-TOZZETTI, 1885) — *Cytisus hirsutum leucotrichus*, 25. 6. 1981, Portoroz, F = 2 (1551). — *Sedum reflexum*, 25. 6. 1981, Portoroz, ♀, ♂, L, F = 4 (1550).

48. **Quadraspidiotus gigas** THIEM et GERNECK, 1934 — *Salix* sp., 7. 5. 1977, Plitvice, F = 3 (717).

49. **Quadraspidiotus labiatarum** (MARCHAL, 1909) — *Thymus pulegioides montanus*, 25. 6. 1981, Portoroz, M♀, L_2, F = 1 (1556).

50. **Quadraspidiotus ostreaeformis** (CURTIS, 1843) — *Ulmus procera*, 27. 6. 1981, Lipica, ♀, F = 2 (1577).

51. **Quadraspidiotus perniciosus** (COMSTOCK, 1881) — *Crataegus* sp., 4. 5. 1977, Osijek, F = 4 (704). — *Pyrus communis*, 7. 5. 1977, Slavonski Brod, F = 4 (712). — *Ribes nigrum*, 7. 5. 1977, Slavonski Brod, ♀, F = 4 (711).

52. **Unaspis euonymi** (COMSTOCK, 1881) — All data from *Euonymus japonica*, 7. 5. 1977, Bastica, F = 3 (724). — 7. 5. 1977, Zadar, F = 2 (725). — 23. 6. 1981, Divaca, F = 4 (1534). — 24. 6. 1981, Portoroz, F = 4 (1540).

Summary. The collectings of scale-insects in Yugoslavia provided 52 species belonging to 8 families: 2 species of Ortheziidae, 1 Margarodidae, 12 Pseudococcidae, 7 Eriococcidae, 1 Cryptococcidae, 14 Coccidae, 1 Cerococcidae and 14 Diaspididae. Three species new to science are illustrated: *Balanococcus mediterraneus* sp. n. (Pseudococcidae), *Gregoporia istriensis* sp. n. and

Rhizococcus evelinae sp. n. (Eriococcidae). 15 species are new to the Yugoslavian scale-insect fauna: *Atrococcus achillea*, *Dysmicoccus walkeri*, *Paroudablis piceae*, *Pseudococcus obscurus*, *Trionymus newsteadi*, *T. perrisi*, *T. radicum* (Pseudococcidae), *Acanthococcus aceris*, *Rhizococcus pseudinsignis* (Eriococcidae), *Exaeretopus formiceticola* (with total figures), *Lecanopsis porifera*, *Parafairmairia gracilis*, *Parthenolecanium rufulum*, *Physokermes hemicryphus* (Coccidae), *Cerococcus cycliger* (Cerococcidae). The occurrence of the genus *Gregoporia* DANZIG, 1979, the boreal *P. gracilis* and *T. radicum* from the south of Yugoslavia are zoogeographically interesting. These are the southernmost data of distribution of these species. Most of the species are of European-Siberian elements, some are cosmopolitan species. Mediterranean ones are also represented in great numbers. From zoogeographical point of view, and on the basis of both literature and our collection data, the scale-insect fauna of Yugoslavia, as has been expected, is very heterogenous. It deserves intensive studies, because it, most probably, still can offer several surprisingly new data especially from the families of Pseudococcidae, Eriococcidae and Coccidae living on grasses and other herbaceous plant species, mainly in karstic and steppe habitats.

Acknowledgement. I wish to express my gratitude for the determination of the host-plants to DR. P. SOLYMOSI, to R. A. VIKTORIN for the preparation of the scale-insects and to DR. E. M. DANZIG for her kind help in the determination of some species.

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ORIBATIDS FROM THE EASTERN PART OF THE ETHIOPIAN REGION. II

S. MAHUNKA

(Received 15 May, 1982)

A study of Oribatid materials collected by DR. A. DEMETER in Ethiopia and DR. T. PÓCS in Tanzania. The description of 20 new species, and four new genera (*Pocsia*, *Tansocepheus*, *Uluguroides*, *Antennoppia*) are given. Supplementary diagnoses and revision of the species of the genus *Nodocepheus* HAMMER, 1958 included.

In the first part of this series of papers I indicated to study the Oribatids of the eastern part of the Ethiopian Region. Thus, these papers are designed for the description of new taxa, and for the partial revision of some genera or species-group. Hereunder I enumerate 20 new species, of which two were collected in Ethiopia and eighteen in Tanzania. I revise all the species of the genus *Nodocepheus* HAMMER, 1958, too.

It is an agreeable duty of the author to express his thanks also in this place to DR. A. DEMETER and its family and DR. T. PÓCS for their invaluable work by the collecting of this material.

LIST OF LOCALITIES

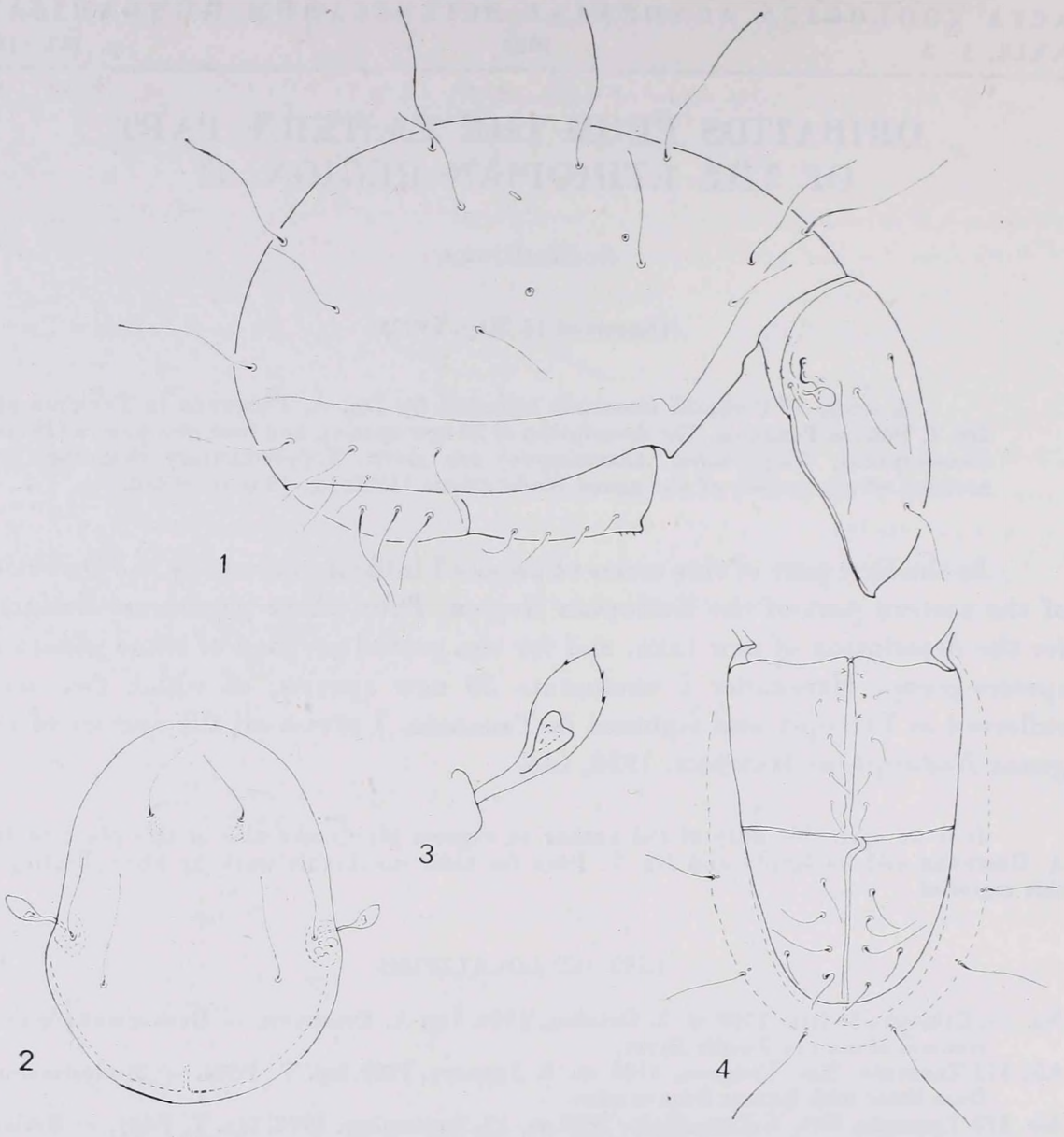
No. 107 Ethiopia, Sodere, 1400 m. 5. October, 1980. leg. A. DEMETER. — Berlese-sample from wet soil along the Awash River.
Afr. 175 Tanzania, Mts. Uluguru, 2100 m. 1. January, 1980. leg. T. PÓCS. — Berlese-sample from litter with humus from stones.
Afr. 178 Tanzania, Mts. Kilimandjaro, 2850 m. 19. September, 1972. leg. T. PÓCS. — Berlese-sample from *Sphagnum* of *Erica* arborea wood, near Umbwe.

Archiphthiracarus pocsi sp. n.

Measurements. — Length of aspis: 216 μm, length of notogaster: 375 μm, height of notogaster: 265 μm.

A s p i s (Fig. 2): Lateral carina fine, long; median ridge absent. Lateral rim complete. All prodorsal setae thin, rostral seta about as long as lamellar ones. Interlamellar setae not reaching the insertion point of rostral ones. Sensillus (Fig. 3) short, its head clavate, slightly lanceolate, with some squama on its margin.

N o t o g a s t e r (Fig. 1): Notogastral setae fine, thin, filiform. Setae c_1 and c_3 originating on the collar line, c_2 more distant from it than the latter



Figs 1—4. *Archiphthiracarus pocsi* sp. n. — 1 = lateral side, 2 = aspis, 3 = sensillus, 4 = anogenital region

two. Setae c_1, d_1, e_1, h_1 and ps_1 mostly curved and flagellate, all long, much longer than c_3, cp, h_3 and ps_2.

Anogenital region (Fig. 4): Anoadanal plate has 5 pairs of setae, 3 pairs of adanal setae much shorter than the 2 pairs of anal ones of equal length, setae ad_1 and ad_2 little shorter than ad_1.

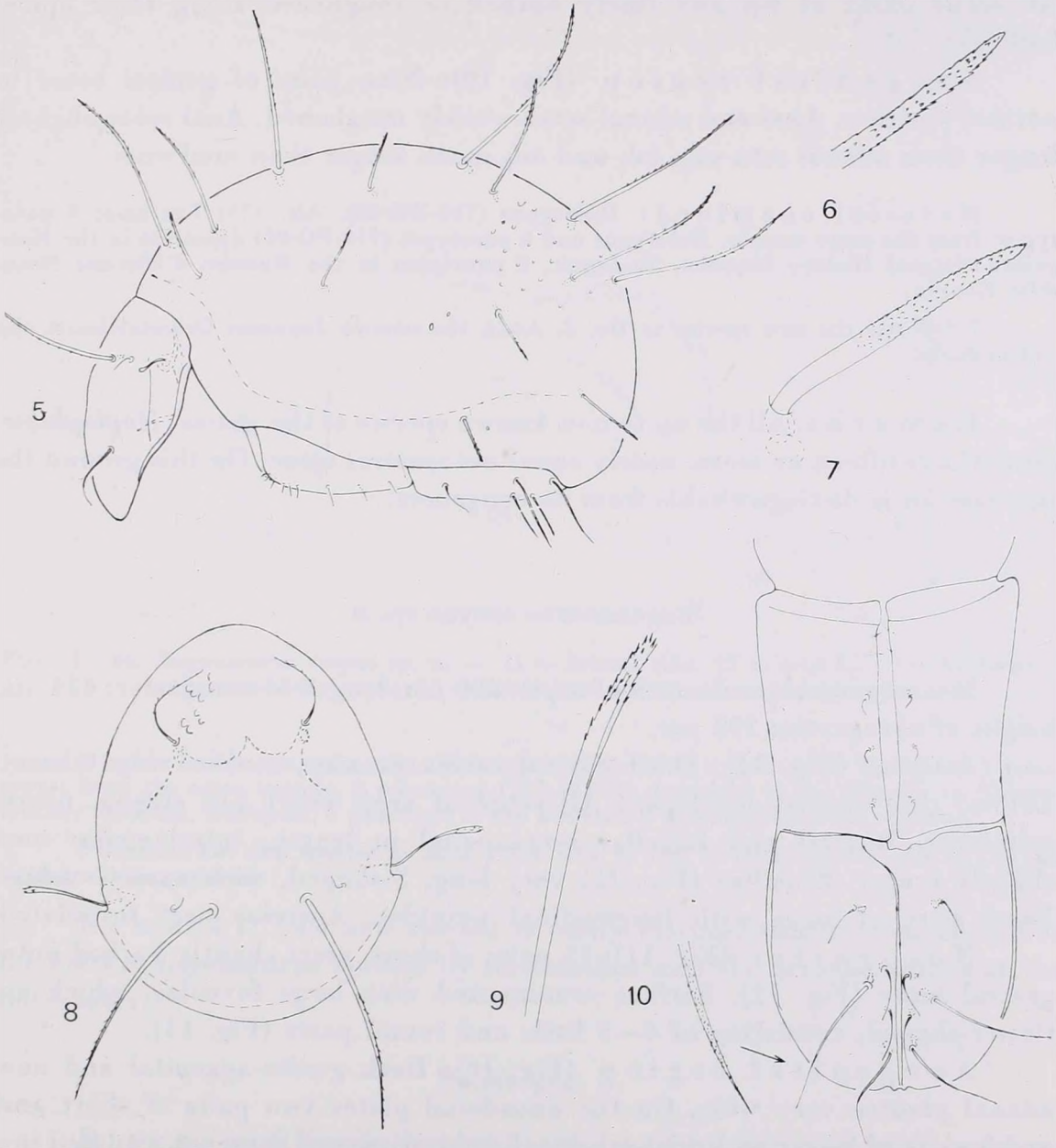
Material examined: Holotypus (715-HO-82): Afr. 178: Tanzania; 2 paratypes: from the same sample. Holotypus and 1 paratype (715-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

I dedicate the new species to Dr. T. Pócs, for collecting this outstanding material.

R e m a r k s. The present new species well characterised by 1. the short, but nearly equal setae of aspis, 2. the position of c_1—c_2—c_3 setae, 3. ratio of c_1—h_1 and c_3, h_3, ps_3 setae, 4. ratio of length of anogenital region. The latter characteristic highly resembles that of *A. gibber* AOKI, 1980, but the other features are different.

Hoplophthiracarus aokii sp. n.

Measurements. — Length of aspis: 285—449 μm, length of notogaster: 587—984 μm, height of notogaster: 372—588 μm.



Figs 5—10. *Hoplophthiracarus aokii* sp. n. — 5 = lateral side, 6 = seta c_1, 7 = seta h_2, 8 = aspis, 9 = distal part of sensillus, 10 = anogenital region

A s p i s (Fig. 8): Lateral carina short, nearly straight. No median ridge present. A fine, curved line between the rostral setae. Rostral setae directed inwards, almost curved, much longer than the minute lamellar ones. Exobothridial setae also minute. Interlamellar setae thick and erect, weakly bending posteriorly at tip, finely roughened on its anterior part. Sensillus (Fig. 9) slightly clavate, but without typical head. Surface of its end finely squamose.

N o t o g a s t e r (Fig. 5): The surface of notogaster ornamented with very indistinct foveolae. There are only 14 (!) pairs of notogastral setae present, great difference in lengths. Setae c_3, cp, d_2, h_3, ps_2 and ps_3 very short; c_1 (Fig. 6), d_1, e_1 etc. much longer, a third or more longer than the others. All setae blunt at tip and finely barbed or roughened along their apical half (Fig. 7).

A n o g e n i t a l r e g i o n (Fig. 10): Nine pairs of genital setae in normal position. Anal and adanal setae weakly roughened. Anal setae slightly longer than adanal seta ad_3, ad_1 and ad_2 much longer than anal ones.

M a t e r i a l e x a m i n e d : Holotypus (716-HO-82): Afr. 175: Tanzania; 8 paratypes: from the same sample. Holotypus and 6 paratypes (716-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

I dedicate the new species to Dr. J. Aoki, the renown Japanese Oribatidologist and soil zoologist.

R e m a r k s. All the up to now known species of the genus *Hoplophthiracarus* have fifteen or more, nearly equal notogastral setae. On this ground the new species is distinguishable from its congeners.

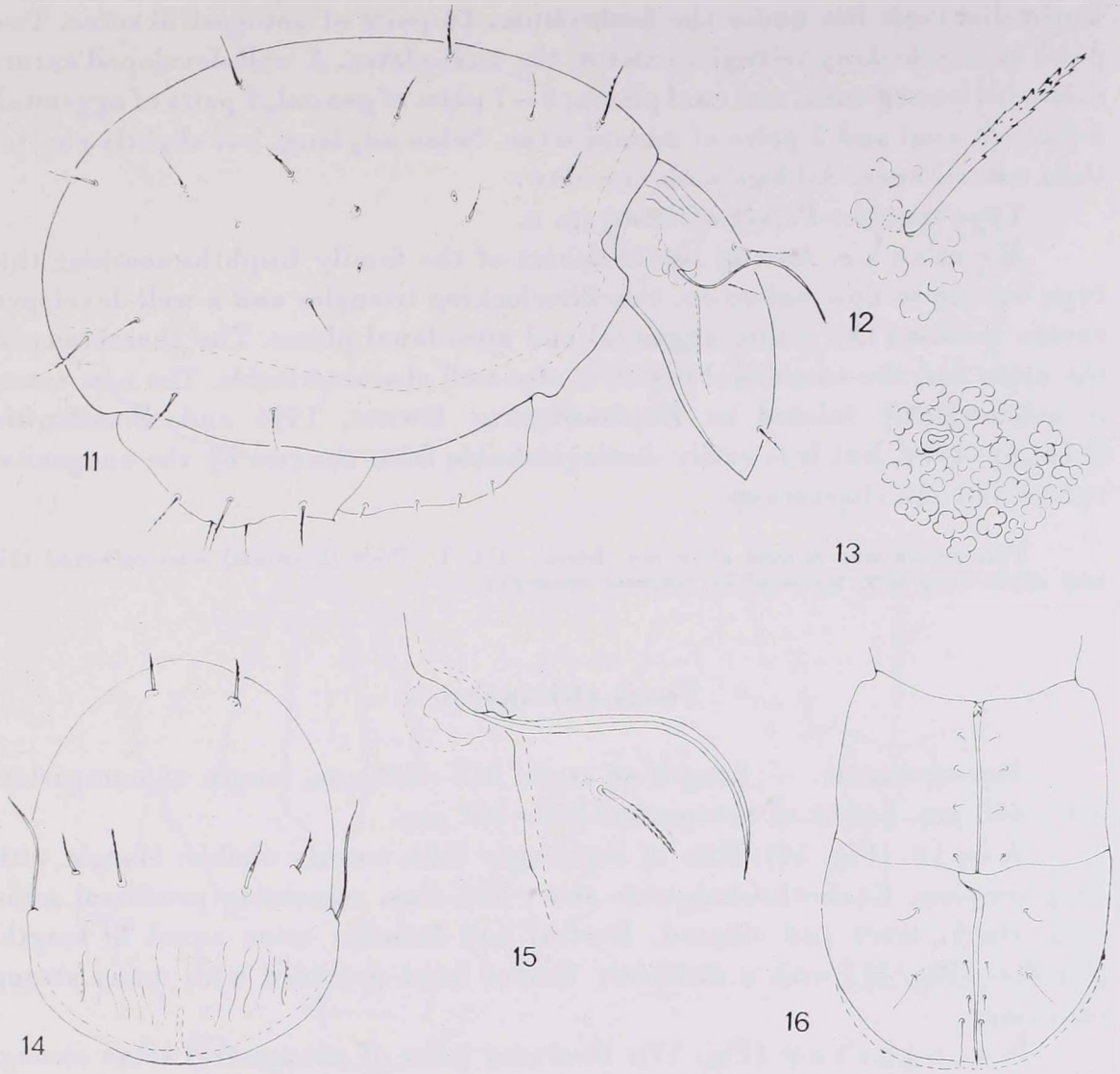
Steganacarus sacyae sp. n.

Measurements. — Length of aspis: 236 μm, length of notogaster: 424 μm, height of notogaster: 298 μm.

A s p i s (Fig. 14): Short curved carina present, median ridge absent. Lateral rim weakly developed. All setae of aspis short but strong, nearly spiniform. Rostral and lamellar setae equal in length, interlamellar ones slightly longer. Sensillus (Fig. 15) very long, S-shaped, with narrow velum. Basal part of aspis with longitudinal wrinkles. Anterior part foveolated.

N o t o g a s t e r (Fig. 11): 15 pairs of short, erect slightly barbed notogastral setae (Fig. 12). Surface ornamented with large foveolae, which are flower-shaped, consisting of 4—5 little and round parts (Fig. 13).

A n o g e n i t a l r e g i o n (Fig. 16): Both genito-aggenital and anoadanal plantes very wide. On the anoadanal plates two pairs of short anal and 3 pairs of longer and thicker adanal setae originate. Setae ad_1 situated in a longitudinal line with an_1—an_2.



Figs 11—16. *Steganacarus sacyae* sp. n. — 11 = lateral side, 12 = seta h_2, 13 = sculptur of notogaster, 14 = aspis, 15 = trichobotrium, 16 = anogenital region

Material examined: Holotypus (717-HO-82): Afr. 178: Tanzania; 3 paratypes: from the same sample. 2 paratypes (717-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

I dedicate the new species to Sacy Pócs, wife of Dr. T. Pócs, for her help in the collecting of this material.

Remarks. This new species is easily distinguishable from all the so far known *Steganacarus* species by its sensillus and the ornamentation of the notogaster.

Pocsia gen. n.

Diagnosis. Family Euphthiracaridae. Aspis with one weak carine on each side. Rostral setae originating far from rostrum, near to lamellar ones.

Bothridial scale lies under the bothridium. 14 pairs of notogastral setae. Two pairs of interlocking triangles exist in the anal plates. A well-developed suture exists between genital and anal plates; 6—7 pairs of genital, 2 pairs of aggenital, 3 pairs of anal and 3 pairs of adanal setae. Setae an_3 long, but slightly shorter than adanal ones. All legs with one claw.

Type species: *Pocsia africana* sp. n.

Remarks. Among the members of the family Euphthiracaridae this type was up to now unknown, two interlocking triangles and a well-developed suture between the genito-aggenital and anoadanal plates. The chaetotaxy of the aspis and the anoadanal region is also well characterisable. The new taxon is most closely related to *Euphthiracarus* EWING, 1916 and *Brasilotritia* MÄRKEL, 1964, but it is easily distinguishable from the two by the anogenital suture and the chaetotaxy.

This genus was named after my friend, DR. T. PÓCS (botanist) who collected this and other very rich material in tropical countries.

Pocsia africana sp. n.

Measurements. — Length of aspis: 212—220 μm, length of notogaster: 386—408 μm, height of notogaster: 270—281 μm.

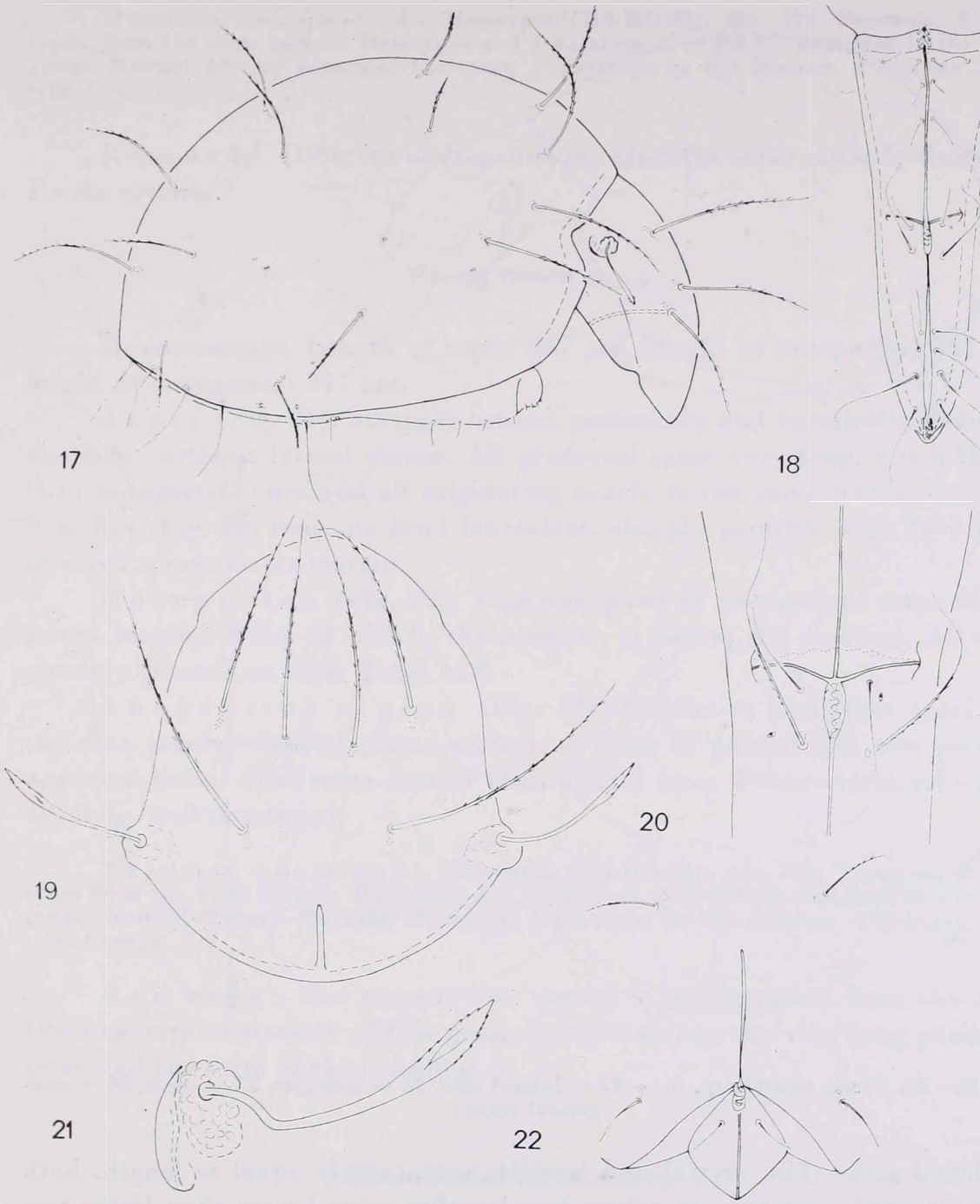
Aspis (Fig. 19): Rim of aspis very thin, weakly visible. Margin with deep incision. Exobothridial setae short and fine, remaining prodorsal setae long, thick, erect and ciliated. Rostral and lamellar setae equal in length. Sensillus (Fig. 21) with a distinctly dilated head provided with many strong squamae.

Notogaster (Fig. 17): Fourteen pairs of notogastral setae strong, distinctly ciliated. Among them d_1, d_2, d_3, ps_2 and ps_3 much shorter than the others. Four pairs of lyrifissures and a pair of gland well visible.

Anogenital region (Fig. 18): On the basal part of genito-aggenital plates only 3 pairs of genital and 2 pairs of aggenital setae present, on the anterior part of this plate further 3—4 pairs visible. The posterior genital setae much longer than the others. Both pairs of interlocking triangles (Fig. 20) thin. Three pairs of anal and 3 pairs of adanal setae present seta ad_3 about twice as long as a_3. Fissura terminalis (Fig. 22) long.

Material examined: Holotypus (718-HO-82): Afr. 175: Tanzania; 16 paratypes: from the same sample. Holotypus and 14 paratypes (718-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks. The present new species is closely related to the following ones, but it is easily distinguishable from them by the ratio of the notogastral setae.

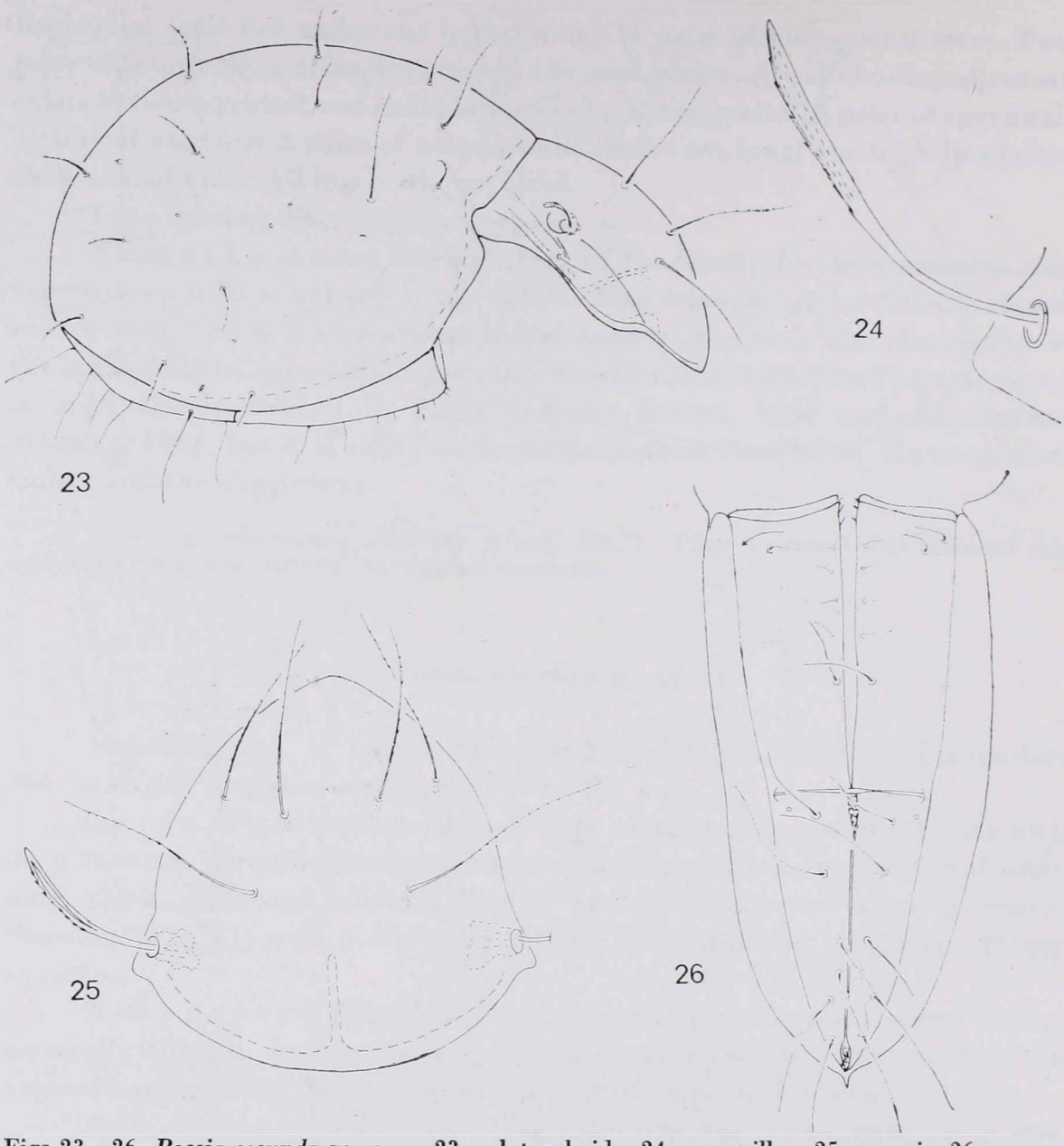


Figs 17—22. *Pocsia africana* sp. n. — 17 = lateral side, 18 = anogenital region, 19 = aspis, 20 = interlocking triangle, 21 = sensillus, 22 = fissura terminalis

Pocsia secunda sp. n.

Measurements. — Length of aspis: 323—359 μm, length of notogaster: 650—726 μm, height of notogaster: 520—550 μm.

Aspis (Fig. 25): Rim of aspis discernible, suddenly narrowing anteriorly. A weakly developed lateral carina on each side of aspis visible. All



Figs 23—26. *Pocsia secunda* sp. n. — 23 = lateral side, 24 = sensillus, 25 = aspis, 26 = anogenital region

prodorsal setae thin, rostral and lamellar setae nearly equal in length, both pairs situated near to each other; interlamellar setae longer than latter two pairs, exobothridial setae minute. Sensillus (Fig. 24) gradually thickening, without well separated head, with some short cilia.

N o t o g a s t e r (Fig. 23): Fourteen pairs of notogastral setae present, two pairs of them long, thin flagellate; all other short, curved, blunt at tip. Four pairs of lyrifissures well visible.

A n o g e n i t a l r e g i o n (Fig. 26): Resembling the other recently described *Pocsia* species, but on the posterior part of genito-aggenital plates 6 pairs genital and 2 pairs of aggenital setae present.

Material examined: Holotypus (719-HO-82): Afr. 175: Tanzania; 2 paratypes: from the same sample. Holotypus and 1 paratype (719-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks. Differential diagnosis see after the other recently described *Pocsia* species.

Pocsia trenta sp. n.

Measurements: Length of aspis: 257 μm, length of notogaster: 441 μm, height of notogaster: 347 μm.

Aspis (Fig. 31): Strongly convex posteriorly and anteriorly, flattened medially, without lateral carina. All prodorsal setae very long, much longer than notogastral ones and all originating nearly in the same transversal line. Sensillus (Fig. 28) long, its head lanceolate, sharply pointed, with 2—3 pairs of small spines on its margin.

Notogaster (Fig. 27): Fourteen pairs of notogastral setae of different lengths. Setae *cp* and h_1 the hongest, c_2 and c_3 the shortest. All setae strongly ciliated on their distal half.

Anogenital region (Fig. 29): Similar to the other species of the new genera. Genital plates with 5—6 pairs of genital and two pairs of aggenital setae. Anal setae shorter than adanal ones. Fissure terminalis (Fig. 30) long, well developed.

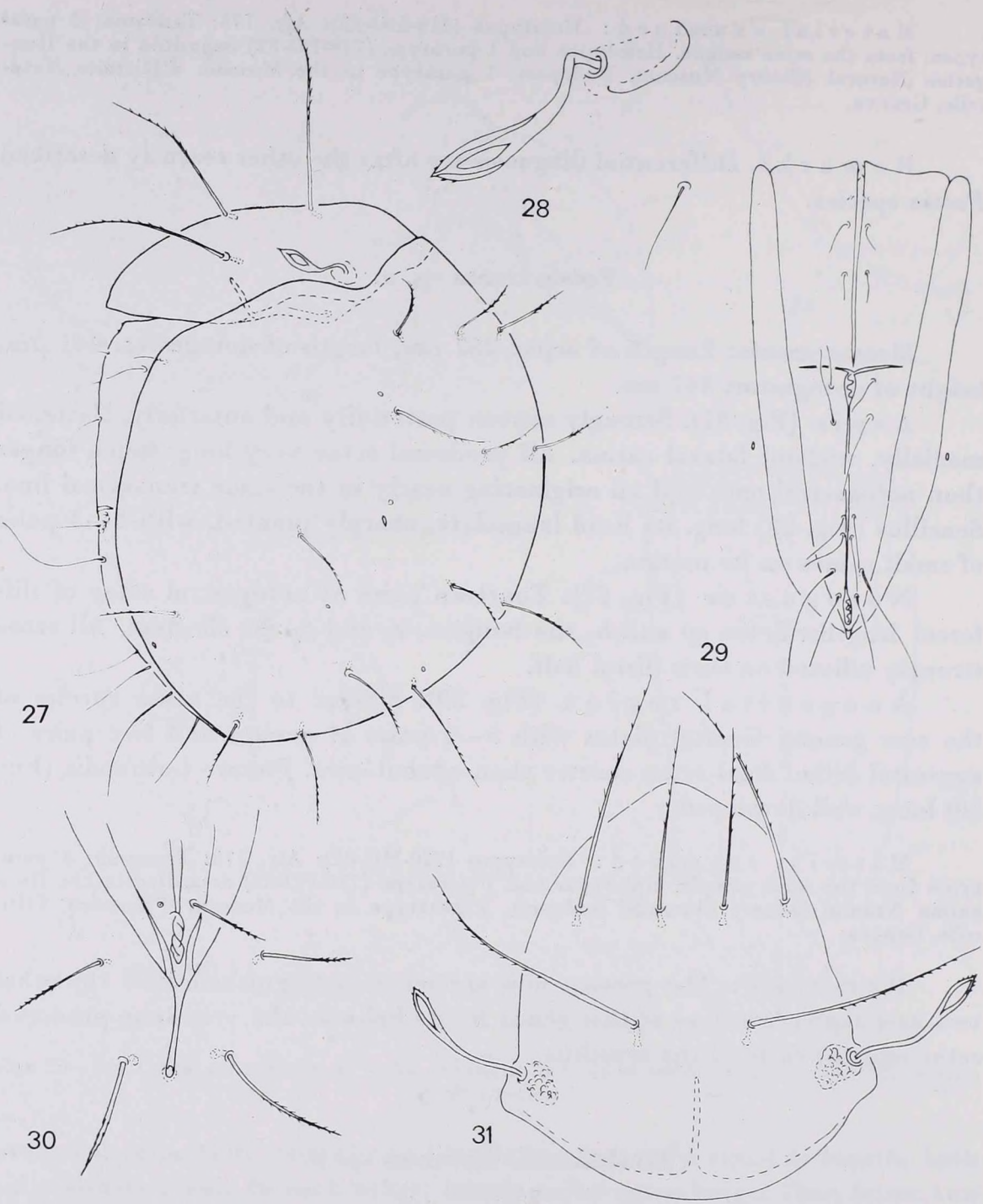
Material examined: Holotypus (720-HO-82): Afr. 178: Tanzania; 2 paratypes from the same sample. Holotypus and 1 paratype (720-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The present new species is distinguished from the other two new representatives of this genus by its habitus, the very long prodorsal setae and the form of the sensillus.

Liochthonius africanus sp. n.

Measurements. — Length: 176—184 μm, width: 108—113 μm.

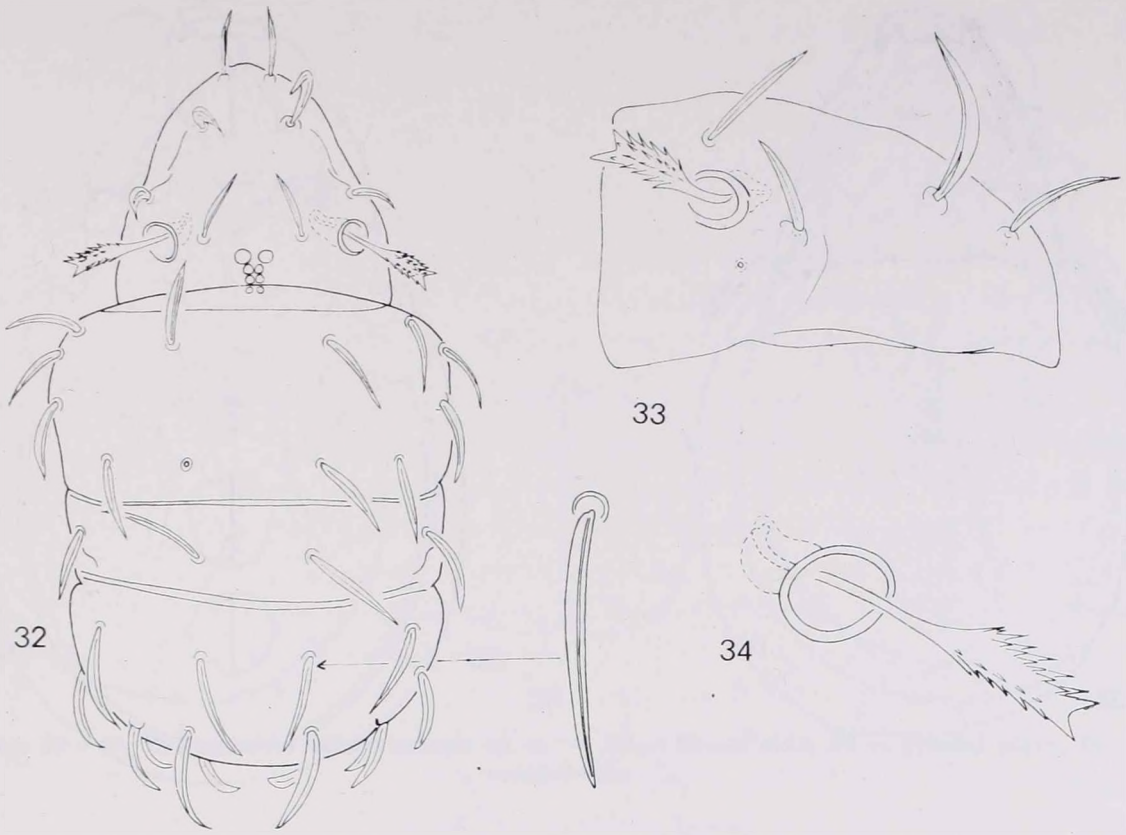
Dorsal side (Fig. 32): Prodorsum wide, rostrum rounded. All prodorsal setae broadened, phylliform, their margin smooth. Rostral, interlamellar and exobothridial setae of about equal length, lamellar ones much longer (Fig. 33). Sensillus (Fig. 34) with a well developed, excised head, on its surface 6—7 spines in 4—5 longitudinal rows. Four pairs of small spots in the interbothridial region, first pairs not connected in the middle, the others three situated close to each other directly.



Figs 27—31. *Pocsia trenta* sp. n. — 27 = lateral side, 28 = sensillus, 29 = anogenital region, 30 = fissura terminalis, 31 = aspis

Ventral side: No significant difference among this and the other species of the genus *Liochthonius* VAN DER HAMMEN, 1959.

Material examined: Holotypus (721-HO-82): Afr. 175: Tanzania; 10 paratypes: from the same sample. Holotypus and 8 paratypes (721-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.



Figs 32—34. *Liochthonius africanus* sp. n. — 32 = dorsal side, 33 = prodorsum from lateral side, 34 = sensillus

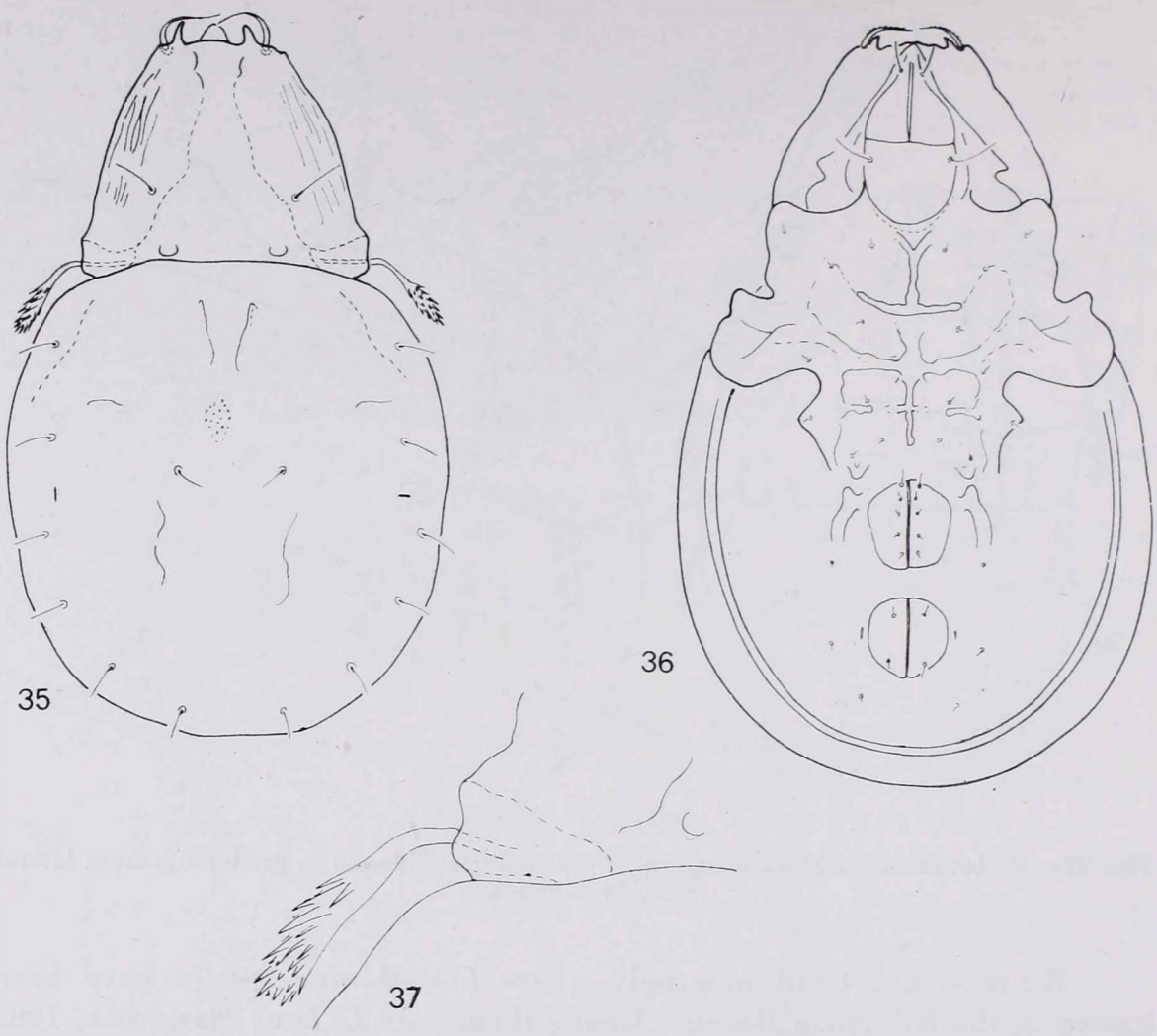
Remarks. Until now only a few *Liochthonius* species have been known in the Ethiopian Region. Among them only *L. latus* MAHUNKA, 1982 has phylliform, about equal notogastral setae, but its setae are ornamented with serrated velum.

Microtegaeus cervus sp. n.

Measurements. — Length: 277—306 μm, width: 179—187 μm.

Dorsal side (Fig. 35): Rostrum triangulate, but its apex rounded. Lamellae with horn-shaped expansion, their surface rugose. Lamellar setae thick and strong, interlamellar setae much thinner, but not shorter than the preceding ones. Posteriorly, in the interbothridial region one pair of lobiform chitinous structure. Sensillus (Fig. 37) with long, curved peduncle, its head directed backwards, with strong, dilated cilia. Notogaster with some weak ridge-like elevations longitudinally. Its surface granulated. Ten pairs of well-visible notogastral setae, 7 pairs much longer than the other three in postero-marginal position.

Ventral side (Fig. 36): Pedotecta 2—3 very large, rounded posteriorly. Apodemes and epimeral setae similar to those of other represen-



Figs 35—37. *Microtegaeus cervus* sp. n. — 35 = dorsal side, 36 = ventral side, 37 = trichobothrium

tatives of this genus. Five pairs of genital setae present, originating in a longitudinal line. Aggenital, anal and two pairs of adanal setae very minute.

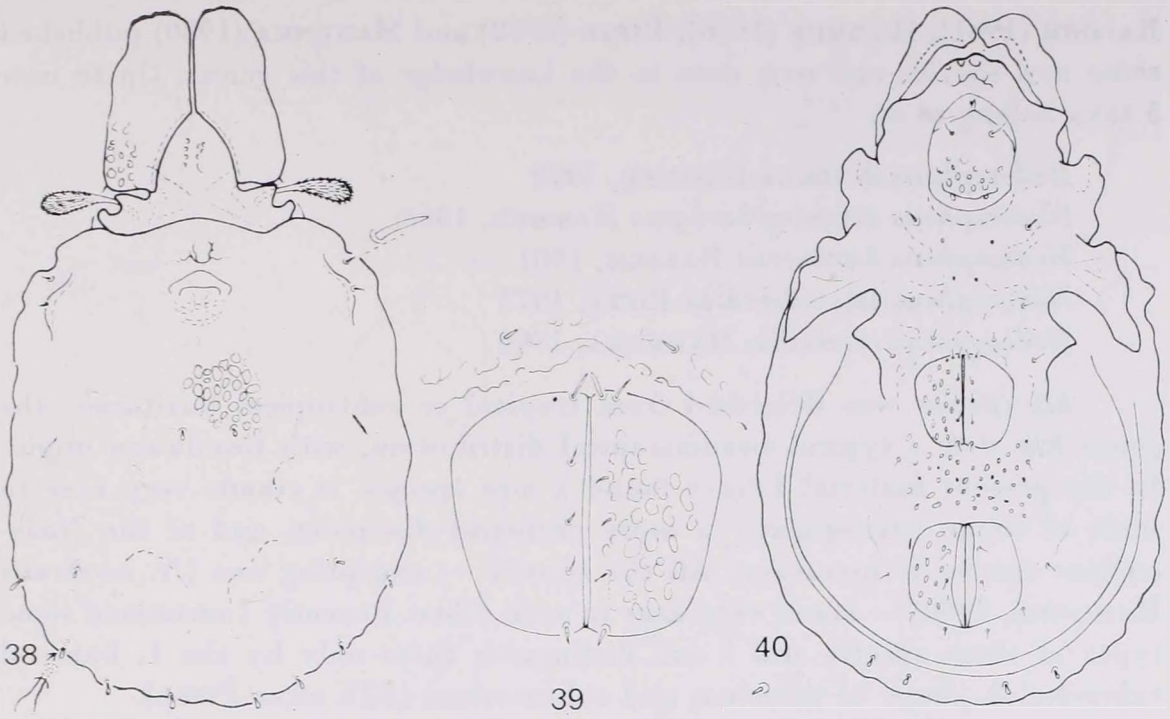
Material examined: Holotypus (722-HO-82): Afr. 175: Tanzania; 9 paratypes: from the same sample. Holotypus and 7 paratypes (722-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is distinguished from all the other representatives of this genus by the horn-shaped protuberance of the lamellae.

Eremaeozetes bituberculatus sp. n.

Measurements. — Length: 408—449 μm, width: 242—253 μm.

Dorsal side (Fig. 38): Rostrum rounded, lamellae very wide, with upcurving cuspis. Lamellar setae hardly visible. Stalk of sensillus short,



Figs 38—40. *Eremaeozetes bituberculatus* sp. n. — 38 = dorsal side, 39 = genital plate, 40 = ventral side

clavate clavus densely ciliate. Notogaster with a knob-shaped chitinous formation before a triangular one, beyond this two spots present. Notogastral surface with a rough, polygonal or foveolate sculpture, with some depressions or laths and humeral tubercles laterally. Ten pairs of short but thick notogastral setae. Two pairs arising in the humeral region, one pair medially. They are spiniform or slightly dilated in the lateromarginal region.

Ventral side (Fig. 40): Pedotecta very large, *Pd* 2—3 with a long projection posteriorly. Epimeral setae minute, hardly visible. Genital plates (Fig. 39) and anogenital region ornamented with large foveolae. Six pairs of genital, one pair of aggenital, two pairs of anal and two pairs of adanal setae present. All minute.

Material examined: Holotypus (723-HO-82): Afr. 175: Tanzania; 2 paratypes: from the same sample. Holotypus and 1 paratype (723-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: No species of the genus *Eremaeozetes* Berlese, 1913 was up to now known with one knob-shaped formation before the spots.

Nodocepheus Hammer, 1958

It was created by Hammer, 1958: 64 based on the type *Nodocepheus dentatus* Hammer, 1958 with original designation from Argentina. After them

BALOGH (1961), HAMMER (1966), PIFFL (1972) and MAHUNKA (1980) published some new species and new data to the knowledge of this genus. Up to now 5 taxa belong to it:

Nodocepheus dentatus HAMMER, 1958
Nodocepheus dentatus barbatus HAMMER, 1966
Nodocepheus hammerae BALOGH, 1961
Nodocepheus laterodentatus PIFFL, 1972
Nodocepheus cerebralis MAHUNKA, 1980

All species was described from tropical or subtropical territories, the genus has now a typical circumtropical distribution, with Gondwana origin. In the present material I have found a new species, it stands very near to some of them, consequently a more profound discussion and of the *Nodocepheus* species is necessary. All the species — excepting one (*N. cerebralis* MAHUNKA, 1980) — stand very near to each other. Recently I examined some types of these species and I can distinguish them only by the 1. humeral tubercles, 2. shape of tutorium and subtutorium (*STh* after PIFFL).

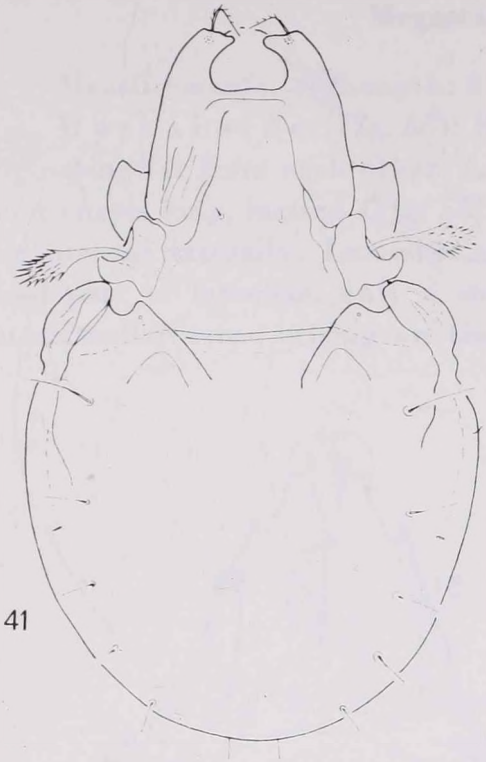
The shape of sensillus and the chaetotaxy of the body are only of secondary significance. On the ground of the examined and re-examined material and the literature I give some additional figures of the previously described species and a key for the identification of the *Nodocepheus* species.

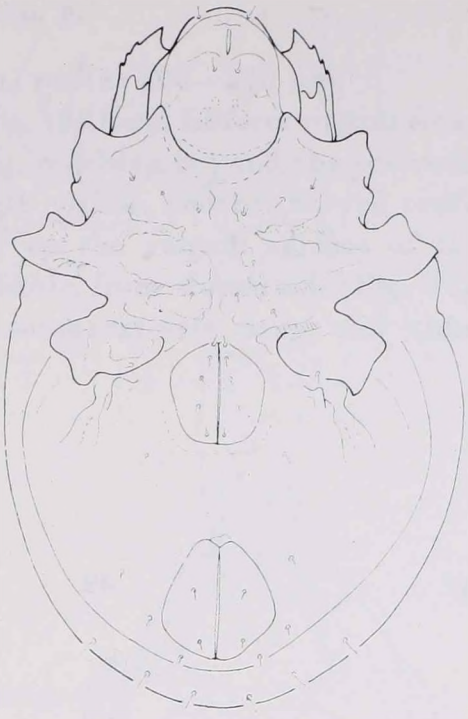
Nodocepheus baloghi sp. n.

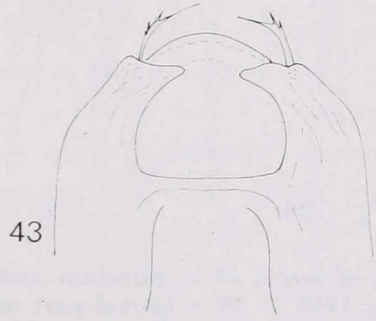
Measurements. — Length: 216—245 μm, width: 138—155 μm.

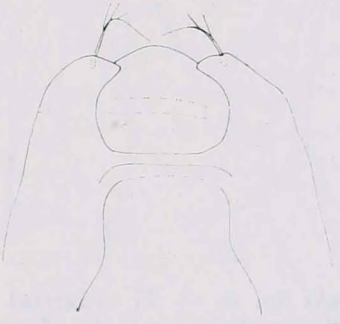
Dorsal side (Fig. 41): Lamellae well developed, connected with well-visible translamella. Cuspis of lamellae (Fig. 43) very wide, concave anteriorly. Rostrum rounded, rostral setae originating on its margin far from each other. Lamellar setae inserted on the cuspis of lamellae, strongly curving inward and with long cilia on their outer margin. Surface of lamellae ornamented with some longitudinal ridges. Interlamellar setae minute, originating before bothridium. Sensillus dilated, well ciliated, all cilia shorter than breadth of clavus. Dorsosejugal region typical. Humeral tubercles well developed, their surface and lateral margin with irregulated sculptures. Anterior part with deep hollow, beside it a triangular tooth with the insertion point of a seta. In addition 9 pairs of notogastral setae present, all — excepting ps_1—ps_3 — arranged submarginally on notogaster. Anterior pair much longer than the other.

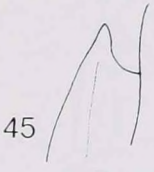
Ventral side (Fig. 42): Tutorium with 4—5 small teeth marginally. Shape of subtutorium as shown in Fig. 46. Shape of pedotecta (Fig. 48) very characteristic. Pedotecta 2 with long, sharp projections laterally. Discidium rounded. All epimeral setae minute, hardly discernible, epimeral setal formula

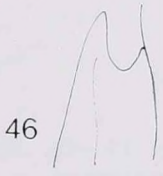












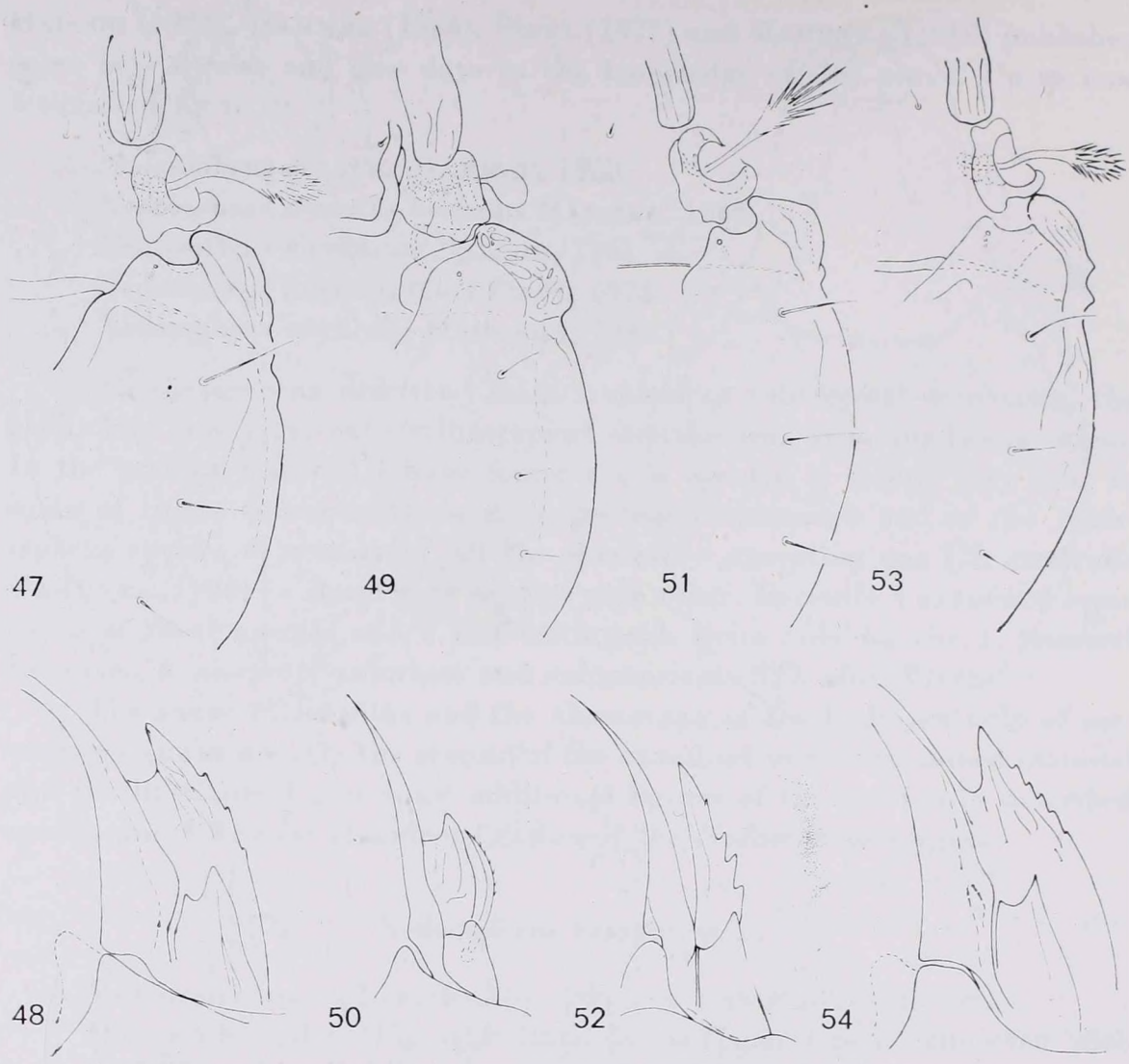
Figs 41—43 and 46. *Nodocepheus baloghi* sp. n. — 41 = dorsal side, 42 = ventral side, 43 = lamellae, 46 = subtutorium. — Figs 44—45. *Nodocepheus hammerae* BALOGH, 1961 — 44 = lamellae, 45 = subtutorium

3—1—3—3. Five pairs of minute genital setae present, they originating in a longitudinal line. One pair of aggenital, 2 pairs of anal and 3 pairs of adanal setae also minute.

Material examined: Holotypus (724-HO-82): Afr. 172: Tanzania; 5 paratypes: from the same sample. Holotypus and 4 paratypes (724-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

I dedicate the new species to Prof. Dr. J. BALOGH, my teacher and friend.

Remarks: The new species is distinguished from the other congeners by the shape of subtutorium and the shape of humeral projection. The known *Nodocepheus* species may be distinguished by the following key:



Figs 47—48. *Nodocepheus baloghi* sp. n. — 47 = lateral part of body, 48 = tutorium and subtutorium. — Figs 49—50. *Nodocepheus cerebralis* MAHUNKA, 1980 — 49 = lateral part of body, 50 = tutorium and subtutorium. — Figs 51—52. *Nodocepheus dentatus* HAMMER, 1958 — 51 = lateral part of body, 52 = tutorium and subtutorium. — Figs 53—54. *Nodocepheus hammerae* BALOGH, 1961 — 53 = lateral part of body, 54 = tutorium and subtutorium

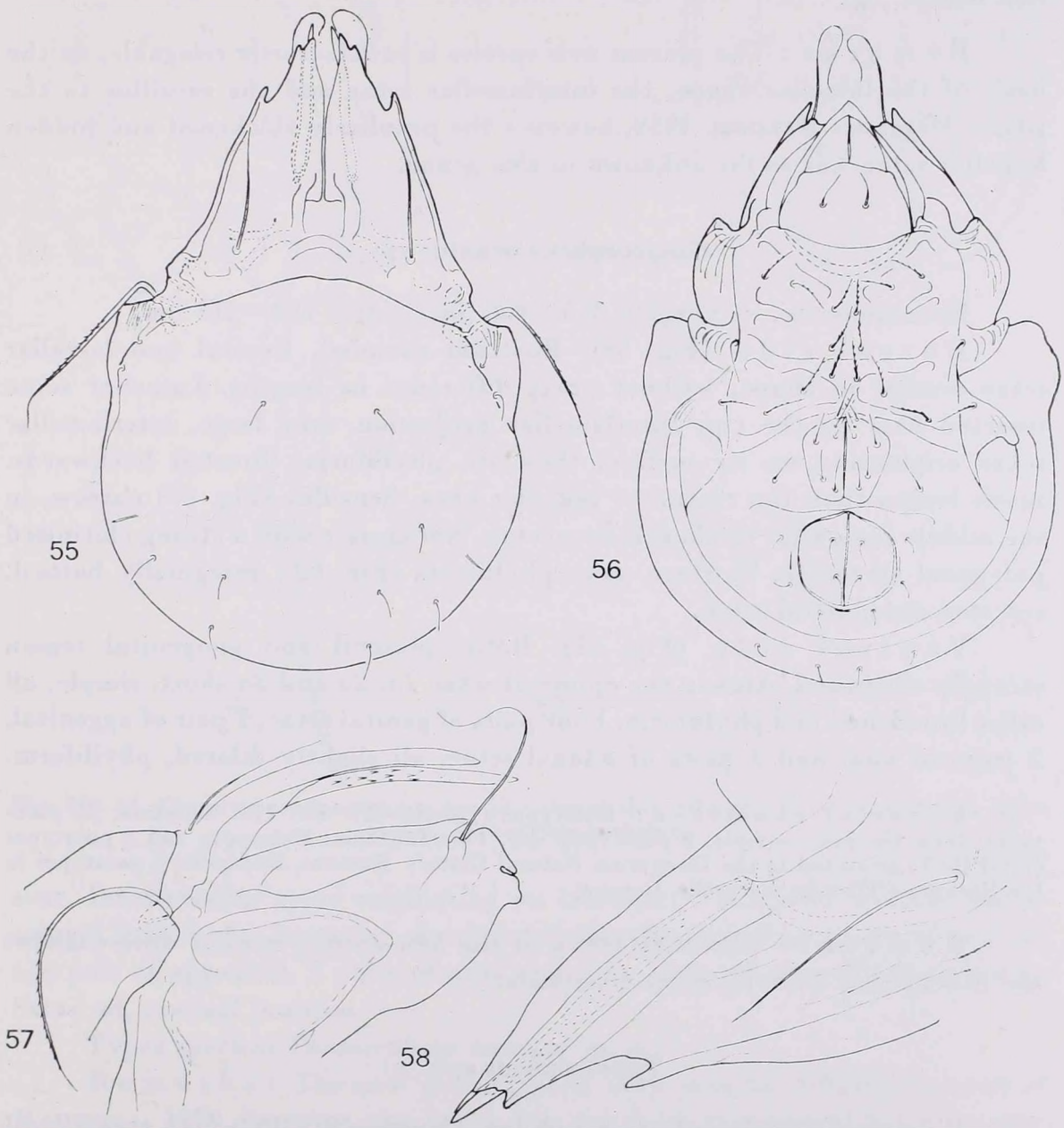
1 (2) Sensillus short, round, strongly claviform. Humeral apophysis rounded, with curved wrinkles, cerebriform (Figs 49, 50) **cerebralis** MAHUNKA, 1981
2 (1) Sensillus long, elongated, with longer cilia. Humeral apophysis of another form and structure.
3 (4) Humeral apophysis with two sharp teeth laterally. Sensillus slightly barbed (Figs 44, 45, 53, 54) **hammerae** BALOGH, 1961
4 (3) Humeral apophysis rounded laterally.
5 (8) Sensillus with very long peduncle, only its distal end ciliated.
6 (7) Head of sensillus with some thick spines **laterodentatus** PIFFL, 1972
7 (6) Head of sensillus with small cilia **barbatus** HAMMER, 1966*
8 (5) Sensillus with gradually thickening head, surface with longer spines.
9 (10) Tectum with 5—6 teeth laterally. Sensillus with very long spines (Figs 51, 52) **dentatus** HAMMER, 1958
10 (9) Tectum with 2—3 teeth laterally. Sensillus more penicillate, with shorter spines (Figs 47, 48) **baloghi** sp. n.

* *Nodocepheus dentatus* var. *barbatus* HAMMER, 1966 = *N. barbatus* HAMMER, 1966 **stat. n.**

Megazetes tanzicus sp. n.

Measurements. — Length: 314—346 μm, width: 208—220 μm.

D o r s a l s i d e (Fig. 55): Rostrum wide, the long, filiform rostral setae originating far from each other. Lamellae long, reaching beyond the rostrum. Their cuspis long, incised (Fig. 58), so two teeth visible, another curved tooth also present laterally. Lamellar setae arising on the ventral surface of the basal part of lamellae, only a small part visible from dorsal side (Fig. 57). Interlamellar setae arising on the lamellae, comparatively long and thin.



Figs 55—58. *Megazetes tanzicus* sp. n. — 55 = dorsal side, 56 = ventral side, 57 = lateral part of prodorsum, 58 = lamellae

Sensillus reclinate, filiform, ciliated laterally. Nine pairs of thin, short notogastral setae present.

Ventral side (Fig. 56): All pedotecta with longitudinal wrinkles. Epimeral surface smooth. Epimeral setae about equal in length, *3a* thicker than the others. Six pairs of long, simple genital, 1 pair of similar aggenital setae present. Anal and adanal setae shorter than the earlier ones. Between the anal and genital opening a transversal ridge present.

Material examined: Holotypus (725-HO-82): Afr. 175: Tanzania; 3 paratypes: from the same sample. Holotypus and 2 paratypes (725-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The present new species is satisfacrorily relegable, on the basis of the lamellar shape, the interlamellar setae and the sensillus to the genus *Megazetes* Balogh, 1959, however the peculiarly thickened and hidden lamellar setae was so far unknown in this genus.

Congocepheus ornatus sp. n.

Measurements. — Length: 350—408 μm, width: 180—213 μm.

Dorsal side (Fig. 59): Rostrum rounded. Rostral and lamellar setae similar in shape, without great difference in lengths. Lamellar setae inserted near to the tip. Interlamellar projection very large, interlamellar setae originating on its surface, they are phylliform, directed backwards, much longer than the rostral or lamellar ones. Sensillus (Fig. 63) narrow, in the middle somewhat thickened, recurving. Notogaster with a strong chitinised polygonal structure. Thirteen pairs phylliform (Fig. 62), marginally barbed, serrated notogastral setae.

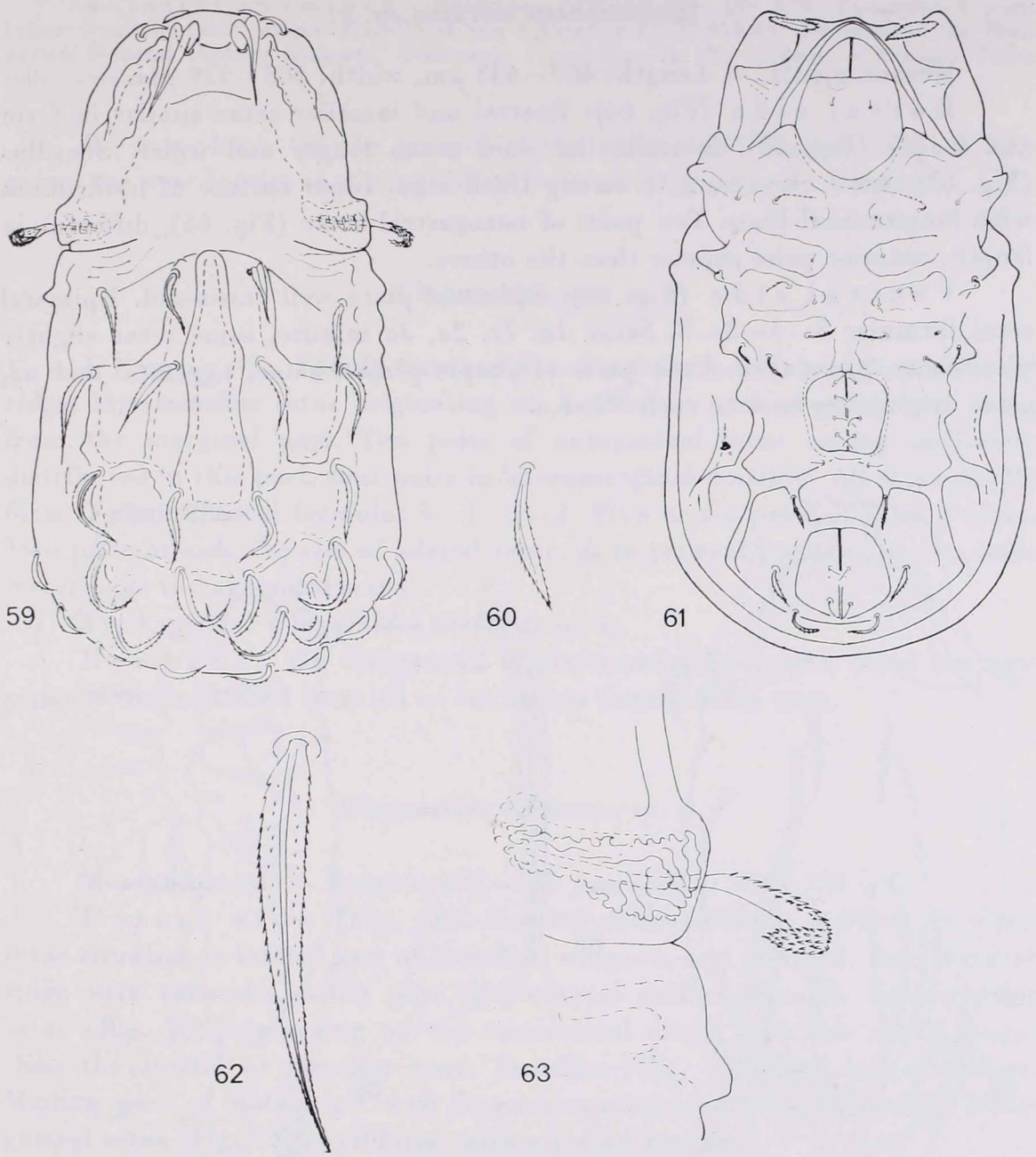
Ventral side (Fig. 61): Both epimeral and anogenital region strongly chitinized. Among the epimeral setae *1a*, *2a* and *3a* short, simple, all other broadened and phylliform. Four pairs of genital setae, 1 pair of aggenital, 2 pairs of anal and 3 pairs of adanal setae, all slightly dilated, phylliform.

Material examined: Holotypus (726-HO-82): Afr. 175: Tanzania; 25 paratypes: from the same sample; 2 paratypes: Afr. 178: Tanzania; Holotypus and 4 paratypes (726-PO-82) deposited in the Hungarian Natural History Museum, Budapest; 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The chaetotaxy of the new species readily differentiates the new species from all other congeners.

Tansocepheus gen. n.

Diagnosis. Family Carabodidae. Prodorsum with a high transversal ridge, rostral part steeply arched hereunder. Lamellae and translamella pre-



Figs 59—63. *Congocepheus ornatus* sp. n.—59 =dorsal side, 60=ad_3, 61 = ventral side, 62 = seta d_1, 63 = trichobothrium

sent. Interlamellar setae originating on lamellae. Notogaster without dorsosejugal hollow. Its posterior margin stepwise divided. Four pairs of genital, one pair of aggenital, 2 pairs of anal and three pairs of adanal setae present. Setae ad_3 preanal position.

Types species: *Tansocepheus serratus* sp. n.

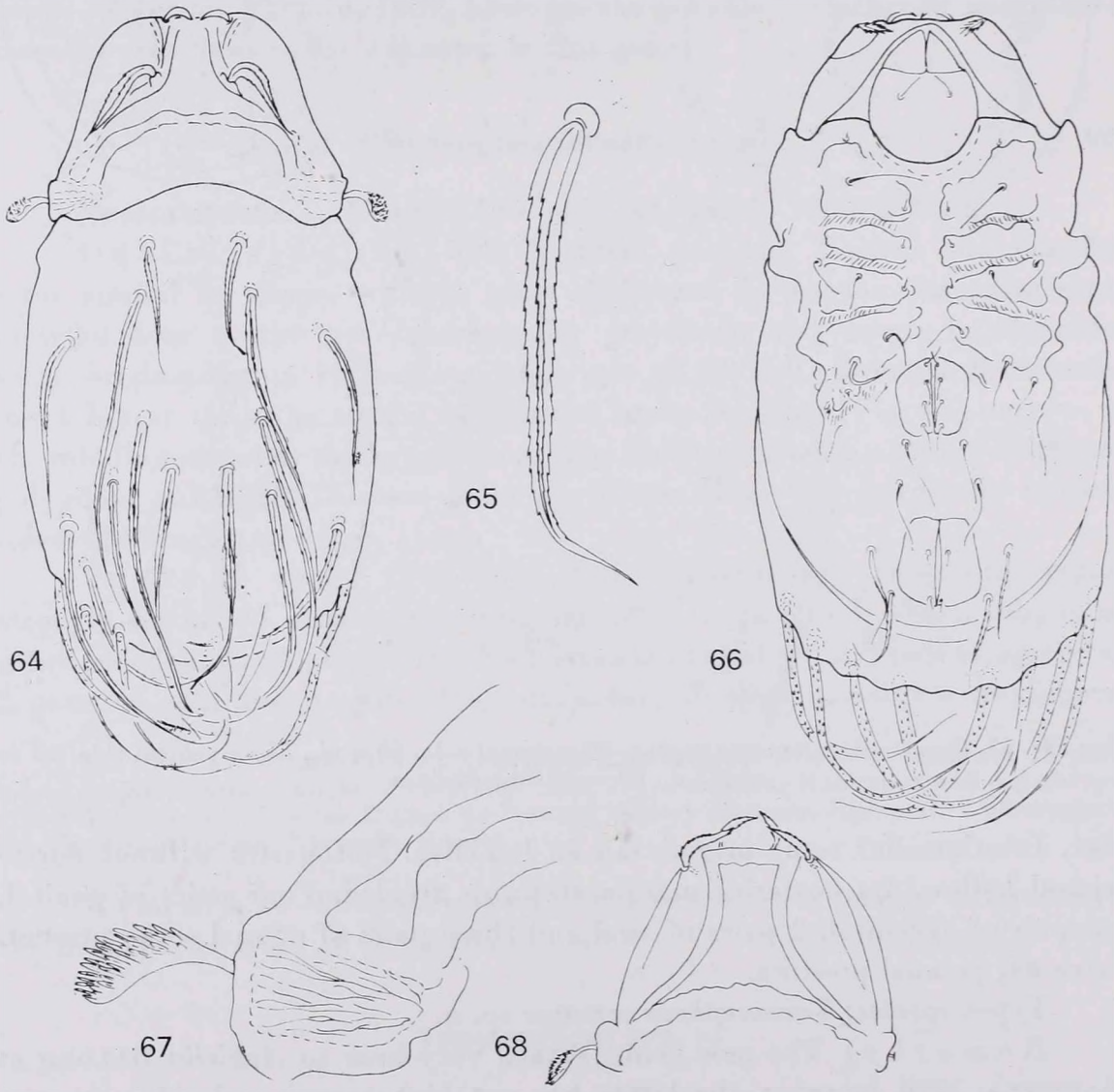
R e m a r k s : The new genus stands very near to *Aokiella* BALOGH et MAHUNKA, 1970, however, the latter has not high transversal ridge on prodorsum and its dorsal chaetotaxy distinguished from the preceding new genera.

Tansocepheus serratus sp. n.

Measurements. — Length: 400—433 μm, width: 208—229 μm.

Dorsal side (Fig. 64): Rostral and lamellar setae similar in form and length (Fig. 68), interlamellar ones much longer and wider. Sensillus (Fig. 67) short, clavate, with strong thick cilia. Inner surface of bothridium with longitudinal lines. Ten pairs of notogastral setae (Fig. 65), different in length, anterior pairs shorter than the others.

Ventral side (Fig. 66): Epimeral plate well chitinised. Epimeral setal formula: 3—1—3—3. Setae *1a*, *1c*, *2a*, *3a* minute, some setae slightly phylliform, broadened. Four pairs of simple genital setae, aggenital and ad_3 setae originating near to each other.



Figs 64—68. *Tansocepheus serratus* sp. n. — 64 = dorsal side, 65 = seta d_1, 66 = ventral side, 67 = trichobothrium, 68 = lamellae

Material examined: Holotypus (727-HO-82): Afr. 178: Tanzania; 4 paratypes: from the same sample. Holotypus and 3 paratypes (727-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: On the ground of the differential diagnosis of the new genus the new species is distinguished from all so far known congeners.

Uluguroides gen. n.

Diagnosis. Family Carabodidae. Prodorsum with a high transversal ridge, interlamellar setae originating on it. Median part of notogaster rising from the marginal part. Ten pairs of notogastral setae arising uniformly distributed in this part, four pairs in lateromarginal position. All setae phylliform. Epimeral setal formula: 3—1—3—3. Five or six pairs of genital setae. Two pairs of anal, 3 pairs of adanal setae, d_3 in preanal position, at the same distance as the aggenital setae.

Type species: *Uluguroides trichosus* sp. n.

Remarks: On the ground of the number of genital setae the new genus is distinguished from all so far known Carabodidae taxa.

Uluguroides trichosus sp. n.

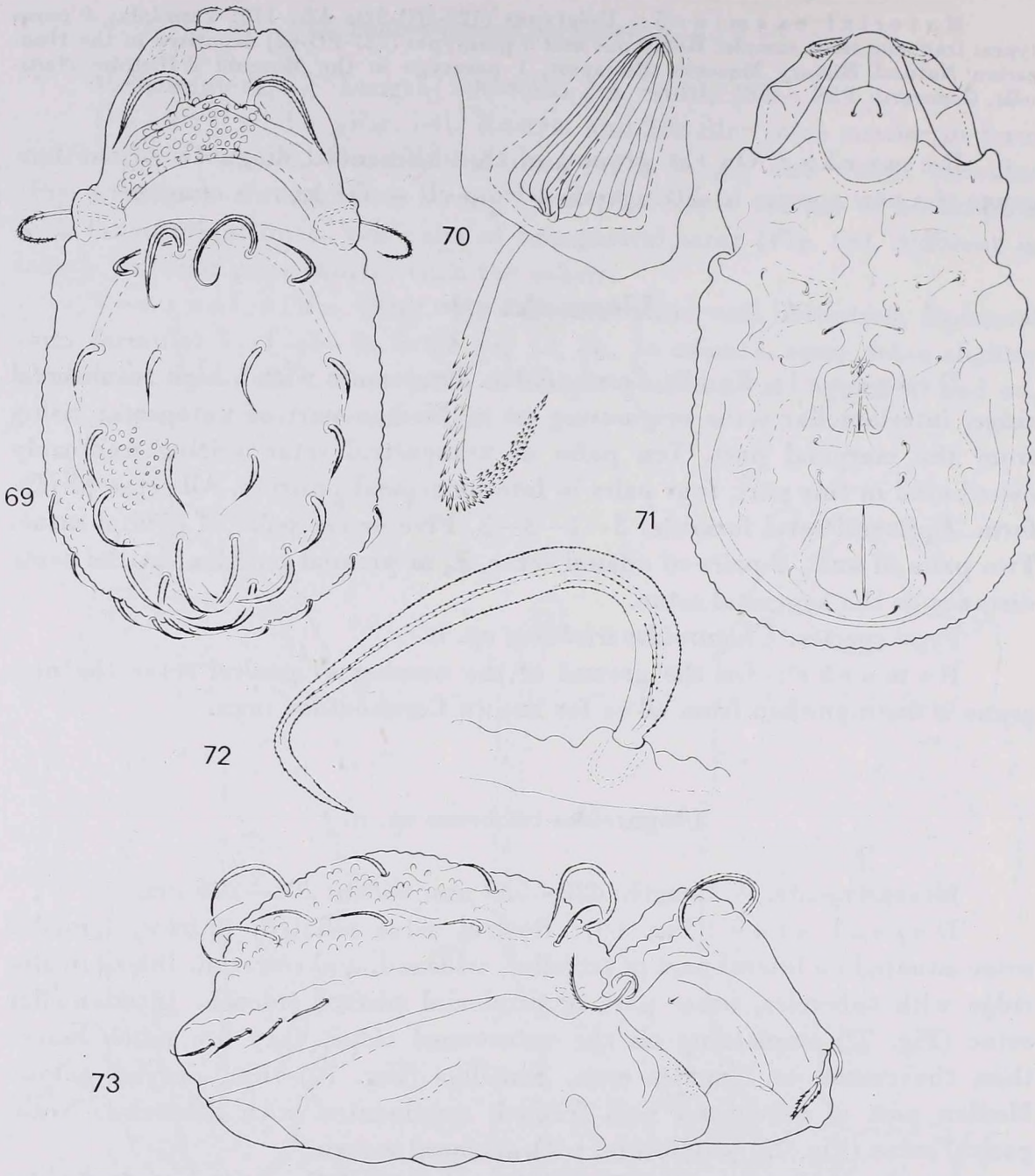
Measurements. — Length: 428—539 μm, width: 204—286 μm.

Dorsal side (Fig. 69): Rostral setae ciliated, narrow, lamellar setae situated on lateral part of lamellae, widened, and serrated. Interlamellar ridge with tubercles, other part of prodorsal surface smooth. Interlamellar setae (Fig. 72) originating on the transversal ridge, they are much longer than the rostral or lamellar ones. Sensillus (Fig. 70) thin, curved, pilose. Median part of notogaster well framed, ornamented with tubercles. Notogastral setae (Fig. 73) phylliform, with serrated margin.

Ventral side (Fig. 71): Epimeral setae different in length, *1a*, *1c*, *2a*, *3a* short; *1b* and *4a* the longest. Five or six pairs of genital setae present in all combinations (!), but only two specimens have six pairs from the 15. Aggenital and adanal setae widened, phylliform, anal setae simple, short. Setae ad_3 in preanal position.

Material examined: Holotypus (728-HO-82): Afr. 178: Tanzania; 22 paratypes: from the same sample. Holotypus and 20 paratypes (728-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: Unique among all the other Carabodidae species.



Figs 69—73. *Uluguroides trichosus* sp. n. — 69 = dorsal side, 70 = sensillus, 71 = ventral side, 72 = interlamellar seta, 73 = lateral side

Antennoppia gen. n.

D i a g n o s i s. Family Oppiidae. Rostrum not divided. Rostral setae originating on the dorsal surface of prodorsum. Lamellar setae standing nearer to rostral setae than to interlamellar ones. Without lamellae or costulae. Sensillus long, setiform. Interlamellar setae well developed. Crista absent. Nine pairs of notogastral setae, setae *ta* represented only by alveoli. Ap. 4

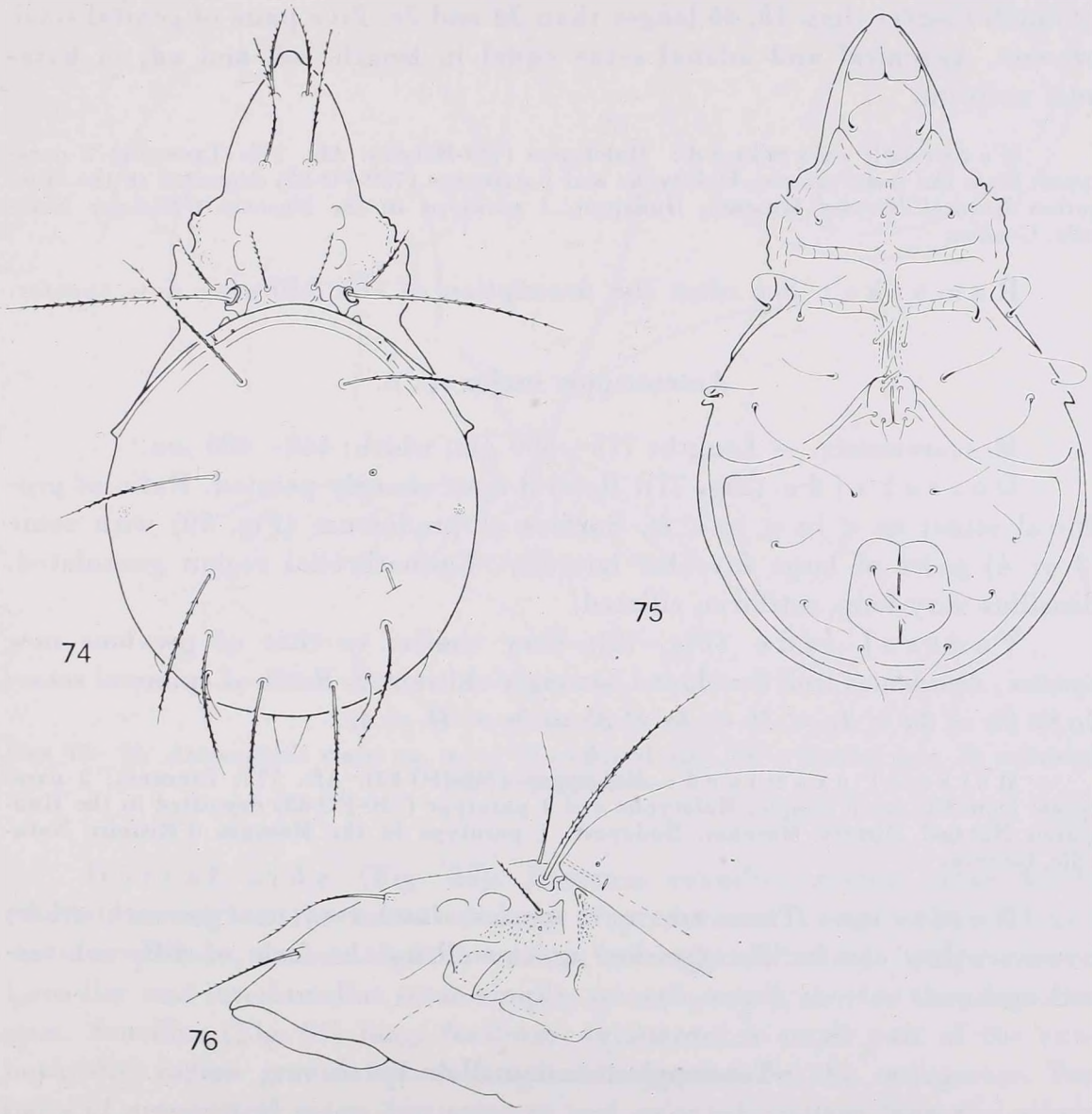
strongly curved, well developed. Five pairs of genital setae. Ad_3 in para-, ad_1 in postanal position, pori *iad* situated parallel with anal plates.

Type species: *Antennoppia minor* sp. n.

R e m a r k s. The genera of the family Oppiidae GRANDJEAN, 1954 were revised by BALOGH (1983). According to his published key it stands nearest to *Oppia* C. L. KOCH, 1836 but the shape of sensillus and apodemes 4 are different.

Antennoppia minor sp. n.

Measurements. — Length: 555—652 μm, width: 314—367 μm.



Figs 74—76. *Antennoppia minor* sp. n. — 74 = dorsal side, 75 = ventral side, 76 = lateral part of prodorsum

Dorsal side (Fig. 74): Rostrum slightly elongated, weakly nasiform, not divided. Lamellar setae originating in the anterior half of prodorsum. Rostral and lamellar setae slightly curved, they have weak ciliation. Ratio of prodorsal setae: *ex* < *in* < *ro* < *le*. Sensillus long, setiform, ciliated. Surface of prodorsum smooth, only two pairs of large foveolae laterally and one pair basally present. Bothridium well chitinized, lateral part of prodorsum (Fig. 76) granulated. One pair of small tubercles behind bothridium present. Nine pairs of setae among them 5 pairs long, 4 pairs much shorter in posteromarginal position. Setae *ta* reduced, represented only by their alveoli.

Ventral side (Fig. 75): Three pairs of apodemes well developed. Sternal apodeme framed by a chitinous line longitudinally. Ap. 4 curved reaching to postero-lateral part of body. Epimeral setae different in length, *1c* much shorter than *1b*, *4b* longer than *3a* and *3c*. Five pairs of genital setae present. Aggenital and adanal setae equal in length, ad_2 and ad_3 in paraanal position.

Material examined: Holotypus (729-HO-82): Afr. 175: Tanzania; 2 paratypes: from the same sample. Holotypus and 1 paratype (729-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: See after the description of the following new species.

Antennoppia major sp. n.

Measurements. — Length: 715—800 μm, width: 448—486 μm.

Dorsal side (Fig. 77): Rostral apex sharply pointed. Ratio of prodorsal setae: *ex* < *in* < *ro* < *le*. Surface of prodorsum (Fig. 79) with some (3 or 4) pairs of large foveolae laterally. Exobothridial region granulated. Sensillus very long, setiform, ciliated.

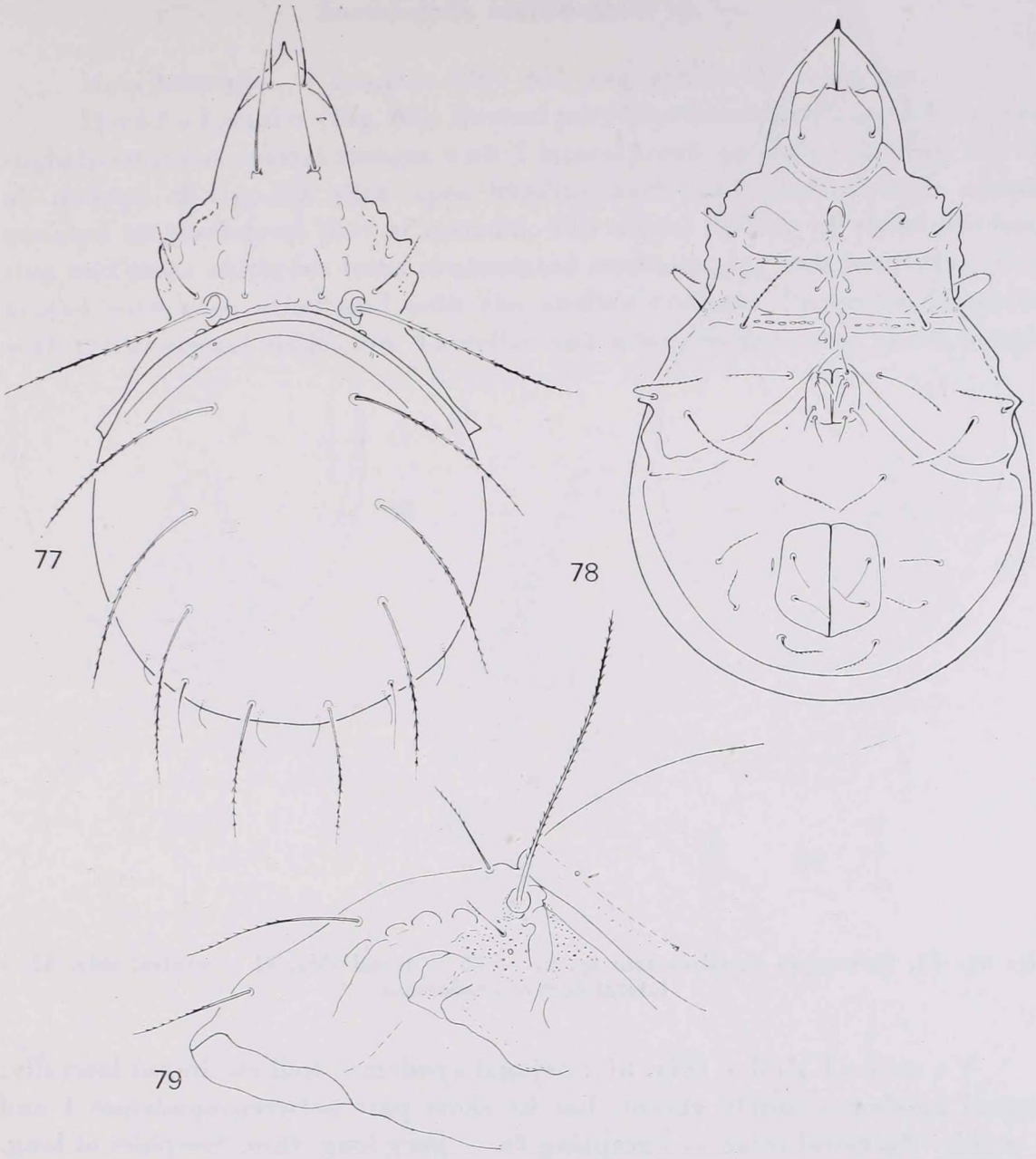
Ventral side (Fig. 78): Very similar to that of previous new species. Apodemes well developed, strongly chitinized. Ratio of epimeral setae: *1a* = *2a* = *3a* < *1c* < *1b* < *4a* < *3b* = *3c* = *4b* = *4c*.

Material examined: Holotypus (730-HO-82): Afr. 175: Tanzania; 2 paratypes: from the same sample. Holotypus and 1 paratype (730-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: These two new species stand very near to each other; however, they can be distinguished quite well by the form of different rostral apex.

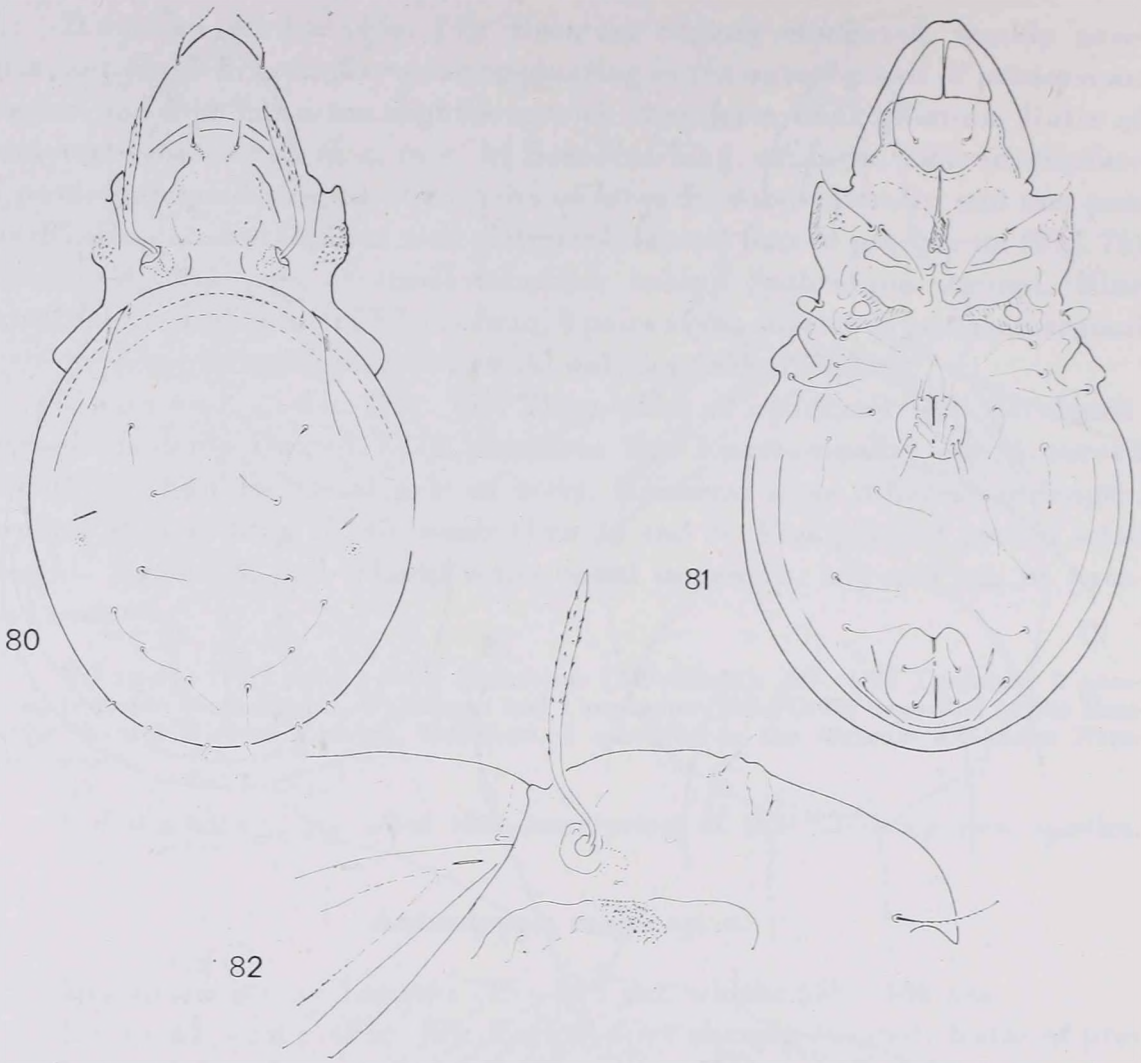
Teratoppia translamellata sp. n.

Measurements. — Length: 350 μm, width: 184 μm.



Figs 77—79. *Antennoppia major* sp. n. — 77 = dorsal side, 78 = ventral side, 79 = lateral part of prodorsum

Dorsal side (Fig. 80): Rostrum rounded, rostral setae finely ciliated, arising on the lateral margin of prodorsum. Long, well-developed costulae present, before them a convex strongly chitinized bridge visible. Lamellar and interlamellar setae simple, smooth, much shorter than lamellar ones. Sensillus (Fig. 82) long, fusiform, squamose. A small part of the exobothridial region granulated. A long crista present on the notogaster. Ten pairs of notogastral setae, but setae *ta* and *ps* much shorter than the others originating on the dorsal-median surface of notogaster.



Figs 80—82. *Teratoppia translamellata* sp. n. — 80 = dorsal side, 81 = ventral side, 82 = lateral part of prodorsum

V e n t r a l s i d e (Fig. 81): Sejugal apodemes well chitinized laterally; sternal apodemes nearly absent, but its short part between apodemes 1 and 2 visible. Epimeral setae — excepting *2a* — very long, thin. Six pairs of long, thin genital, 1 pair of simple aggenital setae present. Among adanal setae neither one in postanal position.

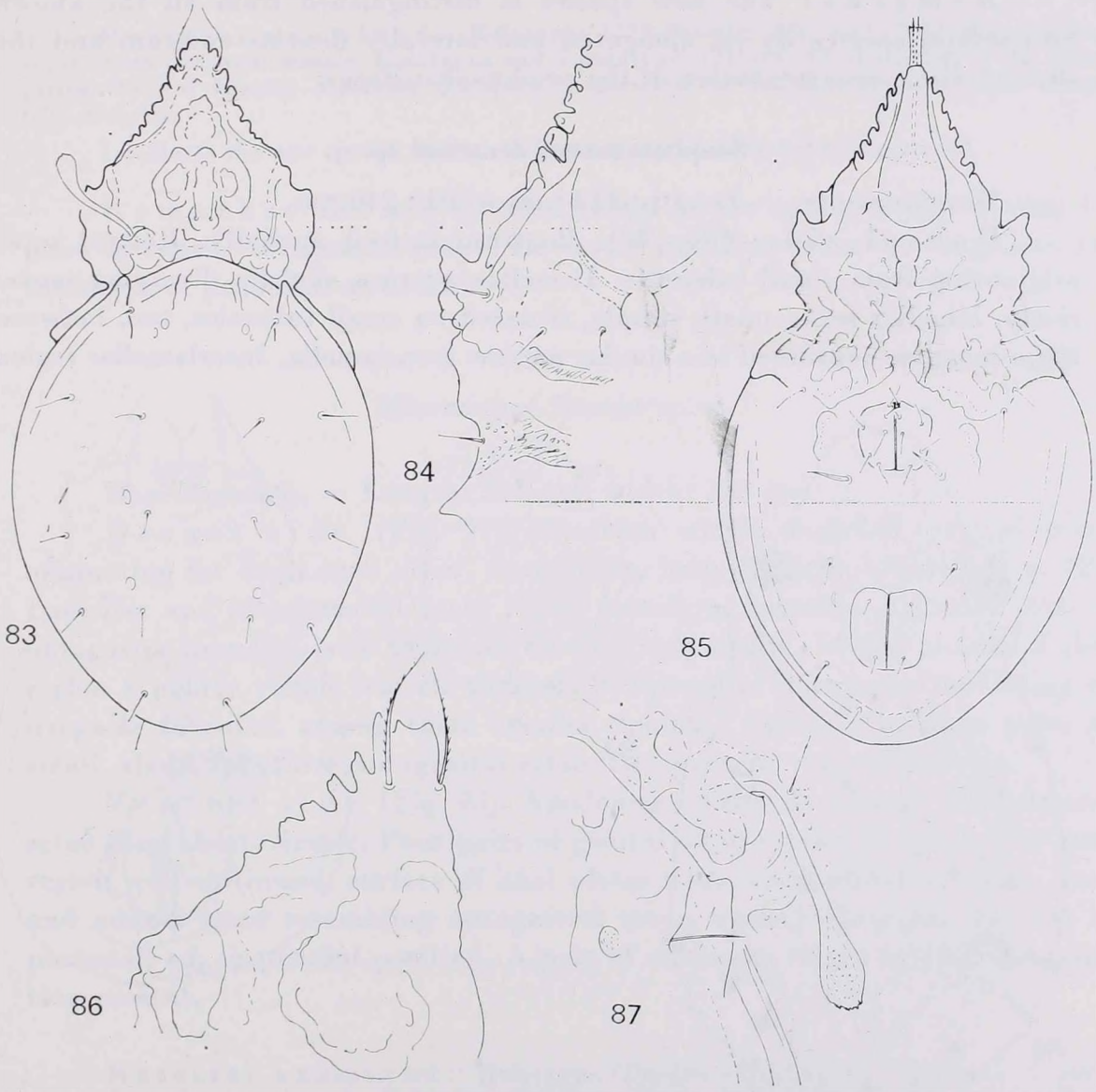
M a t e r i a l e x a m i n e d : Holotypus (731-HO-82): Afr. 175: Tanzania; 2 paratypes: from the same sample. Holotypus and 1 paratype (731-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The most conspicuous features of the new species are 1. strong transversal chitinous ring before the lamellar setae, 2. well-developed costulae, 3. long, fusiform squamose sensillus and 4. well-developed apodemes. On this ground it stands nearer to *T. reducta* BALOGH et MAHUNKA, 1969, but the latter distinguished from it by the chaetotaxy of epimeres.

Suctobelbila multidentata sp. n.

Measurements. — Length: 326—351 μm; width: 171—184 μm.

D o r s a l s i d e (Fig. 83): Rostral part of prodorsum elongated, rostrum slightly concave, rostral margin with 7 lateral teeth on each side (Fig. 84, 86) all pointed at tip, but their apex bending backward. Rostral setae simple, situated on the lateral part of rostrum. The dorsal surface by three chitinous ring and some chitinous laths ornamented medially, the two basal rings connected with each other and with the median triangle. Bothridia connected with a transversal ridge, too. Lamellar and interlamellar setae short, simple.



Figs 83—87. *Suctobelbila multidentata* sp. n. — 83 = dorsal side, 84 = lateral teeth of prodorsum from ventral side, 85 = ventral side, 86 = lateral teeth of prodorsum from dorsolateral side, 87 = trichobothrium and sculptur of dorsosejugal region

Sensillus (Fig. 87) with long peduncle, its head clavate, rounded anteriorly and with small teeth on its anterior margin. One pair of lateral teeth on the notogaster, between them 2—3 well-developed rims longitudinally. Ten pairs of short, simple but rigid notogastral setae, three pairs of little spots present.

Ventral side (Fig. 85): Pedotecta 2—3 with tubercles, epimeral region sharply divided. Epimeral setae simple. Six pairs of genital setae. Aggenital setae slightly dilated, situated near to genital opening. Adanal and anal setae short, simple, ad_3 in preanal, ad_2 in postanal position.

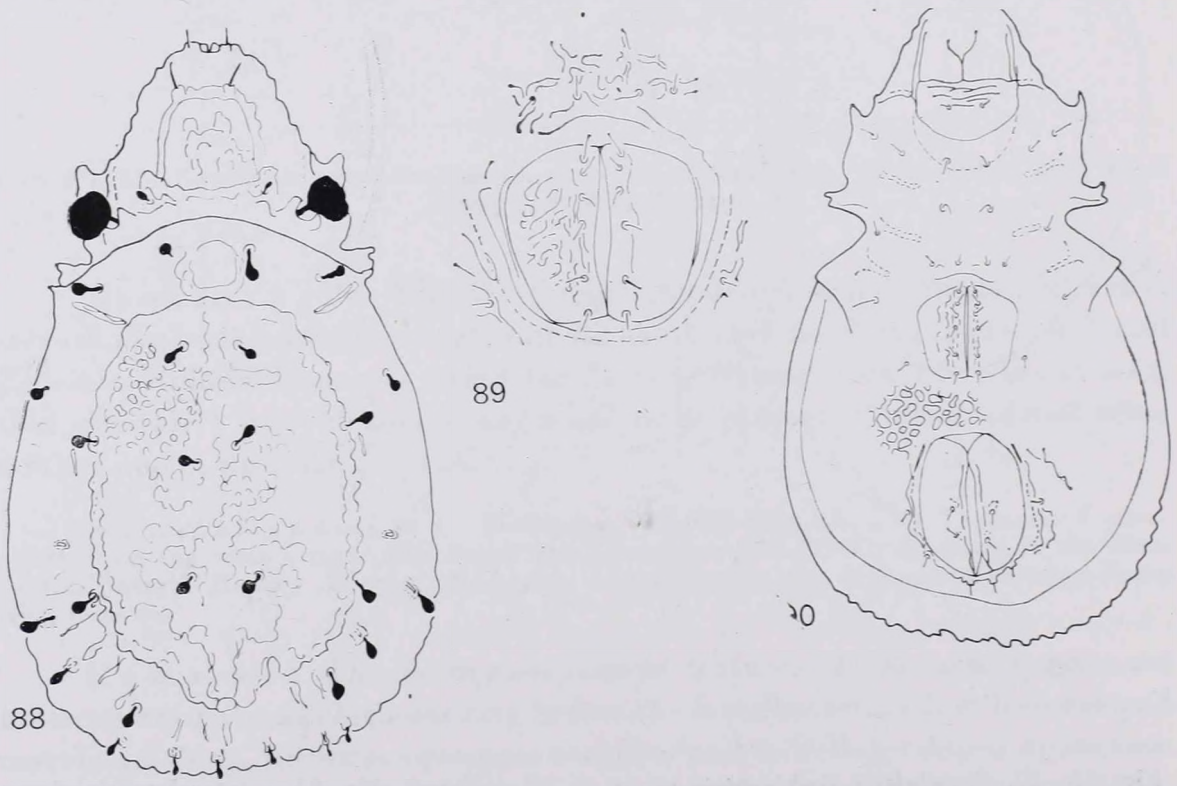
Material examined: Holotypus (732-HO-82): Afr. 178: Tanzania; 8 paratypes: from the same sample. Holotypus and 6 paratypes (732-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is distinguished from all the known *Suctobelbila* species by its elongated and laterally dentate rostrum and the characteristic ornamentation of the prodorsal surface.

Scapheremaeus demeteri sp. n.

Measurements. — Length: 413 μm, width: 240 μm.

Dorsal side (Fig. 88): Rostrum incised medially. Rostral setae originating from small tubercles. Lamellae narrow, slightly diverging posteriorly, lamellar setae small, simple, situated on small tubercles, too, between them lamellae continued in a similar narrow translamella. Interlamellar region



Figs 88—90. *Scapheremaeus demeteri* sp. n. — 88 = dorsal side, 89 = genital plate, 90 = ventral side

with fine costulae, before the interlamellar setae a transversal ridge present, this is connected with the lamellae basally. Sensillus large, its head irregularly shaped, black. In the humeral region a small, weakly sharp projection present. Margin of notogaster divided by tubercles, especially in the posteromarginal point. Middle field of notogaster showing a network, among them stronger wrinkles visible, too. In the marginal part some wrinkles present in radial situation. There are 13 pairs of dilated, black notogastral setae. Posteromarginal setae smaller than the others.

Ventral side (Fig. 90): Epimeral surface and that of genital plates (Fig. 89) with irregular wrinkles. Anogenital region showing a network, too. Around the plates a chitinous ridge present, adanal setae arising on it. Pori *iad* in paraanal position.

Material examined: Holotypus (733-HO-82): Afr. 107: Ethiopia; 3 paratypes: from the same sample. Holotypus and 2 paratypes (733-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

I dedicate the new species to Dr. A. Demeter, who collected this material.

Remarks: The new species belongs in the species-group having 13 pairs of black, notogastral setae. However, it differs from its congeners by the shape of prodorsal structure.

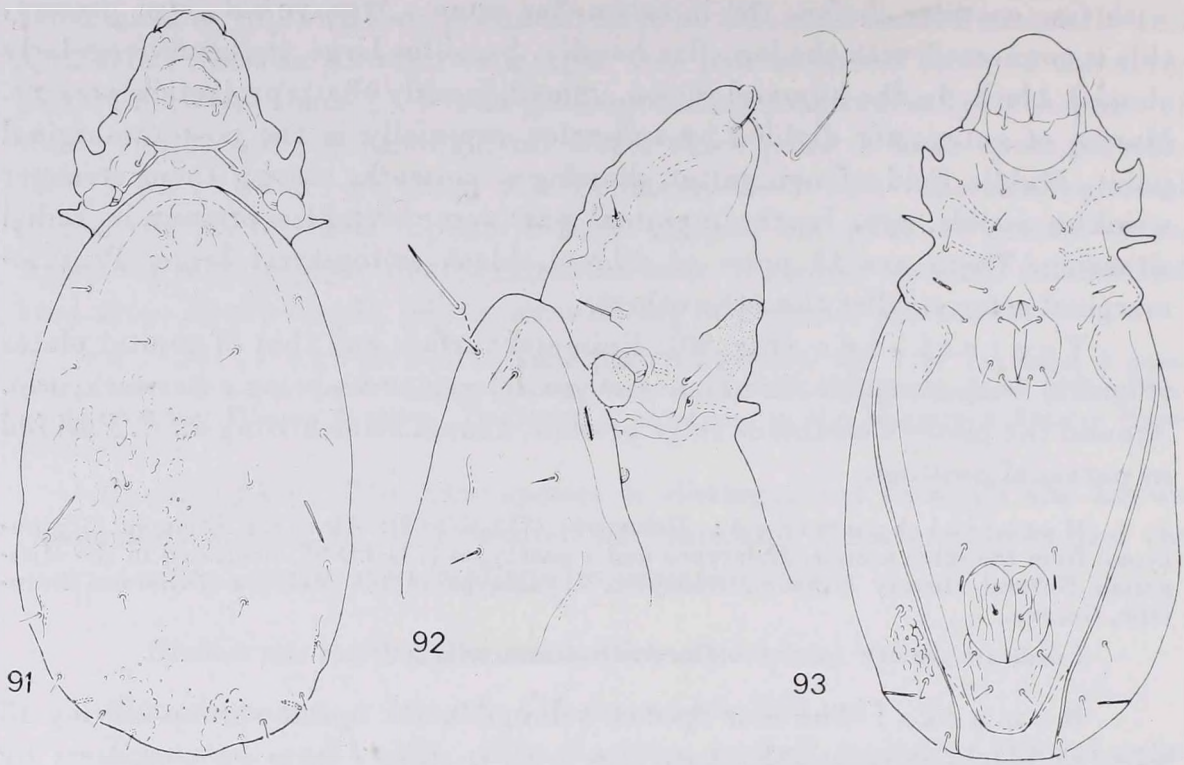
Micreremus florens sp. n.

Measurements. — Length: 240 μm, width: 133 μm.

Dorsal side (Fig. 91): Rostrum widely rounded, rostral setae originating far from each other, marginally, long, filiform, ciliated (Fig. 92). Lamellar and interlamellar setae short, spiniform, smooth. Anterior part of notogaster rounded, with undulate dorsosejugal suture. In the middle of this region a poorly visible lenticle present. Sculpture of notogaster consisting of irregular foveolae, among them smaller "points" visible. Fourteen pairs of small, about spiniform notogastral setae, two pairs in ventral position.

Ventral side (Fig. 93): Apodemes weakly developed. All epimeral setae thin, short, simple. Four pairs of genital setae similar in shape. The anal region well chitinized, surface of anal plates with longitudinal wrinkles, anal and adanal setae resembling notogastral setae, among them ad_1 and ad_2 in postanal, ad_3 in preanal position. A pair of chitinous ridges in postanal position present.

Material examined: Holotypus (734-HO-82): Afr. 107: Ethiopia; 5 paratypes: from the same sample. Holotypus and 4 paratypes (734-PO-82) deposited in the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.



Figs 91—93. *Micreremus florens* sp. n. — 91 = dorsal side, 92 = lateral part of prodorsum, 93 = ventral side

R e m a r k s : The new species differs from all related species of this genus by the surface of notogaster,

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DRYINID SPECIES FROM KOREA (HYMENOPTERA: DRYINIDAE)*

L. MÓCZÁR

(Received 20 April, 1982)

The 25 Dryinid specimens collected by PAPP, VOJNITS partly by HORVATOVICH, DELY and DELY-DRASKOVITS in Korea represent 5 genera with 10 species new for Korea. Moreover, the following 5 new taxa are described from Korea: *Anteon crassifrons* sp. n. ♀, *A. pyonganensis* sp. n. ♂, *Prenanteon pektusanense* sp. n. ♀, *P. clavatum* sp. n. ♀♂ (this one derives also from Mongolia) and *Chlorodryinus koreanus* sp. n. ♀♂.

The scientists of the Hungarian Natural History Museum in Budapest also collected 25 Dryinids among the different animal groups during one-month trip in each year: J. PAPP and A. VOJNITS (in 1975), J. PAPP and S. HORVATOVICH (in 1971) and O. DELY with Á. DELY-DRASKOVITS (in 1977). The 10 ♀ and 15 ♂ specimens represent 5 genera, 10 species there are 5 new species. The majority of the taxa (7) belongs to subfamily Anteoninae, while one proved to be Dryininae and two Gonatopodinae.

The material was identified mostly by using PERKINS's (1905, 1976), RICHARDS's (1939), PONOMARENKO's (1965, 1978) and CURRADO et OLMI's (1972) papers. Since the interpretation of the species are often different in doubtful cases I make reference to the respective authors. The names were kindly revised by M. OLMI. After M. OLMI I changed my names at the species indicated with an asterisk(*).

Family **Dryinidae**

Subfamily ANTEONINAE

Anteon crassifrons sp. n.

♀. — Length 4 mm. Black; mandibles (excepting narrow black base and a red tooth), antennal joints 1—3, legs (excepting the whitish streaks on lower side of fore femora, lower and upper side of fore and hind tibia, as well as, coxae partly) yellow; articulate basis and apex of each leg-joints, all tarsal

* Zoological Collectings by the Hungarian Natural History Museum in Korea, No. 66.

joints (excepting red claws), as well as, palps, whitish; antennal joints 4—10, tegulae, abdomen basally and apically, dark brown. Wings normally developed, hyaline, pterostigma, veins yellow. Distal abscissa of radius only half as long as proximal part. Antennae with short declivous hairs. Body, especially head, pronotum (excepting abdomen) covered with rather long white hairs. Eyes bare.

Head, in dorsal view (including eyes) nearly twice as broad as long (55 : 28),* remarkably converging behind eyes, posteriorly with a very feebly curved, raised margin of which anterior side is crenate; vertex shining, densely and rather deeply punctured, round ocelli centrally with few smaller punctures; ocellar triangle equilateral in an acute angle, not delimited by keels, POL : OOL = 7 : 8, posterior ocelli removed from occiput by a distance equal to POL, lateral margin of head behind eyes equal to OOL, deep and curved impressions at outer sides of each ocelli; frons densely and rather deeply punctured just below ocelli and gradually densely rugulose, towards antennal sockets, mat, with one central keel from median ocellus, as well as, with two lateral keels running towards antennal sockets along inner orbits, keel very distinct; eyes elongate, lower part more convex than upper one, two-thirds as broad as long (10 : 15); malar space narrow, only half as long as broad of eye (5); mandibles with 4 teeth; antennae rather slender, scape nearly twice as long as pedicel, a little curved and distally thickened, pedicel elongate pyriform, joint 3, 6 increasing gradually in thickness, joint 4 the longest, last joint only a little shorter than joint 3, joints 7—10 remarkably thicker than joints 3—5, length (and breadth) proportions of antennal joints 1—10 = 19 (6) : 10 (2 basally — 3.5 apically) : 14 (2—3) : 11 (3) : 10 (3) : 10 (3—4) : 10 (4) : 10 (4) : 9 (4) : 13 (4). Pronotum long, about as long as mesonotum (22 : 20), sides moderately divergent behind, in profile flat and sloping down very little to anterior margin, upper surface dull and very densely punctured anteriorly, shining and with deep but scattered punctures medially, latter more dense only laterally, posterior margin with a small but broad triangular smooth, polished area, lateral surface of pronotum strongly impressed transversally, crossed by strong striae, surface smooth and shining. Mesonotum smooth, shining with scattered distinct punctures, more numerous frontolaterally, outside of notaulices; latter finely crenate, reaching to middle line of mesonotum. Mesonotum separated from scutellum by a deep furrow with some longitudinal wrinkles. Scutellum smooth, polished with some distinct and finer punctures and with crenate line before posterior margin. Postscutellum smooth, polished, with a deep transversal furrow towards propodeum. Propodeum with dorsal surface about half as long as posterior one, surface strongly rugose, posterior part with large oval area well defined by keels, surface here hardly finely and partly shining

* Wild microscope magnification ocular ×10, objective ×25, supplementary objective ×2.

than other parts. Also lateral side of thorax strongly sculptured, dull, with smooth shining, hardly punctured area just above mid-leg. Fore leg with hardly shorter coxae than tibia and trochanter equal length to tarsal joint 3, joint 4 distinctly shorter than 1 (0.76 as long as 1), length proportions of tarsal joints 1 : 2 : 3 : 4 : articulating part to 4 of joint 5 : whole mobile part: enlarged claw = 26* : 7 : 10 : 21 : 33 : 65 : 61, joint 5 with lamellae not expanded at apex distally (Fig. 1) but resembles rather *Anteon brachycerum* (DALMAN) sensu RICHARDS (1939: 252 fig. 55) or of *A. brevicornis* (DALMAN) sensu RICHARDS (l.c. fig. 52) by longer hyaline lamellate bristles densely placed, some bristles also admixed and the separated apex of mobile part with 5 long ordinary lamellae somewhat expanded distally; enlarged claw strongly curved and with a strong bristle basally. Abdomen smooth and shining, last segment sharply compressed laterally.

♂. — Unknown.

Holotype 1 ♀ = "Korea, Prov. Pyong-sung Beksung-lii, Za-mo san, 60 km NE from Pyongyan", "No. 305. 1 August 1975 leg. J. PAPP et A. VOJNITS" (Hym. Typ. No. 3669 Hungarian Natural History Museum, Budapest).

This species resembles *Anteon* (*Chelogynus*) *kiefferi* (CHITTY, 1908) sensu RICHARDS (1939: 274) but differs from it by ocellar triangle not delimited by keels, by its vertex not being finely alutaceous, not very shallowly punctured, by the dissimilar sculpture of pronotum and postscutellum, by the fore leg with joint 1 not two-thirds as long as 4, 5 with lamellae not expanded at apex, etc.; this species differs from *Ch. ruficollis* CHITTY, 1908 sensu RICHARDS (1939: 262) by vertex not sparsely punctured, by its colour, by pronotum not about one-third broader than long, by chela, etc.

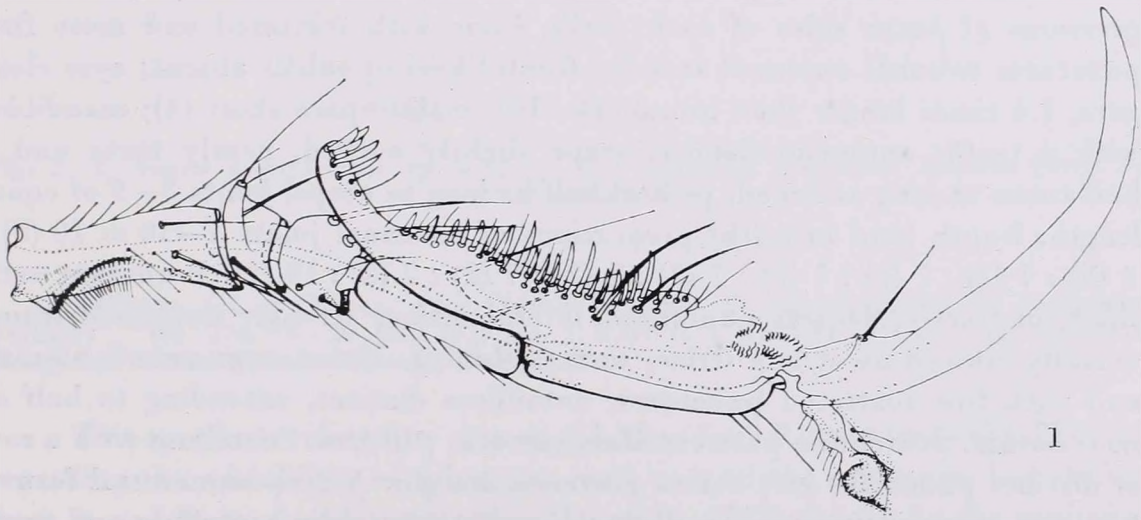


Fig. 1. *Anteon crassifrons* sp. n. ♀, fore tarsal joints with chela (Orig. by A. FAZEKAS)

* Wild microscope magnification ocular ×10, objective ×50, supplementary objective ×2.

Anteon pubicorne (DALMAN, 1818)

2 ♀ = Prov. Ryang-gang: Hyesan, Mt. Ze-dong, 1150 m, 26 July 1975 leg. PAPP—VOJNITS (No. 293).

2 ♂ = Prov. Ryang-gang: Chann-Pay plateau, 24 km NW from Sam-zi-yan, road to Mt. Pektusan, 2000 m, 24 July 1975 leg. PAPP—VOJNITS (No. 281). — 1 ♂ = Prov. Ryang-gang: Hyesan, Mt. Ze-dong, 1150 m 26 July 1975 leg. PAPP et VOJNITS (No. 293).

The ninth sternite and the genitalia with distal acute inner process of paramere agree with *Anteon* (*Chelogynus*) *lucidum* RICHARDS' (1939: 272 fig. 75).

Distribution. England, France (KIEFFER, 1905), Germany, Ireland, Austria (RICHARDS, 1939), Leningrad (PONOMARENKO, 1978).

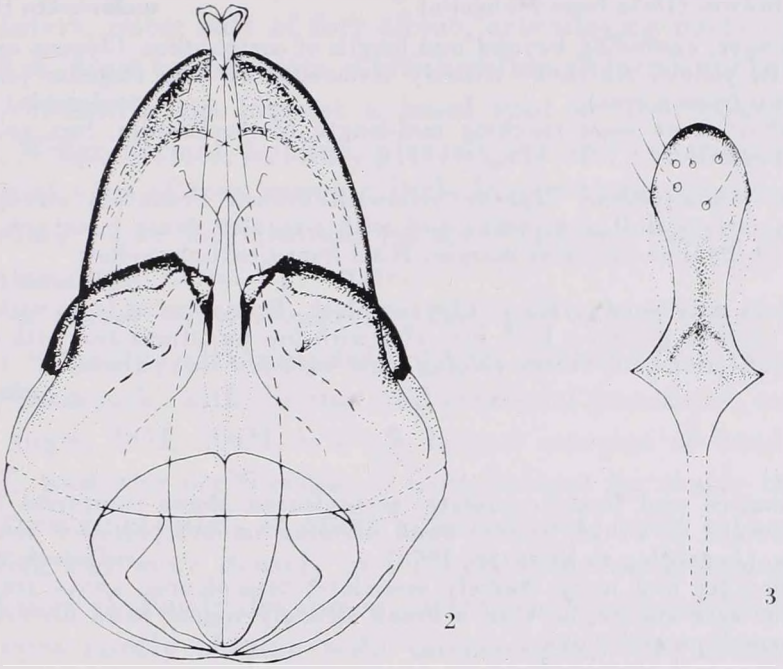
Anteon pyonganensis sp. n.

♂. — Length 2 mm. Black; clypeus, pronotum, mesonotum, scutellum, postscutellum, lateral side of thorax parly and last abdominal segments dark reddish brown; mandibles (excepting reddish teeth), palps, antennal joint 1, lower side of joints 2—6, tegulae, legs yellowish, partly yellowish brown. Wings normal, hyaline, pterostigma and veins yellow. Distal section of radial vein of fore wings about one-third of proximal one. Body (excepting abdomen) covered with rather sparse outstanding pale hairs, antennae with long erect hairs. Eyes bare, a few hairs visible only under high magnification.

Head, in dorsal view, including eyes, 1.6 times as long as broad (29 : 18), converging behind eyes, posteriorly with hardly curving raised margin, anterior side of which scarcely crenate; vertex shining with rather dense distinct punctures, ocellar triangle in an acute, hardly rectangle, POL : OOL = 5 : 5, lateral margins of head behind eyes a little shorter than OOL (4), posterior ocelli removed from occiput by shorter distance than POL (3), curved impressions at outer sides of each ocelli, frons with scattered and more fine punctures towards antennal sockets, frontal keel or sulcus absent; eyes elongate, 1.4 times longer than broad (14 : 10); malar space short (4); mandibles with 4 teeth; antennae slender, scape slightly curved, nearly three and a half times as long as broad, pedicel half as long as scape, joints 3—9 of equal length, length (and breadth) proportions of antennal joints 1—10 = 10 (3) : 5 (3) : 7 (2) : 7 (2) : 7 (2) : 7 (2) : 7 (2) : 7 (2) : 7 (2) : 10 (2). Pronotum very short, distinctly, densely punctured, lateral surface strongly impressed transversally crossed by strong striae, surface shining. Mesonotum smooth shining and with fine scattered punctures, notaulices distinct, extending to half of mesonotum. Scutellum, postscutellum smooth, polished. Scutellum with a row of distinct punctures just before posterior margin. A deep transversal furrow between mesonotum and scutellum, as well as, between scutellum and postscutellum. Propodeum rugose with a large elongate area defined by keels, surface here hardly finer than other parts, hardly shining. Lateral sides of thorax strongly sculptured except postero-ventrally, above mid coxae with

an oblong smooth and polished area only with a row of distinct punctures just before margins. Abdomen smooth, shining. Genitalia (Fig. 2) resembles those of *A. mongolicum* MÓCZÁR (1983) by digitus (= distivolsella) directed laterally, by broadening on its proximal third part, as well as, by inner process of paramere acute, similarly in this respect also to *Anteon* (*Chelogynus*) *lucidum* (HALIDAY in CURTIS) sensu RICHARDS' (1939: 272 fig. 75), but paramere less acute than in *A. mongolicum*, digitus not tridimensional as in RICHARDS' fig. 75 and chiefly the inner margin of the ventral emarginated part of paramere not intact, but with 6 minute nicks on both sides (Fig. 2), ninth sternite (Fig. 3) oval with bristles.

♀. — Unknown.



Figs 2—3. *Anteon pyonganensis* sp. n. ♂. — 2 = genitalia; 3 = ninth sternite (Orig. by A. FAZEKAS)

Holotype = 1 ♂ "Korea, Prov. South Pyongan, Pyongyan, garden of Hungarian Embassy", "No. 274. 18—20 July 1975 leg. J. PAPP et A. VOJNITS" (Hym. Typ. No. 3670 Hungarian Natural History Museum, Budapest).

This species is related to *Anteon* (*Ch.*) *lucidum* RICHARDS (1939: 270) by regarding the variability of colour, as well as and the sculpture, but differs from it and from *A.* (*Ch.*) *ephippiger* (DALMAN, 1818) chiefly by the genitalia, punctures of vertex much finer, etc. According to M. OLMI this species is synonymous with *A.* (*Chelogynus*) *ephippiger* (DALMAN, 1818). I belive that the differences are sufficient to suppose it to be a valid species.

Prenanteon species of Korea and Mongolia

♀♀

1 Mesonotum hardly punctured, smooth and shining over whole surface or only between notaulices 2
— Mesonotum always distinctly punctured at most in anterior part and more or less shining between punctures 4

2 Pronotum densely and irregularly punctured, only hardly shining medially and more finely coriaceous laterally. Last antennal joints conspicuously thicker than penultimate one, clavate **clavatum** sp. n.
— Pronotum largely smooth, shining before posterior margin at least medially, densely punctured and coriaceous only anteriorly. Notaulices fine and short 3

3 Pronotum coriaceous and densely punctured anteriorly and laterally with smooth shining large part before posterior margin. Mesonotum only with very few fine punctures. Legs yellow **basale** (DALMAN, 1818)
— Pronotum densely punctured only anteriorly and gradually scattered posteriorly, before posterior margin smooth and shining medially. Mesonotum with fine scattered punctures. Legs partly brown. (Data from Mongolia) **melanocera** (KIEFFER, 1905)

4 Notaulices longer, extending beyond mid length of mesonotum. Clypeus and sometimes a spot above it, yellow. Antennae entirely testaceous or with flagellar joints infuscated. (Still unknown from Korea) **longicornis** (DALMAN, 1823)
— Notaulices shorter, at most reaching mid-length of mesonotum, legs yellow, excepting basis of hind coxae 5

5 All antennal joints yellow. Clypeus yellowish brown. Pronotum strongly sculptured, entire whole surface dull, coriaceous and with irregular dense punctures, at most with narrow smooth hyaline posterior margin. Hind femur entirely yellow **ruficornis** (DALMAN, 1818)
— Antennal joints only partly yellow. Clypeus black. Pronotum at least with larger smooth and shining parts in posterior half, here also with few punctures and with deep and dense punctures in anterior half. Vertex shining, only with few fine punctures **pektusanense** sp. n.

♂♂

1 Notaulices narrow and finely crenulate; mesopleuron above transverse furrow with at most a coriaceous or weakly rugose band dividing smooth posterior area from smooth anterior area. (According to PERKINS, 1976) **ruficornis** (DALMAN, 1818)
— Notaulices broader and more coarsely crenulate; mesopleuron above transverse furrow with posterior area rugose, or with a broad strongly rugose band dividing the anterior area from a small posterior one 2

2 Notaulices shorter, extending to about mid-line of mesonotum. Frons varies from having close and strong punctures to rather close but shallow, also with a weak indication to a deep furrow in front of median ocellus. Propodeum not sharply angled **basale** (DALMAN, 1818)
— Notaulices extending distinctly beyond mid-length of mesonotum 3

3 Frons, vertex polished, at most with fine scattered punctures, convex, at most with a very weak indication of a discal impression **clavatum** sp. n.
— Frons, vertex shining, rather densely and deeply punctured, with a larger distinct central groove on the disc **longicornis** (DALMAN, 1823)

Prenanteon ruficornis (DALMAN, 1818)

1 ♀ = Prov. Ryang-gang: Chann-Pay plateau, 24 km NW from Sam-zi-yan, road to Mt. Pektusan, 2000 m, 24 July 1975 leg. PAPP et VOJNITS (No. 281).

This specimen corresponds mostly to the PERKINS's description (1976) and not to RICHARDS' (1939) with the following differences. According to PERKINS: "notauli . . . finely aciculate . . . extending to about mid-line of mesoscutum", length of notaulices : half length

of mesonotum of this specimen = 12 : 10, and a slightly deeper; also basal flagellar segments of antenna (PERKINS, 1976), as well as, hind coxa not infuscate but yellow. It is more significant, that the pronotum coriaceous and in apical half characteristically with irregular punctures. It is worthy to note that the distal abscissa of R_1 only slightly shorter than R_S, but mid leg with spur as long as apical breadth of tibia, consequently it is a *Prenanteon*. Fore leg with chela and enlarged claw identical with fig. 11 Plate 5 of PONOMARENKO (1978). Therefore, I suppose that this specimen represents yet *P. ruficornis* (DALMAN) sensu PERKINS (1976).

Distribution. Scotland (KIEFFER, 1914). West Europe, USSR (Europe), Mongolia (PONOMARENKO, 1978).

Prenanteon pektusanense sp. n.

♀. — Length 2.8—3.8 mm. Black; clypeus and abdomen partly dark brown, last abdominal segment yellowish brown; antennal joints 1—2, 8—10 (paratypes 5 partly, 6—7 mostly) yellow, 3—7 (or 3—5, the last partly) brown; mandibles (excepting red teeth) and tegulae, a spot or streak on lower side of coxae, trochanters, outer side of fore tibiae, articulating parts of femora and tibiae, as well as, most tarsal joints, whitish yellow (whitish spots on paratypes partly more reduced); legs (except a basal spot of hind coxae) in another place yellow. Wings normal, hyaline, pterostigma and venation yellow. Distal section of radial vein of fore wings a little longer than proximal part. Body with outstanding white hairs, abdomen more sparsely hairy, antennae with short and rather dense hairs. Eyes bare.

Head, in dorsal view, transverse, two and a half times broader than long (45 : 18), strongly converging behind eyes, posteriorly with curving raised margin; vertex smooth, with distinct and scattered punctures, ocellar triangle in an acute angle, POL : OOL = 6 : 9, lateral margins of head behind eyes equal to OOL, posterior ocelli removed from occiput by nearly the distance of OOL (8), curved impression at outer sides of each ocelli rather deep; frons smooth, shining but more densely and deeply punctured, frontal sulcus only medially and very shallowly developed, lateral angle of frons between antennal socket and eyes hardly shining with microscopical fine sculpture: clypeus smooth, shining, lower margin curved; eyes oval, three-quarters as broad as long (15 : 20); malar space rather broad, equal to length of antennal joint 2 (7); mandibles with 4 teeth; antennae slender, scape little curved, more than twice longer than broad, pedicel cylindrical, twice as long as broad, joints 3 and 4 of equal length, 3 gradually increasing in thickness, nearly six times as long as broad apically, joint 5 nearly as long as 3 and 4, joints 6—9 distinctly shorter than the previous ones, length (and breadth proportions of antennal joints 1—10 = 13 (5.5) : 7 (3.5) : 17 (2.5 basally — 3 apically) : 17 (3) : 16 (3) : 13 (3) : 11 (3) : 10 (3) : 10 (3) : 14 (3.5). Pronotum relatively long, however, shorter than mesonotum (15 : 19), in profile with posterior half nearly flat and anterior half sloping moderately down to anterior margin, surface dull, rugulose anteriorly, as well as, in posterior half laterally and polished with some deeper punctures posteriorly in the middle (holotype and

one paratype) or in posterior half more or less more densely punctures (paratypes partly) but sometimes polished medially also in this case with a rather coarse curved crenulate row in the middle. Mesonotum anteriorly with distinct (one paratype with deeper and denser) and posteriorly with fine sparse punctures, notaulices extending to half its length. Scutellum separated from mesonotum by a deep transversal crenulated furrow, surface polished with scattered fine punctures and with a transversal row of larger punctures just before posterior margin. Postscutellum with a more (most paratypes) or less (holotype, paratypes partly) transversal keel with larger and smaller very dense and coarse punctures before and behind keel. Propodeum with dorsal and posterior surface forming an almost regular curve, surface dull, rugose, posterior area feebly defined and open in front medially. Lateral side of thorax rugulose dull, only mesopleuron postero-ventrally, above mid-coxae polished and punctured only marginally. Fore legs with basitarsus hardly longer than joints 3 + 4 (Fig. 4), much shorter than 2 + 3 + 4, joint 2 produced on its inner side, articulating part of joint 5 one quarter longer than 4 (16 : 12) and remarkably stout, chela resembles that of *P. daos* (WALKER, 1837) sensu RICHARDS (1939: 236 fig. 45) but mobile part of joint 5 with a row of bristles and with some ordinary lamellae only at apex, separately; enlarged claw only moderately curved, length proportions of fore tarsal joints 1 : 2 : 3 : 4 : articulating part of 5 : whole mobile part : enlarged claw = 20 : 6.5 : 7 : 12 : 16 : 35 : 31. Abdomen smooth, polished, last abdominal segment compressed laterally with a few scattered, fine punctures.

♂. — Unknown.

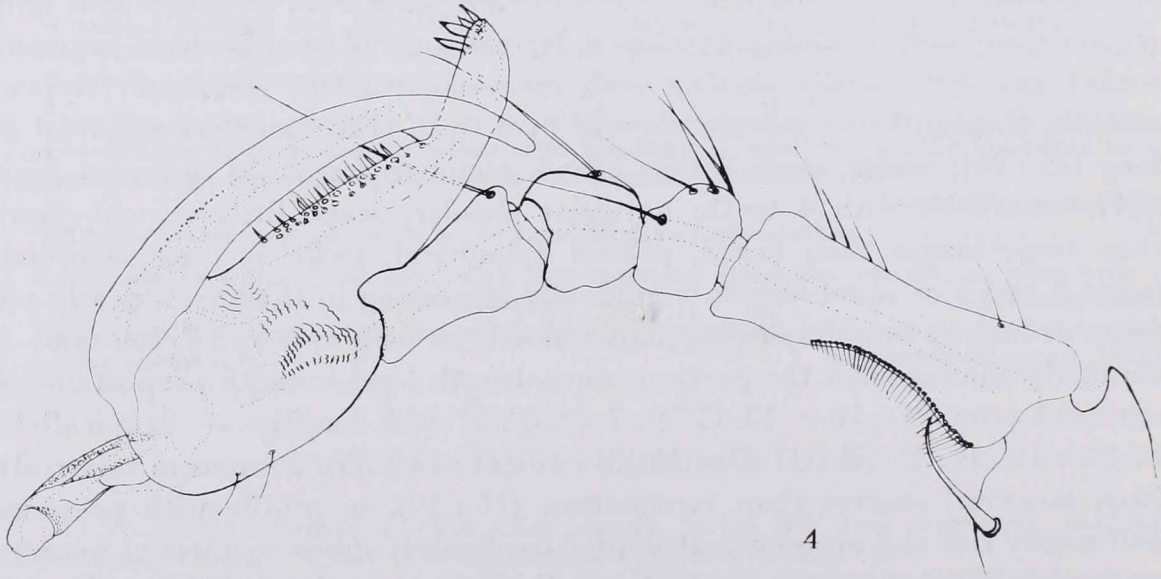


Fig. 4. *Prenanteon pektusanense* sp. n. ♀, fore tarsal joints with chela (Orig. by A. FAZEKAS)

Holotype ♀ = "Korea, Prov. Ryang-gang: Chann-Pay plateau, 24 km NW from Sam-zi-yan, road to Mt. Pektusan, 2000 m", "No. 281. 24 July 1975 leg. J. PAPP et A. VOJNITS" (Hym. Typ. No. 3671 Hungarian Natural History Museum, Budapest). — Paratypes 2 ♀ = with the same data (Hym. Typ. No. 3672—3673 H.N.H. Museum, Budapest). — Paratype 1 ♀ = "Korea, Prov. Ryang-gang Plateau Chann-Pay Sam-zi-yan, 1500 m 24. Aug. 1971", "No 196. leg. S. HORVATOVICH et J. PAPP" (Hym. Typ. No. 3674 H.N.H. Museum, Budapest). — Paratype 1 ♀ — "Korea, Mt. Pektusan environs Sam-zi-yan hotel, lake-shore, 19. VII. 1977", "No. 376-netting in grasses DELY and DRASKOVITS" (Hym. Typ. No. 3675 H.N.H. Museum, Budapest).

This species related with *P. longicornis* (DALMAN, 1823) sensu KIEFFER (1905: 519), but differs by clypeus not white, pronotum not as long as mesonotum, mobile part of chela without ordinary lamellae etc.; differs from *P. longicornis* sensu PERKINS (1976: 24), as well as, *P. ruficornis* (DALMAN, 1818) sensu RICHARDS (1939: 240) mainly by notaulices extending distinctly not beyond midlength of mesonotum; differs from *P. retusus* (THOMSON, 1860) by size not 5 mm, by clypeus not yellow, by chela, etc.; differs from *ruficornis* sensu PERKINS (1976: 23) chiefly by pronotum, colour, chela, etc.

Prenanteon basale (DALMAN, 1818)

5 ♂ = Prov. Ryang-gang: Chann-Pay plateau, 24 km NW from Sam-zi-yan, road to Mt. Pektusan, 2000 m, 24 July 1975 PAPP et VOJNITS (No. 281). — 1 ♂ = The same Chann-Pay plateau Mt. Pektusan, Mu-do-bong, 2100—2200 m, 25. July 1975 PAPP et VOJNITS (No. 288). — 1 ♂ = Mt. Pektusan environs Sam-zi-yan hotel, wood, 18—20. VII. 1977 — netting in grasses, DELY and DRASKOVITS (No. 374).

These specimens correspond to PERKINS's (1976) description and not to that of RICHARDS (1939: 240). Concerning the male genitalia and ninth sternite: see MÓCZÁR (1983).

Distribution. Widely distributed (PERKINS, 1976).

Prenanteon clavatum sp. n.

♀. — Length 2.5 mm. Black; clypeus, a spot of hind coxae basally, abdomen (except last yellowish brown segment) dark brown; palps, antennae, legs mostly yellow; lower side of scape, mandibles (excepting red teeth), lower side of scape, mandibles (excepting red teeth), lower side of fore coxae, upper side of fore tibiae, tarsal joints (excepting last ones), small spots on articulating parts of femora and tibiae, tegulae, whitish. Wings normal, hyaline, pterostigma and venation translucent, whitish yellow. Radial vein of fore wing gradually curved, discal abscissa distinctly longer than proximal part. Body with sparse whitish hairs, abdomen less hairy, eyes bare.

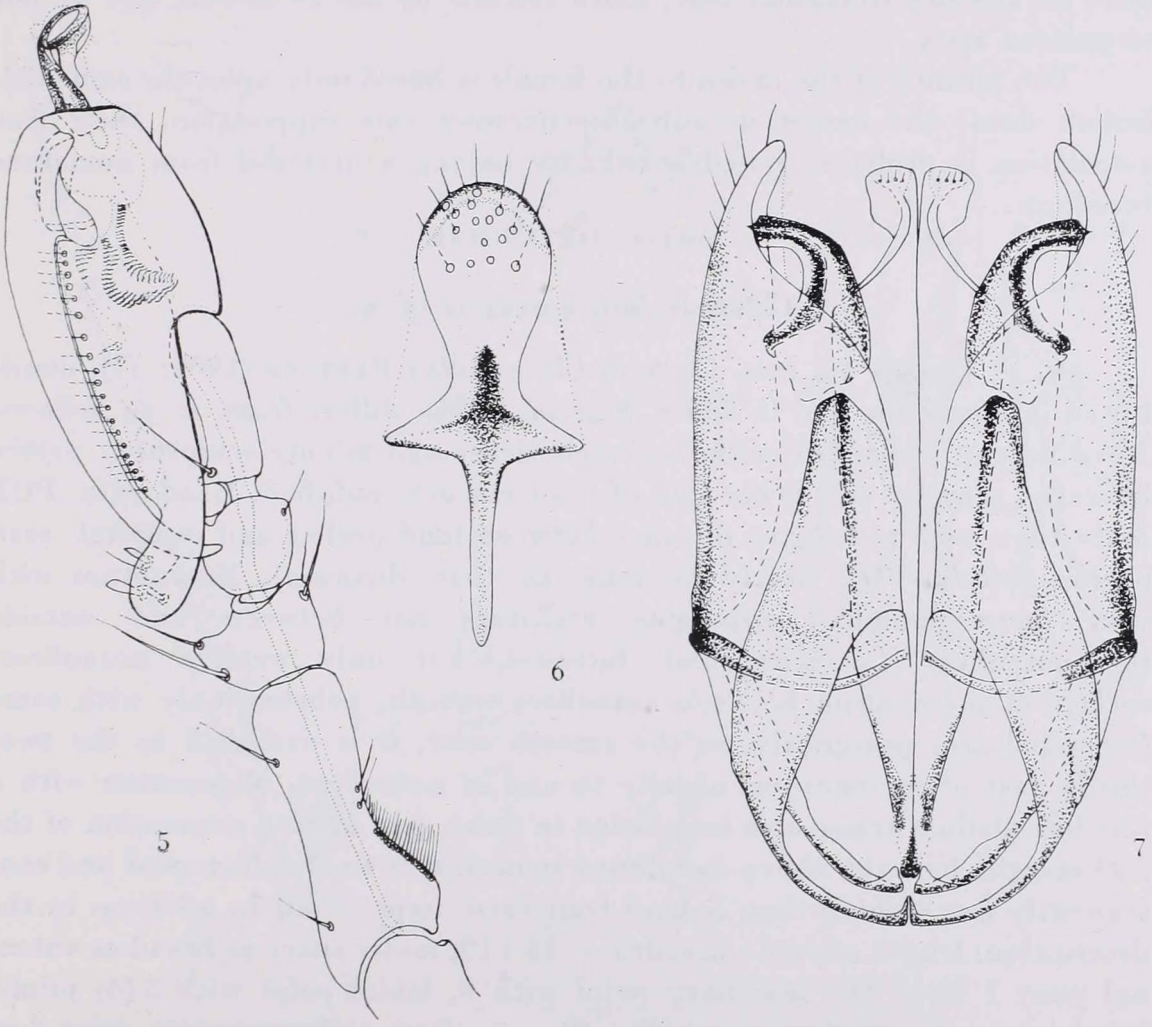
Head, in dorsal view (including eyes), transverse about twice as broad as long, remarkably convergent behind eyes, posteriorly with a very feebly curving, raised margin, shining; vertex shining with scattered and very fine punctures, ocellar triangle equilateral in an acute angle, POL : OOL = 5 : 7, posterior ocelli removed from occiput by a distance equal to POL (5), small impressions at outer sides of hind ocelli; frons smooth and shining, with

distinctly scattered and along eyes denser punctures; eyes elongate, two-thirds as broad as long (15 : 10); malar space as broad as POL (5); antennae slender, joints 1—2, as well as, 7—10 considerably thicker than 3—6, scape slightly curved, more than twice as long as broad, pedicel cylindrical, joints 3—6 gradually increasing in thickness from basally to apically, joints 3—4 longer than 5—9, equal with 10, 3 more than three times as long as broad apically, 4—5 at least four times as long as broad apically, last joints conspicuously thicker, clavate, than penultimate one, length (and breadth) proportions of antennal joints 1—10 = 9 (4) : 5 (3) : 11 (2 basally — 3 apically) : 11 (2—2.5) : 10 (2—2.5) : 8 (2—3) : 8 (3) : 8 (3.5) : 8 (3.5) : 11 (4.5). Pronotum nearly as long as mesonotum, in profile sloping down to anterior margin, surface dull, densely, irregularly punctured, only slightly shining medially and more finely coriaceous laterally. Mesonotum smooth, polished on its whole surface, only with a new scattered punctures, basally more so than apically; notaulices distinct, nearly extending to middle of mesonotum. Scutellum separated from mesonotum by a transverse crenulate deep furrow, surface of scutellum polished. A transverse crenulate furrow also before postscutellum; latter shining only medially. Propodeum with dorsal and posterior surface forming an almost regular curve, former a little shorter, surface dull, strongly rugose, posterior area feebly defined. Lateral side of thorax dull, rugulose, only mesopleuron postero-ventrally, above middle coxae polished and punctured only marginally. Fore legs with basitarsus equalling length of 3 + 4, tarsal joints 2 and 3 of equal length, mobile part of chela with a row of rather short bristles (Fig. 5) before inner margin and with a small group of a few lamellae at apex separately. Enlarged claw gradually and moderately curved. Length proportions of tarsal joints 1 : 2 : 3 : 4 : articulating part of 5 to joint 4 : mobile part : enlarged claw = 16 : 6 : 6 : 10 : 14 : 30 : 28. Abdomen smooth, polished, last abdominal segment compressed laterally.

♂. — Length 2.5—2.7 mm. Black; basis of mandibles, larger spots of coxae, femora, antennal joints 1—7 dark brown, mandibles (excepting red teeth), tegulae, antennal joints 8—10, legs mostly lighter brown, fore tibiae and tarsi partly yellowish brown. Wings normal, pterostigma, venation brown. Discal abscissa of radial vein distinctly longer than proximal part and in a distinct obtuse angle connected to one another. Antennae with long brownish outstanding hairs, they are as long as joints thick, body (excepting abdomen) covered with scattered white hairs. Eyes bare.

Head, in dorsal view (including eyes), transverse, 1.9 times broader than long (35 : 18), remarkably converging behind eyes, posteriorly rather strongly curved with raised margin; surface of vertex smooth, polished with scattered fine punctures; ocellar triangle nearly in an acute angle, POL : OOL = 6 : 7, curved impressions on the outer sides of ocelli small, posterior ocelli removed from occiput by less distance than POL (4); frons conspicuously convex,

smooth, polished with very sparsely fine punctures, a very weak indication of a discal impression, coriaceous only between antennal sockets and eyes; eyes oval, one and a quarter times longer than broad (15 : 12), malar space nearly as long as POL (5); antennae long, slender, scape considerably thicker than others, longer than joint 2, but shorter than others, joint 4 is the longest, equal with 10, joints 3, 5—7 of equal length, joint 1—2 about twice, 3, 5—8 about four times longer than broad, 4 five times longer than broad, length (and breadth) proportions of antennal joints 1—10 = 9 (4) : 7 (3.5) : 13 (3) : 15 (3) : 13 (3) : 13 (3) : 13 (3) : 12 (3) : 11 (3) : 15 (3). Pronotum short somewhat longer than one-third of mesonotum, surface rather dull, strongly coriaceous only medially, slightly shining. Mesonotum smooth polished with distinct punctures mostly along notaulices, latter long, extending distinctly beyond half its length. Scutellum, postscutellum polished with a transverse crenate row before posterior margins. Propodeum rugose, lateral side of thorax



Figs 5—7. *Prenanteon clavatum* sp. n. — 5 = fore tarsal joints with chela (♀, holotype); 6 = ninth sternite of paratype No. 507; 7 = genitalia of allotype (Orig. by A. Fazekas)

rugulose, similar to that of female, also with postero-ventrally smooth shining area. Abdomen smooth, polished. Genitalia (Fig. 7) of the two paratypes resemble those of *Prenanteon ruficornis* (DALMAN) sensu RICHARDS (1939: 239 fig. 48) nec PERKINS, but penis valvae with a distinct oblong membraneous lobe at apex, paramere less hairy, digitus with basis broad, three dimensional and with strongly laterally directed apical part. Ninth sternite slender, rounded apically similar to obtuse end of an egg (Fig. 6), with numerous bristles.

Holotype ♀ = "Korea, Prov. Ryang-gang: Chann-Pay plateau, 24 km NW from Samzi-yan, road to Mt-Pektusan, 2000 m", "No. 281 24 July 1975 leg. J. PAPP et A. VOJNITS" (Hym. Typ. No. 3676 Hungarian Natural History Museum, Budapest). — Allotype ♂ = The same data (Hym. Typ. No. 3677 H.N.H. Museum, Budapest). — Paratype 1 ♂ = "Mongolia, Central aimak Ulan-Baator, Nucht im Bogdo ul, 1880 m Exp. DR. Z. KASZAB, 1966", "Nr. 507 9. VI. 1966" (Hym. Typ. No. 3678 H.N.H. Museum, Budapest).

This species is related to *P. basale* (DALMAN, 1818) sensu PERKINS (1976), differs by its pronotum not smooth on its posterior half, by its antennal joint not elongate, by smaller size, by other chela, by male genitalia: penis valvae have no apically triangular lobe, ninth sternite by not so slender and by not so pointed apex.

The affinity of the males to the female is based only upon the same collection data; the longer notaulices contradict this supposition, their true association is probably possible only by having a material from numerous breedings.

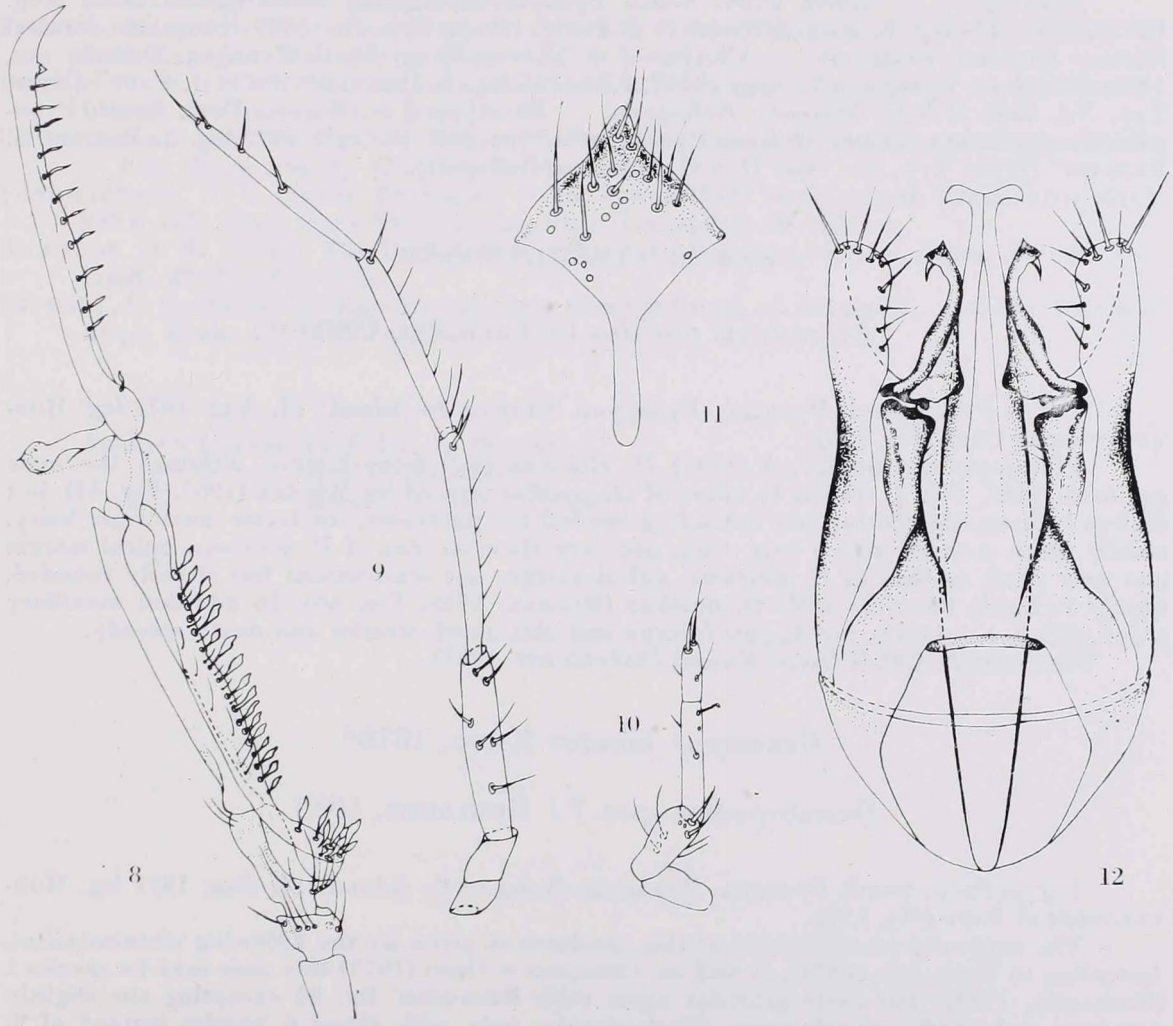
Subfam. DRYININAE

Chlorodryinus koreanus sp. n.

♀. — Length 4.2 mm. Close to *Ch. pallidus* PERKINS (1905: 57), distributed in Australia and in India, Kurian, 1954), differs from it as follows. Head only in frons dull, with extremely dense and minute sculpture, vertex laterally, temples and lower side of head smooth, polished. Head with POL more than wice as long as distance between hind ocellus and occipital carina (on *pallidus*-POL nearly as long as that distance). Mesonotum with very dense, minute coriaceous sculpture not between and outside the notaulices (= parapsidal furrows), but only outside notaulices; surface of mesonotum between notaulices smooth, polished only with some fine punctures posteriorly on the smooth area, it is extended to the two-thirds part of mesonotum, namely to end of notaulices. Mesonotum with a fine but distinct transverse impression in front, just behind excavation of the fore margin, here the above-mentioned smooth area finely alutaceous and consequently less shining than behind transverse impression. In addition to the description: length of eyes : breadth = 25 : 19, malar space as broad as antennal joint 1 thick (4), maxillary palpi with 6, labial palpi with 3 (4) joints, basal joints of maxillary palpi (Fig. 9) very short and transverse, joint 3 of labial palpi (Fig. 10) seems to consist of two parts; POL : OOL = 3 : 7

length (and breadth) proportions of antennal joints 1—10 = 10 (4) : 5.5 (3.5) : 32 (2 basally — 2.5 apically) : 19 (2.5) : 15 (2—3) : 11 (3) : 9 (3) : 8 (3—2.5) : 8 (2.5—2) : 9 (2), joint 3 remarkably long. Mobile part of chela (tarsal joint 5) with a row of lanceolate about 17 lamellae (Fig. 8) and with short bristles before lamellae, at apex with a separated group of lamellae. Enlarge claw with a row of normal, apically acute and smaller, about 11 lamellae and with a minute tooth before apex.

♂. — Length 3 mm. The male differs from *Ch. pallidus* PERKINS especially in colour: in lower part of head, mainly beginning at face between antennal sockets, clypeus, malar spaces and lower side of head yellowish brown or reddish brown, mandibles (excepting red teeth) white, tegulae pale. Lower part of pronotum, scutellum laterally, postscutellum partly dark reddish brown, abdomen brown, not black. Temples very prominent (viewed from above) on *pallidus*-temples slightly prominet. In addition to the de-



Figs 8—12. *Chlorodryinus koreanus* sp. n. — 8 = last tarsal joints of fore leg (♀, holotype); 9 = maxillary palpi (allotype); 10 = labial palpi (allotype); 11 = ninth sternite of allotype; 12 = genitalia of allotype (Orig. by A. FAZEKAS)

scription: eyes only three-quarters as broad as long (15 : 20), malar space hardly broader than POL (6), POL : OOL = 5 : 2, posterior ocelli removed from occiput by a less distance than OOL (1.5) and also in a less distance from occipital carina than on *pallidus*; antennal joint 3 twice as long as 1, length (and breadth) proportions of antennal joints 1—10 = 8 (4) : 6 (3) : 16 (2 basally — 3 apically) : 12 (3) : 11 (3) : 11 (2.5) : 10 (2) : 10 (2) : 9 (2) : 11 (2). Notaulices extending to half of horizontal part of mesonotum. Scutellum granulated similar to mesonotum. Postscutellum smooth, shining except in front. Propodeum rugose. Genitalia with parameres broadly truncate apically and with bristles (Fig. 12), digitus with basis three dimensional and with a strong, ventral curved bristle, as well as, with minute tooth apically, lamina volsellaris (= basivolsella) distinctly chitinized on its inner and upper margin, here with a few bristles. Ninth sternite like a rhombus (Fig. 11) with pointed apex and with bristles on surface, stalk slender.

Holotype ♀ = "Korea Prov. South Pyongan Pyongyan, Hotel garden 5—6. Aug. 1971", "No. 144 leg. S. HORVATOVICH et J. PAPP" (Hym. Typ. No. 3679 Hungarian Natural History Museum, Budapest. — Allotype ♂ = "Korea, Prov. South Pyongan, De-sang san, 12 km NE from Pyongyan 7. Aug. 1971", "No. 145 leg. S. HORVATOVICH et J. PAPP" (Hym. Typ. No. 3680 H.N.H. Museum, Budapest). — Paratype ♂ = "Korea, Prov. South Pyongan: Lyong-ak san, 14 km W from Pyongyan", "No. 300. 30. July 1975 leg. J. PAPP et A. VOJNITS" (Hym. Typ. No. 3681 H.N.H. Museum, Budapest).

Subfam. GONATOPODINAE

Dicondylus pusillus (SZÉPLIGETI, 1901)

1 ♂ = Prov. South Pyongan, Pyongyan Nung-ra do (island) 14. Aug. 1971 leg. HORVATOVICH et PAPP (No. 175).

PONOMARENKO published (1965) *D. sibiricus* (♀♂) from Siberia, although the male genitalia (1965, Fig. 3) similar to those of *D. pusillus* figured by MÓCZÁR (1965, Fig. 44), but digitus is distinctly shorter, not extending beyond the paramere, the latter much finer hairy, chiefly ninth sternite with a long stalk, not very short as that of *D. sibiricus*, apical margin not very short as that of *D. sibiricus*, apical margin not semicircular but slightly rounded, nearly straight, identical with *D. pusillus* (MÓCZÁR, 1965, Fig. 46). In addition maxillary palpi with 2 + 3 joints, not 4, gonoforceps well chitinized, slender and acute apically.

Distribution. USSR (Asia: Kasan) (SZÉPLIGETI, 1901).

Gonatopus lunatus KLUG, 1810*

Gonatopodini spec.? 1 RICHARDS, 1939

1 ♂ = Prov. South Pyongan, Pyongyan Nung-ra do (island) 14. Aug. 1971 leg. HORVATOVICH et PAPP (No. 175).

The equivocal identification of this specimen is given by the following circumstances. According to RICHARDS (1939), as well as, CURRADO et OLMI (1972) this male may be species 1 (RICHARDS, 1939). The male genitalia agree with RICHARDS' fig. 30 excepting the slightly narrower and shorter gonoforceps. Ninth sternite only with about 6 bristles instead of 9. Labial palpi with 2 joints, but maxillary palpi 2 + ?. Unfortunately, the apex of the second right joint was damaged, the left one is perceptibly unbroken. The colour also differs from the description. The specimen is only 1.9 mm instead of 2.3 mm.

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DRYINIDS FROM MONGOLIA COLLECTED BY DR. Z. KASZAB (HYMENOPTERA: DRYINIDAE)*

L. MÓCZÁR

(Received 20 April, 1982)

The 52 Dryinid specimens collected by KASZAB (1966—1968) in Mongolia represent 7 genera with 17 species mostly unknown from Mongolia. A new genus and two new species are described here: *Radiimancus* gen. n., *olmii* sp. n. ♀ and *Anteon mongolicum* sp. n. ♂

The Dryinid fauna of Mongolia was fairly recently treated by PONOMARENKO (1972, 1975, 1979). The following results are based on the material collected by DR. Z. KASZAB also in Mongolia. KASZAB collected 52 specimens (34 ♀ and 18 ♂) during his trips 1966—1968 comprising mostly subfam. Anteoninae with two new species, of which one was published earlier (MÓCZÁR, 1983). In the subfam. Bocchinae one species proved to be earlier also new: *Bocchus szelenyii* MÓCZÁR, 1974; another one here is described as a new genus and species. In the material there are only six species of subfam. Gonatopodinae. Most of the species are new for the fauna of Mongolia.

The detailed data of the localities concerning the species and the circumstances of collecting as well as the vegetation were given by KASZAB (1966, 1968a, 1968b).

The material was identified mostly by the help of publications of the following authors: PERKINS (1976), RICHARDS (1939, 1953), PONOMARENKO (1965, 1972, 1975, 1978, 1979) and CURRADO and OLMI (1972). Since the interpretation of the species are often different in doubtful cases I indicate also the authors. Also the specific names of this material were kindly revised by M. OLMI. After M. OLMI I changed my names at the species indicated with an asterisk (*).

Acknowledgements. I express here my sincere thanks for the kind collaboration in the ascertainment of the gen. n. and *Gonatopus mongolicus* PONOMARENKO to Prof. M. OLMI (Viterbo) Mrs. N. PONOMARENKO (Moscow).

Family **Dryinidae**

Subfam. ANTEONINAE

Anteon jurineanum LATREILLE, 1809

Central aimak: SO von Bajanzogt, 1600 m, 11. VI. 1966 (Nr. 519), 1 ♀. — Chovd aimak: 3 km N von Somon Uenč, im Tal des Flusses Uenč gol, 1450 m, 2—3. VII. 1966 (Nr. 614), 1 ♂.

* Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei. Nr. 474.

Distribution. Sweden, England, Germany (KIEFFER, 1914), France, Austria (RICHARDS, 1939), USSR (PONOMARENKO, 1978).

Anteon arcuatum KIEFFER, 1905

Südgobi aimak: Gurban Sajchan ul Gebirge, 15 km S von der Stadt Dalanzadgad, cca 1750 m, 13. VI. 1967 (Nr. 794), 1 ♀.

Distribution. France, Ireland, England (KIEFFER, 1905), Germany, Austria (RICHARDS, 1939), Leningrad (PONOMARENKO, 1978).

Anteon ephippiger (DALMAN, 1818)

Central aimak: SO von Somon Bajancogt, 1600 m, 11. VI. 1966 (Nr. 519), 1 ♀. — Chovd aimak: 3 km N von Somon Uenč, im Tal des Flusses Uenč gol, 1450 m, 2.—3. VII. 1966 (Nr. 614), 1 ♀. — Bulgan aimak: am Fluss Selenge-mörön, zwischen Somon Unt und Somon Chutag, 14 km O von Chutag, 920 m, 17. VI. 1968 (Nr. 972), 1 ♀.

Distribution. France, Austria, Germany, Sweden, England (RICHARDS, 1939).

Anteon pubicorne (DALMAN, 1818)

Central aimak: SO von Somon Bajancogt, 1600 m, 11. VI. 1966 (Nr. 519, 520), 4 ♀; ibid., 1600 m, 13. VI. 1968 (Nr. 944), 1 ♂. — Archangaj aimak: Changaj Gebirge, 8 km W von Somon Urdtamir, 1620 m, 19. VI. 1966 (Nr. 538), 2 ♀. — Bulgan aimak: 7 km NW von Somon Chanžargalant, 1350 m, 16. VI. 1968 (Nr. 967), 1 ♂.

Distribution. France, England (KIEFFER, 1905), Germany, Austria, Ireland (RICHARDS, 1939), Leningrad (PONOMARENKO, 1978), Korea (MÓCZÁR, 1983).

Anteon mongolicum sp. n.

♂. — Length 2.6 mm. Black; teeth of mandibles red; palps, antennae dark brown; coxae, trochanters and femora except the small marks partly basally, apically and broadly the inner side of fore femora, hind tibiae and tarsi, tegulae, abdomen brown; fore and middle tibiae, tarsi light brown; hind leg with spur conspicuously longer than apical breadth of tibia. Wings hyaline, hardly infuscated, pterostigma, radius, costa, subcosta brown, other pale yellow. Distal abscissa of radius hardly longer than half proximal part (7 : 13), fore wings with radial vein obtuse angled. Antennae with long outstanding light brown hairs, hairs as long as breadth of the four ultimate joints, body covered with rather sparse pale hairs. Eyes almost bare, a few hairs visible under high magnification.

Head transverse in dorsal view, nearly twice as broad as long; occipital carina complete, head rather densely and deeply punctured, interspaces smooth and shining, frons convex, with a very short furrow under mid ocellus; ocelli in a slight acute angle, POL : OOL = 7* : 8.5, outer side of hind ocelli

* Wild microscope magnification ocular ×10, objective ×25, supplementary objective ×2.

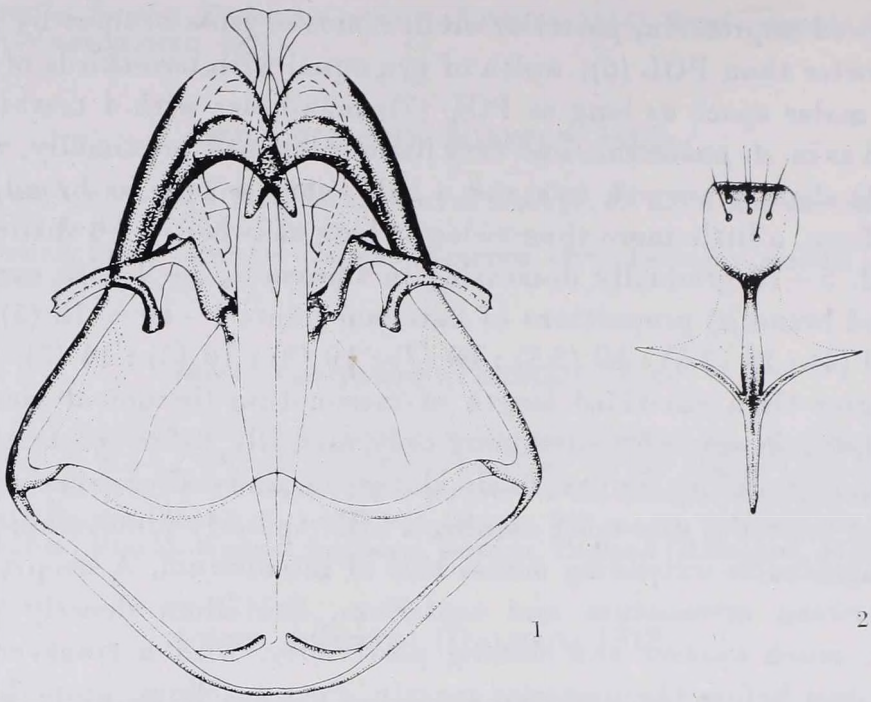
with a curved impression, posterior ocelli removed from occiput by a distance a little shorter than POL (6); width of eye equal with two-thirds of its length (12 : 18); malar space as long as POL (7); mandibles with 4 teeth; antennae not as thin as in *A. pubicorne*, and very little thickened proximally, with scape (= joint 1) slightly curved, two and a half times as long as broad, joint 2 a little pyriform, a little more than twice as long as broad, 3—4 distinctly thinner than 2. 5—10 gradually decreasing in thickness, 3—9 with same length, length (and breadth) proportions of antennal joints 1—10 = 12 (5) : 6 (4.5) : 10 (4) : 10 (4) : 10 (3.5) : 10 (3.5) : 10 (3) : 10 (3) : 10 (3) : 14 (3). Pronotum short, shorter than one-third length of mesonotum (in dorsal view, 7 : 24), finely sculptured, smooth and shining only medially before posterior margin. Mesonotum remarkably convex, finely alutaceous and rather densely punctured basally and laterally, disc more shining a little sparsely punctured; notaulices well distinguishable extending across half of mesonotum. A deep transversal furrow between mesonotum and scutellum. Scutellum densely punctured anteriorly, much sparser and shining posteriorly, with a transverse row of punctures just before the posterior margin. Postscutellum, propodeum finely rugose, rather mat with feebly defined central area, surface sculpture distinctly finer than parts outside it. Mesopleuron finely rugose only posteroventrally, above mid coxae with a smooth, almost unpunctured shining area. Abdomen smooth, shining.

Male genitalia (Fig. 1) similar to *Anteon* (*Ch.*) *lucidum* RICHARDS (1939: 270), but inner process of paramere more acute and directed to the outer margin of the opposite part of basal ring, apical tip of paramere evenly rounded, digitus (= distivolsella) directed laterally (like to *Anteon brachycerum* DALMAN according to RICHARDS's 1939: 252 fig. 57) but with narrow basis, which turning at a right angle, gradually broadened in proximal half, in the middle well chitinized, narrow in apical half, slightly curved and ending in one feeble tooth medially; gonoforceps broad, membranous, its margin only on inner side distinguishable. Ninth sternite (Fig. 2) more similar to *A. brachycerum* (l.c. fig. 56), but rounded laterally and truncated apically with about eight long bristles.

♀. — Unknown.

Holotype 1 ♂: "Mongolia, Central aimak, Ulan-Baator, Nucht im Bogdo ul, 1800—2000 m, Exp. Dr. Z. Kaszab, 1966", "Nr. 746, 27. VII. 1966" (Hym. Typ. No. 3667, Hungarian Natural History Museum, Budapest).

This species resembles *Anteon* (*Ch.*) *lucidum* RICHARDS (1939: 270), regarding the variability in colour as well as in sculpture described by RICHARDS (1939: 270), but differs from it chiefly by its genitalia and by ninth sternite. This species is synonymous with *A. pubicorne* (DALMAN, 1818) according to M. OLMI. On the basis of the differences, especially those of the genitalia, I suppose it to be a separate species.



Figs 1—2. *Anteon mongolicum* sp. n. ♂. — 1 = genitalia, 2 = ninth sternite (Orig. by A. FAZEKAS)

Prenanteon melanocera (KIEFFER, 1905)

Central aimak: 11 km OSO von Somon Bajancogt, 1600—1700 m, 26. VII. 1968 (Nr. 1150), 1 ♀.

This species was synonymized by RICHARDS (1939) with *P. ruficornis* (DALMAN, 1818). In spite of the fact, that this Mongolian specimen corresponding in many respect to the description of *P. ruficornis* (DALMAN) sensu RICHARDS (1939) I use the name *P. melanocera* KIEFFER in consequence of the

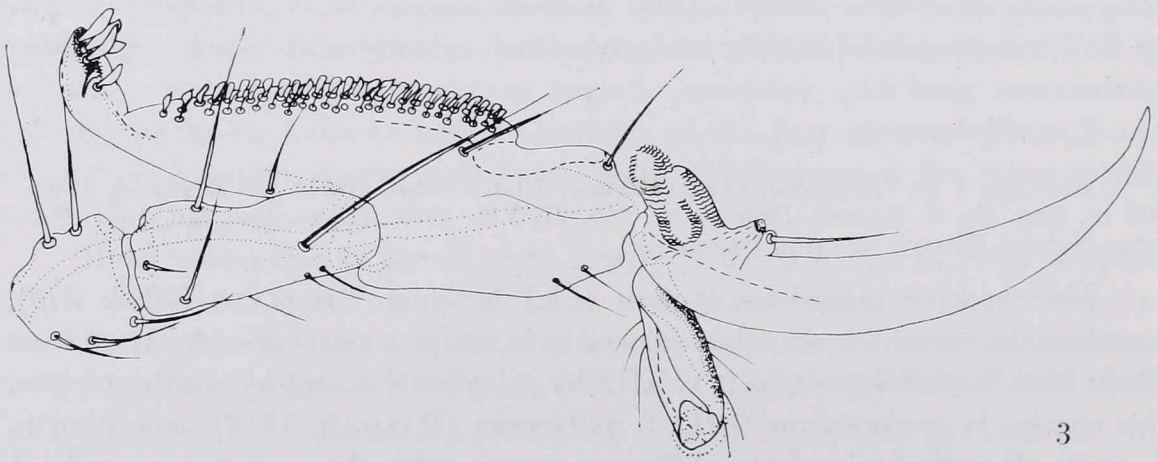


Fig. 3. *Prenanteon melanocera* (KIEFFER) ♀, last tarsal joints of fore leg with chela (Orig. by A. FAZEKAS)

following differences. According to RICHARDS (1939): "pronotum entirely or at least the anterior half rugosely punctured, mesonotum with notaulices longer, extending over three-quarters its length . . .". KIEFFER wrote in his original diagnosis (1905: 179): "Pour tout le reste, semblable à *proceicornis* (voir n° 46)" . . ., p. 183: "Pronotum . . . chagriné ou finement ponctué; mesonotum . . . sillons distinct dans la moitié antérieure". As far as the mesonotum is concerned, PERKINS (1976) gave the figure of it and wrote: "Notauli shallower, narrow and finely aciculate extending to about mid-line of mesoscutum (fig. 55)" corresponding to the above-mentioned specimen. PONOMARENKO (1978: 21) gave the chela of *P. ruficorne* DALMAN but this species differs by lack of the short setae (Fig. 5: 11), by the basis of the enlarged claw, etc.

In addition to "*P. melanocera* KIEFFER" collected in Mongolia: Length of eye: breadth of eye = 13 : 8, POL : OOL = 10 : 13, malar space and the distance between hind ocelli and occiput equal with POL (10). Length (and breadth) proportions of antennal joints 1—10 = 16 (6) : 10 (4) : 18 (2 basally — 3 apically) : 18 (2—3) : 17 (3) : 15 (3) : 14 (4) : 13 (4) : 12 (4) : 16 (4). Mesonotum nearly as long as pronotum, notaulices distinctly shorter than half mesonotum. Length of fore tarsal joints 1—4, as well as, (only articulated part) whole mobile part and enlarged claw: 14 : 4.5 : 4.5 : 8 (11) : 24 : 23; mobile part (Fig. 3) with very dense two, here and there with three rows of lamellae, while the separate distal group may consist of as many as 5 or 6.

Distribution. France (KIEFFER, 1905), England (KIEFFER, 1914).

Prenanteon basale (DALMAN, 1818)

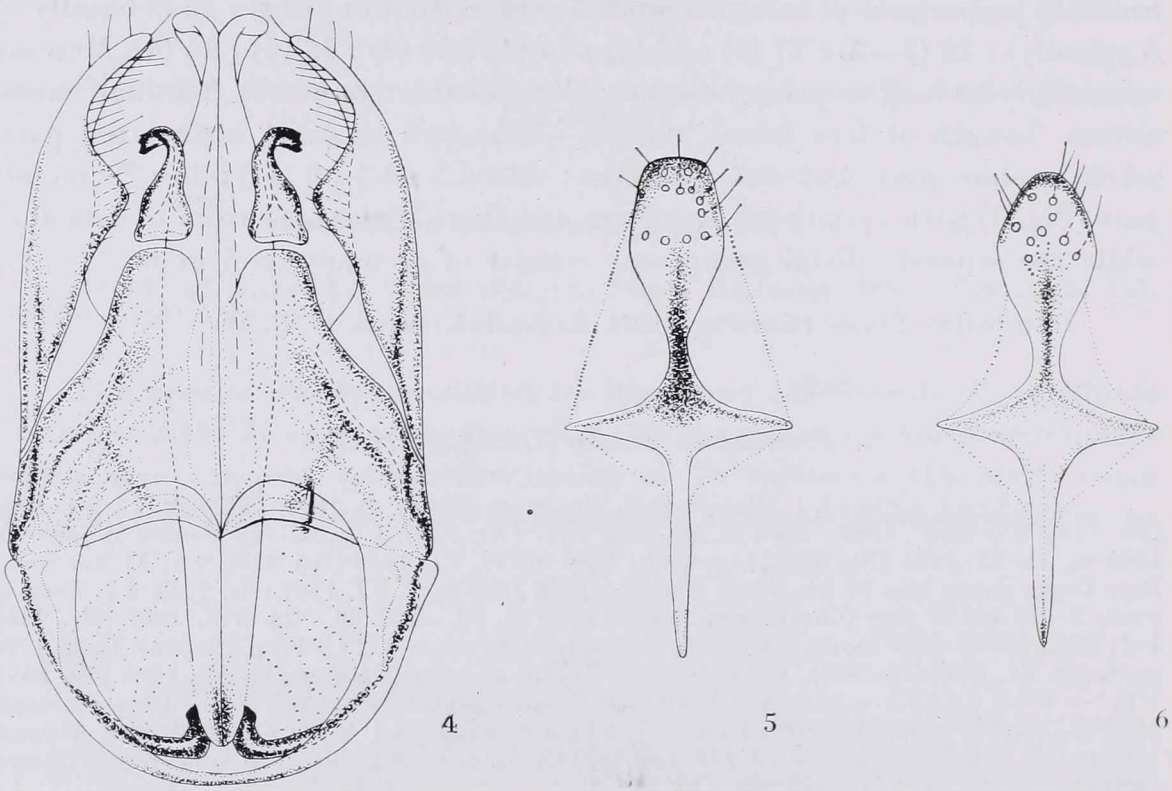
Central aimak: Ulan-Baator, Nucht im Bogdo ul, 1600—1750 m, 10. VI. 1966 (Nr. 514), 3 ♀; ibid., 1500—1600 m, 21. VII. 1967 (Nr. 930), 1 ♀; SO von Somon Bajancogt, 1600 m, 11. VI. 1966 (Nr. 519), 1 ♂; ibid., 1600 m, 13. VI. 1968 (Nr. 944), 4 ♀; 11 km S von Pass Zosijn davaa (cca 90 km S von Ulan-Baator), 1650 m, 7. VI. 1967 (Nr. 771), 4 ♀; Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1500—1700 m, 19.—20., 23.—24. VII. 1967 (Nr. 926), 1 ♂; ibid., 1700—1900 m, 23.—24. VII. 1967 (Nr. 926a), 1 ♀, 1 ♂ (♂ Prep. No. 16); ibid., 1700 m, 7.—8. VI. 1968 (Nr. 938), 1 ♀; Bogdo ul, Bugijn až achuj, 1650 m, 10. VI. 1968 (Nr. 939), 1 ♀. — Chövsgöl aimak: 8 km von Somon Burenchaan, am Fluss Delger mörön, 1450 m, 20. VI. 1968 (Nr. 990), 1 ♂. — Bulgan aimak: 9 km O von Somon Abzaga, 1300 m, 23. VII. 1966 (Nr. 732), 2 ♂ (Prep. No. 19); Namnan ul Gebirge, 23 km NW von Somon Chutag, 1150 m, 21. VII. 1968 (Nr. 1135), 1 ♂.

According to RICHARDS (1939: 236) in the *Prenanteon* genus, neither the chela of the female nor the genitalia of the male seems to have much value in separating the species. Consequently, the interpretation of the species is different as given by KIEFFER, RICHARDS and by PERKINS. According to PERKINS (1976) *P. basalis* (DALMAN) may well represent a species group but at present it is considered to be a single species with synonyms *daos* WALKER, *ruficornis* var. *melanocera* KIEFFER and *proceicornis* KIEFFER.

The above-listed females are identical with each other and correspond to the *Pr. basalis* sensu PERKINS (1976) not RICHARDS (1939: 240). The male represents probably also a species-group, some specimens being more strongly punctate on the frons, while others less and more finely, so with a weak indication of a discal impression to a rather deep furrow; propodeum in lateral view rounded from base to apex or rather angular between the dorsal and the declivous part. Ninth sternite and genitalia of 8 males have no essential differences coupled with the morphological differences.

Apex of the ninth sternite sometimes slightly truncate (Fig. 5, of specimen No. 16) mostly rounded (Fig. 6). Penis valvae of genitalia only with a triangular hyaline lobe (Fig. 4 of specimen No. 16), paramere with more or less number of long hairs.

Distribution. Sweden (KIEFFER, 1905). Widely distributed (PERKINS, 1976), Korea (MÓCZÁR, 1983).



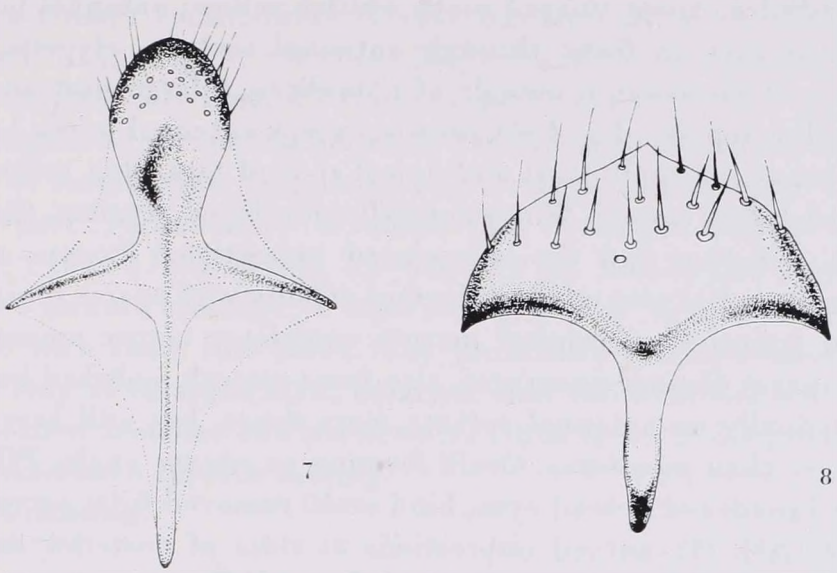
Figs 4—6. *Prenanteon basale* (DALMAN) ♂. — 4 = genitalia of male specimen No. 926a (Prep. No. 16); 5 = ninth sternite of the same male; 6 = ninth sternite of specimen ♂ No. 732 (Prep. 19) (Orig. by A. FAZEKAS)

Prenanteon longicornis (DALMAN, 1823)

A r c h a n g a j a i m a k : Changaj Gebirge, zwischen Somon Ichtamir und Somon Culuut, cca 20 km W von Somon Ichtamir, 3 km S vom Tal des Flusses Chanuj gol, 2150 m, 20. VII. 1966 (Nr. 719), 1 ♂.

I put this specimen here on the basis of notaulices extending well behind mid-length of mesonotum (PERKINS, 1976: 25), by the distinctly and rather deeply punctures of frons, by the clypeus and the black basis of mandibles as well as, by the central groove of the disc on frons. Length 4 mm. Male genitalia similar to *P. daos* (WALKER) sensu RICHARDS (1939, 239: fig. 48), dark brown, digitus conspicuously stumpy and directed laterally and not anteriorly. Ninth sternite rounded apically like the obtuse end of an egg (Fig. 7), apical part with three curved rows of long bristles, with 7—8 bristles in each row, not as given by RICHARDS (1939: 241, 239: fig. 46) for *P. daos* (WALKER).

Distribution. Sweden, Lappland, England, Germany, Italy (KIEFFER, 1905).



Figs 7—8. 7 = *Prenanteon longicornis* (DALMAN) ♂, ninth sternite; 8 = *Dicondylus helleni* Raatkainen ♂, the same (Orig. by A. FAZEKAS)

Prenanteon clavatum MÓCZÁR, 1983

Central aimak: Ulan-Baator, Nucht im Bogdo ul, 1800 m, 9. VI. 1966 (Nr. 507), 1 ♂ (paratype).
Distribution. Korea (MÓCZÁR, 1983).

Subfam. BOCCHINAE

Radiimancus gen. n.

♀. — Mandibles tridentate, maxillary palpi with 6, labial palpi with 3 joint. Eyes with very few microscopical hairs. Occipital margin complete. Pronotum long, posterio-lateral angles produced into lobes which reach tegulae. Postscutellum normal. Fully winged, pterostigma lanceolate, radial vein of fore wings missing. Fore trochanter only as long as its apical breadth, basi-

tarsus remarkably longer than any other joints, also fourth joint longer than 2 or 3, third tarsal joint produced laterally into a hook, bearing long hairs, mobile part of fifth joint with minute lamellae, enlarged claw smooth, chela with reduced claw. Tibial spurs 1, 1, 1. Petiole short.

♂. — Unknown.

Type-species: *Radiimancus olmii* sp. n.

Radiimancus olmii sp. n.

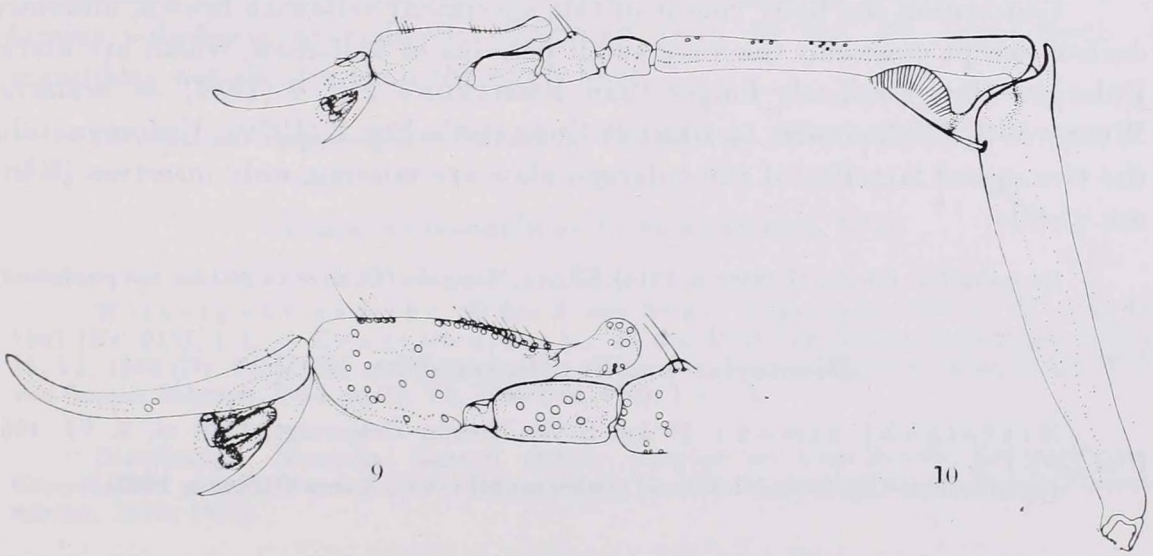
♀. — Length 4.2 mm. Black; tegulae nearly the whole lower side of fore coxae, mandibles except the red tooth whitish yellow; antennal joints 4, lower face between eyes in front through antennal sockets, clypeus, pronotum, lateral parts of mesonotum outside of notaulices, a large spot on episternum medially below tegulae, legs light brown, except antennal joints 1—3, fore leg yellowish brown, a small basal and apical spot of fore tibia yellow; antennal joints 5—10 darker brown. Wings normally developed, hyaline, the apical half infuscated, venation and the lanceolated pterostigma brown, with a pale proximal spot, radial vein missing. Surface of body with sparse short, pale hairs.

Head transverse, occipital margin complete; vertex smooth, polished with very sparse distinct punctures, also frons smooth, polished but punctures become gradually on antennal sockets more dense, but still here interspaces always larger than punctures. Ocelli forming on obtuse angle, POL : OOL = 8 : 9, head broadened behind eyes, hind ocelli removed from occiput by equal distance of OOL (9), curved impressions at sides of posterior and before of anterior ocellus present, frontal sulcus only medially very short and shallow, hardly visible; eyes elongate, length and breadth of eyes = 25 : 15; malar space hardly present, width of basis of mandible: malar space = 7 : 1.5; mandibles with 3 teeth, which gradually becoming larger from internal one to external one; maxillary palpi with 6, labial palpi with 3 joints, last joints appears to be divided in two parts; clypeus with hardly curved lower margin; antennae thin except joints 1 and 2, scape slightly curved, twice longer than broad, pedicel one and a half longer than broad with convex sides, pyriform; joints 3, 4 with sides straight, with distal end a little thickened, 5—9 with slightly convex inner side, 3 about as long as 1 + 2 or 5 + 6, length (and breadth) proportions of joints 1—10 = 8 (4) : 4.5 (3) : 12 (2 basally — 2.5 at tip) : 7.5 (2—2.5) : 6.5 (3) : 6 (3) : 6 (3) : 6 (3) : 6 (3) : 8 (2.5). Pronotum long, posterio-lateral angles produced into lobes, which reach tegulae, length of pronotum : mesonotum = 8 : 18, surface of pronotum nearly flat in lateral view, finely sculptured, finely transversally wrinkled and mat medially, nearly smooth and slightly shining postero-laterally. Mesonotum remarkably convex in lateral view, smooth, polished with some very sparse distinct punctures,

only basally denser between notaulices and deeper, notaulices fine and hardly extending to mid-line of mesonotum, parapsidal furrows well developed. Scutellum, postscutellum smooth, polished, just before posterior margin of scutellum a transverse row of very small punctures, between mesonotum and scutellum, as well as, between scutellum and postscutellum a deep transversal furrow. Propodeum short and very convex, irregularly, mostly transversely rugulose, lateral side of propodeum with diagonal wrinkles. Lateral side of thorax with a broad and deep diagonal furrow above the mid and hind coxa. The brown spot below tegulae rather smooth and shining, around it sculptured, hardly shining medially.

Fore coxae 1.6 times as long as broad, fore trochanter as long as broad apically, fore femora considerably clavate basally and nearly three times as long as broad, tibia (Fig. 9) 5.4 times longer than broad apically, basitarsus of fore leg conspicuously long, 4.7 times longer than tarsal joint 4, joint 2 and 3 of equal length, 4 1.4 times longer than 2 or 3, length (and greatest breadth) proportions of tarsal joints (Fig. 10) 1 : 2 : 3 : 4 : articulated part of 5 : whole 5 = mobile part : rudimentary or small claw : enlarged claw = 33 (3.5)* : 5 (4) : 5 (5) : 7 (3) : 8 (6) : 16 (6) : 7.5 (0.5) : 15 (2). Mobile part with two rows of very dense minute lamellae, a separated group at apex also with minute lamellae and with short fine hairs, they are hardly distinguishable, reduced claw half as long as enlarged claw, enlarged claw of chelae smooth, without a subapical tooth or lamellae and not serrate. Tibial spurs of fore, mid and hind legs 1, 1, 1. Abdomen smooth shining.

♂. — Unknown.



Figs 9—10. *Radiimancus olmii* sp. n. ♀. — 9 = last tarsal joints of fore leg with chela; 10 = fore tibia and tarsi (Orig. by A. Fazekas)

* Wild microscope magnification: ocular ×10, objective ×50, supplementary objective ×2.

Holotype 1 ♀: "Mongolia, Chovd aimak, 10 km SSW von Somon Bulgan, 1200 m, Exp. Dr. Z. Kaszab, 1966", "Nr. 632, 4.—6. VI. 1966" (Hym. Typ. No. 3668, Hungarian Natural History Museum, Budapest).

I name this species in honour of the outstanding Dryinid specialist Prof. Massimo Olmi (Viterbo, Italy).

Bocchus szelenyii Móczár, 1974

One single female was captured in 23. VI. 1967, Bajanchongor aimak. This species is easy to recognize among the few *Bocchus* species known from the world (Nagy, 1969) by its tibial spurs 1, 1, 1, by the brown radial vein, the enlarged claw of chela with 8 triangular teeth, etc.

Distribution. Mongolia (Móczár, 1974).

Subfam. GONATOPODINAE

Dicondylus dichromus Kieffer, (1906)*

Bulgan aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 14. VI. 1968 (Nr. 958), 1 ♀.

According to Olmi et Currado (1979: 44): "The 3 species of *Haplogonatopus* have females very similar, it is impossible to distinguish the females". Therefore, I suggest to give this name to the specimen collected in Mongolia and neither *H. apicalis* Perkins (distributed in the Australian region) nor *H. oratorius* (Westwood) (distributed in Europe of the Palearctic Region).

Concerning the body colour of this specimen: yellowish brown, abdomen darker except eyes and the very small petiolus of abdomen, which are black. Enlarged claw distinctly longer than Richards's Fig. 4 (1939) of *oratorius* Westwood, 1833, similar to Olmi et Currado's Fig. 2 (1979). Unfortunately, the two apical lamellae of the enlarged claw are missing, only insertion points are visible.

Distribution. Corsica (Kieffer, 1914). Sibiria, Mongolia (Olmi et Currado, not published).

Dicondylus pusillus (Szépligeti, 1901)

Mittelgobi aimak: 20 km S von Somon Delgercogt, 1480 m, 9. VI. 1967 (Nr. 779), 1 ♂.

Distribution. USSR (Asia: Kasan) (Szépligeti, 1901), Korea (Móczár, 1983).

Dicondylus helleni Raatkainen, 1961

Central aimak: Ulan-Baator, Nucht im Bogdo ul, 12 km SO vom Zentrum, 1650—1950 m, 4. VI. 1966 (Nr. 494), 1 ♂; SO von Somon Bajancogt, 1600 m, 11. VI. 1966 (Nr. 519), 1 ♂. — Chovd aimak: 3 km N von Somon Uenč, im Tal des Flusses Uenč gol, 1450 m, 2.—3. VII. 1966 (Nr. 614), 1 ♂.

In RAATKAINEN's original diagnosis (1961: 129), as well as, in Fig. 2d, maxillary palpi are given with three joints, with reference to the variation in the *Dicondylus* species with respect to the number of both maxillary palpi and labial palpi (1961: 132). The Mongolian specimens have 2 + 2 joints. The male genitalia (paramere, penis valvae, the shape of digitus) very close to the *D. helleni* (Fig. 2b), only digitus turns to lateral direction and not apically (probably owing to the last functional condition). Gonoforceps although flat and broad similar to *D. helleni*, but with the apical part slightly lengthened, not directed to penis valvae but to paramere. Ninth sternite with about 17 bristles but each seated in circular spots (Fig. 8). I suppose that the Mongolian specimens represent the species *D. helleni*, in spite of the small differences.

Distribution. Sweden, Finland (RAATKAINEN, 1961).

Pseudogonatopus distinctus (KIEFFER, 1906)

? = Gonatopodini ♂ species 3 RICHARDS (1939: 225)

C e n t r a l a i m a k : 11 km vom Pass Zosijn davaa (cca 90 S von Ulan-Baator), 1650 m, 7.—8. VI. 1967 (Nr. 769), 1 ♂.

This specimen is similar to RICHARDS's (1939) and CURRADO et OLMI's (1972) description. According to OLMI the notaulices are more reparated here than in the typical *distinctus*. The ninth sternite, male genitalia also agree (RICHARDS, 1939: 225, fig. 36, 37) except the following details: outer side of lamina volsellaris more shortly chitinized than in fig. 37, inner tooth of mandibles not shorter than the outer ones.

Distribution. England (KIEFFER, 1906), West Europe, USSR (Krim) (PONOMARENKO, 1978).

Gonatopus mongolicus PONOMARENKO, 1972

M i t t e l g o b i a i m a k : 20 km S von Somon Delgercogt, 1480 m, 13.—14. VII. 1967 (Nr. 915), 1 ♀. — C e n t r a l a i m a k : 11 km OSO von Somon Bajancogt, 1600 m, 13. VI. 1968 (Nr. 945), 1 ♀. — C h ö v s g ö l a i m a k : am See Tunamal nuur 26 km WNW von Somon Scharga, 1950 m, 21. VI. 1968 (Nr. 996), 1 ♀.

Distribution. Mongolia, Central aimak: Songino nr. Ulan-Baator, Erdene-Chuduk; Central-Gobi aimak: Mandal Gobi, Delger-Cogt; East-Gobi aimak: Tamcag-Bulak (PONOMARENKO, 1972, 1979).

Gonatopus camperlris PONOMARENKO, 1965*

U v s a i m a k : Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (Nr. 1036), 1 ♀.

Distribution. USSR: Middle Volga (PONOMARENKO, 1965).

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NEW TAXA OF EPHYDRIDAE (DIPTERA) FROM THE HORTOBÁGY NATIONAL PARK (HUNGARY)

L. PAPP

(Received 6 May, 1982)

A new genus, *Subpelignus* gen. n. (type-species *S. hortobagyensis* sp. n.) of the tribe Psilopini and three species of *Hydrellia* (*asymmetrica* sp. n., *minutissima* sp. n. and *parafrontosa* sp. n.) are described from the Hortobágy N. P. With 21 figures.

In the frame of studies on the fauna of the Hortobágy National Park, a rather significant material of ephydrids was collected and identified (more than 2500 specimens of 73 ephydrid species); their data are published in a separate paper (PAPP, 1983). Four new species were found which are described below. All type-specimens of the new species are preserved in the collection of the Zoological Department of the Hungarian Natural History Museum (specimens on minutia pins, genitalia of some males in plastic microvials with glycerine).

Subpelignus gen. n.

Very small greyish species with a peculiar combination of features. Head higher than long in profile, facial plate not bulging. Outer and inner verticals very long and thick, postoculars incurving and low in number (Fig. 1); one pair of small postocellars at level with outer verticals; ocellars very long, ocellar bases somewhat distally to anterior ocellus but slightly outside of ocellar triangle; 3 pairs of upper frontoorbitals: 1 pair of long anterior proclinate bristle on orbitalia, 1 pair of long and thick reclinate bristles much more medially and somewhat distally to anterior pair, a third pair of short proclinate frontoorbitals rather distally to the proclinate ones. Facial plate without bristles medially, no bristles on mouth edge but 3 pairs of bristles laterally at the same distance from ptilinal suture: upper pair inclinate, middle pair proclinate (Fig. 1) and downcurving; two pairs of short bristles laterally to facial bristles just on suture. Gena with 2 long bristles below eyes and some shorter bristles posteriorly (on the widened part of genae). Arista pectinate dorsally. Second antennal joint medially with a long proclinate bristle. No presutural dorsocentrals. Four rows of short but rather well-arranged acro-

stichals. Costal vein distinct to the conjointment with medial vein, second costal section distally with a long, comparatively thick spine (Fig. 21) and 1 other shorter bristle. Legs without characteristic bristles.

Type-species: *Subpelignus hortobagyensis* sp. n.

Subpelignus gen. n. key out to the couplet 34 (33) of PAPP's (1975) key for the Hungarian (and also Palaearctic) ephydrids or to couplet 39 (40): *Psilopa*. It keys out also to *Psilopa* in STURTEVANT and WHEELER's (1954) key for the Nearctic Ephydridae (more closely to subg. *Psilopa*, since its basal antennal joint much shorter than its diameter and face without fine wrinkles). I do not think that this new genus is closely related to *Psilopa*: its body is not black nor metallic but grey, it is much smaller than the majority of the *Psilopa* species, it has no strong bristle on gena below eyes, aristal rays are shorter, some important ratios of body are different (Fig. 1). It can be characterized by a peculiar combination of features of Psilopini and Discocerini.

Subpelignus hortobagyensis sp. n.

Measurements in mm (holotype male): length of body: 1.25; length of wings 1.19, width of wings 0.47; second costal section 0.534, third costal section 0.483, ratio 1.424; distal section of medial vein 0.483, t_a—t_p 0.29, ratio 0.67.

Features other than in the description of genus: Orbitalia and interfrontal stripe (frontal triangle) grey, area between them greyish blue. Body and legs grey. Thoracic chaetotaxy: 1 humeral, 2 notopleural (both close to mesopleural suture), 1 presutural, 1 supraalar, 1 intraalar, 1 big postalar, 2 scutellar pairs of bristles. One pair of dorsocentrals in a rather medial and almost prescutellar position. Disc of scutellum with some short bristles. Mesopleuron with two robust distally curved mesopleural pairs and with some short mesopleurals on upper and distal part (Fig. 1); 1 sternopleural. Middle tibia with a short ventroapical. Wings light brown, veins dark brown. Vein r_{2+3} almost straight (Fig. 21), slightly upcurving only its apical 1/8, r_{4+5} downcurving, terminating in apex of wing, medial vein slightly S-curved. Hind crossvein darker than other veins surrounded by a small indistinct brown infuscation (Fig. 21). Distal section of cubital almost twice longer than hind crossvein (0.17 mm vs. 0.09 mm), apex of cubital vein removed by 0.02 mm from wing margin; anal and axial veins represented by a rather distinct fold of vein each. Tergum 5 of male abdomen rather long. Inner genitalia not studied.

Holotype male: Hortobágy N. P., Hortobágy-Máta — Kungyörgytó, 1974. VIII. 29. — fűháló [= netted] — leg. PAPP, L. The right wing of the holotype is preserved on a slide.

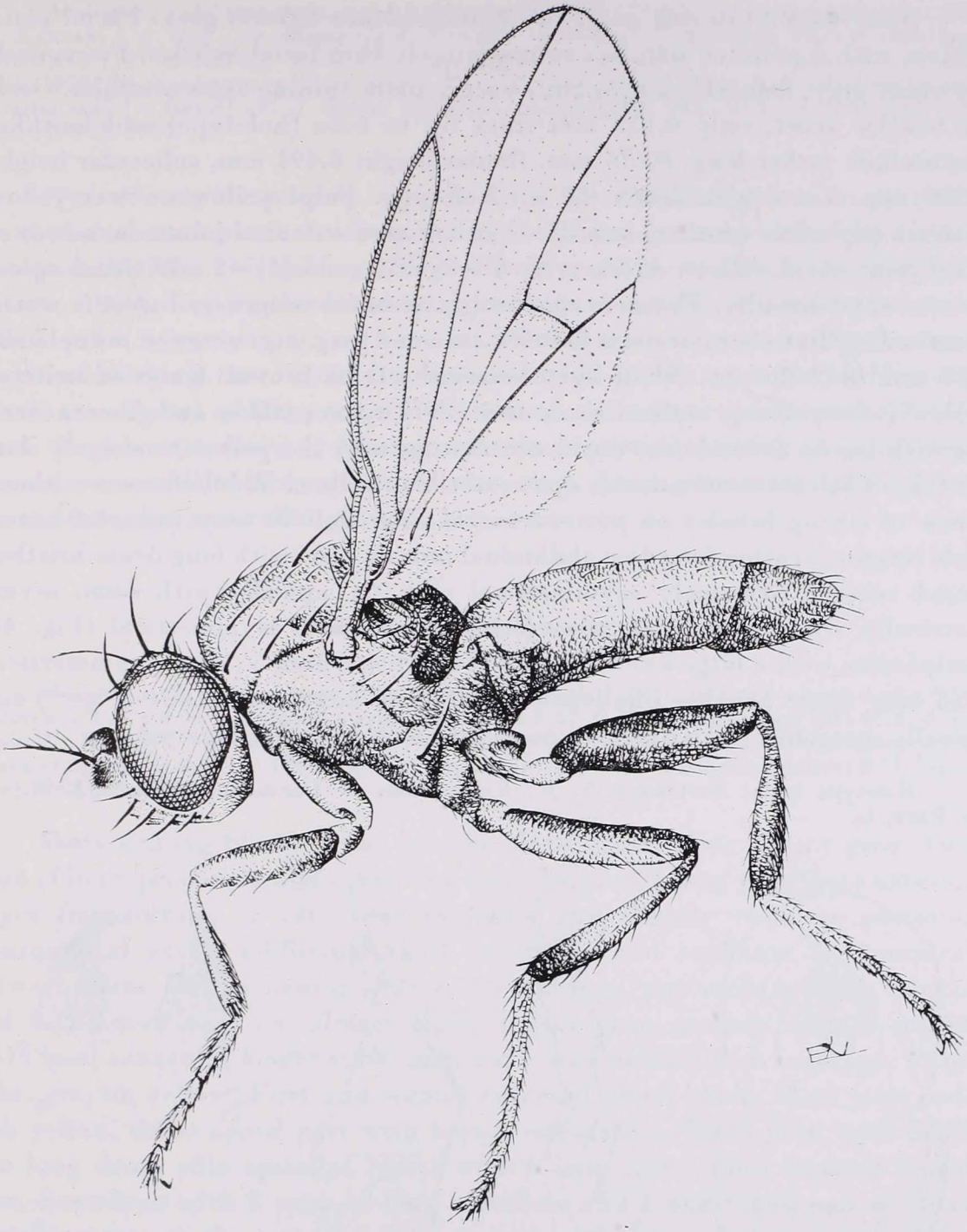


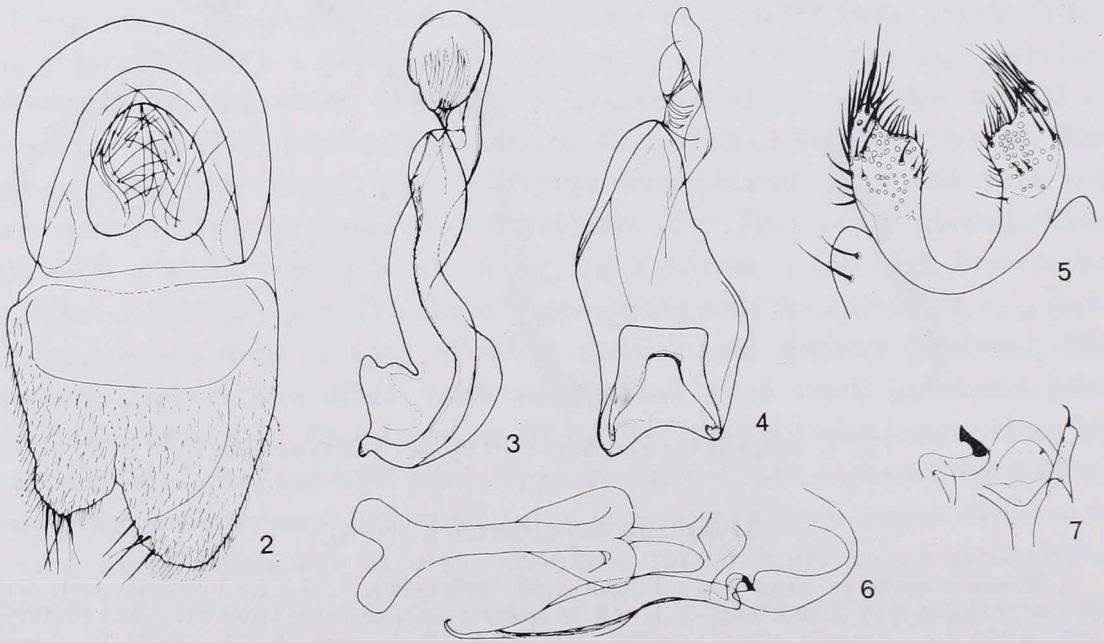
Fig. 1. *Subpelignus hortobagyensis* sp. n., holotype male

Hydrellia asymmetrica sp. n.

Measurements in mm: body length 2.00 (holotype), 1.74—1.80 (paratypes); wings: 2.23 × 0.79 (holotype), 2.00 × 0.66—2.17 × 0.74 (paratypes); costal section II: 0.853 (holotype), 0.707—0.786 (paratypes); costal section III: 0.696 (holotype), 0.651—0.674 (paratypes); index II : III: 1.226 and 1.086—1.167; length of tergum 5: 0.337 and 0.303 (paratype); length of tergum 4: 0.247 (holotype), 0.225 (paratype); abdominal index: 1.363 (holotype), 1.35 (paratype).

Body dark brownish grey, subshining, pleura lighter, grey. Facial plate golden, with 4 pairs of long but comparatively thin facial bristles. Frons dark brownish grey, frontal triangle mat, hardly more shining than orbitalia. Ocellar bristles short, only 0.112 mm from tip to base (holotype) and hairlike, postocellars rather long, 0.236 mm. Ocular height 0.494 mm, subocular height 0.056 mm, i.e. ocular index 8.8 on holotype. Palpi yellow or wax-yellow without any other (darker) hue. First and second antennal joints dark brown, third joint vivid yellow. Arista with 6 very long and (1)—2 additional apical shorter rays dorsally. Thoracic chaetotaxy as in its congeners but it is worth mentioning that characteristic bristles are very long, e.g. anterior notopleural 0.25 mm on holotype. Wing light brownish, veins brown. Knob of halteres yellow (wax-yellow), stalk dark brown. Fore coxae, tibiae and femora dark blackish brown (even knees dark) contrasting with the yellow tarsi (only dorsal side of 5th tarsomere dark); apices of tibiae yellow. Middle femora without a row of strong bristles on posteroventral side. Pulvilli very wide, 0.04 mm. Male tergum 5 rather long (see abdominal index), cerci with long dense bristles. Fused surstyli extremely asymmetrical (Fig. 2), apically with some asymmetrically situated bristles; also phallus extremely asymmetrical (Fig. 4), distiphallus with a large knob apically (Fig. 3); sternum 5 (Fig. 5) symmetrical with long dense bristles; phallapodeme (Fig. 6) large, postgonite (Fig. 7) cut apically, pregonite with one long curved bristle. Female unknown.

Holotype male: Hortobágy N. P., Kunmadaras — Darvas-tó, 1975. VIII. 27. — leg. Papp, L.



Figs 2—7. *Hydrellia asymmetrica* sp. n., paratype male; 2 = surstyli with epandrium and cerci, 3 = phallus in lateral view, 4 = phallus in ventral view, 5 = sternum 5, 6 = phallapodeme and right gonal arch in ventral view, 7 = left postgonite and right pregonite

Paratypes: 5 ♂: data same as for holotype; 1 ♂: ibid., fűháló [= netted], 29. VI. 1976, leg. KASZAB; 1 ♂: ibid., víz, tündérrózsa [= water surface, on *Nymphaea*], 29. VI. 1976, leg. MAHUNKA; 1 ♂: Hortobágy N. P., Újszentmargita, csatornapart [= on bank of a canal], 3. VI. 1976, leg. VÁSÁRHELYI, T. et SIMON, M.: 4 ♂: ibid., 2. VI. 1976; 1 ♂: Újszentmargita, Margitai erdő [= forest] 197 — fényre repült [= on light], 16. VII. 1974, leg. KASZAB; 1 ♂: ibid., 17. VII. 1974.

Hydrellia asymmetrica sp. n. is an easily identifiable species. Its genitalia are the most asymmetrical among the known Palaearctic species of *Hydrellia*. It is probable that this new species is related to *H. tarsata* HAL. (see Pl. 21 of COLLIN, 1966), but its third antennal joint vivid yellow, apices of tibiae are yellow and it has no strong bristles on middle femora posteroventrally. It seems worth mentioning that while the asymmetry is rather rare in the Nearctic species (see figures of DEONIER, 1971) there are numerous species in the Palaearctic Region with more or less asymmetrical surstyli, phallus or gonal arch (*discors*, *ranunculi*, *concolor*, *fusca*, *tarsata*, etc.). Among them this new species has the most asymmetrical genitalia.

Hydrellia minutissima sp. n.

Measurements in mm: body length 1.24 (holotype), 1.30 (paratype); wings: 1.60×0.54 (holotype), 1.67×0.61 (paratype); costal section II: 0.45, 0.55; costal section III: 0.58, 0.58; index II : III: 0.77, 0.94; distal section of *m*: 0.54, t_a—t_p: 0.32 (holotype); median index: 1.69. length of tergum 5: 0.135, 0.146; length of tergum 4: 0.19, 0.235; abdominal index: 0.71 (holotype), 0.62 (paratype).

Body shining black. Frons velvety black, facial plate silvery grey. Two pairs of long, proclinate and upcurving facial bristles, 1 long proclinate anterior upper frontoorbital, 1 very long exclinate and slightly reclinate posterior frontoorbital and 1 additional short proclinate and exclinate frontoorbital between them. Ocellar bristles only 0.056 mm long, postocellars much thicker and 0.157 mm long, i.e. almost thrice longer than ocellars. Ocular height 0.315 mm, subocular height 0.056 mm, i.e. ocular index 5.6 on holotype. Palpi light, greyish yellow. First and second antennal joints black, third joint reddish yellow, dorso-apical part with brown infuscation. Third joint with 0.022 mm long dense cilia apically. Arista with 6 long and 1 short (apical) dorsal rays. Scutellum with 2 pairs of long scutellars and 1 additional pair of short scutellar between them, and a pair of short and thin apical scutellars. Vein r_{2+3} almost straight, r_{4+5} slightly downcurving in its apical tenth. Knob of halteres light yellow, stalk dark brown. Two rows of comparatively long acrostichals (0.05 mm or even longer). Fore coxae, femora, tibiae and tarsi all black, shining or subshining. Middle femora without a row of posteroventral bristles.

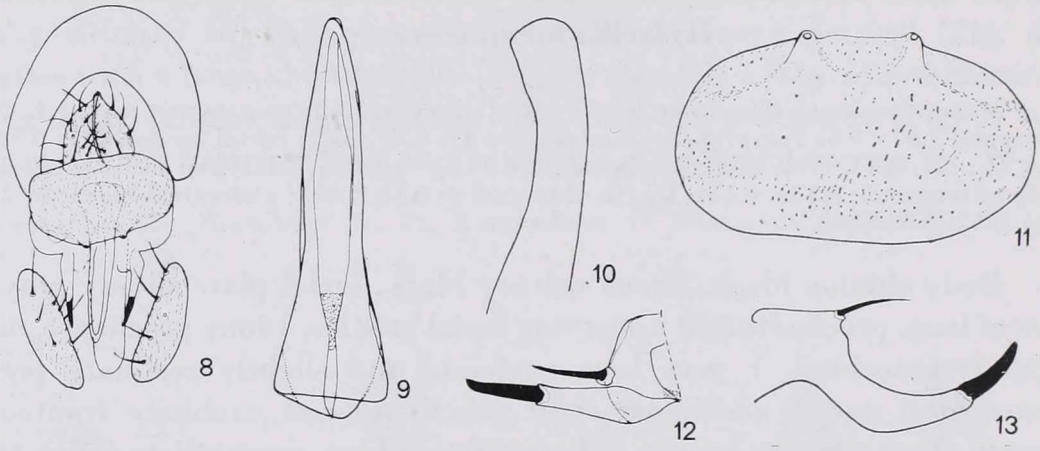
Male epandrim comparatively large (Fig. 8), cerci distinct with numerous long bristles. Surstyli transverse elliptical (Fig. 11), their anterior processes

smaller than those of *albilabris* (cf. COLLIN, 1966). Phallus rather simple, ± symmetrical (Fig. 9), peculiar, blunt in profile (Fig. 10). Gonal arch without conspicuous characteristics, postgonite with a blunt thorn apically (Figs 12, 13). Sternum 5 bipartite (Fig. 8) like in *albilabris*, their bristles very strong.

Holotype male: Hortobágy N. P., Újszentmargita — *Peucedanum*-os rét [= meadow], 1974. VIII. 28. — leg. PAPP, L.

Paratype male: Börzsöny hg., Magyarkút — 1980. VIII. 15., leg. PAPP, L. Genitalia preparations were made on the genitalia of the paratype male; they are preserved in ANDERSSON's microvial in glycerine.

Hydrellia minutissima sp. n. is one of the smallest species of the genus. Its closest relative is *H. albilabris* (MEIGEN, 1830) but its third antennal joint reddish yellow. Their genitalia are different in details. Their surstyli are similar (Fig. 11, cf. Pl. 25 of COLLIN, 1966) but phallus and postgonite are of a different shape of *albilabris*. It seems probable that one can find a significant difference also in the length of the bristles on sternum 5 (bristles are longer in *minutissima*).



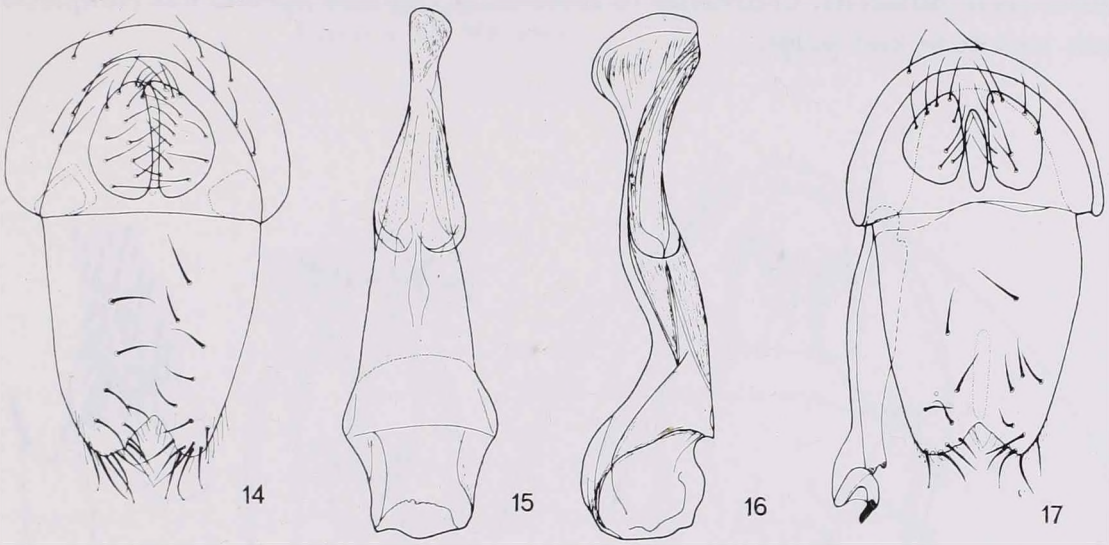
Figs 8—13. *Hydrellia minutissima* sp. n., paratype male; 8 = genitalia in ventral view, 9 = phallus in ventral view, 10 = same in lateral view, 11 = fused surstyli, 12 = postgonite with uncus, ventral view, 13 = same, lateral view

Hydrellia parafrontosa sp. n.

Measurements in mm: body length 1.80 (holotype), 1.43—1.60 (paratype males), 1.71—1.89 (paratype females); wings: 1.89 × 0.685 (holotype, 1.57 × 0.57—1.86 × 0.69 (paratype males), 1.86 × 0.67—2.23 × 0.84 (paratype females); costal section II: 0.74 (holotype), 0.76 (paratype male), 0.79 (paratype female); costal section III: 0.573 (holotype), 0.60 (paratype male), 0.62 (paratype female), index II : III: 1.29, 1.28, 1.27; distal section of *m*: 0.815 (holotype), 0.79 (paratype male), 0.80 (paratype female); t_a—t_p: 0.46, 0.52, 0.54; median index: 1.77 (holotype), 1.52, 1.48; length of tergum 5: 0.25 (holotype); length of tergum 4: 0.25, i.e. abdominal index of holotype male: 1.00.

Frontal triangle with a green sheen. Facial plate bluish silvery, subshining, with 2 pairs of proclinate and slightly upcurving facial bristles and with 2 pairs of short bristles below eyes. Anterior frontoorbital proclinate,

0.12 mm on holotype (from base to tip), posterior frontoorbital exclinate and slightly reclinate, 0.135 mm on holotype, a third proclinate bristle (0.079 mm) between them, i.e. comparatively long. *vti* cruciate. Antennae all black, incl. third joint. Arista with 6 (7) long and 1—2 short (apical) dorsal rays. Palpi black. Ocular height 0.371 mm, subocular height 0.045 mm, i.e. ocular index 8.25 on holotype. Mesonotum and abdomen dark grey, shining, pleura light graphite-grey. Scutellum with a pair of short (0.08—0.15 mm) bristles between apical and basal scutellars but without short bristles on apex. Two rows of enlarged *acmi*. Wings light grey, veins ochreous, incl. costal vein, r_{2+3} almost straight, r_{4+5} slightly downcurving. Distal section of cubital longer than hind crossvein (0.17 mm vs. 0.14 mm). Knob of halteres light yellow, stalk ochreous to light brown. Fore coxae light: greyish yellow, laterally with some silvery dust. Male genitalia (Fig. 18) largely symmetrical, tergum 5 short (abdomina



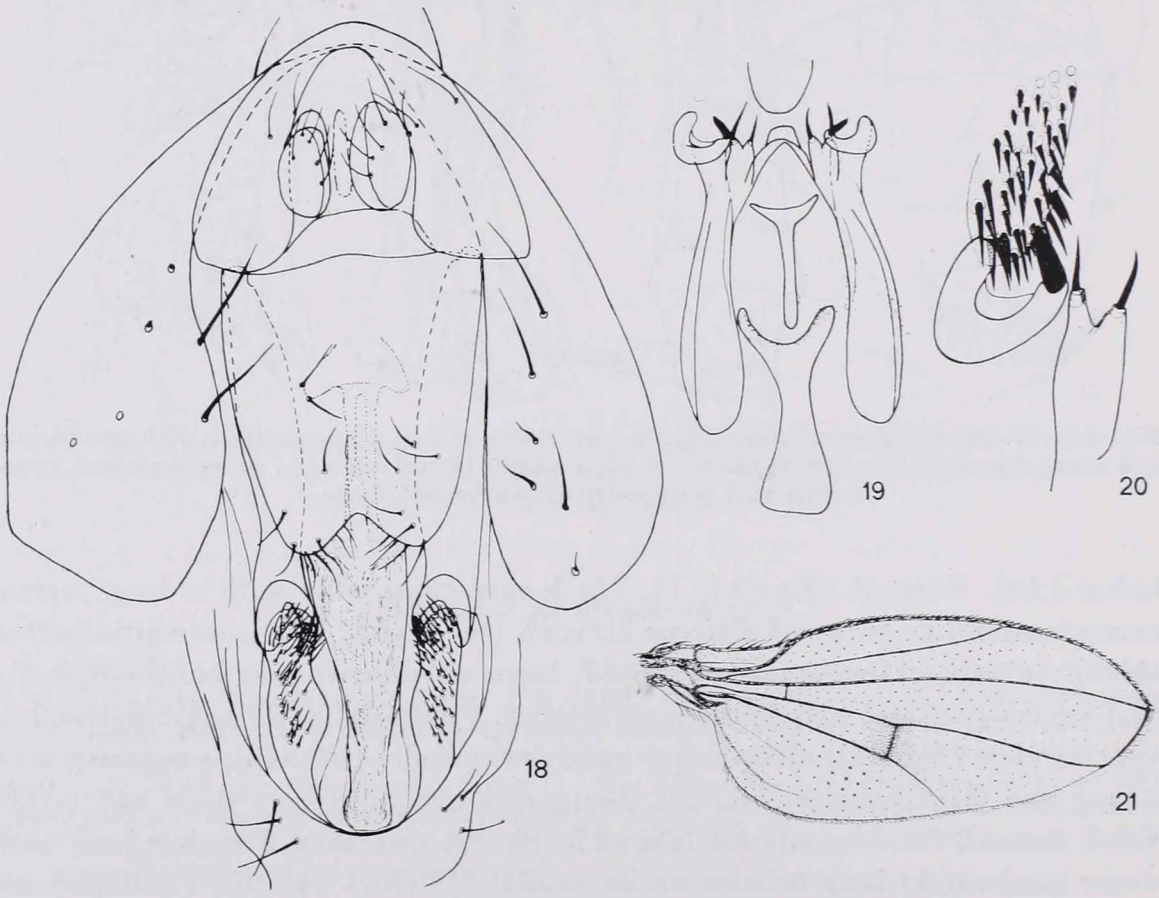
Figs 14—17. *Hydrellia parafrontosa* sp. n., paratype males; 14 = surstyli with epandrium and cerci, 15 = phallus in ventral view, 16 = same, lateral view, 17 = surstyli and gonal arch with postgonite of another paratype

index 1.00). Surstyli (Figs 14, 17, 18) longer than wide with a large apical emargination like those of *albiceps* MEIGEN (see DAHL, 1964), its chitinization thinner in sagittal line apically (Figs 17, 18); surstyli with long bristles apically and ventrally. Cerci with some long bristles. Phallus slightly asymmetrical in ventral view (Fig. 15), distiphallus enlarged apically (Fig. 16); pregonite with 2 long and thick bristles (Fig. 20), postgonite comparatively short and rather much curved, its uncus blunt (Figs 17, 19, 20). Sternum 5 rather long with dense moderately long bristles on its caudal 2/3 (Figs 18, 20). Phallapodeme (Fig. 19) comparatively short, forked, gonal arch rather wide.

Holotype male: Hortobágy N. P., Újszentmargita — Margitai erdő [= forest], 1974. VIII. 27., Malaise csapda [= trap] — leg. PAPP, L.

Paratypes: 2 ♂, 1 ♀: ibid., 16. VII. 1974, leg. KASZAB; 1 ♀: ibid., 28. VIII. 1974, leg. DRASKOVITS; 2 ♂, 2 ♀: Hortobágy N. P., Újszentmargita, Margitai legelő [= pasture], 25. VIII. 1975, leg. VÁSÁRHELYI, T. et SIMON, M.; 1 ♂, 1 ♀: ibid., *Peucedanum*-os rét [= meadow], 28. VIII. 1974, leg. PAPP, L.; 1 ♂: Hortobágy N. P., Hortobágy-Máta, Zám-puszta, 18. VI. 1975, leg. MAHUNKA, KASZAB.

Hydrellia parafrontosa sp. n. runs to couplet 54 (53) in COLLIN's key (1966) and to couplet 2 (3) in PAPP's (1975) key for the Hungarian species (palpi all black, fore coxae light, antennae black) but contrarily to *frontalis* LOEW its legs are not black, its facial plate is silvery and not light yellow, its costal index is less than 1.3 (1.5 in *frontalis*). It is probably related to *cochleariae* HALIDAY and *frontosa* BECKER (see CANZONERI and MENEGHINI, 1976) but its genitalia are rather different from *frontosa*. The surstyli of *cochleariae* (more precisely *H. cochleariae* HALIDAY, 1939 sensu COLLIN, 1966, cf. Pl. 26 of COLLIN, 1966) are similar but its phallus is much different and also postgonites seem different. Contrarily to *cochleariae* this new species has completely black antennae and palpi.



Figs 18—21. 18—20 = *Hydrellia parafrontosa* sp. n., paratype males: 18 = genitalia in ventral view, 19 = phallapodeme, gonal arch and gonites, 20 = left postgonite, pregonite and left tip of sternum 5 in a higher magnification; 21 = *Subpelignus hortobagyensis* sp. n., holotype male, wing

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ZWEI NEUE VITREA-ARTEN (GASTROPODA: ZONITIDAE)

L. PINTÉR

(Eingegangen am 15. Mai 1982)

The author describes two new species of *Vitrea* FITZINGER, one from Greece, and an other one from France.

DR. E. GITTENBERGER hat mir ein kleines, aber sehr interessantes *Vitrea*-Material zur Bearbeitung überlassen. Unter mehreren bekannten Arten fanden sich auch zwei neue Arten, die hier beschrieben werden. Ich danke Herrn DR. E. GITTENBERGER für die Überlassung des Materials.

Vitrea ossaea sp. n. (Abb. 1—3)

Beschreibung: Gehäuse mittelgroß (Holotypus 1,7 : 3,6 mm), Gewinde etwas konisch erhoben, Umgänge fast 5, regelmäßig zunehmend, der letzte Umgang an der Mündung etwas mehr als 1,5mal breiter als der vorletzte. Umgänge von oben schwach gewölbt, seitlich gut gerundet, von unten gewölbt, nicht abgeflacht. Mündung nicht viel breiter als hoch, mittelmäßig ausgeschnitten, Mündungsränder gut gerundet. Nabel breit und tief, alle Umgänge deutlich zeigend. Schale bei jüngeren und unverwinterten Exemplaren glasartig glänzend, weißlichgelb, dünn und durchscheinend. Ältere Exemplare undurchsichtig. Auf der Oberfläche sind feine Zuwachslinien sichtbar (Abb. 1—3).

Locus typicus: »Grèce, Thessalie, massif Ossa au-dessus de Ampelakia, grotte sans nom près de l'église Profitis Elias, 600 m«.

Untersuchtes Material: 1. Vom Locus typicus, leg. B. HAUSER, 14. V. 1976, Holotypus und 5 Paratypen, Sammlungsnummer: Genève The-76/13. 2. »Massif Ossa, prélèvement de terre dans la grotte de Profitis Elias«, leg. B. HAUSER, 14. V. 1976, 1 Paratypus, Sammlungsnummer: Genève The-76/14. 3. »Massif Ossa, prélèvement de terre et feuilles mortes dans la grotte de Profitis Elias«, leg. B. HAUSER, 10. IV. 1978, 56 Paratypen, Sammlungsnummer: Genève Kri-78/28. Holotypus in Rijksmuseum van Natuurlijke Historie (Leiden), Paratypen daselbst, im Muséum d'Histoire Naturelle (Genève), im Ungarischen Naturwissenschaftlichen Museum (Budapest) und in Slg. PINTÉR (Budapest).

Beziehungen: Eine wirklich ähnliche Art ist vorläufig nicht bekannt. Von weitem ähnelt die neue Art gewissermaßen an *Vitrea botterii*

(L. PFEIFFER). Alle übrigen bekannten Arten lassen sich auf den ersten Blick leicht trennen.

Namengebung: Da *Vitrea ossaea* sp. n. bisher nur im Ossa-Gebirge gesammelt worden ist, wird der Name der Art von der Fundortbezeichnung abgeleitet.

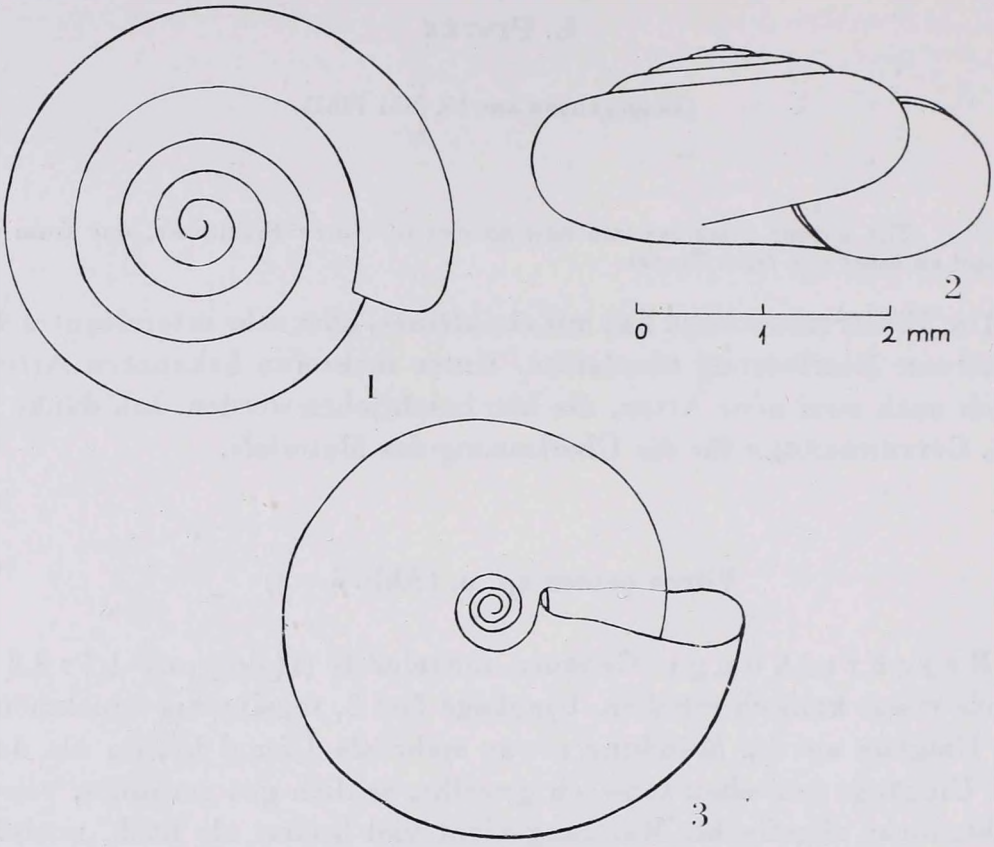

Abb. 1—3: *Vitrea ossaea* sp. n. Holotypus

B e m e r k u n g : Diese neue Art stammt aus den Bodenproben, die B. HAUSER (Genève) während zwei entomologischer Exkursionen gesammelt hat. Das Material wurde teilweise in Leiden ausgesucht.

Vitrea pseudotrolli sp. n. (Abb. 4—8)

Vitrea trolli — GITTENBERGER, 1978: 111—112, Figs 2—3. Non *Crystallus trolli* A. J. WAGNER, 1922.

B e s c h r e i b u n g : Gehäuse klein (Holotypus 1,2 : 2,7 mm, größtes Exemplar bis 3,0 mm breit), Gewinde deutlich konisch erhoben, mit etwa 5 3/4 sehr regelmäßig und langsam zunehmenden Umgängen. Der letzte 1,5mal breiter als der vorletzte. Seitlich etwas oberhalb der Peripherie unscharf gekielt. Naht seicht, Umgänge von oben wenig gewölbt, aber nicht abgeflacht.

Unterseite regelmäßig sanft gebogen. Mündung schmal, stark ausgeschnitten, breiter als hoch. Außenrand der Mündung kurz gebogen, schnell abfallend, Basalrand gleichmäßig, und geht plötzlich in den kurzen, schief-vertikalen Spindelrand über. Nabel sehr eng, vom rückgebogenen Spindelrand wenig verengt. Schale im frischen Zustand gelblichweiß, durchscheinend, glänzend, verwitterte Exemplare grauweiß. Die Oberflächenskulptur besteht aus feinen, etwas verschwommenen, mehr oder minder regelmäßigen niedrigen Rippchen, die an älteren Stücken kaum sichtbar sind (Abb. 4—8).

Locus typicus: Frankreich, dept. Alpes-Maritimes, O von Gorbio, 4 km WNW von Menton, an einem kleinen Fluß.

Untersuchtes Material: Vom Locus typicus, leg. E. GITTENBERGER, VIII. 1977, Holotypus und 18 Paratypen im Rijksmuseum van Natuurlijke Historie (Leiden), 2 Paratypen im Ungarischen Naturwissenschaftlichen Museum (Budapest), 1 Paratypus in Slg. PINTÉR (Budapest). Die von GITTENBERGER erwähnten und abgebildeten Exemplare von Monti habe ich nicht gesehen.*

Beziehungen: Die bisher bekannte ähnlichste Art ist die aus Jugoslawien (Slovenija, unweit Planina) beschriebene *Vitrea binderi* PINTÉR, 1972. Sie ist aber viel größer, mit 6—6 1/3 Umgängen, wobei die Peripherie-

* Nach Fertigstellung des Manuskriptes hat mir Prof. DR. F. GIUSTI (Siena) 2 Exemplare einer *Vitrea*-Art aus Italien zugeschickt, die zweifellos zu *V. pseudotrolli* sp. n. gestellt werden muß. Dadurch erweitert sich das Areal der Art beträchtlich nach Osten. Fundort: Italien, Millesimo, Sorgente di Case Spalletto (Savona). Leg. BODON, 29. II. 1980 und 29. XI. 1980, 2 Paratypen im Istituto di Zoologia dell'Università di Siena. Herrn Prof. GIUSTI schulde ich Dank für das Material.

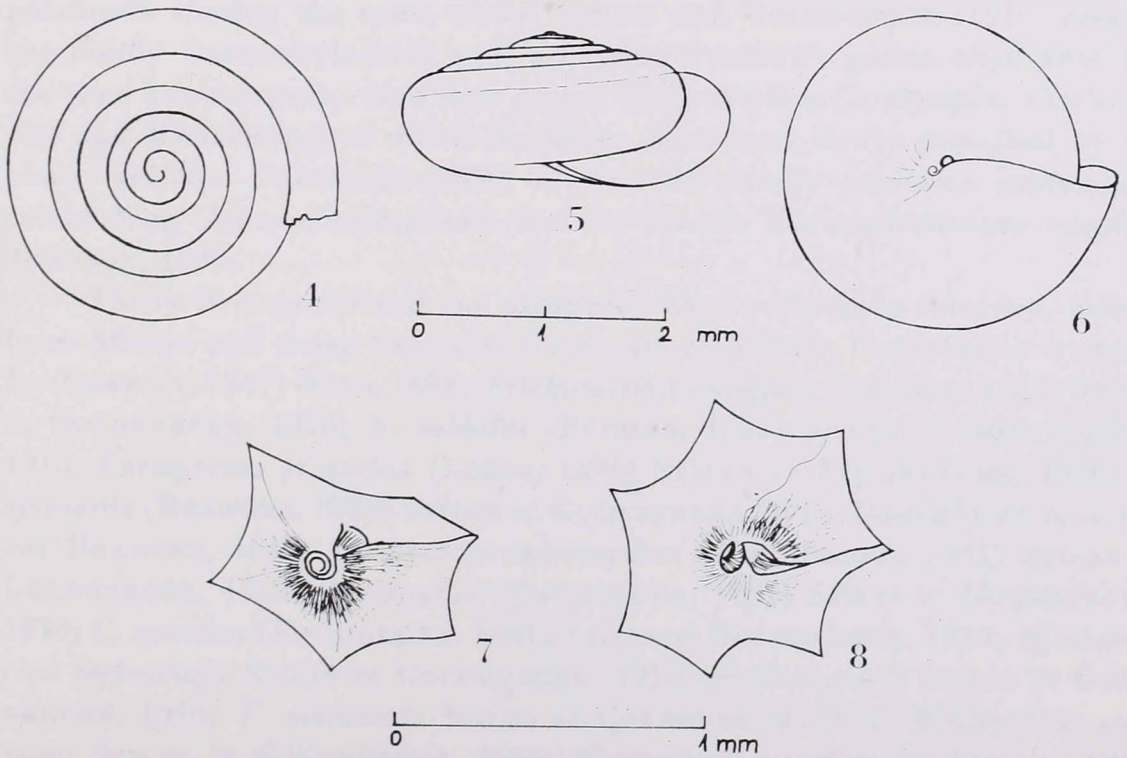

Abb. 4—8: *Vitrea pseudotrolli* sp. n. Holotypus (4—6 = Gehäuse, 7 = Nabelgegend von oben gesehen, 8 = Nabelgegend von der Seite her gesehen, etwa 50° zur horizontalen Ebene)

kante deutlicher entwickelt ist. Nabel, obwohl sehr ähnlich, relativ enger und vom Spindelrand mehr verdeckt. Es besteht eine gewisse Ähnlichkeit auch mit *V. trolli* (A. J. WAGNER, 1922), die aber — soweit aufgrund aller vorhandenen Exemplare beurteilt werden kann (Originalmaterial 13 Exemplare, 2 Stücke in Slg. VENMANS im RMNH in Leiden. Siehe hierzu PINTÉR, 1972: 222—224) — durchschnittlich etwas größer ist, von oben abgeflacht, und auf der Oberfläche höchstens ganz schwache Zuwachsstreifen aufweist.

Namengebung: Der Name »*pseudotrolli*« stammt von DR. E. GITTENBERGER (Brief vom 9. I. 1981), der diesen Fund zuerst irrtümlich zu *V. trolli* stellte.

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REVISION OF THE FAMILY GASTROTHYLACIDAE STILES ET GOLDBERGER, 1910 (TREMATODA: PARAMPHISTOMATA)

O. SEY

(Received 10 April, 1982)

Examination of the pouched worms of the family Gastrothylacidae has showed that it is of three valid genera (*Carmyerius*, *Fischoederius* and *Gastrothylax*). It is concluded that the genus *Gastrothylax* includes two valid species (*G. crumenifer*, *G. compressus*), the *Carmyerius* consists of fifteen genuine species (*C. bubalis*, *C. chabaudi*, *C. cruciformis*, *C. diplopharyngialis*, *C. endopapillatus*, *C. exoporus*, *C. graberi*, *C. gregarius*, *C. mancupatus*, *C. multivitellarius*, *C. parvipapillatus*, *C. schoutedeni*, *C. spatiosus*, *C. synethes*, *C. wenyoni*) and the *Fischoederius* three (*F. elongatus*, *F. cobboldi*, *F. skrjabini*). Histomorphology of the muscular organs of the valid species, their synonyms and zoogeographical affinites are discussed in full length.

CREPLIN (1847) was the first to recognise the special feature exhibited by the pouched worms when he described *Gastrothylax crumenifer* as *Amphistomum crumeniferum*. POIRIER (1883) erected the genus *Gastrothylax* for amphistomes sharing the same traits. STILES and GOLDBERGER (1910) created the family Gastrothylacidae and, accepting POIRIER's genus, they allocated the then known species into four genera (*Gastrothylax*, *Carmyerius*, *Fischoederius* and *Wellmanius*) of which the latter three were newly described by the above authors. YAMAGUTI (1958) divided the family into two subfamilies, establishing Johnsonitrematinae for the species *Paramphistomum magnum* JOHNSON, 1939.

Thirty five species and one subspecies have so far been recorded, mainly from African and Asian countries. These are as follows: *Gastrothylax crumenifer* (CREPLIN, 1847) OTTO, 1896; *Fischoederius elongatus* (POIRIER, 1883) STILES et GOLDBERGER, 1910; *F. cobboldi* (POIRIER, 1883) STILES et GOLDBERGER, 1910; *Carmyerius gregarius* (LOOSS, 1896) STILES et GOLDBERGER, 1910; *C. spatiosus* (BRANDES, 1898) STILES et GOLDBERGER, 1910; *Gastrothylax compressus* BRANDES, 1898; *Carmyerius mancupatus* (FISCHOEDER, 1901) STILES et GOLDBERGER, 1910; *C. minutus* (FISCHOEDER, 1901) STILES et GOLDBERGER, 1910; *C. synethes* (FISCHOEDER, 1901) STILES et GOLDBERGER, 1910; *Fischoederius ceylonensis* STILES et GOLDBERGER, 1910; *F. fischoederi* STILES et GOLDBERGER, 1910; *F. siamensis* STILES et GOLDBERGER, 1910; *Wellmanius wellmani* STILES et GOLDBERGER, 1910; *Carmyerius cruciformis* (LEIPER, 1910) MAPLESTONE, 1923; *C. bubalis* (INNES, 1912) STUNKARD, 1925; *Fischoederius*

japonicus FUKUI, 1922; *Carmyerius exoporus* MAPLESTONE, 1923; *Gastrothylax glandiformis* YAMAGUTI, 1939; *Johnsonitrema magnum* (JOHNSON, 1939) YAMAGUTI, 1958; *Carmyerius dollfusi* GOLVAN, CHABAUD et GRETILLAT, 1957; *C. graberi* GRETILLAT, 1962; *C. papillatus* GRETILLAT, 1962; *C. parvipapillatus* GRETILLAT, 1962; *C. endopapillatus* DOLLFUS, 1962; *C. gregarius congolensis* DOLLFUS, 1963; *Fischoederius skrjabini* KADENAZII, 1963; *Carmyerius schoutedeni* GRETILLAT, 1964; *C. chabaudi* STRYDONCK, 1970; *C. diplopharyngialis* STRYDONCK, 1970; *C. multivitellaris* STRYDONCK, 1970; *C. gretillati* STRYDONCK, 1970; *Gastrothylax indicus* DUTT, 1978; *G. zhonghuaensis* WANG, 1979; *Fischoederius boyangensis* WANG, 1979 and *F. compressus* WANG, 1979.

Opinions on the validity of the species listed above are rather controversal in consequence of synonymization done by several authors who have dealt with taxonomic problems of these helminths (MAPLESTONE, 1923; STUNKARD, 1925; FUKUI, 1929; DAWES, 1936). The aim and endeavour to clarify the status of the valid species on the basis of modern standards of amphistome diagnosis, has been hindered by difficulties such as 1. the degree of individual variations dependent on pre-fixative and fixative treatment, the incomplete conserving technique, age of the flukes, the host species, the crowding effects etc. are not known, 2. morphological details of certain species and their descriptions are imperfect in light of the present day requirements, 3. the unavailability, due either to loss of the type specimens or their deposition in unknown place, 4. the usage of different nomenclature, mainly in designation of certain parts of the genital opening.

These inadequances are actually experienced by the workers of the field and the controversal opinions on validity and synonymy of certain species are in connection with the causes outlined above. Although some of these difficulties have not been eliminated up to now, it is necessary to establish a more or less equal level of information about the species on which the analysis of specific composition of the family can be based.

Material and methods

Study material of gastrothylacids, including some type specimens was obtained from the Naturhistorisches Museum, Vienna (NMV); Museum d'Histoire Naturelle, Geneva (MHNG); Musée Royal de l'Afrique Central, Tervuren (MRAC); Naturhistoriska Riksmuseet, Stockholm (NRS); Museum für Naturkunde, Berlin (MNB); British Museum (Natural History), London (BMNH); Commonwealth Institute of Helminthology, St. Albans (CIH); National Parasite Collection, Maryland (NPCM); Muséum National d'Histoire Naturelle, Paris (MNHNP); Vses. Inst. Gelm. Skrjabina, Moscow (VIGIS). Besides, several samples of these helminths were available in the writer's private collection (PC) derived from Egypt and India as well as from other African and Asian countries sent by colleagues with whom joint projects have been carried out.

The terminology used here has been adapted from NÄSMARK (1937), which is generally accepted in amphistome diagnosis. Sections were prepared by the usual method, appearance of the ventral pouch was examined on cross sections made at the middle part of the body.

Results and discussion

Of the features which can be utilized in identification of gastrothylacids, no doubt morphological properties have primary importance. These characters, however, can be subject to significant individual variation induced by various external factors. It is well known in amphistome taxonomy that the problem of limits of variability is fundamental, especially in cases when the body musculature is strongly developed like in gastrothylacids. In striving to delimit the valid species, special attention was paid to the degree of morphological variability and to revealing the histomorphological structure of the muscular organs.

Morphological variability. Under this section the taxonomic value of size, appearance of the ventral pouch, shape and position of the testes, form and extension of the caeca, arrangement of the vitellaria are analyzed as these features are often attributed to bear specific characters.

The lack of solid external skeleton, the actual size of gastrothylacids which is manifested before the taxonomist as dimensions of the fixed specimens is effected by numerous factors. It is evident from DINNIK's (1962) and HORAK's (1967) experimental studies that under living conditions these factors might be the age of infestation, kinds and individual of the definitive hosts, magnitude of the worm burden, site of the attachment in the rumen. DINNIK (1962), for instance, found that with increase in age of infestation the size of the worms gradually increased (mature worms 3.8 to 5.4 mm in length attained 8.0 to 12.0 mm in length by the third year, post infection). Although these findings apply to paramphistomids, on the basis of analogy they probably fit well for gastrothylacids also.

Remarkable changes in size occur during the fixative procedure. Worms killed in water enlarge in size due to endosmosis and it can also affect the structure of organs and their relationships to one another. Different kinds of fixative solutions and the degree of pressing have also some influence over the worm's size.

The intraspecific crowding effect can also influence the body dimensions, as it was pointed out by TANDON (1973) in case of *Fischoederius elongatus* and *Gastrothylax crumenifer*. It was found that when the intensity of the infection was low the worms attained a very large size remained mature and in a heavily crowded state they were small but mature.

As it is difficult to reveal the background and the nature of the effects exerted on the actual size of specimens of a given study material stored in museums or private collections, body dimensions are properties which can be employed only in conjunction with other morphological details in species diagnosis.

The ventral pouch is a unique feature of gastrothylacids; its shape was regarded as a specific or species-group property by previous authors (BRANDES,

1898; Looss, 1896; Fischoeder, 1903; Leiper, 1910) who did not pay proper attention to the possible variability to its appearance. Innes (1912) and later Maplestone (1923) demonstrated the variable nature of the ventral pouch and the latter author was of the opinion that this character is of no value for specific diagnosis. Dawes (1936), however, used its shape in the diagnosis of some gastrothylacids. Dollfus (1963) listed the forms of the ventral pouches of all the then known species without indicating his opinion of their taxonomic value. Gretillat (1960) did not take this character into account in preparation of the key of the species in the genus *Carmyerius*.

The controversal opinions expressed in the above short review outline the necessity of a detailed examination of the taxonomic value of the various characters. For this purpose those species seem to be appropriate which are doustlessly valid as shown by other features e.g. morphology (*C. gregarius*, *C. exoporus*, *G. crumenifer*) or host specificity (*C. cruciformis*), and those of which specimens are available in great numbers.

One hundred *C. gregarius* (ventral pouch described as triangular in appearance with a forked, dorsally directed apex) were examined, the shape of the ventral pouch was quadrangular in 79, triangular in 8, pentagonal in 7 and hexagonal in 6 per cent.

On hundred and fifty specimens of *G. crumenifer* (ventral pouch triangular with dorsally directed apex) were dissected and they were found to be triangular with a dorsal apex in 88, and a pentagonal one in 12 per cent.

Having studied forty seven specimens of *C. cruciformis*, it was found that the form of the ventral pouch showed an important deviation from Leiper's (1910) finding. A pentagonal form (which is characteristic for this species) was found in 30, quadrangular in 49, triangular shape with ventral and dorsal apeces alike in 21 per cent.

Results of the examined 54 specimens of *C. exoporus* showed that the shape of the ventral pouch was fairly constant. It was hexagonal in 90, quadrangular in 4, and pentagonal in 6 per cent.

Of the examined species, fixation was carried out made in the same way in the case of *G. crumenifer*, *C. gregarius*, *C. exoporus*, whereas in case of the *C. cruciformis* it was unknown. These results indicate that the form of the ventral pouch may be characteristic to a limited degree even in well-fixed specimens.

The testes of gastrothylacids are situated in the posterior part of the body, in the lateral regions or along the median line. When they are located in the lateral sides they may be found near to the median line or a bit further away from it, nearer to the lateral margins. The position, measurements and the lobulation of the testes are sometimes utilizable in diagnosis (e.g. the size of the testes of *C. graberi* is much larger than that of *C. spatiolsus*, although the body measurements significantly differ from each other).

The position of the caeca, the extension of their end-parts, their configuration along their length are often listed among the specific features. However, they are utilizable in diagnosis, of species with greatly different ceacal length only (e.g. *C. gregarius*, *F. elongatus*). Slight differences in ceacal length are not valuable characters due to their variable nature.

Vitelline gland cells are usually situated in the ventral and lateral regions of the body, their size being 50 to 200 by 50 μm. Vitellaria like this is called normally developed. Sometimes, however, they are found on the dorsal side and they may be bigger than the above figures; such are termed as well developed.

Of such morphological features as the relationship of the pores of LAURER's and excretory ducts, length of the pars prostatica seem to be occasionally usuable as well as specific features.

It is evident from the analysis of taxonomic value of the morphological features that they may be used in isolation in extreme cases only, and the species' diagnosis should be based on employing them in conjunction with one another. Besides, the structure of the muscular organs of gastrothylacids may be taken into consideration similarly to that of other amphistome of ruminants.

Histomorphology of the muscular organs. Although the structure of the muscular organs (pharynx, genital opening, acetabulum) had already been known in the earlier revelent literature (OTTO, 1896; FISCHOEDER, 1903), specific importance was attributed to them much later.

LOOSS (1912) was the first to call attention to the diagnostic value of the structure of these organs, and his concept was successfully realized by NÄSMARK (1937). The latter author typified and characterized the muscular organs of amphistomes available; complete elaboration was done, however, in case of the subfamily Paramphistominae only. In connection with the subfamily Gastrothylacinae, only "Preliminary notes" have been published indicating some types of organs of these helminths. GRETILLAT (1964a, 1964b) found that the structure of the genital opening is a useful tool in identification, and he could separate eleven species out of the sixteen of the genus, the name *Carmyerius* then being familiar.

Apparently, original sections of the earlier described species had not been available to him, thus it may have happened that species having structurally different genital openings were included in the same group (GRETILLAT, 1964b, No. 3 group *gregarius*). During the present study, most species of gastrothylacids (except a few) have been examined in this respect owing to the courtesy of some European and overseas museums. These studies revealed not only the type of these organs but, at the same time, they showed the value and limits of these structures used in species identification.

Structure of the pharynx. NÄSMARK (1937) found that the entire subfamily Gastrothylacinae possessed a *Paramphistomum*-type of pharynx which

was characterized, amongst others, by the absence of the middle circular muscle layer. DINNIK (1964) and REINHARDT (1969) pointed out that this muscle layer, however, occurres in this type seen on transverse sections.

Examining cross sections of several species of gastrothylacids I could be detect one type of pharynx. This type has no middle circular layer even when viewed in cross sections (Figs 1, 2). For this type the name Gastrothylacid is recommended.

STRYDONCK (1970) described a special structure in the pharynx of *C. diplopharyngialis* on the basis of single specimen. It is the writer's opinion that it is a rather artifical phenomenon which came into being upon the intrusion of the anterior part of the pharynx.

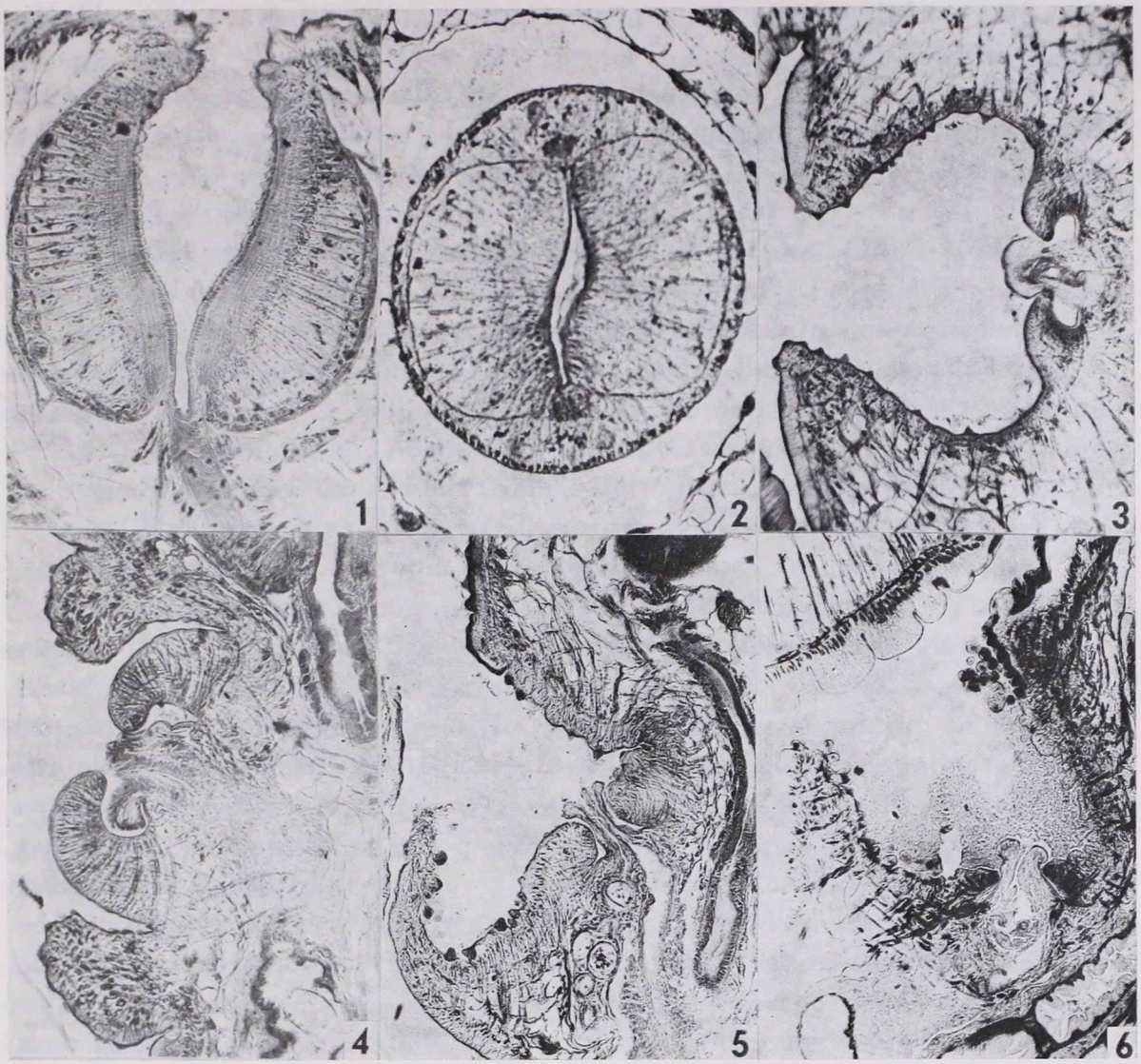
Structure of the genital opening. As to the types of the genital openings of gastrothylacids, NÄSMARK (1937) designated only one type (*Bothriophoron*) for the species *C. synethes*. Although GRETILLAT (1964a, 1964b) used this characters in the species diagnosis, he did not follow consistently NÄSMARK's conceptions in every respect. In this study the writer employed NÄSMAWK's nomenclature to avoid misunderstanding arising from the different interpretations of structural elements of the genital opening.

It should be remembered, however, that NÄSMARK (1937) did not nominate the papilla of the genital opening bearing the genital and ventral sphincters. This deficiency was later noted by both KOTLÁN (1958) and REINHARDT (1969) who created the name "ventral papilla" for that bearing the genital sphincter. This term, however, was reserved by NÄSMARK (1937) for a certain part of the *Calicophoron*-type of genital opening. Therefore, the writer recommends the names "median papilla" and "lateral papilla" for those bearing the genital and ventral sphincters, respectively.

Having examined the genital openings of gastrothylacids, the presence of small tegumental papillae was often found along the genital opening. Their importance in diagnosis was emphasized by the workers of the recently studies on gastrothylacids. As these papillae seem to be constant in well-fixed specimens, their presence cannot be ignored. More recent examinations carried out by scanning electromicroscope have supported the importance of these papillae (TANDON and MAITRA, 1981).

In the species available for examinations, eleven types of genital openings have been revealed, some of them being identical with those described by NÄSMARK (1937) in connection with other amphistomes, but some others proved to be newly described (*Gregarius*, *Synethes*, *Endopapillatus*, *Elongatus*, *Mancupatus*, *Bubalis*, *Cruciformis* and *Schoutedeni*; types of genital openings refer to the species are in brackets).

Gregarius-type (*C. gregarius*). It is similar to the *Bothriophoron*-type but differs from it in the absence of sphincter papillae and the presence of tegumental papillae (Fig. 3).



Figs 1—6. 1 = Median sagittal section of pharynx of *Carmyerius spatiosus*. — 2—3 = Transverse sections of pharynx (2) and genital opening (3) of *C. gregarius*. — 4—6 = Median sagittal sections of genital openings: 4 = *C. synethes*, 5 = *C. endopapillatus*, 6 = *C. papillatus*

Synethes-type (*S. synethes*, *C. graberi*). Structurally it agrees with the *Bothriophoron*-type but differs from it by the presence of tegumental papillae along the lateral papilla (Fig. 4).

Endopapillatus-type (*C. endopapillatus*, *C. papillatus*, *? C. wenyoni*). This type is similar to the preceding one but the ventral sphincter is absent (Figs 5, 6, 7).

Parvipapillatus-type (*C. parvipapillatus*). Genital and median papillae are present, the latter with a sphincter. There are tegumental papillae along the ventral atrium (Figs 8, 9).

Gracile-type (*G. crumenifer*, *G. compressus*, *G. indicus*, *C. spatiosus*; Figs 10, 11, 12, 13).

Microbothrium-type (*C. diplopharyngialis*, *C. exoporus*, *F. cobboldi*; Figs 14, 15).

Elongatus-type (*F. elongatus*, *C. chabaudi*). In this type there are genital and median papillae with genital sphincter and tegumental papillae along the median papilla (Fig. 16).

Mancupatus-type (*C. mancupatus*, *C. dollfusi*, *C. minutus*). It is characterized by the presence of the genital and median papillae, the latter with a moderately developed genital sphincter (Figs 17, 18). The median papillae are embedded in tegumental folds which surrounded them.

Bubalis-type (*C. bubalis*, *C. gretillati*, *C. multivitellarius*). This type is similar to the preceding one but the median papillae are situated freely, not embedded. The genital sphincter is well developed (Figs 19, 20).

Cruciformis-type (*C. cruciformis*). This type is similar to the *Gracile* one, but tegumental papillae are found around the median papilla (Fig. 21).

Schoutedeni-type (*C. schoutedeni*). Genital and median papillae are found, the former with a sphincter, the latter with tegumental papillae.

Structure of the acetabulum. Muscle units in the acetabulum of gastrothylacids are situated in dorsal exterior and interior circular as well as ventral exterior and interior layers. The number of the muscle units in the exterior and interior layers is more or less equal. Muscle units are found in two different forms: either in one longitudinal layer or in two different layers a longer and a shorter one. Acetabula of the species having muscle units in a longitudinal layer can be divided into two groups on the basis of the number of muscle units themselves. Accordingly, three types of acetabula can be distinguished in gastrothylacids; attention will be focused to the units of the dorsal exterior layer only.

Fischoederius-type (*F. elongatus*). Muscle units are situated in a longer and in a shorter layer (46—50 and 9—10 units each). These two layers are separated by some longitudinal muscle fibres (Fig. 21).

Gastrothylax-type (*G. crumenifer*, *G. multivitellarius*, *C. mancupatus*, *F. cobboldi*, *C. spatiosus*, *C. synethes*). This type is characterized by the number of the muscle units, consisting of 55 to 150 (Figs 22, 23, 24, 25).

Carmyerius-type (*G. compressus*, *G. indicus*, *C. gregarius*, *C. parvipapillatus*, *C. gretillati*, *C. diplopharyngialis*, *C. cruciformis*, *C. schoutedeni*, *C. wenyoni*, *C. exoporus*, *C. garberi*, *C. endopapillatus*, *C. chabaudi*, *C. bubalis*). This number of the muscle units varies from 22 to 50 (Figs 26, 27, 28, 29, 30).

Of the presently known species, information on the histomorphological structure of the muscular organs was not available of the species *Fischoederius boyangensis*, *F. compressus*, *F. japonicus*, *F. skrjabini* and *Gastrothylax zhonghuaensis*.

Summarizing the taxonomic significance of the gross-morphological features, it may be said that their use in identification is limited due to their

variable nature. There are only some species which can be differentiated on the basis of these characters. The structure of the muscle organs is much more reliable but they are not suitable alone in diagnosis because some of them have no specific but species-group value. Combination of gross- and histomorphological properties render precise identification possible on the basis of information presently available.

Accordingly, the identification of the valid species below was based on the following traits: structure of the muscular organs, position and formation of the reproductive organs' system, arrangement of the caeca and the vitellaria, measurements of the body, form of ventral pouch and relationship of excretory and Laurer's canals.

GENEALOGICAL RELATIONSHIP OF GASTROTHYLACIDAE

At the establishment of the family Gastrothylacidae STILES et GOLDBERGER (1910) designated four genera (*Gastrothylax*, *Carmyerius*, *Fischoederius* and *Wellmanius*). The latter genus was synonymized with *Carmyerius* by MAPLESTONE (1923) and the validity of the rest was accepted by subsequent authors except for DAWES (1936) who insisted on the conservative system and gastrothylacids with which he worked were included again in the single genus *Gastrothylax*. FUKUI (1929) considered *Carmyerius* and *Fischoederius* as subgenera of the genus *Gastrothylax*.

Among the species of gastrothylacids three monophylic groups can be separated on the basis of the structure of the reproductive system. These groups constitute the genera *Gastrothylax*, *Carmyerius* and *Fischoederius*. Agreeing with MAPLESTONE (1923), the genus *Wellmanius* is considered to be synonymous with *Carmyerius* due to the unimportant and variable nature of the features on which this genus was originally separated.

Gastrothylacidae STILES et GOLDBERGER, 1910

Diagnosis: Paramphistomoidea with ventral pouch, opening at anterior part of body, behind mouth opening. Body conical to acorn-shaped, sometimes much elongated. Lumen of ventral pouch with different appearances in cross section. Pharynx *Gastrothylax*-type; oesophagus without muscular thickening; caeca more or less sinuous, reaching middle part of body or level of testes. Genital opening being of different types with or without circular musculature and tegumental papillae. Genital pore opening to ventral pouch near anterior extremity. Vas deferens, seminal vesicle, pars musculosa, pars prostatica and ductus ejaculatorius in median dorsal field (vas deferens and uterus may cross

each other and extend into lateral field). Testes symmetrical lateral or median (one dorsal or anterodorsal to each other). Ovary inter- or posttesticular. Uterus in dorsal median field or crossing median line and running opposite male terminalia. Vitellaria extensive in lateral or ventro-lateral regions. Acetabulum being different types with one or two dorsal exterior muscle layers. Laurer's canal anterior to excretory pore, exceptionally uniting. Excretory vesicle preacetabular. Lymph system with one pair of trunk. Life-cycle pattern similar to Paramphistomidae. Parasite of stomach of mammals.

Key to the genera of Gastrothylacidae

1 Uterus crossing from one side of body to other near middle ..... **Gastrothylax**
— Uterus in dorsal median field along its length 2

2 Testes symmetrical, one on each side of median line ..... **Carmyerius**
— Testes tandem, in median line ..... **Fischoederius**

Gastrothylax Poirier, 1883

Diagnosis. Gastrothylacidae. Body elongate conical, flattened ventrally, convex dorsally. Ventral pouch reaching to near acetabulum, usually triangular in cross section, with apex directed dorsally. Pharynx *Gastrothylax*-type, caeca long, more or less sinuous, terminating at or in front of testes. Testes lobed, symmetrical, preovarian. Vas deferens crossing over uterus and extending into lateral field opposite anterior uterine field. Pars musculosa, pars prostatica long, well developed; short hermophroditic duct opening on tip of genital opening. Genital opening *Gracile*-type, genital pore a little posterior to subterminal opening of ventral pouch. Ovary posttesticular among right or left testis and excretory vesicle. Vitellaria follicular, extending close to ventral pouch from near anterior extremity to base of ventral pouch. Uterus crossing over to other side in midregion of body. Acetabulum *Gastrothylax*- and *Carmyerius*-types. Parasitic in rumen of ruminants.

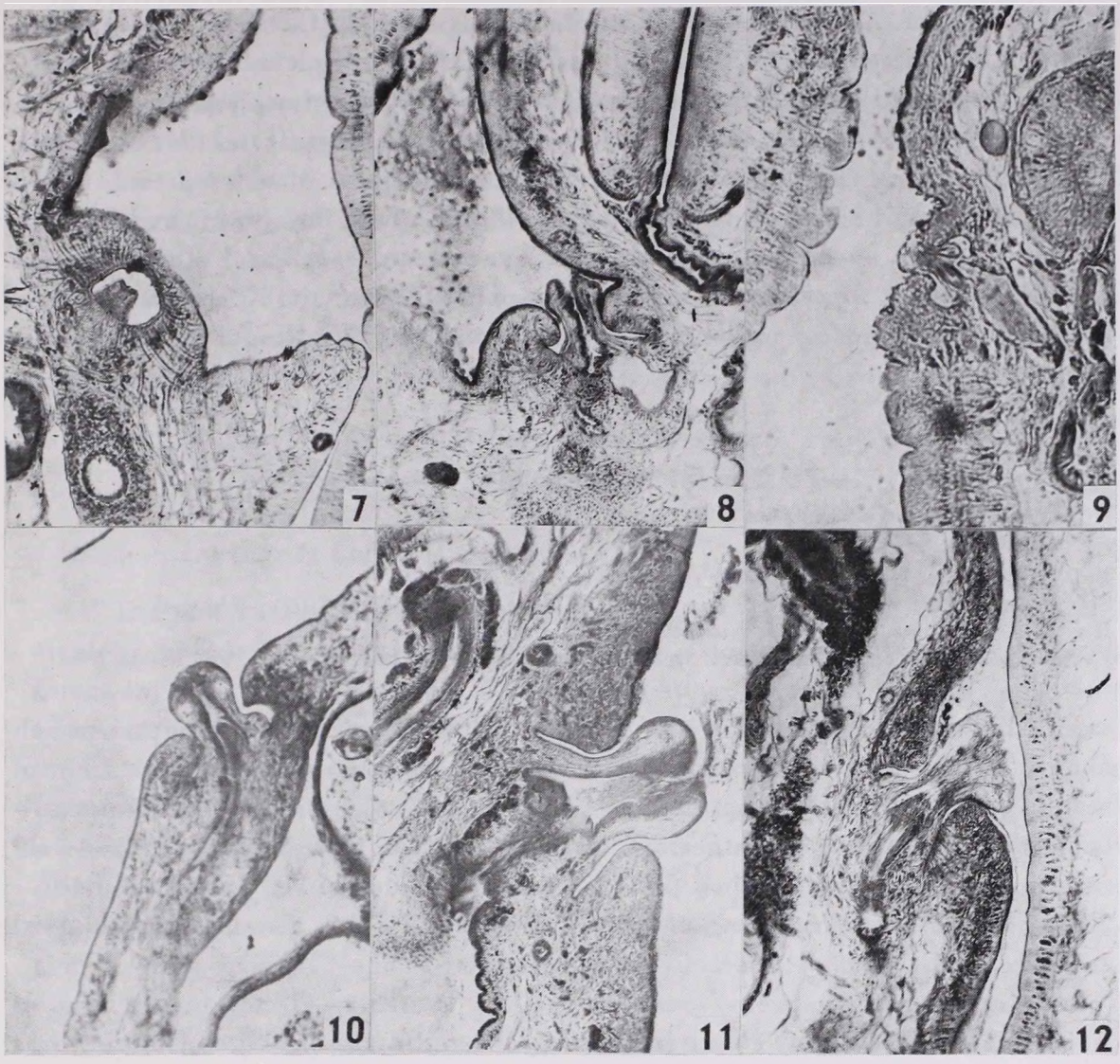
Type-species: *Gastrothylax crumenifer* (Creplin, 1847).

Key to the species of Gastrothylax

1 Acetabulum Gastrothylax-type, caeca ending at testes, genital chamber 50—70 μm ..... **G. crumenifer**
— Acetabulum Carmyerius-type, caeca ending in front of testes, genital chamber 180—210 μm ..... **G. compressus**

Gastrothylax crumenifer (Creplin, 1847) (Fig. 10)

Type specimens: Not available for examination.
Specimens examined: NRS (12 specimens), PC (14 specimens, three as *G. glandiformis*), VIGIS (6 specimens).



Figs 7—12. Median sagittal sections of genital openings: 7 = *Carmyerius wenyoni*, 8 = *C. parvipapillatus*, 9 = *C. gregarius*, 10 = *Gastrothylax crumenifer*, 11 = *G. indicus*, 12 = *G. compressus*

Hosts: *Antilope cervicapra*, *Axis axis*, *Bos indicus*, *B. taurus*, *Boselaphus tragocamelus*, *Bubalus bubalis*, *Capra hircus*, *Cervus eldi*, *Hyelaphus porcinus*, *Kobus leche*, *Ovis aries*, *Tragelaphus spekei*.

Localities: Africa (Republic of South Africa, Zambia); Asia (Afghanistan, Cambodia, China, India, Iran, Iraq, Malaysia, Philippines, Vietnam); Europe (Soviet Union).

Diagnosis. Length 11—18 mm, breadth 5—8 mm. Ventral pouch usually triangular with dorsally directed apex. Pharynx *Gastrothylax*, genital opening *Gracile*, acetabulum *Gastrothylax*-type (d.e. 100—150). Oesophagus 1—1.5 mm caeca ending at anterior margin of testes. Testes lobed, 1—1.2 by 0.6—0.7 mm, situated laterally. Pars prostatica 1.5—1.8 mm in length. Ovary 0.24—0.3 mm in diameter. Vitellaria: in lateral and ventral fields, from pharynx to acetabulum. Size of eggs: 130—140 by 65—72 μm.

Remarks. After early descriptions of this species [CREPLIN (1847), OTTO (1896) and BRANDES (1896)], FISCHOEDER (1903) supplemented the scanty observations of the earlier authors, and completed the morphological characterization of this species, including some histomorphological details. NÄSMARK (1937), typifying the structure of the muscular organs of this species, found that the dorsal exterior circular layer consisted of many muscular units (about 120). In specimens available for examinations I found similarly high number of these units in the acetabulum. This feature should be emphasized because of its important role in differentation of this and the following species.

Gastrothylax compressus BRANDES, 1898 (Figs 11, 12, 27, 29)

= *G. glandiformis* YAMAGUTI, 1939
= *G. indicus* DUTT, 1978

Type specimens: Not available for examination.
Specimens examined: BMNH (5 specimens), NMV (1 specimen), PC (6 specimens).
Hosts: *Bos indicus*, *B. taurus*, *Bubalus bubalis*, *Ovis aries*.
Localities: Asia (Cambodia, China, India, Iran, Japan, Vietnam).

Diagnosis. Length 4.5—15 mm, breadth 3.5—5.2 mm. Ventral pouch usually triangular with apex dorsally directed. Pharynx *Gastrothylax*, genital opening *Gracile*, acetabulum *Carmyerius*-type (d.e. 42—45). Oesophagus 0.4—0.77 mm in length; caeca terminating in front of testes. Ovary 0.28—0.39 mm in diameter. Testes lobed 0.4—1.5 mm in diameter. Pars prostatica 1.0—2.5 mm in length. Vitellaria: in ventral and lateral fields, from preoesophageal to preacetabular zones. Size of eggs: 115—150 by 60—81 μm.

Remarks. This species was described by BRANDES (1898) on the basis of Asian material (without closer indication). FISCHOEDER (1903) considered it as genuine species but MAPLESTONE synonymized it with *G. crumenifer* and subsequent authors accepted his standpoint, and only much later did YAMAGUTI (1958) list it as a valid species, but even than without any comment.

In this study the study material was obtained from the Vienna Museum (probably the same with which BRANDES and FISCHOEDER had worked), the British Museum (from Cambodia) and from Indian and Iranian collections.

Of the specific features, the length of the caeca did not prove to be constant; in the specimens they ended before or at the anterior margin of the testes. Histomorphological structure of the acetabulum shows, however, considerable deviations from that of *G. crumenifer*. The acetabulum of *G. compressus* contains less than half of the muscular units of *G. crumenifer*, indicating the species' validity and pointing out the most important difference between these two species.

It is interesting to note that both in *G. crumenifer* and *G. compressus* the position of the vas deferens was found to be variable. It was situated

either on the left or on the right side from the median line. Its position, however, did not prove to be correlated with other specific features.

G. glandiformis and *G. indicus* are regarded as synonyms of this species because the histological structure of the acetabulum of both of these species was identical with *G. compressus*. Other morphological features listed by both YAMAGUTI (1939) and DUTT (1978) in diagnosis are variable in nature and they are not fit for differentiation.

GUPTA and DUTTA's (1967) species, described under the name *G. crumenifer* from India seems to be rather *G. compressus* due to the shorter gut caeca and mainly the smaller number of the musculer units found in the acetabulum.

Carmyerius STILES et GOLDBERGER, 1910

= *Wellmanius* STILES et GOLDBERGER, 1910

Diagnosis. Gastrothylacidae. Body more or less conical or subelliptical, straight or curved, circular in cross section. Ventral pouch shows different forms in appearance. Pharynx *Gastrothylax*-type, caeca in lateral fields, long or short, sinuous or not. Testes lobed, symmetrical, preacetabular. Vas deferens, seminal vesicle, pars musculosa, pars prostatica and ductus ejaculatorius in median dorsal field. Genital opening of different types, with or without circular muscle units. Ovary intertesticular, prevesicular. Uterus confined to dorsal median field throughout its length. Vitellaria extending in lateral, ventral and rarely dorsal fields, from behind level of intestinal bifurcation to near base of ventral pouch or more limited in extent. Laurer's canal opening anterior to excretory pore. Excretory vesicle preacetabular, pore in acetabular zone. Parasitic in stomach of mammals.

Type species: *Carmyerius gregarius* (Looss, 1896)

Key to the species of Carmyerius

1 Genital opening without tegumental papillae 2
— Genital opening with tegumental papillae 5

2 Genital opening inside ventral pouch 3
— Genital opening outside ventral pouch ..... **C. exoporus**

3 Vitellaria normally developed 4
— Vitellaria strongly developed ..... **C. multivitellarius**

4 A) Genital opening Gracile-type ..... **C. spatiosus**
B) Genital opening Microbothrium-type ..... **C. diplopharyngialis**
C) Genital opening Bubalis-type ..... **C. bubalis**
D) Genital opening Mancupatus-type ..... **C. mancupatus**

5 Caeca terminating at middle part of body 6
— Caeca terminating at level of testes 7

6 Genital opening Gregarius-type ..... **C. gregarius**
— Genital opening Elongatus-type ..... **C. chabaudi**

7 Excretory and Laurer's canals open separately 8
— Excretory and Laurer's canals unite ..... **C. wenyoni**

8 A) Genital opening Synethes-type, pars prostatica 1.2—1.4 mm in length ... **C. synethes**
B) Genital opening Synethes-type, pars prostatica 0.5—0.6 mm in length .... **C. garberi**
C) Genital opening Parvipapillatus-type ..... **C. parvipapillatus**
D) Genital opening Endopapillatus-type ..... **C. endopapillatus**
E) Genital opening Cruciformis-type ..... **C. cruciformis**
F) Genital opening Schoutedeni-type ..... **C. schoutedeni**

Carmyerius gregarius (Looss, 1896) (Figs 2, 3, 26)

Type specimens: Not available for examination.
Specimens examined: PC (18 specimens).
Hosts: *Antilope cervicapra*, *Bos taurus*, *Bubalus bubalis*, *Kobus megaceros*, *Synceros caffer*, *Tragelaphus scriptus*.
Localities: Africa (Central African Empire, Congo, Egypt, Sudan); Asia (India, Philippines).

Diagnosis. Length 7—10, breadth 2—2.5 mm. Ventral pouch usually triangular with a ramifying dorsally directed apex. Pharynx *Gastrothylax*, genital opening *Gregarius*, acetabulum *Carmyerius*-type (d.e. 43—45). Oesophagus 0.7—1.2 mm in length; caeca terminating at about middle part of body. Testes lobed 0.8—1.1 by 0.5—0.7 mm, laterally located. Pars prostatica 1.2—1.4 mm in length. Ovary 0.7 by 0.5 mm. Vitellaria: in ventral, lateral and dorsal fields, from bifurcation to middle of testes. Size of eggs: 114—135 by 80—85 μm.

Carmyerius bubalis (Innes, 1912) (Figs 28, 29)

= *C. gretillati* Strydonck, 1970

Type specimens: MNB (8 syntypes).
Other materials MRC (holotype, 7 paratypes as *C. gretillati*).
Hosts: *Boocercus euryceros*, *Bubalus* sp.
Localities: Africa (Rhodesia, Congo).

Diagnosis. Length 3.2—12.5, breadth 1.5—4.2 mm. Ventral pouch triangular with ventrally directed apex. Pharynx *Gastrothylax*, genital opening *Bubalis*, acetabulum *Carmyerius*-type (d.e. 38—40). Oesophagus 2.2—4.8 mm in length; caeca ending at anterior margin of testes. Testes spherical 0.4—1.1 by 0.3—1.3 mm, situated laterally near to middle line. Pars prostatica 0.5—1.2 mm in length. Ovary 0.15—0.62 mm in diameter. Vitellaria: in lateral, ventral and dorsal fields, from bifurcation to testes. Size of eggs: 110—122 by 60—80 μm.

Remarks. This species was synonymized by Maplestone (1923) with *C. spatiosus*, later with *C. synethes* by Dawes (1936). Fukui (1929) accepted Maplestone's view, Yamaguti (1971), however, shared Dawes' opinion as to the synonymy of this species.

Having examined the syntypes of this species, histomorphologically it was found that the structure of its genital opening differed from both *C. spa-*

tiosus and *C. synethes* and it was also found that the structure of the muscular organs was similar to that of *C. gretillati*. Due to this similarity the latter species is regarded to be synonymous with *C. bubalis*.

Carmyerius chabaudi STRYDONCK, 1970

Type specimens: MRAC (holotype, 5 paratypes).
Host: *Gazella thomsoni*.
Locality: Africa (Congo).

Diagnosis. Length 4.5—8.8, breadth 1.7—2.1 mm. Ventral pouch poligonal in appearance. Pharynx *Gastrothylax*, genital opening *Elongatus*, acetabulum *Carmyerius*-type (d.e. 32—40). Oesophagus 0.5—0.6 mm in length; caeca terminating at third or middle part of body. Testes oval 0.77—1.26 by 0.6—1.0 mm. Pars prostatica 0.9—1.1 mm in length. Ovary 0.22—0.23 by 0.29—0.47 mm. Vitellaria: in antero-lateral region, from bifurcation to acetabulum. Size of eggs: 100—115 by 55—65 μm.

Carmyerius cruciformis (LEIPER, 1910) (Figs 21, 28)

Type specimens: Not available for examination.
Specimens examined: PC (13 specimens), NPCM (8 specimens).
Host: *Hippopotamus amphibius*.
Localities: Africa (Chad, Dahomey, Kenya, Uganda).

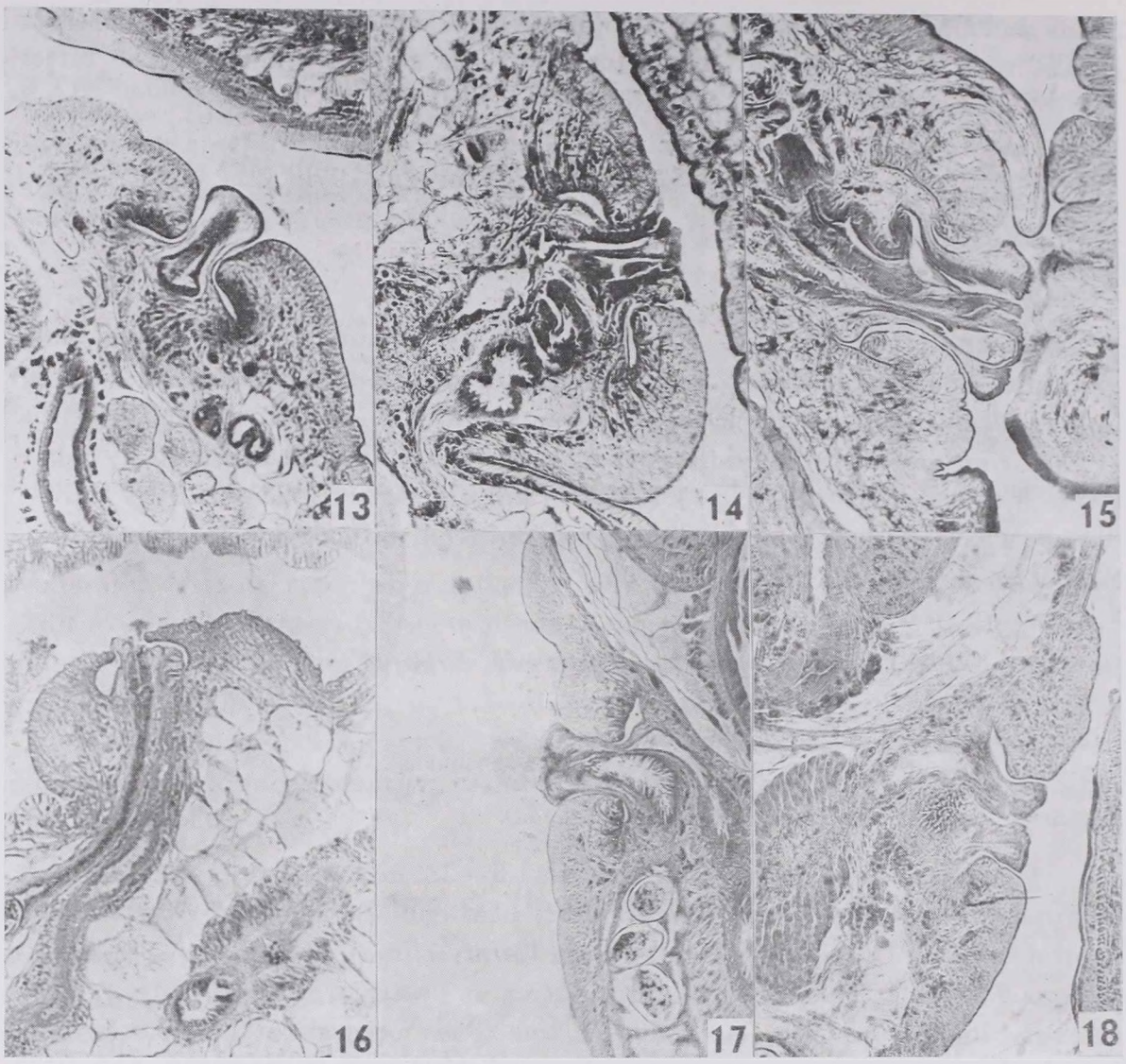
Diagnosis. Length 4.4—8.0, breadth 1.5—2.2 mm. Ventral pouch variable in appearance (triangular, quadrangular, pentagonal). Pharynx *Gastrothylax*, genital opening *Cruciformis*, acetabulum *Carmyerius*-type (d.e. 22—25). Oesophagus 0.2 mm in length; caeca terminating at posterior level of testes. Testes strongly lobed, 0.2 mm, laterally located. Pars prostatica 0.8—0.9 mm in length. Ovary 0.3 mm in diameter. Vitellaria: in lateral, dorsal and ventral sides, from pharynx to acetabulum. Size of eggs: 125—140 by 70—75 μm.

Remarks. LEIPER (1910) was of the opinion that the configuration of the ventral pouch is sufficiently distinguishing feature for this species. SEY's (1980) examinations and the present study show that the appearance of the ventral pouch is too variable in nature to be a valuable specific trait. DAWES (1936) considered this species to be synonymous with *C. spatiosus* although he was not able to examine original material and sections.

Histological examinations have revealed that the structure of the genital opening and the acetabulum are characteristic for this species, thus the writer considers to be as a genuine species.

Carmyerius diplopharyngialis STRYDONCK, 1970 (Fig. 14)

Type specimen: MRAC (holotype).
Host: Bovidae.
Locality: Africa (Congo).



Figs 13—18. Median sagittal sections of genital openings. 13 = *Carmyerius spatiosus*, 14 = *C. diplopharyngialis*, 15 = *C. exoporus*, 16 = *Fischoederius elongatus*, 17 = *Carmyerius mancupatus*, 18 = *C. dollfusi*

Diagnosis. Length 7.4, breadth 2.75 mm. Ventral pouch slit form. Pharynx *Gastrothylax*, genital opening *Microbothrium*, acetabulum *Carmyerius*-type (d.e. 27—35).— Oesophagus 0.59 mm in length; caeca terminating at anterior margin of acetabulum. Testes lobed, 1.6—1.7 by 1.9—2.2 mm. Pars prostatica 1.2 mm in length. Ovary 0.4 by 0.7 mm. Vitellaria: in lateral and ventral regions, from bifurcation to testes. Size of eggs: 112—125 by 60—74 μm.

Remarks. Examining the type specimen it was found that, contrary to the description, the sphincter papillae was present (Fig. 14). As one specimen is available only, it is difficult to assert the specific value of the form of the pharynx. For the time being, however, it seems to be correct to accept it as valid.

Carmyerius endopapillatus DOLLFUS, 1962 (Figs 5, 6, 30)

= *C. papillatus* GRETILLAT, 1962

Type specimens: Not available for examination.
Other material: MRAC (13 paratypes), PC (3 specimens).
Hosts: *Bos indicus, B. taurus, Hippopotamus amphibius, Hippotragus equinus, Kobus defassa, K. kob, K. thomsoni, Redunca redunca, Syncerus caffer, Tragelaphus scriptus.*
Localities: Africa (Central African Empire, Chad, Congo, Ethiopia).

Diagnosis. Length 4.2—9.6, breadth 2.5—5.2 mm. Ventral pouch variable: circular, pentagonal, triangular (in latter with apex ventrally directed). Pharynx *Gastrothylax*, genital opening *Endopapillatus*, acetabulum *Carmyerius*-type (d.e. 36—39). Oesophagus 0.2—1.2 mm in length; caeca terminating at anterior part of testes or acetabulum. Testes slightly lobed or spherical, 1.0—1.7 by 1.2—1.3 mm. Pars prostatica 0.7—0.9 mm in length. Ovary 0.3—0.4 by 0.2—0.4 mm. Vitellaria: in lateral and dorsal regions, from bifurcation to acetabulum. Size of eggs: 120—145 by 66—79 μm.

Remarks. In 1962 two papers were published in the same volume (37) and number (1—2) of the periodical Annls. Parasit. hum. comp. The authors were DOLLFUS and GRETILLAT, respectively, who appearently independently of each other described two new species, *C. endopapillatus* and *C. papillatus*. The writer considers the latter to be synonymous with the former.

In the diagnosis, the well developed genital opening and the presence of the tegumental papillae were emphasized as the chief features distinguishing these species from others earlier described ones. Taking into account the structure of the genital opening of DOLLFUS' species, I found the same one in *C. papillatus* as to the musculature and tegumental papillae. The other unimportant differences indicated by GRETILLAT (1962) are within the limits of individual variability described by DOLLFUS (1962) in connection with *C. endopapillatus*.

Carmyerius exoporus MAPLESTONE, 1923 (Fig. 15)

Type specimens: Not available for examination.
Other materials: NRS (1 specimen), PC (8 specimens).
Hosts: *Bos taurus, Damaliscus korrigum, Redunca redunca, Tragelaphus spekei, Syncerus caffer.*
Localities: Africa (Central African Empire, Congo, Malgasy, Malawi, Kenya, Tanzania).

Diagnosis. Length 5.3—11.5, breadth 2.6—3.8 mm. Ventral pouch hexagonal. Pharynx *Gastrothylax*, genital opening *Microbothrium*, acetabulum *Carmyerius*-type (d.e. 45—48). Oesophagus 0.3 mm in length; caeca terminating at level of testes. Testes lobed, 1.3—1.5 by 0.7—1.2 mm. Ovary 0.7—0.9 mm in diameter. Pars prostatica 1.5—1.8 mm. Vitellaria: in ventral, lateral and somewhat dorsal sides, from pharynx to acetabulum. Size of eggs: 115—130 by 60—68 μm.

Carmyerius graberi GRETILLAT, 1960

Type specimens: Not available for examination.
Specimens examined: PC (11 specimens).
Hosts: *Bos indicus*, *B. taurus*, *Kobus ellipsiprymnus*, *K. kob*, *Ovis aries*, *Redunca redunca*, *Syncerus caffer*, *Tragelaphus scriptus*.
Localities: Africa (Central African Empire, Cameroon, Chad, Kenya, Niger).

Diagnosis. Length 3.0—5.0, breadth 2.5—3.2 mm. Ventral pouch circular. Pharynx *Gastrothylax*, genital opening *Synethes*, acetabulum *Carmyerius*-type (d.e. 32—35). Oesophagus 0.3—0.4 mm in length; caeca terminating at anterior margin of testes, sinuous. Testes spherical, 1.5—1.7 by 0.7—0.9 mm, situated laterally. Pars prostatica 0.5—0.6 mm in length. Ovary 0.4—0.5 mm in diameter. Vitellaria: well developed in ventral, lateral and dorsal regions, from pharynx to acetabulum. Size of eggs: 125—130 by 70—75 μm.

Remarks. In the description of the species GRETILLAT (1960) did not give any details of the structure of the musculature of the pharynx. Later (GRETILLAT, 1964b) he illustrated the pharynx indicating the presence of the middle circular layer. In specimens examined by the writer this muscle layer was not detectable, thus, it seems to be probable that the structure of pharynx of this species is similar to that of other carmyerids.

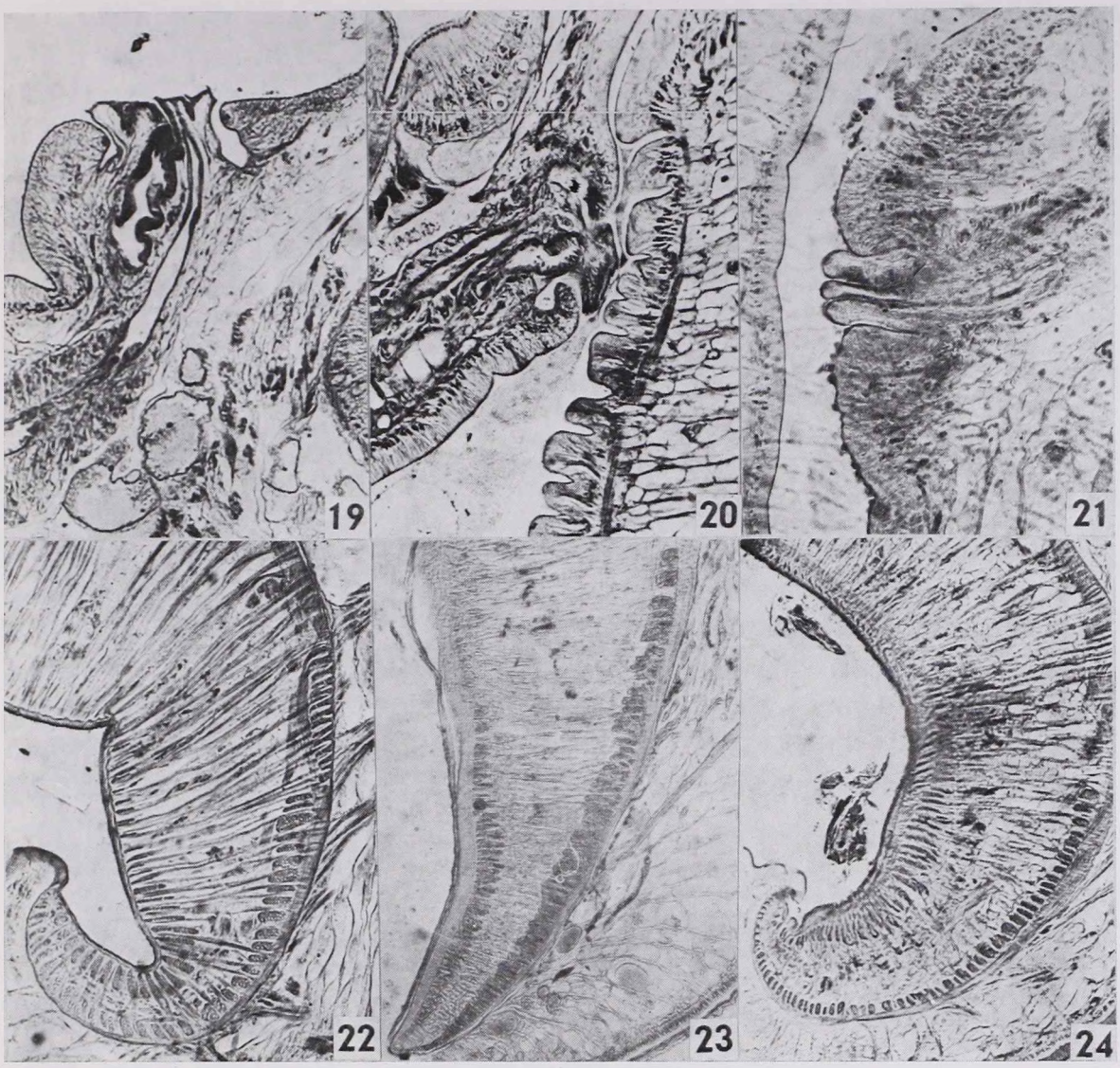
Carmyerius mancupatus (FISCHOEDER, 1901) (Figs 17, 18, 24)

= *C. dollfusi* GOLVAN, CHABAUD et GRETILLAT, 1957
= *C. minutus* (FISCHOEDER, 1901)
= *Wellmanius wellmani* STILES et GOLDBERGER, 1910

Type specimens: Not available for examination.
Specimens examined- MNB (10 specimens, 10 specimens as *C. minutus*), NRS (1 specimen, 1 specimen as *C. minutus*), BMNH (3 specimens), PC (14 specimens), MNHNP (5 specimens as *C. dollfusi*).
Hosts: *Alcelaphus* sp., *Boocercus eurycerus*, *Kobus defassa*, *K. kob*, *K. leche*, *Redunca redunca*, *Syncerus caffer*, *Taurotragus oryx*, *Tragelaphus scriptus*.
Localities: Africa (Cameroon, Central African Empire, Congo, Guinea, Malgasy, Kenya, Botswana).

Diagnosis. Length 5.2—11.3, breadth 2.3—4.5 mm. Ventral pouch usually triangular with apex ventrally directed, but circular or pentagonal forms also occur. Pharynx *Gastrothylax*, genital opening *Mancupatus*, acetabulum *Gastrothylax*-type (d.e. 64—78). Oesophagus 0.45—2.1 mm in length; caeca terminating at middle part of testes. Testes unlobed 1.6—1.9 by 1.2—1.4 mm, situated near to median line in a hemispherical fold. Pars prostatica 0.6—1.3 mm in length. Ovary 0.15—0.43 mm in diameter. Vitellaria: in lateral and somewhat dorsal regions, from bottom of pharynx to anterior margin of acetabulum. Size of eggs: 120—140 by 67—76 μm.

Remarks. Since FISCHOEDER's (1903) description the taxonomic position of this species has varied. STILES and GOLDBERGER (1910) considered it to be valid while MAPLESTONE (1923), FUKUI (1929) were of the opinion that it was



Figs 19—24. 19—21. Median sagittal sections of genital openings: 19 = *Carmyerius bubalis*, 20 = *C. gretillati*, 21 = *C. cruciformis*. — 22—24. Median sagittalis sections of dorsal half of acetabula: 22 = *Fischoederius elongatus*, 23 = *F. cobboldi*, 24 = *Carmyerius mancupatus*

synonymous with either *C. spatiosus* or *C. synethes*. PRUDHOE (1957) pointed out again the validity of this species and its distinctness from both *C. spatiosus* and *C. synethes* and, at the same time, the identity of *C. minutus* with this species.

Out of the differences found between *C. dollfusi* and *C. mancupatus*, GOLVAN et al. (1957) emphasized the measurements of pharynx, length of oesophagus, position of genital pore and the arrangement of the vitellaria. The position of vitelline glands does not seem to be constant; there were specimens in our collection [derived from the same place (Malgasy) as the material of GOLVAN et al.] with vitellaria both in the lateral and dorsal sides of the body. The rest of the morphological features listed by the authors fit into the framework of the individual variability exhibited by this species.

Agreeing with PRUDHOE (1957) as to the position of *C. minutus*, the writer adds *Wellmanius wellmani* as another synonym of *C. mancupatus*. The genus *Wellmanius* was synonymized with *Carmyerius* by MAPLESTONE (1923) who refuted the minute difference (the first part of the vesicula seminalis is straight or coiled) as sufficiant generic feature (on which the original separation was based). According to the writer the generic feature mentioned by STILES and GOLDBERGER (1910) has no such value, and the specific traits of *W. wellmani* are within limits of *C. mancupatus* characterized herein.

Carmyerius multivitellarius STRYDONCK, 1970

Type specimens: MRAC (holotype, 2 paratypes).
Host: *Gazella thomsoni.*
Locality: Africa (Congo).

Diagnosis. Length 4.7—5.2, breadth 1.6—1.9 mm. Ventral pouch characterized by large tissue invaginations. Pharynx *Gastrothylax*, genital opening *Mancupatus*, acetabulum *Gastrothylax*-type (d.e. 72—79). Oesophagus 1.3—1.9 mm in length; caeca terminating at anterior border of testes. Testes lobed 1.22—1.28 by 0.98—1.2 mm. Pars prostatica 11—1.3 mm in length. Ovary 0.22 by 0.51 mm in diameter. Vitellaria: big follicules in lateral, ventral and somewhat dorsal sides, from bifurcation to testes. Size of eggs: 118—125 by 61—74 μm.

Carmyerius parvipapillatus GRETILLAT, 1962 (Figs 8, 9)

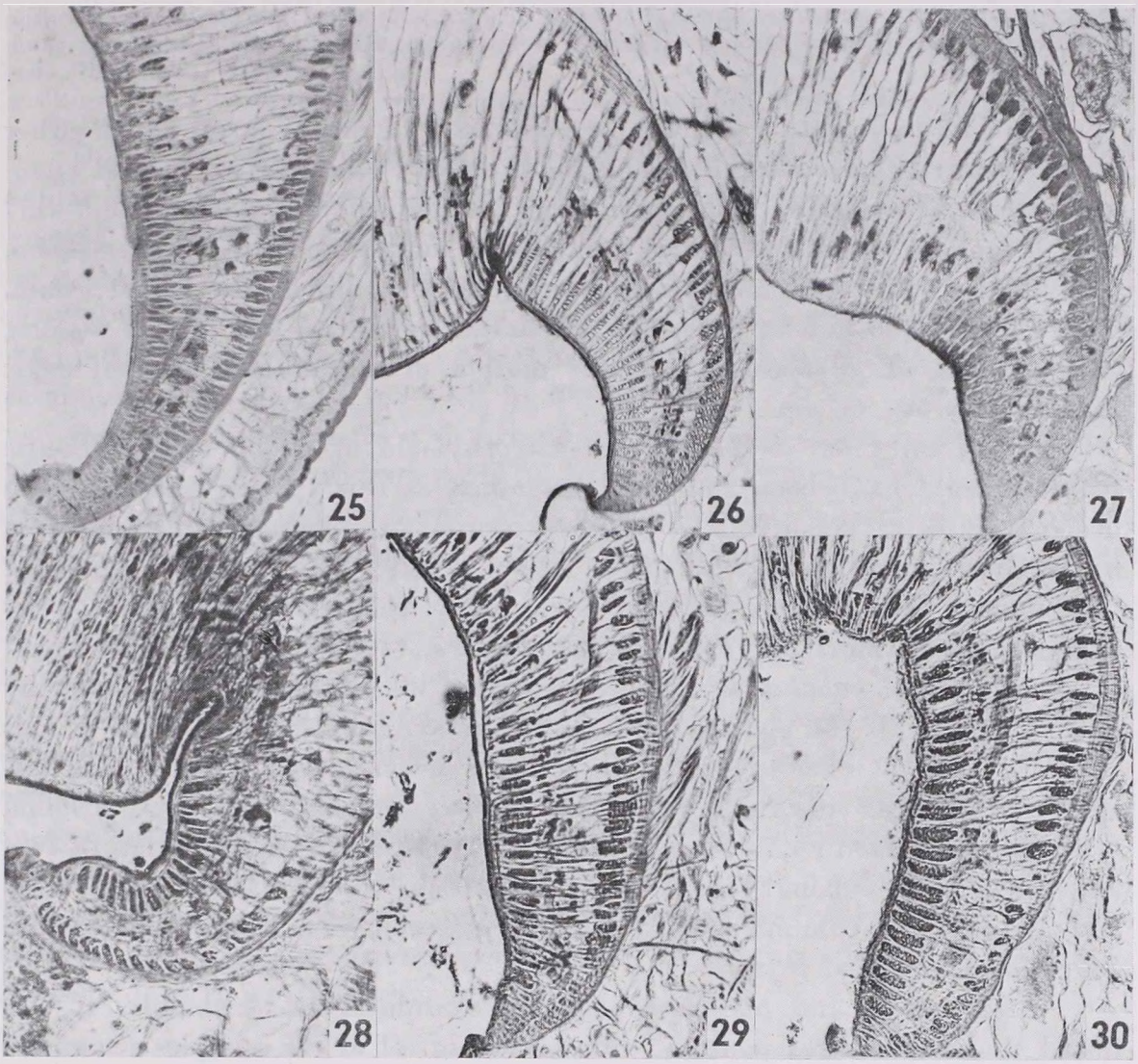
= *C. gregarius congolensis* DOLLFUS, 1963

Type specimens: Not available for examination.
Species examined: MNB (3 specimens), MNHNP (3 syntypes as *C. gregarius congolense*), PC (9 specimens).
Hosts: *Bos indicus*, *Capra hircus* (exp.), *Damaliscus korrigum*, *Hippotragus beckeri*, *Kobus defassa*, *K. ellipsiprymnus*, *K. kob*, *Ovis aries* (exp.), *Tragelaphus scriptus.*
Localities: Africa (Cameroon, Chad, Congo, Guinea, Kenya, Niger).

Diagnosis. Length 3.7—7.2, breadth 2.5—2.8 mm. Ventral pouch usually quadrangular. Pharynx *Gastrothylax*, genital opening *Parvipapillaris*, acetabulum *Carmyerius*-type (d.e. 40—48). Oesophagus 0.45—0.75 mm in length; caeca terminating at anterior margin of testes. Testes lobed 1.2—1.3 by 0.7—0.9 mm. Pars prostatica 0.62—0.69 mm in length. Ovary 0.5 by 0.58 mm. Vitellaria: in lateral regions, from level of pars prostatica to anterior margin of testes. Size of eggs: 125 by 75 μm.

Carmyerius schoutedeni GRETILLAT, 1964

Type specimens: MRAC (holotype, 14 paratypes).
Hosts: *Boocercus euryceros*, *Bubalus bubalis*, *Cephalophus nigrifrons*, *Hippopotamus amphibius*, *Syncerus caffer.*
Localities: Africa (Central African Empire, Congo, Zaire).



Figs 25—30. Median sagittal sections of dorsal half of acetabula: 25 = *Carmyerius spatiosus*, 26 = *C. gregarius*, 27 = *Gastrothylax indicus*, 28 = *Carmyerius cruciformis*, 29 = *Gastrothylax compressus*, 30 = *Carmyerius endopapillatus*

Diagnosis. Length 3.2—4.1, breadth 2.2—2.5 mm. Ventral pouch triangular with apex ventrally directed. Pharynx *Gastrothylax*, genital opening *Schoutedeni*, acetabulum *Carmyerius*-type (d.e. 29—32). Oesophagus 0.3 mm in length; caeca sinuous, terminating at anterior margin of testes. Testes spherical 0.6—0.7 by 0.35—0.37 mm. Pars prostatica 0.15—0.17 mm. Ovary 0.22—0.25 mm. Vitellaria: in antero-lateral region, from bifurcation to acetabulum. Size of eggs: 100—115 by 55—65 μm.

Carmyerius spatiosus (Brandes, 1898) (Figs 1, 13, 25)

Type specimens: Not available for examination.
Specimens examined: MNB (3 specimens), NRS (1 specimen), MBNH (2 specimens), MRAC (31 specimens), NMV (5 specimens), PC (10 specimens).

Hosts: *Bos indicus*, *B. taurus*, *Bubalus bubalis*, *Ovis aries*, *Redunca redunca*, *Syncerus caffer*.
Localities: Africa (Central African Republic, Mozambique, Sudan), Asia (Iran, Iraq, Saudi Arabia).

Diagnosis. Length 9.2—12.1, breadth 2.8—3.1 mm. Ventral pouch either circular or triangular with blunt angles. Pharynx *Gastrothylax*, genital opening *Gracile*, acetabulum *Gastrothylax*-type (d.e. 65—68). Oesophagus 0.3—0.7 mm in length; caeca terminating in front of margin of testes. Testes lobed, 0.8—1.2 by 0.45—0.64 mm, laterally located. Pars prostatica 1.2—1.7 mm. Ovary 0.21—0.28 mm in diameter. Vitellaria: in ventral and lateral regions, from bottom of pharynx to anterior margin of acetabulum. Size of eggs: 115—125 by 60—68 μm.

Remarks. There is not other gastrothylacid of which actual specific feature would have been concealed insomuch as this species since the first designation of its synonyms by MAPLESTONE (1923). Confusion has increased by further synonymization (FUKUI, 1929; DAWES, 1936) and it became an "assemblage" of species provided with many characters exhibited by its synonymous species. For instance, *C. synethes*, *C. mancupatus*, *C. minutus*, *C. cruciformis*, *C. bubalus*, *Wellmanius wellmani* were sunk to its synonyms by FUKUI (1929). Of the species listed under its synonyms, in the light of this paper several have been regarded to be valid or synonyms of other than this species. Thus, the specific traits of this species were searched in the original descriptions (BRANDES, 1898; FISCHOEDER, 1903) and re-examination of reliable museum specimens (Vienna Museum, British Museum, Musée Royal Central Afrique) was combined with available material from Indian and Iranian collections.

After gross- and histomorphological examinations of samples it was found that the ventral pouch is voluminous in all of the samples examined and thus, the wall of the body is thin. Contrary to earlier descriptions the cross; section of the ventral pouch is triangular with blunt apeces rather than circular In fresh and well fixed Iranian specimens the triangular form was characteristic and in some of the museum specimens it was rather circular and rarely triangular. The latter form is considered to be the primary feature and the circular one is a secondary phenomenon apparently due to the unfavourable effects of fixation (e.g. watery treatment). The length of caeca also showed variable appearance; in well fixed specimens it terminated in front of the testes, in others they reached the anterior their margin.

Instead of these features, being variable in nature, the structure of the genital opening, length of the pars prostatica and measurement of testes are rather characteristic of this species.

Carmyerius synethes (FISCHOEDER, 1901) (Fig. 4)

Type specimens: Not available for examination.

Specimens examined: MNB (3 specimens), MBNH (1 specimen), NRS (2 specimens), NPCM (2 specimens), PC (6 specimens).
Hosts: *Bos taurus*, *Bubalus bubalis*.
Localities: Africa (Cameroon), Asia (Ceylon, India, Malaysia, North Borneo, Philippines).

Diagnosis. Length 7.2—15.3, breadth 3.2—5.5 mm. Ventral pouch triangular with apex ventrally directed. Pharynx *Gastrothylax*, genital opening *Synethes*, acetabulum *Gastrothylax*-type (d.e. 63—68). Oesophagus 0.6—0.8 mm in length; caeca terminating to margin of testes. Testes lobed 1.2—1.5 by 0.7—0.9 mm, laterally located. Pars prostatica 1.3—1.5 mm in length. Ovary 0.34 by 0.32 mm. Vitellaria: in ventral and lateral regions, from bifurcation to acetabulum. Size of eggs: 100—125 by 60—65 μm.

Remarks. Since the first description of this species (FISCHOEDER, 1901, 1903), STILES and GOLDBERGER (1910), NÄSMARK (1937), GRETILLAT (1964), SCHAD et al. (1964) and EDUARDO (1975) recognized this species. MAPLESTONE (1923), MUKHERJEE and CHAUHAN (1965) considered it, together with other carmyerids, to be synonymous with *C. spatiosus* and *C. gregarius*, respectively. The latter authors were apparently unable to make sections to demonstrate the characters of the genital opening.

Observations of the present writer agree with those authors who recognized this species as valid. The structure of the genital opening, which seems to be constant, is so characteristic that this feature, employed in conjunction with other histological details, warrants its distinctness and validity.

In the collection of the Berlin Museum there was a sample, labelled as "*Gastrothylax* sp. *Bubalus aff. pumilus*, Kamerun, Dschand, Immel" which after histomorphological examination proved to be this species. This is the first record, as to its occurrence in Africa.

Carmyerius wenyoni (LEIPER, 1908) (Fig. 7)

Type specimen: CIH (1 specimen).
Host: *Kobus megaceros*.
Locality: Africa (Sudan).

Diagnosis. Length 6.3, breadth 2.1 mm. Ventral pouch triangular with apex dorsally directed, divided at its tip by a ridge. Pharynx *Gastrothylax*, genital opening ? *Endopapillatus*, acetabulum *Carmyerius*-type (d.e. 43—45). Oesophagus 0.7 mm in length; caeca terminating in front of anterior limit of testes. Testes with some lobuli, 1.0 by 0.9 mm, laterally located. Pars prostatica 0.7 mm in length. Ovary 0.2 mm in diameter. Vitellaria: in lateral and dorsal regions, poorly developed, from pharynx to acetabulum. Size of eggs: 130—150 by 50—75 μm.

Remarks. In the diagnosis of this species LEIPER (1908) designated the union of the excretory and Laurer's canals as the most important specific feature which is quite unique in the genus. Examination of LEIPER's sections

(probably one specimen of four slides) it was found that they were not cut in complete median sagittal plane thus, the structure of the genital opening could not be analyzed in full length. It is, however, established that there are sphincter papillae and genital sphincter. Ventral sphincter absent and ventral papillae was covered with tegumental papillae. STUNKARD (1925) expressed his doubt on the validity of this species because the unique feature mentioned above was found only once. For the time being, however, the distinctness of this species should be accepted.

Fischoederius STILES et GOLDBERGER, 1910

Diagnosis. Gastrothylacidae. Body elongate or conical with or without slight contraction in pretesticular region. Ventral pouch approximately triangular in cross section, with apex directed ventrally. Pharynx *Gastrothylax*-type, caeca more or less sinuous, in dorsal or lateral fields, may extend to middle part of body or beyond ovarytesticular region. Testes in median line one testis dorsal or anterodorsal to other. Vas deferens, seminal vesicle, pars musculosa, pars prostatica and ductus ejaculatorius in median dorsal field. Genital opening with circular musculature, opening on dorsal wall of ventral pouch near its subterminal opening. Ovary anterior to excretory vesicle between two testes or posterodorsal to anterior testes. Uterus ascending in dorsal median field, winding posterior but almost straight anteriorly. Vitellaria extending in ventrolateral fields from behind genital pore to ovariotesticular zone, posterior to opening of Laurer's canal. Acetabulum with dorsal exterior muscle layer in one or two rows. Parasitic in rumen of ruminants.

Type species: *Fischoederius elongatus* (POIRIER, 1883)

Key to the species of Fischoederius

1 Caeca in dorsal field, extending to about middle part of body 2
— Caeca in lateral field, extending to acetabulum ..... **F. cobboldi**

2 Testes lobed, opening of ventral pouch without tegumental papillae ..... **F. elongatus**
— Testes unlobed, opening of ventral pouch with tegumental papillae ..... **F. skrjabini**

Fischoederius elongatus (POIRIER, 1883) (Figs 16, 22)

= *F. fischoederi* STILES et GOLDBERGER, 1910
= *F. ceylonensis* STILES et GOLDBERGER, 1910
= *F. siamensis* STILES et GOLDBERGER, 1910
= *F. japonicus* FUKUI, 1922

Type specimens: Not available for examination.
Specimens examined: NRS (4 specimens), PC (15 specimens).
Hosts: *Anoa depressicornis*, *Bos indicus*, *B. taurus*, *Bubalus bubalis*, *Capra hircus*, *Cervus unicolor*, *Muntiacus muntjak*, *Ovis aries*, *Palonia frontalis*.
Localities: Asia (Cambodia, Ceylon, China, India, Indonesia, Korea, Malaysia (North Borneo), Philippines, Vietnam) and Mariana Islands (Guam).

Diagnosis. Length 3.7—20.8, breadth 1.8—3.7 mm. Ventral pouch usually triangular with apex ventrally directed. Pharynx *Gastrothylax*, genital opening *Elongatus*, acetabulum *Fischoederius*-type (d.e. 46—50; 9—10). Oesophagus 0.6—0.8 mm in length; caeca dorsal field, terminating at about middle part of body. Testes lobed, in median line, one behind the other, 0.82—1.2 mm in diameter. Pars prostatica 1.2—1.5 mm in length. Ovary 0.22—0.31 by 0.27—0.42 mm. Vitellaria: lateroventral region, from bifurcation to middle part of anterior testis. Size of eggs: 125—132 by 67—72 μm.

Remarks. MAPLESTONE (1923) has pointed out that the species *F. ceylonensi*, *F. fischoederi*, *F. siamensis* are synonyms of this species. Agreeing with MAPLESTONE's statement, I have also found during the study of this material that the distinguishing characters, indicated by STILES and GOLDBERGER (1910) are variable features and they have no specific value.

FUKUI (1922, 1929) described the subspecies *F. siamensis japonicus* and *Gastrothylax elongatus japonicus* respectively which were later (cit. YAMAGUTI, 1939) identified with *Gastrothylax elongatus* by FUKUI. On the basis of *Fischoederius siamensis japonicus*, YAMAGUTI (1939) elevated the subspecies to species rank, under the name *Fischoederius japonicus* FUKUI, 1922, emphasized its body length as a noticable specific feature. As this trait is subjected to individual variations, induced by various external factors, it cannot be considered constant and has no specific value. It is, therefore, considered as a synonym of *F. elongatus*.

Fischoederus cobboldi (POIRIER, 1883) (Fig. 23)

Type specimens: Not available for examination.
Specimens examined: NRS (5 specimens), NPCM (6 specimens), PC (10 specimens).
Hosts: *Bos taurus*, *Bubalus bubalis*, *Boselaphus tragocamelus*, *Capra hircus*, *Cervus brookei*, *C. eldi*, *Ovis aries*, *Palonia frontalis*.
Localities: Asia (Afghanistan, Cambodia, Ceylon, China, India, Indonesia, Japan, Malaysia, Philippines, Thailand, Vietnam) and Mariana Islands (Guam).

Diagnosis. Length 8—12, breadth 5—7 mm. Ventral pouch usually triangular with apex directed ventrally. Pharynx *Gastrothylax*, genital opening *Microbothrium*, acetabulum *Gastrothylax*-type (d.e. 65—93). Oesophagus 0.9—1.3 mm in length: caeca lateral zone, strongly sinuous, terminating at acetabulum. Testes strongly lobed, 0.8—1.2 by 0.6—0.9 mm, situated in median line. Pars prostatica 1.2—1.5 mm in length. Ovary 0.33—0.39 mm in diameter. Vitellaria: in ventrolateral region, from bifurcation to anterior margin of acetabulum. Size of eggs: 110—120 by 60—65 μm.

Fischoederius skrjabini KADENAZII, 1963

Type specimens: Not available for examination.
Specimen examined: VIGIS (1 specimen, whole mount).
Hosts: *Alces alces*, *Capreolus pygargus*, *Cervus canadensis*.
Locality: Asia (Soviet Union).

Diagnosis. Length 20.0—25.0, breadth 3.8—4.9 mm. Ventral pouch triangular with ventrally directed apex. Oesophagus 0.82—0.92 mm in length; caeca dorsal region, terminating first third of body. Testes unlobed, spherical or oval, 1.9—3.3 by 1.8—3.3 mm, in median line. Ovary 0.82—0.92 by 0.64 mm. Vitellaria: in lateral region, from bifurcation to posterior end of first testis. Size of eggs: 145—156 by 82—85 μm.

Gastrothylacidae incertae sedis. In 1939 JOHNSON described the species *Paramphistomum magnus* on the basis of study material originating from India. The illustration and the description indicated, however, the presence of the ventral pouch. Thus, YAMAGUTI (1958) transferred it to the new gastrothylacid subfamily Johnsonitrema erected by himself. In JOHNSON's description two unique features were attributed to this species, viz. the genital pore, situated on the dorsal side and the ovary at the middle part of the body.

It is the writer's opinion that both the position of the genital pore and the ovary are probably the consequences of a misleading diagnosis. This assumption seems to be indirectly supported by the fact that when this species was allocated to the genus *Paramphistomum*, inspite of the presence of the ventral pouch, and specific features of this species were compared with paramphistomid and not gastrothylacid species, although several species of the pouched worms have already been described at that time.

WANG (1979) reported three new gastrothylacids from Chinese ruminants (*Gastrothylax zhonghuaensis*, *Fischoederius boyangenisis*, *F. compressus*). The insufficient quality of information does not render it possible to take them into account in the context of the present paper.

ZOOGEOGRAPHICAL AFFINITIES OF GASTROTHYLACIDS

The analysis of the accurate geographical distribution of gastrothylacids, similarly to other groups of parasites, is rendered difficult by the vast amount of presently available records which were often based on misidentification. The confusion was agrevated by synonymization of species and by the fact that the previous inaccurate findings were followed by subsequent authors, whereas some of the synonyms of that time proved to be valid. Although some of the misidentifications have been clarified by re-examination, others could not be verified due to the absence of the original material. Therefore, the present picture of the distributional pattern was based on the twenty valid species recognized as a result of this paper.

The distribution of gastrothylacids is restricted to the Eurasian and African continents along their tropical and subtropical areas. Of the three genera, species of *Carmyerius* (*C. bubalis*, *C. chabaudi*, *C. cruciformis*, *C. diplopharyngialis*, *C. endopapillatus*, *C. exoporus*, *C. graberi*, *C. mancupatus*, *C.*

multivitellarius, *C. parvipapillatus*, *C. schoutedeni*, *C. wenyoni*) are strictly Ethiopian, while *C. synethes* is of the Ethiopian/Oriental, *C. spatiosus* if of the Ethiopian/Palaearctic and *C. gregarius* is of the Ethiopian/Oriental/Palaearctic distributional regions. The high number of carmyerids and their frequency in Africa indicate that the centre of their origin had been in tropical Africa. The great number of bovid definitive hosts, after invading Africa from Asia during the late Pliocene, segregated the wealth of different species which in the presence of susceptible intermediate hosts and favourable climatic conditions advanced the sympatric speciation of these helminths. From this primary center, one species (*C. gregarius*) reached the northern African area (Egypt) and four species have distributions outside Africa (*C. gregarius*, *C. spatiosus*, *C. synethes* in Asia and *C. mancupatus* in Malgasy). The colonization of these territories had taken place in ancient times by the continuous distribution of wild ruminants and later by the introduction of domestic stocks (e.g. *C. mancupatus* in Malgasy).

Intermediate hosts of carmyerids are known in a few cases and nothing is known on the intermediate host specificity. *C. gregarius* develop in *Physa alexandrina*, *Ph. microleptera* (= *Bulinus truncatus*, *B. forskalii*) (Looss, (1896); *C. exoporus* and *C. mancupatus* in *Anisus natalensis* (Dinnik and Dinnik, 1960; Dinnik, 1965); *C. parvipapillatus* in *Physopsis globosus* (Dinnik, 1965). Grétillat (1959) found *Bulinus mariei* as intermediate host of *C. dollfusi* (now *C. mancupatus*) in Malgasy.

Apparently, both bulinid and planorbid snails might be intermediate hosts and, supposedly certain specificity to their snails hosts can influence the distributional pattern of these helminths.

The main distributional area of the species of *Gastrothylax* is restricted to the Oriental region where they are very common parasites. From the place supposed to be their origin (South Asia) they have radiated and the most adapted species (*G. crumenifer*) has invaded some areas of the Palaearctic (Europe, Rybaltovskii, 1957) and the Ethiopian region (Zambia, LeRoux, 1932) regions. The latter finding, however, needs further confirmation because after the first report it has not yet been recorded again.

This wide distributional area reflects the affinity of this species to its intermediate hosts. They are species of the widely distributed planorbid genus *Gyraulus* [*G. convexiusculus*, Tandon (1957), India; *G. albus*, Nikitin (1967), Soviet Union] which can be found in all of the continents except South America and Australia.

G. compressus was originally described from Asia and in the study material available it was only found in Asian countries belonging the Palaearctic and Oriental regions.

Species of the genus *Fischoederius* are found in the Oriental/Palaearctic regions and their presence in the Australian region (Mariana Islands) is obvi-

ously the consequence of human activity. GOHAR's (1934) record of the occurrence of *F. elongatus* in Egypt is questionable. Subsequent examinations (SEY, 1976, 1977) have not revealed this species either in the said country or in other African states.

Of the three species recognized presently, only the intermediate host of *F. elongatus* has been discovered. TANDON (1958) found that it developed in *Lymnaea luteola* in India, a snail with a Central and South Asian distribution. The distributional pattern of *F. elongatus* and *F. cobboldi* seems to be continuous while the position of *F. skrjabini* is somewhat isolated.

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UNTERSUCHUNGEN DES TYPENMATERIALS DER RONDANISCHEN SAMMLUNG.
2. OTITIDAE (DIPTERA)

Á. Soós

(Eingegangen am 26. April 1982)

Lecto- and paralectotype designation of eight Otitid species from the collection RONDANI in Firenze are given.

In einem vorhergehenden Artikel wurde die Wiederbeschreibung zweier RONDANIscher Otitiden-Arten mitgeteilt (SOÓS, 1981). Es sind dies solche Otitiden-Taxa, die von HENNIG (1939), dem Autor der Familie Otitidae in LINDNER: »Die Fliegen der palaearktischen Region« wegen der unzulänglichen Beschreibung RONDANIS (1869) dem Bestimmungsschlüssel *Otites* LATREILLE, 1805, bzw. *Herina* ROBINEAU-DESVOIDY, 1830 nicht eingereiht werden konnten. Die Ergebnisse der weiteren Untersuchungen bezüglich der RONDANIschen Otitide-Typen werden nachstehend bekanntgegeben. Alle Lecto- und Paralectotypen sind hier designiert worden. Das Typenmaterial sämtlicher Arten wird in der Dipteren-Sammlung von RONDANI im Museo Zoologico de »La Specola« degli Studi in Florenz, aufbewahrt.

Mein Dank gebührt einerseits der Ungarischen Akademie der Wissenschaften, die mir im Rahmen eines wissenschaftlichen Kulturabschlusses der beiden Länder die Studienreise nach Italien ermöglichte, anderseits Herrn Prof. DR. BENEDITTO LANZA und Frau SARAH MASCHERINI, Florenz, die mir zum Studium der Dipteren-Sammlung von RONDANI jegliche Hilfe und Unterstützung zukommen ließen.

DIE TYPEN DER VALIDEN RONDANISCHEN NAMEN

Dorycera grandis (RONDANI, 1869)

RONDANI, 1869: Bull. Soc. ent. Ital., **1:** 13 (*Macheirocera*). — »In montuosis alpinis Insubriae et Pedemontii raro inventa a Decristofori, Mussino et Bellardi.«

Untersuchungsmaterial: 4 Exemplare.

Lectotypus, ♂: »1588« (weißes, elliptisches, 10×6 mm großes Kartonplättchen mit roten Zahlen, gedruckt), »Lectotypus *Dorycera grandis* ROND., design. Á. Soós, 1978«. — Paralectotypen, 1 ♂, 2 ♀: »1588« (weißes, elliptisches, 10×6 mm großes Kartonplättchen mit roten Zahlen, gedruckt), »Paralectotype *Dorycera grandis* ROND., design. Á. Soós, 1978«. Sowohl beim Männchen als auch beim Weibchen auf separiertem Artennamenzettel der Fundort: »Insub. Pedem.«*

* Um Wiederholungen zu vermeiden, wird im nachfolgenden nur die Nummer angeführt, da sich unter allen Arten ein weißes, elliptisches 10×6 mm großes mit roten Zahlen gedrucktes Kartonplättchen befindet. Ferner wird noch der Fundort, der auf der den Artnamen tragenden Etikette steht, angegeben.

HENNIG (1939: 17—18, Taf. III., Fig. 31, Taf. VIII., Fig. 85) gibt in der LINDNER-Monographie eine sehr genaue und ausführliche Beschreibung der Art, selbst anhand der untersuchten Typen läßt sich nichts Wesentliches hinzufügen. Leider sind sämtliche Typenexemplare mehr oder weniger angegriffen, insbesondere das als Lectotypus designierte männliche Exemplar, trotzdem konnten an diesem Männchen die Charaktere, die die Art kennzeichnen, am deutlichsten erkannt werden.

Diese Art wurde noch in folgenden italienischen Sammlungen angetroffen und untersucht (die meisten sehr gut erhalten): Neapel (Sammlung von COSTA) 1 ♂; Mailand (Sammlung von BEZZI), 5 ♂, 4 ♀; Torino (coll. Piemontae) 6 ♂, 5 ♀.

Tetanops contarinii RONDANI, 1869

RONDANI, 1869: Bull. Soc. ent. Ital., **1**: 16 (*Tetanops*). — »Unicum exemplar olim accepi hujus speciei a Nob. Nicolao Contarini ad littora Adriatici lectum, et post a cl. Haliday ad ostium sarculi in Etruria specimina aliqua inventa fuerunt.«

Untersuchungsmaterial: 4 Exemplare.

Lectotypus, ♂: »1594«. — Paralectotypen, 1 ♂, 2 ♀: »1594«. Auf dem Artenzettel steht hinter dem Männchen der Fundort: »Venit«, bei den Weibchen »Etrur«.

Lectotypus, ♂: Kopf so hoch wie lang (58 : 60), Wangen breit, um 1/3 schmaler als horizontaler Augendurchmesser (24 : 17). Backen sehr breit. Höhe mehr als die Hälfte des vertikalen Augendurchmessers (20 : 37). Stirn nur etwas länger als breit (38 : 33), nach vorn sehr verschmälernd (38 : 20). Mitte der Stirn rötlichbraun, Muster genauso wie von HENNIG (1939: 38) beschrieben, schwach behaart, Seitenränder grauweißlich bestäubt, aber Fußpunkte der Haare nicht bestäubt, deswegen dieser Teil punktiert, im mittleren Teil der Stirn an den Fußpunkten der Haare kein dunklerer Fleck. Breite Wangen grauweißlich bestäubt so wie der vordere Teil der Backen. Auf den Backen unter den Augen ein unbestäubter rötlichbrauner Fleck vorhanden, ganzer Hinterkopf grauweißlich bestäubt. Augen gestreckt ovalförmig, Verhältnis der Längs- und Queraxe wie 95 : 65. Gesicht bräunlichgelb, Gesichtskiel breit, gebogen, oberer Teil zwischen den Fühlern bestäubt ebenso wie die länglichen Fühlergruben. Epistom schmal, glänzend, oberhalb mit hellen, sehr kleinen Härchen versehen. Palpen stäbchenförmig, Ventralseite und Spitze mit einigen langen, steifen borstenartigen Haaren besetzt. Lunula spärlich behaart. Fühler rötlichgelb, 3. Fühlerglied doppelt so lang wie breit (35 : 18). Kopfchaetotaxie: *pvt*, *vte*, *vti*, *oc*, 1 *ors*; nur die vertikalen Borsten kräftig.

Thorax und Scutellum grau bestäubt, gelbe Grundfarbe schimmert auf beiden durch. An den Fußpunkten der Borsten und Haare dunkle Flecke vorhanden, deswegen ganzes Mesonotum schwarz punktiert. Thoraxchaetotaxie: 1 *h*, 2 *n*, 1 *sa*, 2 *pa*, 1 *dc*, 1 *prsc*, 2 *sc*, *pp*, 3 *m*, 1 *st*. Vor der Supraalarborste stehen 3 kurze borstenartige Haare (anstatt vordere *sa*), *dc* sehr verkümmert,

kürzer als *prsc*. Flügel gelblich, mit 5, nicht kräftigen Flecken entlang t_a und t_p, und bei der Einmündung der r_1, r_{2+3} und r_{4+5} in die Randadern, bzw. davor. Am größten das am Ende der r_{2+3}, ebenso kräftig, jedoch kleiner das entlang von r_1, die übrigen drei bedeutend schwächer, die an den Queradern befindlichen sind kaum zu erkennen, es ist aus der dunkleren Farbe der Queradern auf diese zu schliessen. Verhältnis des vorletzten und letzten Abschnitts der *m* Ader, $m_3 : m_4 = 38 : 57$, $t_a - t_p : t_p = 38 : 19$. Halteren bräunlichgelb. Beine einfarbig bräunlichgelb. Abdomen glänzend, bräunlichschwarz, Vorderrand des 2., 3. und 4. Tergit mit silbergrauen Querstreifen.

Länge des Körpers 7,1 mm, Länge des Flügels 6,8 mm.

Paralectotypus, ♀: In allen wesentlichen Merkmalen mit dem Männchen übereinstimmend, nur beim Weibchen sind die Dorsozentralborsten so kräftig wie die Prescutellarborsten, ferner sind die grauen Querstreifen des 2., 3. und 4. Tergit am Abdomen gleichbreit und besetzen den vorderen Teil der Tergite.

Länge des Körpers 6,7 mm, Länge des Flügels 6,2 mm.

Hypochra parmensis (RONDANI, 1869)

RONDANI, 1869: Bull. Soc. ent. Ital., **1**: 19 (*Melieria*). — »Non frequenter lecta in collibus agri parmensis, et aliquando etiam in Pedemontio a Bellardi et in Etruria a Piccioli et Haliday.«

Lectotypus, ♂: »1597«, Parma. — Paralectotypen, 1 ♂, 2 ♀: »1597«. Auf dem Artenzettel steht hinter dem Männchen der Fundort »Parma«, bei den Weibchen »Etr. Parma«.

Untersuchungsmaterial: 4 Exemplare.

Lectotypus, ♂: Kopf bedeutend höher als lang (79 : 60), Wangen schmal, Breite erreicht die des 3. Fühlergliedes nicht. Wangen verhältnismäßig schmal, Höhe etwas größer als 1/3 des vertikalen Augendurchmessers (36 : 16). Stirn etwas breiter als lang (35 : 28). Kopf gelb, Vertex, Punktaugendreieck und Hinterkopf jedoch silbergrau bestäubt. Parallelrandige, konvexe Stirn gelb, Ränder sehr schmal silbergrau bestäubt, Bestäubung geht auch auf die Wangen über. Gesicht gelb, Gesichtskiel nicht hervorstehend, Kante abgeplattet, in Richtung des Mundrandes ausgebreitet, Fühlergruben lang, schmal ovalförmig. Gelbe Backen fein silbergrau bestäubt, unter dem caudoventralem Teil der Augen jedoch ein brauner Fleck; Peristromalhaare mikroskopisch winzig. Fühler einfarbig gelb, 3. Fühlerglied doppelt so lang wie breit (20 : 11). Fühlerborste braun, Basalteil verdickt, nur mikroskopisch, dicht behaart. Kopfchaetotaxie: *pvt*, *vte*, *vti*, *oc*, 2 *ors* (!). *oc* und vordere *ors* schwach entwickelt. Es muß erwähnt werden, daß die 2 *ors* beim Lectotypus eine Anomalie sein muß, da bei den nahezu 100 von mir untersuchten Männchen nie 2 Paar *ors* nachgewiesen werden konnten.

Thorax schwarz, aber grau bestäubt. Thoraxchaetotaxie: 1 *h*, 2 *n*, 1 *sa*, 2 *pa*, 0 + 3 *dc*, *prsc*, 2 *sc*, *pp*, 2 *m*, 1 *st*. Von den 3 Paar *dc* vorderes Paar halb

so lang wie die hinteren 2 Paare, die *prsc* so lang wie vordere *dc*, jedoch haarförmig dünn. *acr* in 4 Reihen. Flügel stark gezeichnet, mit drei Querstreifen und einem großen Spitzenfleck, so wie dies auf der Abbildung von HENNIG zu sehen ist (1939: Taf. IV., Fig. 38), jedoch mit der Bemerkung, daß der auf t_a liegende Streifen sich mit dem von t_a gegenüberliegenden, von der Costa kommenden Streifen nicht berührt. Schenkel und Schienen schwarz, grau bestäubt, aber Knie und der breite mediane Ring der hinteren Tibien sowie Tarsenglieder gelblichbraun. Abdomen einfarbig schwarz, matt, 5. Tergit grau bestäubt. Hier muß jedoch erwähnt werden, daß der Lectotypus offensichtlich stark abgerieben ist, da bei den anderen untersuchten Exemplaren das Abdomen gänzlich bestäubt ist und sich auf dem hinteren Rand des 3., 4. und 5. Tergit ein rötlichbrauner Querstreifen hinzieht.

Länge des Körpers 3,0 mm, Länge des Flügels 3,3 mm.

Paralectotypus, ♀: unterscheidet sich vom Lectotypus (♂) in folgenden: Backen, mit Ausnahme des braunen Fleckens bestäubt, Peristomalleiste glänzend gelb, Gesichtskiel braun und ausgebreitet, grau bestäubt, 3. Fühlerglied gelblichbraun (mit Ausnahme der Wurzel), auf der mittleren Schiene, wenn auch nicht deutlich, ein gelblichbrauner Medianring zu erkennen.

Länge des Körpers 3,0 mm, Länge des Flügels 2,9 mm.

Hypochra subapennina (RONDANI, 1869)

RONDANI, 1869: Bull. Soc. ent. Ital. **1**: 18 (*Melieria*). — »Raro a me lecta in collibus ditionis parmensis et a Prof. Bellardi in Pedemontio.«

Untersuchungsmaterial: 1 Exemplar.

Lectotypus, ♀: »1602«. Auf dem Artenzettel hinter dem Tier der Fundort: »Apnn«.

Lectotypus, ♀: Höhe des Kopfes um 1/4 höher als lang (119 : 87). Stirn nur etwas breiter als lang (56 : 52), nach vorn verbreitert (68 : 52). Backen verhältnismäßig breit, Höhe mehr als 1/3 des vertikalen Augendurchmessers (82 : 26). Augen länglich elliptisch, Verhältnis der Längs- und Queraxe wie 82 : 53. Kopf einfarbig gelb, Punktaugendreieck, Scheitel Oberteil des Hinterkopfes, hinterer Rand der Augen, vorderer Teil der Backen und Fühlergruben jedoch grauweißlich bestäubt. Vorderteil der Stirn rötlichbraun, hinterer (oberer) Teil bräunlichgelb. Gesicht schmal, kaum breiter als die Hälfte der 3. Fühlergliedbreite. Ziemlich flacher, breiter Gesichtskiel kaum hervorragend, Fühlergruben breit, oval. Unterrand der Backen bestäubt, darüber behaart. Fühler gelb, 3. Fühlerglied mehr als doppelt so lang wie breit (37 : 15), Spitze des 3. Fühlergliedes ausgezogen (Form zeigt einen Übergang zu den *Melieria*-Arten), Fühlerborste spärlich, länglich gefiedert, die Federn beiderseitig sind so breit wie die Breite des 3. Fühlergliedes. Kopfchaetotaxie: *pvt*, *vte*, *vti*, *oc*, 2 *ors*; *oc* sehr verkümmert, *pvt* und vordere *ors* ungefähr gleichlang und kräftig, *vte*, *vti* und hintere *ors* kräftig.

Thorax weißlichgrau, mit Ausnahme der Wurzel der Schulterbeule, und Scutellum gelb, Thoraxchaetotaxie: 1 *h*, 2 *n*, 2 *sa*, 2 *pa*, (2)—3 *dc*, *prsc*, 2 *sc*, *pp*, 3 *m*, 1 *st*. Von den beiden *sa* die vordere bedeutend kürzer und dicker, von den *dc* die hinteren 2 Paare kräftig, davor noch 3—4 »*dc*« die länger sind als die übrigen Borsten des Thorax, von denen die zwei kräftigeren vor *dc* stehenden noch dicker sind, die übrigen haarartig; Borsten *prsc* so stark wie die hinteren *dc*. Flügel mit den kennzeichnenden 5 Flecken, wie dies auch auf der Abbildung von HENNIG (1939: Taf. III, Fig. 35) zu sehen ist. Halteren gelb. Beine bräunlichgelb, auf den Schenkeln schmale, grau bestäubte Streifen, auf den vorderen Schenkeln dorsal in zwei parallelen Reihen, distal posteroventral 4—5 kräftige, lange schwarze Borsten. Abdomen grau bestäubt. Hinterrand der 2.—5. Tergite schmal gelb.

Länge des Körpers 5,9 mm, Länge des Flügels 5,2 mm.

Das einzige in der Sammlung RONDANIS vorliegende Exemplar kann nicht als Holotypus bezeichnet werden, da in der Originalbeschreibung mehrere Exemplare angeführt wurden.

Otites fastuosa (RONDANI, 1869)

RONDANI, 1869: Bull. Soc. ent. Ital., **1**:30 (*Ortalis*). — »Bis tantum in Pedemontio lecta, una vice a Genéo, et nuper a Prof. Bellardi.«

Untersuchungsmaterial: 1 Exemplar. 1 ♂: »1621« »Bois Champeaux, 3. 6. 77«. — Einer der selten Fälle in der Sammlung RONDANIS, wo unter dem Tier auch ein Zettel mit dem Fundort aufgestochen ist.

Zuerst wurde angenommen, daß es sich um den Typus von *Otites fastuosa* ROND. handelt, aber aus der Fundortsangabe (1877), die in diesem Fall ausschlaggebend ist und die Wichtigkeit dieser Angabe betont, geht einwandfrei hervor, daß es sich nicht um das Typusexemplar handeln kann. HENNIG (1939: 29) betrachtet diese Art als Synonym von *O. formosa jucunda* ROBINEAU-DESVOIDY, 1830, SÉGUY hingegen führt sie als Varietät von *O. formosa* PANZER, 1798 an. Weder HENNIG noch SÉGUY haben das Typusexemplar von RONDANI nicht gesehen. Es wurde auch von mir nicht gefunden; das in der Sammlung vorliegende, unter diesem Namen fungierende Männchen, das nachstehend beschrieben wird, ist mit *O. formosa* PANZ., nicht identisch. Aufgrund des Vorausgehenden wird dieses Exemplar als Neotype designiert.

♂: Kopf etwas höher als lang (90 : 77). Stirn etwas länger als breit (49 : 37) nahezu parallelrandig. Gesicht schmaler als die Breite des 3. Fühlergliedes (11 : 13). Backenhöhe ungefähr 1/3 des vertikalen Augendurchmessers (61 : 21). Augen länglichoval, Verhältnis der Längs- und Queraxe wie 61 : 35. Kopf in verschiedenen Nuancen gelb. Punktaugendreieck schwarz. Stirn rötlichgelb, Gesicht hellgelb, ventraler Teil der seichten Fühlergruben dunkelbraun, Oberteil des Hinterkopfes, beiderseits von *vte*, etwas dunkler gelblichbraun. Augen, abgesehen vom Ventralteil, von grauweißer Bestäubung um-

geben. Stirn und Hinterteil der Backen von dichten, schwarzen Haaren bedeckt. Gesichtskiel stark hervorragend, Kiel abgeplattet. Fühler bräunlichgelb, 3. Fühlerglied nur etwas länger als breit (17 : 13), fein bestäubt. Fühlerborste dunkelbraun, nur mikroskopisch pubeszent, an der Basis nicht plötzlich, sondern allmählich sich verschmälernd. Lunula kahl. Kopfchaetotaxie: *pvt*, *vte*, *vte*, *oc*, 2 *ors*, von den letzteren vordere bedeutend kürzer als hintere.

Thorax schwarz, auf dem Mesonotum ziehen sich 5 silberweiße Streifen hin: einer in der Mittellinie, je einer in der dorsozentralen Borstenreihe, je einer lateral davon, diese jedoch sind vor der Quernaht unterbrochen und verzweigen sich, der innere Zweig verläuft parallel mit dem *dc* Streifen und reicht bis *pa*, der andere verläuft entlang des Mesonotumrandes und reicht bis zur Wurzel des Flügels. Die beiderseits des Mittelstreifens verlaufenden schwarzen Streifen erreichen das Scutellum. Pleuren bestäubt. Thoraxchaetotaxie: 1 *h*, 2 *n*, 2 *sa*, 2 *pa*, 2 *dc*, ? *prsc*, *pp*, 3—4 *m*, 1 *st*. Zeichung des durchsichtigen Flügels ähnelt der *levigata* LOEW, 1873 am meisten, der Spitzenfleck jedoch besitzt eine andere Form. Beine bräunlichgelb, Wurzel der Schenkel sämtlicher Beine bräunlichschwarz, an den vorderen Schenkeln am breitesten und am dunkelsten, an den hinteren weniger ausgebreitet und nicht so intensiv bräunlichschwarz. Abdomen schwarz. Am Vorderrand der 2.—5. Tergite zieht sich ein grauweißer Querstreifen hin.

Länge des Körpers 10 mm, Länge des Flügels 8,9 mm.

Ein Exemplar dieser Art wurde auch in der Sammlung des Museums in Torino angetroffen.

Der Umstand, daß bei *O. fastuosa* ROND. die beiderseits des Mittelstreifens verlaufenden Streifen, am Mesonotum das Scutellum erreichen, schließen eine Zugehörigkeit zum Artenkreis *O. formosa* PANZ. aus. Aufgrund dieses Merkmales steht sie der *O. levigata* LW. am nächsten, doch ist bei ihr das Gesicht breiter, Beine schwarz, Spitzenfleck des Flügels andersförmig und von anderer Ausbreitung. Deswegen ist *Otites fastuosa* RONDANI, 1869 kein junior Synonyme von *Otites formosa* (PANZER, 1798), sondern eine selbständige Art, die der *O. levigata* LW. am nächsten steht.

TYPENEXEMPLARE DER IN SYNONYM GESTELLTEN RONDANISCHEN NAMEN

Melieria etrusca RONDANI, 1869: Bull. Soc. ent. Ital., **1:** 18, junior Synonym der *Melieria omissa* (MEIGEN, 1826): Syst. Beschr., **5:** 274. **syn. n.**

Untersuchungsmaterial: 2 Exemplare.

Lectotypus, ♂: »1599«, Fundort: »Etrur. (?) Giunella«. — Paralectotypus, ♀: »1599«, Fundort: »Etru. Sicilie«.

In allen wesentlichen Merkmalen stimmt sie mit *M. omissa* (MEIG.), inbegriffen auch die Chaetotaxie, überein. Fühler, Beine gelb, Hinterrand der Tergite sind nicht von einem dunklen Querstreifen umrandet. Einziger wesent-

licher Unterschied besteht darin, daß die Zeichnung des Flügels ausgebreiteter ist als bei *omissa* (MEIG.) und fast mit der von *picta* (MEIGEN, 1826) übereinstimmt.

HENNIG führt sie in der LINDNER-Monographie (1939: 51) unter den »Undeutbare Arten« an und bemerkt, daß sie eventuell zum Artenkreis *omissa* (MEIG.) gehören könnte. Da er die Typenexemplare von RONDANI nicht untersuchen konnte, hat er von einer Synonymisierung abgesehen. Aufgrund der Untersuchungen des Typenmaterials kann festgestellt werden, daß *Melieria etrusca* RONDANI, 1869 tatsächlich ein junior Synonyme von *Melieria omissa* (MEIGEN, 1826) ist.

Ceroxys pomariana RONDANI, 1869: Bull. Soc. ent. Ital., **1:** 22, junior Synonyme der *Ceroxys fraudulosa* (LOEW, 1864): Wien. ent. Mschr., **8:** 11.
Untersuchungsmaterial: 4 Exemplare.
Lectotypus, ♂: »1604«, Fundort: »Parma«. — Paralectotypen, 1 ♂, 2 ♀: »1604«, Fundort: »Parma«.

RONDANI verglich seine Art mit *hortulana* (ROSSI, 1790) und seine beiden Unterscheidungsmerkmale (l. c.: 21), die er anführt, stimmen mit den beiden überein, in denen *fraudulosa* LW. sich von *pomariana* ROND. unterscheidet. Dies konnte bereits auch HENNIG (1939: 55) feststellen, ohne die Typenexemplare von *fraudulosa* gesehen zu haben. RONDANI erwähnt das wichtigste Merkmal u. zw. daß r_1 der ganzen Länge nach beborstet ist — worauf LOEW später (1868: 7) unter der Benennung *Holodasia* eine gesonderte Gattung begründet — überhaupt nicht. Bei der Untersuchung der 4 Typenexemplare konnte festgestellt werden, daß bei allen 4 Exemplaren die r_1 der ganzen Länge nach beborstet ist. Nun ist beim Untersuchen des Typenmaterials erwiesen worden. daß die beiden Arten identisch sind, d. h. *Ceroxys pomariana* RONDANI, 1869 ist ein junior Synonyme von *Ceroxys fraudulosa* LOEW, 1864.

Herina helvipes RONDANI, 1869: Bull. Soc. ent. Ital., **1:** 24, junior Synonyme von *Herina scutellaris* (ROBINEAU-DESVOIDY, 1830: Essai Myod., 726.
Untersuchungsmaterial: 7 Exemplare.
Lectotypus, ♂: »1607«, Fundort: »Etrur«. — Paralectotypen, 2 ♂, 4 ♀: »1607«. Fundort: »Etrur«.

RONDANI fand, daß die obigen Exemplare mit *rufipes* MACQUART, 1835 identisch sind, da jedoch der Name *rufipes* von ROBINEAU-DESVOIDY, 1830 vergeben war, gab er seine Tieren den Namen *helvipes*. Eine Untersuchung des Typenmaterials von mir erbrachte den Nachweis, daß sie in allen wesentlichen Merkmalen mit *H. scutellaris* ROBINEAU-DESVOIDY, 1830 übereinstimmen. Die Art *rufipes* von MACQUART ist ebenfalls ein Synonym von *scutellaris* ROB.-DESV. PANDELLÉ (1902), der wahrscheinlich die in Paris aufbewahrten Arten von MACQUART und ROBINEAU-DESVOIDY kannte, synonymisierte mit Recht den Namen *H. helvipes* ROND. zu *H. scutellaris* ROB.-DESV.

Die Ergebnisse der an dem Otitida-Material von RONDANI durchgeführten Untersuchungen können folgendermaßen zusammengefaßt werden.

Das Otitida-Material enthält 34 beschriebene bzw. benannte Taxa. Eine von den beschriebenen Arten: *Herina pusilla* RONDANI, 1869: Bull. Soc. ent. Ital., **1**: 27, wurde in der Sammlung nicht angetroffen. HENNIG führt sie in der LINDNER-Monographie (1939: 68) nach der Anführung der Arten aus der Gattung *Herina* unter den »Ungedeutete Arten« an. Von den 34 Taxa beschrieb bzw. benannte RONDANI 15. Von diesen sind:

Valide Namen für 7 Arten: *Dorycera grandis*, *Otites fastuosa*, *Otites immaculata*, *Tetanops contarinii*, *Hypochra parmensis*, *Hypochra subapennina*, *Herina ghilianii*.

Synonyme Namen 3 (*Melieria etrusca* = *Melieria omissa* MEIGEN, 1826, *Ceroxys pomariana* = *Ceroxys fraudulosa* LOEW, 1864, *Herina helvipes* = *Herina scutellaris* ROBINEAU-DESVOIDY, 1830).

Nomen nudum 2 (*Terellia hercyngii* = *Tetanops flavescens* MACQUART, 1835, *Herina hilaris* = *Herina tristis* MEIGEN, 1826).

Namen in der Sammlung 3. Es sind dies Benennungen die von RONDANI nur ein »n« erhalten haben und hier nicht angeführt werden sollen, da sie nirgends in der Literatur bisher erwähnt wurden und übrigens auch Synonyme bisher bekannter Arten sein würden.

SCHRIFTTUM

HENNIG, W. (1939): 46./47. Otitidae. In LINDNER: Die Fliegen der palaearktischen Region. Stuttgart, **5** (1): 1—78.

LOEW, H. (1868): Die europäischen Ortalidae. — Z. ges. Naturw., **32**: 1—11.

RONDANI, C. (1869): Ortalidinae italicae collectae, distinctae et in ordinem dispositae [= Dipterologiae italicae Prodromi, Pars VII — Fasc. 3, Stirps XX. Ortalinidae Rndn.]. — Bull. Soc. ent. Ital., **1**: 5—37.

SÉGUY, E. (1934): Diptères (Brachycères) (Muscidae acalyptera et Scatophagidae). In: Faune de France. Paris, **28**: 1—832.

SOÓS, Á. (1981): Wiederbeschreibung zweier Rondanischen Otitiden-Arten (Diptera). — Acta zool. hung., **28** (1—2): 133—137.

Anschrift des Verfassers: DR. Á. SOÓS
Zoologische Abteilung des
Ungarischen Naturwissenschaftlichen Museums
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DATA TO THE EUPITHECIA FAUNA OF NEPAL. II (LEPIDOPTERA: GEOMETRIDAE)*

A. M. VOJNITS

(Received 30 April, 1982)

The description of 17 new species from the Nepalese collection of the Zoologische Sammlung des Bayerischen Staates, Munich: *Eupithecia concinna* sp. n., *E. contraria* sp. n., *E. dierli* sp. n., *E. forsteri* sp. n., *E. suspiciosa* sp. n., *E. emendata* sp. n., *E. improba* sp. n., *E. commiserenda* sp. n., *E. torva* sp. n., *E. tenebricosa* sp. n., *E. marmorea* sp. n., *E. sola* sp. n., *E. acuta* sp. n., *E. damnosa* sp. n., *E. discolor* sp. n., *E. circumscriptrix* sp. n., and *E. subviridis* sp. n. The majority of the species have a very characteristic appearance.

The elaboration of the first part of the Nepalese Eupithecini material, consisting of more than 600 specimens, of the Zoological Collection of the Bavarian State was published in 1981 (VOJNITS, 1981). I have also submitted several new data concerning *Eupithecia mustangata* SCHÜTZE, 1961, and the description of eleven new Eupithecia species. The present paper contains the diagnoses of seventeen new species and the demonstration of *Eupithecia vivida* VOJNITS, 1978, from Nepal.

As I have already stated in the previous paper, the majority of the Nepalese species display characteristics of such strikingness that in most cases the probability of the Nepalese origin of a specimen might be assumed even without knowledge of locality data. However, the same holds for a great many other groups of Eupithecini; I might mention, among others, species from Iran, South China, or temperate South America. These evolutional trends within a worldwide and in itself extremely homogenous group merit further investigations — and also pose a number of theoretical problems. These shall be discussed after the review of the Eupithecini fauna of certain key areas.

The serial numbers of the new species is contiguous with respect to the preceding paper.

12. **Eupithecia concinna** sp. n.

(Derivation of specific name: concinnus = ornate)

D i a g n o s i s. A dark, large *Eupithecia* species. Average alar expanse of male fore wings 21 mm (based on 21 specimens), extreme values: 20 and

* Studies on Palaearctic Eupithecia Species. XVI.
* Part I in Acta zool. hung., **27** (1981): 217—238.

25 mm; female values (based on 7 specimens): 22.5 mm, that is, 20 and 24 mm, respectively. Wings broad. Costa and termen of fore wing evenly arcuate. Apex pointed, tornus rounded. Hind wing short, angulate. Fore wing ferruginous, transverse lines indicated by a margaritaceous white row of spots. Discal spot round, black, externally backed by an inversely sigmoid margaritaceous pattern. Submarginal line disintegrated, white. Hind wing grey, terminal field dark; tornus with white spots. Discal spot minute, grey. Underside of wings with dark grey pattern elements. Cilia long, striated greyish white and grey.

G e n i t a l i a ♂: Valva wide, dorsum straight, ventrum sinuous. Uncus thick, wide. Aedoeagus long, cylindrical, with two long chitinous cornuti. Sternite VIII displaying a peculiar appendage; shape of tergite VIII also characteristic (Fig. 1); ♀: bursal wall soft, padded with smaller to larger chitinous spines and chitinous teeth on several plates. Anterior and posterior apophyses thin, papillae anales rice-shaped, small (Fig. 3).

B i o l o g y. First stages and foodplant unknown. The type-specimens have been collected from the end of June till the end of July. Univoltine.

D i s t r i b u t i o n. Occurring at medium high levels in Nepal. Locus typicus: Khumbu, Khumdzung, 3900 m.

S p e c i f i c d i f f e r e n c e s. The nearest related species is *Eupithecia mustangata* SCHÜTZE, but the new one is smaller, darker, less yellowish, and the light spots are definitely margaritaceous white, while those of *mustangata* are yellowish white. Differences in the configuration of the genitalia are conspicuous and self-evident.

Holotype ♂: "NEPAL Khumbu Kumdzung 16. VII. 1962 leg. G. EBERT u. H. FALKNER" "Gen. prep. No. 11741 ♂ DR. A. VOJNITS Budapest TTM". Paratypes: same locality, 11—25.

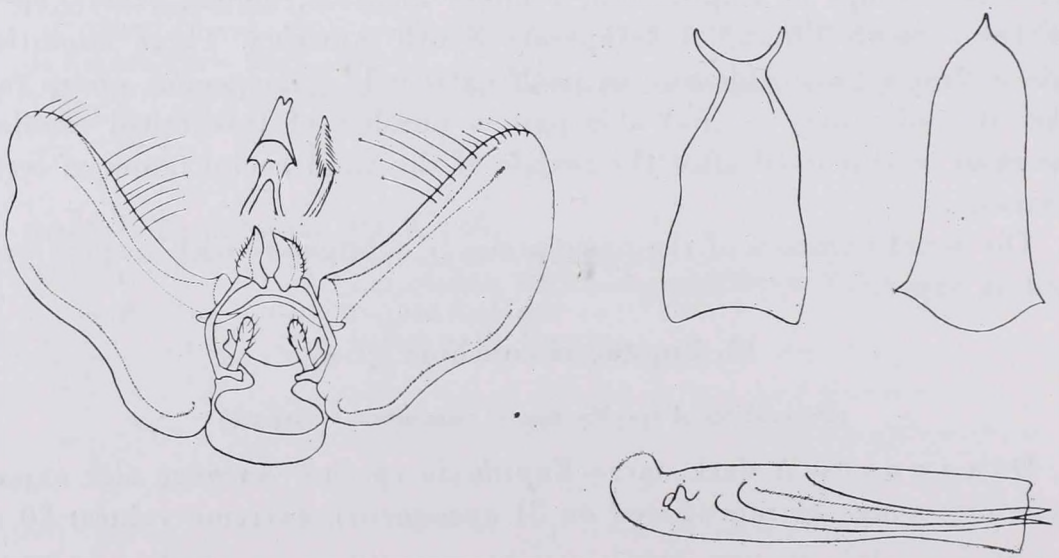


Fig. 1. Male genitalia, aedoeagus separated, tergite and sternite VIII of *Eupithecia concinna* sp. n.

7. 1962, leg. EBERT and FALKNER, 9 ♂♂, 5 ♀♀; Prov. No. 3 East, Khumjung, 3800 m, 29. 6.—31. 7. 1964, leg. DIERL, 4 ♂♂, 2 ♀♀; Dudh Kosi Valley, 3500 m, 22—23. 7. 1962, leg. EBERT and FALKNER, 2 ♂♂. Holotype deposited in the Zoologische Staatssammlung, Munich, paratypes in Munich and in the Hungarian Natural History Museum, Budapest.

Slides: 10671, 11661, 11664, 11681, 11683, 11687, 11688, 11738, 11740, 11741, 11742, 11745, 11757, 11762, 11811, 11868, 11871, 11905, 11915 (♂♂); 10669, 11682, 11684, 11689, 11736, 11739, 11793, 11809, 11914 (♀♀); gen. prep. Á. MÉSZÁR and A. VOJNITS.

13. **Eupithecia contraria** sp. n.

(Derivation of specific name: contrarius = contrary)

D i a g n o s i s. A dark, large-sized *Eupithecia* species. Average expanse of male fore wings 20 mm (based on 27 specimens), extreme values: 18.5 and 22.5 mm; female values: 20.5 mm (based on 16 specimens), or 18 and 25.5 mm. Basic colour brown, in median field with a light, terminal field with a ferrugineous, grey irroration. Transverse stripes and lines yellowish, ante- and postmedian lines less discernible, the one bisecting median field more conspicuous. Discal spot elongate, sharply defined, velutinous black. Submarginal stripe disintegrated into white spots in wide terminal field. Hind wing brownish yellow, transverse stripes grey; tornus with white spots, discal spot white. Underside of wings brownish yellow, pattern elements rather conspicuous. Cilia long, shiny, yellowish brown.

G e n i t a l i a. ♂: Male genitalia small. Valva resembling an orange slice, dorsum and ventrum arcuate. Uncus long. Aedoeagus small, with a short and a large, terminally right-angled, chitinous spine. Appendages of sternite VIII very wide, apically acute (Fig. 2); ♀: Bursa copulatrix rather peculiar: elongate and medially constricted, padded with fields of smaller to larger chitinous spines and a gradually tapering bundle of chitinous spines decurrent posteriorad. Apophyses anteriores and posteriores medium long and thick, papillae anales rotund and large (Figs 4 and 5).

B i o l o g y. First stages and foodplant unknown. The type-specimens have been collected from the end of May till the end of July. Univoltine.

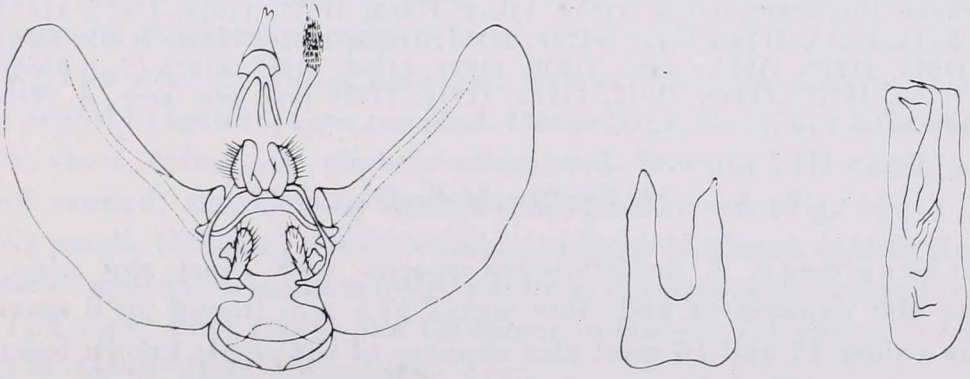
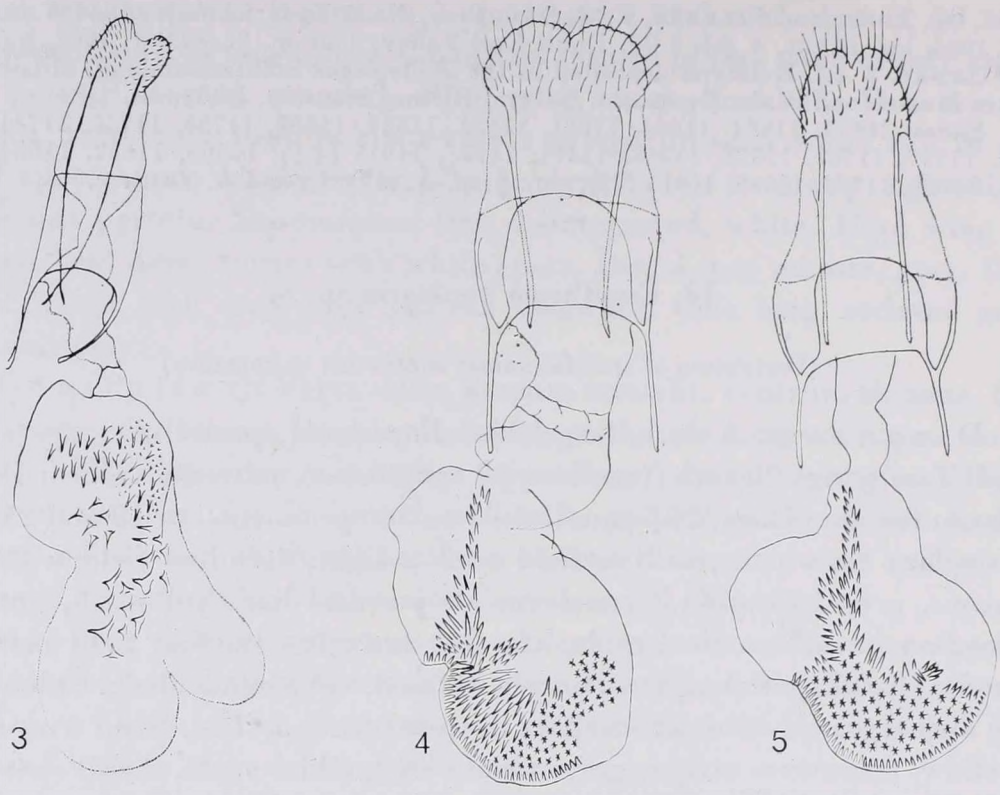


Fig. 2. Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia contraria* sp. n.



Figs 3—5. 3 = Female genitalia of *Eupithecia concinna* sp. n.; 4 and 5 = Female genitalia of *Eupithecia contraria* sp. n.

Distribution. Occurring at medium elevations in Nepal (3100—3900 m). Locus typicus: Tanga, 3800 m.

Specific differences. Standing between the species *Eupithecia concinna* sp. n. and *E. mustangata* SCHÜTZE, but nearer to the latter with respect to external morphology. The genitalic configuration differs essentially.

Holotype ♂: "NEPAL Tanga 3800 m, 29. VII. 1962, leg. G. EBERT u. H. FALKNER Staatsslg. München" "Gen. prep. No. 11654 ♂ DR. A. VOJNITS Budapest TTM". Paratypes: Khumbu, Khumdzung, 12—24. 7. 1962, leg. EBERT and FALKNER, 6 ♂♂, 5 ♀♀; Prov. No. 3 East, Khumjung, 3800 m, 1—26. 7. 1964, leg. DIERL, 1 ♂, 7 ♀♀; Thodung, 3100 m, 22. 5. 1962, 1 ♂; Dudh Kosi Valley, 3500 m, 22—23. 7. 1962, leg. EBERT and FALKNER, 1 ♀. Holotype deposited in the Zoologische Staatssammlung, Munich, paratypes in Munich and the Hungarian Natural History Museum, Budapest.

Slides: Nos 10661, 11654, 11656, 11659, 11662, 11675, 11676, 11677, 11678, 11680, 11713, 11714, 11715, 11747, 11787, 11788, 11791, 11810, 11816, 11845, 11885, 11904, 11909, 11911, 11915, 11930, 11931, 11932, 11936, 11937, 11952, 11953, 11954 (♂♂); 10660, 11685, 11868, 11768, 11770, 11849, 11912, 11913, 11914, 11956 (♀♀), gen. prep. Á. MÉSZÁR and A. VOJNITS.

14. **Eupithecia dierli** sp. n.

Diagnosis. A medium-sized species with short and wide wings. Average alar expanse of male fore wings 17.5 mm (based on 8 specimens), extreme values 17 and 18 mm; alar expanse of the single known female 18.5 mm. Fore wing definitely short and wide, an isosceles triangle. Costa slightly,

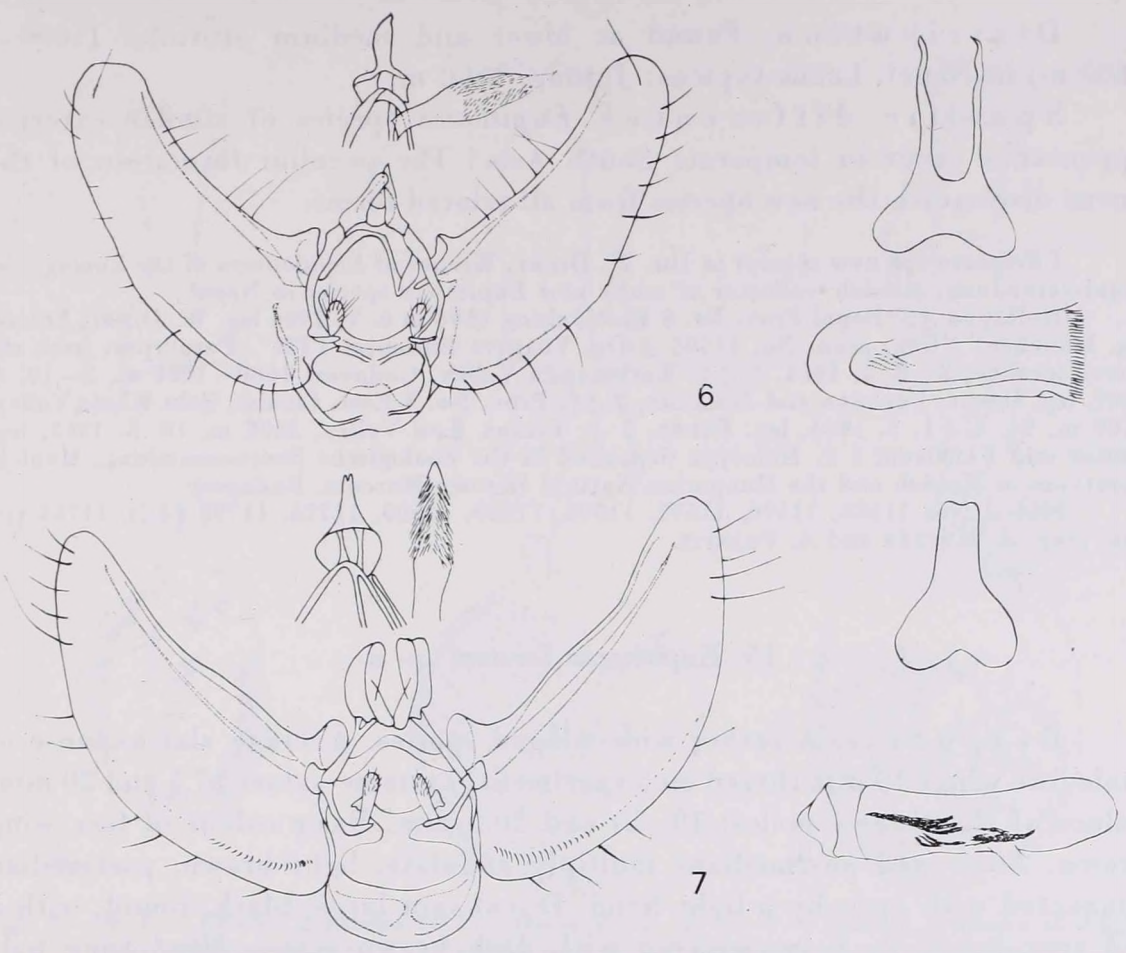


Fig. 6—7. 6 = Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia dierli* sp. n.; 7 = Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia forsteri* sp. n.

termen hardly arcuate, dorsum straight. Apex obtuse, tornus rounded. Hind wing short, wide, angular. Basic colour of fore wing rufous yellow, along costa with smaller spots but near tornus with bigger ones tinted dark brown to brown. Costal field brown, apical area blackish brown, submarginal line disintegrated, yellowish white. Antemedian angulate near costa, otherwise nearly wholly straight; postmedian slightly arcuate. Discal spot very large, deep black, slightly elongated. Hind wing yellowish brown, transverse lines hardly discernible, discal spot minute, black. Underside of wings shiny yellowish brown, pattern elements sharply defined. Cilia medium long, dark brown.

G e n i t a l i a. ♂: Valva long and narrow, dorsum arcuate, ventrum medially slightly angulate, apex rounded. Uncus large, thick, not bifid. Aedoeagus thick, short, cylindrical, slightly constricted. Sternite VIII small, basally wide and excised, considerably attenuating posteriorad (Fig. 6); ♀: Bursa copulatrix small, elongate, with a number of large chitinous spines. Anterior and posterior apophyses medium long and thick. Papillae anales rotund (Fig. 8).

B i o l o g y. First stages and foodplant unknown. All known specimens collected in April—June. Univoltine.

Distribution. Found at lower and medium altitudes (1600—2600 m) in Nepal. Locus typicus: Jubing, 1600 m.

Specific differences. *Eupithecia* species of similar external appearance occur in temperate South Asia! The peculiar formation of the uncus distinguish the new species from all related forms.

I dedicate the new species to DR. W. DIERL, Keeper of Lepidoptera of the Zoologische Staatssammlung, Munich, collector of many new *Eupithecia* species in Nepal.

Holotype ♂: "Nepal Prov. Nr. 3 East Jubing 1600 m 6. V. 1964 leg. W. DIERL, Staatsslg. München" "Gen. prep. No. 11595 ♂ DR. VOJNITS Budapest TTM". Paratypes: from the above locality, 3—8. 5. 1964, 3 ♂♂; Kathmandu Valley, Godavari 1600—1800 m, 2—10. 6. 1967, leg. DIERL, FORSTER and SCHACHT, 3 ♂♂; Prov. No. 3 East, Chialsa, Solu Khola Valley, 2700 m, 24. 6.—1. 5. 1964, leg. DIERL, 1 ♂; Tampa Kosi Valley, 2600 m, 10. 5. 1962, leg. EBERT and FALKNER, 1 ♀. Holotype deposited in the Zoologische Staatssammlung, Munich, paratypes in Munich and the Hungarian Natural History Museum, Budapest.

Slides: Nos 11595, 11596, 11597, 11598, 11599, 11600, 11778, 11798 (♂♂), 11764 (♀), gen. prep. Á. MÉSZÁR and A. VOJNITS.

15. **Eupithecia forsteri** sp. n.

Diagnosis. A rather wide-winged species. Average alar expanse of male fore wings 19 mm (based on 5 specimens) extreme values 17.5 and 20 mm; values of the three females: 19, 20 and 20.5 mm. Basic colour of fore wing brown. Ante- and postmedians multiply angulate, light brown, postmedian connected with apex by a light band. Discal spot large, black, round, with a red spot below it. Veins covered with dark brown scales. Hind wing pale yellowish brown, discal spot minute, black, round, subbasal. Underside of wings yellowish brown, pattern elements sharply defined. Cilia medium long, striated yellowish brown and brown.

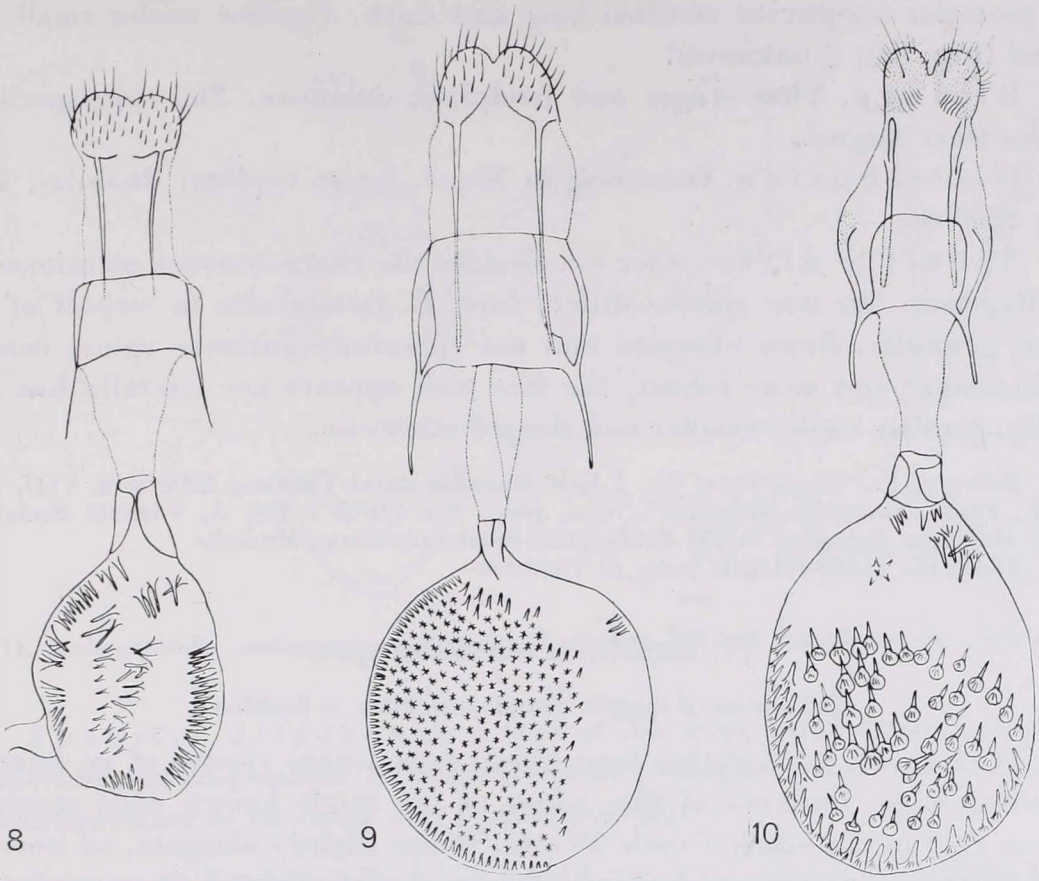
Genitalia. ♂: Valva elongate, arcuate, apex slightly prolonged. Uncus bifid, robust. Aedoeagus small, cylindrical and slightly constricted, with two furcate elements and an irregularly shaped chitinous formation. Base of sternite VIII wide, excised, medium long, lateral arms long, slightly sinous, terminally uncinate (Fig. 7); ♀: Bursa copulatrix spherical, its 2/3 padded with chitinous spines; anterior and posterior apophyses thick and medium long, papillae anales wide (Fig. 9).

Biology. First stages and foodplant unknown. The type-series was collected in July—August. Univoltine.

Distribution. Occurring at medium high altitudes (2000—3500 m) in Nepal. Locus typicus: Dudh Kosi Valley, 3000 m.

Specific differences. Approaching *Eupithecia dierli* sp. n., but wings more elongate, stature larger. The reddish suffusion below the discal spot is especially characteristic. Configuration of genitalia utterly different.

I dedicate the new species to DR. W. FORSTER, retired director of the Zoologische Staatssammlung, Munich.



Figs 8—10. 8 = Female genitalia of *Eupithecia dierli* sp. n.; 9 = Female genitalia of *Eupithecia forsteri* sp. n.; 10 = Female genitalia of *Eupithecia suspiciosa* sp. n.

Holotype ♂: "NEPAL Dudh Kosi Tal 3000 m 27. VII. 1962 leg. G. EBERT u. H. FALKNER Staatsslg. München" "Gen. prep. No. 11796 ♂ DR. A. VOJNITS Budapest TTM". Paratypes: from the same locality, 22—27. VII. 1962, 1 ♂, 1 ♀; Prov. No. 3 East, Bujan, Dudh Kosi Valley, 18—19. VII. 1964, leg. DIERL, 2 ♂♂; Prov. No. 3 East, Junbesi 2750 m, 25—31. VII. 1964, leg. DIERL, 1 ♂; Dudh Kosi Valley, 3500 m, 22—23. VII. 1962, leg. EBERT and FALKNER, 1 ♂, 1 ♀. Holotype deposited in the Zoologische Staatssammlung, Munich, paratypes in Munich and the Hungarian Natural History Museum, Budapest.

Slides: Nos 11583, 11765, 11777, 11796, 11801 (♂♂), 10672, 11776, 11799 (♀♀), gen. prep. Á. MÉSZÁR and A. VOJNITS.

16. **Eupithecia suspiciosa** sp. n.

(Derivation of specific name: suspiciosus = suspicious)

D i a g n o s i s. Alar expanse of fore wings of the single known female specimen 19.5 mm. Externally extremely similar to *Eupithecia forsteri* sp. n., hence only the distinguishing features are given here: wings, especially fore wing, of a more yellowish shade, while *E. forsteri* displays a rather violet tinge, and is of a darker coloration as a whole. Discal spot of new species elongate, not rounded.

G e n i t a l i a. ♀: Bursa copulatrix oval, its anterior 3/5 padded with robust spines and some of these appearing also in cervical section. Anterior

and posterior apophyses medium long and thick. Papillae anales small and rotund (Fig. 10); ♂ unknown.

Biology. First stages and foodplant unknown. The type-specimen derives from August.

Distribution. Occurring in Nepal. Locus typicus: Bhandar, Thodung 2200 m.

Specific differences. Besides the characteristics mentioned in the diagnosis, the new species differs from *E. forsteri* also in respect of the female genitalia. Bursa elongate and not spherical, chitinous spines considerably longer and more robust, the free wall appears not laterally but cervically, papillae anales smaller and shaped otherwise.

Holotype ♀: "Nepal Prov. Nr. 2 East Bhandar unter Thodung 2200 m 2. VIII. 1964 leg. W. DIERL Staatsslg. München" "Gen. prep. No. 11602 ♀ DR. A. VOJNITS Budapest, TTM". Holotype deposited in the Zoologische Staatssammlung, Munich.
Slide: No. 11602 (♀), gen. prep. A. VOJNITS.

17. **Eupithecia emendata** sp. n.

(Derivation of specific name: emendatus = faultless)

Diagnosis. A rather large-sized, conspicuous species of an interesting wing-shape. Expanse of fore wings of the single known male specimen 18 mm, that of the single female 23 mm. Wings slightly elongate, an isosceles triangle. Fore wing arcuate at apex, termen strongly curved, dorsum straight. Apex pointed. Tornus rounded so evenly that termen and dorsum indistinguishably contiguous. Hind wing short and lobate. Basic colour of wings yellowish white. Transverse stripes obsolete. Fore wing with brownish black spots at base, along costa, in apical area and at tornus. Discal spot large, somewhat elongate, velvety black. Hind wing with pale grey transverse stripes, discal spot small and grey. Underside of wings yellowish grey, transverse stripes and discal spots very marked but brownish black blotches of fore wing wholly indiscernible. Cilia short, striated white and grey.

Genitalia. ♂: Valva wide, robust, dorsum slightly sinous, ventrum with a considerably bent and chitinized tooth, apex obtuse. Uncus very strong, biapical, vinculum extremely elongate. Aedoeagus clavate, with a large and terminally angulate chitinous spine, a twistes chitinous plate and a field of minute chitinous spinelets. Appendages of sternite VIII very long (Fig. 11); ♀: Bursa copulatrix long, heavily sclerotized, basally with some chitinous spines, cervically densely padded with chitinous spines. Anterior and posterior apophyses thick, and medium long. Papillae anales very long (Fig. 16).

Biology. First stages and foodplant unknown. Type-specimens collected in July.

Distribution. Occurring at medium elevations in Nepal (2750—3500 m). Locus typicus: Junbesi, 2750 m.

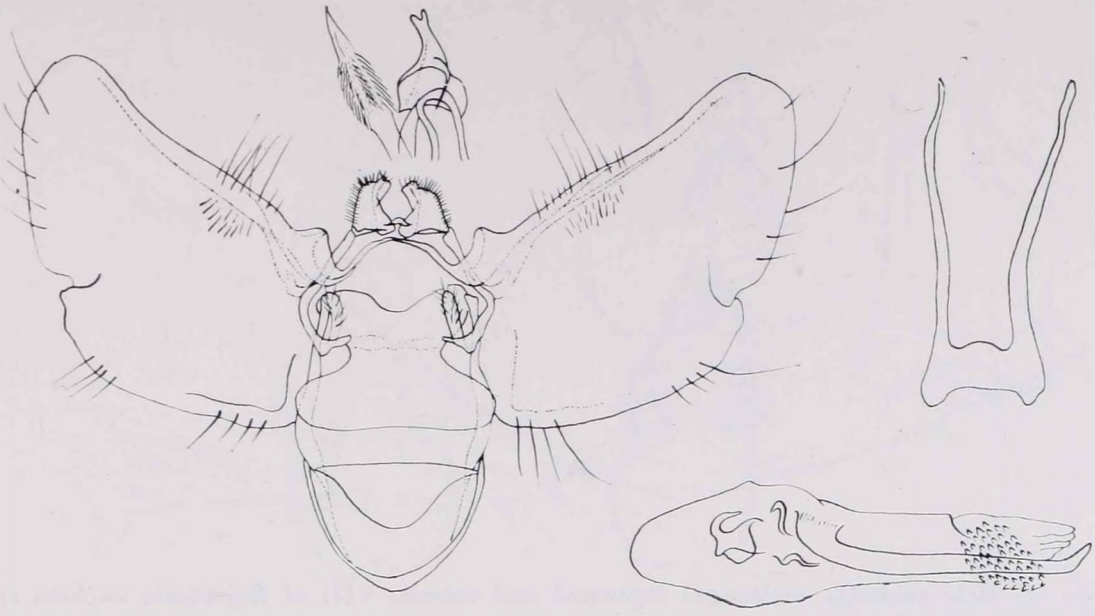


Fig. 11. Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia emendata* sp. n.

Specific differences. One of the most characteristic *Eupithecia* species, standing unique both as to external morphological features and to the configuration of the male and female genitalia.

Holotype ♂: "Nepal Prov. Nr. 3 East Junbesi 2750 m 25.—31. VII. 1964 leg. W. DIERL Staatsslg. München" "Gen. prep. No. 11749 ♂ DR. A. VOJNITS Budapest TTM". Paratype: Dudh Kosi Valley, 3500 m, 22—23. 7. 1962, leg. EBERT and FALKNER, 1 ♀. Holotype deposited in the Zoologische Staatssammlung, Munich, paratype in the Hungarian Natural History Museum, Budapest.

Slides: Nos 11749 (♂), 11844 (♀), gen. prep. A. VOJNITS.

18. **Eupithecia improba** sp. n.

(Derivation of specific name: improbus = rascal)

Diagnosis. Alar expanse of fore wings of the three known male specimens 19, 20 and 21 mm. Wings medium wide. Costa of fore wing arcuate, near apex termen evenly and finely arcuate. Apex pointed. Hind wing short and angulate. All three specimens rather worn, basic colour yellowish brown, transverse stripes wide and yellow, discal spot black, marked on fore wing, minute on hind wing.

Genitalia. ♂: highly characteristic. Valva long, both margins (dorsum and ventrum) straight, valva terminally an inverted sigmoid and truncate, dorsum ending in a tooth. Uncus wide. Aedoeagus with a minute, a large and wide, and a long and curved chitinous spine as well as an irregularly shaped chitinous formation. Sternite VIII attenuating evenly (Fig. 12); ♀ unknown.

Biology. First stages and foodplant unknown. Collected in July.

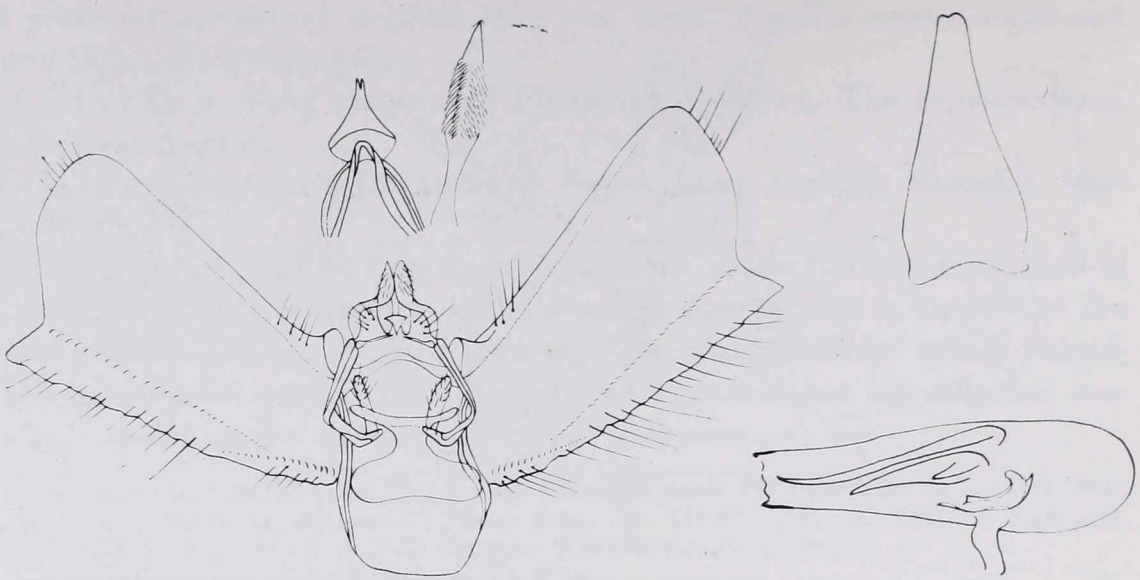


Fig. 12. Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia improba* sp. n.

Distribution. Found at medium elevations in Nepal (2750—3900 m). Locus typicus, Khumbu, Khumdzung, 3900 m.

Specific differences. By reason of the uniquely shaped valva, the species is easily distinguishable (despite the worn type-specimens).

Holotype ♂: "NEPAL Khumbu Khumdzung 3900 m 18. VII. 1962 leg. G. EBERT u. H. FALKNER Staatsslg. München" "Gen. prep. No. 11850 ♂ DR. A. VOJNITS Budapest TTM". Paratypes: Dudh Kosi Valley, 3500 m, 22—23. 7. 1962, leg. EBERT and FALKNER, 1 ♂; Prov. No. 3 East, Junbesi, 2750 m, 25—31. 7. 1964, leg. DIERL, 1 ♂. Holotype deposited in the Zoologische Staatssammlung, Munich, paratypes in Munich and in the Hungarian Natural History Museum, Budapest.

Slides: Nos 11850, 11872, 11875 (♂♂), gen. prep. Á. MÉSZÁR and A. VOJNITS.

19. **Eupithecia commiserenda** sp. n.

(Derivation of specific name: commiserendus = regrettable)

Diagnosis. Alar expanse of fore wings of the two known male specimens 16 and 18 mm. Wings rather wide. Fore wing an isosceles triangle. Hind wing elongate. Basic colour of fore wing yellowish brown, transverse stripes wide, yellowish, discal spot large, elongate, black. Basic colour of hind wing as in fore wing, discal spot obsolescent. Underside of wings brownish yellow, pattern elements well discernible. Cilia medium long, yellowish brown.

Genitalia. ♂: Valva elongate, dorsum arcuate, ventrum sinuous. Uncus long. Aedoeagus large, cylindrical, with a large dentate chitinous spine. Sternite VIII large, lateral arms very long (Fig. 13); ♀ unknown.

Biology. First stages and foodplant unknown. Type-specimens collected in July.

Distribution. Known from Nepal. Locus typicus: Junbesi, 2750 m.

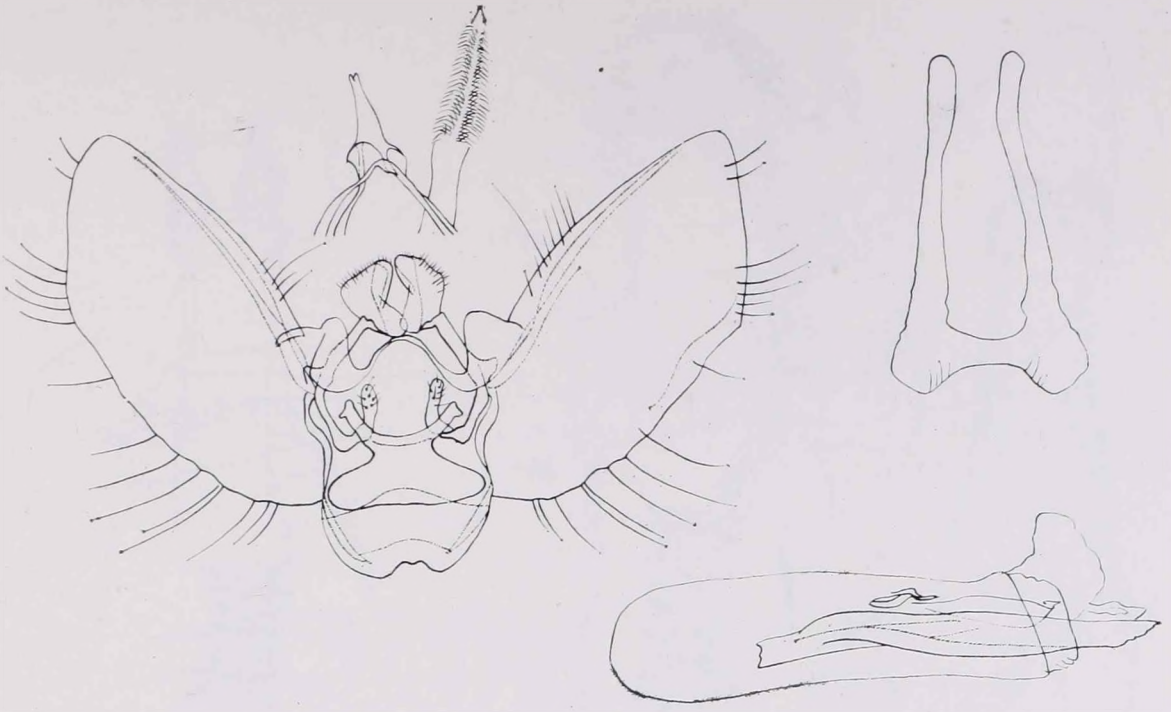


Fig. 13. Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia commiserenda* sp. n.

Specific differences. Rather resembling *Eupithecia denotata* Hbn., but well distinghuishable by both the external characteristics (principally the very large, marked discal spot) and the configuration of the genitalia.

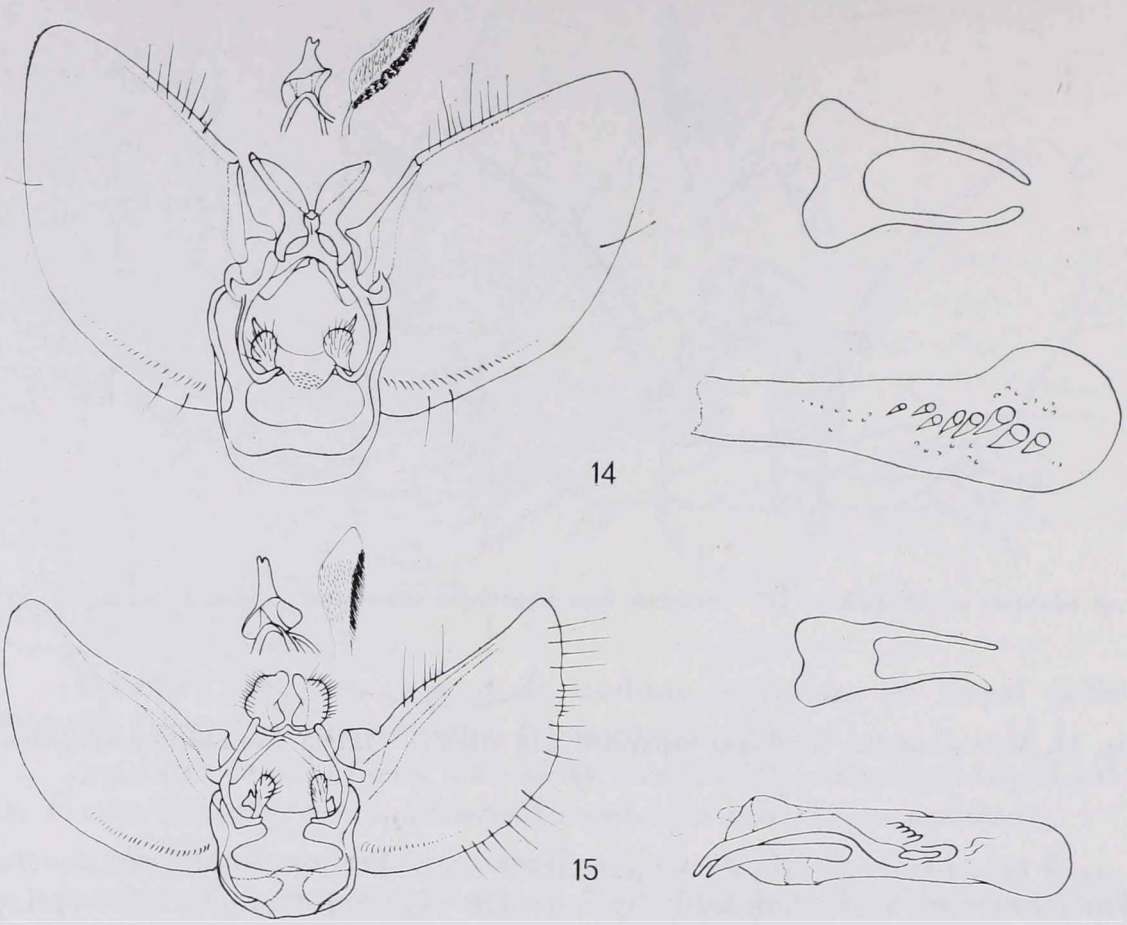
Holotype ♂: "Nepal Prov. Nr. 3 East Junbesi 2750 m 25.—31. VII. 1964 leg. W. Dierl Staatsslg. München" "Gen. prep. No. 11955 ♂ Dr. A. Vojnits Budapest TTM". Paratype ♂: with the same data. Holotype deposited in the Zoologische Staatssammlung, Munich, paratype in the Hungarian Natural History Museum, Budapest.

Slides: Nos 11874, 11955 (♂♂), gen. prep. A. Vojnits.

20. **Eupithecia torva** sp. n.

(Derivation of specific name: torvus = grim)

Diagnosis. A large species with conspicuous pattern. Average alar expanse of male fore wings 22 mm (based on 8 specimens), extreme values 19 and 24 mm; females 25 mm (based on 7 specimens), extreme values 22.5 and 26 mm. Wings elongate. Costa of fore wing slightly arcuate at base, more curved in apical region, termen finely arcuate, dorsum only slightly so. Apex obtuse, tornus rounded. Hind wing rounded. Basic colour of fore wing rufous yellow, largely covered by a brown and dark brown pattern. Antemedian obsolete, postmedian sharply angulate both at costa and dorsum, otherwise straight. Discal spot very large, round, black, situated in middle of median field. Apical area irrorated with dark brown and blackish scales. Hind wing



Figs 14—15. 14 = Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia torva* sp. n.; 15 = Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia tenebricosa* sp. n.

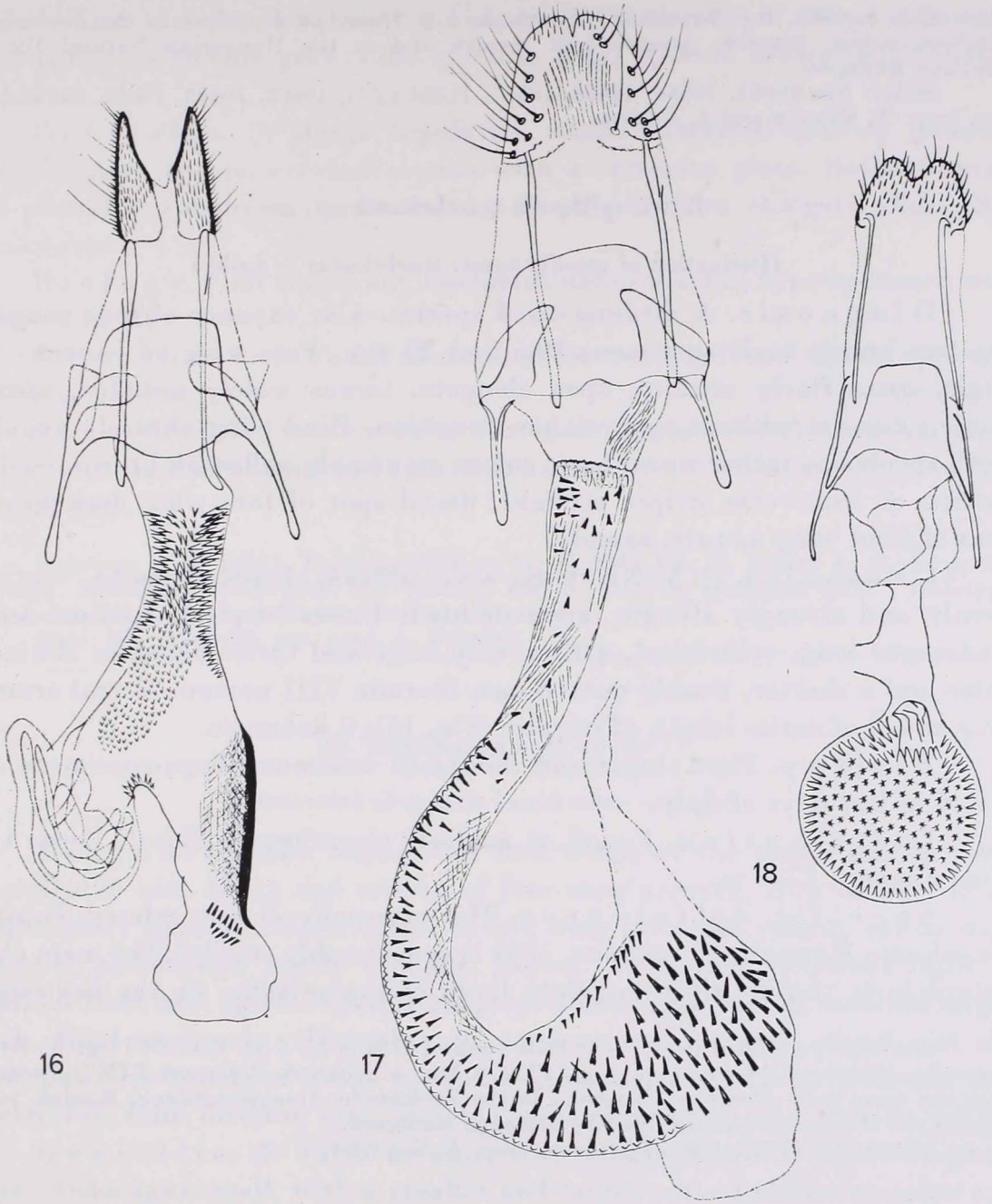
grey and fuscous, discal spot minute, grey. Underside of wings yellowish brown, pattern elements yellowish greey. Cilia medium long, striated brown and yellowish brown.

Genitalia. ♂: Valva short and wide, both dorsum and ventrum arcuate. Uncus small, stout, biapical. Aedoeagus terminally incrassate, with 8 small to bigger chitinized cornuti. Base of sternite VIII finely concave, lateral arms long, arcuate (Fig. 14); ♀: one of the most characteristic genitalia among the *Eupithecia* species: Bursa copulatrix very long, hook-shaped, heavily sclerotized and padded with numerous chitinized spines. Anterior and posterior apophyses short and thick. Papillae anales large. Entire genital organ strikingly large as a whole (Fig. 17).

Biology. First stages and foodplant unknown. All known specimens collected in April—May and in August. Bivoltine.

Distribution. Shown from the relatively lower regions of Nepal (1400—2200 m). Locus typicus: Kathmandu, 1400 m.

Specific differences. The highly characteristic species cannot be confused with any known taxon, taking in, as it were, a special place, both



Figs 16—18. 16 = Female genitalia of *Eupithecia emendata* sp. n.; 17 = Female genitalia of *torva* sp. n.; 18 = Female genitalia of *Eupithecia marmorea* sp. n.

by its morphological features (e.g. the course of the postmedian) and anatomical characteristics (aedoeagus and bursa copulatrix), among the *Eupithecia* species.

Holotype ♂: "Nepal Kathmandu 1400 m 15. IV. 1962 leg. G. EBERT u. H. FALKNER" "Gen. prep. No. 10667 ♂ DR. A. VOJNITS Budapest TTM". Paratypes: from the same locality, 9—23. 4. 1962, 2 ♂♂, 3 ♀♀; Kathmandu, Chauni, 1400 m, 22—26. 5. 1967, leg. DIERL and SCHACHT, 3 ♂♂; Prov. No. 2 East, Bhandar, Thodung 2200 m, 3—13. 8. 1964, leg. DIERL, 1 ♂, 3 ♀♀; Prov. No. 3 East Jubing, 1600 m, 8. 5. 1964, leg. DIERL, 1 ♂; Sun Khosi Valley,

2150 m, 2. 5. 1962, leg. EBERT and FALKNER, 1 ♀. Holotype deposited in the Zoologische Staatssammlung, Munich, paratypes in Munich and in the Hungarian Natural History Museum, Budapest.

Slides: Nos 10663, 10664, 10666, 10667, 11594 (♂♂); 10662, 10665, 10668, 11750 (♀♀), gen. prep. Á. MÉSZÁR and A. VOJNITS.

21. **Eupithecia tenebricosa** sp. n.

(Derivation of specific name: tenebricosus = dusky)

Diagnosis. A medium-sized species. Alar expanse of fore wings of the two known male specimens 19.5 and 20 mm. Fore wing an isosceles triangle, costa finely arcuate, apex elongate, tornus widely rounded, termen joining dorsum without appreciable transition. Hind wing obtusely angular. Both specimens rather worn, basic colour assumably yellowish brown, median section of transverse stripes straight, discal spot of fore wing dark brown, that of hind wing minute, round.

Genitalia. ♂: Valva short, wide, dorsum slightly sinuous, ventrum evenly and strongly arcuate, apex pointed. Uncus biapical, medium large. Aedoeagus long, cylindrical, with a very large and thrice angulate chitinous spine and a shorter, weakly curved one. Sternite VIII narrow, lateral arms as long as 3/5 of entire length of sternite (Fig. 15); ♀ unknown.

Biology. First stages and foodplant unknown. Type-specimens collected in last days of July.

Distribution. Found at medium elevations in Nepal. Locus typicus: Junbesi, 2750 m.

Specific differences. The externally closely related *Eupithecia selinata* HERRICH-SCHAEFFER, 1861 is considerably smaller. The main characteristic is the multiply angulate large chitinous spine in the aedoeagus.

Holotype ♂: "Nepal Prov. Nr. 3 East Junbesi 2750 m 25.—31. VII. 1964 leg. W. DIERL Staatsslg. München" "Gen. prep. No. 11722 ♂ DR. A. VOJNITS Budapest TTM". Paratype with the same data. Holotype deposited in the Zoologische Staatssammlung, Munich, paratype in the Hungarian Natural History Museum, Budapest.

Slides: Nos 11722, 11814 (♂♂), gen. prep. A. VOJNITS.

22. **Eupithecia marmorea** sp. n.

(Derivation of specific name: marmoreus = like marble)

Diagnosis. A large-sized *Eupithecia* species with a very market pattern. Alar expanse of fore wings of the single known female specimen 24 mm. Fore wing an isosceles triangle. Costa slightly arcuate at apex and also termen. Apex pointed. Hind wing angulate. Basic colour of fore wing yellowish brown, median field light reddish yellow, basal field, apical area and along transverse lines blackish. Antemedian and postmedian, doubled, yellow, zigzaggy. Median field very wide. Discal spot large, round, black. Hind wing yellowish,

grey at inner margin, discal spot round, black. Underside of wings yellowish grey, pattern elements grey. Cilia medium long, striated brown and yellowish brown.

Genitalia. ♀: Bursa copulatrix small, spherical, entirely padded with chitinous spines; cervical section with a chitinous plate. Both anterior and posterior apophyses medium long. Papillae anales elongate (Fig. 18); ♂ unknown.

Biology. First stages and foodplant unknown. The type-specimen was collected in May.

Distribution. Found at medium elevation in Nepal. Locus typicus: Thodung, 3100 m.

Specific differences. The new species differs from its congeners with similarly small and spherical bursae by the chitinous plate in the cervical part.

Holotype ♀: "NEPAL Thodung 3100 m 21. V. 1962 leg. G. EBERT u. H. FALKNER Staatsslg. München" "Gen. prep. No. 11660 ♀ DR. A. VOJNITS Budapest TTM". Holotype deposited in the Zoologische Staatssammlung, Munich.
Slide: No. 11660 (♀), gen. prep. A. VOJNITS.

23. **Eupithecia sola** sp. n.

(Derivation of specific name: solus = single)

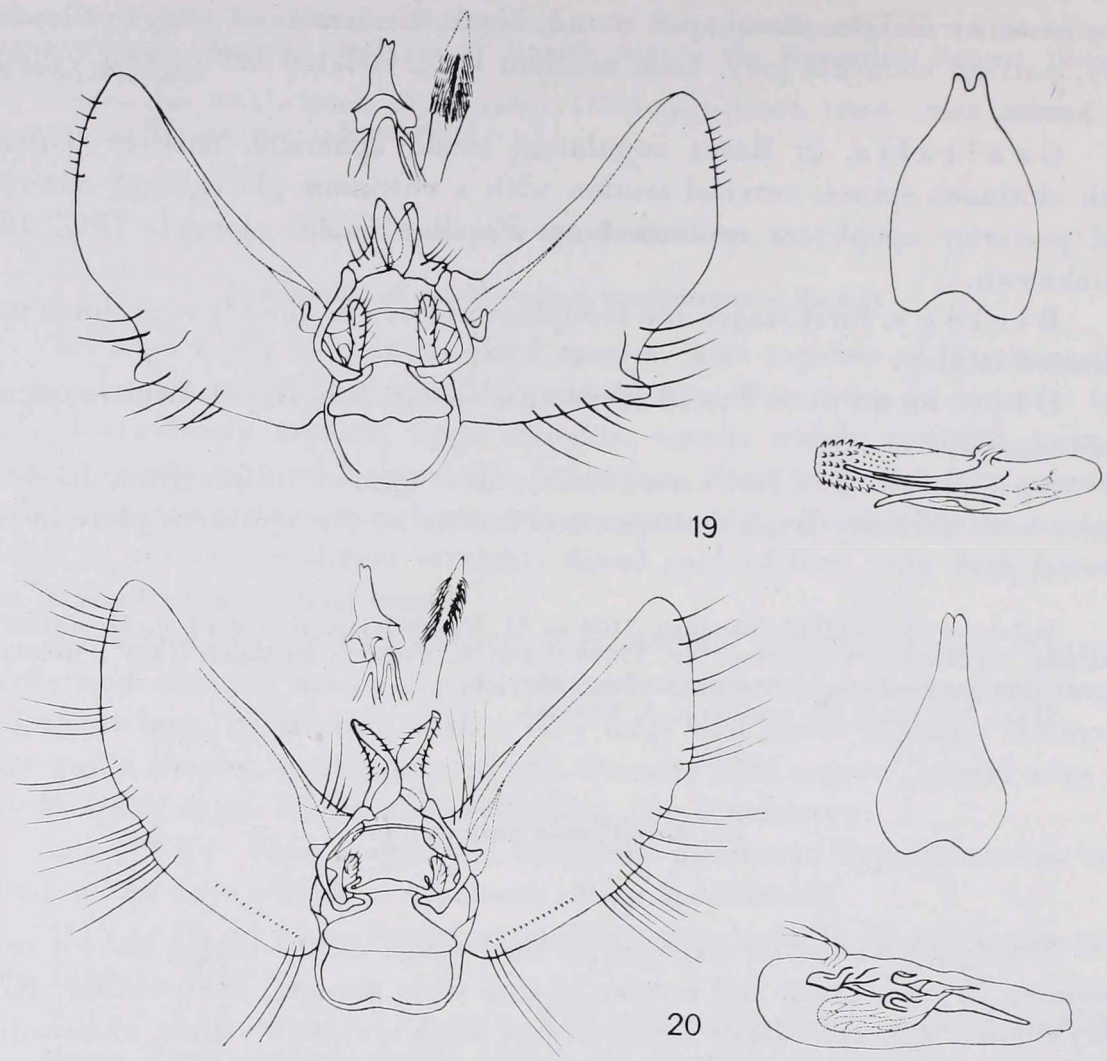
Diagnosis. Alar expanse of fore wings of the single known male specimen 20 mm. Costa and termen of fore wing arcuate, apex obtuse. Hind wing slightly angulate. Basic colour of fore wing brownish yellow, antemedian obsolete, postmedian nearly straight, brown. Basal field, external third of terminal field and apical region dark grey. Discal spot round, medium large, black. Hind wing pale yelllowish grey, transverse stripe grey, discal spot minute, pale. Underside of wings yellowish grey, all grey pattern elements well discernible. Cilia medium long, striated yellowish brown and greyish yellow.

Genitalia. ♂: Valva arcuate, with a robust tooth; uncus biapical, large. Aedoeagus small, with a smaller and larger curved chitinous spine and several minute chitinous teeth (thereby rendering aedoeagus similar to a war hammer). Sternite VIII wide, rapidly attenuating, terminally lip-shaped (Fig. 19); ♀ unknown.

Biology. First stages and foodplant unknown. The type-specimen was collected in July.

Distribution. Found at medium elevation in Nepal. Locus typicus: Dudh Kosi Valley, 3500 m.

Specific differences. As regards shape of valvae and sternite VIII similar to *Eupithecia studiosa* VOJNITS, 1979, but the configuration of the aedoeagus is different. The two species also differ externally.



Figs 19—20. 19 = Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia sola* sp. n.; 20 = Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia damnosa* sp. n.

Holotype ♂: "NEPAL Dudh Kosi Tal 3500 m 22.—23. VII. 1962 leg. G. EBERT u. H. FALKNER Staatsslg. München" "Gen. prep. No. 10670 ♂ DR. A. VOJNITS Budapest TTM" Holotype deposited in the Zoologische Staatssammlung, Munich.
Slide: No. 10670 (♂), gen. prep. A. VOJNITS.

24. **Eupithecia acuta** sp. n.

(Derivation of specific name: acutus = splintery)

D i a g n o s i s. A small-sized species with elongate wings. Alar expanse of fore wings of the single known female specimen 18.5 mm. Costa of fore wing strikingly arcuate, termen hardly so, dorsum straight and long. Apex pointed, tornus angulate. Hind wing short. Fore wing fuscous with a yellowish suffusion. Transverse stripes grey. Discal spot elongate, black. Hind wing yellowish grey, discal spot grey. Underside of wings yellowish, pattern well discernible. Cilia short, striated yellowish grey and brown.

Genitalia. ♀: Bursa copulatrix spherical, padded with large spines; both anterior and posterior apophyses short, papillae anales flat (Fig. 23); ♂ unknown.

Biology. First stages and foodplant unknown. The type-specimen was collected in April.

Distribution. Found at comparatively low level in Nepal. Locus typicus: Jiri, 2000 m.

Specific differences. The new species evidently belongs in the *Eupithecia abbreviata* STPH. alliance, but differs from it both as to external features and genitalic characteristics.

Holotype ♀: "Nepal Prov. Nr. 2 East Jiri 2000 m 6. IV. 1964 leg. W. DIERL Staatsslg. München" "Gen. prep. No. 10642 ♀ DR. A. VOJNITS Budapest TTM". Holotype deposited in the Zoologische Staatssammlung, Munich.
Slide: No. 10642 (♀), gen. prep. A. VOJNITS.

25. **Eupithecia damnosa** sp. n.

(Derivation of specific name: damnosus = injured)

Diagnosis. Of medium-size and stature. Alar expanse of fore wings of the single known male specimen 19 mm. Costa of fore wing evenly arcuate, termen hardly so. Apex pointed, tornus rounded. Hind wing angulate. Type-specimen much abroaded, basic colour assumably yellowish brown, discal spot brown, elongate.

Genitalia. ♂: Valva elongate, arcuate, ventrum sinuous. Uncus large. Aedoeagus short, thick, with several chitinous formations of irregular shape and one chitinous spine. Base of sternite VIII excised, otherwise bottle-shaped (Fig. 20); ♀ unknown.

Biology. First stages and foodplant unknown. Type-specimen collected in September.

Distribution. Found at medium elevation in Nepal. Locus typicus: Gusun Banjyang, 2600 m.

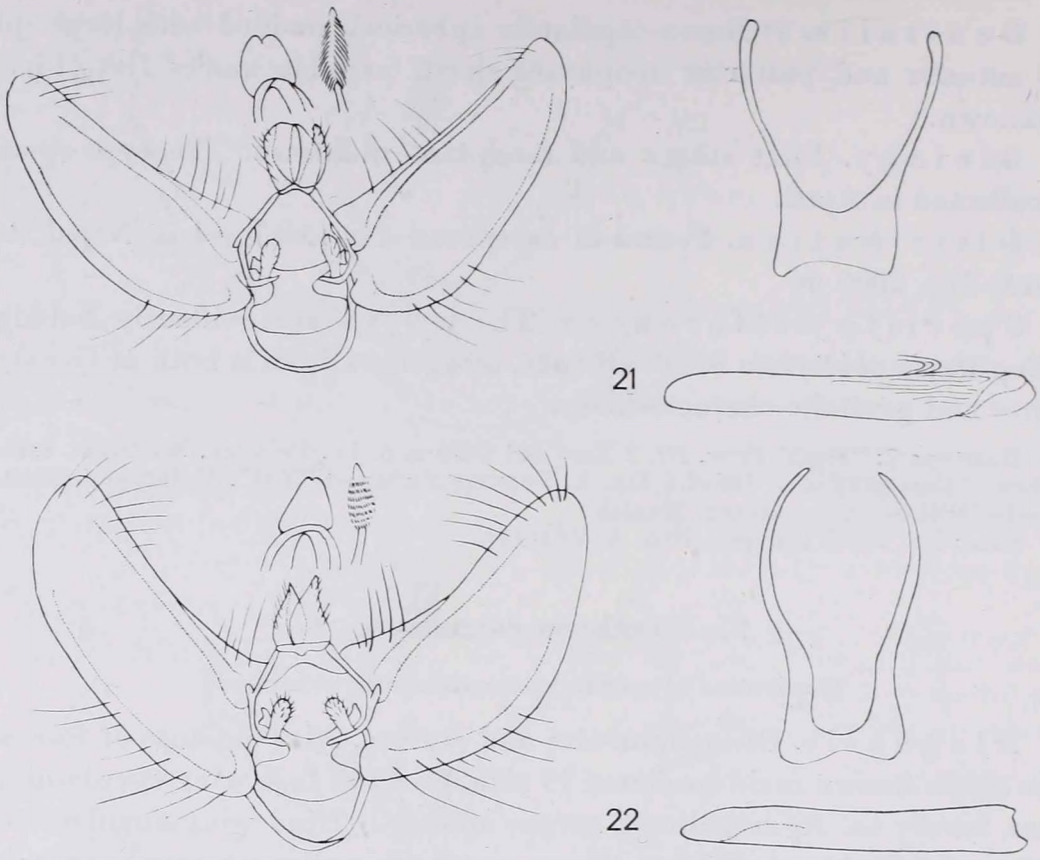
Specific differences. Despite the worn state of the specimen, the species is well and readily identifiable by the peculiar shape of sternite VIII.

Holotype ♂: "Nepal Helmu-Gebiet Gusum Banjyang 2600 m 4. IX. 1967 leg. DIERL Staatsslg. München" "Gen. prep. No. 11763 ♂ DR. A. VOJNITS Budapest TTM". Holotype deposited in the Zoologische Staatssammlung, Munich.
Slide: No. 11763 (♂), gen. prep. A. VOJNITS.

26. **Eupithecia discolor** sp. n.

(Derivation of specific name: discolor = differing by its colour)

Diagnosis. A medium-sized species with elongate wings. Alar expanse of fore wings of the two known male specimens 18.5 and 19 mm, that



Figs 21—22. 21 = Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia discolor* sp. n.; 22 = Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia circumscriptrix* sp. n.

of the single female 20.5 mm. Costa and termen of fore wing arcuate, dorsum straight. Apex obtuse, tornus rounded. Hind wing obtusely angulate. Fore wing rufous brown, at base and in median field around discal spot whitish: terminal and median fields suffused dark brown. Antemedian obsolete, nearly straight, postmedian crenellate. White submarginal of terminal field very striking. Discal spot small, round, black, well marked. Hind wing grey along inner margin, otherwise yellowish white. Discal spot grey, elongate. Underside of wings yellowish grey, pattern elements sharply delineated. Cilia definitely elongate, striated brown and yellowish brown on fore wing, but grey and white on hind wing.

G e n i t a l i a. ♂: Valva elongate, arcuate, apex rounded, uncus truncate, aedoeagus long, thin, with a chitinous spine. Lateral arms of sternite VIII arcuate (Fig. 21); ♀: Bursa copulatrix small, spherical, both anterior and posterior apophyses very long and thick. Papillae anales long (Fig. 24).

B i o l o g y. First stages and foodplant unknown. Type-specimen collected from the middle of July till the first days of September.

D i s t r i b u t i o n. Occurring at low and medium elevations in Nepal (730—3600 m). Locus typicus: Gosain kund Lekh, Tarke Banjyang, 3600 m.

Specific differences. The new species stands nearest to *Eupithecia yunnani* VOJNITS, 1980 but it is darker and also bigger. The aedoeagus is longer and thinner, the lateral branches of sternite VIII are more arcuate. There is a great similarity between the female genitalia.

Holotype ♂: "Nepal Gosainkund Lekh Tarke Banjang 3600 m 27. VIII. 1967 leg. DIERI—SCHACHT Staatsslg. München" "Gen. prep. No. 10655 ♂ DR. A. VOJNITS Budapest TTM". Paratypes: Helmu, Gueum Banjyang 2600 m, 3. 9. 1967, leg. DIERL, 1 ♂; Prov. Chisapani Garhi, Bhainse Dobhan 730 m, 16—20. VII. 1967, leg. DIERL and SCHACHT, 1 ♀.
Slides: Nos 10655, 10656 (♂♂), 10654 (♀), gen. prep. A. VOJNITS.

27. **Eupithecia circumscriptrix** sp. n.

(Derivation of specific name: circumscriptrix = deceiver)

Diagnosis. Alar expanse of fore wings of the three known male specimens 18, 19 and 20 mm. Externally highly similar to *Eupithecia discolor* sp. n. Fore wings somewhat wider, apex elongate, hind wing margin slightly sinuous. Discal spot large. Submarginal band consisting of a row of spots. The most striking feature is the ochreous yellow thorax.

Genitalia. ♂: Differring from *E. discolor* mainly in aedoeagal structure: aedoeagus considerably shorter and thicker in the new species (Fig. 22); ♀ unknown.

Biology. First stages and foodplant unknown. Type-specimens collected in May—June.

Distribution. Occurring at medium elevations in Nepal (3100—3900 m). Locus typicus: Khumbu, Khumdzung, 3900 m.

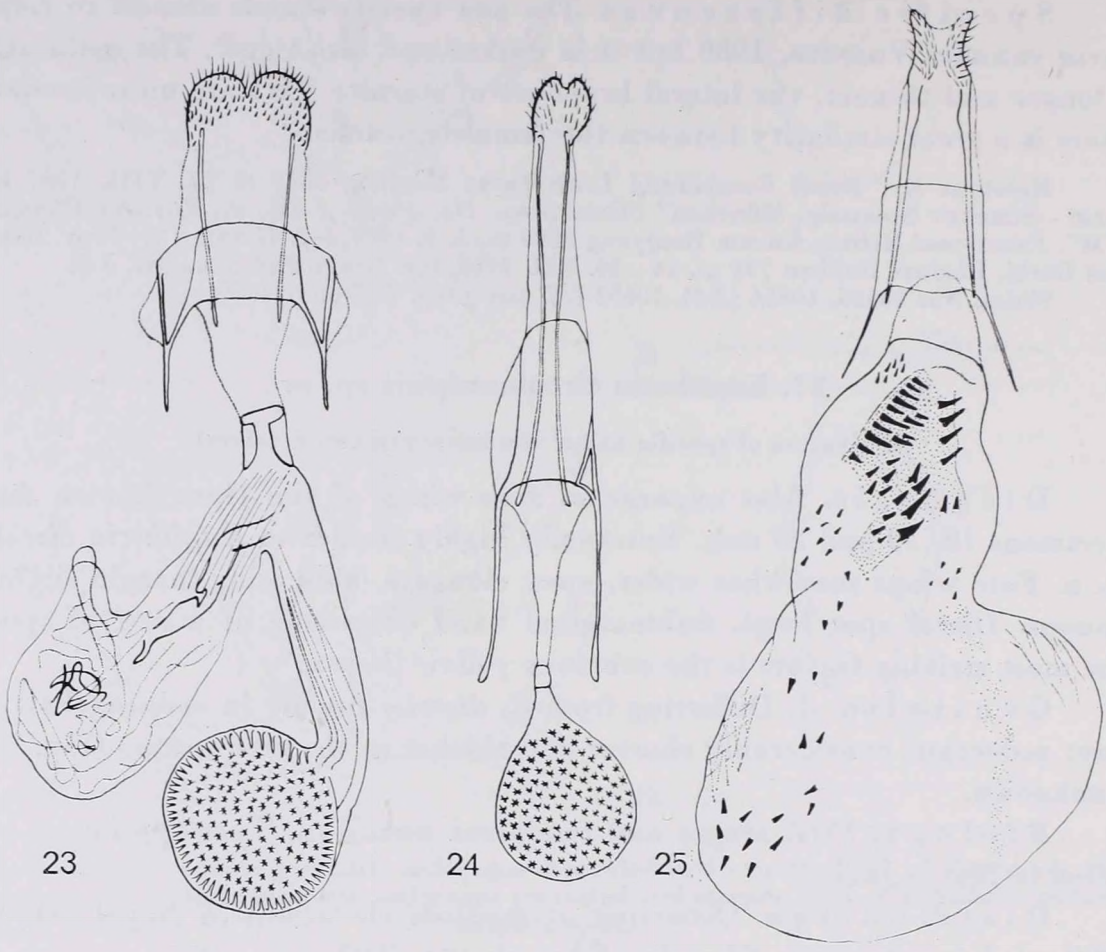
Specific differences. Nearest to *Eupithecia discolor* sp. n. (and also naturally to *E. yunnani* VOJNITS), but on the basis of the differences and characteristics outlined above, to be considered a distinct species.

Holotype ♂: "Nepal Khumbu Khumdzung 3900 m 18. VI. 1962 leg. G. EBERT u. H. FALKNER Staatsslg. München" "Gen. prep. No. 10651 ♂ DR. A. VOJNITS Budapest TTM". Paratypes: Thodung, 3000 m, 22. 5. 1962, leg. EBERT and FALKNER, 1 ♂; Thodung, 3100 m, 1. 6. 1962, leg. EBERT and FALKNER, 1 ♂. Holotype deposited in the Zoologische Staatssammlung, Munich, paratypes in Munich and in the Hungarian Natural History Museum, Budapest.
Slides: Nos 10651, 10653 (♂♂), gen. prep. A. VOJNITS.

28. **Eupithecia subviridis** sp. n.

(Derivation of specific name: subviridis = greenish)

Diagnosis. A *Chloroclystis*-like species of small stature. Alar expanse of fore wings of the two known female specimens 17 mm. Wings slightly elongate. Costa and termen of fore wing hardly arcuate, dorsum straight. Apex pointed. Hind wing somewhat angulate and very short. Basic colour of fore wing yellowish brown, inner half of basal field and median field greenish. Antemedian very wide, a nearly straightly decurrent wide band. Postmedian narrow, sinuous. Discal spot minute, round, black. Terminal field wide, with



Figs 23—25. 23 = Female genitalia of *Eupithecia acuta* sp. n.; 24 = Female genitalia of *Eupithecia discolor* sp. n.; 25 = Female genitalia of *Eupithecia subviridis* sp. n.

a brown, umbrous band. Hind wing pale grey, marginal field grey, discal spot hardly discernible. Underside of wings with pale pattern elements. Cilia short, yellowish brown.

Genitalia. ♀: Highly characteristic. Anterior part of extremely large bursa copulatrix protruding, with some chitinous spines; narrower cervical portion padded with several groups of chitinous spines and robust, dentate chitinous plates. Both anterior and posterior apophyses medium long and narrow. Papillae anales long, small (Fig. 25); ♂ unknown.

Biology. First stages and foodplant unknown. Type-specimens collected in August.

Distribution. Found at comparatively low elevations in Nepal (2200 m). Locus typicus: Bhandar, Thodung, 2200 m.

Specific differences. A peculiar species as to external morphological characters, its relegation to the genus *Eupithecia* CURTIS to be regarded as provisional; any further considerations as to generic assignment will have to await the general revision of the generic-groups concerned.

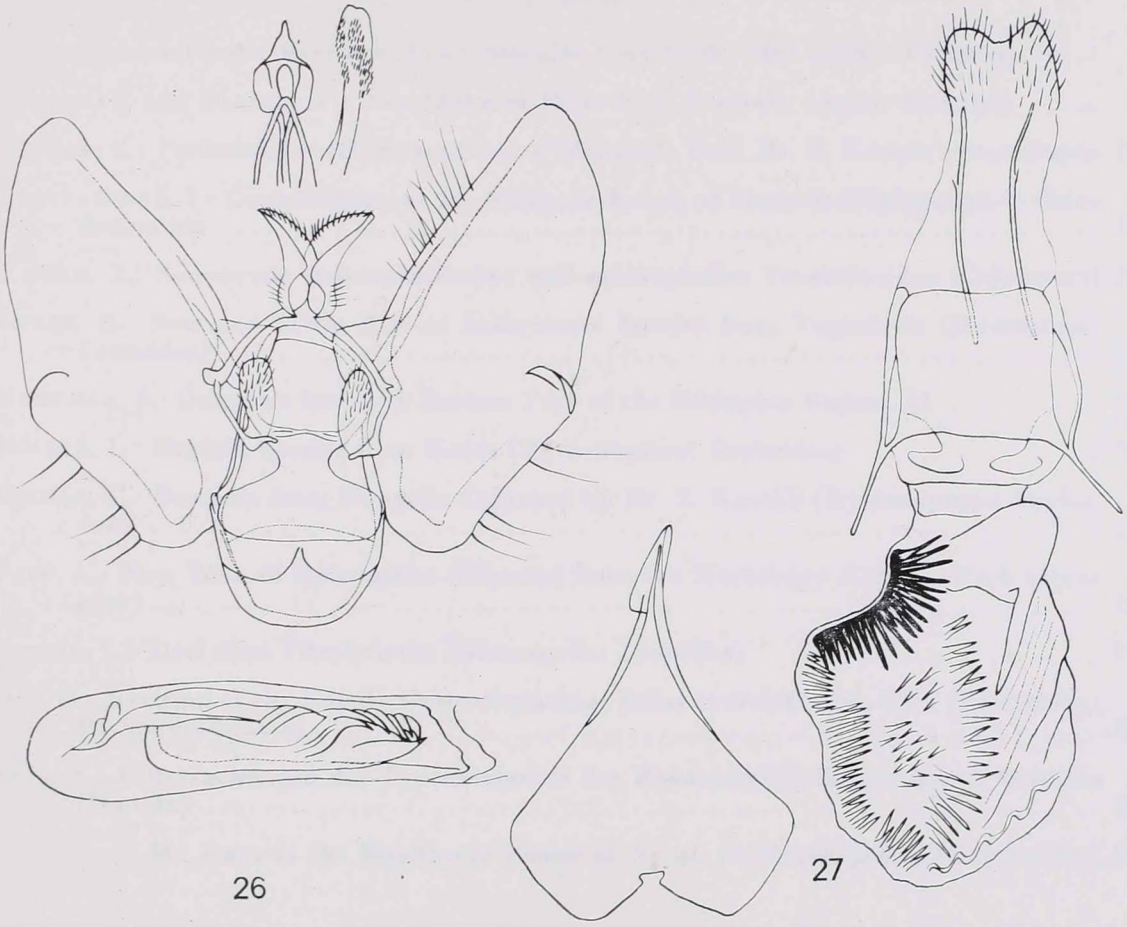
Holotype ♀: "Nepal Prov. Nr. 2 East Bhandar unter Thodung 2200 m 4. VIII. 1964 leg. W. DIERL Staatsslg. München" "Gen. prep. No. 11800 ♀ DR. A. VOJNITS Budapest, TTM". Paratype: 1 ♀ of the same data. Holotype deposited in the Zoologische Staatssammlung, Munich, paratype in the Hungarian Natural History Museum, Budapest.

Slides: Nos 11748, 11800 (♀♀), gen. prep. A. VOJNITS.

Eupithecia vivida VOJNITS, 1978

Acta zool. hung. **24**: 238—242, Figs 18 and 20.

Some very worn specimens of the taxon described from Li-kiang, China, have been found in Nepal (Fig. 26). The male genitalia display no differences.*



Figs 26—27. 26 = Male genitalia, aedoeagus separated and sternite VIII of *Eupithecia vivida* VOJNITS; 27 = Female genitalia of *Eupithecia vivida* VOJNITS

Examined material: Prov. No. 2 East. Jiri, 2000 m, 2. 4. 1964, leg. DIERL, 2 ♂♂. Deposited in the Zoologische Staatssammlung, Munich.

Slide: No. 10653 (♂), gen. prep. A. VOJNITS.

* A figure of the female genitalia is also submitted here (Fig. 27), given rather sketchily in the original description.

Acknowledgements. The study of the Nepalese 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 Dr. W. Forster and Dr. W. Dierl, Zoological Collection of the Bavarian State, Munich.

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XXIX. 4 1983 p. 283—301

DATA TO THE ORIBATID FAUNA OF AUSTRALIA (ACARI). II

J. Balogh and P. Balogh

(Received 7 December, 1982)

Twelve new Oribatid species are described from Australia. One new family and three new genera are also established.

Miss C. Plowmann and Dr. G. B. Monteith (Brisbane, Queensland) have sent me a larger Oribatid material which had been collected by them and partly by their colleagues mostly in Queensland, a small lot in New South Wales. In some of our publications we had already given data from these materials. So in fact the present contribution is a continuation of a series, the first part of which appeared in Opusc. zool. Budapest, **15** (1—2) 1978: 31—49, written by J. Balogh and S. Mahunka. This paper includes such forms which either systematically or biogeographycally seem to be interesting. These are the three new genera, furthermore, such groups that indicate some links to the once existing Gondwanaland, like the species of the genus *Austrophthiracarus* Balogh and Mahunka, 1978, and the representatives, newly described hereunder, of the families Eutegaeidae Balogh, 1965 and Otocepheidae Balogh, 1961. Owing to shortage in space now we can give the description of only a few Australian species that still await publication. The holotypes of the hereunder described species will be deposited in the National Insect Collection, C.S.I.R.O., Canberra, Australia, the paratypes partly in the above institute and partly in the Balogh Collection later to be transferred to the Zoological Department of the Hungarian Natural History Museum, Budapest.

PHTHIRACARIDAE Perty, 1841

Austrophthiracarus similis sp. n. (Fig. 1)

Length of notogaster: 710—775 μm, height: 429—554 μm.

A s p i s : In dorsal view ovoid. Hairs *le* and *in* very close to each other short and fine; situated almost in a transversal line. Lateral surface without polygonal sculpture. Sensillus similar as that of *A. radiatus*, but its surface not aciculate.

Notogaster: 27—29 pairs of short and fine notogastral hairs. Puntulated sculpture absent.

Anogenital region: 9 pairs of genital, 6—7 pairs of ano-adanal hairs. Number of adanal-anal-anal-adanal hairs of the holotype and a single paratype:

5 2 2 5
5 2 2 4

The anal hairs only a little nearer to each other than the first adanal and first anal hairs.

Remarks: The new species differs from *A. radiatus* by number and position of anal and adanal hairs. *Fuegoplophora foveoreticulata* MAHUNKA, 1980 (Argentina) has similar ano-adanal setation, but this species has foveolated sculpture.

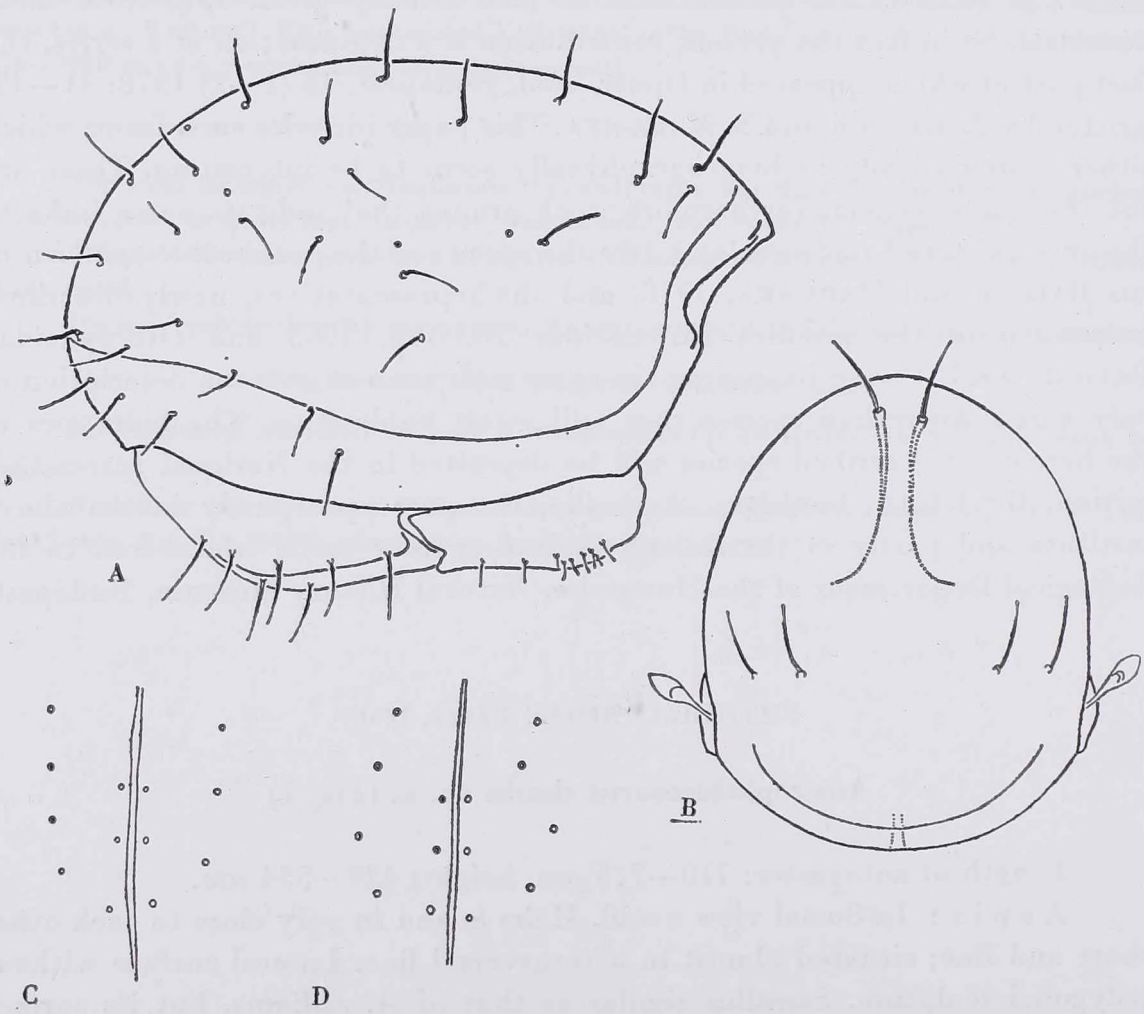

Fig. 1. *Austrophthiracarus similis* sp. n. — A = notogaster, B = aspis, C—D = anal setation

Material examined. — Holotype: Barrington Tops, 5000 feet, via Salisbury N.S.W. 10. II. 1965, G. B. MONTEITH. Temperate rainforest, ex *Nothofagus morei* leaf litter; 2 paratypes: same locality.

Austrophthiracarus wallworki sp. n. (Fig. 2)

Length of notogaster: 410 μm, height: 340 μm, length of aspis: 254 μm, breadth: 217 μm.

Aspis: in dorsal view broadly ovoid, in lateral view flat, with bothrydial scale above bothrydium. There is an arched keel on the lateral part of

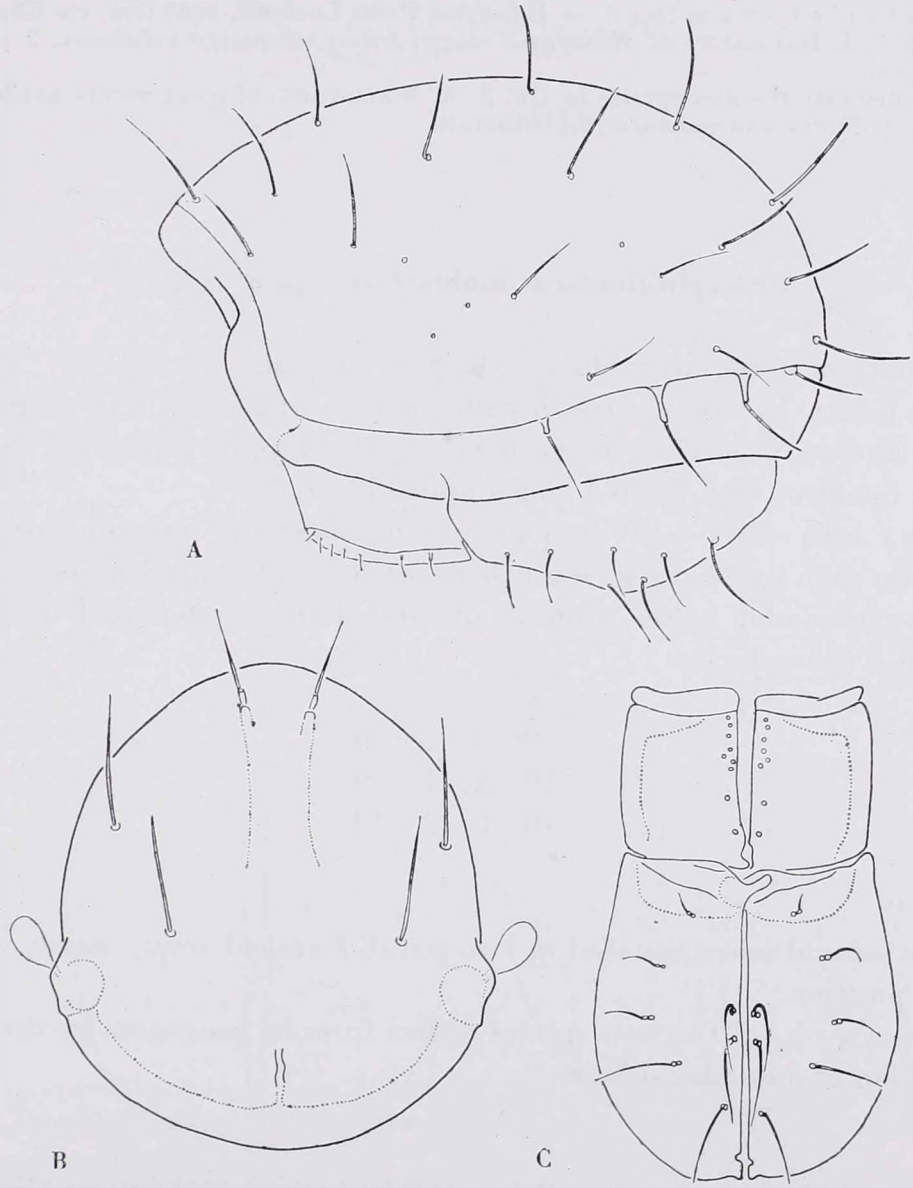

Fig. 2. *Austrophthiracarus wallworki* sp. n. — A = notogaster, B = aspis, C = anogenital region

rostral region. Hairs medium long; hairs *le* before of hairs *in*. Sensillus capitate with a short stalk.

Notogaster: 21—22 pairs of fairly long notogastral hairs. Notogaster smooth.

Anogenital region: 8—9 pairs of genital hairs. 7 pairs of ano-adanal hairs. Two pairs of anal, 5 pairs of adanal hairs. Anal hairs much nearer to each other, than distance between the first anal and first adanal hairs. Ano-adanal hairs long.

Remarks: The new species differs from its congeners by the position of anal hairs, by the form of sensillus and the position of hairs *le* and *in*.

Material examined. — Holotype: Point Lookout, 5000 feet, via Ebor, N.S.W. 23. IV. 1973, I. NAUMANN, ex *Nothofagus moorei* litter; temperate rainforest; 2 paratypes: same locality.

We dedicate the new species to DR. J. A. WALLWORK, of great merits in the exploration of the Antarctic and Subantarctic Oribatids.

Austrophthiracarus multisetosus sp. n. (Fig. 3)

Length of notogaster: 562 μm, height: 332 μm.

Aspis: In dorsal view broadly ovoid, with very fine punctulation. Hairs *le* and *in* very close to each other, all hairs of aspis fine and short. Sensillus fusiform with dilated and rounded head.

Notogaster: 32—34 pairs of very short and fine notogastral hairs.

Anogenital region: 8 to 10 pairs of genital hairs (?). 11—12 pairs of ano-adanal hairs. Number of adanal-anal-anal-adanal hairs of the examined 3 exemplars:

9	2	2	9
10	2	2	9
10	2	2	10

The adanal hairs situated in two parallel arched rows, mostly in asymmetrical position.

Remarks: The new species differs from its congeners by the number and position of ano-adanal hairs.

Material examined. — Holotype: Point Lookout, 5000 feet, via Ebor, N.S.W., 23. IV. 1973, I. NAUMANN, ex *Nothofagus moorei* litter; temperate rainforest; 2 paratypes: same locality.

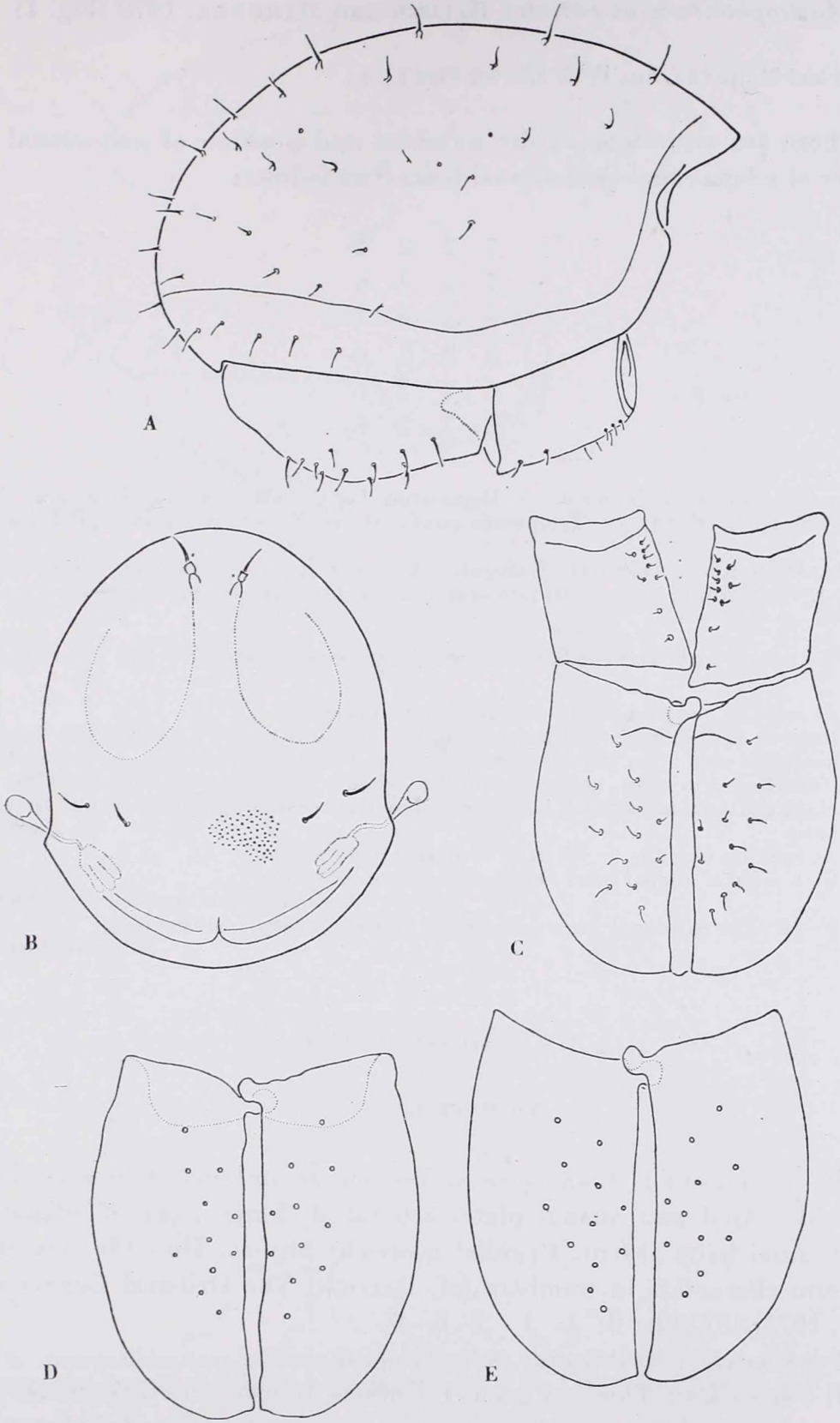

Fig. 3. *Austrophthiracarus multisetosus* sp. n. — A = notogaster, B = aspis, C = anogenital region, D—E = anal setation

Austrophthiracarus radiatus BALOGH and MAHUNKA, 1978 (Fig. 4)

(BALOGH and MAHUNKA, l.c., 1978: 32—33, Figs 1—4.)

There are variations in the numbers and position of ano-adanal hairs (number of adanal-anal-anal-adanal hairs !) as follows:

7	2	2	6
7	2	2	6
6	2	2	7
6	2	2	6
6	2	2	6
6	2	2	5

Material examined. — Barrington Tops, 5000 feet, via Salisbury, N.S.W. 10. II. 1965, G. B. MONTEITH. Temperate rainforest; ex *Nothofagus moorei* leaf litter, 6 exemplars.

Air Drop Road, 2700 feet, Wiangarie State Forest, via Lynch's Ck., N.S.W. 29. V. 1973, V.-J. PATTEMORE, subtropical rainforest; ex leaf litter around base of tree.

The species of *Austrophthiracarus* may be separated by the following key:

1 (4) At least on one side 5 pairs of adanal hairs present.
2 (3) Hairs *le* and *in* long far from each other. Sensillus rounded. Anal hairs long, much nearer to each other than the first adanal and first anal hairs **A. wallworki** sp. n.
3 (2) Hairs *le* and *in* short, near to each other, almost in a transversal line. Sensillus with a blunt tip. Anal hairs short, not nearer to each other than the first anal and first adanal hairs **A. similis** sp. n.
4 (1) At least on one side 6—10 pairs of adanal hairs present.
5 (6) 6—8 pairs of adanal hairs arranged in one arched row **A. radiatus** BALOGH and MAHUNKA, 1978
6 (5) 9—10 pairs of adanal hairs arranged in two asymmetric parallel rows **A. multisetosus** sp. n.

LOHMANNIIDAE BERLESE, 1916

Austracarus gen. n.

Diagnosis: Transverse suture on genital plates absent. Preanal plate wide. Anal and adanal plates separated. Three pairs of adanal hairs present. Anal hairs absent. Pygidial neotrichy absent. Thus the combination of generic characters in numbers (cf. BALOGH: The Oribatid Genera of the World, 1972: 48—49): 0 1 1 3 0 0.

Type-species: *Austracarus reductus* sp. n.

Remarks: This new genus resembles *Meristacarus* GRANDJEAN, 1934, but the setation of the ano-adanal region is extremely reduced. Lohmanniidae with only 3 pairs of adanal hairs heretofore has not been discovered.

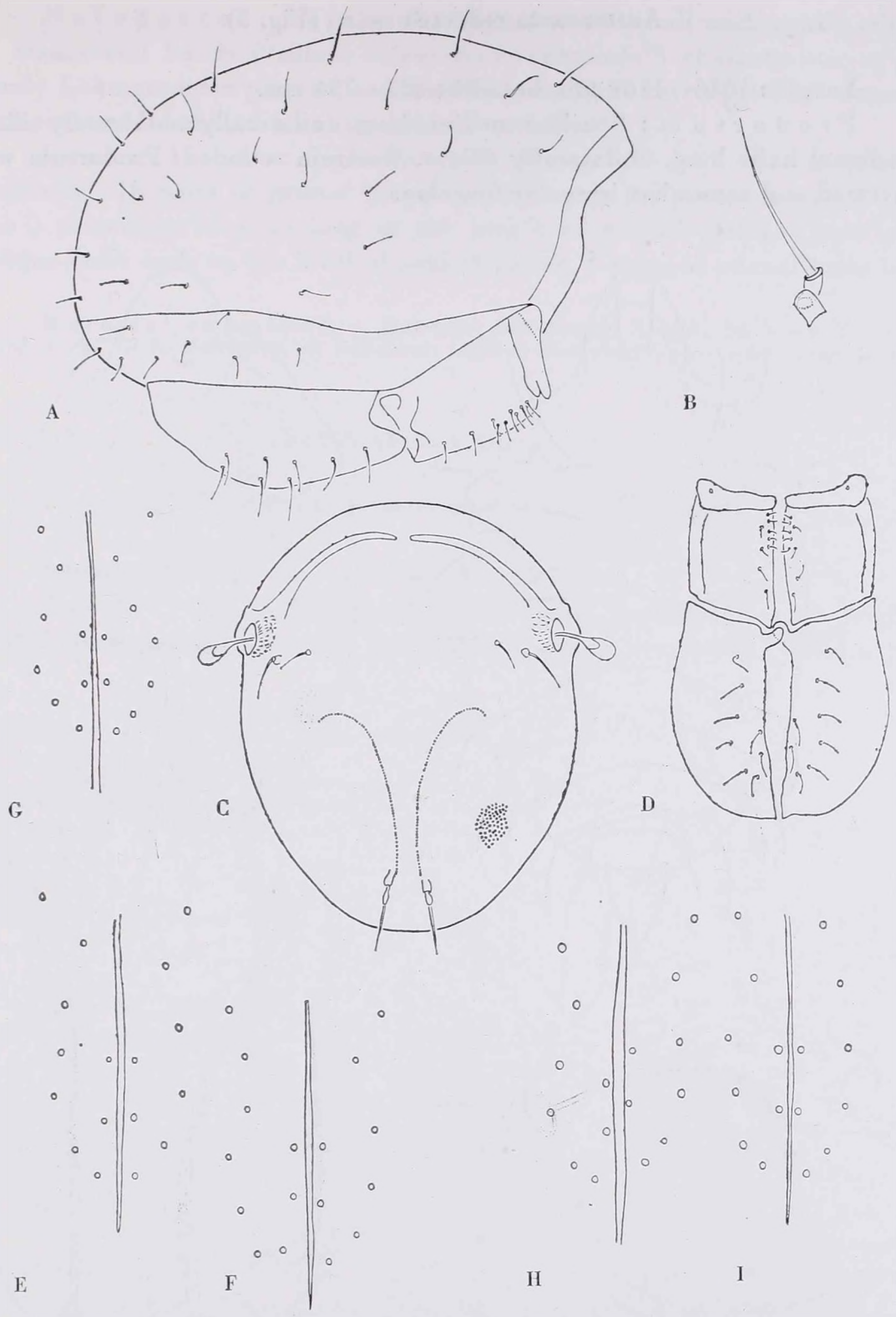

Fig. 4. *Austrophthiracarus radiatus* Balogh and Mahunka, 1978 — A = notogaster, B = notogastral seta, C = aspis, D = anogenital region, E—I = variation of the anal setation

Austracarus reductus sp. n. (Fig. 5)

Length: 1046—1189 μm, breadth: 623—754 μm.

P r o d o r s u m : Sensillus medium long, unilaterally and densely ciliate. Prodorsal hairs long, unilaterally ciliate. Rostrum rounded. Prodorsum with scattered and somewhat irregular foveolae.

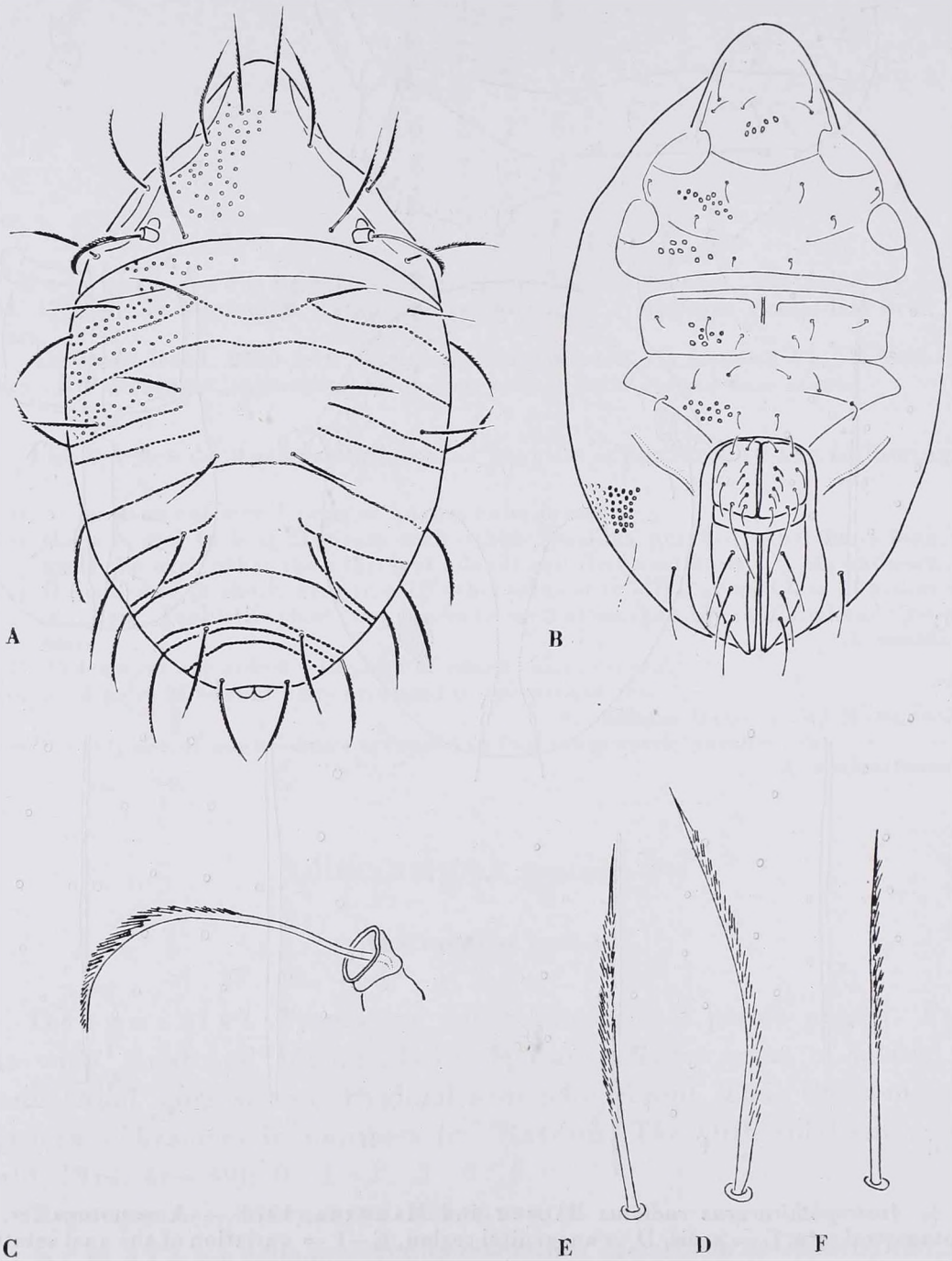

Fig. 5. *Austracarus reductus* gen. n., sp. n. — A = notogaster, B = ventral side, C = sensillus, D = seta *in*, E = seta *exp*, F = seta c_1

Notogaster: 16 pairs of notogastral setae, all unilaterally ciliate. 11 transversal bands ("sillons transversaux rubannés") characteristic of the family Lohmanniidae present, some of these medially interrupted. Notogaster with scattered and somewhat irregular foveolae.

Ventral side: Epimeral setal formula: 3—1—3—4, no epimeral neotrichy. 10 pairs of genital hairs, the first pair (in posteromarginal position!) extremely long, as long as the length of genital plates. There is an oblique crest each on the level of genital plates. 3-pairs of adanal hairs long.

Material examined. — Holotype: Iron Range, N. Qld., 26. V.—8. VI. 1971 "First week" G. B. MONTEITH, ex leaf litter; tropical rainforest; 5 paratypes: same locality

EUTEGAEIDAE BALOGH, 1965

Neoeutegaeus phyllophorus sp. n. (Fig. 6)

Length: 312—353 μm, breadth: 197—226 μm.

Prodorsum: Sensillus long, straight, bacilliform, with slightly dilated head and apically with short cilia. Hairs *in* very short. Hairs *le* thin

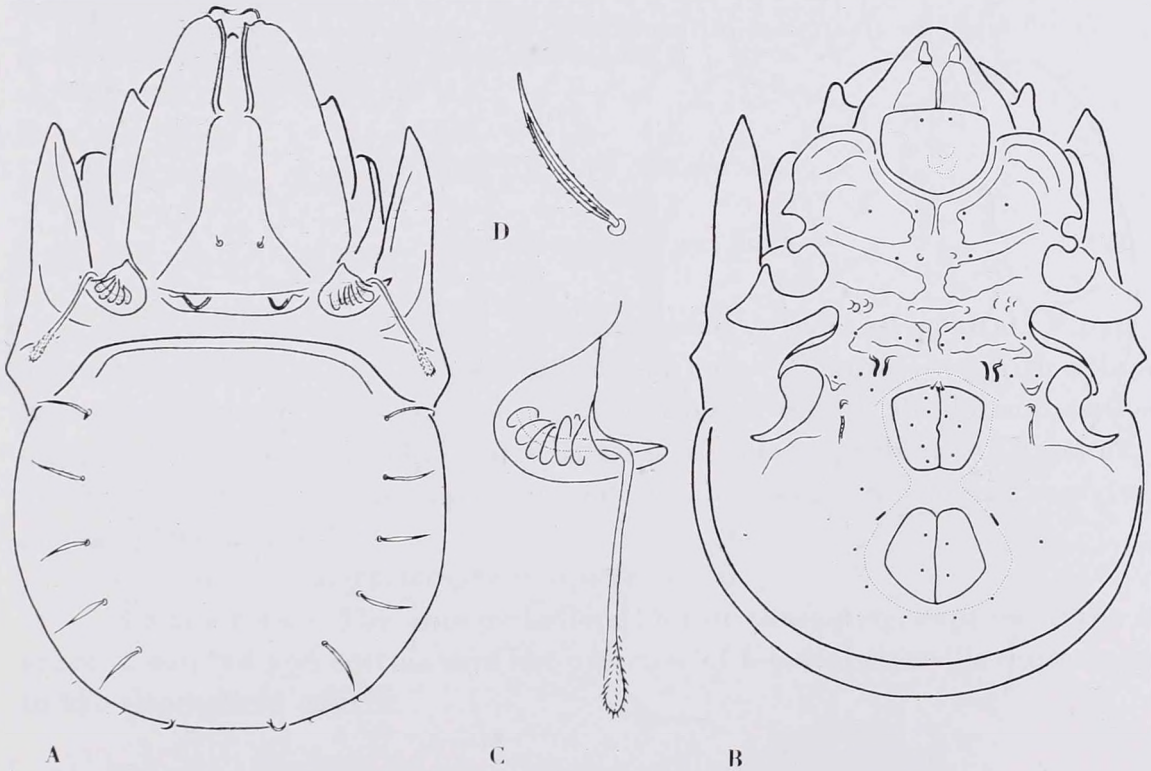

Fig. 6. *Neoeutegaeus phyllophorus* sp. n. — A = notogaster, B = ventral side, C = bothrydium and sensillus, D = notogastral seta

and short, situated on the anterior margin of lamellar cuspis, directed inwards. Hairs *ro* short.

N o t o g a s t e r : 5 pairs of hairs on dorsal surface resembling willow-leaves; 3 pairs of posteromarginal hairs very thin and short.

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 hairs. All ventral hairs are very short and thin. Hairs ad_1 in postanal, ad_2 and ad_3 in adanal position. *Pori iad* apoanal, obliquely situated. Distance between genital and anal plates shorter than half the length of genital plates.

R e m a r k s : This is the first *Neoeutegaeus* species having dilated, phylliform dorsal hairs.

M a t e r i a l e x a m i n e d. — Holotype: Point Lookout, 5000 feet, via Ebor, N.S.W. 23. IV. 1973. I. NAUMANN, ex *Nothofagus moorei* litter; temperate rainforest; 4 paratypes: Barrington Tops, 5000 feet, via Salisbury, N.S.W. 10. II. 1965. G. B. MONTEITH; temperate rainforest; ex *Nothofagus moorei* leaf litter.



Fig. 7. *Neseutegaeus monteithi* sp. n. — A = notogaster, B = ventral side, C = bothrydium and sensillus

Neseutegaeus monteithi sp. n. (Fig. 7)

Length: 500—513 μm, breadth: 340—353 μm.

P r o d o r s u m : Sensillus long, bacilliform, with very slightly fusiform, finely ciliate head. Hairs *in* long, hairs *le* short, thin, originating in a small incisure of lamellar cuspis; hairs *ro* short. Lamellae broad, parallel, with long and broad cuspis.

N o t o g a s t e r : Humeral process ("pteromorphae", sensu TRÄGÅRDH, 1931 and HAMMER, 1966) long, directed forwards. 8 pairs of notogastral hairs, 2 controdorsal pairs with flagellate end, 3 pairs of submarginal hairs setate, 3 pairs of posteromarginal hairs very short and thin. Dorsosejugal suture straight.

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 hairs. All hairs on ventral side are very short and fine.

R e m a r k s : Only one *Neseutegaeus* species has fine and setiform (or nearly setiform !) hairs on dorsal surface of notogaster, *Neseutegaeus consimilis* HAMMER, 1966 (New Zealand), but the hairs *in* of this species are much shorter, the sensillus with dilate head and the lamellae with longitudinal lines.

M a t e r i a l e x a m i n e d. — Holotype: Barrington Tops, 5000 feet, via Salisbury, N.S.W. 10. II. 1965, G. B. MONTEITH; temperate rainforest; ex *Nothofagus moorei* leaf litter; 5 paratypes: same locality.

We dedicate the new species to G. B. MONTEITH (Brisbane, Qld.), who contributed much to the knowledge of the Oribatid fauna of Australia.

OTOCEPHEIDAE BALOGH, 1961

Lophotocepheus gen. n.

D i a g n o s i s : 10 pairs of notogastral, 3 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Femora 1—4 with a broad dorsoventral crest. Dorsosejugal region without condyli. Prodorsum without costula. Prodorsum and notogaster without foveolae or tuberculi. Hairs ad_3 in adanal position. *Pori iad* apoanal and parallel with the lateral margin of genital plates.

Type-species: *Lophotocepheus simplex* sp. n.

R e m a r k s : The above combination of characters, especially the absence of condyli and costula and the presence of femoral crests, is quite unique in the Otocepheid genera.

Lophotocepheus simplex sp. n. (Fig. 8)

Length: 369—476 μm, breadth: 193—216 μm.

P r o d o r s u m : Sensillus long, smooth, with fusiform head. Hairs *in* short and thin. Hairs *le* and *ro* situated in the rostral region, externally ciliate. Costula absent. Basal part of prodorsum without condyli. Prodorsum smooth.

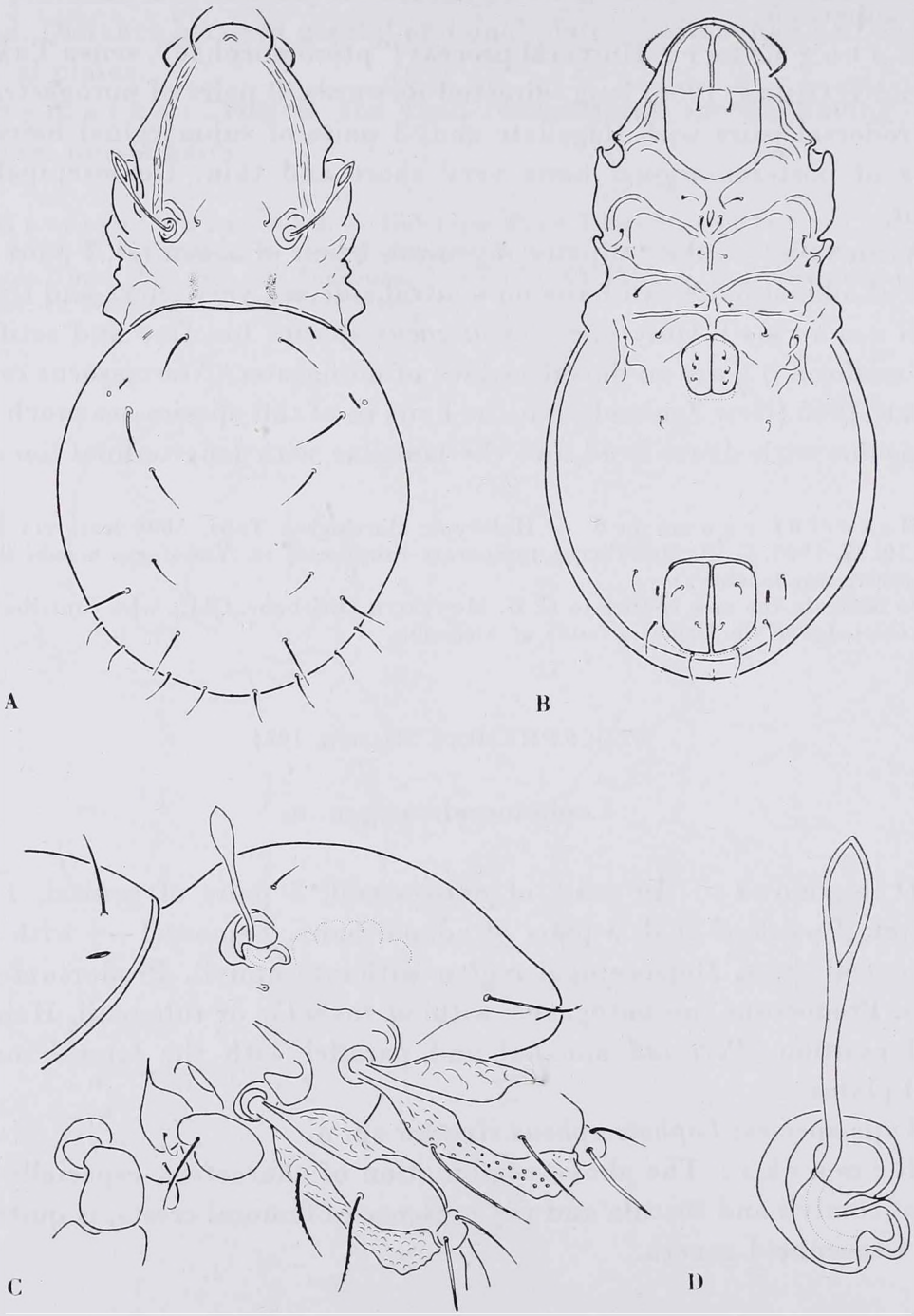

Fig. 8. *Lophotocepheus simplex* gen. n., sp. n. — A = notogaster, B = ventral side, C = prodorsum, lateral side, D = sensillus, lateral

Legs typical of Otocepheidae, with 1 claw. Femora 1—4 with dorsoventral crests.

N o t o g a s t e r : 10 pairs of smooth and thin notogastral hairs. 4 pairs of posteromarginal hairs (p_1, p_2, p_3 and r_3) shorter than the rest of notogastral hairs. Notogaster is smooth.

V e n t r a l s i d e : Apodemata 4 evanescent; apodemata 1, 2, sejugal and 3 thin, linear. Epimeral setal formula 3—1—3—3. 3 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Aggenital hairs near to genital plates. Hairs ad_3 adanal, *pori iad* somewhat removed from anal plates, vertical.

M a t e r i a l e x a m i n e d. — Holotype: Little Yabba Ck., via Kenilworth, S.E.Qld, 11. II. 1973. I. NAUMANN, ex leaf litter and soil, subtropical rainforest; 2 paratypes: same locality.

Papillocepheus deficiens sp. n. (Fig. 9)

Length: 503 μm, breadth: 230 μm.

P r o d o r s u m : Sensillus short with fusiform, rounded head. Hairs *in* long, like willow-leaf, curved with long, pointed tip; hairs *le* and *ro* similar, but shorter. Costulae long, slightly convergent. Behind each bothrydium there is a condylus. Dorsosejugal suture straight. Surface with great, rounded foveoli.

N o t o g a s t e r : 9 pairs of long willow-leaf-like, curved and pointed notogastral hairs; but the 4 pairs of posteromarginal hairs somewhat shorter. Hairs *ta* absent. The first third of notogaster without hairs. Surface of notogaster with large, round foveoli.

V e n t r a l s i d e : Epimeral setal formula 3—1—3—3. 3 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Hairs ad_3 in adanal position. *Pori iad* apoanal, oblique, situated at level with hairs ad_2. Surface of ventral side with rounded foveoli.

R e m a r k s : This is the second species of the genus *Papillocepheus*. The generotype: *Papillocepheus heterotrichus* BALOGH and MAHUNKA, 1966 (South Africa) has very small hairs *ta*, further the notogastral hairs are different.

M a t e r i a l e x a m i n e d. — Holotype: Whian Whian State Forest, 600 m via Dunoon, N.S.W. 5. V. 1972. I. NAUMANN, ex leaf litter and soil; subtropical rainforest ex *Carnoys*.

Pseudotocepheus bacilliger sp. n. (Fig. 10)

Length: 812 μm, breadth: 410 μm.

P r o d o r s u m : Sensillus long, smooth, bacilliform, with pointed tip. Hairs *in* very long, straight, as long as costulae. Hairs *le* and *ro* smooth, long

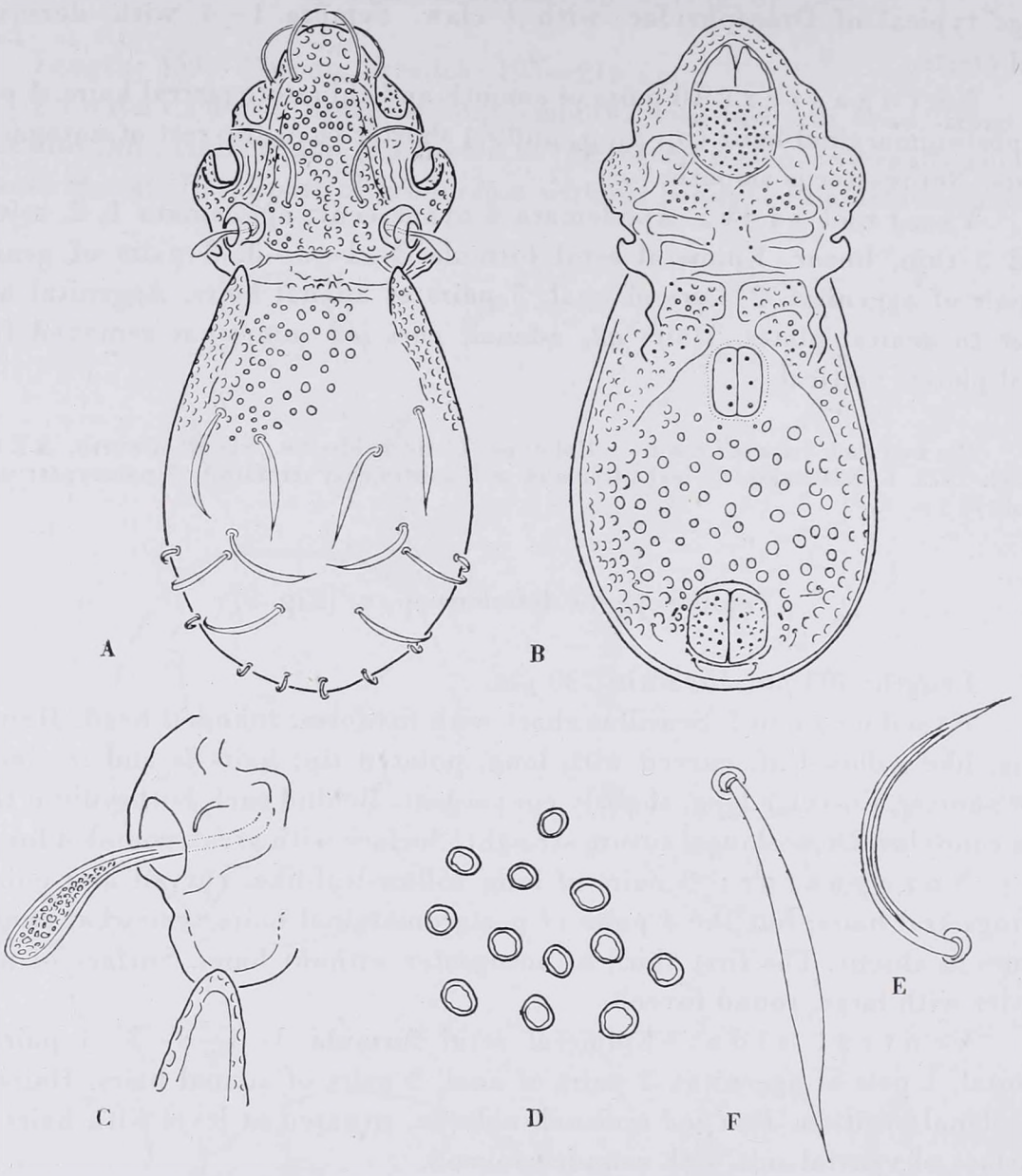

Fig. 9. *Papillocepheus deficiens* sp. n. — A = notogaster, B = ventral side, C = bothrydium and sensillus, D = sculpture of notogaster, E = seta *in*, F = seta *te*

and arched. Costulae present. Basal part of prodorsum each with two pairs of condyli.

N o t o g a s t e r : 10 pairs of long, thin, smooth notogastral hairs. The end of notogastral setae not flagellate. Surface of notogaster smooth, neither foveolate, nor tuberculate.

V e n t r a l s i d e : 3 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Hairs ad_3 in preanal position. *Pori iad* apoanal, obliquely placed at level with ad_2.

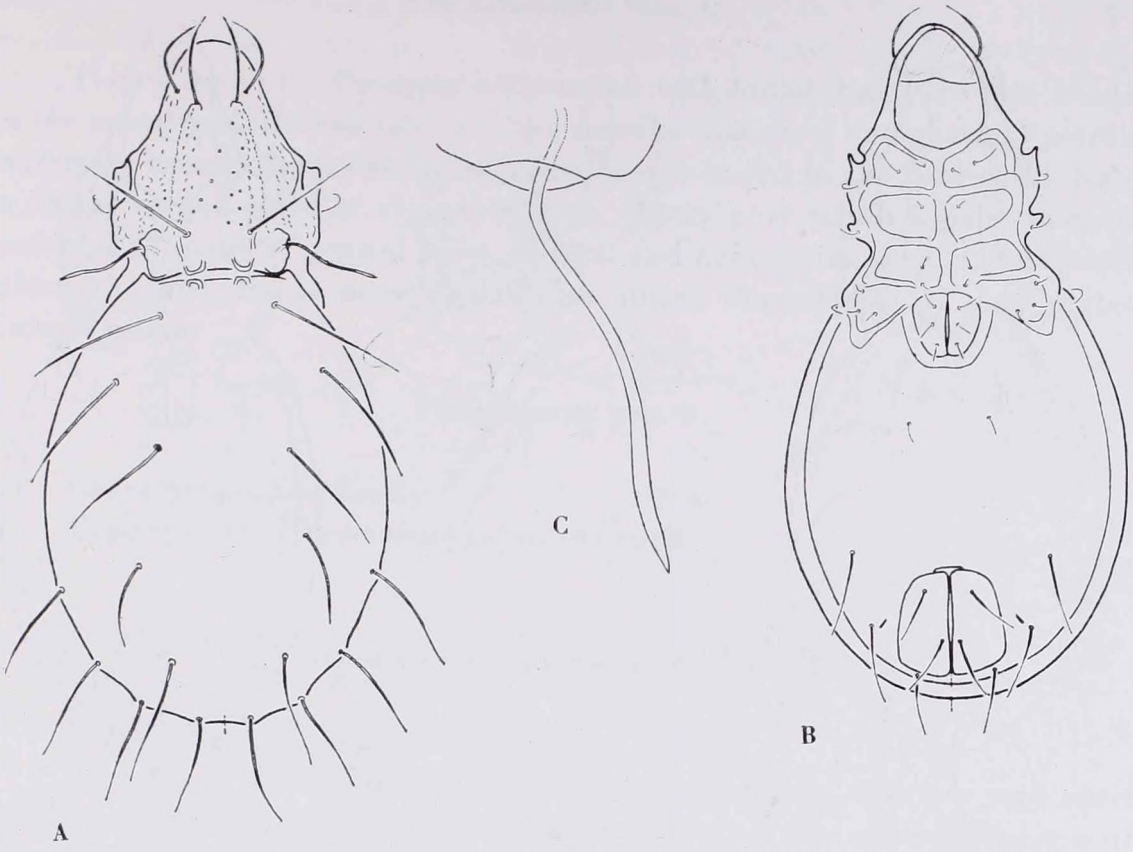

Fig. 10. *Pseudotocepheus bacilliger* sp. n. — A = notogaster, B = ventral side, C = sensillus

R e m a r k s : There are two *Pseudotocepheus* species having bacilliform, or nearly bacilliform sensillus: 1) *P. gemmatus* BALOGH and MAHUNKA, 1969 (S. America) has flagellate notogastral hairs and coalesced inner condyli on dorsosejugal region; 2) *P. longus* BALOGH, 1960 (Madagascar) is much longer (1512—1796 μm) and the notogastral hairs are very short.

M a t e r i a l e x a m i n e d. — Holotype: Barrington Tops, 5000 feet, via Salisbury, N.S.W. 10. II. 1965. G. B. MONTEITH. Temperate rainforest; ex *Nothofagus moorei* leaf litter.

Pseudotocepheus parallelus sp. n. (Fig. 11)

Length: 237—569 μm, breadth: 246—357 μm.

P r o d o r s u m : Sensillus short with fusiform, round head. Hairs *in* medium long, longer than half the distance between hairs *in* and *le*. Costulae present. Two pairs of condyli in the dorsosejugal region. Apical half of interlamellar area foveolate.

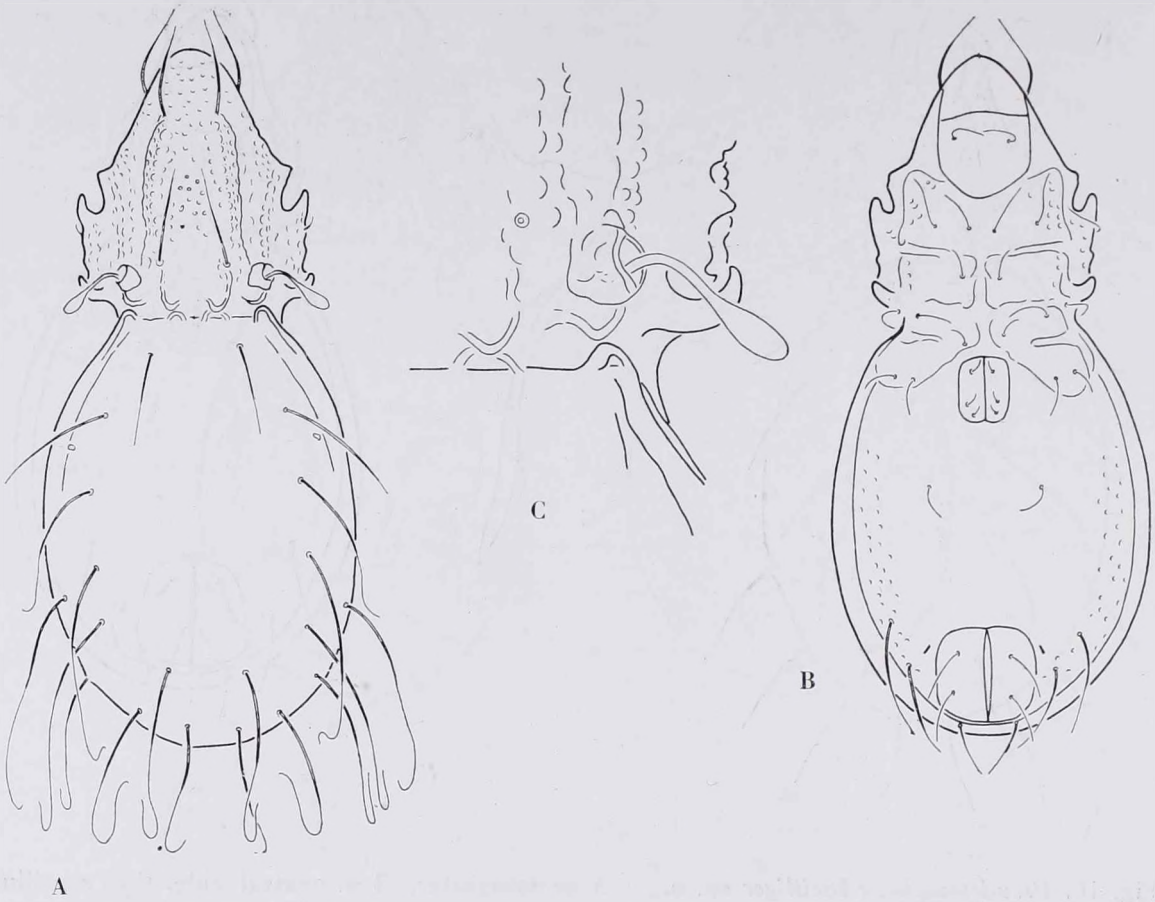

Fig. 11. *Pseudotocepheus parallelus* sp. n. — A = notogaster, B = ventral side, C = bothrydium and sensillus

Notogaster: 10 pairs of notogastral hairs. Hairs *ta* medium long, straight, the remaining 9 pairs very long, apically flagellate. Hairs *te*, *ti*, *ms* and r_2 each in two longitudinal and parallel rows. At the posteromarginal hairs 4 small, flattened tubercles present. Notogaster not foveolate.

Ventral side: Epimeral setal formula: 3—1—3—3. 3 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Hairs ad_3 in preanal, *pori iad* in apoanal position, but near to anal plate. Ad_2 originating behind *pori iad*, in adanal position.

Remarks: None of the *Pseudotocepheus* species has similarly placed *te*, *ti*, *ms* and r_2 notogastral hairs. *Ps. radiatus* HAMMER, 1973 (Samoa) has 4 pairs of posteromarginal tubercles, but has shorter notogastral hairs and foveolated notogaster.

Material examined. — Holotype: Little Yabba Ck., via Kenilworth, S.E.Qld, 11. II. 1973. NEUMANN, ex leaf litter and soil; subtropical rainforest ex *Carnoy*; 2 paratypes: same locality.

Platyameridae fam. n.

D i a g n o s i s : Prodorsum flattened with broad, but very thin border on the apical half. Hairs *le* and *ro* in the anterior margin of notogaster. Rostrum extremely broad. Bothrydium and sensillus far ahead in the first third, hairs *in* in the second third of the prodorsum. Mouth part small. 8 pairs of notogastral, 3 (2) pairs of genital hairs. Genital and anal plates very far from each other: the distance is more than twice longer than length of anal plates. Unique genus:

Platyamerus gen. n.

Characters of the family.
Type-species: *Platyamerus peculiaris* sp. n.

Platyamerus peculiaris sp. n. (Fig. 12)

Length: 435 μm, breadth: 238 μm.

P r o d o r s u m : Sensillus lanceolate, medium long. Hairs *in* very short and fine. Hairs *le* and *ro* medium long, flagellate, at the anterior margin of rostrum. Pedotecta short and round.

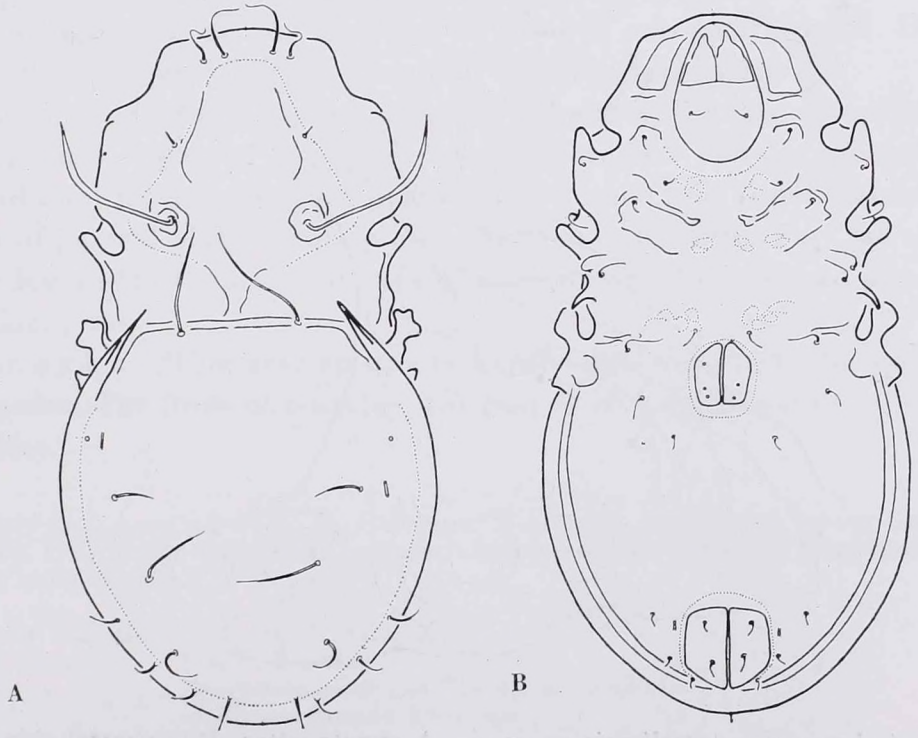

Fig. 12. *Platyamerus peculiaris* gen. n., sp. n. — A = notogaster, B = ventral side

Notogaster: Dorsosejugal suture straight, each with one forward and inward directed spine at the shoulder, opposite of bothrydia. 9 pairs of fine notogastral hairs. Hairs *ta* very long, forward directed, hairs p_1-p_3 very short.

Ventral side: apodemata partly reduced; apodemata 4 absent. Epimeral hairs partly missing. 3 (2) genital hairs. Aggenital hairs near to

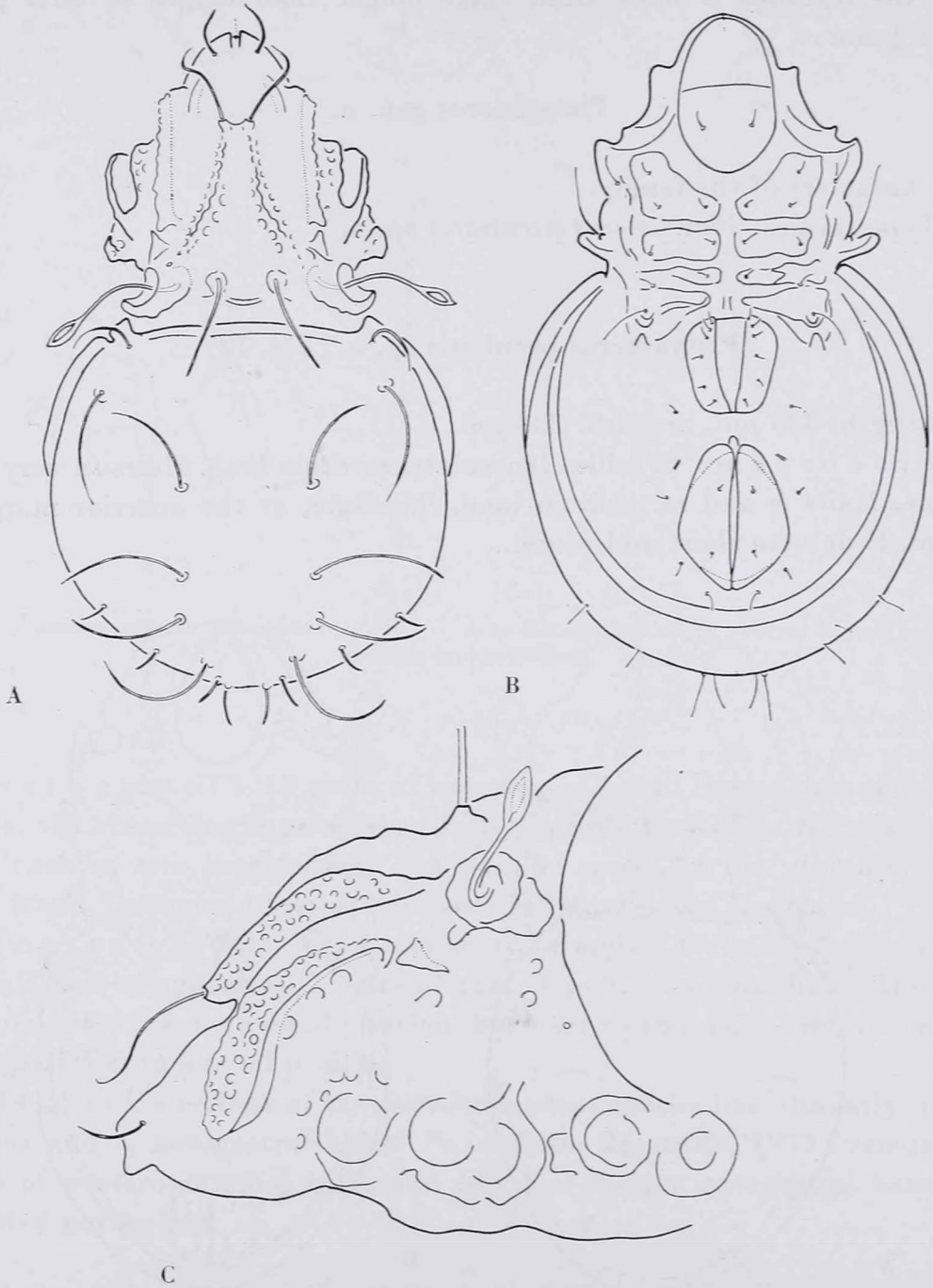

Fig. 13. *Anderemaeus australiensis* sp. n. — A = notogaster, B = ventral side, C = prodorsum, lateral side

genital plates. Hairs ad_1 in postanal, ad_2 and ad_3 in adanal position. *Pori iad* a little removed from anal plates, but parallel with the lateral margin of anal plates.

Remarks: *Platyamerus peculiaris* gen. et sp. n. is a very curious Oribatid without any connexion with the superfamilies of the Oribatei superiores. We have only one adult specimen. It is necessary to describe it as gen. et sp. n. and must be placed into a new family. Provisionally it should be fitted into the artificial unit of Oppioidea.

Material examined. — Holotype: Nightcap Ra., 2500 feet, via Dunoon, N.S.W. 6. V. 1973. I. NAUMANN; ex rainforest leaf litter and soil, subtropical rainforest; 1 paratype: same locality.

ANDEREMAEIDAE BALOGH, 1972

Anderemaeus australiensis sp. n. (Fig. 13)

Length: 344—443 μm, breadth: 213—238 μm.

Prodorsum: Sensillus long with fusiform head. Hairs *in* long and thick erectile. Costulae convergent with undulated keel. Costular cuspides with coalescent basis, bearing the long, flagelliform hairs *le*. Rostral hairs setiform, short. There is each with a long protruding, sublateral keel (homology uncertain) on the lateral part of prodorsum. Pedotecta 2 very large. Rostrum with broad incision.

Notogaster: Dorsosejugal suture straight. There is each with a chitinous protuberance on the shoulder. 10 pairs of notogastral hairs. Hairs *ta* shorter, *te*, *ti*, *ms*, r_2 and r_3 long, arcuated, r_1, p_1, p_2 and p_3 short.

Ventral side: 4 pairs of epimeral plates, 5 pairs of apodemata. 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Genital and anal plates near each other: the distance four times shorter than the length of genital plates. Anal plates rhomboid and long. *Pori iad* adanal, but at the level with the anterior part of anal plates. Hairs p_1 and p_2 in postanal position.

Remarks: This new species is hardly different from the species of South America. The form of costulae, the length of notogastral hairs, etc. are highly unlike.

Material examined. — Holotype: Barrington Tops, 5000 m via Salisbury, N.S.W. 10. II. 1965. G. B. MONTEITH; temperate rainforest; ex *Nothofagus moorei* leaf litter; 6 paratypes: same locality.

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NEW ORIBATIDS (ACARI) FROM THE PACIFIC REGION

J. Balogh and P. Balogh

(Received 7 December, 1982)

Seventeen new Oribatid species are described from the Pacific Region. Four new genera (*Lineoppia*, *Geminoppia*, *Exanthoppia* and *Pentazetes*) are erected.

The various collectings made in the Pacific Region continuously yield in an ever increasing number interesting Oribatid Mites. This contribution includes primarily the description of those new species which somehow proved to be interesting either systematically or biogeographically and seem to be the missing links; thus some new genera and new species demonstrating the historical geological connections of the southern continents. These are the first data from the territory of New Caledonia, since heretofore, only a single Berlese species has been known.

The type-material of the hereunder described new species is in the Balogh Collection eventually to be incorporated in the collection of the Zoological Department of the Hungarian Natural History Museum, Budapest

BRACHICHTHONIIDAE Balogh, 1943

Liochthonius szemmelveiszi sp. n. (Fig. 1)

Length: 189 μm, breadth: 103 μm.

P r o d o r s u m : Sensillus medium long, fusiform, aciculate, with sharp tip. Hairs *in*, *le* and *ro* phylliform with very thin lateral membrane and with a blunt tip. Hairs *ex* with ciliate margin and a very sharp tip. Prodorsum without areolae.

N o t o g a s t e r : Notogastral hairs similar to *in*, *le* and *ro*, with very thin lateral membrane and some fine marginal cilia. Hairs c_3 similar to hairs *ex* on prodorsum. Notogaster without areolae.

V e n t r a l s i d e : Typical of *Liochthonius*. Hairs ad_2 phylliform.

R e m a r k s : This new species belongs to the species-group of *Liochthonius evansi* Forsslund (phylliform notogastral hairs with thin lateral membrane, etc.), but none of these has a blunt tip and only fine, scattered

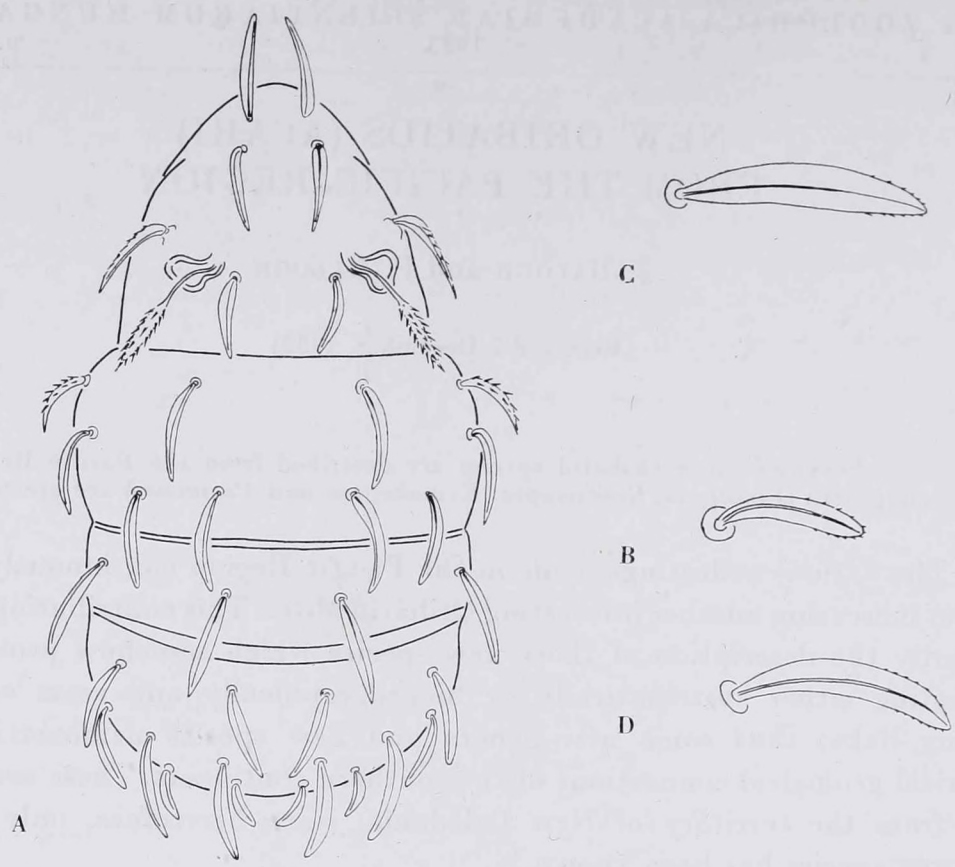

Fig. 1. *Liochthonius szemmelveiszi* sp. n. — A = notogaster, B = seta *in*, C = seta e_1, D = seta f_2

marginal cilia on the apical half of the lateral membrane. *L. szemmelveiszi* sp. n. is the first representative of the species-group in the Pacific Islands.

Material examined. — Holotype: New Caledonia, Koumac, Mandjélia, 29. VII. 1982, primary rainforest, leaf litter and soil around base of tree.

We dedicate the new species to Mrs. and Mr. SZEMMELVEISZ, New Caledonia (Nouméa) for their intensive help in my soil zoological investigations in New Caledonia.

LOHMANNIIDAE BERLESE, 1916

Meristacarus douhereti sp. n. (Fig. 2)

Length: 768 μm, breadth: 439 μm.

Prodorsum: Sensillus pectinate, with 7—8 unequal branches: 1—4 are of the same length, 5—7 or 5—8 gradually shortened. Hairs *in*, *le* and *ro* very long and straight, hairs *exp* shorter; hairs *exa* shorter than *exp*. Prodorsum with irregularly scattered areae porosae.

Notogaster: Hairs c_3, d_3, f_1, f_2, h_3, h_2 and ps_1 long, hairs h_1 shorter, hairs c_1, c_2, d_1, d_2, e_1 and e_2 short. 10 or 11 transversal bands (sillons transversaux rubannés) on the notogaster.

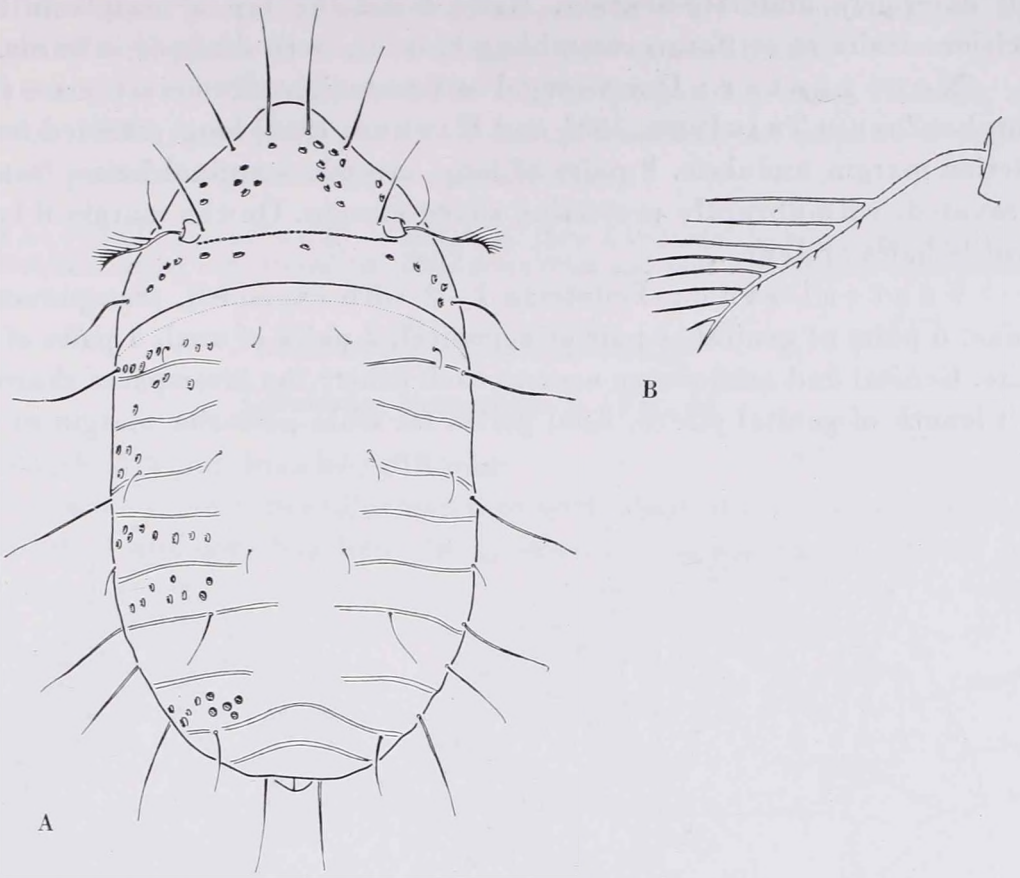

Fig. 2. *Meristacarus douhereti* sp. n. — A = notogaster, B = sensillus

V e n t r a l s i d e : Peculiar to *Meristacarus*, i.e. genital plates without a transverse suture; preanal plate wide; anal and adanal plates separated; anal plates without anal hairs; 4 pairs of adanal hairs.

R e m a r k s : This species is very similar to *Meristacarus heterotrichus* Csiszár, 1961 (Indonesia), but the latter has much shorter *exa* and *exp* and longer h_1 hairs.

M a t e r i a l e x a m i n e d. — Holotype: New Caledonia, Koumac, Mandjélia, 29. VII. 1982, primary rainforest, leaf litter and soil around base of tree; 2 paratypes: same locality.

We dedicate the new species to Mr. P. Douheret, New Caledonia (Nouméa), head of les Eaux et Forêts for his considerable help during my investigations in New Caledonia.

EUTEGAEIDAE Balogh, 1965

Porrhotegaeus herminae sp. n. (Fig. 3)

Length: 972—1066 μm, breadth: 841—869 μm.

P r o d o r s u m : Sensillus long, bacilliform, with pointed tip. Hairs *in* not visible. Lamellae broad converging, with triangular cuspis; their apical

half exteriorly undulate-dentate. Hairs *le* on the top of cuspis in a small excision. Hairs *ro* setiform, resembling hairs *le*, both directed inwards.

N o t o g a s t e r : Dorsosejugal suture straight. Humeral process ("pteromorphae" sensu TRÄGÅRDH, 1931 and HAMMER, 1966) long, directed forwards, interior margin undulate. 8 pairs of long, erectile marginal hairs. Notogaster excavated, with abruptly projecting sharp margin. On the margin 8 long and erectile hairs present.

V e n t r a l s i d e : Pedotecta 1—3 with expanded, transparent membrane. 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Genital and anal plates near to each other; the interspaces shorter than half length of genital plates. Anal plates far from posterior margin of ventral

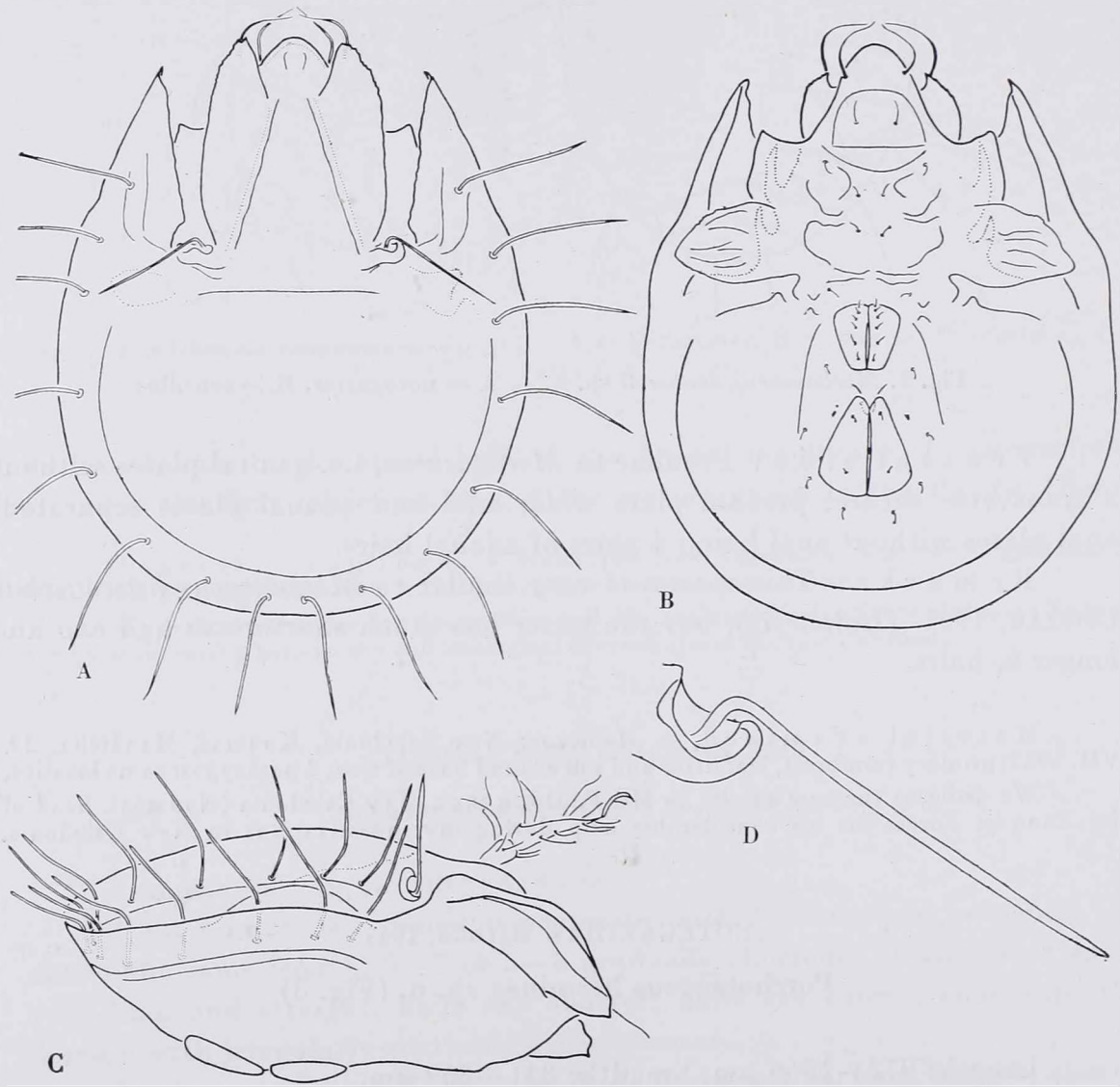

Fig. 3. *Porrhotegaeus herminae* sp. n. — A = notogaster, B = ventral side, C = lateral side, D = sensillus

plate. Hairs ad_1 in postanal, ad_3 in adanal postion. *Pori iad* apoanal, but near to margin of anal plates at level of anterior pair of anal hairs.

Remarks: Generally similar to *Porrhotegaeus ornatus* BALOGH and MAHUNKA, 1966 (Australia), but the form of sensillus, the expanded part of pedotecta, position of *pori iad*, etc. are different.

Material examined. — Holotype: New Caledonia, Koumac, Mandjélia; primary rainforest, mixed with *Pandanus*, sifted from litter and soil; 3 paratypes: same locality.

CARABODIDAE C. L. KOCH, 1937

Carabodes kusseri sp. n. (Fig. 4)

Length: 472 μm, breadth: 213 μm.

Prodorsum: Sensillus capitate with short stalk. Its head smooth, black. Rostral and lamellar hairs long, smooth and arcuate. Hairs *in* with

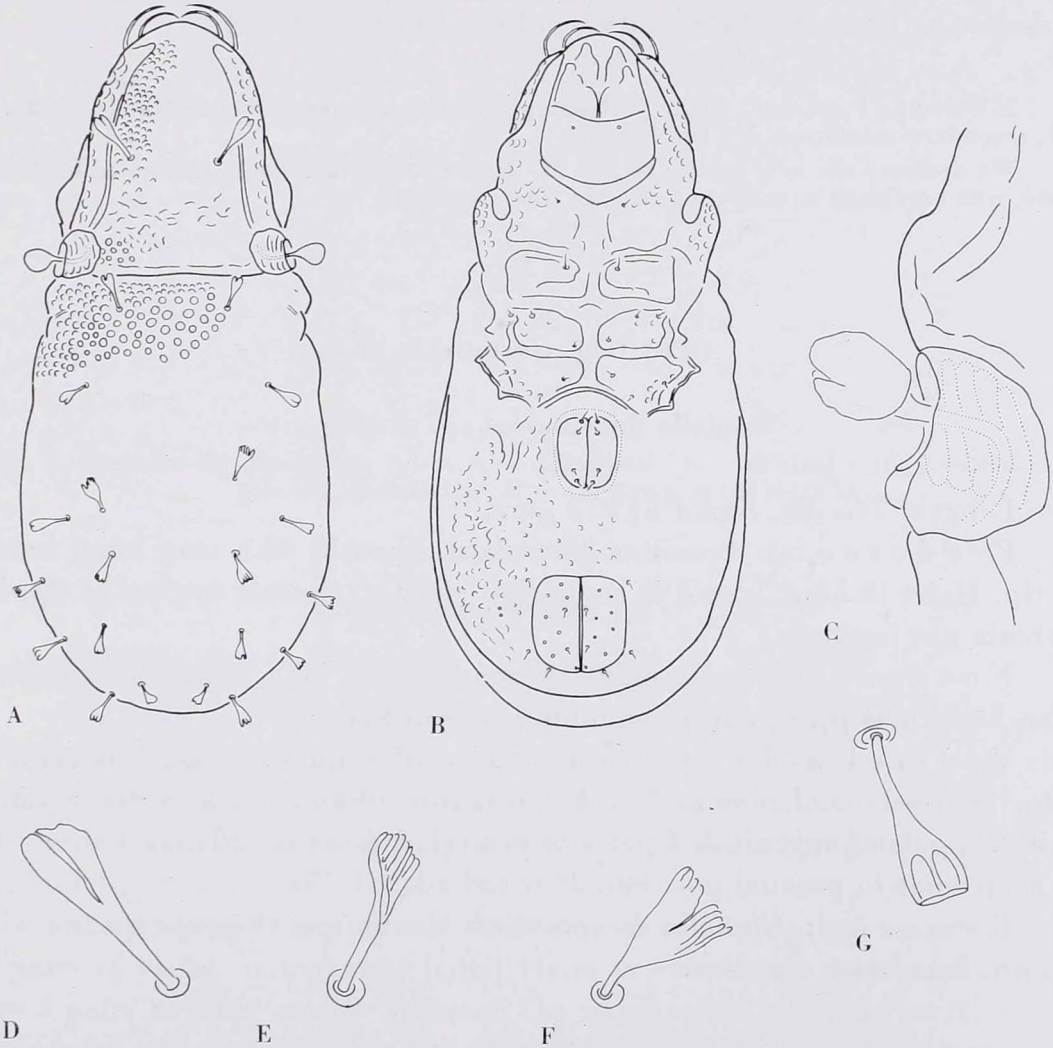

Fig. 4. *Carabodes kusseri* sp. n. — A = notogaster, B = ventral side, C = bothrydium and sensillus, D = seta *in*, E = seta *ta*, F = seta *ti*, G = seta p_1

dilated apical haf. Lamellae narrow, marginally foveolated. Interlamellar region with scattered tuberculation. Rostral part of prodorsum densely tuberculated.

N o t o g a s t e r : 10 pairs of dilated notogastral hairs. Notogaster densely tuberculated.

V e n t r a l s i d e : Epimeral hairs short, simple. 4 pairs of very short genital hairs. Aggenital hairs absent. 2 pairs of anal, 3 pairs of adanal hairs, all very short and setiform. Ventral plate with scattered foveolae and with some wrinkles in the lateral region.

R e m a r k s : There are two tropical *Carabodes* species without aggenital hairs: *C. strinovichi* BALOGH and MAHUNKA, 1978 (Queensland) and *Carabodes borhidii* BALOGH and MAHUNKA, 1979 (Cuba), both having dilated notogastral and setiform ventral hairs. The new species is nearer to *C. borhidii*, but their notogastral hairs more dilated, nearly palmate, while *C. strinovichi* has only less dilated notogastral hairs. Other *Carabodes* species without aggenital hairs occurring in the Holarctic Region belong to a quite different species-group (*C. dissimilis* BERNINI, 1976 and *C. pulcher* BERNINI, 1976).

M a t e r i a l e x a m i n e d. — Holotype: New Caledonia, Koumac, Mandjélia, 29. VII. 1982, secondary rainforest, dry leaf litter.

We dedicate the new species to Mr. M. KUSSER, New Caledonia (Nouméa) les Eaux et Forêts, who organized to collecting trips in New Caledonia.

OPPIIDAE GRANDJEAN, 1954

Oppiella doryphoros sp. n. (Fig. 5)

Length: 246 μm, breadth: 152 μm.

P r o d o r s u m : Sensillus lanceolate, smooth, with very long, acuminate tip. Hairs *in* long, *le* and *ro* somewhat shorter. Costula typical of *Oppiella*. Rostrum not incised.

N o t o g a s t e r : 10 pairs of moderately long, smooth notogastral hairs. Length of p_1, p_2 and p_3 equalling that of hairs *r*.

V e n t r a l s i d e : Generally a typical *Oppiella*. Epimeral setal formula: 3—1—3—3. Epimera 3 + 4 short, not arching backwards. 5 pairs of genital, 1 pair of aggenital, 2 pairs of genital, 3 pairs of adanal hairs. Hairs ad_3 somewhat in preanal position. *Pori iad* adanal.

R e m a r k s : *Oppiella doryphoros* is the unique *Oppiella* species with a smooth, lanceolate sensillus.

M a t e r i a l e x a m i n e d. — Holotype: Hawai, Kauai, Kokec, 23. X. 1969, rainforest, decaying tree, leg. J. BALOGH; 1 paratype: same locality.

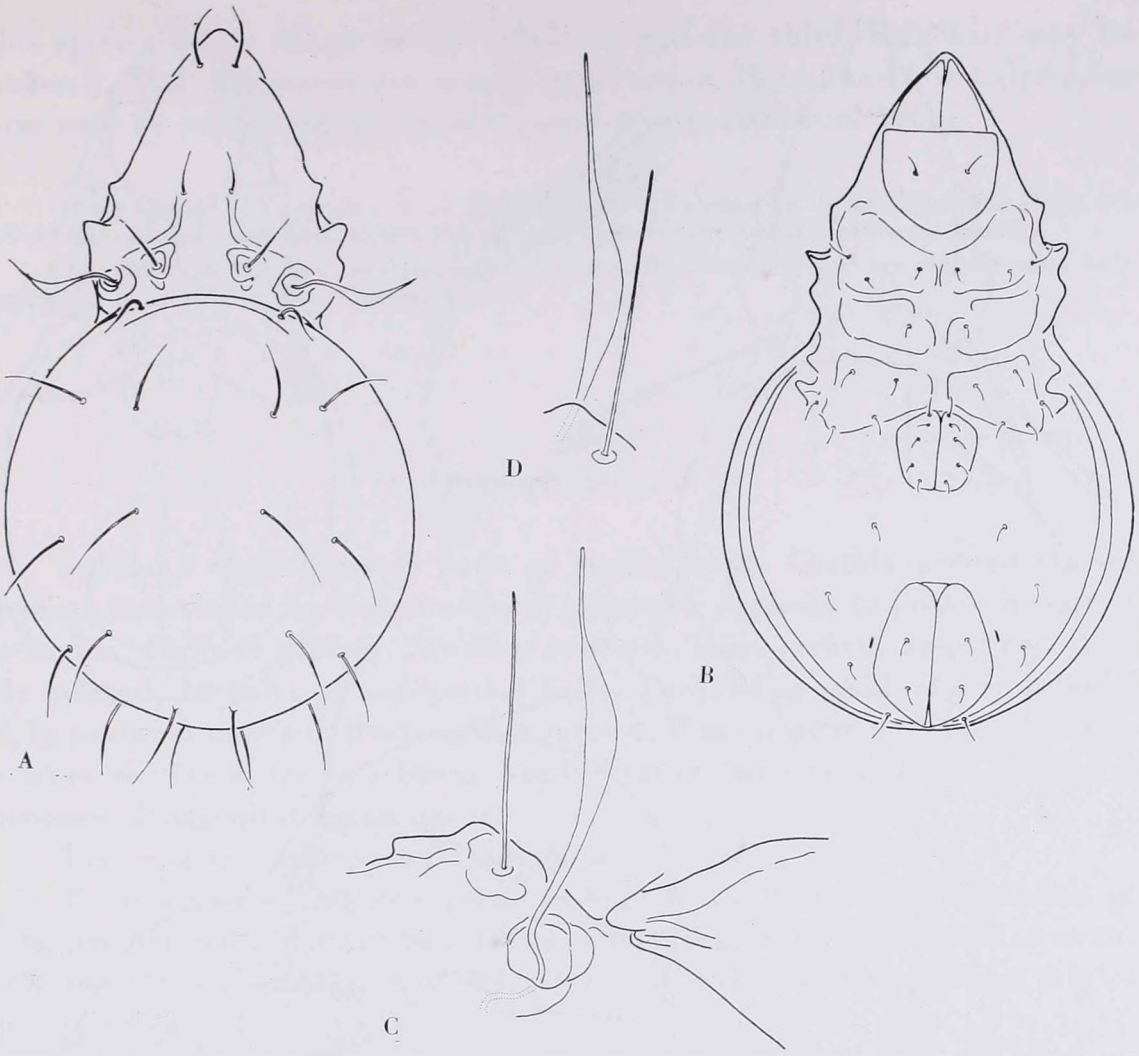

Fig. 5. *Oppiella doryphoros* sp. n. — A = notogaster, B = ventral side, C = sensillus and seta *in*, lateral view, D = the same in the right side

Elaphoppia lapelerii sp. n. (Fig. 6)

Length: 205—237 μm, breadth: 107—111 μm.

P r o d o r s u m : Sensillus very long, with long, fusiform head and with a long setiform tip, bilaterally ciliated with long cilia. Hairs *in* long, erectile; hairs *le* very small, on the cuspis of costula; hairs *ro* medium long, parallel. Costulae present as short Z-shaped crests. Prodorsum elongated; rostrum with a blunt tip, not incised.

N o t o g a s t e r : Crista visible as a very thin line on the shoulder. 8 pairs of visible notogastral hairs. Hairs *ta* extremely short and fine. There are 3 pairs of long, erectile hairs on the notogaster (*te*, *ti* and *ms*?), one short hair in the region of hairs and 3 pairs of very small posteromarginal hairs (probably p_1, p_2 and p_3). Notogaster circular.

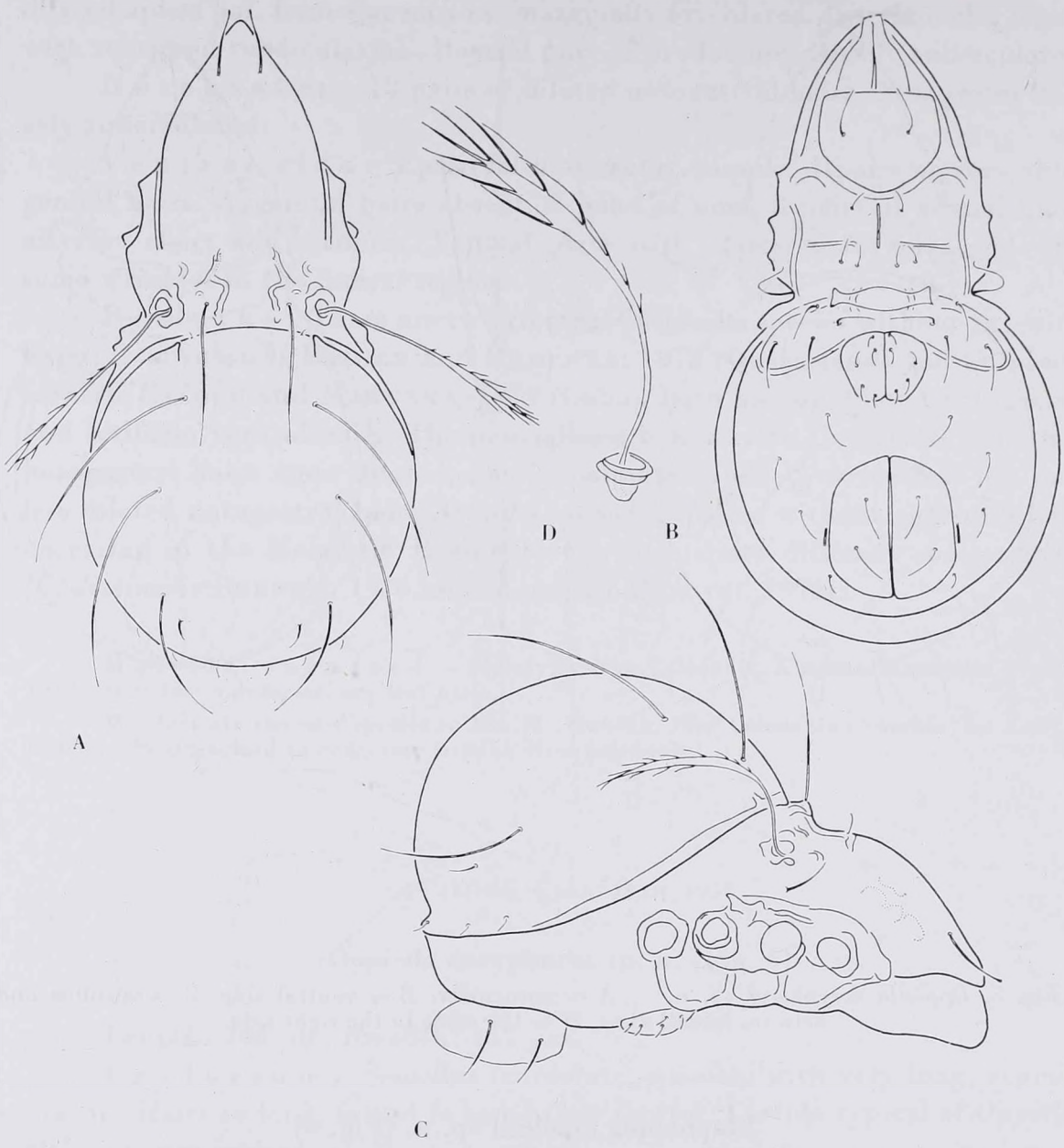

Fig. 6. *Elaphoppia lapelerii* sp. n. — A = notogaster, B = ventral side, C = lateral side, D = sensillus, lateral side

V e n t r a l s i d e : Epimera 3 + 4 narrow, therefore apodemata sejugal near to genital plates. 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Hairs ad_1 in a transitional position between the adanal and postanal plates, at the posterior corner of anal plates. Hairs ad_3 in preanal position. Anal plates extremely large. Distance between genital and anal plates shorter than the length of genital plates.

R e m a r k s : The new species is very similar to *E. quadripilosa* (BALOGH, 1960) (Madagascar). This species has only 2 pairs of long notogastral hairs

(this species is not found in our collection and the third, long hair may be broken !). The differences are mostly qualitative, thus, the New Caledonian form may be only a subspecies of *E. quadripilosa* (BALOGH, 1960).

Material examined. — Holotype: New Caledonia; Île des Pins, Pic N'ga, cca 200 m, humus and roots from under the maqui vegetation; 6 paratypes: same locality.

We dedicate the new species to Mr. F. LAPELERI (Nouméa) for his considerable help during our collecting in New Caledonia.

Lineoppia gen. n.

Subfam.: Oppiellinae. 5 pairs of genital hairs. Costula present. Crista present; represented by two cuneiform processes, opposite to posterior part of bothrydia. Hairs *ta* present. Sensillus setiform, long, arched, apical half densely ciliated, 10 pairs of notogastral hairs. *Pori iad* apoanal. Ad_3 in adanal, ad_1 in postanal position. Rostrum not incised. Hairs *le* nearer to hairs *in*, than to hairs *ro*. There are two linear bands behind hairs *ta* and the cuneiform processes. Postgenital region linear.

Type-species: *Lineoppia frouini* sp. n.

Remarks: This new genus belongs in the *Oxyoppia*-group close to *Oxyoppia* BALOGH and MAHUNKA, 1969 and *Sacculoppia* BALOGH and MAHUNKA, 1968, the above combination of characters distinctly separates it from that of the latter two.

Lineoppia frouini sp. n. (Fig. 7)

Length: 287 μm, breadth: 156 μm.

Prodorsum: Sensillus setiform, long, semicircular, densely ciliate. Hairs *in* reduced, represented by alveoli only. Hairs *le* short, arising inside of costulae, near to its cuspis. Hairs *ro* each on a short crest. Converging costulae present. There is a chitinous arch between hairs *le* and *ro*. Bothrydium with a chitinous tubercle opposite to cuneiform processes on the dorsosejugal suture. Intercostular region with scattered small foveolae or tuberculi.

Notogaster: Crista ıepresented by two cuneiform processes. 10 pairs of short notogastral hairs. Hairs *ta* arising inside of processes. Two radiate linear bands behind hairs *ta* and the cuneiform processes.

Ventral side: Apodemata sejugal laterally each with a cuneiform tubercle. 5 pairs of very short or reduced genital hairs. Hairs *ag* behind the

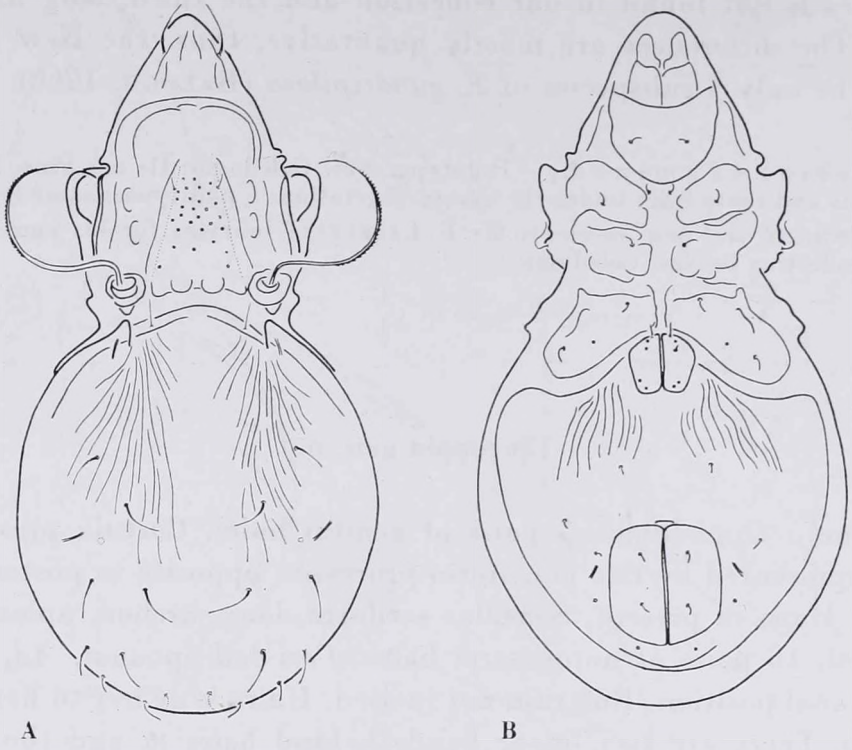

Fig. 7. *Lineoppia frouini* sp. n. — A = notogaster, B = ventral side

linear band. 3 pairs of adanal, 2 pairs of anal hairs, all extremely short. Hairs ad_1 in postanal, ad_3 in adanal position. *Pori iad* apoanal.

Material examined. — Holotype: New Caledonia, Koumac, Mandjélia; primary rainforest in a deep valley, near to a spring; very wet *Mnium*-moos and soil around the base of a tree; 1 Paratype: same locality.

We dedicate the new species to Mr. Th. Frouin, New Caledonia (Koumac), who organized the collectings in the Mandjélia area.

Brachyoppiella hannecarti sp. n. (Fig. 8)

Length: 332—336 μm, breadth: 180—186 μm.

Prodorsum: Sensillus pectinate, but only with three branches on its subapical part. Sensillus apically fusiform (this form is really a transition between the "pectinate" and "fusiform, unilaterally ciliate" type!). Hairs *in* medium long, *le* and *ro* shorter. Hairs *le* nearer to *in* than to *ro*. Behind hairs *in* a tubercle present. Hairs *le* each on a short, converging chitinous crest, resembling a cuspis. Rostrum not incised. Behind bothrydium a tubercle present.

Notogaster: Dorsosejugal suture arched, with two tubercles opposite to bothrydium. 10 pairs of short notogastral hairs. Hair *ta* very short.

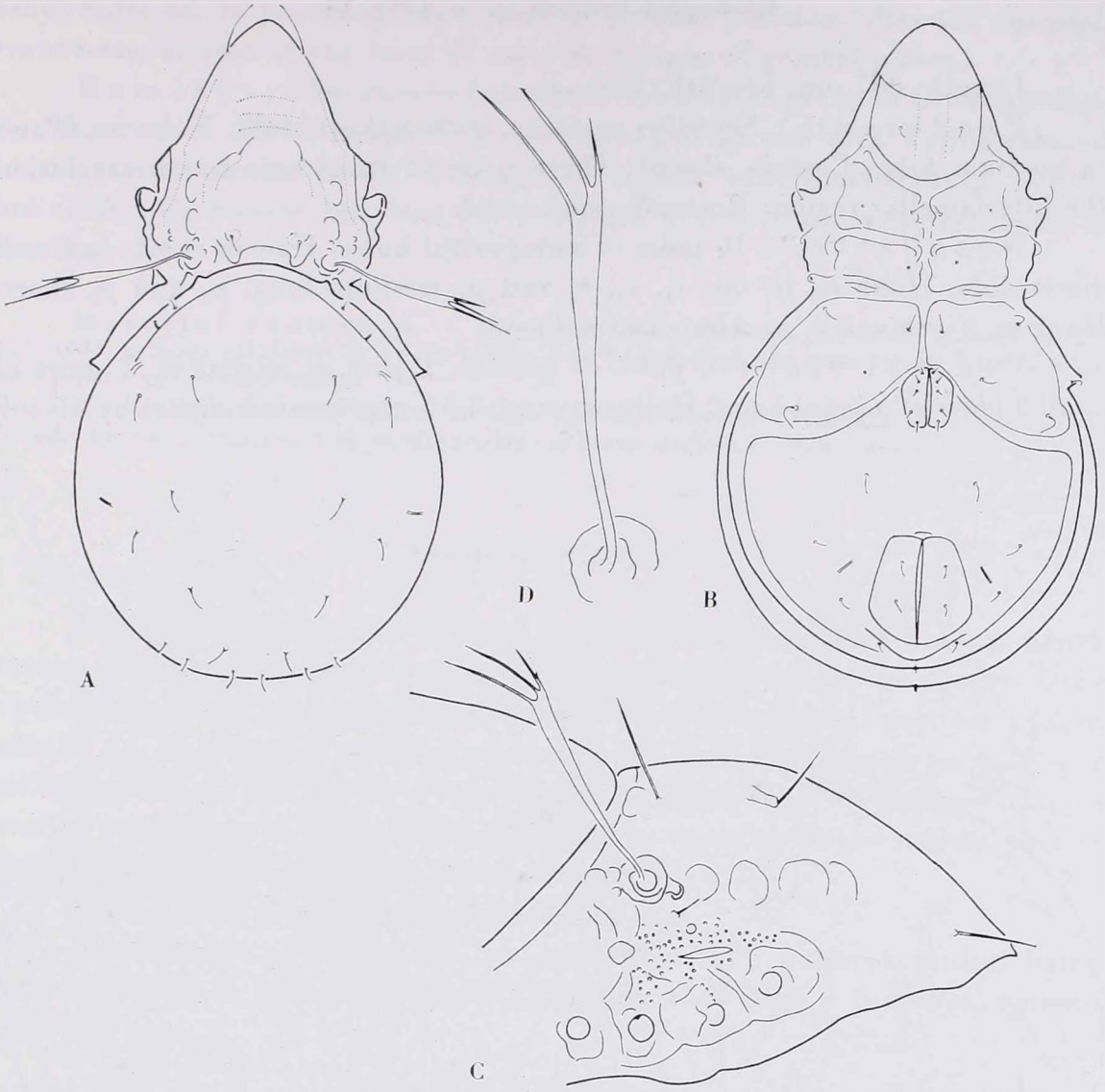

Fig. 8. *Brachioppiella hannecarti* sp. n. — A = notogaster, B = ventral side, C = prodorsum lateral side, D = sensillus, lateral side

Ventral side: 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. *Pori iad* in apoanal position. Hairs ad_1 in postanal, ad_3 in adanal position.

Remarks: The type of sensillus, the tubercles behind hairs *in* and the short chitinous crests at the hairs *le* quite unique in the genus *Brachioppiella* HAMMER, 1962.

Material examined. — Holotype: New Caledonia, Koumac, Mandjélia, Farino, 29. VII. 1982, primary rainforest, leaf litter and soil, around the base of tree; 1 paratype: same locality.

To express our gratitude to Mr. F. HANNECART (Nouméa), New Caledonian ornithologist, we name our new species after him.

Globoppia brinoni sp. n. (Fig. 9)

Length: 357 μm, breadth: 209 μm.

P r o d o r s u m : Sensillus capitate, with a short stalk. Hairs *in*, *le* and *ro* medium long. Costula absent. Three pairs of transverse ovate areolae in the interlamellar region. Rostrum not incised.

N o t o g a s t e r : 10 pairs of notogastral hairs. Hair *ta* short, but well discernible. Hairs *te*, *ti*, *ms*, r_1, r_2, r_3 and p_1 medium long, p_2 and p_3 short. Hairs *te*, *ti*, *ms* and r_2 in a longitudinal row.

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 hairs. Hairs *ag* very short, represented almost by alveoli

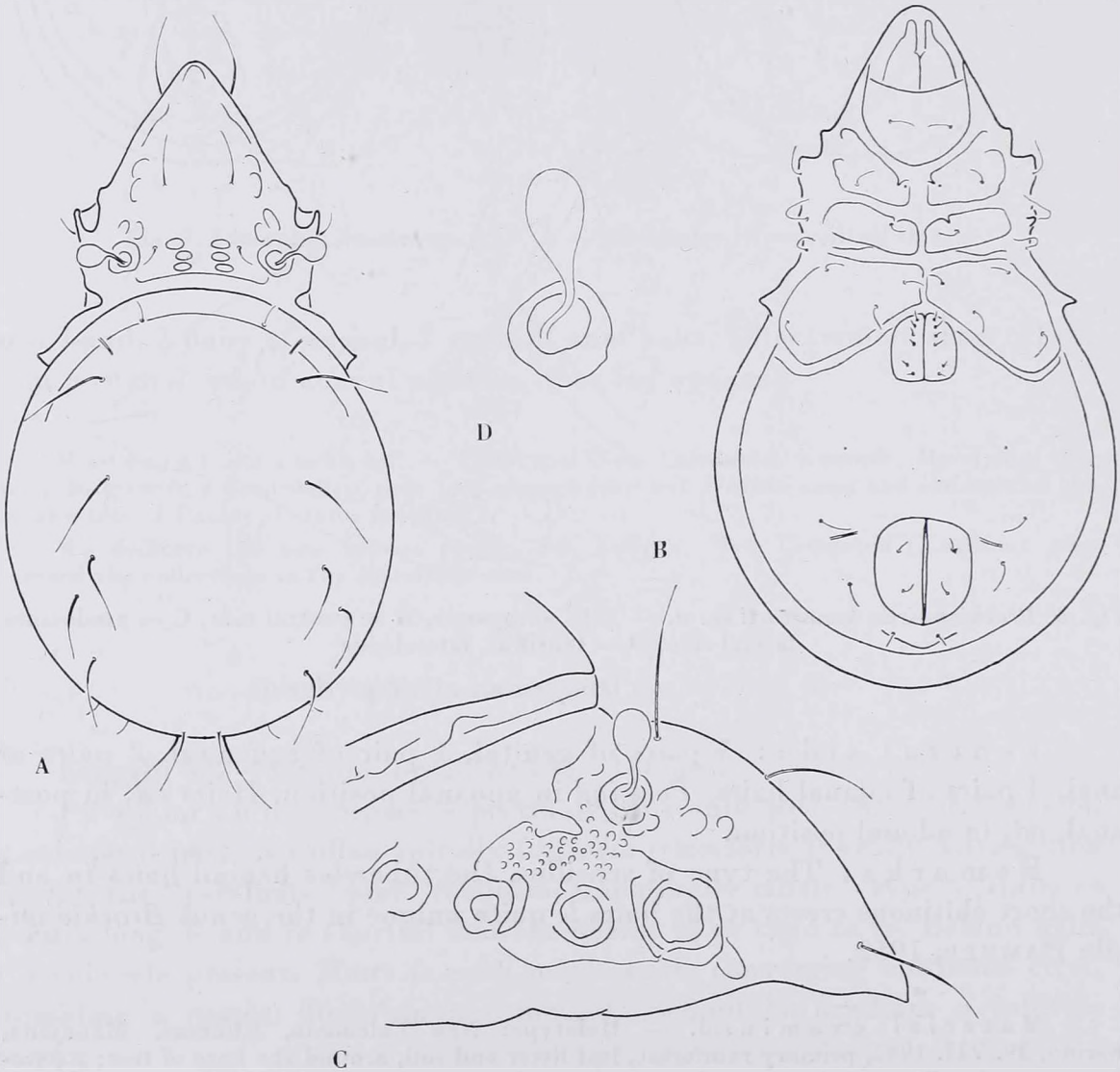

Fig. 9. *Globoppia brinoni* sp. n. — A = notogaster, B = ventral side, C = prodorsum, lateral side, D = sensillus

only; hairs ad_1 in postanal, ad_3 a little in preanal position. *Pori iad* apoanal, transverse, almost at the level of anterior margin of genital plates.

R e m a r k s : This species belongs to the species-group of *G. campbellensis* WALLWORK, 1964 (Campbell I.) i.e. *Globoppia* species with well-developed hairs *ta*, with areolae in the interlamellar region, with short hairs p_2 and p_3 but *Globoppia brinoni* has long hairs *in* and a very short, capitate head of sensillus.

M a t e r i a l e x a m i n e d. — Holotype: New Caledonia, Koumac, Mandjélia, 29. VII. 1982, primary rainforest in a deep valley, near to a spring; wet moss on the bark of a big tree; 1 paratype: same locality.

We dedicate this new species to Mrs. and Mr. BRINON (Nouméa, The Forest), our friends, for their immense help in our zoological investigations in New Caledonia.

Geminoppia gen. n.

Subfam.: Globoppiinae. 6 pairs of genital hairs. Costula absent. Crista absent. Sensillus fusiform, smooth, with a round tip. Hairs *ta* absent. Only 5 pairs of medium long notogastral hairs. *Pori iad* in apoanal position. Ad_3 in adanal, ad_1 in postanal position. Rostrum not incised. Hairs *le* in half way between hairs *in* and *ro*, or a little nearer to hairs *in*. Two chitinous knobs near to each other in the interlamellar region, opposite to the middle part of dorsosejugal suture (hence the generic name).

Type-species: *Geminoppia papineaui* sp. n.

R e m a r k s : This is the first Oppiid with 6 pairs of genital hairs, combined with a notogastral setal reduction and with a fusiform, smooth sensillus.

Geminoppia papineaui sp. n. (Fig. 10)

Length: 394 μm, breadth: 217 μm.

P r o d o r s u m : Sensillus long, fusiform, smooth, with a rounded tip. Hairs *in* short, near to bothrydium. Two chitinous knobs in the interlamellar region. Hairs *le* and *ro* longer; hairs *le* nearer to hairs *in* than to hairs *ro*, or in half way between these. Rostrum not incised. Laterobasal part of prodorsum granulate.

N o t o g a s t e r : 5 pairs of fairly long notogastral hairs. Hairs *ta* represented only by alveoli.

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 hairs. *Pori iad* in apoanal position. All hairs on the ventral side short.

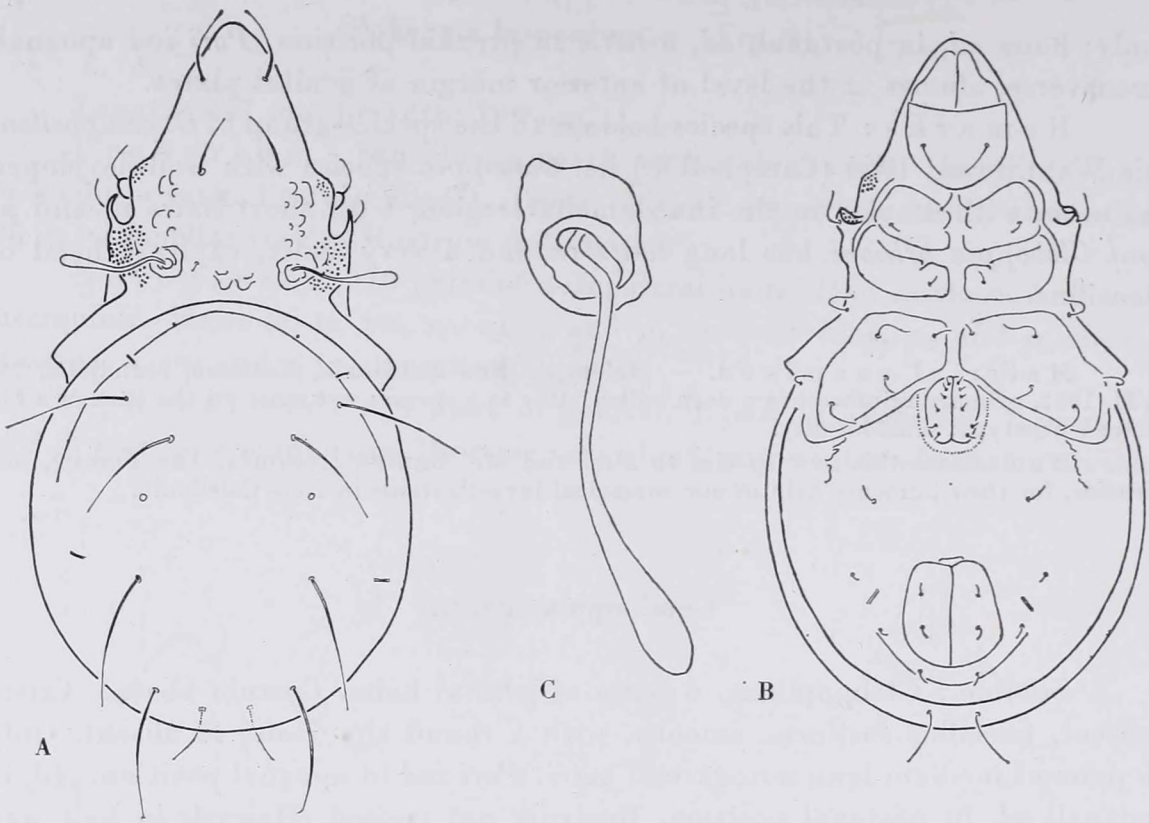

Fig. 10. *Geminoppia papineaui* sp. n. — A = notogaster, B = ventral side, C = sensillus

Material examined. — Holotype: New Caledonia, Koumac, Mandjélia, 29. VII. 1982, primary rainforest, leaf litter and soil, around the base of tree; 1 paratype: same locality.

To express our gratitude to Mr. C. PAPINEAU (Koumac) we name our new species after him; he supported our collecting work in the Koumac area.

Exanthoppiinae subfam. n.

5 pairs of genital hairs. Costula absent. Crista absent. Hairs *ta* absent. Sensillus capitate with a short stalk. 9 pairs of short, simple notogastral hairs. Ad_3 in preanal, ad_1 in postanal position. Rostrum not incised. Hairs *le* nearer to hairs *in* than to *ro*. Notogaster, prodorsum and ventral side with dense chitinous granulation.

Type of subfamily: *Exanthoppia* gen. n.

Remarks: The combination of these characters is quite unique in the family of Oppiidae.

Exanthoppia gen. n.

5 pairs of genital setae. Costula absent. Crista absent. Hair *ta* absent. Sensillus capitate, with a short stalk. *Pori iad* in marginal position. 9 pairs of notogastral hairs. Rostrum not incised. Lamellar hairs nearer to interlamellar

than to rostral hairs. Notogastral hairs setiform. Hairs ad_3 in preanal position. Apodemata 4 absent. Entire dorsal surface and the greatest part of the ventral side covered with dense chitinous granulation.

Type-species: *Exanthoppia ornatissima* sp. n.

Remarks: The above combination of characters is unique in the family Oppiidae. It is probable that *Exanthoppia ornatissima* is an isolated form, belonging to a new subfamily Exanthoppiinae.

Exanthoppia ornatissima sp. n. (Fig. 11)

Length: 201 μm, breadth: 131 μm.

Prodorsum: Sensillus capitate with a big head and with a short stalk. Hairs *in* and *le* very short and fine; hairs *ro* much longer, parallel.

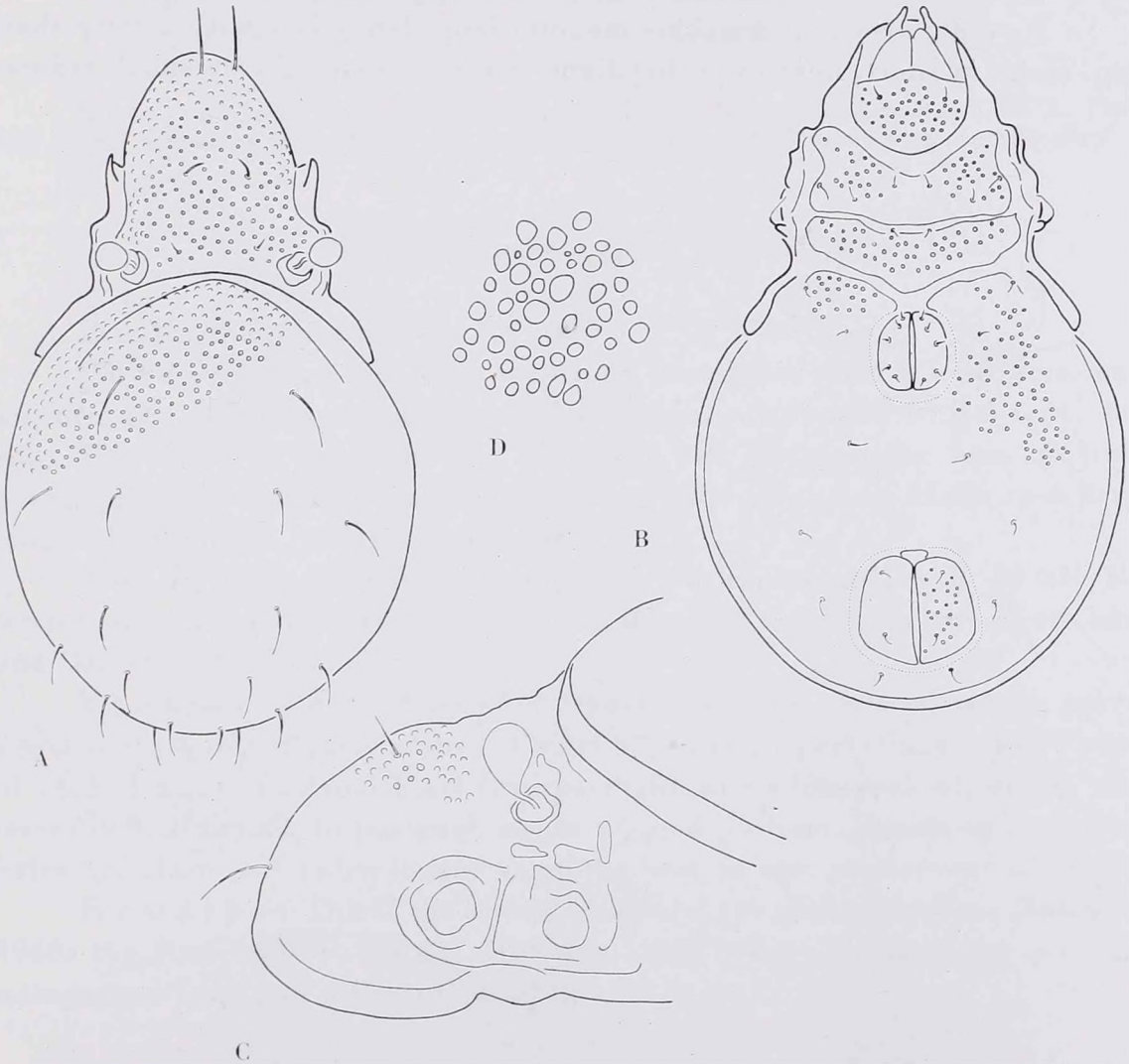

Fig. 11. *Exanthoppia ornatissima* sp. n. — A = notogaster, B = ventral side, C = prodorsum, lateral side, D = sculpture of notogaster, deeper part of cuticula

Costulae absent. Rostrum not incised. Prodorsum covered with fairly dense granulation.

N o t o g a s t e r : 9 pairs of short, setiform notogastral hairs. Hairs *ta* absent. Notogaster covered with dense chitinous granulation, broadly oval. Under the chitinous granulation (under greater magnification!) there is an irregular foveolate structure.

V e n t r a l s i d e : 5 pairs of very tiny genital, 1 pair small aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Hairs ad_3 preanal position. Ventral side with the exception of genital plates densely granulate.

M a t e r i a l e x a m i n e d. — Holotype: Hawaii, Maui, Olinda; Korlau State Forest, 26. X. 1969, swampy forest, hanging moss, leg. J. BALOGH; 1 paratype: same locality.

Paroppia hawaiiensis sp. n. (Fig. 12)

Length: 385—430 μm, breadth: 217—246 μm.

P r o d o r s u m : Sensillus medium long, lanceolate with a very sharp tip. Hairs *in* short, near to bothrydium. A small group of very small, reduced

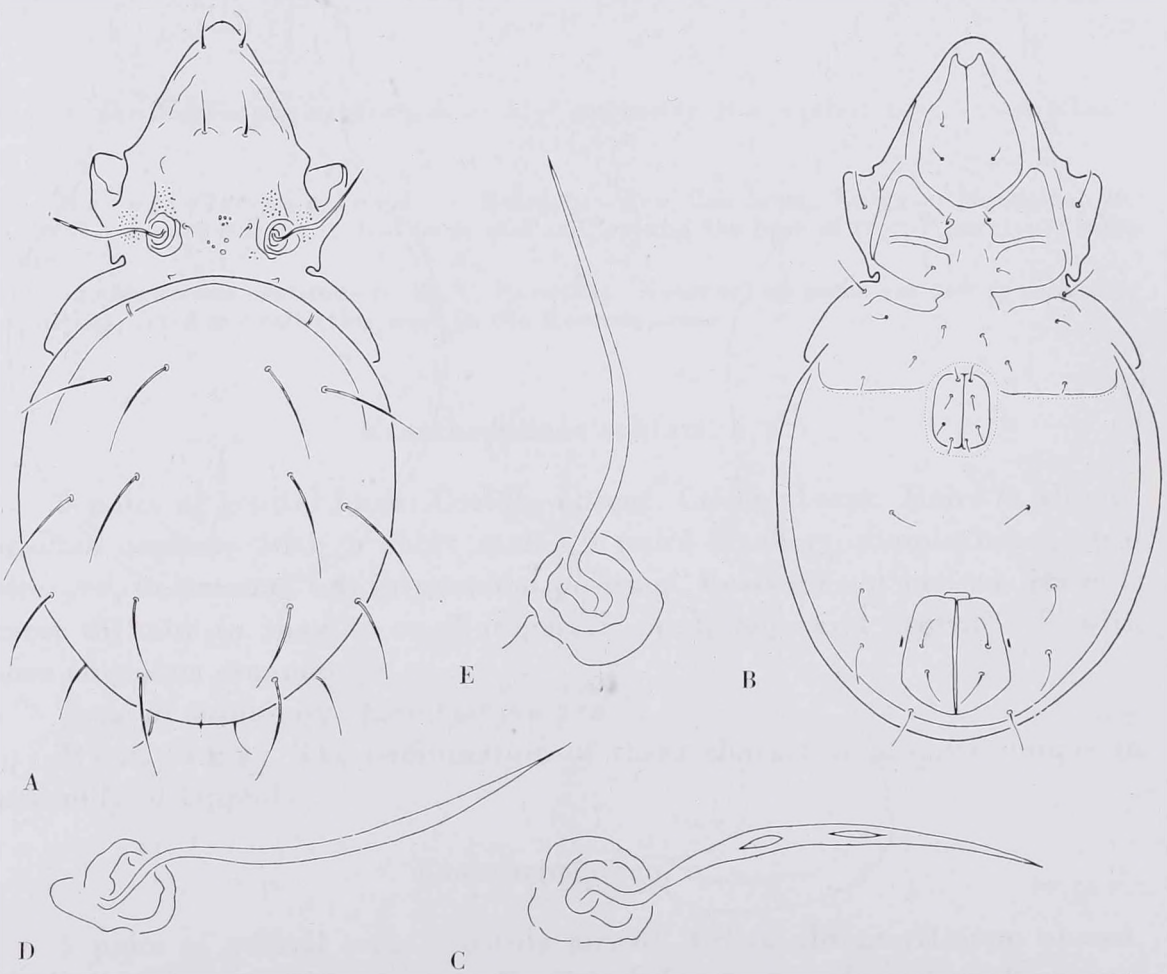

Fig. 12. *Paroppia hawaiiensis* sp. n. — A = notogaster, B = ventral side, C—E = sensillus, different types

areolae present in the interlamellar area. Fine punctulation before bothrydia. Hairs *le* about in half way between hairs *in* and *ro*, medium long. Hairs *ro* shorter, setiform. Rostrum not incised.

Notogaster: 9 pairs of long, setiform notogastral hairs. Hairs *ta* reduced; no alveoli present.

Ventral side: Apodemata 4 straight. 4 pairs of genital hairs, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Anal and adanal hairs medium long, hairs ad_1 in postanal, ad_3 in preanal position, but in half way between hairs ad_2 and *ag*.

Remarks: The new species is similar to *P. lebruni* HAMMER, 1968 (New Zealand) but the differences are:

	P. lebruni	*P. hawaiiensis*
alveoli of hairs *ta*	present	absent
notogastral hairs	shorter	longer
punctulation before bothrydium	absent	present
apodemata 4	arched	straight

Material examined. — Holotype: Hawaii, Hawaii I., Kilauea, 5—6. X. 1968, fern jungle (*Cibotium* fern), litter and humus; leg. J. BALOGH; 3 paratypes: same locality.

Paroppia flagellata sp. n. (Fig. 13)

Length: 250 μm, breadth: 160 μm.

Prodorsum: Sensillus very long, lanceolate with a long, fine, and setiform tip. Hairs *in* extremely small and thin, surrounded with a fairly big ring. Two or three small slit-like areolae in the interlamellar area. Costula absent. Hairs *le* small, in half way between hairs *in* and *ro*. Hairs *ro* a little longer than hairs *le*. Rostrum not incised.

Notogaster: Crista absent. Hairs *ta* represented only by alveoli. 9 pairs of very fine notogastral hairs with flagellate end. Hairs p_1—p_3 are long and flagellate, too.

Ventral side: Somewhat transformed and reduced mouth parts. Apodemata 4 only slightly arched. 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs (exceptionally one additional ad_3 or ad_2 unilaterally !). Hairs ad_1 in postanal, ad_3 in preanal position, almost in level with hairs *ag*. Hairs ad^1 twice longer than the rest in the genito-ventral region.

Remarks: This is the second species of the genus *Paroppia* HAMMER, 1968; the first one: *P. lebruni* HAMMER, 1968 (New Zealand) has setiform notogastral hairs and different sensillus.

Material examined. — Holotype: Hawaii, Hawaii I., Kilauea, 2—6 X. 1968, fern jungle (*Cibotium* fern); leg. J. BALOGH.

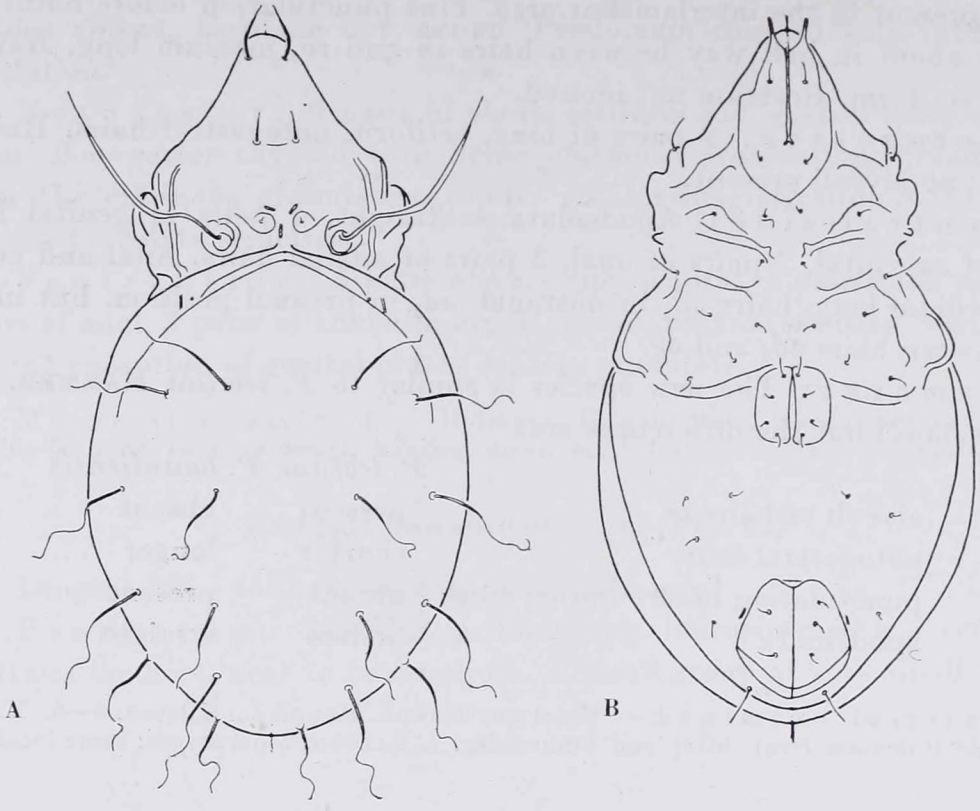

Fig. 13. *Paroppia flagellata* sp. n. — A = notogaster, B = ventral side

Rhynchoppia azaisi sp. n. (Fig. 14)

Length: 394 μm, breadth: 262 μm.

P r o d o r s u m : Sensillus long, at the end slightly fusiform, smooth. Hairs *in* and *le* short, hairs *ro* much longer, typical of Subtobelbidae. Hairs *in* near to bothrydium sitting on a small tubercle. Hairs *le* very near to each other, on a common tubercle. Hairs *ex* very small. Prodorsum with concentric tuberculation.

N o t o g a s t e r : 9 pairs of notogastral hairs(?) with flagelliform end. 2 pairs in posteromarginal position somewhat shorter.

V e n t r a l s i d e : Ventral hairs short. 6 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Apodemata 4 well developed.

R e m a r k s : There are two species of *Rhynchoppia: Rh. capillata* (BALOGH, 1963) (Angola) and *Rh. sedlaceki* BALOGH, 1968 (Papua New Guinea); both have dentate rostral margin, different sensillus and notogastral setation.

M a t e r i a l e x a m i n e d. — Holotype: New Caledonia, Koumac, Mandjélia, 29. VII. 1982, primary rainforest, leaf litter and soil, around the base of a tree; 1 paratype: same locality.

The new species is dedicated to Mr. N. AZAIS New Caledonia (Nouméa) les Eaux et Forêts, for his help in our collecting work in New Caledonia.

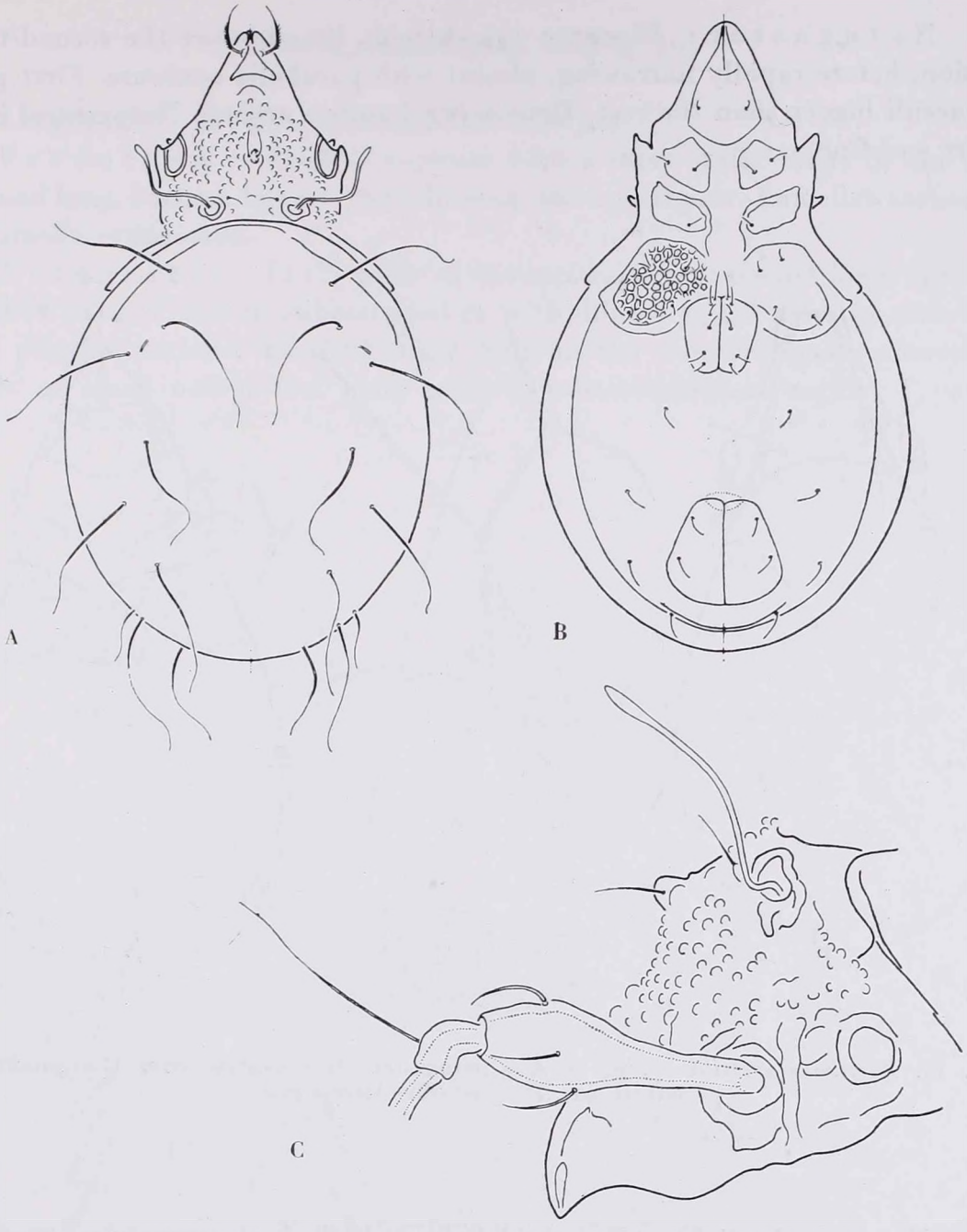

Fig. 14. *Rhynchoppia azaisi* sp. n. — A = notogaster, B = ventral side, C = prodorsum, lateral side

ORIBATULIDAE Thor, 1929

Hemileius gressitti sp. n. (Fig. 15)

Length: 525 μm, breadth: 267 μm.

P r o d o r s u m : Sensillus medium long, with capitate head, finely granulate. Prodorsal hairs long. Lamellae narrow; sublamellae and prolamellae present.

Notogaster: Elongate egg-shaped: broadest at the second-third section, before rapidly narrowing, almost with parabolic contours. First pairs of sacculi bigger than the rest. Dorsosejugal suture arched. Notogastral hairs short and fine.

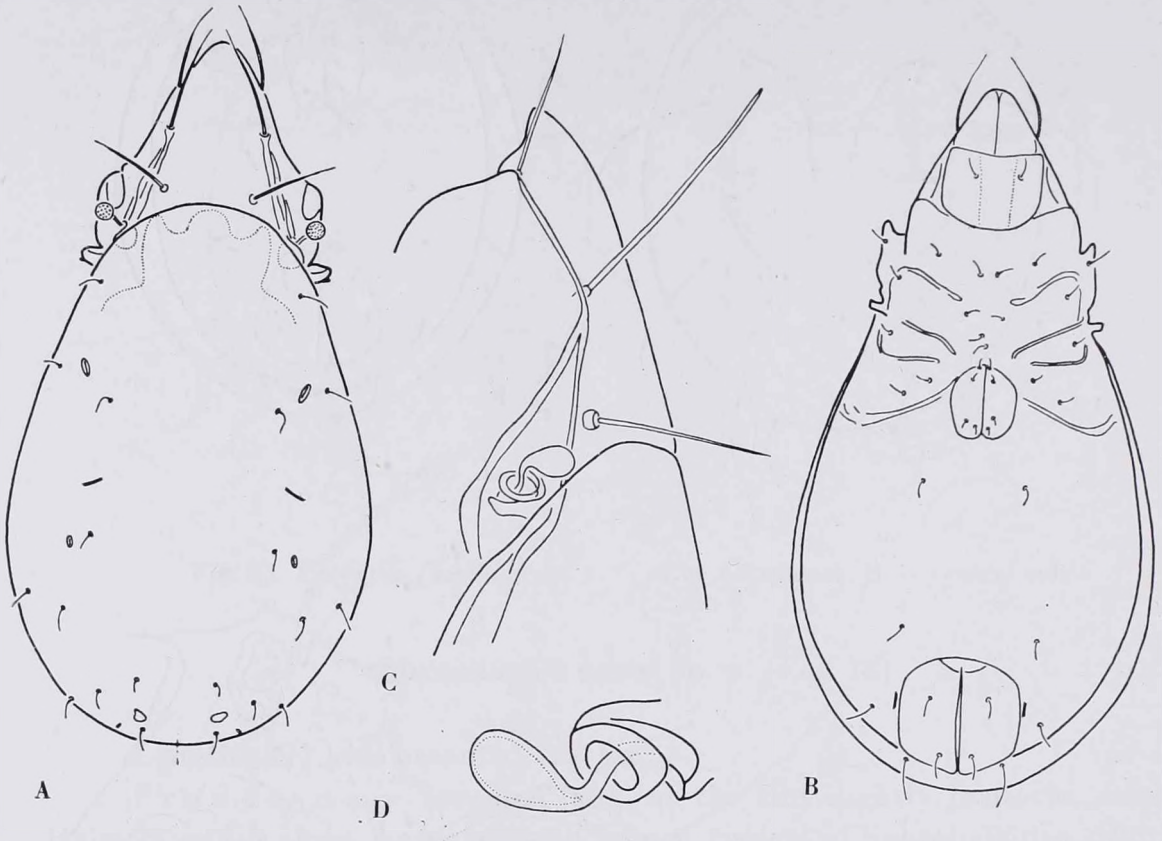

Fig. 15. *Hemileius gressitti* sp. n. — A = notogaster, B = ventral side, C = prodorsum, lateral side, D = sensillus lateral side

Ventral side: Epimeral hairs a little in asymmetrical position. All ventral hairs short. 4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 3 pairs of adanal hairs. Hairs ad_3 in preanal position. *Pori iad* adanal.

Remarks: The shape of notogaster, the sensillus, the length and position of the notogastral hairs, etc. clearly separate this species from all its congeners.

Material examined. — Holotype: Hawaii, Maui, Olinda, Makavvao Forest Reserve, 9. X. 1968, thick moss on a *Metrosideros*-tree; leg. J. BALOGH.

We dedicated our new species to the late DR. J. L. GRESSITT (Honolulu, USA, and Wau, Papua New Guinea), who had extended invaluable help to Hungarian zoologists carrying out research in the Hawaian Islands and everywhere in the Pacific Region.

Brassiella arboricola sp. n. (Fig. 16)

Length: 287—316 μm, breadth: 176—205 μm.

P r o d o r s u m : Sensillus capitate with a short stalk. Hairs *in* and *le* thick and long, barbed, but not densely so on the apical part. Lamellae arched; translamella evanescent.

N o t o g a s t e r : 13 (?) pairs of notogastral hairs: 6 pairs long, thick, barbed (4 pairs of this in submarginal *ro* with dilated tip; 2 pairs in contiodorsal position without dilation). Each hair on the shoulder small, smooth. 4 pairs of small notogastral hairs near to posteromarginal region, 1 pair

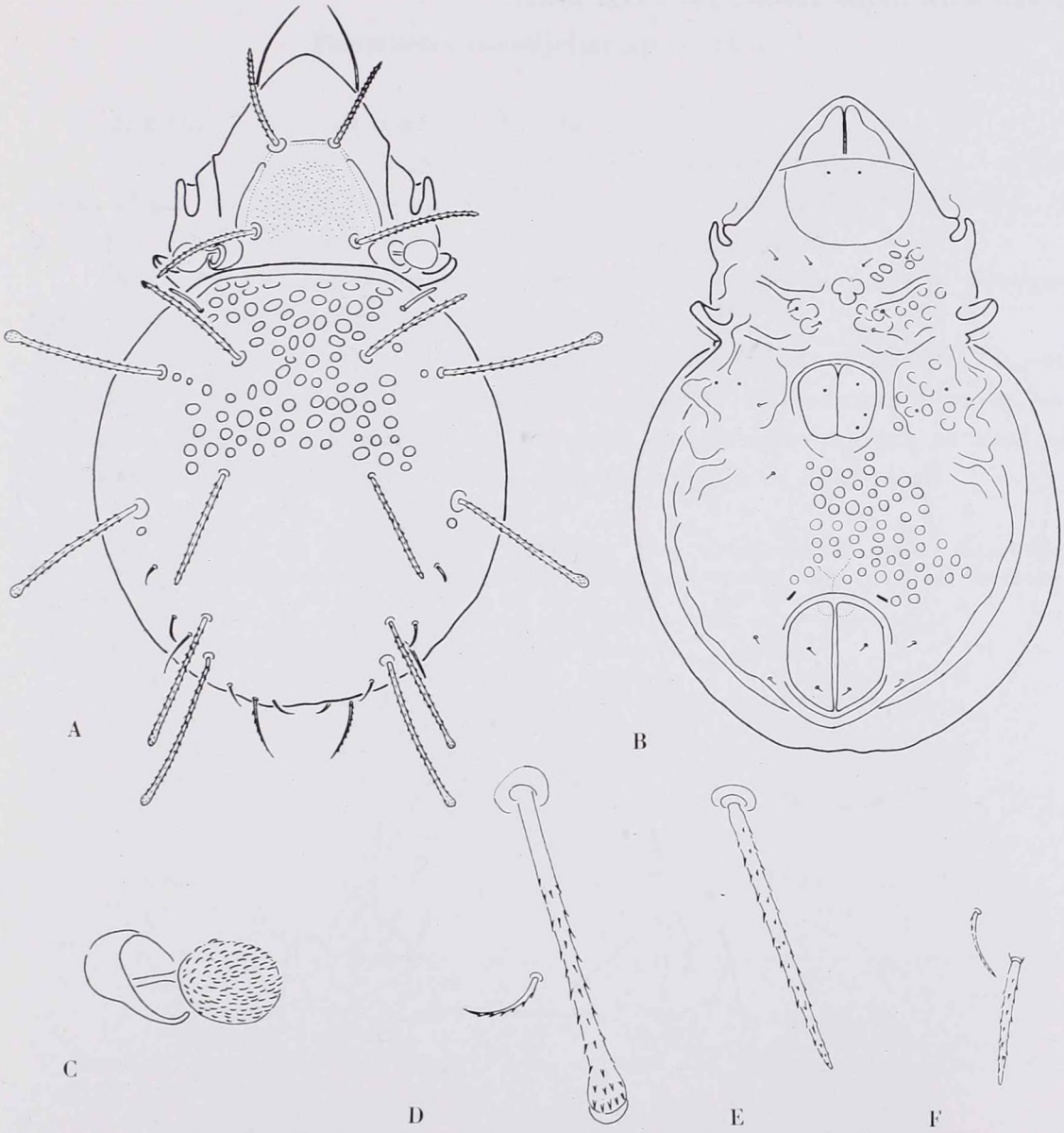

Fig. 16. A—F: *Brassiella arboricola* sp. n. — A = notogaster, B = ventral side, C = sensillus, dorsal, D—F = different types of notogastral setae

longer with fine cilia on the posterior margin. Notogaster with irregular foveolae.

V e n t r a l s i d e : 3—4 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 2 pairs of adanal hairs. *Pori iad* in preanal position as in the other species of the genus.

R e m a r k s : There are two known species: *B. reticulata* (OUDEMANS, 1916) (Ceylon) captured by *Nephentes*, occurring in the litter on Papua New Guinea, too; *B. penicillifer* HAMMER, 1973 (Samoa) Tongatapu, at Ha'amonga, slightly moist litter from a one metre deep hole in the coral cliff on the shore. The new species has different notogastral setation and has been collected with an umbrella fom the lower canopy level. New Caledonia, Lifou I., Wé, coral plateau with dense forest, 15. VIII. 1982.

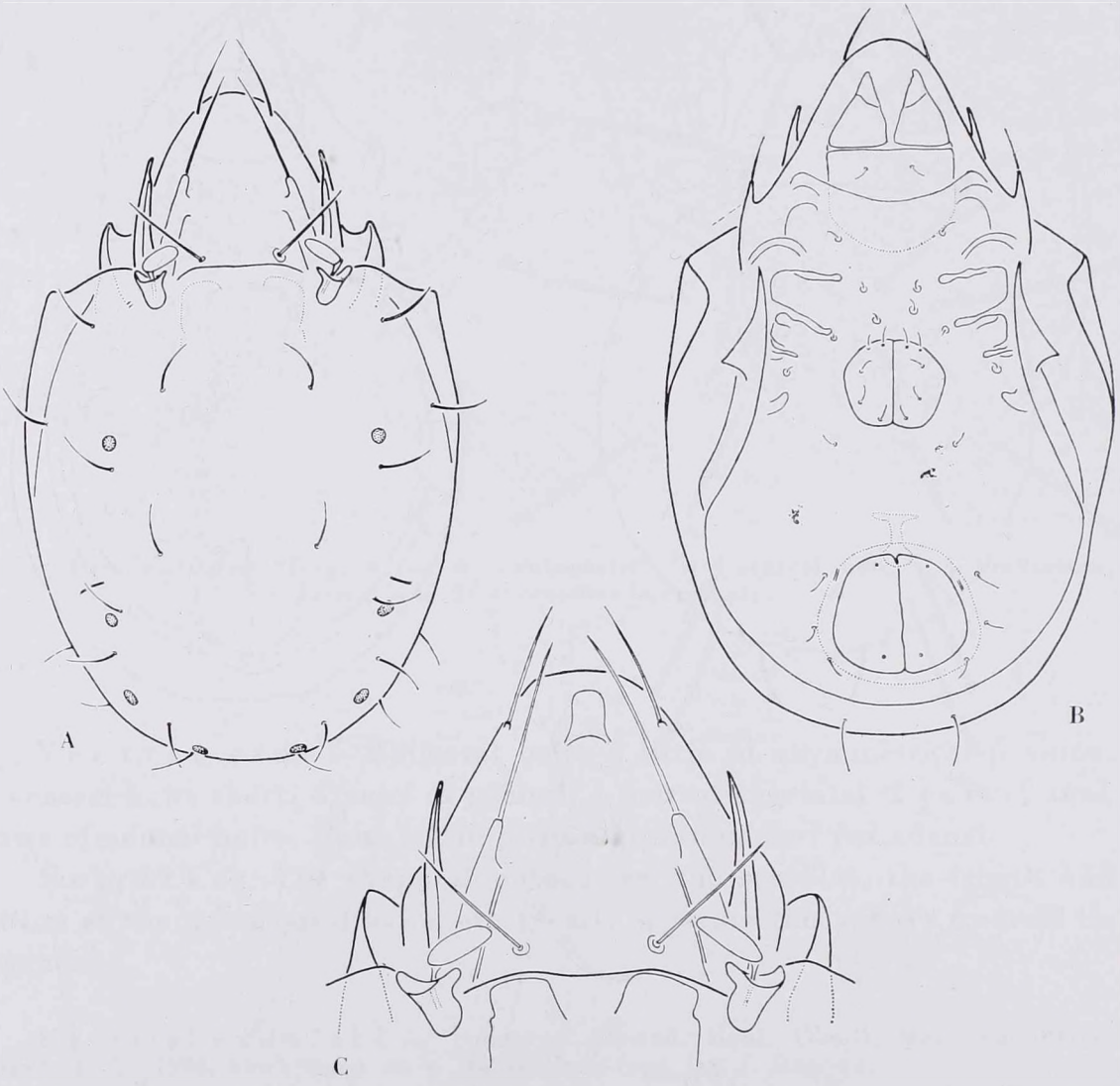

Fig. 17. A—C: *Pentazetes mandjeliae* gen. n., sp. n. — A = notogaster, B = ventral side, C = prodorsum, dorsal

CERATOZETIDAE JACOT, 1925

Pentazetes gen. n.

Diagnosis: Prodorsum with short lamellae and with lamellar cuspides bearing the hairs *le*. Custodium, discidium and tutorium well developed. Translamella evanascent. 5 pairs of genital hairs. 4 pairs of true areae porosae. 11 pairs of notogastral hairs.

Type-species: *Pentazetes mandjeliae* sp. n.

Remarks: The typical Ceratozetidae characters combined with 5 pairs of genital hairs are exceptional.

Pentazetes mandjeliae sp. n. (Fig. 17)

Length: 328 μm, breadth: 217 μm.

Prodorsum: Sensillus with thick, oval head and with a very short stalk. Hairs *in*, *le* and *ro* long. Lamellae short, translamella evanescent. Hairs *le* on the top of lamellar cuspis. Tutorium long and sharp.

Notogaster: 4 pairs of true areae porosae, 11 pairs of notogastral hairs. Dorsosejugal suture straight.

Ventral side: Custodium pointed. 5 pairs of genital, 1 pair of aggenital, 2 pairs of anal, 2 pairs of adanal hairs. All adanal hairs in adanal position! Anal hairs nearer to anterior than to posterior margin of anal plate. *Pori iad* in adanal position, near to anterior margin of anal plate.

Material examined. — Holotype: New Caledonia, Koumac, Mandjélia, 29. VII. 1982, primary rainforest in a deep valley, near to a spring; wet moss on the bark of a big tree.

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REVISION DER TYPEN DER PALÄARKTISCHEN ARTEN DER GATTUNG TRICIMBA LIOY, 1864 (DIPTERA: CHLOROPIDAE)*

Á. DELY-DRASKOVITS

(Eingegangen am 30. November 1982)

A revision of the Palaearctic species belonging to the genus *Tricimba* LIOY, 1864 is given. Paper contains the descriptions of 13 new species of the genus, the designations of 7 lectotypes, for 2 species the originally them given taxonomic rank of a species is restituted and 1 new synonymic name has been proposed. Beside the descriptions of the known and new species of the genus, designations of the types, differential diagnoses a key for determination and faunistical data are given too.

Die Gattung *Tricimba* wurde 1864 von LIOY beschrieben. Er ordnete zwei schon früher beschriebene Arten (*Oscinis lineella* FALLÉN, 1820 und *Chlorops cincta* MEIGEN, 1830) der neuen Gattung aufgrund der auf der Dorsalseite des Thorax ziehenden Längsfurchen zu. Als Typusart der Gattung wurde von ENDERLEIN (1911) *T. lineella* FALLÉN, 1820 bezeichnet. Dies ist die kurze, aber authentische Geschichte der Aufstellung der Gattung. Darüber wurde auch in den seither erschienenen Arbeiten berichtet (BECKER, 1905, 1910; DUDA, 1933; SABROSKY, 1941; ANDERSSON, 1977; NARTSHUK, 1983). BECKER (1903) wußte überhaupt nichts von der früher erschienenen Arbeit von LIOY. Aufgrund eines in Ägypten gesammelten Exemplars (*N. setulosa* BECKER, 1903) stellte er eine neue Gattung (*Notaulax* BECKER, 1903) auf. Einige Jahre später erwähnte ENDERLEIN (1911) diesen Namen schon als ein Synonym der Gattung *Tricimba*. Später stellte es sich noch von einer anderen Art (*Oscinis humeralis* LOEW, 1858) heraus, daß sie ebenfalls zu dieser Gattung gehört *T. curvata* SABROSKY, 1964 wurde schon als Angehörige dieser Gattung beschrieben. Im Laufe der Zeit wurde weiterhin klar, daß einige weitere Arten die Synonyme jener oder einer anderen gültigen *Tricimba*-Art darstellen (die Synonymien siehe weiter unten). Der Gattung *Tricimba* gehören zur Zeit 5 valide Arten (NARTSHUK, 1983) an. Diese Arten sind untereinander nicht so nahe verwandt, wie dies aufgrund der Anwendung des Systems, sie an einem einzigen Merkmal zu erkennen, angenommen wurde. Auf ihre hochgradige Heterogenität wurde auch von BESCHOVSKI (1981) hingewiesen, der für 4 *Tricimba*-Arten 3 Untergattungen aufgestellt hat. Nach unserer Meinung wäre es zur Zeit noch verfrüht, diese Gruppe sowohl in Untergattungen als auch in Gattungen aufzuspalten. Dieses Problem sollte einer späteren Phase der taxonomischen Bearbeitung überlassen werden.

Eine zusammenfassende Arbeit über die Arten der Gattung *Tricimba* ist bisher noch nicht erschienen. Dies würde aufgrund der niedrigen Artenzahl als eine Selbstverständlichkeit gelten. Sie wurden sowohl in dem Ausland als auch bei uns in Ungarn in großen Serien gesammelt; auch in unserer Dipteren-Sammlung befinden sich ungefähr 800 Exemplare. Ein Teil dieser Fliegen wurde aus Pilzen gezüchtet (DELY-DRASKOVITS, 1972), die ich unlängst neuerlich untersucht habe. Unerwarteterweise wiesen die Hypopygia äußerlich vollkommen identischer Formen weitgehende Unterschiede auf, aber keine von ihnen zeigte Ähnlichkeiten mit dem von ANDERSSON (1977) und BESCHOVSKI (1981) abgebildeten Kopulationsapparat der *T. cincta* MEIG. Deshalb schien mir eine unter neuen Gesichtspunkten durchgeführte Bearbeitung der Gattung als unbedingt notwendig.

* Contributions by Hungarian Zoologists to the exploration of invertebrates in Afghanistan (No. 11).

Vor allem wollte ich mich mit den ungarischen Arten beschäftigen. Ich hegte aber den Wunsch, einer weiteren Bearbeitung auch die gesamte paläarktische Region einzubeziehen. Um dies verwirklichen zu können, habe ich mich entschlossen, vor allem die Typen-Exemplare der bisher beschriebenen Arten zu untersuchen. Außerdem habe ich mir das Ziel gesetzt, aufgrund von Differential-Diagnosen enthaltenden Gattung- und Artbeschreibungen einen Bestimmungsschlüssel für die paläarktischen Arten zusammenzustellen. Auch der geographischen Verbreitung der Arten wurde besondere Aufmerksamkeit gewidmet.

Unser Untersuchungsmaterial stammt aus etwa 15 Ländern der paläarktischen Region (außerdem fanden aber auch die in Nordamerika heimischen Arten Berücksichtigung). Als Ausgangsbasis diente unseren Untersuchungen die mehrere hundert Exemplare enthaltende ungarische Sammlung. Das wertvollste Typen-Material wurde mir von den Berliner Kollegen zur Verfügung gestellt (WENDT, 1975). Wissenschaftlich besonders wertvoll haben sich die aus Israel und Afghanistan (PAPP, 1975) stammenden Exemplare erwiesen.

Die Typenexemplare sowie die Mehrzahl der an ausländischen Fundorten gesammelten Exemplare erhielt ich durch die Vermittlung folgender ausländischer Dipterologen-Kollegen: E. NARTSHUK (Zoologisches Institut, Leningrad), F. KAPLAN (Universität, Tel Aviv), U. ASPÖCK (Naturhistorisches Museum, Wien), S. MASCHERINI (Zoologisches Museum, Florenz), H. WENDT und H. SCHUMANN (Zoologisches Museum, Berlin), C. W. SABROSKY und N. MATHIS (National Museum, Washington), H. ANDERSSON und R. DANIELSSON (Zoologisches Museum, Lund), V. BESCHOVSKI (Zoologisches Institut, Sofia), K. KANMIYA (Universität, Kurume) und B. HERTING (Staatliches Museum, Stuttgart). Ich möchte ihnen allen für ihre Hilfsbereitschaft auch an dieser Stelle meinen aufrichtigsten Dank aussprechen.

Meine Untersuchungen können in aller Kürze folgenderweise zusammengefaßt werden: eine eingehende Revision der Gattung *Tricimba*, die dadurch um 13 weitere Arten bereichert wurde. In 7 Fällen habe ich einen Lectotypus designiert (*Chlorops apicalis* VON ROSER, *Ch. cincta* MEIG., *Notonaulax maculifrons* BECK., *Oscinis aristolochiae* ROND., *O. delpinii* ROND. und *O. humeralis* LOEW, *Notonaulax setulosa* BECK.). In zwei Fällen (*Chlorops apicalis* VON ROSER und *Oscinis sulcella* ZETT.) habe ich synonyme Name in ihren originalen Rang zurückgestellt, und eine neue Synonymie (*O. aristolochiae* ROND.) eingeführt.

Gattung **Tricimba** LIOY, 1864

LIOY, 1864: Atti Ist. veneto Sci., (3) **9**: 1125
= *Notonaulax* BECKER, 1903

Die Gattung *Tricimba* gehört zu der Unterfamilie Oscinellinae. Von ihren nächsten Verwandten lassen sie sich aufgrund der auf dem Thoraxrücken vorhandenen Längsfurchen trennen. Weitere ergänzende Merkmale sind: größerer Teil des Thorax sowie Stirndreieck bestäubt, letzteres reicht nicht über die Mitte der Stirn, Oberfläche kahl. Von den nächsten Verwandten der Gattung können an dieser Stelle die Gattungen *Aphanotrigonum* DUDA und *Conioscinella* DUDA erwähnt werden. Körpermaße: 1,3—2,9 mm. Grundfarbe des Körpers dunkelbraun oder schwarz, Rückenseite des Thorax mit aschgrauen Bereifung bedeckt. Beborstung schwarz oder braun bis gelb, bei der Mehrzahl der Arten eher dunkler. Vorderer Teil des Kopfes gelb, selten hellbraun. Kopf in Seitenansicht höher als lang. Die Backe erstreckt sich bis ein wenig von den Vorderrand der Stirn oder fällt in eine Linie mit ihr; Backen so breit wie das 3. Fühlerglied oder schmaler als letzteres. Die Wange wird durch den

äußeren Rand des Augen vollständig verdeckt. Vordere Spitze des Stirndreiecks reicht mehr oder weniger bis zur Mitte der Stirn. Die Oberfläche kahl und bestäubt, höchstens zwischen den Punktaugen und der vorderen Spitze des Stirndreiecks befindet sich ein glänzendes Fleckchen (Abb. 7, 12). Form und Größe des Stirndreiecks ermöglicht unter Umständen eine Entscheidung über die Artzugehörigkeit des Tieres. Das Stirndreieck wird von einem kleineren oder größeren graubraunen Hof umgeben. Vorderer Rand der Stirn bei sämtlichen Arten hell. Manchmal ist die Stirn in ihrer ganzen Ausdehnung gelb. Bei allen Arten mehr als 5 Orbitalborsten vorhanden. Entlang der Umrandung des Stirndreiecks, stehen die Interfrontalborsten in einer Reihe. Außerdem besitzen die Arten 1 Paar äußere und 1 Paar innere Vertikalborsten, weiterhin 1 Paar Postvertikal- und 1 Paar Ocellarborsten. Das 3. Fühlerglied immer breiter als lang, von gelber Grundfarbe (selten von hellbrauner). Fühlerborste mit kurzer Behaarung. Taster gelb. Auf der Rückenseite des Thorax befinden sich 3 oder 5 Längsfurchen, die durch kleinere Pünktchen gebildet werden. Falls 3 Längsfurchen vorhanden sind, nehmen sie ihren Platz in der Mitte und entlang der Dorsocentralen ein. Da die einzelnen Punkte klein und seicht sind, sind auch die Furchen selbst schmal und seicht (Abb. 2, 3). Gibt es 5 Längsfurchen, so laufen sie in der Mitte, entlang der Dorsocentralen sowie zwischen den Notopleuren und Postalarcallen. Die einzelnen Punktreihen bestehen aus verhältnismäßig großen und tiefen Punkten, und infolgedessen sind auch die Längsfurchen selbst breit und tief (Abb. 1). Rückenseite des Thorax, Schultern sowie ein großer Teil der Mesopleuren und Pteropleuren bestäubt. Im allgemeinen haben sie 1 Humeral-, 1 + 2 (1) Notopleural-, 1 Postalar- und 1 Dorsocentralborste. Für die Bestimmung der Artzugehörigkeit sind sie unwichtig. Aber die Beborstung des Scutellums hat eine besondere Bedeutung. Die Apikalborsten neigen sich einander zu (z. B. Abb. 17) oder stehen starr voneinander ab, evtl. stehen sie parallel zueinander, aber sie sind immer dornartig (Abb. 16, 18, 20). Im ersten Fall sind sie im allgemeinen länger als die Hälfte der Länge des Scutellums, im letzteren Fall aber immer kürzer. Das Verhältnis zwischen den Apikal- und Lateralborsten sowie ihre Farbe, weiterhin die Form und Farbe des Scutellums können auch characteristisch sein. Das Geäder des Flügels im allgemeinen normal, die Größe des von der hinteren Querader und der Medianader gebildeten Winkels ist in einigen Fällen ein gutes Unterscheidungsmerkmal (z. B. Abb. 21, 26). Ausnahmsweise kann die Medianader stark nach aufwärts gebogen sein (Abb. 23). Farbe der Beine veränderlich, im allgemeinen ist die Farbe der Beine eine Kombination von gelb, braun und schwarz, manchmal sind sie aber auch einfarbig gelb. (Beine der Weibchen wahrscheinlich bei allen Arten gelb.) Hinterleib meistens einfarbig glänzend braun oder schwarz, die Tergite sind manchmal mit breiten braunen Querbinden versehen (Abb. 10), es kommt aber vor, daß die Tergite beiderseits durch je einen dunklen Saum umrandet sind (Abb. 5).

Zu den wichtigsten Unterscheidungsmerkmalen der Arten gehört der Bau des männlichen Kopulationsapparates. Innerhalb der Gattung gibt es kaum Arten, die ohne das zu berücksichtigen, mit Sicherheit bestimmt werden können. Bau des Hypopygium im allgemeinen sehr unterschiedlich. Der zwischen den Surstyli stehende Endfortsatz (»terminal process«) meistens paarig (z. B. Abb. 32), es gibt jedoch Arten, bei welchen die paarigen Endfortsätze zum Teil zusammengeschmolzen sind (Abb. 27). Form und Größe der Surstyli sowie die der zwischen ihnen stehenden Endfortsätze gelten als wichtiges Trennungsmerkmal. Ausnahmsweise kann auch ein Fortsatz über den Surstyli vorhanden sein (Abb. 42, 43).

Die aufgezählten Merkmale ermöglichen eine Gruppierung der Arten. Auch ihr Bestimmungsschlüssel beruht darauf.

Die Weibchen können wegen der großen Anzahl der Arten nicht bestimmt werden. Von zwei Arten sind dagegen die Männchen unbekannt. Die eine von ihnen (*T. curvata* SABROSKY) besitzt ein ganz eigenartiges Flügelgeäder; es ist anzunehmen, daß dieses auch für Männchen bezeichnen ist. *T. curvata* wurde unter Berücksichtigung dieses Merkmals in den Bestimmungsschlüssel einbezogen. Im Falle der zweiten Art, *T. cincta* MEIG., gibt es nur die Legeröhre als für diese Art bezeichnendes morphologisches Merkmal.

Die Arten der Gattung *Tricimba* bewohnen fast alle Erdteile. Aus der Paläarktis sind zur Zeit 20 Arten bekannt. Die meisten Fundortangaben wurden bisher von *T. cincta* mitgeteilt, *T. cincta* ist zur Zeit nur vom Typus-Fundort (Spanien) bekannt. Zwei Synonyme (*T. apicalis* und *T. sulcella*), die ihren originalen taxonomischen Rang zurückgewonnen haben, sind aus Deutschland, bzw. Schweden bekannt. Zu dem allernächsten Verwandtschaftskreis der *T. cincta* gehören noch 3 weitere Arten aus Israel (*T. kaplanae*, *T. meridiana* und *T. paraalbiseta*) und 2 aus dem Karpatenbecken (*T. fungicola* und *T. hungarica*). *T. albiseta* wurde bisher aus 3 Ländern Mitteleuropas (Bulgarien, Jugoslawien und Ungarn) nachgewiesen, während *T. japonica* die japanischen Inseln bewohnt. Die nächsten Verwandten der über die ganzen Paläarktis verbreiteten *T. humeralis* sind aus Israel bekannt (*T. freidbergi*, *T. magna* und *T. submagna*). *T. lineella* ist in Europa und Asien weit verbreitet. In ihrem Merkmalskomplex besitzen auch *T. heratica* und *T. pulla*, die in Afghanistan heimisch sind. Ebenfalls aus Afghanistan wurde eine nahe Verwandte der ägyptischen *T. setulosa* nachgewiesen, und zwar die *T. parasetulosa*. Der engere Verwandtschaftskreis von einer anderen afghanischen, *T. curvata*, ist bisher noch nicht bekannt geworden. Aus Nordamerika wurden bisher 6 Arten nachgewiesen (SABROSKY, 1965), von welchen 2 (*T. cincta* und *T. lineella*) mit der altweltlichen Fauna gleich sind. Aus der afrotropischen Region wurden bisher 6 Arten erwähnt (SABROSKY, 1980), unter ihnen auch die der weitverbreiteten *T. humeralis*. Unter den 6 *Tricimba*-Arten, die aus der orientalischen Region beschrieben wurden, gibt es keine, die mit der paläarktischen Fauna übereinstimmt (SABROSKY, 1977).

1. *Tricimba lineella* (FALLÉN, 1820)

FALLÉN, 1820: Oscinides Sveciae, Lund : 8 (*Oscinis*).
= *delpinii* (RONDANI, 1869) (*Oscinis*).

Sie ist die typische Art der Gattung, die sich aufgrund der auf dem Thoraxrücken vorhandenen 5 Längsfurchen leicht von den anderen trennen läßt (Abb. 1). In letzter Zeit wurden zwei weitere Arten (*T. heratica* sp. n. und

T. pulla sp. n.) in die *lineella* Artengruppe beschrieben, die ebenfalls 5 Längsfurchen haben. Der Bau des Hypopygium weist aber bei erwähnten Arten wesentliche Unterschiede gegenüber jenem der *T. lineella* auf. Während bei der erwähnten Art zwischen den Surstyli nur ein einziger Endfortsatz zu sehen ist (Abb. 27), stehen bei den neuen Arten immer paarige Endfortsätze zwischen den Surstyli (Abb. 29, 32). Die bezeichnendsten Merkmale der *T.*

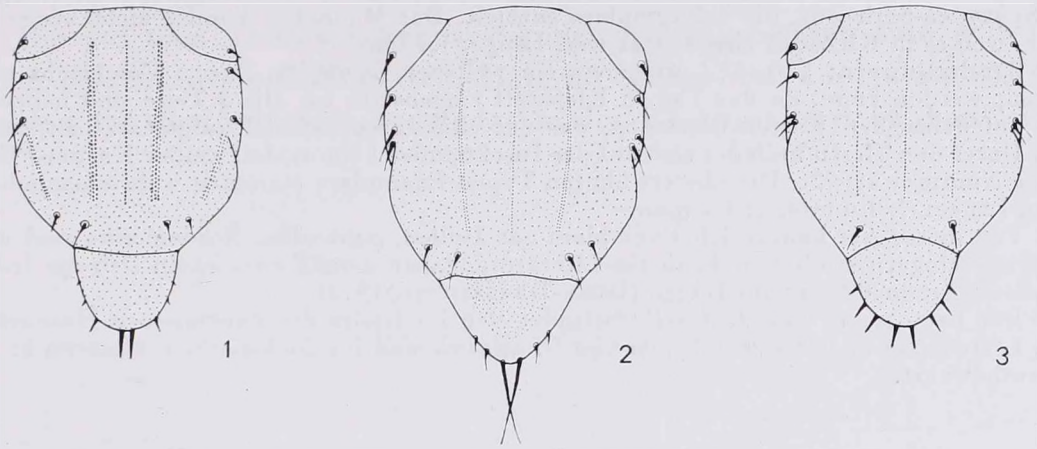


Abb. 1—3. Thorax der *Tricimba*-Arten, 1 = *T. lineella* FALL., 2 = *T. humeralis* LOEW, 3 = *T. setulosa* BECK. (Lectotypus ♂)

lineella sind: Körper schlank, aschgrau. Vorderer Teil des Kopfes, Beine und Sternite des Hinterleibs sowie Beborstung des Körpers gelb. Auf der Rückenseite des Thorax 5 Längsfurchen vorhanden (Abb. 1). Scutellarborsten entspringen aus gut wahrnehmbaren Warzen. Apikalborsten stehen nahe zueinander, sie sind etwa 2mal so lang wie die benachbarten Lateralborsten. Scutellarborsten stark, dornartig (Abb. 20). Zahl der Notopleuralborsten 1 + 1. Die hintere Querader des Flügels verhältnismäßig schief abwärtslaufend, mit der Mittelader einen Spitzwinkel bildend (Abb. 21). Auf den Tergiten des Hinterleibes dunkle Flecken, die zu einem Saum zusammengeschmolzen sind (Abb. 5). Dies ist am besten an alkoholkonserviertem Material zu sehen). Zwischen den Surstyli ist auf dem Hypopygium ein einziger Endfortsatz zu sehen, dessen apikaler Teil eine sattelartige tiefere Einsenkung trägt (Abb. 27). In seiner größten Ausdehnung besitzt der Surstylus eine unregelmäßige Form (Abb. 28).

Länge: 1,5—1,8 mm.

Verbreitung: Die Art bewohnt ganz Europa und Asien, sie kommt sogar in Nordamerika vor.

Lectotypus ♀: Von ANDERSSON (1963) ausgewählt, ich selbst hatte nicht die Gelegenheit, ihn zu sehen. ANDERSSON gelang es seinerzeit nicht, die Typenexemplare von *O. lineella* weder in der FALLÉN'schen noch der ZETTERSTEDT'schen Sammlung zu entdecken. Es tauchte

jedoch ein ♀ von dem in der Original-Artbeschreibung mitgeteilten Typus-Fundort (Südschweden. Mellby Esperöd, Umgebung von Skåne) auf, das aufgrund der oben erwähnten Beschreibung zweifellos zu *O. lineella* gehört, obzwar es mit einem Etikett: »*O. frontella*« versehen ist. Dies widerlegt also COLLIN's (1946) Annahme, wonach diese Form in Schweden überhaupt nicht vorkomme.

Oscinis delpinii RONDANI, 1869: Di alcuni insetti Dipteri. — Arch. zool. anatomia e fisiol., **4** (2): 188—189.

Lectotypus ♀: Unter dem auf eine dünne Insektennadel aufgestochenen Tier befindet sich ein ovales weißes Karton-Etikett mit der Nummer »2072«. Das Tier wäre in tadellosem Zustand, hätte man ihm während des Aufsteckens nicht den Kopf abgerissen. Der Kopf des Tieres ist auf der anderen Seite der Insektennadel aufgeklebt. Den Lectotypus wählte ich aus einer Syntypen-Serie aus, die 4 Exemplare enthielt. Das Männchen konnte nicht verwendet werden, weil es in Klebstoff eingebettet war. Länge: 1,7 mm.

Paralectotypen: 1 ♂, 1 ♀ und noch ein weiteres Exemplar, dessen Geschlecht nicht bestimmt werden kann, da das Tier in Klebstoff eingebettet ist. Die 3 Tiere sind nebeneinander auf demselben Karton-Blättchen, das auf eine Insektennadel aufgesteckt ist, aufgeklebt. Unter den Tieren befindet sich auf der Insektennadel ein ovales, weißes Karton-Etikett mit der Nummer »2072«. Die obererwähnten Typen-Exemplare stammen wahrscheinlich aus Italien. Länge: ♂: 1,6 mm, ♀: 1,7 mm.

Von dieser Art konnte ich Exemplare aus Italien, Schweden, Nordamerika und nicht zuletzt aus Ungarn studieren. Früherer Literaturangaben gemäß entwickeln sich die Individuen dieser Art in Pilzen zum Imago (DELY-DRASKOVITS, 1972).

Der Lectotypus von *O. lineella* befindet sich im Besitz des Zoologischen Museums in Lund. Lectotypus und Paralectotypen von *O. delpinii* sind im Zoologischen Museum in Florenz aufbewahrt.

2. Tricimba heratica sp. n.

Auf der Rückenseite des Thorax sind 5 Längsfurchen vorhanden, von welchen aber die beiden seitlichen nur in Spuren zu sehen sind. Dieses Merkmal dient als ein überzeugender Beweis dafür, daß die neue Art zu der Gattung *Tricimba* gehört. Sie läßt sich mit der Artengruppe *T. lineella* FALL. in Beziehung bringen, obzwar im Bau des Hypopygium etliche Unterschiede beobachtet werden können. Es ist zur Zeit unmöglich, diese neue Art exakt zu beschreiben, denn die Scutellarborsten der uns zur Verfügung stehenden Exemplare sind beschädigt (Abb. 18). Körper schlank. Vorderer Teil des Kopfes (Abb. 11), Hinterleib und Beine sowie Beborstung des Körpers gelb. Hinterer Teil des Kopfes, Thorax sowie Scutellum bräunlich grau. Scutellarborsten dornartig, teilweise abgebrochen (Abb. 18). Ganzer Körper mit einem aschgrauen Überzug bedeckt. Surstyli und die zwischen den Surstyli stehenden Endfortsätze wie auf Abb. 29.

Länge: Holotypus ♂: 1,3 mm. Paratypus ♂: 1,3 mm, Paratypen ♀♀: 1,3—1,4 mm.

Verbreitung: Afghanistan.

Holotypus ♂: »Afghanistan, Prov. Herat, Hari Rud river, 950 m, 21. V. 1974, leg. L. PAPP«.

Paratypen: Afghanistan, 1974, leg. L. PAPP: 1 ♀: Die Daten stimmen mit denen des Holotypus überein. — 1 ♂, 1 ♀: Herat, 980 m, 20. V. — 1 ♀: Kandahar, 1000 m, 23. V.

Holotypus und Paratypen sind im Ungarischen Naturwissenschaftlichen Museum in Budapest aufbewahrt.

3. Tricimba pulla sp. n.

Die 5 Längsfurchen, die auf der Rückenseite des Thorax vorhanden sind, beweisen, daß die neue Art in Verwandtschaft zu der Artengruppe *T. lineella* FALL. steht. Der Umstand, daß mir von der Art nur ein einziges Exemplar zur Verfügung stand, erschwert ihre exakte Beschreibung. Aufgrund des Baues des männlichen Kopulationsapparates läßt sich jedoch die neue Art einwandfrei diagnostisieren. Körper schlank. Grundfarbe sowie Beborstung gelb. Die auf dem Thoraxrücken vorhandenen Längsfurchen sind gelb (wie dies am besten an alkoholfixiertem Material beobachtet werden kann). Zwischen den Furchen schwarze Streifen. Auf der Rückenseite sieht man 4 brei-

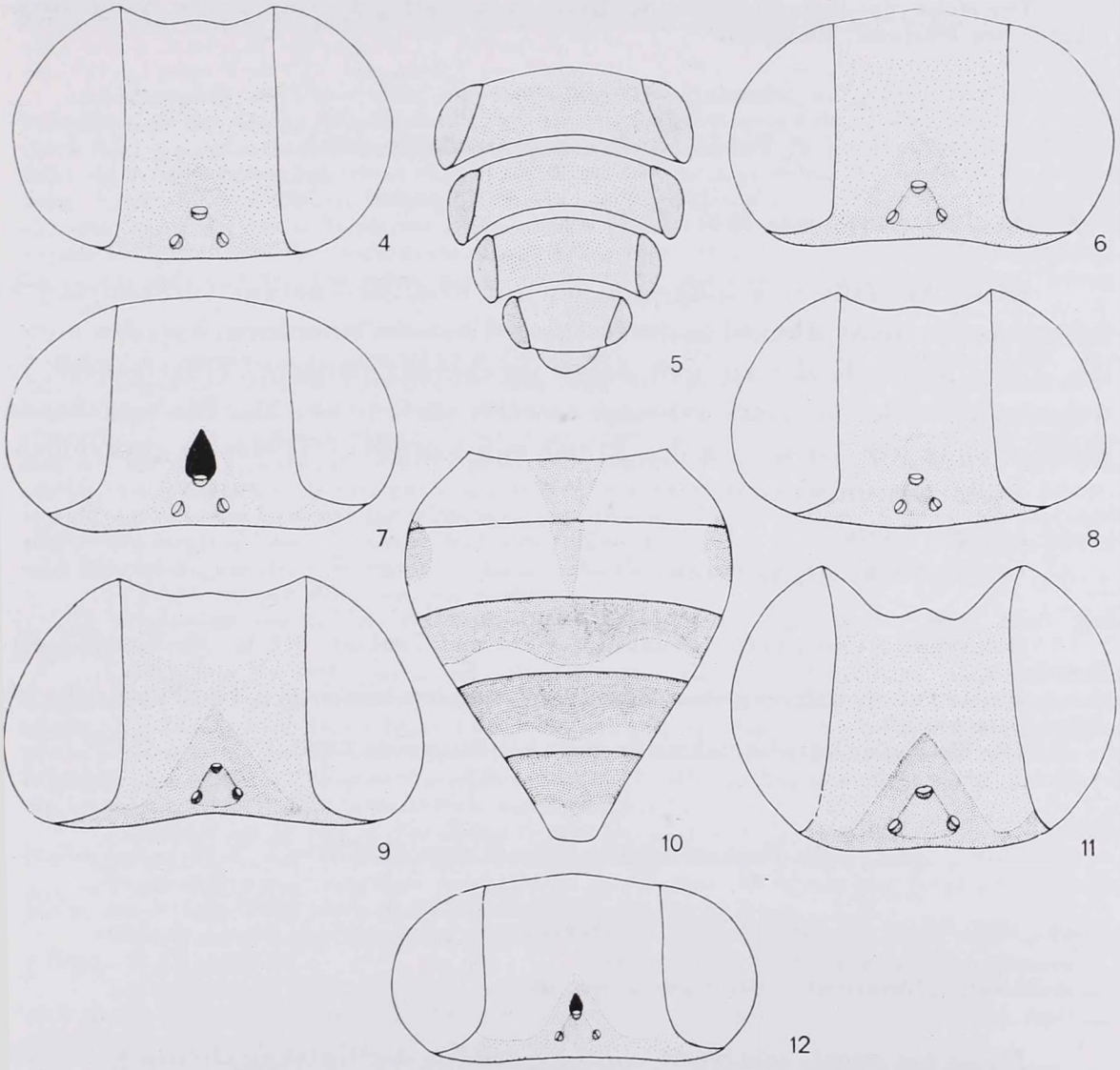


Abb. 4—12. 4, 6, 7, 8, 9, 11, 12 = Kopf der *Tricimba*-Arten, 4 = *T. hungarica* sp. n., 6 = *T. parasetulosa* sp. n., 7 = *T. humeralis* LOEW, 8 = *T. albiseta* sp. n., 9 = *T. fungicola* sp. n., 11 = *T. heratica* sp. n., 12 = *T. freidbergi* sp. n.; 5, 10 = Dorsalansicht des Abdomens, 5 = *T. lineella* FALL., 10 = *T. freidbergi* sp. n.

tere und 2 schmalere Streifen, Schultern mit einem braunen Fleck. Pleuren und Scutellum gelb. Scutellarborsten an dem untersuchten Exemplar leider abgebrochen. Mittel- und Hinterschenkel sowie Schiene verschwommen braun gefärbt. Hinterleib gelb. Die zwischen den Surstyli sitzenden Endfortsätze breit, an ihrer Spitze abgerundet (Abb. 32). Surstyli weniger als 2mal so lang wie breit (Abb. 30).

Weibchen unbekannt.

Länge: Holotypus ♂: 1,3 mm.

Verbreitung: Afghanistan.

Holotypus ♂: »Afghanistan, Prov. Nangarhar: Jalalabad, 580 m, 8. V. 1974, leg. L. PAPP«.

Der Holotypus befindet sich in der Dipteren-Sammlung des Ungarischen Naturwissenschaftlichen Museums, Budapest.

4. *Tricimba curvata* SABROSKY, 1961

SABROSKY, 1961: Opusc. ent., **26** (1—2): 64—65.

Diese Art läßt sich aufgrund der auf dem Mesonotum vorhandenen 3 Längsfurchen, ohne Zweifel in die Gattung *Tricimba* einordnen. Von den anderen Arten unterscheidet sie sich durch ihr charakteristisches Flügelgeäder, in welchem die Ader m_4 stark gebogen abwärts läuft (Abb. 23). Die eingehende Beschreibung der Art ist aus der Arbeit von SABROSKY (1961) zu entnehmen.

Männchen unbekannt.

Länge: 2 mm.

Verbreitung: Afghanistan.

Holotypus ♀: Sang-Toda, zwischen Sar-Pol und Toukzar, 810 m, 15. X. 1957, leg. LINDBERG.

Die Art wurde aufgrund eines einzigen ♀ Exemplars beschrieben. Den Typus habe ich selbst nicht gesehen.

Der Holotypus befindet sich im Zoologischen Institut in Lund.

5. *Tricimba humeralis* (LOEW, 1858)

LOEW, 1858: Wien. ent. Mschr., **2** (2): 59 (*Oscinis*).
= *maculifrons* (BECKER, 1903) (*Notonaulax*)
= *aristolochiae* (RONDANI, 1869) (*Oscinis*) **syn. nov.**

Diese Art wurde seinerzeit von LOEW als zu der Gattung *Oscinis* gehörend beschrieben. Aufgrund der 3 Längsfurchen muß sie aber in die Gattung *Tricimba* eingereiht werden. Sie steht in Verwandschaft zu den aus Israel stammenden drei neuen Arten (*T. freidbergi*, *T. magna* und *T. submagna*). *T. humera-*

lis läßt sich durch folgende Merkmale charakterisieren: Allein aufgrund ihrer äußeren morphologischen Merkmale kann sie mit *T. freidbergi* leicht verwechselt werden. Ihre Körperlänge aber von 1,5—2 mm gilt als sicheres Unterscheidungsmerkmal. Auf dem Stirndreieck vor dem Ozellenfleck gibt es einen dunkelbraunen glänzenden Fleck. Dieser Fleck ist verhältnismäßig groß, nähert sich der Vorderspitze oder erreicht sie sogar (Abb. 7). Dorsalseite des Scutellus aschgrau oder teilweise gelb (Abb. 14). Apikalborsten ungef. 3mal so lang wie die Lateralen Flügel, wie Abb. 22. Form des Hypopygium und der zwischen den Surstyli sitzenden Endfortsätze wie auf Abb. 34. Abb. 35 zeigt den Surstylus in größter Ausdehnung.

Länge: 1,5—2 mm.

Verbreitung: Diese Art ist in der ganzen paläarktischen Region verbreitet, sie wurde sogar aus der afrotropischen Region nachgewiesen.

Lectotypus ♂: Unter dem auf eine dünne Insektennadel aufgestochenen Exemplar befindet sich ein weißes Stückchen Papier mit der Bezeichnung »96«. Unter diesem Papierstück folgt ein gedrucktes Etikett mit folgender Aufschrift: »Coll. H. Loew«. Auf dieses Etikett folgt ein drittes, verblaßtes, rotes »Typus«-Etikett, das kaum größer ist als das darüber befindliche. Unter diesem Etikett befindet sich ein weißes Blättchen mit folgender Handschrift: »*Oscinis humeralis* Lw.«. Zuunterst befindet sich auf der Insektennadel ein weißes, schmales Papierstreifchen, das die Aufschrift »*humeralis*« trägt. Das Tier ist ein wenig beschädigt. Es fehlen ihm das 3. Fühlerglied sowie Vorder- und Mittelbein der rechten Seite. Länge: 1,6 mm.

Paralectotypen: 1 ♀: Unter dem mit einer Minutia-Nadel durchstoßenen und auf einem Kunststoff-Fähnchen befestigten Tier befindet sich ein Etikett mit der Nummer »143«. Darunter ein anderer Zettel mit der Bezeichnung »Coll. H. Loew«, worauf ein weiteres verblaßtes, rotes »Typus«-Etikett folgt. Dem Tier fehlt ein Teil der rechten Fühlerborste sowie das linke Hinterbein. — 1 ♀: Unter dem auf eine dünne Insektennadel aufgestochenen Tier befindet sich ein kleines Etikett mit der Nummer »63«, darunter ein zweites Etikett mit der Aufschrift »var. *pedobscur.*«, weiter unten ein drittes Etikett mit der Bezeichnung »Coll. H. Loew«, worauf ein »Typus« Etikett und schließlich ein schmaler Papierstreifen folgen mit der Aufschrift »*humeralis*«. Dem Exemplar fehlt der apikale Teil seiner Fühlerborste sowie das Mittel- und Hinterbein auf der rechten Seite. Länge: Paralectotypen ♀♀: 1,7—1,8 mm.

Typenexemplare stammen von Sizilien.

Notonaulax maculifrons Becker, 1903: Aegyptische Dipteren. — Mitt. zool. Mus. Berl., **2** (3): 154.

Lectotypus ♂: Unter dem mit einer Minutia-Nadel durchstoßenen und auf einem Kunststoff-Fähnchen befestigten Tier befindet sich ein Karton-Etikett mit der Aufschrift »Kairo XI. 44352«. Auf dieses Etikett folgt ein zweites, verblaßtes, rotes »Typus«-Etikett, das etwas breiter ist als das oberste. Unter dem »Typus«-Etikett sieht man ein drittes Etikett mit folgender Aufschrift: »*Tricimba maculifrons* Beck. Type, Th. Becker det.«. Kopf des Tieres ein wenig eingedrückt, Hinterbein fehlt auf der linken Seite.

1 Lectotypus ♂ und 1 Paralectotypus ♀ der Art *maculifrons*, mit je einer Minutia-Nadel durchstoßen, sind an demselben Kunststoff-Fähnchen befestigt. Länge: 1,5 mm.

Paralectotypus ♀: Angaben wie bei dem Lectotypus. Es fehlen ihm Kopf und alle drei Beine der rechten Seite sowie das Vorderbein auf der linken Seite.

Oscinis aristolochiae Rondani, 1869: Di alcuni insetti Dipteri. — Arch. zool. anatomia e fisiol., **42** (2): 188.

Lectotypus ♂: Unter dem auf eine dünne Insektennadel aufgestochenen Tier befindet sich ein ovales weißes Karton-Etikett mit der Nummer »2073«. Tier in tadellosem Zustand, nur infolge des Aufstechens ein wenig gedrückt. Länge: 1,6 mm.

Paralectotypen: 5 ♂♂, 2 ♀♀: Mit denselben Bezeichnungen versehen wie die Lectotypen, ausgenommen das eine ♂, unter dem ein Karton-Etikett mit der Nummer »2072« zu finden ist. Das eine Weibchen ist auf ein Karton-Blättchen aufgeklebt. Länge: Paralectotypen ♂♂: 1,5—1,6 mm, Paralectotypen ♀♀: 1,7—1,8 mm.

Die Typenexemplare stammten wahrscheinlich aus Italien.

Ich selbst hatte die Gelegenheit, Exemplare aus Afghanistan, Ägypten, Bulgarien, Israel, Italien, der Mongolei und Ungarn sowie von Sizilien und den Kanarischen Inseln zu untersuchen. Zuerst erhielt ich aus der LOEWschen Sammlung, die im Berliner Zoologischen Museum aufbewahrt ist, die aus 1 ♂ und 2 ♀♀ bestehende Syntypus-Serie. Aus dieser Serie habe ich den Lectotypus sowie die Paralectotypen ausgewählt. Sämtliche Exemplare ohne Fundortangaben. Es ist aber anzunehmen, daß sie alle von Sizilien stammen, wie dies in der Original-Beschreibung der Art angegeben wurde. Ebenfalls von Berlin habe ich 1 ♂ und 1 ♀ Exemplar von der Art *N. maculifrons* erhalten. Diese Exemplar habe ich als Lecto- und Paralectotypus der Art bezeichnet. Diese Art ist, wie das schon früher nachgewiesen wurde, ein Synonym von *T. humeralis*.

Von dem Zoologischen Museum Berlin erhielt ich weiterhin 1 ♂ mit der Bezeichnung *T. humeralis* var. *opacifrons* DUDA. Dieses Exemplar erwies sich ohne Zweifel als zur Art *T. humeralis* gehörend. An dieser Stelle wird auch über die Ergebnisse jener Untersuchungen berichtet, die an einer Syntypen-Serie der Art *O. aristolochiae* (7 ♂♂ und 2 ♀♀) durchgeführt worden waren. Die in der RONDANI-Sammlung in Florenz aufbewahrten Exemplare stammen wahrscheinlich aus Italien. Sie sind aber nicht identisch mit den Exemplaren der Art *T. cincta*, wie dies früher angenommen wurde, denn sie stellen eine neue Synonymie der Art *T. humeralis* dar.

Aus dem Synonym-Kreis der Art *T. humeralis* wird noch eine weitere Art in Betracht gezogen, und zwar *T. punctifrons* BECKER (NARTSHUK, 1983). Obzwar ich keine Gelegenheit hatte, das Typus-Exemplar der Art zu untersuchen, kann man aus der originalen Art-Beschreibung mit großer Wahscheinlichkeit folgern, daß sie eine nahe Verwandte der Art *Aphanotrigonum trilineatum* MEIG. ist, es ist sogar möglich, daß sie identisch mit ihr ist. Eben deshalb betrachte ich diese Art nicht als ein Synonym der Art *T. humeralis*.

Neben den Typenexemplaren untersuchte ich selbstverständlich die aus etwa 150 ungarischen Exemplaren bestehende Sammlung unseres Museums. Einige Exemplare dieser Art sammelte auch DR. L. PAPP im Jahre 1974 in Afghanistan; ihre Fundort- und Sammel-Angaben sind wie folgt: 1 ♂: Kabul, Aliabad, 13. VI. 1974. — 3 ♂♂, 1 ♀: Kandahar, 1000 m, 23. V. 1974. — 1 ♂, 11 ♀♀: Prov. Nangarhar: Jalalabad, 560 m, 8. V. 1974. Aus der Mongolei sind nur 2 ♀♀ in meine Hände gelangt (NARTSHUK, 1971). Sie sind etwas dunkler als die europäischen Exemplare. Die Bestimmung ihrer Artzugehörigkeit erfordert weitere Untersuchungen.

Lectotypus und Paralectotypen von *T. humeralis* und *N. maculifrons* befinden sich im Zoologischen Museum in Berlin, während der Lectotypus und die Paralectotypen von *O. aristolochiae* im Zoologischen Museum in Florenz aufbewahrt sind.

6. Tricimba freidbergi sp. n.

Die neue Art ist neben *T. magna* sp. n. und *T. submagna* sp. n. die größte in der Gattung. Erwähnte Arten sind etwa 1,5—2mal so groß wie die anderen Mitglieder der Gattung. Alle drei neuen Arten haben auf dem Stirndreieck vor dem Ozellenfleck einen dunkelbraunen glänzenden Fleck (Abb. 12), der aber verhältnismäßig viel kleiner ist als bei *T. humeralis*. Körper vorwiegend aschgrau, nur teilweise gelb. Die Borsten des Körpers hell. Vorderer Teil des Kopfes gelb, nur das 3. Fühlerglied und Arista etwas bräunlich. Stirndreieck und Occiput aschgrau, nur hinter den Ozellen gelb. Die Dorsalseite des Thorax aschgrau, die Schultern gelblich. Pleuren mit dunkelbraunen Flecken. Die Grundfarbe des Scutellums gelb, nur an der Rückenseite teilweise aschgrau (Abb. 17). Von den Scutellarborsten die Apikalen etwa 3mal so lang wie die Lateralen. Schenkel fast vollkommen dunkelbraun. Schienen mit einem breiten dunkelbraunen Ring. Die ersten zwei Tergite des Hinterleibes von gelber Farbe, nur in der Mitte ist ein matt dunkelbrauner, dreieckiger und an den Seiten des zweiten Segments rundlicher Fleck zu sehen. Die folgenden Segmente

mit breiten dunkelbraunen Querbinden, die in der Mitte und an den Seiten verbreitert sind. Hinterrand der Abdominalsegmente und Sternite gelb (Abb. 10). Hypopygium des Männchens matt dunkelbraun. Surstyli in Seitenansicht nicht gekrümmt, etwa 2,5mal so lang wie breit, basale und apikale Hälfte von ungef. gleicher Breite (Abb. 37). Gestalt der zwischen den Surstyli stehenden Endfortsätzen einfach, symmetrisch, etwa so lang wie breit, an der Spitze abgerundet (Abb. 36).

Länge: Holotypus ♂: 2,7 mm, Paratypen ♂♂: 2,5—2,7 mm, Paratypen ♀♀: 2,7—2,8 mm.

Verbreitung: Israel.

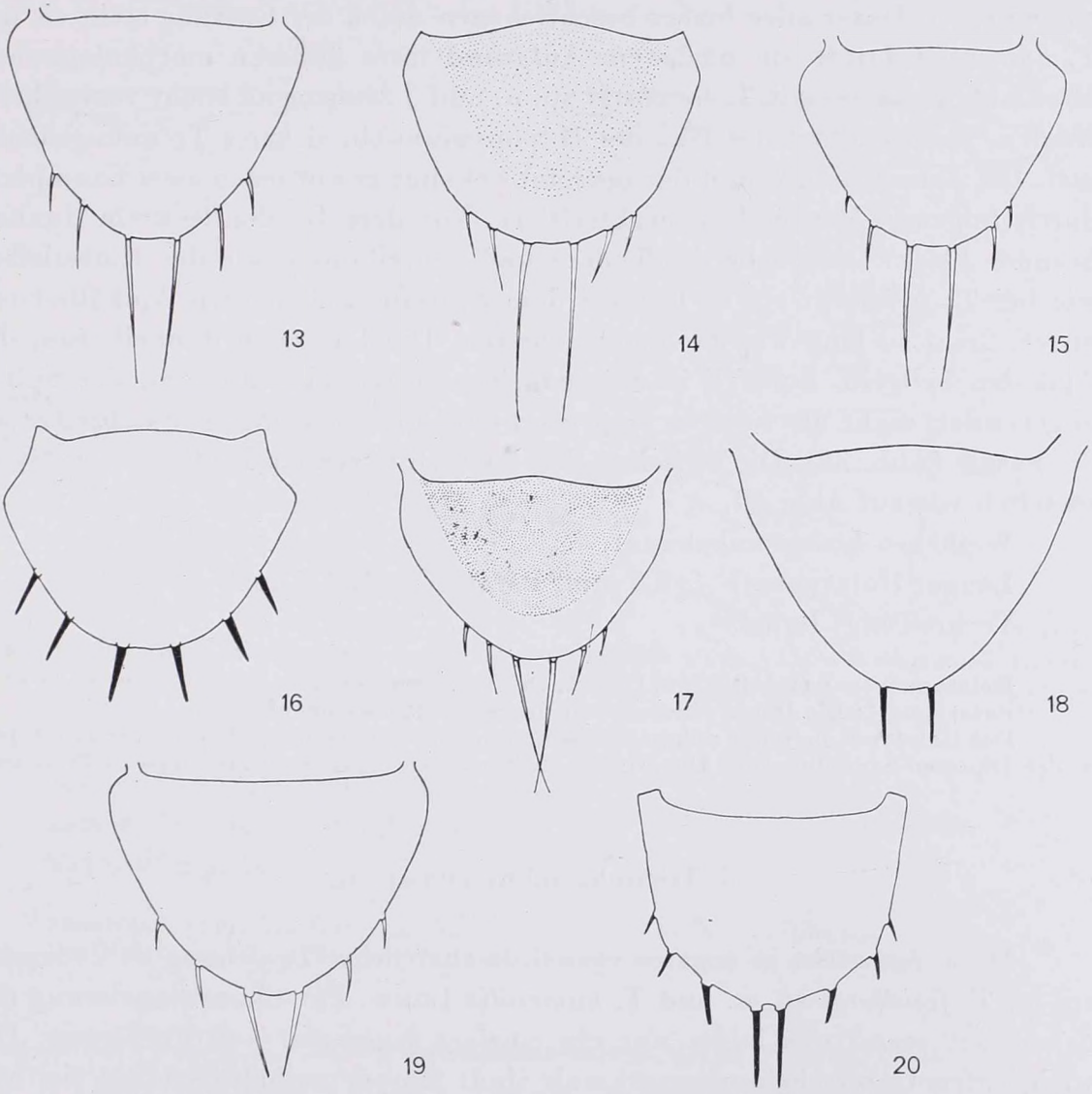


Abb. 13—20. Scutellum der *Tricimba*-Arten, 13 = *T. hungarica* sp. n., 14 = *T. humeralis* Loew, 15 = *T. albiseta* sp. n., 16 = *T. parasetulosa* sp. n., 17 = *T. freidbergi* sp. n., 18 = *T. heratica* sp. n., 19 = *T. fungicola* sp. n., 20 = *T. lineella* Fall.

Holotypus ♂: »Israel, Mt. Meiron, 30. IX. 1979, A. FREIDBERG«.
Paratypen: 1 ♀: Die Daten stimmen mit denen des Holotypus überein. — 1 ♂, 2 ♀♀: 1100 m, 19. VII. 1977. — 1 ♂: 4. VIII. 1978. — 1 ♀: 17. IX. 1978, leg. F. KAPLAN. — 3 ♂♂, 3 ♀♀: 17. IX. 1981. — 1 ♂: Hammat Gader, 13. V. 1981, leg. A. FREIDBERG. — 1 ♂: Har Dov, 15. VIII. 1976, leg. A. FREIDBERG.
Der Holotypus wird in der Sammlung der Universität Tel Aviv aufbewahrt. Die Paratypen befinden sich in Tel Aviv (5 ♂♂, 6 ♀♀) und im Ungarischen Naturwissenschaftlichen Museum, Budapest (2 ♂♂, 1 ♀).

Diese Art wurde DR. A. FREIDBERG benannt, der die Mehrzahl der Exemplare der neuen Art gesammelt hat.

7. Tricimba magna sp. n.

Sie steht in enger Verwandtschaft zu *T. freidbergi* sp. n. und *T. submagna* sp. n. Unter allen bisher beschriebenen Arten der Gattung steht sie der *T. humeralis* LOEW am nächsten. Aufgrund ihrer äußeren morphologischen Merkmale kann sie mit *T. freidbergi* sp. n. und *T. submagna* leicht verwechselt werden, jedoch bildet der Bau des Hypopygium ein sicheres Trennungsmerkmal. Die Art wird aufgrund der bis jetzt bekannt gewordenen zwei Exemplare durch folgende Merkmale charakterisiert: Vor dem Ozellenfleck ein dunkelbrauner Fleck. Die Farbe des Thorax und Scutellums sowie des Hinterleibes wie bei *T. freidbergi* sp. n. Die auf dem Scutellum stehenden Apikalborsten ungef. 2mal so lang wie die Lateralborsten. Die Lateralen dunkelbraun, die Apikalen hellgelb. Surstyli in Seitenansicht stark gekrümmt, an der Spitze abgerundet, mehr als 4mal so lang wie breit, apikale Hälfte etwas breiter als die basale (Abb. 38). Die zwischen den Surstyli sitzenden Endfortsätze asymmetrisch wie auf Abb. 39.

Weibchen bisher unbekannt.

Länge: Holotypus 1 ♂: 2,8 mm, Paratypus ♂: 2,9 mm.

Verbreitung: Israel.

Holotypus ♂: »Israel, Bar'am, 28. XI. 1977, A. FREIDBERG«.
Paratypus ♂: Die Daten stimmen mit denen des Holotypus überein.
Der Holotypus befindet sich in der Sammlung der Universität Tel Aviv, der Paratypus in der Dipteren-Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

8. Tricimba submagna sp. n.

Diese Art steht in engster verwandtschaftlicher Beziehung zu *T. magna* sp. n., *T. freidbergi* sp. n. und *T. humeralis* LOEW. Zur Charakterisierung der neuen Art stand uns leider nur ein einziges Exemplar zur Verfügung. Die wichtigsten Unterscheidungsmerkmale sind: Körper verhältnismäßig viel heller als der von *T. magna* sp. n. und *T. freidbergi* sp. n. Alle Borsten hell. Auf dem Stirndreieck vor dem Ozellenfleck ein dunkelbrauner, glänzender Fleck. Dorsalseite des Thorax einfarbig aschgrau, nur die Schultern gelblich. Pleuren

mit dunkelbraunen Flecken. Scutellum einfarbig gelb. Apikalborsten ungef. 2mal so lang wie die Lateralen. Beine vorwiegend gelb, nur die Schienen etwas bräunlich. Hinterleib gelb mit braunen Querbinden. Surstyli in Seitenansicht (nicht gekrümmt, etwa 2,5mal so lang wie breit, an der Spitze abgerundet Abb. 41). Die zwischen den Surstyli stehenden Erdfortsätze wie auf Abb. 40.

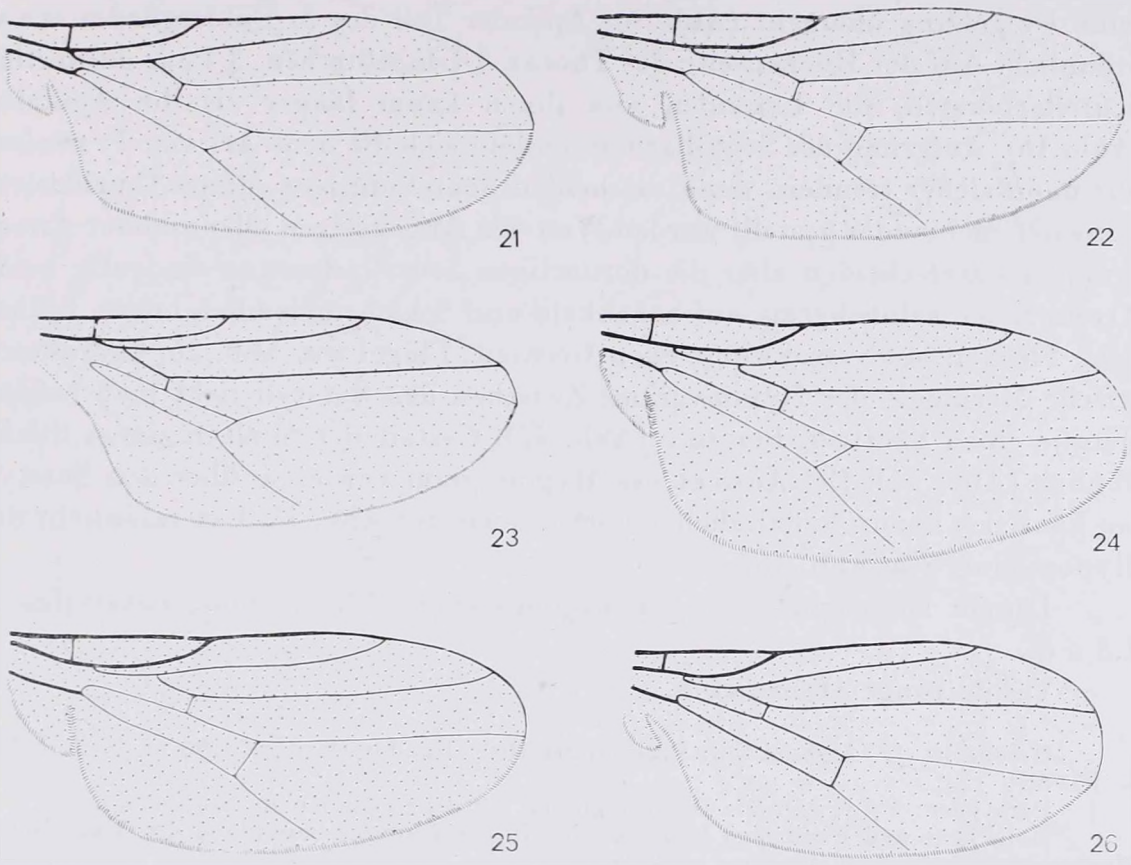


Abb. 21—26. Flügel der *Tricimba*-Arten, 21 = *T. lineella* FALL., 22 = *T. humeralis* LOEW, 23 = *T. curvata* SABROSKY (gezeichnet nach SABROSKY 1961), 24 = *T. hungarica* sp. n., 25 = *T. albiseta* sp. n., 26 = *T. parasetulosa* sp. n.

Weibchen bisher unbekannt.
Länge: Holotypus ♂: 2,8 mm.
Verbreitung: Israel.

Holotypus ♂: »Israel, Golan K. Nafech, 1. XII. 1973, A. FREIDBERG«.
Der Holotypus ist in der Sammlung der Universität Tel Aviv aufbewahrt.

9. Tricimba parasetulosa sp. n.

Die Art steht zweifelsohne *T. setulosa* BECKER am nächsten. Allein aufgrund der äußeren morphologischen Merkmale läßt sie sich von der erwähnten nicht einmal sicher trennen, nur der Bau des Hypopygium gibt einen sicheren

Anhaltspunkt zur Trennung beider Arten. Die Erkennung einer neuen Art in dieser Form wurde durch den Umstand erleichtert, daß die ganze Typenserie — mit Ausnahme eines einzigen Exemplars — aus Männchen bestand. Die neue Art wird durch folgende Merkmale charakterisiert: Ganzer Körper aschgrau, nur der vordere Teil des Kopfes gelb. Vorderer Rand der Stirn mit einem schmalen gelben Saum umrandet, der mit verschwommener Grenze in seine Umgebung übergeht (Abb. 6). Apikaler Teil des 3. Fühlergliedes etwas bräunlich. Auf der Rückenseite des Thorax 3 Längsfurchen, 3 Paar dornartige Scutellarborsten, die Lateralen von ihnen kaum länger als die Apikalen (Abb. 16). Aufgrund der Scutellarborsten läßt sich die neue Art von *T. setulosa* nur dann sicher trennen, wenn die beiden Scutellum bzw. deren Umrißzeichnung nebeneinander gestellt werden. Von den Angehörigen aller anderer Artengruppen unterscheiden aber die dornartigen Scutellarborsten eindeutig beide Arten. Beine gelblichgrau, auf Schenkeln und Schienen ziemlich breite, bräunliche Flecken mit verschwommenen Grenzen. Flügel wie Abb. 26. Charakteristische Merkmale des Hypopygium: Zwischen den Surstyli sieht man beiderseits je einen häutigen Fortsatz (Abb. 42). Gestalt der Surstyli einem Stiefel ähnlich (Abb. 44). Bei Ansicht des Hypopygium von oben über den Surstyli ein häutiger, handschuhähnlicher Fortsatz wie auf Abb. 43. Lateralansicht des Hypopygium wie Abb. 46.

Länge: Holotypus ♂: 1,3 mm, Paratypen ♂♂: 1,3 mm, Paratypus ♀: 1,3 mm.

Verbreitung: Afghanistan.

Holotypus ♂: »Afghanistan: Prov. Nangarhar: Band-e Darunta, 590 m, 8. V. 1974., L. Papp«.

Paratypen: 5 ♂♂, 1 ♀: Die Daten stimmen mit denen des Holotypus überein.

Holotypus und Paratypen befinden sich in der Dipteren-Sammlung des Ungarischen Naturwissenschaftlichen Museums in Budapest.

10. *Tricimba setulosa* (Becker, 1903)

Becker, 1903: Mitt. zool. Mus. Berl., **2** (3): 154—155 (*Notonaulax*).

Nähere Verwandte der Art *setulosa* waren bisher nicht bekannt. Dr. L. Papp sammelte 1974 in Afghanistan einige Exemplare (*T. parasetulosa* sp. n.), an welchen die Beborstung des Scutellums jener der *setulosa* weitgehend ähnlich ist (Abb. 3, 16). Eine sichere Trennung der beiden Arten läßt sich nur aufgrund des Hypopygium durchführen. Eingehende Beschreibung des Hypopygium siehe bei der Art *T. parasetulosa* sp. n.

Verbreitung: Ägypten.

Lectotypus ♂: Das Tier ist mit einer Minutia-Nadel durchstoßen, auf einem Kunststoff-Blättchen befestigt. Unter diesem Blättchen befinden sich 3 Etiketten. Auf dem ersten

ist zu lesen: »Genital-Unters. Nr. 296. Zool. Mus. Berlin«. Das zweite Etikett ist ein rotes Typenetikett: »Typus«. Das dritte trägt folgende Aufschrift: »*setulosa*«. Das Tier ist beschädigt. Der Kopf, eine der Apikalborsten des Scutellums und die letzten Segmente des Hinterleibes fehlen. Die letzten Segmente des Hinterleibes und das Hypopygium befinden sich auf einem Objektträger in Kanadabalsam eingeschlossen und mit einem Deckglas bedeckt. Unter dem Tier mit der Nummer »296« versehen.

Länge: nicht mehr als 1,3 mm (beschädigt).

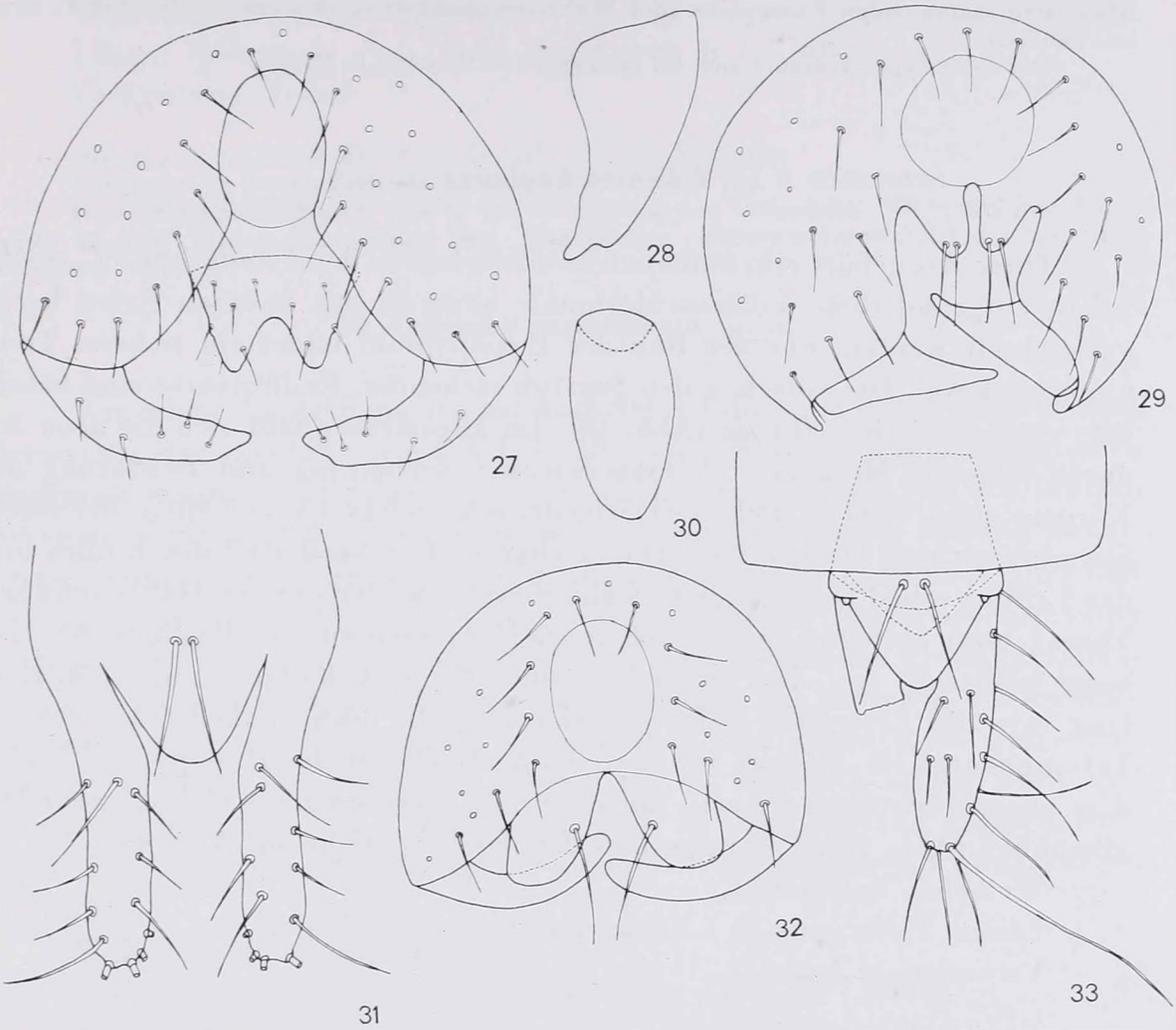


Abb. 27—33. 27, 29, 32 = Dorsalansicht des Hypopygium der *Tricimba-Arten*, 27 = *T. lineella* FALL., 29 = *T. heratica* sp. n., 32 = *T. pulla* sp. n.; 28, 30 = Lateralansicht des Surstylus, 28 = *T. lineella* FALL., 30 = *T. pulla* sp. n.; 31, 33 = Legeröhre der Weibchen, 31 = *T. albiseta* sp. n., 33 = *T. cincta* MEIG. (Lectotypus ♀)

Diese Art wurde vom Autor aufgrund 1 ♂ und 1 ♀ aus Kairo beschrieben und zur Gattung *Notonaulax* gestellt. Und später, als es sich herausgestellt hatte, daß sie ein Synonym der Gattung *Tricimba* ist, gelangte die Art *setulosa* automatisch auf ihre jetzige Stelle (ENDERLEIN, 1911; SABROSKY, 1941). In der jüngsten Vergangenheit wurde die Art von BESCHOVSKI (1981) besonders eingehend studiert: er hat den Kopulationsapparat des einzigen bisher bekannt gewordenen männlichen Exemplars herauspräpariert und abgezeichnet. Sowohl das in Kanadabalsam eingeschlossene Präparat als auch die Abbildung zeugen davon, daß wir einen äußert kompliziert gebauten und von allen anderen *Tricimba*-Arten abweichenden Kopulationsapparat vor uns haben. Die Trennung wird aber dadurch erschwert, daß das Hypopygium des einzigen Exemplars während des Präparierens beschädigt wurde. BESCHOVSKI stellt für die einzige Art eine neue Untergattung: *Schumaniella* BESCHOVSKI, 1981 auf. Das

andere Typus-Exemplar, ein ♀ befindet sich leider nicht in meinem Besitz, und deshalb bin nicht in der Lage, einen Paralectotypus zu designieren.

Unter dem Namen *T. setulosa* zähl BECKER (1913) 6 Exemplare (2 ♂♂, 4 ♀♀) aus Abessinien, und zwar von Marako auf, die von E. KOVÁCS in März 1912 gesammelt worden waren. Von den 6 von ihm untersuchten Exemplaren gehören aber nur 4 zur Gattung *Tricimba*, und wie aufgrund einer eingehenden Überprüfung des männlichen Kopulationsapparates festgestellt werden konnte, sind sie auch nicht zu der Art *setulosa* zu stellen. Die Ergebnisse letzterwähnter Untersuchungen bestätigen die Annahme von SABROSKY (1980), wonach die aus Abessinien stammenden Exemplare aller Wahrscheinlichkeit nach nicht zu der Art *T. setulosa* gehören.

Der Lectotypus befindet sich im Zoologischen Museum in Berlin.

11. Tricimba kaplanae sp. n.

Diese Art gehört rein äußerlich zweifelsohne zu der Artengruppe *T. cincta*. Allein aufgrund ihrer äußeren Merkmale kann sie mit anderen Arten leicht verwechselt werden, nur der Bau des Hypopygium bildet ein sicheres Trennungsmerkmal. Die zwischen den Surstyli stehenden Endfortsätze sind besonders charakteristisch für sie (Abb. 48). Im allgemeinen läßt sich die neue Art durch folgende Merkmale charakterisieren: Beborstung und Behaarung des Körpers gelb. Vordere Ecke des Stirndreiecks reicht bis zur Mitte der Stirn. Stirndreieck und Occiput einfarbig aschgrau. Der Vorderteil des Kopfes und das 3. Fühlerglied teilweise gelb. Fühlerborste auf der zweiten Hälfte schwarz. Thorax matt aschgrau, nur Propleuren, Sternopleuren und Hypopleuren teilweise glänzend. Auf dem Scutellum sind die Apikalborsten ungef. 3mal so lang, wie die Lateralen. Beine vorwiegend hell- oder dunkelbraun, nur die Tarsenglieder gelb. Gestalt der paarigen Endfortsätze des Hypopygium besonders charakteristisch: schmal, lanzettförmig, verschmälern sich spitzenwärts allmählich (Abb. 48). Lateralansicht des Surstylus siehe auf Abb. 47.

Weibchen unbekannt.

Länge: Holotypus ♂: 1,7 mm, Paratypus ♂: 1,7 mm.

Verbreitung: Israel.

Holotypus ♂: »Israel, 1100 m, Mt. Meiron, 17. IX. 1981., A. FREIDBERG«.

Paratypus ♂: Israel: Monfort, 10. III. 1981, leg. A. FREIDBERG.

Der Holotypus befindet sich in der Sammlung der Universität Tel Aviv, der Paratypus im Ungarischen Naturwissenschaftlichen Museum, Budapest.

Diese Art wurde nach Frau DR. F. KAPLAN benannt, die das von Israel stammende wertvolle Material mir zur Verfügung stellte.

12. Tricimba meridiana sp. n.

Diese Art steht der *T. cincta*-Gruppe nahe. In ihren äußeren Merkmalen zeigt sie viele Ähnlichkeiten mit den Formen, die zu der erwähnten Artengruppe gehören. Die Exemplare der neuen Art können von anderen Formen

(zum Beispiel *T. kaplanae* sp. n.) durch folgende Merkmale unterschieden werden: Beborstung des Körpers braun, Beine heller. Ein sicheres Trennungsmerkmal bildet vor allem der Bau des Hypopygium. Die zwischen den Surstyli stehenden paarigen Endfortsätze sowie die Surstyli sind immer spitz ausgezogen (Abb. 45).

Weibchen bisher unbekannt.

Länge: Holotypus ♂: 1,7 mm, Paratypus ♂: 1,7 mm.

Verbreitung: Israel.

Holotypus ♂: »Israel, Tel Aviv, 15. III. 1976, F. KAPLAN«.
Paratypus ♂: Israel, Zikhron Ya'akov, 30. IV. 1981, leg. A. FREIDBERG.
Der Holotypus befindet sich in der Sammlung der Universität Tel Aviv, der Paratypus in der Dipteren-Sammlung des Ungarischen Naturwissenschaftlichen Museums, Budapest.

13. Tricimba paraalbiseta sp. n.

Wie schon der Artname darauf hinweist, ist die neue Art die allernächste Verwandte der ebenfalls neuen Art *T. albiseta*. Die äußeren morphologischen Merkmale stimmen mit denen der vorerwähnten Art überein. Von den übrigen Arten der Gattung läßt sie sich am sichersten aufgrund ihrer helleren Beborstung trennen. Körpergestalt etwas gedrungener als bei *T. albiseta*. Dies läßt sich aber nur dann beurteilen, wenn Exemplare beider Arten nebeneinander betrachtet werden können. Es gibt nur ein einziges sicheres Trennungsmerkmal, und zwar der männliche Kopulationsapparat. Die zwischen den Surstyli stehenden paarigen Endfortsätze verschmälern sich gegen ihren Spitzenteil allmählich. Der Spitzenteil ist ungef. 1/2 so breit wie an der Basis und 1,5mal so breit wie lang. Der Spitzenteil ist lang, gerade abgeschnitten (Abb. 54). Surstyli gegen die Spitze allmählich verschmälernd und gebogen (Abb. 51).

Weibchen bisher nicht bekannt.

Länge: Holotypus ♂: 1,5 mm, Paratypen ♂♂: 1,4–1,5 mm.

Verbreitung: Israel.

Holotypus ♂: »Israel: Mt. Meiron, 18. IX. 1976, leg. A. FREIDBERG«.
Paratypen: leg. A. FREIDBERG: 1 ♂: Carmel, 9. IX. 1978. — 1 ♂: Har Dov, 15. VIII. 1976. — 1 ♂: Kfar Shamai, 27. V. 1980. — 1 ♂: Mt. Meiron, 30. IX. 1976. — 1 ♂: Mt. Meiron, 1100 m, 12. IX. 1977.
Der Holotypus und 3 Paratypen befinden sich in der Sammlung der Universität Tel Aviv, 1 Paratypus ist im Ungarischen Naturwissenschaftlichen Museum in Budapest aufbewahrt.

14. Tricimba albiseta sp. n.

Auch diese Art gehört zu den allernächsten Verwandten der Art *T. cincta* MEIG. Von den äußeren morphologischen Merkmalen ist vor allem ihre helle Beborstung charakteristisch. Körperfarbe der von *T. hungarica* sp. n. und *T.*

fungicola sp. n. weitgehend ähnlich. Das Stirndreieck erreicht nie die Mitte der Stirn (Abb. 8). Unter den Scutellarborsten sind die Apikalen etwa 3mal so lang wie die Lateralen (Abb. 15). Im Flügelgeäder läuft die Querader nie besonders auffallend schräg ab, sie bildet mit der Medianader einen Winkel, der größer ist als 45° (Abb. 25). Beine gelb, manchmal sind aber auch die Schultern zum Teil gelb. Von *T. paraalbiseta* sp. n. kann sie nur aufgrund des Baues des Hypopygium getrennt werden. Die zwischen den Surstyli stehenden paarigen Endfortsätze verschmälern sich kaum gegen den Spitzenteil. An dem

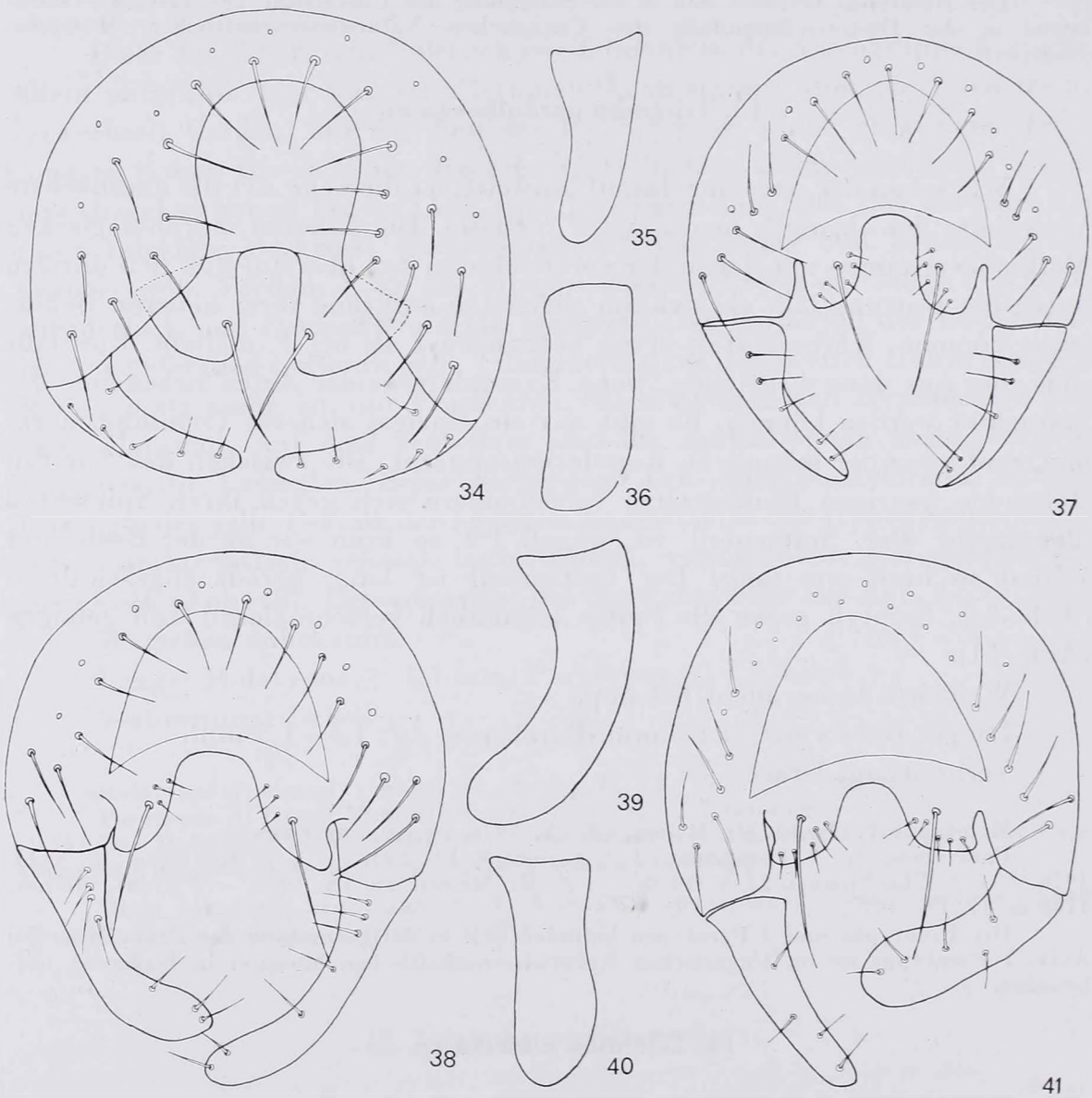


Abb. 34—41. 34, 37, 38, 41 = Dorsalansicht des Hypopygium der *Tricimba*-Arten, 34 = *T. humeralis* Loew, 37 = *T. freidbergi* sp. n., 38 = *T. magna* sp. n., 41 = *T. submagna* sp. n.; 35, 36, 39, 40 = Lateralansicht des Surstylus, 35 = *T. humeralis* Loew, 36 = *T. freidbergi* sp. n., 39 = *T. magna* sp. n., 40 = *T. submagna* sp. n.

Spitzenteil sind sie fast so breit wie an der Basis, außerdem sind sie fast so breit wie lang. Spitzenteil gerade abgeschnitten (Abb. 52). Die fast geraden Surstyli gegen den Spitzenteil kaum verschmälernd (Abb. 53).

Weibchen sind zur Zeit noch unbekannt.

Länge: Holotypus ♂: 1,4 mm, Paratypen ♂♂: 1,3—1,4 mm.

Verbreitung: Typus-Exemplare aus Bulgarien, Jugoslawien und Ungarn.

Holotypus ♂: Ungarn: »Hortobágy, halastó [Fischteich], 1960. VII. 16., leg. Tóth S.«.
Paratypen: Ungarn: Hortobágy, National Park, leg. L. Papp: 1 ♂: Egyek, Ohati erdő [Wald von Ohat], 30. VII. 1976. — 1 ♂: Püspökladány, Ágotapuszta [Pußta von Ágota], 31. V. 1976. — 4 ♂♂: Tiszacsege, Kiskecskés, 25. VIII. 1975. — 1 ♂: Tiszaug, ártéri erdő [Wald im Überschwemmungsgebiet der Theiß], 17. V. 1962, leg. Á. Soós. — 1 ♂: Gyula: Szanazug, 18. IX. 1963, leg. F. Mihályi. — 1 ♂: Börzsöny-Gebirge, 6. VIII. 1972, leg. L. Papp. — 1 ♂: 16. IX. 1973. — Jugoslawien: leg. Thalhammer: 1 ♂: Deliblát. — 1 ♂: Versecz. — Bulgarien: Bacskovo, 13. IX. 1929, leg. Z. Szilády.
Der Holotypus und die Paratypen sind im Ungarischen Naturwissenschaftlichen Museum in Budapest aufbewahrt.

15. Tricimba japonica sp. n.

Diese neue Art gehört ohne Zweifel zu dem Verwandtschaftskreis von *T. cincta*. Aufgrund ihrer äußeren morphologischen Merkmale, kann sie weder von der Art *T. cincta* noch von den übrigen Verwandten getrennt werden. Als sicheres Unterscheidungsmerkmal gilt nur der Bau des Hypopygium. Die Beschreibung der neuen Art bereitete ziemlich große Schwierigkeiten, da mir nur ein einziges Exemplar zur Verfügung stand, das sich auch noch im beschädigten Zustand befand. Der vordere Teil des Kopfes sowie die Beine nicht von gelber Farbe, sondern von hellbraunem Ton. Stirndreieck reicht bis zur Mitte der Stirn. Scutellarborsten beschädigt. Von den Apikalborsten ist nur die eine vorhanden, sie läßt aber vermuten, daß die Apikalborsten dieser Art verhältnismäßig kurz sind. Beine, wie schon erwähnt, von hellbrauner Farbe, Schenkel schwarz. Die zwischen den Surstyli stehenden paarigen Endfortsätze auffallend lang; die Länge der Endfortsätze entspricht etwa 3/4 der Gesamtlänge der Surstyli. Von ähnlicher Länge sind die Endfortsätze auch bei der Art *T. kaplanae* sp. n., ihre Form ist aber grundverschieden. Innerhalb der *T. cincta*-Artengruppe erreicht die Länge der paarigen Endfortsätze höchstens die Hälfte der Surstyli, sehr oft sind sie auch nicht einmal so lang. Die Surstyli relativ kurz (Abb. 49).

Weibchen bisher unbekannt.

Länge: Holotypus ♂: 1,3 mm.

Verbreitung: Japan.

Holotypus ♂: »(Kyushu), Mt. Haneyama, Oita Pref., 17. VI. 1970, K. Kanmiya, *Tricimba cincta* (Meigen), det. Kanmiya, 1982«.
Der Holotypus befindet sich im Zoologischen Laboratorium der Universität Kurume, Japan.

16. *Tricimba sulcella* (ZETTERSTEDT, 1848)

ZETTERSTEDT, 1848: 188. Oscinis. — *In:* Diptera Scandinaviae, Lund 7 (1847): 2657 (*Oscinis*).

Diese Art ist die allernächste Verwandte der *T. apicalis* VON ROSER. Hinsichtlich der äußeren morphologischen Merkmale sind beide Arten einander weitgehend ähnlich, ein bescheidener Unterschied macht sich höchstens in den Körpermaßen bemerkbar. Trotzdem wurden beide Arten mit der *T. cincta* identisch erklärt und dementsprechend für ihre Synonyme gehalten. Sie kaum von ihren allernächsten Verwandten nur aufgrund des Hypopygium getrennt werden. Grundfarbe des Körpers sowie Beborstung schwarz. Rückenseite des Thorax und ein großer Teil der Pleuren mit aschgrauem Bereifung

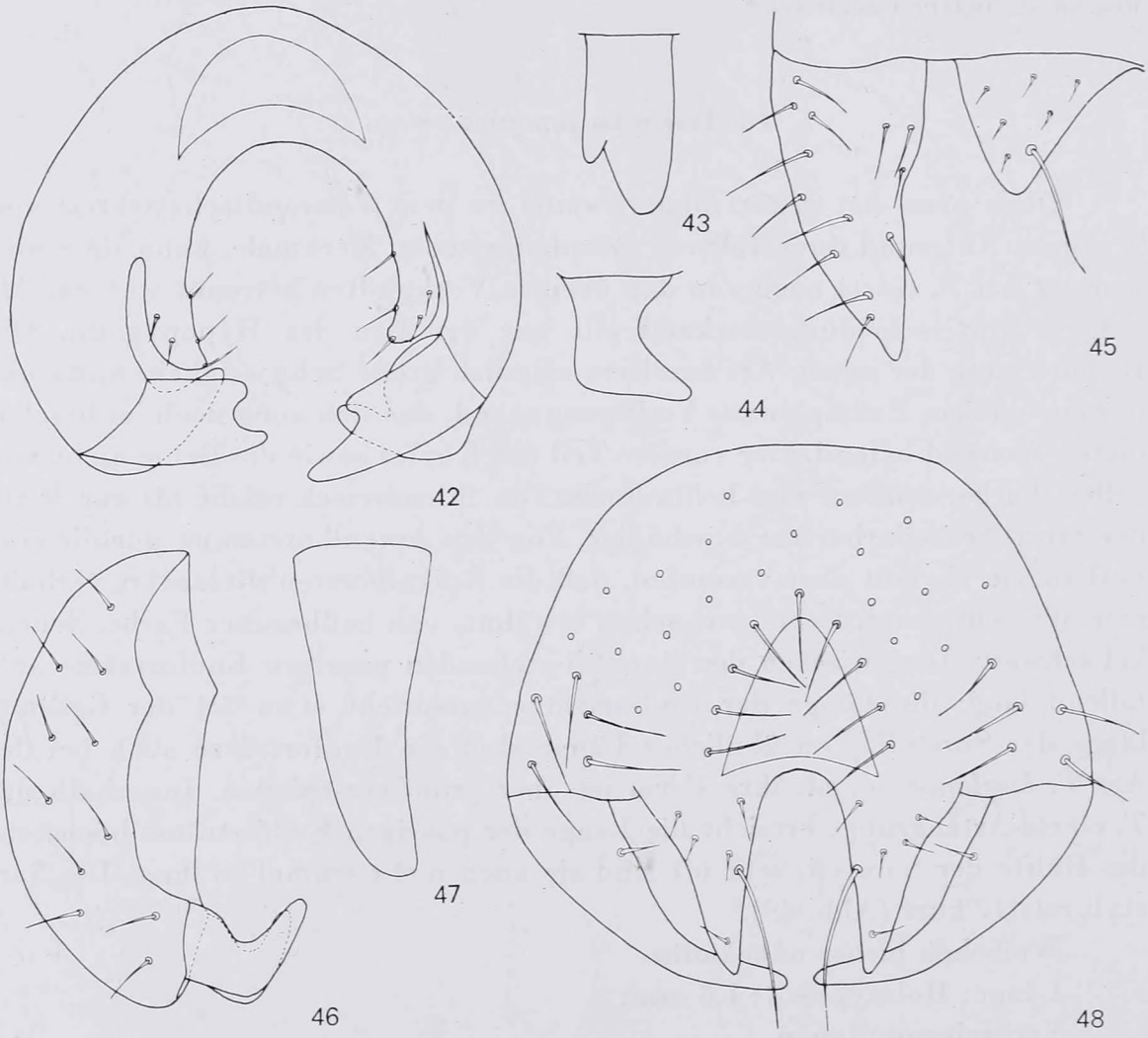


Abb. 42—48. 42, 48 = Dorsalansicht des Hypopygium der *Tricimba*-Arten, 42 = *T. parasetulosa* sp. n., 48 = *T. kaplanae* sp. n.; 43 = Fortsatz des Hypopygium der *T. parasetulosa* sp. n.; 44, 45, 47 = Lateralansicht des Surstylus, 44 = *T. parasetulosa* sp. n., 45 = *T. meridiana* sp. n., 47 = *T. kaplanae* sp. n.; 46 = Lateralansicht des Hypopygium der *T. parasetulosa* sp. n.

bedeckt. Vorderer Teil des Kopfes und die Spitze des Scutellums gelb. Von den Scutellarborsten sind die Apikalen 4mal so lang wie die neben ihnen stehenden Lateralen. Schenkel schwarz, nur dessen apikaler Teil gelb. Auf den Schienen ein breiter brauner Ring, andere Teile der Schiene sowie Tarsenglieder von gelber Farbe. Surstylus gegen seine Spitze sich allmählich verschmälernd, von ebenmäßiger Gestalt (Abb. 60).

Weibchen unbekannt.

Verbreitung: Schweden.

Lectotypus ♂: ANDERSSON (1966) wählte von den 2 bisher bekannt gewordenen Exemplaren der Art das eine als Lectotypus aus. Ich konnte dieses Exemplar untersuchen und von seinem Kopulationsapparat ein Präparat herstellen. Hinterleib und Kopulationsapparat dieses Tieres befinden sich in einem Kunststoff-Röhrchen unter dem Fundort-Etikett. Der Lectotypus stammt aus Schweden (Sk., Tranas, Esperöd). Länge: 1,7 mm.

Der Lectotypus befindet sich im Zoologischen Museum in Lund.

17. **Tricimba hungarica** sp. n.

Diese Art gehört zu der im engsten Sinne genommenen *T. cincta*-Artengruppe. Aufgrund der äußeren morphologischen Merkmale ist es fast völlig unmöglich, sie von den Verwandten zu trennen. Von den äußeren Merkmalen dienen Beborstung des Scutellums sowie die Farbe der Beine nur dazu, die Notwendigkeit der Herstellung von Kopulationsapparat-Präparaten zu unterstreichen. Unter den Formen, die hinsichtlich ihrer äußeren Merkmale miteinander fast vollkommen identisch sind, besitzt das Hypopygium den eigenartigsten Bau. Die wichtigsten Unterscheidungsmerkmale sind wie folgt: Beborstung und Behaarung des Körpers hellbraun. Stirndreieck und Occiput aschgrau. Das Stirndreieck wird manchmal von einem graubraunen Hof umgeben. Das Stirndreieck reicht mehr als ein Drittel der Stirn (Abb. 4). Das 3. Fühlerglied in der Nähe des Inserierungspunktes der Fühlerborste von bräunlichem Ton. Thorax dunkelbraun. Rückenseite, Schulten, der größere Teil des Meso- und Pteropleura aschgrau, übriger Teil des Hinterleibes glänzend. Von den Scutellarborsten die Apikalen 2,5mal so lang wie die neben ihnen entspringenden Lateralen (Abb. 13). Beine gelb, höchstens die Schenkel braun. Im Flügelgeäder läuft die hintere Querader (t_p) auffallend schräger ab (Abb. 24). Die ersten zwei Segmente des Hinterleibes gelb, die übrigen dagegen — samt dem Hypopygium — hell, bzw. dunkelbraun. Surstylus des männlichen Kopulationsapparates in seiner größten Ausdehnung fast 1,5mal so lang wie der zwischen den beiden am weitesten entfernten Punkten gemessene Abstand, Spitzenteil breit abgerundet (Abb. 57). Auf den paarigen Endfortsätzen, die zwischen den Surstyli stehen, sieht man je eine sattelartige Einsenkung (Abb. 55).

Weibchen unbekannt.

Länge: Holotypus ♂: 1,4 mm, Paratypen ♂♂: 1,4—1,5 mm.

Verbreitung: Die Typenexemplare stammen aus Ungarn.

Holotypus ♂: »Budai hg. 1969. VII. 11., leg. Babos M., *Russula* sp. kelt. 1969. VIII. 8.«.

Paratypen: 23 ♂♂: Die Angaben stimmen mit denen des Holotypus überein. — 1 ♂: Budaer Gebirge, Hárshokorhegy, 13. VII. 1969. leg. M. Babos, aus *Russula luteotacta* 5. VIII. 1969. — 1 ♂: Pilis-Gebirge: Lajos-Quelle, 20. VI. 1969, leg. M. Babos, aus *Lactarius azonites*, 15. VII. 1969. — 1 ♂: Pilisszentkereszt, 3. IX. 1959, leg. F. Mihályi. — 3 ♂♂: Bükk-Gebirge: Tardi patak völgye, 4. IX. 1959, leg. S. Tóth. — 1 ♂: Tard (mit Obstfalle gefangen), 11. IX. 1959, leg. F. Mihályi.

Wie aus dem oben angeführten hervorgeht, besteht unsere Typenserie — mit Ausnahme von einigen Exemplaren — aus Fliegen, die aus Pilzen (*Lactarius*, *Russula*) gezüchtet

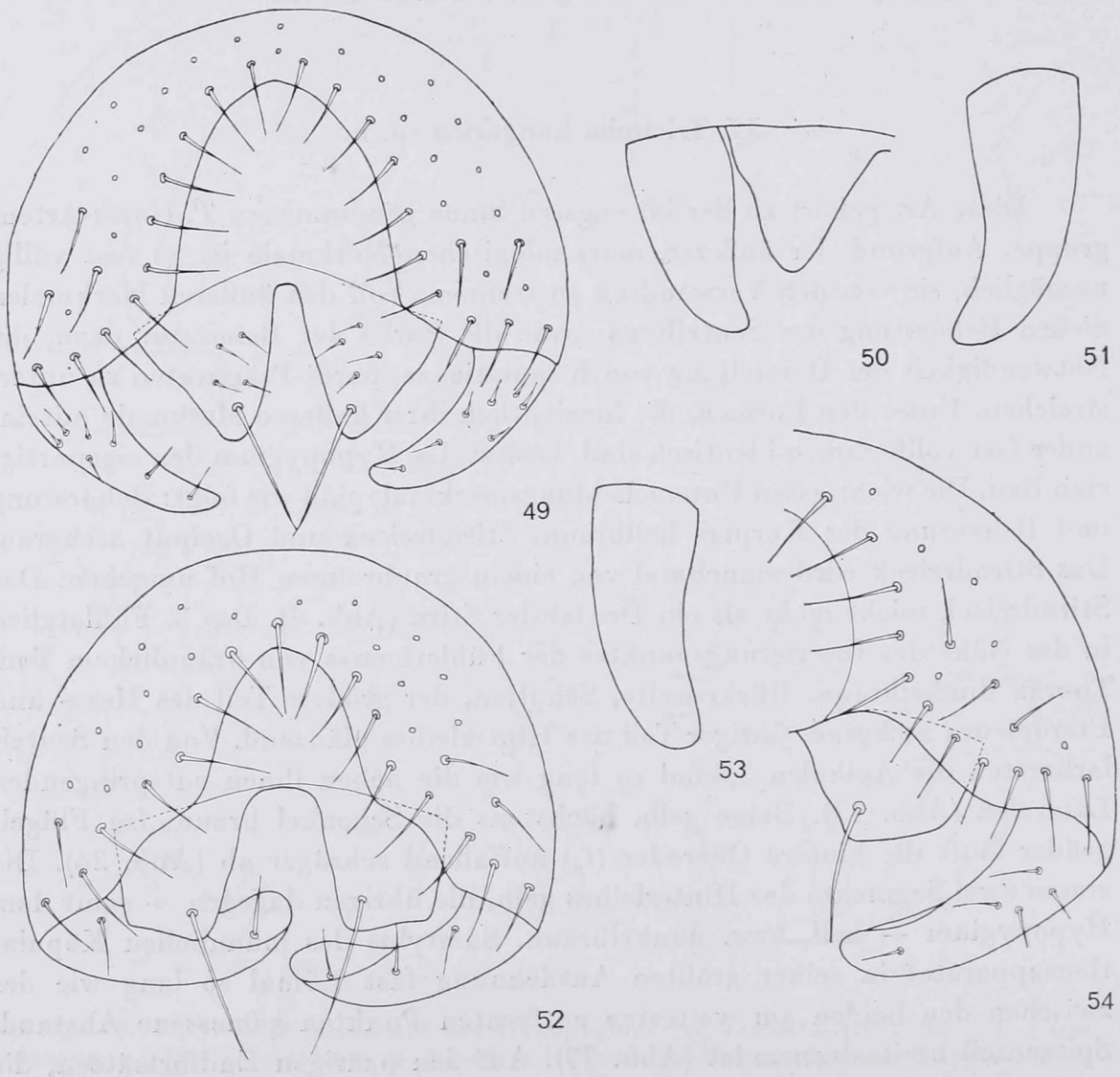


Abb. 49—54. 49, 52, 54 = Dorsalansicht des Hypopygium der *Tricimba*-Arten, 49 = *T. japonica* sp. n., 52 = *T. albiseta* sp. n., 54 = *T. paraalbiseta* sp. n.; 50, 51, 53 = Lateralansicht des Surstylus, 50 = *T. japonica* sp. n., 51 = *T. paraalbiseta* sp. n., 53 = *T. albiseta* sp. n.

worden sind. Seinerzeit wurde über diese Fliegen als *T. cincta* berichtet (DELY-DRASKOVITS, 1972).

Holotypus und Paratypen befinden sich in der Dipteren-Sammlung des Ungarischen Naturwissenschaftlichen Museums, Budapest.

18. *Tricimba apicalis* (VON ROSER, 1840)

VON ROSER, 1840: Corresp. Bl. württ. landw. Ver. Stuttgart (N. S.), **17** (1): 63 (*Chlorops*).

Diese Art gilt zur Zeit als die allernächste bekannte Verwandte der *T. sulcella* ZETT. Aufgrund ihrer äußeren morphologischen Merkmale lassen sie sich nicht voneinander trennen, höchstens in ihren Körpermaßen machen sich etliche Unterschiede bemerkbar. Sie können nur aufgrund des Baues des Hypopygium getrennt werden. Beide Arten waren früher mit *T. cincta* synonym. Für das einzige Exemplar der Art ist Folgendes kennzeichnend: Grundfarbe des Körpers sowie Beborstung schwarz. Größter Teil des Thorax mit einen aschgrauen Bereifung bedeckt. Vorderer Teil des Kopfes sowie apikaler Teil des Scutellums gelb. Scutellarborsten abgebrochen. Vorderschenkel schwarz, mittler und hinterer braun, nur in dem apikalen Abschnitt gelb. Schienen mit einem breiten braunen Ring, an ihrem Grund und ihrer Spitze gelb, die gleiche Farbe besitzen auch die Tarsenglieder. Die innere Spitze der paarigen Endfortsätze gerade abgeschnitten (nicht abgebrochen!). Surstylus in seiner größten Ausdehnung von etwas unregelmäßiger Gestalt, gegen die Spitze sich nicht ganz allmählich verschmälernd (Abb. 59).

Weibchen bisher nicht bekannt.

Länge: Lectotypus ♂: 1,4 mm.

Verbreitung: Deutschland.

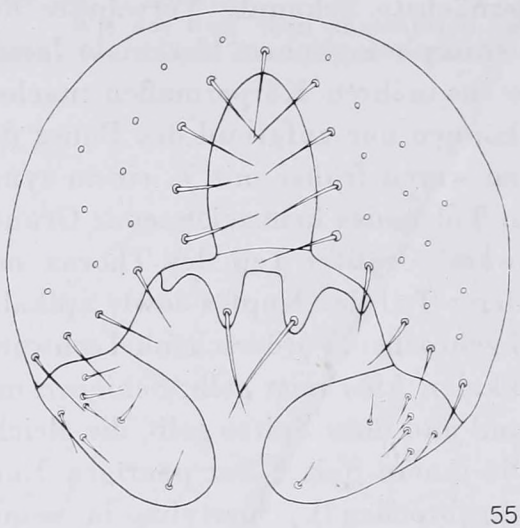
Lectotypus ♂: Unter dem auf eine dünne Insektennadel aufgestochenen Tier befindet sich ein weißes Karton-Etikett mit der Aufschrift »*apicalis*«. Darunter ein zweites, ebenfalls weißes Karton-Etikettchen mit der Nummer »23«. Darunter folgt BECKER's »det«-Etikettchen: »*Oscinis apicalis* v. ROSER«. Endlich folgt ein rotes »Typus« Etikett. Das Tier wurde auf eine verhältnismäßig dicke Nadel gestochen, wodurch der Thorax stark beschädigt wurde. Scutellarborsten fehlen. Hinterleib und Kopulationsapparat sind in Glyzerin aufbewahrt und befinden sich in einem Kunststoff-Röhrchen unter dem Tier. Der Lectotypus stammt aus Deutschland (Württemberg).

Der Lectotypus befindet sich im Staatlichen Museum für Naturkunde in Stuttgart.

19. **Tricimba fungicola** sp. n.

Auch diese neue Art gehört zu den allernächsten Verwandten der *T. cincta*. Aufgrund ihrer äußeren morphologischen Merkmale kann sie nicht auf ihre Artzugehörigkeit bestimmt werden; diese Merkmale reichen nur dazu aus, die Artengruppe festzulegen. Zur Artbestimmung ist es notwendig, das Hypopygium gut zu kennen. Wichtigste Merkmale der Art sind: Beborstung des

Körpers dunkelbraun. Von den Scutellarborsten sind die Apikalen verhältnismäßig kurz, sie sind weniger als 2mal so lang wie die neben ihnen stehenden Lateralen (Abb. 19). Beine gelb, höchstens die Schenkel sind bräunlich überflogen. Körperfarbe stimmt mit jener der Art *T. hungarica* sp. n. überein (siehe *T. hungarica*). Stirn etwa doppelt so lang wie die Höhe des Stirndreiecks (Abb. 9). Dorsalansicht des Hypopygium und Surstylus in der größten Ausdehnung wie auf Abb. 56—58.



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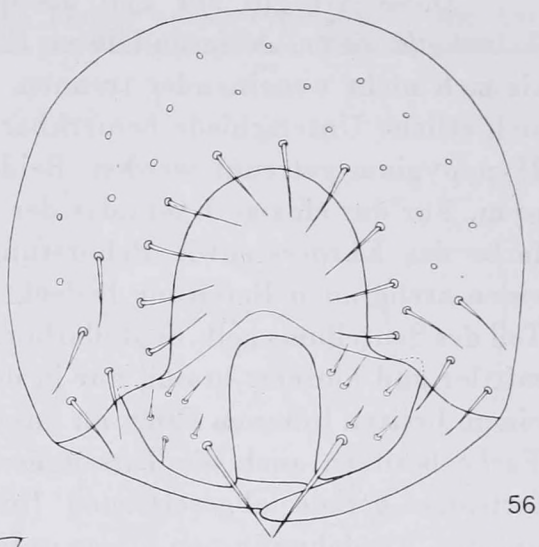

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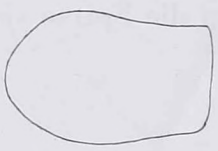

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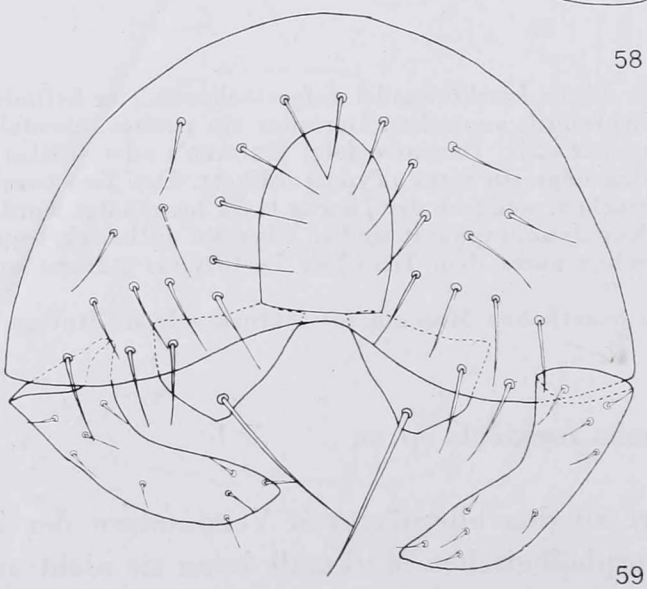

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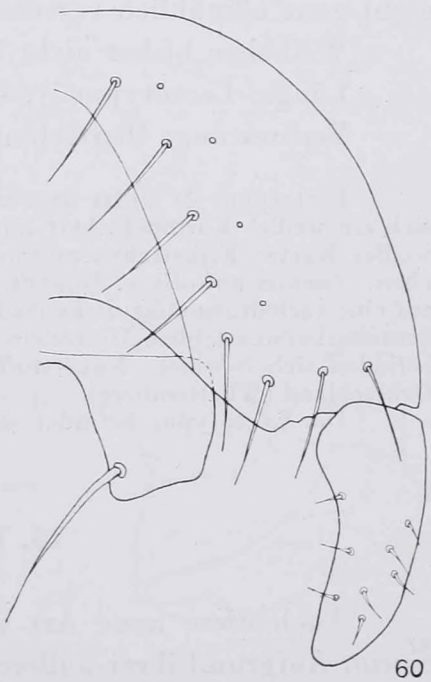

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Abb. 55—60. 55, 56, 59, 60 = Dorsalansicht des Hypopygium der *Tricimba*-Arten, 55 = *T. hungarica* sp. n., 56 = *T. fungicola* sp. n., 59 = *T. apicalis* von Roser (Lectotypus ♂), 60 = *T. sulcella* Zett. (Lectotypus ♂); 57, 58 = Lateralansicht des Surstylus, 57 = *T. hungarica* sp. n., 58 = *T. fungicola* sp. n.

Weibchen unbekannt.

Länge: Holotypus ♂: 1,4 mm. Paratypen ♂♂: 1,4—1,5 mm.

Verbreitung: Die Art ist bisher nur aus dem Karpatenbecken (Tschechoslowakei, Ungarn, Rumänien) bekannt.

Holotypus ♂: »Pilis-hg., Lomhegy, 1970. VII. 14, leg. Babos M., *Russula foetens*, kelt. 1970. VIII. 4«.

Paratypen: Ungarn: 2 ♂♂: Die Angaben stimmen mit denen des Holotypus überein. — Aus Pilzen, leg. M. Babos: 3 ♂♂: Pilis-Gebirge: Helyiipari-forrás [Quelle], 14. VII. 1970, aus *Russula delica*, 4. VIII. 1970. — 1 ♂: Lajos-forrás [Quelle], 13. VII. 1966, aus *Boletus edulis*, 8. VIII. 1966. — 1 ♂: 4. VII. 1969, aus *Lactarius serifluus*, 25. VII. 1969. — 1 ♂: aus *Russula delica*, 30. VIII. 1969. — 4 ♂♂: Budaer Gebirge: 17. VIII. 1966, aus *Lactarius uvidus*, 13. IX. 1966. — 1 ♂: Hárshegy [Hárs-Berg], 9. VIII. 1970, aus *Russula nigricans*, 7. IX. 1970. — 7 ♂♂: Remetehegy [Remete-Berg], 8. VII. 1970, aus *Russula pectinata*, 3. VIII. 1970. — 3 ♂♂: aus *Russula foetens*, 4. VIII. 1970. — 1 ♂: Mátra-Gebirge: Parádsasvár, 6. VII. 1966, aus *Russula grisea*, 25. VII. 1966. — 3 ♂♂: aus *Russula foetens*, 29. VII. 1966. — 1 ♂: Kékes, Ilona-völgy [Ilona-Tal], 7. VIII. 1970, aus *Russula densifolia*, 21. IX. 1970. — 1 ♂: Nyirád, 24. IX. 1969, aus *Russula densifolia*, 15. V. 1970. — 1 ♂: Szakonyfalu: 17. X. 1969, aus *Hypholoma sublateritium*, 29. V. 1970. — Nicht von Pilzen: 2 ♂♂: Bükk-Gebirge: Tardi patak völgye [Tal vom Bach Tard], 4. IX. 1959, leg. S. Tóth. — 1 ♂: Tard, Újhegy [Új-Berg], 28. V. 1958, leg. S. Tóth. — 1 ♂: Bakony-Gebirge: Bakonybél, 1. VIII. 1959, leg. F. Mihályi. — 1 ♂: Csomád, 6. IX. 1972, leg. L. Papp. — 1 ♂: Bicsérd, 25. VII. 1959, leg. F. Mihályi. — 1 ♂: Gyula: Szanazug, 18. IX. 1963, leg. F. Mihályi. — Tschechoslowakei: 1 ♂: Árvaváralja, VII. 1913, leg. Kertész. — 1 ♂: Dobsina, 23. VII. 1964, leg. S. Horvatovich. — Rumänien: 1 ♂: Csíkszépvíz, leg. J. Fodor.

Die Mehrzahl der Typus-Exemplare wurde samt der Art *T. hungarica* sp. n. aus Pilzen (*Russula*, *Lactarius*, *Boletus* und *Hypholoma*-Arten) gezüchtet. Die Angaben wurden unter dem Namen *T. cincta* veröffentlicht (Dely-Draskovits, 1972).

Holotypus und Paratypen sind im Naturwissenschaftlichen Museum in Budapest aufbewart.

Tricimba cincta (Meigen, 1830)

Meigen, 1830: Syst. Beschr., **6:** 162 (*Chlorops*).

Diese Art wurde anhand eines Weibchens beschrieben, das aufgrund seiner äußeren morphologischen Merkmale nicht bestimmt werden kann. Als sicherste Artcharakteristik gilt der Bau der Legeröhre. Solange bis ein entsprechender Bestimmungsschlüssel ausgearbeitet wird, müssen wir uns damit begnügen, die Weibchen wenigstens bis zur Artengruppe bestimmen zu können. Dies betrifft *T. cincta* und ihre nächsten Verwandten. Die Beine der Weibchen sind auch von solchen Arten gelb, bei welchen die Beine der Männchen mehr oder weniger braun, bzw. schwarz gefärbt sind. Gekennzeichnet werden sie weiter durch die 3 Längsfurchen auf dem Thoraxrücken. Stirndreieck ohne jeglichen glänzenden Fleck. Scutellarborsten einander zugeneigt, nie dornartig. Grundfarbe des Körpers dunkelbraun oder schwarz. Thoraxrücken sowie ein Teil der Pleuren mit aschgrauem Überzug bedeckt. Hinterleib glänzend. Vorderteil des Kopfes, apikaler Teil des Scutellums und Beine im allgemeinen gelb. Beborstung gelb, braun oder schwarz. Für die Weibchen der *T. cincta* gilt als bezeichnendes Merkmal: von den Scutellarborsten die Apikalen etwas

mehr als 2mal so lang wie die Lateralen. Die Cerci haben auf der Legeröhre eine eigentümliche Form (Abb. 33).

Männchen bisher nicht bekannt.

Länge: 1,7—1,8 mm.

Verbreitung: Spanien.

Lectotypus ♀: Unter dem auf eine dünne Insektennadel aufgestochenen Tier befindet sich ein weißes Karton-Etikett mit der Aufschrift: »*cincta* Coll. Winth.«. Darunter ein zweites Etikett mit den Angaben: »Madrid 7. August«. Darauf folgt ein drittes: »*cincta* det. BECKER«. Dem Tier fehlen der rechte Fühler, die linke Fühlerborste sowie die Scutellarborsten. Unter dem Tier befindet sich ein Kunststoff-Röhrchen mit dem fehlenden Abschnitt des Hinterleibes (der eine Cercus ist abgebrochen!). Länge: 1,7 mm.

Paralectotypen: 1 ♀: Sämtliche Etiketten mit derselben Handschrift geschrieben wie jene des Lectotypus. Der einzige Unterschied besteht darin, daß anstatt des Fundort-Etiketts unter diesem Tier ein anderes zu finden ist, und zwar mit der Bezeichnung: »*cincta*«. Es ist aber anzunehmen, daß beide Exemplare von demselben Fundort stammen. Rechter Fühler fehlt. — 2 ♀♀: Die unter diesen Tieren befindlichen Etiketten stimmen miteinander überein, sie weichen aber von jenen der vorerwähnten Exemplare ab. Unter den Tieren befindet sich je ein weißes Karton-Etikett mit der Bezeichnung: »Coll. Winth.«, darunter ein zweites: »*cinctus* det. BECKER«. Dem einen Exemplar fehlt das rechte mittlere und das linke hintere Bein. Der Hinterleib befindet sich in Glycerin in einem Kunststoff-Röhrchen (die Cerci waren wahrscheinlich schon früher abgebrochen, denn zur Zeit des Präpariens waren sie sicher nicht mehr vorhanden). Dem zweiten Exemplar fehlt das linke vordere Bein. Hinterleib und Legeröhre befinden sich in Glyzerin in einem Kunststoff-Röhrchen. Der Lectotypus und wahrscheinlich auch der eine Paralectotypus stammen aus Spanien (Madrid). Herkunft der beiden anderen Exemplare unbekannt. Länge: 1,7—1,8 mm.

T. cincta wurde bis zum heutigen Tage als eine der sog. klassischen MEIGEN'schen Fliegenarten (MORGE, 1976) betrachtet. Ihre Imagines wurden überall gesammelt, sogar gezüchtet. Sie gelangte in großen Serien in die Sammlungen der Museen. Auch in unserer Dipteren-Sammlung ist sie durch mehrere Hunderte vertreten. In zahlreichen faunistischen und taxonomischen Aufsätzen beruft man sich auf diese Fliegenart. Von ihren allernächsten Verwandten waren bisher nur *T. humeralis* und *T. lineella* bekannt (DELY-DRASKOVITS und PAPP, 1978). Damit ist es zu erklären, daß die Typus-Exemplare bis zum heutigen Tage nicht untersucht wurden. Die 4 Typenexemplare konnte ich in Wien, in der WINTHEM'schen Sammlung finden (BECKER, 1902). Während ihrer Untersuchung stellte es sich jedoch heraus, daß sämtliche Weibchen sind. Das hätte an sich selbst noch keine Verwicklungen verursacht; inzwischen ist es aber gelungen, Klarheit über die Fülle der verwandten Arten zu schaffen. Man mußte zur Kenntnis nehmen, daß neben *T. lineella* und *T. humeralis* eine ganze Reihe von verwandten Arten existiert. Diese bilden gemischte Populationen und können voneinander nur aufgrund des Hypopygium getrennt werden.

Um die Männchen klarzustellen habe ich vor allem die beiden früheren Synonymien (*Oscinis sulcella* ZETT. und *Chlorops apicalis* VON ROSER) für ungültig erklärt. Diese müssen so lange als valid betrachtete Arten bestehen bleiben, bis die entsprechenden Weibchen aufgefunden werden. In dem einen Fall (*apicalis*) ist der Größenunterschied zwischen den Typen zu groß. In dem anderen Fall (*sulcella*) macht die große Entfernung der Fundorte die Artzugehörigkeit fraglich. Um die Frage von einer anderen Seite aus lösen zu können, habe ich versucht, die Männchen im Kreis der allernächsten Verwandten (*T. fungicola* und *T. hungarica*, *T. albiseta*) aufzufinden. Die Weibchen von dem gezüchteten Material aus großen, homogenen Serien wurden aufgrund der Beschaffenheit ihrer Legeröhre mit den Typen von *T. cincta* verglichen; ich fand sie aber weder den Typen noch einander ähnlich (z. B. Abb. 31, 33). Aus dem Gesagten geht hervor, daß die früheren Literaturangaben über die *T. cincta* ungültig sind.

Aus dem Verwandtschaftskreise der *T. cincta* findet man noch einen Namen in der Literatur, und zwar jenen von *T. flavipila* DUDA (DUDA, 1933). In der Typen-Sammlung ist jedoch unter diesem Namen kein einziges Exemplar zu finden. Es gibt aber 2 ♀♀, mit dem Etikett »albipila Duda«. Dieser Artname ist aber in der Literatur unauffindbar. (Die beiden weiblichen Exemplare konnte ich im Laufe meiner Revisionsarbeiten nicht untersuchen.) Es scheint daher begründet zu sein, den Artnamen *T. flavipila* DUDA im weiteren für einen falschen Namen zu erklären.

Bestimmungstabelle der Arten der Gattung Tricimba Lioy, 1864

1 (6) Auf der Rückenseite des Thorax 5 Längsfurchen (Abb. 1).
2 (3) Im männlichen Kopulationsapparat zwischen den Surstyli nur ein einziger Endfortsatz, in seiner Mitte mit einer kleinen Einbuchtung (Abb. 27). Länge 1,5—1,8 mm. — Europa, Asien und Nordamerika 1. **T. lineella** (FALLÉN, 1820)
3 (2) Im männlichen Kopulationsapparat zwischen den Surstyli zwei Endfortsätze.
4 (5) Surstylus des männlichen Kopulationsapparates in seiner größten Ausdehnung von fußartiger Form (Abb. 29). Länge 1,3—1,4 mm. — Afghanistan 2. **T. heratica** sp. n.
5 (4) Surstylus des männlichen Kopulationsapparates in seiner größten Ausdehnung annähernd walzenförmig (Abb. 30). Länge 1,3 mm. — Afghanistan 3. **T. pulla** sp. n.
6 (1) Auf der Rückenseite des Thorax 3 Längsfurchen (Abb. 2, 3).
7 (8) Medianader im Flügelgeäder stark gebogen, aufwärts gekrümmt (Abb. 23). Länge 2 mm — Afghanistan 4. **T. curvata** SABROSKY, 1964
8 (7) Medianader im Flügelgeäder normal ablaufend (z. B. Abb. 21).
9 (16) Auf dem Stirndreieck vor dem Ozellenfleck ein dunkelbrauner, glänzender Fleck (Abb. 7, 12).
10 (11) Körperlänge 1,5—2 mm. Der Fleck vor dem Ozellenfleck verhältnismäßig groß, sich der Vorderspitze des Stirndreiecks nähernd oder diese auch erreichend (Abb. 7). — Paläarktische und Afrotropische Region 5. **T. humeralis** (LOEW, 1858)
11 (10) Körperlänge 2,5—2,9 mm. Der Fleck vor dem Ozellenfleck verhältnismäßig klein, sich der Vorderspitze des Stirndreiecks nicht nähernd und diese auch nie erreichend.
12 (13) Apikalborsten auf dem Scutellum etwa 3mal so lang wie die Lateralborsten. Rückenseite des Scutellums teilweise aschgrau (Abb. 17). Surstyli in Seitenansicht nicht gekrümmt, etwa 2,5mal so lang wie breit (Abb. 3). Länge 2,5—2,8 mm. — Israel 6. **T. freidbergi** sp. n.
13 (12) Apikalborsten auf dem Scutellum etwa 2mal so lang wie die Lateralborsten.
14 (15) Rückenseite des Scutellums teilweise aschgrau. Apikalborsten hellgelb, Lateralborsten dunkelbraun. Surstyli in Seitenansicht stark gekrümmt, mehr als 4mal so lang wie breit (Abb. 39). Länge 2,8—2,9 mm. — Israel 7. **T. magna** sp. n.
15 (14) Scutellum gelblich. Apikalborsten und Lateralborsten einfarbig gelb. Surstyli in Seitenansicht nicht gekrümmt, etwa 2,5mal so lang wie breit (Abb. 40). Länge 2,8 mm. — Israel 8. **T. submagna** sp. n.
16 (9) Auf dem Stirndreieck vor dem Ozellenfleck kein glänzender Fleck.
17 (20) Auf dem Scutellum voneinander abstehende, starre, dornartige Borsten (Abb. 16).
18 (19) Zwischen den Surstyli beiderseits paarige häutige Endfortsätze (Abb. 42). Surstyli von stiefelartiger Form (Abb. 44). Oberhalb der Surstyli ein fausthandschuh-ähnlicher Fortsatz (Abb. 43). Länge 1,3 mm. — Afghanistan 9. **T. parasetulosa** sp. n.
19 (18) Zwischen den Surstyli kein häutiger Endfortsatz. Oberhalb der Surstyli von anderer Form. Länge 1,3 mm. — Ägypten 10. **setulosa** (BECKER, 1903)
20 (17) Auf dem Scutellum einander zugeneigte Borsten, nie dornartig (z. B. Abb. 13).
21 (28) Beborstung des Körpers gelb oder hellbraun, nie schwarz.
22 (23) Scutellum einfarbig aschgrau. Die zwischen den Surstyli stehenden paarigen Endfortsätze auffallend lang, stets länger als die Hälfte der Gesamtlänge der Surstyli (Abb. 48). Surstyli lanzettenartig zugespitzt (Abb. 47). Länge 1,7 mm. — Israel 11. **T. kaplanae** sp. n.
23 (22) Scutellum in seinem apikalen Drittel gelb.
24 (25) Beine zum Teil hellbraun. Die zwischen den Surstyli stehenden paarigen Endfortsätze zugespitzt endend, auch das Ende der Surstyli zugespitzt (Abb. 45). Länge 1,7 mm. — Israel 12. **T. meridiana** sp. n.
25 (24) Beine gelb. Die zwischen den Surstyli stehenden paarigen Endfortsätze gerade abgeschnitten. Das Ende der Surstyli abgerundet.
26 (27) Die zwischen den Surstyli stehenden paarigen Endfortsätze deutlich wahrnehmbar verschmälernd. In ihren Spitzenteil 1/2mal so breit wie an ihrer Basis (Abb. 54). Surstyli gegen ihre Spitze allmählich verschmälernd und gebogen (Abb. 51). Länge 1,4—1,5 mm. — israel 13. **T. paraalbiseta** sp. n.
27 (26) Die zwischen den Surstyli stehenden paarigen Endfortsätze nur kaum wahrnehmbar verschmälernd. In ihrem Spitzenteil fast so breit wie an ihrer Basis (Abb. 52). Sur-

styli gegen ihre Spitze kaum verschmälernd, fast gerade (Abb. 53). Länge 1,3—1,4 mm. — Bulgarien, Jugoslawien und Ungarn 14. **T. albiseta** sp. n.

28 (21) Beborstung des Körpers dunkelbraun oder schwarz.

29 (30) Vorderer Teil des Kopfes, apikaler Teil des Scutellums und auf den Beinen die Tarsenglieder, distaler und proximaler Teil der Schienen sowie distaler Teil der Schenkel hellbraun. Die zwischen den Surstyli stehenden paarigen Endfortsätze verhältnismäßig lang, sie erreichen 3/4 der Gesamtlänge der Surstyli (Abb. 49, 50). Länge 1,3 mm. — Japan 15. **T. japonica** sp. n.

30 (29) Vorderer Teil des Kopfes, apikaler Teil des Scutellums und auf den Beinen die Tarsenglieder, distaler und proximaler Teil der Schienen sowie distaler Teil der Schenkel gelb.

31 (32) Größeres Tier, Länge 1,7 mm. Innere Spitze der zwischen den Surstyli stehenden paarigen Fortsätze abgerundet. Surstyli gegen die Spitze sich allmählich verschmälernd (Abb. 60). Länge 1,7 mm. — Schweden 16. **T. sulcella** (ZETTERSTEDT, 1848)

32 (31) Kleinere Tiere, Länge 1,4—1,5 mm.

33 (34) Die zwischen den Surstyli stehenden paarigen Endfortsätze mit einer sattelartigen Einsenkung (Abb. 55). Surstylus etwa 1,5mal so breit wie der Abstand zwischen den beiden am weitesten entfernten Punkten, seine Spitze breit, abgerundet (Abb. 57). Länge 1,4—1,5 mm. — Ungarn 17. **T. hungarica** sp. n.

34 (33) Die zwischen den Surstyli stehenden paarigen Endfortsätze ohne eine sattelartige Einsenkung. Surstylus wenigstens 2mal so breit wie der Abstand zwischen den beiden am weitesten entfernten Punkten; gegen die Spitze sich allmählich verschmälernd.

35 (36) Die innere Spitze der zwischen den Surstyli stehenden paarigen Endfortsätze gerade abgeschnitten. Form des Surstylus ein wenig unregelmäßig, gegen die Spitze sich nicht allmählich verschmälernd (Abb. 59). Länge 1,4 mm. — Deutschland 18. **T. apicalis** (VON ROSER, 1840)

36 (35) Die innere Spitze der zwischen den Surstyli stehenden paarigen Endfortsätze abgerundet (Abb. 56). Form des Surstylus regelmäßig, gegen die Spitze sich allmählich verschmälernd (Abb. 58). Länge 1,4—1,5 mm. — Karpatenbecken (Tschechoslowakei, Ungarn und Rumänien) 19. **T. fungicola** sp. n.

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REVISION DER GATTUNG CHIRONOMUS MEIGEN (DIPTERA). IX

C. BALATONICUS SP. N. AUS DEM FLACHSEE BALATON (UNGARN)

GY. DÉVAI, W. WÜLKER und A. SCHOLL

(Eingegangen am 3. Dezember 1982)

The description of *C. balatonicus* sp. n. includes karyological, enzymological and morphological characters as well as some data on habitat, behaviour and ecological importance. It is based on material from the open water sediment of Keszthely-basin, Lake Balaton and laboratory rearings.

The differential diagnosis of *C. balatonicus* against *C. plumosus* is based on differences in the chromosomal banding pattern, especially of arms A, B and F. The difference between the two species is also expressed in the electrophoretic pattern of 7 out of 14 enzymes analysed, while being nearly indeterminable when using conventional morphological characters and also ambiguous with methods of numerical taxonomy.

C. balatonicus occurs in Lake Balaton and at other sampling sites sympatrically with *C. plumosus*. However, the relative density of *C. balatonicus* indicates preference of habitats poorer in decomposing organic matter. No hybrids have been found, thus both species seem to be isolated by mating barriers.

Einleitung. Vor fünf Jahren hat die Arbeitsgruppe für Hydrobiologie des Lehrstuhles für Ökologie an der Lajos-Kossuth-Universität Debrecen begonnen, die Zuckmückenfauna (Diptera: Chironomidae) des Flachsees Balaton taxonomisch und ökologisch zu bearbeiten. Diese Arbeiten werden seit 1978 vom Kulturministerium, seit 1979 von der Ungarischen Akademie der Wissenschaften und seit 1981 vom Landesamt für Umwelt- und Naturschutz unterstützt; gegenwärtig laufen sie unter Zeichen A-12 (»Forschung zum regionalen Umweltschutz des Balaton«) im Rahmen eines Landeszielprogrammes.

Diese Forschungen haben unter anderem das Ziel, biologische Informationen zu sammeln, die Grundlage eines Planes zur Verbesserung und zum Schutz der Wasserqualität des immer bedrohlicher eutrophierten Sees werden sollen und später eine Kontrolle gestatten, wie wirksam die durchgeführten Maßnahmen waren. Zur Erreichung dieses Zieles eignen sich die Chironomiden besonders gut, weil ihre Larven ökologisch sehr verschiedene Ansprüche stellen und daher als Indikatoren der Gewässergüte bekannt sind (z. B. STRENZKE, 1960) und weil sie als dominierende Bodenorganismen im Stoff- und Energiehaushalt von Seen eine hervorragende Rolle spielen.

Unsere Arbeiten haben sich zuerst auf die am stärksten eutrophierten westlichen Becken (Keszthelyer und Szigligeter Becken) konzentriert. Dort dominieren in den Sedimenten der offenen Wasserflächen nach Individuenzahl und Biomasse die Larven der Gattung *Chironomus* (vgl. DÉVAI, 1980, DÉVAI et al., 1979, 1980). Die bisher verfügbare Literatur (LENZ, 1926, ZILAHI-SEBESS, 1932, BERCZIK, 1960, ENTZ, 1964, 1965, PONYI et al., 1971) nennt für den Balaton-See drei Larven-Typen dieser Gattung, nämlich *plumosus-*, *semireductus-* und *thummi*-Typ. Unser Material enthielt nur Larven des *plumosus*-Typs (tubuli laterales des 7. und tubuli ventrales des 8. Abdominalsegmentes vorhanden). Nach anderen Larvenmerkmalen als den tubuli — z. B. den von GEIGER et al. (1978) genannten — und nach der Morphologie von Puppen und Imagines geurteilt, war das Material jedoch uneinheitlich und dadurch der Verdacht begründet, daß es mehr als eine Art enthielt. Das wäre nicht erstaunlich, weil jeder der Larventypen von *Chironomus* sicher mehrere Arten umfaßt (LENZ, 1954—62, WÜLKER und BUTLER, 1983, WÜLKER et al., 1983). Die Unterschiede könnten aber natürlich

auch durch hohe individuelle Variabilität einer einzigen Art bedingt sein. Diese Alternative kann nur mit Hilfe moderner cytotaxonomischer und chemotaxonomischer Methoden, allenfalls auch durch verfeinerte morphologische Analyse, die an gezüchteten, eindeutig zusammengehörenden Larven, Puppen und Imagines vorgenommen wird, geklärt werden.

Die Anwendung dieser Methoden ergab schon 1979, daß in den Sedimenten der offenen Wasserflächen des Balaton neben *C. plumosus* eine morphologisch nahestehende, bisher nicht beschriebene *Chironomus*-Art in Massen vorhanden ist. Wenn diese beiden Arten schwer unterscheidbar sind, ist damit zu rechnen, daß auch in anderen Fällen die Indikatoreigenschaft für eutrophe Seen, die *C. plumosus* allgemein zugesprochen wird (THIENEMANN, 1954, BRUNDIN, 1958, STAHL, 1969, SAETHER, 1975, 1979, 1980a, KANSANEN und AHO, 1981), in Wirklichkeit mehrere nah miteinander verwandte Arten betrifft. In der Tat ist kürzlich das sympatrische Vorkommen zweier nächstverwandter neuer Arten zusammen mit *C. plumosus* im Wohlensee (Schweiz) zum Anlaß genommen worden, eine »*plumosus*-Artengruppe« (*C. plumosus*, *C. muratensis*, *C. nudiventris*) aufzustellen (RYSER et al., 1983).

In der vorliegenden Arbeit können wir für *C. plumosus* auf den existierenden Beschreibungen der Larve, Puppe (Literatur bei LENZ, 1954–62) und Imago (STRENZKE, 1959, PINDER, 1978) sowie auf der Analyse des Karyotyps durch KEYL und KEYL (1959) und KEYL (1962) und den enzymologischen Angaben bei SCHOLL et al. (1980) aufbauen. Es bleibt als Aufgabe, die konstanten Unterschiede der neuen Art aus dem Balaton diesen Angaben differentialdiagnostisch gegenüberzustellen und die individuelle Variabilität beider Arten, die ihre Unterscheidung erschwert, genauer einzugrenzen.

Material und Methoden. Die Artbeschreibung stützt sich auf Freiland-Aufsammlungen aus den Jahren 1978–1982 sowie auf Material aus Laborzuchten.

Die Larven entstammen größtenteils dem Sediment der offenen Wasserflächen im Mittelteil des Keszthelyer Beckens. Zur morphologischen Untersuchung sind zusätzlich vier Probenserien von Fundstellen entlang der Längsachse des Balaton und fünf weitere aus dem Keszthelyer Becken (DÉVAI et al., 1980) einbezogen. Ferner sind Kopfkapselreste aus Proben palaeolimnologischer Untersuchungen (DÉVAI und MOLDOVÁN, 1983) berücksichtigt. Bei der karyologischen Analyse haben wir außerdem Mischpopulationen vom Uferbereich vor Keszthely analysiert, die Larven von *C. balatonicus* und *C. plumosus* enthielten.

Puppenexuvien wurden vorwiegend aus dem Schwemmgut im Uferbereich bei Keszthely, weitere vom Ufer bei Szigliget, Badacsony, Ábrahámhegy und Tihany gewonnen, Puppenhäute frisch geschlüpfter Imagines konnten an der Wasseroberfläche im mittleren Teil des Keszthelyer Beckens abgesammelt werden.

Imagines haben wir in der Ufervegetation bei Keszthely und Vonyarcvashegy sowie entlang der gesamten nördlichen Uferstrecke des Balaton gefangen, einen kleineren Teil auch abends von Schiffen und Gebäuden in Ufernähe abgelesen.

Zuchtmaterial ist einbezogen in die karyologischen (Larven) und morphologischen (Larven, Puppen und Imagines) Untersuchungen. Die Stammzuchten waren aus Freilandlarven-Fängen (Juni 1981, April 1982) aufgebaut, die im Labor in 180-Liter-Aquarien zum Schlüpfen und zur Eiablage gebracht wurden. Aufzucht der Geschwisterschaften nach Gelegen getrennt in Glasschalen (∅ 23 cm, Höhe 10 cm) bei 18–22 °C. Die Aquarien wurden belüftet und zur Vermeidung von Kontamination mit Gaze abgedeckt, Fütterung der Larven mit Nesselpulver.

Zur Präparation der Speicheldrüsen (KEYL und KEYL, 1959) verwendeten wir Larven des vierten Stadiums, Phasen 6–8 (Bestimmung der Entwicklungsphase und des Geschlechtes nach WÜLKER und GÖTZ, 1968). Freilandmaterial wurde bis zur Bearbeitung in Wasser vom Fundort im Kühlschrank (4–6 °C) aufbewahrt. In einzelnen Fällen ist auch nach KEYL (1962) in Alkohol-Glycerin-Eisessig konserviertes Material verwendet worden. In der Bezeichnung der chromosomalen Strukturtypen folgen wir KEYL (1962). Angaben zur Inversionshäufigkeit beziehen sich auf 50 Larven aus Freilandproben.

Die enzymologischen Untersuchungen gingen von lebenden Freiland-Larven aus, Aufbewahrung bis zur Bearbeitung in Wasser vom Fundort (Kühlschrank, 4–6 °C). Zur Enzymanalyse wurden Überstandsfraktionen von Körperhomogenaten einzelner Larven in vertikalen Stärkegelen elektrophoretisch aufgetrennt, Enzymstichprobe und Methodik entsprechen den ausführlichen Beschreibungen und Zitaten bei WÜLKER et al. (1981). Die in Text und Tabellen verwendeten Abkürzungen der Enzyme sind folgende: Alkohol-Dehydrogenase (ADH), Adenylat-Kinase (AK-1 und AK-2), Arginin-Phosphokinase (APK), Glutamat-Oxalacetat-Transaminase (GOT-1 und GOT-2), Isocitrat-Dehydrogenase (IDH-1 und IDH-2), Indophenol-Oxydase (IPO), Malat-Dehydrogenase (MDH-1 und MDH-2), Phosphoglucose-Isomerase (PGI), Phospho-Glucomutase (PGM) und Pyruvat-Kinase (PK). Die Bezeichnungen AK-1 und AK-2, GOT-1 und GOT-2 etc. beziehen sich jeweils auf zwei genetisch unabhängige Isoenzymsysteme. Allelbezeichnungen beziehen sich auf die Mobilitätsdifferenzen der

betreffenden Enzyme im Vergleich zu *C. plumosus* (WÜLKER et al., 1981). Es gelangten 15 Larven von *C. balatonicus* zur Untersuchung, ferner wurden 8 Larven des auch in früheren Untersuchungen stets als Referenz mitgeführten *C. plumosus* von Fundorten in der Schweiz analysiert sowie *C. plumosus* aus Ungarn (3 Larven Szamos-Altwasser bei Tunyogmatolcs, 5 Larven Fluß Hortobágy nahe der Gemeinde Hortobágy).

Die für morphologische Untersuchungen bestimmten Larven, Puppen, Puppenexuvien und Imagines wurden in 70% Äthanol konserviert. Präparation nach SCHLEE (1966) und mündlichen Anweisungen der Kollegen F. REISS, G. MOTHES und H. K. M. MOLLER PILLOT. Auswahl und Messung der Merkmale nach persönlichen Erfahrungen im Verlauf der Bearbeitung, außerdem sind wir bei Larven ATCHLEY und MARTIN (1971) und bei Imagines SCHLEE (1966) gefolgt. Terminologie nach SAETHER (1980b). Zur morphologischen Merkmalsanalyse war ein Vergleich mit *C. plumosus* notwendig. Hierfür stand einerseits die Freilandsammlung vom Szamos-Altwasser bei Tunyogmatolcs, andererseits das von K. STRENZKE gesammelte und gezüchtete Material (Larven, Puppen und Imagines) zur Verfügung. Die numerisch-taxonomische Auswertung der Meßergebnisse führten wir mit einem programmierbaren Rechner (Texas Instruments TI-59) nach SNEATH und SOKAL (1973), LEUSCHNER (1974) und SMIRNOV (1969) durch.

ARTBESCHREIBUNG

Chironomus balatonicus sp. n.

Locus typicus: Balaton-See, Ungarn, Keszthelyer Becken, ca. 4 km südöstlich von Keszthely.

Typenmaterial: Holotypus (Chromosomen, Kopfkapsel, Hinterende und übriger Körper der Larve) »*Chironomus balatonicus* sp. n., Keszthely, 17. 04. 1982, leg. GY. DÉVAI und W. WÜLKER« in Dipteren-Sammlung Zoologische Abteilung Ungarisches Naturwissenschaftliches Museum Budapest; Paratypen (je 2 entsprechende Präparate) in Zoologischer Staatssammlung München BRD, Sammlung Lehrstuhl Ökologie Lajos-Kossuth-Universität Debrecen/Ungarn, Sammlung Wülker Institut Biologie I (Zoologie) Freiburg Br./BRD, Naturhistorisches Museum Bern/Schweiz.

Diagnose: Chromosomen gehören zum *thummi*-Komplex (Armkombination AB, CD, EF, G), von *C. plumosus* vor allem durch die Bandenmuster des Armes A und F zu unterscheiden. Larve gehört zum *plumosus*-Typ. In der männlichen Imago differieren vor allem der processus analis und die Analtergitbänder des Hypopygiums von *C. plumosus*.

Verbreitung und Lebensraum: Außer am locus typicus auch an anderen Stellen des Balaton-Sees gefunden (leg. GY. DÉVAI, I. MOLNÁR, J. MOLDOVÁN), weiterhin im Schlamm des in den Balaton mündenden Nyugati-övcsatorna [= westlichen Ringkanals] (leg. J. MOLDOVÁN), des Szamos-Altwassers bei Tunyogmatolcs und des Flußufers von Hortobágy nahe der Gemeinde Hortobágy (leg. GY. DÉVAI, J. MOLDOVÁN, W. WÜLKER) und in Karpfenteichen V. Podvinice Tschechoslowakei (1. 03. 82, leg. J. MATĚNA).

KARYOLOGISCHE BESCHREIBUNG

Armkombination AB, CD, EF, G (*thummi*-Komplex). Centromere nicht heterochromatinisiert. Die Chromosomenstruktur ist meistens wesentlich besser als bei dem durch arttypische Kontraktion der Chromosomen gekennzeichneten *C. plumosus*.

Arm A (Taf. I: Abb. 1): Die beobachteten Strukturtypen des Armes können durch einfache Inversionen an Strukturtyp A1 von *C. plumosus* angeschlossen werden.

	c		c			a—cg—d					h	d	b	
1—2		9—7		14—13	4		2	10—12		3—2		4—7	15—19	*balatonicus 2*
	c			d	h				d—gc—a					
1—2		9—4		2—3		12—10		2	4		13—19			*balatonicus 1*
	c					h	d	d—gc—a						
1—2		10—12		3—2		4—9		2	4		13—19			*plumosus 1*

Bei der Erkennung der Strukturtypen sind vor allem die dunklen Banden des Abschnittes 2h—3 hilfreich, die bei A1 distal, bei A2 proximal der Armmitte liegen.

Arm B (Taf. I: Abb. 2): Im Vergleich zu Strukturtyp B2 von *C. plumosus* liegen die beiden distalen Drittel des Armes vertauscht (Buchstaben in Taf. I: Abb. 2), aber in gleicher Orientierung. Dieser Umbau erfordert drei Inversionsschritte.

Arm C (Taf. I: Abb. 3): C1 ist identisch mit C2 von *C. plumosus*, C2 hat das gleiche Bandenmuster wie Arm C von *C. muratensis*, jedoch fehlt der Nucleolus, der bei *C. muratensis* an der durch Pfeil gekennzeichneten Stelle ausgebildet ist. Die Strukturtypen von *C. balatonicus* können an der Lage der »Hantel« (markiert in Taf. I: Fig. 3, Gruppe 2 bei KEYL, 1957) erkannt werden.

Arm D (Taf. II: Abb. 4): D1 ist identisch mit D1 von *C. plumosus* mit Ausnahme des Centromers, das bei *C. plumosus* als viel stärkere Bande ausgebildet ist und einer centromernahen Bande (Pfeile in Taf. II: Abb. 4), die umgekehrt bei *C. balatonicus* stärker ist. D2 differiert durch eine kurze Inversion in Armmitte (Grenzen in Taf. II: Abb. 4, heterozygot in Taf. III: Abb. 10). Der nur heterozygot gefundene seltene Strukturtyp D3 beruht auf einer langen, den größten Teil des Armes umfassenden Inversion. Die zu Strukturtyp D4 führende Inversion ist sehr kurz und liegt terminal (Taf. II: Abb. 4).

Arm E (Taf. II: Abb. 5): identisch mit *C. plumosus*, *C. nudiventris* und anderen Arten (KEYL, 1962).

e	b	f	c
1—3	5—10	4—3	10—13

Arm F (Taf. II: Abb. 6): identisch mit *C. aberratus* (KEYL, 1962), *C. sororius* (WÜLKER, 1973), *C. tardus*, *C. cucini*, *C. major* (WÜLKER und BUTLER, 1983).

1—10 17—11 18—23

Arm G (Taf. II: Abb. 7): G1 erscheint sehr ähnlich mit Arm G von *C. plumosus* (Zeichnung bei KEYL und KEYL, 1959), in beiden Fällen ist ein terminaler Nucleolus (durch Heterochromatin abgeschlossen), ein terminaler Balbiani-Ring am anderen Ende und ein weiterer Balbiani-Ring in seiner Nähe vorhanden. Im einzelnen sind aber bei *C. balatonicus* mehr Banden nachweisbar, die Homologen sind im Gegensatz zu *C. plumosus* meistens gepaart. Zu *C. muratensis* und *C. nudiventris* bestehen deutliche Unterschiede in der Anordnung des Bandenmusters. Zu G2 von *C. balatonicus* führt eine lange Inversion (Klammern in Taf. II: Abb. 7).

In den 50 Präparaten unseres Materiales, die von Freilandsammlungen aus dem Keszthelyer-Becken des Balaton stammen, haben wir die quantitative Verteilung der zygotischen Kombinationen und Strukturtypen ermittelt. Für die Häufigkeit der zygotischen Kombinationen ergab sich:

A11	A12	A22	C11	C12	C22	D11	D12	D22	D13	D14	G11	G12	G22
7	31	12	24	20	6	42	4	—	2	1	35	13	2

Daraus errechnen sich die folgenden Häufigkeiten der Strukturtypen:

A1	A2	C1	C2	D1	D2	D3	D4	G1	G2
0,45	0,55	0,68	0,32	0,93	0,04	0,02	0,01	0,83	0,17

Die im ungarischen Material nur selten beobachtete Strukturvariante D2 ist am tschechoslowakischen Fundort offenbar häufiger, dort konnte auch die zygotische Kombination D22 gefunden werden, die in ungarischen Proben bisher noch fehlt.

ENZYMOLOGISCHE BESCHREIBUNG

Zur enzymologischen Abgrenzung den *C. balatonicus* wurden die an 14 Enzymloci festgestellten Allele und deren Frequenzen untersucht.

Zwischen den als Vergleichsmaterial gebrauchten *C. plumosus* Exemplaren ungarischer und schweizerischer Provenienz haben sich keine nennenswerten Differenzen ergeben, abgesehen von geringfügigen Unterschieden in den Allelfrequenzen an polymorphen Loci (Tabelle 1). Bei den meisten Enzymen dürften diese Unterschiede auf die kleinen Stichprobenumfänge zurückzufüh-

ren sein. Eine etwas größere Differenz, die geographisch bedingt sein könnte, ergibt sich in den Allelfrequenzen am GOT-1-Locus (Tabelle 1).

C. balatonicus und *C. plumosus* waren elektrophoretisch nicht unterscheidbar bei den folgenden Enzymen: AK-1, AK-2, APK, IDH-2 (Taf. IV: Abb. 12b), IPO, MDH-2 und PK. In Tabelle 1 sind diejenigen Enzyme zusammengestellt, bei welchen sich Differenzen ergeben haben.

Tabelle 1

Allelfrequenzen an den 7 unterschiedlichen Enzymloci bei C. balatonicus und C. plumosus

Enzymlocus	Allel	*balatonicus* (Keszthely) N = 15	*plumosus* (Schweiz) N = 8	*plumosus* (Ungarn) N = 8
ADH	100	—	1,0	1,0
	106	1,0	—	—
GOT-1	100	—	0,87	0,31
	110	1,0	0,13	0,69
GOT-2	95	0,03	—	—
	100	0,07	1,0	1,0
	106	0,90	—	—
IDH-1	94	—	0,13	—
	97	1,0	—	—
	100	—	0,87	1,0
MDH-1	95	0,87	—	—
	100	0,13	0,50	0,57
	105	—	0,50	0,43
PGI	90	0,10	—	0,10
	100	0,90	1,0	0,90
PGM	88	0,03	—	—
	94	0,47	—	0,06
	100	0,47	1,0	0,88
	106	0,03	—	0,06

C. balatonicus und *C. plumosus* unterscheiden sich bei ADH (Taf. IV: Abb. 12a) und IDH-1 (Taf. IV: Abb. 12b) durch andersartige Mobilität, bei *C. plumosus* ist zudem IDH-1-Polymorphismus beobachtet worden, bei *C. balatonicus* hingegen nicht. Bei anderen Enzymen unterscheiden sich die beiden Arten in den Frequenzen der beiden Elektromorphen (MDH-1 und PGM) oder darin, daß ein bei der einen Art monomorphes Enzym bei der anderen Art polymorph ist (GOT-1 und GOT-2), wobei beträchtliche Unterschiede bestehen in den Frequenzen der jeweils bei beiden Arten gefundenen Elektro-

morphen. Bei PGI werden dagegen bei beiden Arten die gleichen Elektromorphen in vergleichbaren Frequenzen gefunden.

Wie schon in früheren Arbeiten (SCHOLL et al., 1980, WÜLKER et al., 1981) sind die elektrophoretisch erkennbaren genetischen Ähnlichkeiten nach NEI (1972) quantifiziert worden. Der Ähnlichkeitskoeffizient ($\bar{I}$) zwischen *C. balatonicus* und *C. plumosus* beträgt 0,65. In Kenntnis der bei SCHOLL und Mitarbeitern (1980) mitgeteilten Befunde läßt sich abschätzen, daß annähernd die gleichen Ähnlichkeitskoeffizienten auch für einen Vergleich der Artenpaare *C. balatonicus*—*C. muratensis* und *C. balatonicus*—*C. nudiventris* resultieren dürften. Im Vergleich der drei Arten *C. plumosus*, *C. muratensis* und *C. nudiventris* waren an früherer Stelle (SCHOLL et al., 1980) Ähnlichkeitskoeffizienten zwischen 0,81 und 0,89 gefunden worden. Nach den Enzymbefunden steht *C. balatonicus* damit den drei Arten der *plumosus*-Gruppe nicht so nahe, wie diese untereinander.

MORPHOLOGISCHE BESCHREIBUNG

Die Larven von *C. balatonicus* gehören zum *plumosus*-Larventyp: kurze tubuli laterales sind vorhanden, ebenso zwei Paar tubuli ventrales, von denen das vordere meist etwas kürzer und dünner ist (Taf. IV: Abb. 13c). Die Länge der tubuli ventrales ist sehr variabel, in Grenzfällen können sie annähernd doppelte oder nur etwa halbe Segmentlänge aufweisen, die letztere, nur von einzelnen Individuen represäntierte Situation entspräche dem »*semireductus*«-Typ. Die tubuli ventrales sind etwas steifer als bei *C. plumosus* und höchstens aufgebogen, nicht gedreht (Taf. IV: Abb. 13c und 14c), ihr Ende ist vor allem beim vorderen Paar verjüngt (aber nicht zugespitzt).

Auch andere Larvalmerkmale sind nicht sicher von *C. plumosus* unterscheidbar. Die Larven sind im IV. Stadium sehr groß (Länge >20 mm, Lebendgewicht 45—50 mg, Kopfkapsellänge 770 μm, Breite 775 μm, Höhe 500 μm). Das Verhältnis des Abstandes der dorsalen Augen zur Länge des ersten Antennengliedes ist >3. Das schwarze Band der Antennenbasis reicht mit feinen Ausläufern bis hinter die dorsalen Augen, ist aber meist weniger stark pigmentiert als bei *C. plumosus*. Kopfkapsel dorsal hell, Gula in voller Länge dunkelbraun. Die dunkle Pigmentierung der Gula endet meist scharfrandig (Taf. IV: Abb. 13a), bei einzelnen Exemplaren kann sie aber auch wie bei *C. plumosus* (Taf. IV: Abb. 14a) auf die Postoccipitalregion ausgebreitet sein.

Unterschiede bei den Larven liegen oft auch in der Bezahnung des Mentums (Taf. IV: Abb. 13b und 14b). Die Zahnreihe erscheint bei *C. balatonicus* im allgemeinen einheitlicher als die von *C. plumosus*, der Abstand des linken und rechten ersten Seitenzahnes (von innen gezählt) ist geringer, die Lücke zwischen den 2. und 3. Seitenzähnen ist nicht so groß, Mittelzahn und Nebenzähne sind höher und spitzer als bei *C. plumosus*. Diese Merkmalskom-

bination, die bei direktem Vergleich der Menta beider Arten zu ihrer Unterscheidung brauchbar erscheint, war allerdings bei numerisch-taxonomischer Analyse nicht überschneidungsfrei. Insgesamt erscheinen uns beide Arten nur unter gleichzeitiger Berücksichtigung sämtlicher Merkmale und auch dann nur mit großer Wahrscheinlichkeit, nicht völliger Sicherheit, morphologisch unterscheidbar, wesentlich sicherer ist die karyologische oder enzymologische Untersuchung.

Bei den Puppen und Puppenexuvien konnten wir keine nennenswerten Unterschiede zwischen *C. balatonicus* und *C. plumosus* feststellen.

Die Imagines von *C. balatonicus* sind groß (Körperlänge 9—12 mm, Lebendgewicht 7—16 mg). In den traditionellen morphologischen Merkmalen (z. B. A.R., L.R., Tarsenverhältnis Ta_3/Ta_2 des Vorderbeines) können sie nicht von *C. plumosus* unterschieden werden. Ein bemerkenswerter Unterschied zeigte sich jedoch in der Seitenansicht des Hypopygiums: Der processus analis und die Analtergitbänder sind viel stärker ausgewölbt als bei *C. plumosus* (Taf. V: Abb. 15 und 16). Das Hypopyg ist bei *C. balatonicus* gedrungen, bei *C. plumosus* gestreckter. Der Unterschied läßt sich mit dem Quotienten aus den Produkten jeweils zweier Meßwerte darstellen (Taf. V: Abb. 17). Dieser Quotient beträgt im Durchschnitt bei *C. balatonicus* 5,16, bei *C. plumosus* 8,30.

HABITAT, LEBENSWEISE UND ÖKOLOGISCHE STELLUNG

Der See Balaton ist der größte Flachsee in Mitteleuropa (Fläche 588,5 km^2, Maximaltiefe 11,2 m, durchschnittliche Tiefe 3,4 m, Wassermenge 1978 · 10^6 m^3 — vgl. BARANYI, 1980). Wegen der morphometrischen Gegebenheiten seiner vier Becken und der dazu gehörenden Einzugsgebiete sowie wegen der ungleichen Belastung durch unterschiedliche Abwasserführung seiner Zuflüsse wird die Wasserqualität — in erster Linie durch Erhöhung des Grades der Eutrophierung — von NO nach SW immer schlechter. Dieser Gradient drückt sich auch in der Zuckmückenfauna aus: im nordöstlichen und mittleren Becken dominieren Tanypodinen (Gattungen *Procladius* und *Tanypus*), in den südwestlichen Becken kommen die Larven der Gattung *Chironomus* in größerer Anzahl vor; Gesamtindividuenzahl und Biomasse verhalten sich deshalb gerade umgekehrt zueinander (DÉVAI et al., 1980). Diese Unterschiede sind aber offenbar sekundär zustandegekommen; dies zeigen die palaeolimnologischen Untersuchungen von DÉVAI und MOLDOVÁN (1983).

Die Larven von *C. balatonicus* kommen im Balaton in erster Linie in den Ca- und $MgCO_3$-reichen Sedimenten mit Anteilen organischer Stoffe über 15 gC kg^{-1} vor. Der Biotop enthält im allgemeinen 10—20% tonhaltigen Schluff mit Mehlsand, dessen Trockensubstanz sich von der Oberfläche bis zur Tiefe von 25 cm linear von 10—50% verändert. Der Verlauf der Korn-

verteilungskurve und die mittleren Werte des Ungleichförmigkeitsgrades (zwischen 4—8) zeugen an diesen Stellen von einem gut sortierten Sediment, das einerseits wegen seiner guten Raumfüllung, andererseits infolge der stabilisierenden Wirkung des hohen Kalkschlamm-Gehaltes (50—60%) nicht sehr zum Fortströmen neigt.

Die Larven von *C. balatonicus* leben wie die anderer *Chironomus*-Arten in Röhren in der oberen (im Balaton 15—20 cm tiefen) Sedimentschicht. Durch die starke Beteiligung an der Umschichtung des Schlammes spielen sie — hauptsächlich infolge der hohen Individuenzahlen, im Balaton 200—1500 pro Quadratmeter — sicher eine wichtige Rolle für die Qualität des Sedimentes und für die Stoff- und Energiehaushalte im See (DÉVAI et al., 1979, DÉVAI, 1980).

Die Generationsdauer von *C. balatonicus* ist im Laboratorium bei Temperaturen von 20—22 °C 3—4 Wochen, gelegentlich sogar nur 15 Tage. Demnach könnten im Freiland 4—6 Generationen jährlich heranwachsen, genaue Beobachtungen fehlen aber noch. Sicher ist, daß sich die Generationen stark überlappen, anders wäre nicht zu erklären, daß bei täglichen Beobachtungen über 236 Tage im Jahre 1980 vom Mai—September im Durchschnitt jeden zweiten Tag schlüpfende Imagines gefunden wurden, im Abstand von etwa 5 Tagen erreichte das Schlüpfen zumindest mittlere Stärke.

C. balatonicus und *C. plumosus* kommen an den meisten in dieser Arbeit genannten Fundorten sympatrisch vor. *C. balatonicus* bevorzugt aber wahrscheinlich die mit zerfallenden organischen Stoffen weniger belasteten Biotope. Hybriden sind nie nachgewiesen worden. Offenbar haben beide Arten nicht völlig identische ökologische Ansprüche und sind daher zumindest quantitativ ungleich verteilt. Außerdem sind sie trotz weitgehender morphologischer Ähnlichkeit doch offenbar in anderen, für die Fortpflanzung bedeutsamen Merkmalen voneinander isoliert, wofür auch die karyologischen und enzymologischen Daten dieser Arbeit sprechen.

Zusammenfassung. Die Beschreibung von *C. balatonicus* sp. n. umfaßt karyologische, enzymologische und morphologische Charaktere und einige Angaben über Habitat, Lebensweise und ökologische Bedeutung. Sie gründet sich auf Material aus dem Sediment der offenen Wasserfläche des Keszthelyer Beckens des Balaton-Sees und auf Laboratoriumszuchten.

Die Differentialdiagnose von *C. balatonicus* gegenüber *C. plumosus* basiert auf Unterschieden des chromosomalen Bandenmusters, speziell in den Armen A, B und F. Die Unterschiede zwischen beiden Arten sind auch im elektrophoretischen Muster von 7 der 14 analysierten Enzyme ausgeprägt, während sie bei Verwendung konventioneller morphologischer Charaktere nahezu undefinierbar und auch mit Methoden der numerischen Taxonomie nicht genügend klar darstellbar sind.

Die Art lebt im Balaton-See in Sedimenten mit guter Raumfüllung, stabilisierendem Kalkschlammanteil und organischem Gehalt über 15 $gC\,kg^{-1}$.

Ihrer Abundanz und Lebensweise entsprechend spielt sie eine große Rolle für das Zustandekommen der Sedimentqualität sowie für die biogeochemischen Kreisläufe und den Energiefluß im See, besonders weil sie die Belastung mit organischen Stoffen und den Nährstoffgehalt (hauptsächlich C, N und P) reduziert. Da Laborzuchten nur 3—4 Wochen dauern, könnten im See 4—6 Generationen im Jahr aufwachsen, die sich jedoch stark überlappen.

C. balatonicus kommt im Balaton und an anderen Fundstellen sympatrisch mit *C. plumosus* vor. Die Art scheint jedoch Sedimente mit relativ geringerem Anteil an zerfallendem organischen Material zu bevorzugen. Beide Arten sind also quantitativ ungleich verteilt, zumindest unter den Bedingungen der hier erfaßten Fundorte. Da Hybride nicht nachweisbar waren, ist auf Fortpflanzungsisolation beider Arten zu schließen.

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Tafelerklärungen

Tafel I

Abb. 1 — Chromosomenarme A: a = *C. balatonicus* A22, b = *C. balatonicus* A11, c = *C. plumosus*. Inversionsgrenzen durch Klammern markiert, Pfeilspitzen = Centromere. (Auch das Material von *C. plumosus* in Abb. 1, 2 und 7 stammt aus dem Balaton-See)

Abb. 2 — Chromosomenarme B: a = *C. balatonicus*, b = *C. plumosus*. Vertauscht angeordnete Chromosomenabschnitte durch *x* und *y* gekennzeichnet, der basale Abschnitt *z* ist bei beiden Arten in gleicher Lage, B = Balbiani-Ring

Abb. 3 — Chromosomenarme C: a = *C. balatonicus* C22, b = *C. balatonicus* C11. »Hantel« durch seitlichen Längsstrich markiert, Pfeil = Region, in der bei *C. muratensis* ein Nucleolus ausgebildet ist

Tafel II

Abb. 4 — Chromosomenarm D von *C. balatonicus*. Grenzen der Inversionen zu D2 (Abb. 10b), D3 (Abb. 10a) und D4 durch Klammern markiert, Pfeile = Banden, deren Struktur gegenüber *C. plumosus* modifiziert ist

Abb. 5 — Chromosomenarm E von *C. balatonicus*

Abb. 6 — Chromosomenarm F von *C. balatonicus*

Abb. 7 — Chromosomenarme G: a = *C. balatonicus* G22, b = *C. balatonicus* G11, c = *C. plumosus*. B = Balbiani-Ring, N = Nucleolus

Tafel III

Abb. 8a und b — Chromosomenarme A12 von *C. balatonicus*

Abb. 9a und b — Chromosomenarme C12 von *C. balatonicus*

Abb. 10 — Chromosomenarme D14 (a) und D12 (b) von *C. balatonicus*

Abb. 11a und b — Chromosomenarme G12 von *C. balatonicus*. B = Balbiani-Ring, N = Nucleolus

Tafel IV

Abb. 12 — Zymogramm der Alkohol-Dehydrogenase (ADH) und der Isocitrat-Dehydrogenase (zwei genetisch unabhängige Systeme IDH-1 und IDH-2) von *C. balatonicus* und *C. plumosus*. Extrakte 1—2 *C. plumosus* (Fluß Hortobágy bei Hortobágy), 3—4 *C. plumosus* (Szamos-Altwasser bei Tunyogmatolcs), 5—6 *C. plumosus* (Murtensee bei Murten, Schweiz), 7—16 *C. balatonicus* (Flachsee Balaton bei Keszthely)

Abb. 13 — Kopfkapsel (a), Mentum (b) und Abdomenende (c) von *C. balatonicus* (Flachsee Balaton bei Keszthely)

Abb. 14 — Kopfkapsel (a), Mentum (b) und Abdomenende (c) von *C. plumosus* (Szamos-Altwasser bei Tunyogmatolcs)

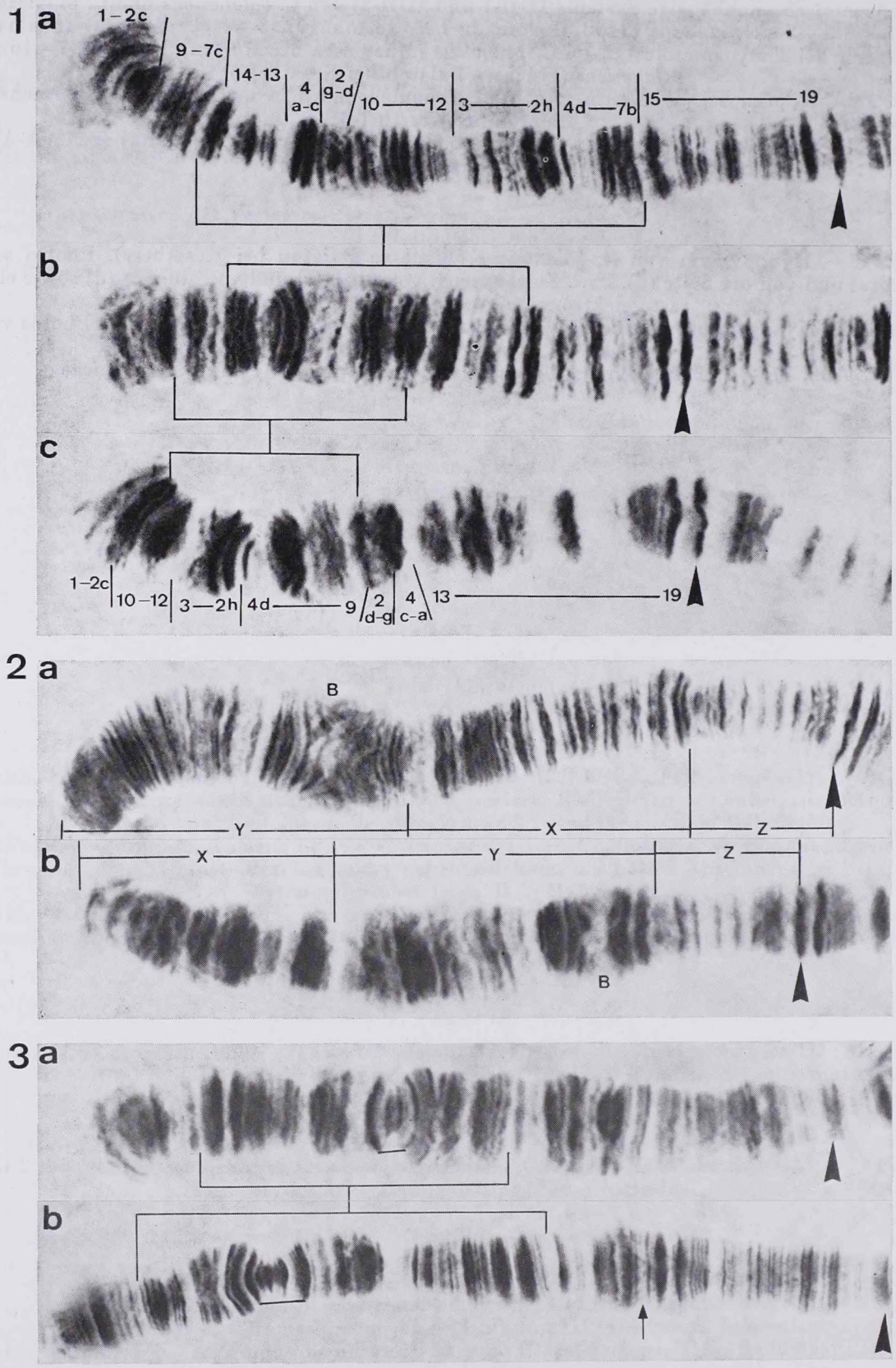
Tafel V

Abb. 15 — Hypopygium von *C. balatonicus* (Flachsee Balaton bei Keszthely). Photos von oben (a) und von der Seite (b), bzw. Zeichnungen von oben (c) und von »innen« (d) sowie eine rasterelektronenmikroskopische Aufnahme (e)

Abb. 16 — Hypopygium von *C. plumosus* (Szamos-Altwasser bei Tunyogmatolcs). Photos von oben (a) und von der Seite (b)

Abb. 17 — Meßstrecken am Hypopygium von *C. plumosus* und *C. balatonicus*

Tafel I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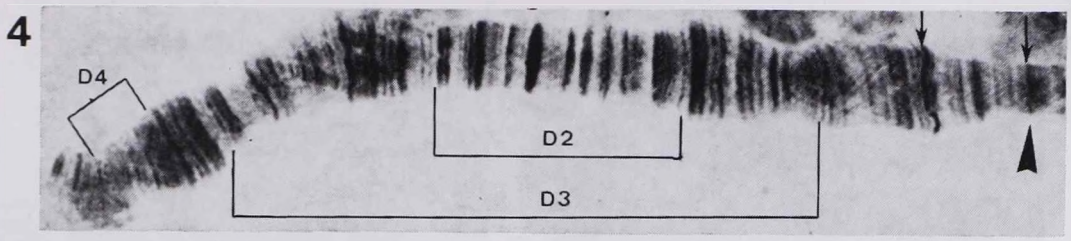
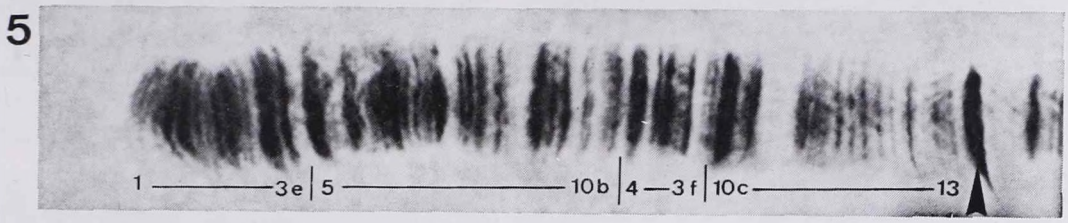
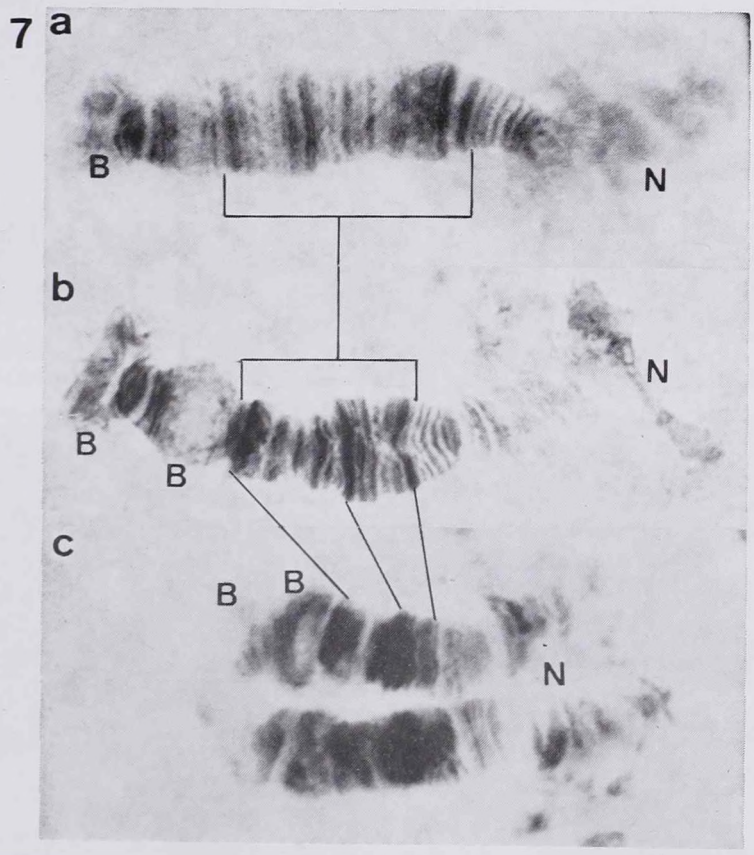
Tafel II









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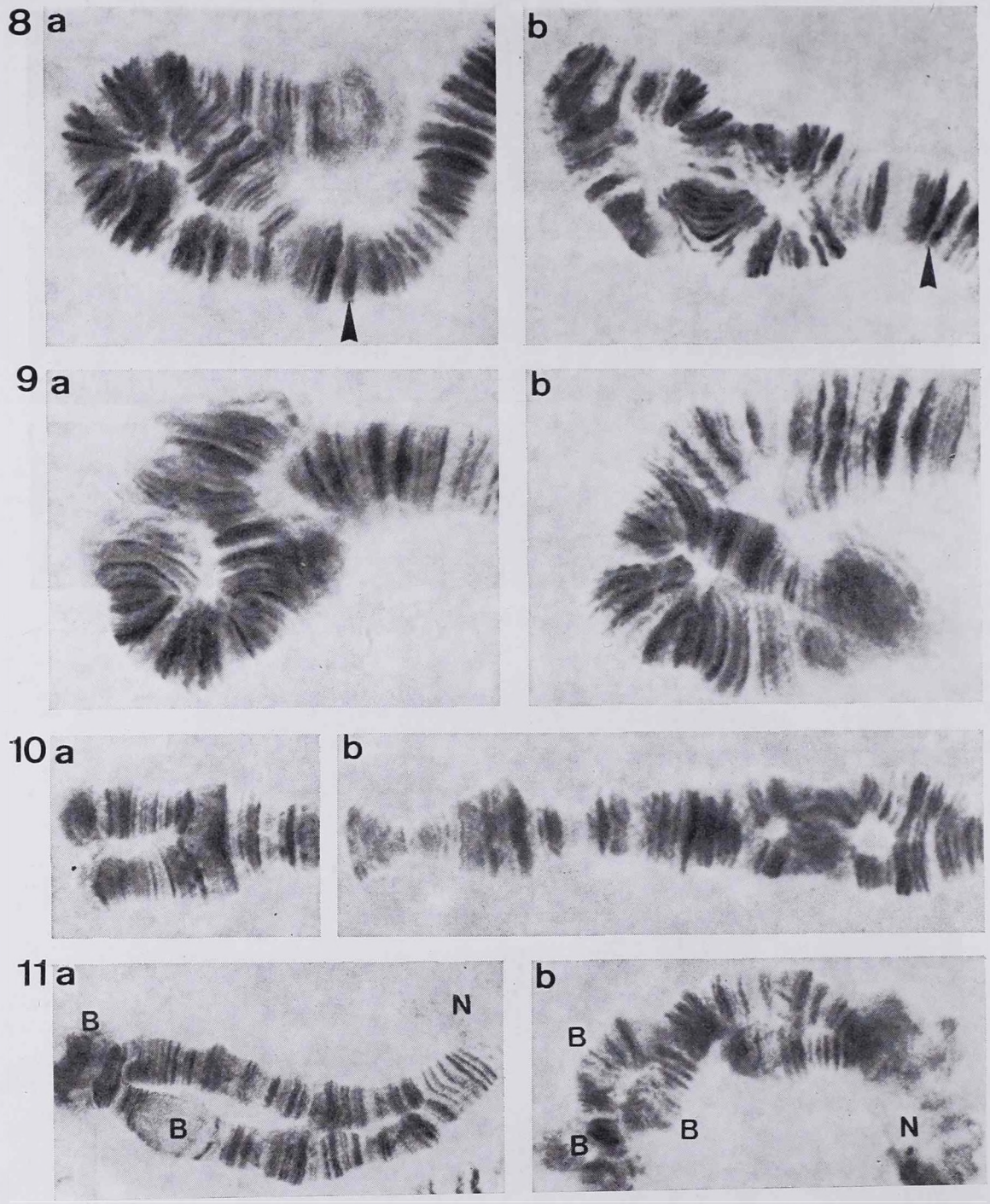

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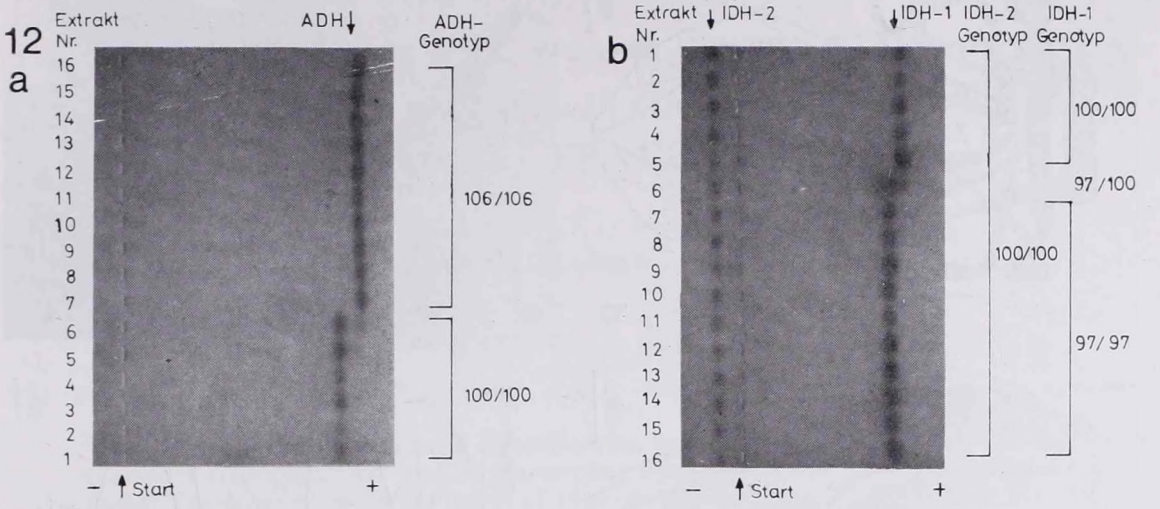
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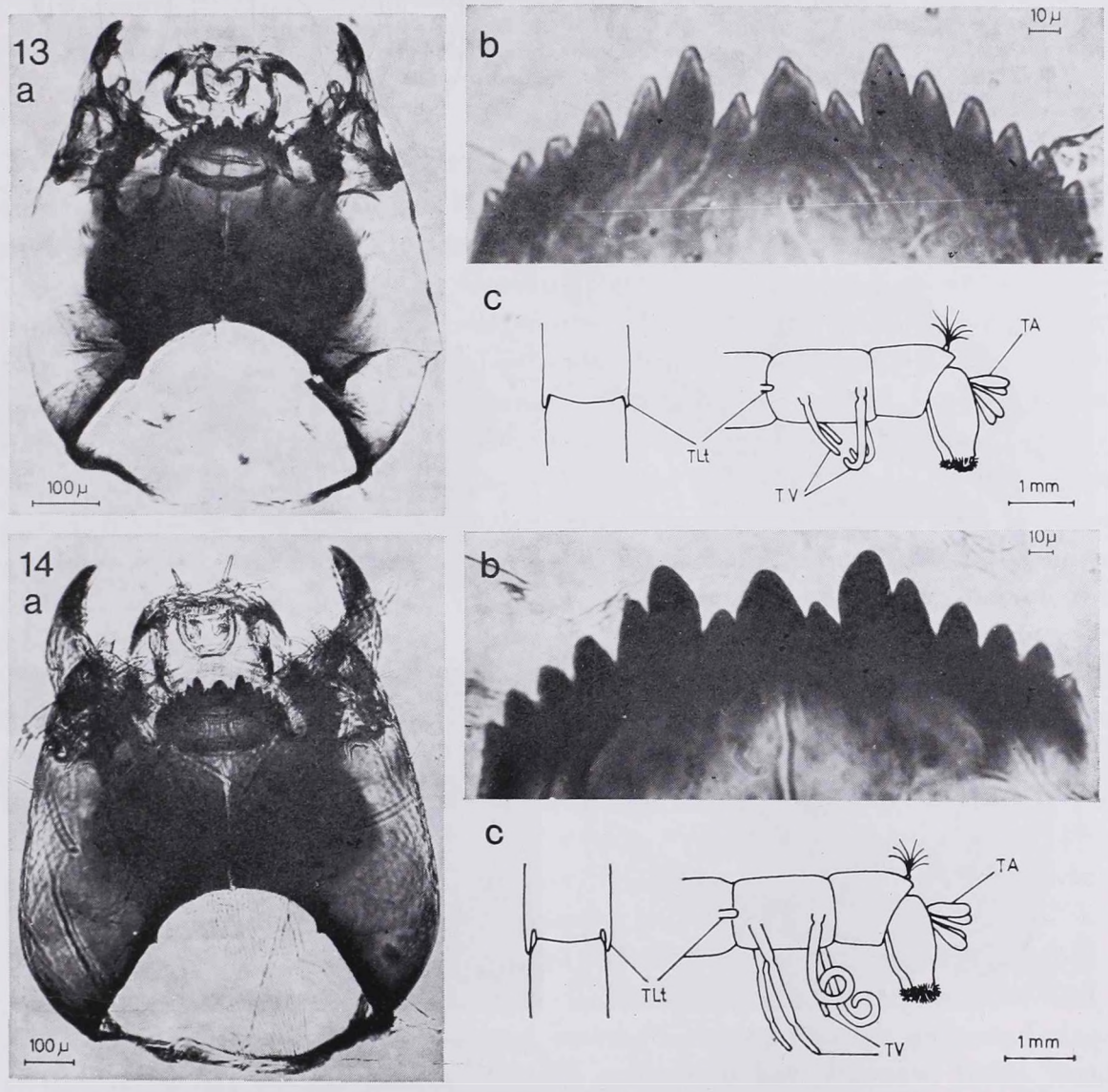
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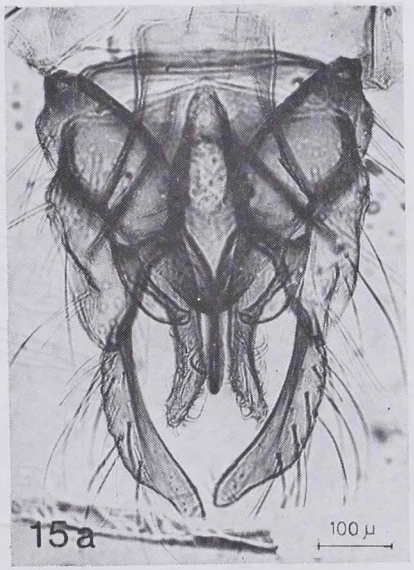
Tafel V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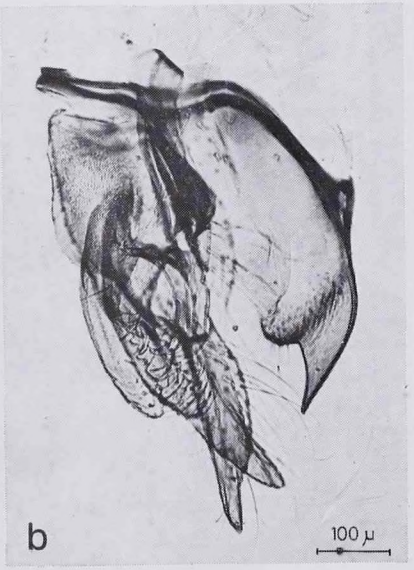
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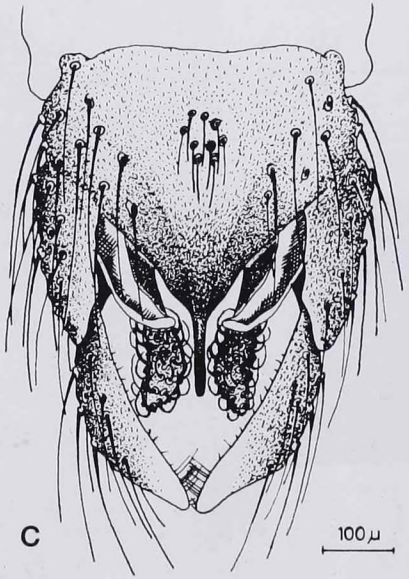
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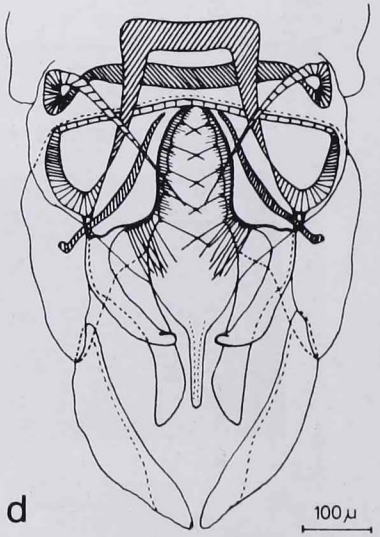
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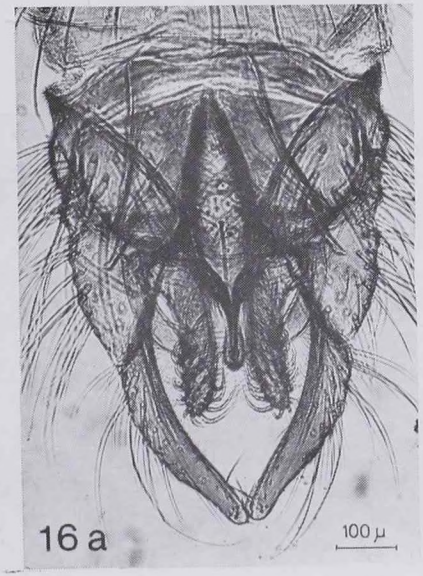
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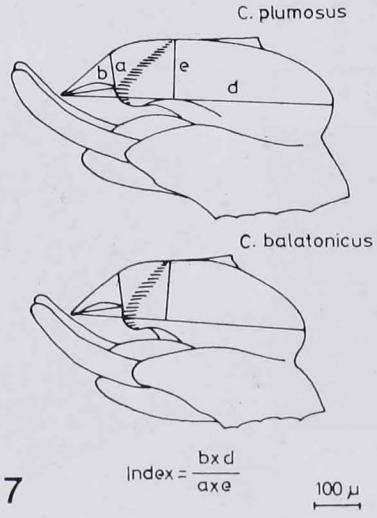
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ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
XXIX. 4 1983 p. 375—387

ÜBER DIE MIT PSYDUS VERWANDTEN GATTUNGEN DER CNODALONINEN (COLEOPTERA: TENEBRIONIDAE)

Z. KASZAB

(Eingegangen am 15. April 1982)

Revision, synonymy and identification keys of the genera *Psydus* PASCOE, 1868, *Cleomis* FAIRMAIRE, 1893 and *Psydomorphus* PIC, 1921 of the tribe Cnodalonini (Coleoptera: Tenebrionidae) on the basis of type-material examination. *Oyanus* PIC, 1921 is synonym of *Psydus*, while *Pseudeucyrtus* PIC, 1916 is that of *Cleomis*. The genus *Cleomis* is not a synonym, must be reestablished. Ten species are synonyms, five proved to be new combinations. New species and subspecies are *Psydus bremeri* sp. n., *Psydus plantaris opacus* ssp. n. and *Cleomis viridicinctus excellens* ssp. n.

Im indomalayischen Gebiet kommt eine Gruppe der Arten vor, welche sich in Körperform und einigen Merkmalen sehr ähnlich sind, und bis jetzt gab es keine Anhaltspunkte, die hierher gehörenden Arten richtig erkennen zu können. Dies ist die Gruppe der Gattung *Psydus* PASCOE, 1868, zu der orientalischen Arten zusammengefaßt sind, welche eine verhältnismäßig breite, flache Gestalt, breit queren und vorn abgerundeten Halsschild, spitzwinklig vorgezogene Prosternalapophyse, vorn ungerundete, hinten gerandete Epipleuren der Flügeldecken, weiters eckig vortretende Mittelbrust sowie lange, einfache Beine, vortretende Augen, und abgeschnürten Scheitel haben. Es gibt auch Arten, bei welchen am Halsschildrand sehr breit und innen durch eine Furche abgegrenzt ist, weiters besitzen alle Arten etwa in Zwischenraumbreite einen Seitenrand, welcher auffallend breit, horizontal liegt und bei Draufsicht gut übersehbar ist.

Wie bei fast allen orientalischen Cnodaloninen-Gattungen, haben auch hier FAIRMAIRE und PIC eine Anzahl neue Arten beschrieben und auch neue Gattungen aufgestellt. Es war aber ohne Untersuchung des Typenmaterials nicht möglich, sie richtig zu deuten. Vor allem bezieht sich diese Feststellung auf Neubeschreibungen von PIC. Neuerlich habe ich aber die Möglichkeit gehabt, alle in diese Gruppe gehörenden Typen studieren zu können, was ich der Freundlichkeit von Herrn CL. GIRARD (Museum Paris) verdanke, der mir die Typenserie von FAIRMAIRE und PIC ausgeliehen hat, infolgedessen konnte ich die *Psydus*-Gruppe klären.

Als Beispiel sei *Psydus* genannt, welche Gattung PASCOE aufgrund einer auffallenden Art aus Sri Lanka (Ceylon) aufgestellt hat (PASCOE, 1868). Bald

darauf beschrieb FAIRMAIRE auch eine Gattung unter dem Namen *Cleomis* (FAIRMAIRE, 1893), welche aber GEBIEN zu *Psydus* als Synonym einbezog. Nachher beschrieb PIC noch weitere drei Gattungen: *Pseudeucyrtus* PIC, 1916, *Oyanus* PIC, 1921 und *Psydomorphus* PIC, 1921. Inzwischen wurden von GEBIEN, PIC und mir selbst mehrere Arten als *Psydus* beschrieben, so daß letzten Endes die ganze Gruppe bis heute 27 Arten enthält, in denen sich niemand mehr auskennt, weil die Gattungsgrenzen oder sogar die Zusammenhänge nicht geklärt sind. Ich habe jetzt die Gelegenheit ergriffen, diese Probleme zu lösen, zumal alle diesbezüglichen Typen in meinen Händen sind.

Im Folgenden gebe ich erst eine Bestimmungstabelle der Gattungen, bzw. die Unterschiede, welche aufgrund äußerer Merkmale leicht voneinander zu unterscheiden sind.

1 (2) Die Mittel- und Hinterschenkel vor dem Ende rot geringelt. Seiten des Halsschildes breit und flach abgesetzt, gegen die Scheibe durch eine scharfe Furche getrennt. Flügeldecken am Ende einfach, der 7. Streifen nicht scharf vertieft und der 8. Zwischenraum daneben nicht kielartig. Vorderschienen des ♂ innen vor dem Ende mit einem stumpfen Zahn 3. **Psydomorphus** PIC, 1921

2 (1) Die Schenkel ohne roten Ring vor dem Ende. Seiten des Halsschildes entweder ohne durch Furche abgegrenzten, abgesetzten Rand oder mit breitem, flachem Rand. Flügeldecken am Ende mit oder ohne scharfen Streifen an der 7. Reihe, der 8. Zwischenraum am Ende mehr oder minder kielförmig, manchmal gewellt. Vorderschienen des ♂ vor dem Ende ohne Zahn.

3 (4) Die Querwölbung des Halsschildes reicht bis zum Rand; die Seiten sind meist flach, aber nicht durch eine tiefe Furche von der Scheibe abgegrenzt. Der 8. Zwischenraum am Ende gewellt oder kielförmig, daneben ist bei gewelltem Zwischenrand mit tiefen Längsstrichen oder bei gekieltem Zwischenraum eine tiefe 7. Längsfurche (= *Oyanus* PIC, 1921) 1. **Psydus** PASCOE, 1868

4 (3) Seiten des Halsschildes horizontal sehr breit abgeflacht und innen durch eine scharfe Furche begrenzt, welche sich von der Basis der Länge nach durchzieht. Flügeldecken am Ende in 7. Längsreihe oder Streifen tiefer, daneben ist der 8. Zwischenraum gekielt (= *Pseudeucyrtus* PIC, 1916) 2. **Cleomis** FAIRMAIRE, 1893

1. Die Gattung Psydus Pascoe, 1868

Bei der neuen Auffassung der Abgrenzung dieser Gattung werden mehrere, bisher der Gattung *Psydus* eingereihte Arten anderen Gattungen zugestellt, deshalb entsteht eine völlig andere Synonymie als im Katalog GEBIEN, 1942.

Vor allem ist die Gattung *Oyanus* PIC, 1921 mit *Psydus* völlig synonym, und beide von PIC hierher beschriebenen Arten: *O. curticornis* PIC, 1921 und *O. collaris* PIC, 1925 sind mit *Psydus plantaris* PASCOE, 1868 identisch.

Die bei GEBIEN in Synonym gestellte Gattung *Cleomis* FAIRMAIRE, 1893 stelle ich wieder als gute Gattung zurück; aus der Gattung *Psydus* gehören hierher *C. violaceipes* FAIRMAIRE, 1893, weiters *marginicollis* GEBIEN, 1913, *viridicollis* PIC, 1924 und *substriatus* PIC, 1930 sowie *nitidissimus* KASZAB, 1980; *substriatus* ist aber mit *marginicollis* und *nitidissimus* mit *subelongatus* synonym.

Drei weitere, als *Psydus* beschriebene Arten, namentlich *striatus* KASZAB, 1980, *kabakovi* KASZAB, 1980 und *elongatus* KASZAB, 1980 gehören ebenfalls nicht hierher, sondern zur Gattung *Psydomorphus* PIC, 1921; von diesen ist *striatus* KASZAB, 1980 (*Psydus*) mit *striatus* PIC, 1924 (*Psydomorphus*), *kabakovi* KASZAB, 1980 mit *ater* PIC, 1921 synonym.

Der Katalog von *Psydus* ergibt folgendes Bild:

Psydus PASCOE, 1868

1868 PASCOE: Proc. ent. Soc. London, **1868**: 12 (Gattungstypus: *plantaris* PASCOE, 1868).
1872 MÄKLIN: Stettin. ent. Ztg, **33**: 248.
1893 *Cleomis* FAIRMAIRE: Notes Leyden Mus., **15:** 54, partim.
1921 *Oyanus* PIC: Mélang. exot.-ent., **34:** 23 (Gattungstypus: *curticornis* PIC, 1921), **syn. n.**

plantaris PASCOE (1868): Proc. ent. Soc. London, **1868:** 12. — KASZAB (1979): Folia ent. hung. (S. N.), **32** (2): 105.	Sri Lanka
= *curticornis* PIC (1921): Mélang. exot.-ent., **34:** 23 *(Oyanus)*	
= *collaris* PIC (1925): Mélang. exot.-ent., **43:** 7 *(Oyanus)*	
plantaris opacus ssp. n.	Sri Lanka
minor KASZAB (1980): Acta zool. hung., **26** (2): 316.	Sri Lanka
nigritissimus KASZAB (1980): Acta zool. hung., **26** (2): 315	Sri Lanka
sinuaticollis PIC (1923): Mélang. exot.-ent., **38:** 24	Sumatra, Borneo
philippinensis GEBIEN (1913): Arch. Naturgesch., **79,** A (9): 38, Fig. 1.	Philippinen
opaculus FAIRMAIRE (1893): Notes Leyden Mus., **15:** 55 (*Cleomis*)	Singapur
bremeri sp. n.	Malaysia

Synonymie

Oyanus PIC (1921): Mélang. exot.-ent., **34:** 23, **syn. n.**
= **Psydus** PASCOE, 1868.

Oyanus curticornis PIC (1921): Mélang. exot.-ent., **34:** 23, **syn. n.**
= **Psydus plantaris** PASCOE, 1868.

Oyanus collaris PIC (1925): Mélang. exot.-ent., **43:** 7, **syn. n.** (Lokalität falsch).
= **Psydus plantaris** PASCOE, 1868.

Cleomis opaculus FAIRMAIRE (1893): Notes Leyden Mus., **15:** 55.
= **Psydus opaculus** (FAIRMAIRE, 1893).

Psydus kabakovi KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 212, **syn. n.**
= **Psydomorphus ater** PIC (1921): Mélang. exot.-ent., **34:** 24.

Psydus elongatus KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 215.
= **Psydomorphus elongatus** (KASZAB, 1980), **comb. n.**

Psydus striatus KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 215, **syn. n.**
= **Psydomorphus striatus** PIC (1924): Mélang. exot.-ent., **41:** 27.

Psydus nitidissimus KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 214, **syn. n.**

Pseudeucyrtus subelongatus PIC (1930): Mélang. exot.-ent., **56:** 34.
= **Cleomis subelongatus** (PIC, 1930), **comb. n.**

Holotypen der Taxa der Gattung *Psydus* PASCOE, 1868

Psydus plantaris PASCOE, 1868: Ceylon, Holotypus (Geschlecht nicht untersucht) (British Museum).

Psydus plantaris opacus ssp. n.: Ceylon, Holotypus ♀ (Museum Budapest).

Oyanus curticornis PIC, 1921: Belihul-Oya, Ceylon, trim. 89, I. Z. KANNEGIETER [Ceylon], Holotypus ♀ (Museum Paris, coll. PIC).

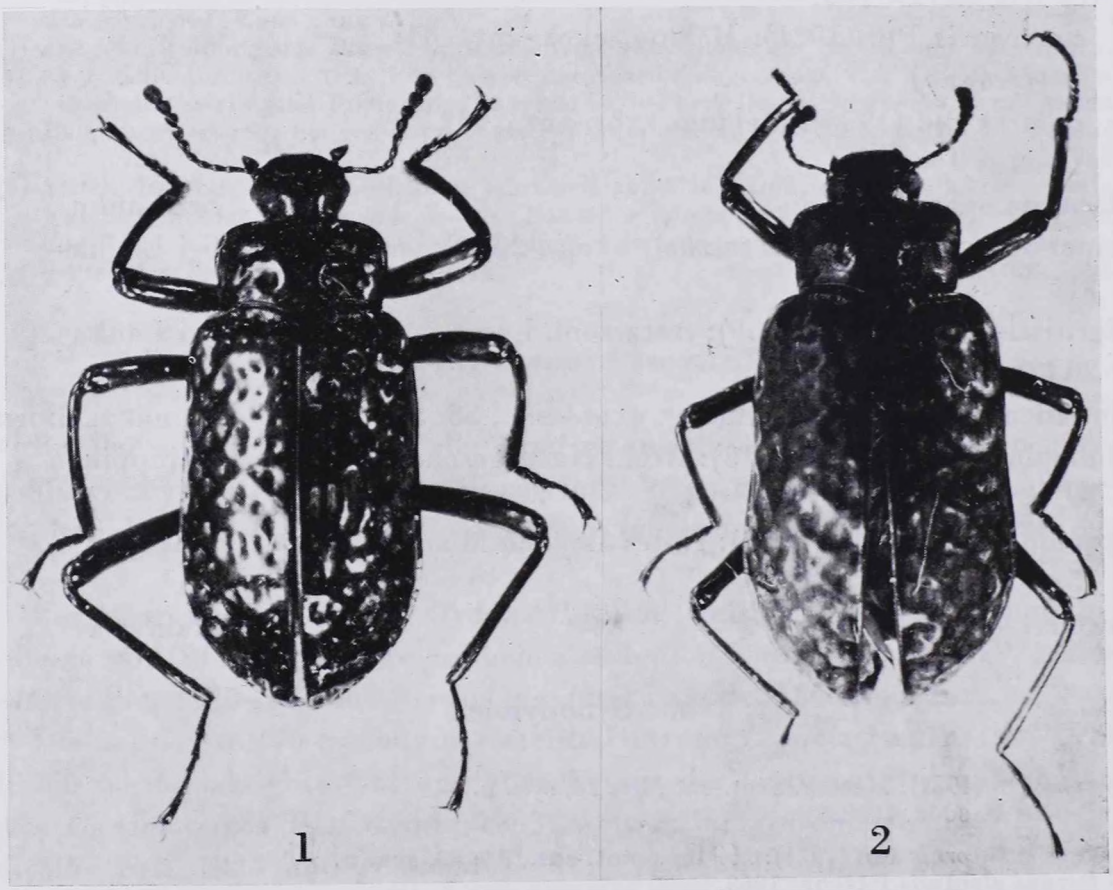

Abb. 1. *Psydus plantaris plantaris* PASCOE, 1868. — Abb. 2. *Psydus plantaris opacus* ssp. n. (Foto: A. KEVE & G. HORVÁTH)

Oyanus collaris PIC, 1925: »Cochinch.« [Cochinchina] Holotypus ♀ (Museum Paris, coll. PIC).

Psydus minor KASZAB, 1980: Ceylon, Holotypus ♂ (Museum Budapest).

Psydus nigritissimus KASZAB, 1980: Ceylon, Holotypus ♂ (Museum Budapest).

Psydus sinuaticollis PIC, 1923: Sumatra, Bedunjei, KANNEGIETER [Sumatra], Holotypus (Geschlecht nicht untersucht) (Museum Paris, coll. PIC).

Psydus philippinensis GEBIEN, 1913: Philipp. Mindanao, Dapitan, G. BAKER; [Mindanao, Daptan], Holotypus ♂ (Museum G. FREY).

Cleomis opaculus FAIRMAIRE, 1893; Singapore [Singapore, RAFFRAY], Holotypus ♀ (Museum Paris, coll. FAIRMAIRE).

Psydus bremeri sp. n.: Holotypus ♂: Malaysia, Camaron Highlands, X. 1980 (coll. H. BREMER).

Bestimmungstabelle der Arten der Gattung Psydus Pascoe, 1868

1 (8) Flügeldecken mit sehr feinen Punktreihen oder Streifen, welche gegen das Ende deutlich feiner oder erloschen sind. Die Zwischenräume vollkommen flach.

2 (5) Oberfläche stark glänzend, auch die Flügeldecken sind nicht chagriniert.

3 (4) Punktreihen der Flügeldecken sind fein, die einzelnen Punkte sind nicht durch eine feine Linie verbunden. Stirn sehr grob und dicht punktiert. Bei voll ausgefärbten Exemplaren sind Vorderkörper und Beine schwarz mit bläulichem oder kupferigem Erzglanz, manchmal ist der Vorderkörper rötlichbraun, und die Schenkel sind gegen die Basis ebenfalls aufgehellt. Flügeldecken dunkel erzfarbig. — Länge: 12,5—16,5 mm. Philippinen (Mindanao) **philippinensis** GEBIEN, 1921

4 (3) Die feinen Reihenpunkte der Flügeldecken sind miteinander durch feine Längsstriche verbunden, am Absturz ist die Punktierung vollkommen erloschen. Stirn feiner und spärlich punktiert. Körper dunkel mit Erzglanz, manchmal bräunlich mit leichtem kupferigem Glanz. — Länge: 13—18 mm. Sumatra, Borneo (Pontianak, Kinabalu, usw.) **sinuaticollis** PIC, 1923

5 (2) Wenigstens die Flügeldecken chagriniert, fettglänzend oder matt.

6 (7) Vorderkörper glänzend, Flügeldecken chagriniert. Die Punktreihen der Flügeldecken sind sehr fein, die Punkte länglich, die inneren vier Reihen dicht, die äußeren spärlicher. Körper braun metallisch. — Länge: 12,5—14 mm. Singapur **opaculus** (FAIRMAIRE, 1893)

7 (6) Halsschild und Flügeldecken grob chagriniert, deshalb matt, Kopf glänzend. Die Reihepunkte der Flügeldecken äußerst fein, am Ende erloschen. Halsschildscheibe fein und spärlich punktiert. Kopf und Beine schwarzblau, Halsschild und Flügeldecken schwarzblau mit etwas grünlichem Schimmer. — Länge: 15—15,5 mm. Malaysia (Camaron Highlands) (Abb. 3) **bremeri** sp. n.

8 (1) Flügeldecken mit sehr groben Punkten oder an Stelle der Reihen sind unterbrochene Längseindrücke, feine Längsstriche, dazwischen sind die Zwischenräume aber niemals abgeflacht, deshalb entsteht eine Skulptur, durch welche unregelmäßige Eindrücke der Flügeldecken erscheinen.

9 (10) Flügeldecken mit tiefen und scharfen, rundlichen, einzeln stehenden Punkten, sie stehen eigentlich in Reihen, aber spärlich. Kopf und Halsschild sehr spärlich, aber verhältnismäßig grob punktiert. Der ganze Körper glänzend schwarz. — Länge: 13 mm. Sri Lanka **nigritissima** KASZAB, 1980

10 (9) Flügeldecken mit unterbrochenen, flachen, sehr schmalen Längslinien, welche an der Stelle der Längsstreifen sind; dazwischen ist die Oberfläche quer und längs gewölbt, deshalb entsteht eine Skulptur, welche durch Längsrisse unregelmäßig erscheint.

11 (12) Flügeldecken mit verhältnismäßig feinen, vorn und innen punktförmigen, außen und

am Ende länglichen, kurzen Längsstrichen, welche aus höchsten 2—3 Punkten zusammengesetzt sind. Der 8. Zwischenraum am Ende kaum gewellt und ziemlich kielartig. Halsschildoberfläche einfach leicht gewölbt, spärlich gleichmäßig punktiert, ohne flache Eindrücke. Körper bräunlich, Flügeldecken mit ausgesprochenem Erzglanz. — Länge: 11 mm. Sri Lanka **minor** KASZAB, 1980

12 (11) Flügeldecken sehr uneben, mit längeren, schmalen Längsstrichen, welche manchmal aus 2—3 Punkten bestehen, dazwischen ist die Oberfläche stärker gewölbt. Halsschild in der Mitte mit einzelnen gröberen Punkten, die Scheibe mit ganz flachen Eindrücken, deshalb ungleich.

13 (14) Flügeldecken glänzend, höchstens die Umgebung der Eindrücke erloschen chagriniert. Beine schwarzbraun. Körper dunkelbraun bis schwarzbraun, Kopf schwarz, Oberseite mit ausgesprochen dunklen erzfarbigem Glanz. — Länge: 12,8—13,2 mm. Sri Lanka (Abb. 1) **plantaris plantaris** PASCOE, 1868

14 (13) Flügeldecken sehr grob isodiametrisch chagriniert und matt, die unterbrochenen Längsstriche sind länger, die Wölbungen dazwischen höher, die Schenkel — ausgenommen die Knie — rotgelb. — Länge: 13,6 mm. Sri Lanka (Abb. 2) **plantaris opacus** ssp. n.

Psydus bremeri sp. n. (Abb. 3)

Holotypus ♂: Malaysia, Camaron Highlands, X. 1980 (Coll. H. BREMER). — Allotypus ♀ wie Holotypus (Coll. BREMER); Paratypus: Taiping, III. 1978 (ex coll. BREMER im Ungarischen Naturwissenschaftlichen Museum, Budapest).

Kopf glänzend schwarz, Halsschild und Flügeldecken grob chagriniert, Beine schwarzblau, Flügeldecken und Halsschild ebenfalls schwarzblau mit leichtem grünlichem Schimmer. Kopf mit großen, gewölbten Augen, bei Seitenansicht breit nierenförmig, Stirn und Clypeus ziemlich flach, Stirn stärker, Clypeus feiner punktiert, die Punktierung spärlich. Clypealsutur nicht eingedrückt. Mentum verkehrt trapezförmig, beiderseits von vorn bis zur Basis eingedrückt, die Scheibe hoch, vorn konisch vorgezogen. Fühler mit sechsgliedriger, flacher Keule, die Keulenglieder allmählich erweitert, dichter behaart und mit längeren Tasthaaren. Die Länge der Glieder 2—11 verhält sich wie 6 : 15 : 10 : 10 : 10 : 10 : 10 : 10 : 10 : 15 und die Breite von 1—11 wie 7,5 : 6,8 : 7 : 7,8 : 9 : 10 : 11,5 : 12,5 : 13 : 13 : 14,5. Halsschild quer, breiter als lang (wie 33 : 21,5), die Vorderecken vollkommen breit halbkreisförmig abgerundet, Seiten parallel, dick gerandet, vor allem vorn, nicht abgesetzt und ohne Furche. Vorderrand etwas ausgebuchtet, die Mitte breit ungerandet. Hinterecken rechtwinklig, Hinterrand fein und scharf gerandet, zweibuchtig. Oberfläche mit feiner, spärlicher, erloschener Punktierung. Der Grund dicht isodiametrisch chagriniert. Schildchen dreieckig, flach. Flügeldekken an der Basis so breit wie der Halsschild, bis zu den Schulterbeulen stark erweitert, der Seitenrand breit abgesetzt, an der Basis läuft er der Naht zu bis zur 1. Punktreihe, deshalb ist die Basis stark aufgewölbt; nach hinten wenig verbreitert, die größte Breite liegt etwa in dem Niveau des 1. Abdominalsegments. Die Länge und größte Breite verhalten sich wie 80 : 53, und die Länge der Flügeldecken und des Halsschildes wie 80 : 21,5. Mit sehr feinen Punktreihen und vollkommen flachen Flügeldeckenzwischenräumen; am Ende

sind die Reihen vollkommen erloschen. Die 7. Punktreihe am Absturz eingedrückt und der Innenrand des 8. Zwischenraumes daneben ziemlich scharf kielartig erhaben. Der Grund vollkommen matt, fein chagriniert, seidenschim-

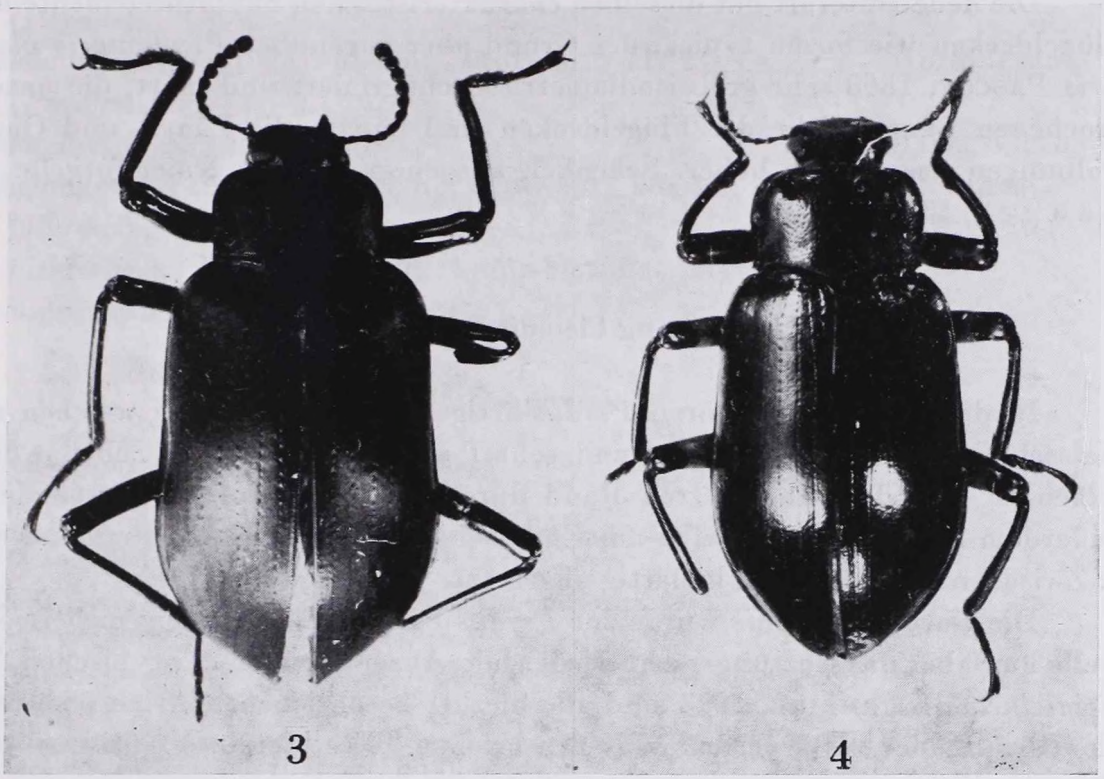

Abb. 3. *Psydus bremeri* sp. n. — Abb. 4. *Psydomorphus diversipes* PIC, 1921 (Foto: A. KEVE & G. HORVÁTH)

mernd. Prosternum zwischen den Hüften beiderseits der Länge nach gerandet, das Ende keilförmig und zugespitzt, hinten der Quere nach gewölbt. Mittelbrust tief v-förmig und beiderseits mit scharfer Ecke. Hinterbrust und Abdomen sehr fein skulptiert. Analsegment am Ende fein gerandet. Beine lang und dünn, die Schenkel überragen weit die Seiten des Körpers, gebogen, Schienen ebenfalls lang und gerade, bei Vorder- und Mitteltarsen ist das Endglied länger als die vorangehenden zusammengenommen, an den Hintertarsen ist es zwar lang, aber kürzer als die drei vorangehenden gemeinsam. — Länge: 15—15,5 mm.

Nächstverwandt mit *P. opaculus* (FAIRMAIRE, 1893), welche Art braun metallisch gefärbt ist, der Halsschild glänzend und grob punktiert, Flügeldecken stärker eingedrückt, Halsschild neben dem Seitenrand der Länge nach flach eingedrückt. Von den übrigen Arten durch die matte Oberseite leicht zu unterscheiden.

Psydus plantaris opacus ssp. n. (Abb. 2)

Holotypus ♀: Ceylon [Sri Lanka] (im Ungarischen Naturwissenschaftlichen Museum, Budapest).

Die neue Unterart hat dieselben charakteristischen Skulpturelemente der Flügeldecken wie forma typica, der Grund aber gegenüber *P. plantaris plantaris* PASCOE, 1868 sehr grob isodiametrisch chagriniert und matt, die unterbrochenen Längsstriche der Flügeldecken sind länger, die Längs- und Querwölbungen dazwischen höher. Schenkel, ausgenommen die Knie, rotgelb. — Länge: 13,6 mm.

2. Die Gattung Cleomis Fairmaire, 1893

In diese Gattung gehören *Psydus*-artige Cnodaloninen, bei welchen die Halsschildseiten breit verflacht und scharf abgesetzt sind, die Scheibe derselben ist von dem abgesetzten Rand durch eine tiefe Furche abgesondert; außerdem ist die 7. Längsreihe am Ende scharf strichförmig vertieft und der 8. Zwischenraum daneben kielartig abgesetzt.

Die Gattung *Cleomis* wurde zur *Psydus* PASCOE, 1868 synonymisiert, ich stelle hier aber das Gattungsrecht wieder her. Ausgenommen der typischen Art *viridicinctus* FAIRMAIRE, 1893 sind alle hierher beschriebenen Arten entweder als *Psydus* oder als *Pseudeucyrtus* beschrieben. Diese letztere Gattung wird *Cleomis* als Synonym eingereiht.

Der Katalog der hierher beschriebenen Arten zeigt folgendes Bild:

Cleomis FAIRMAIRE, 1893

1893 FAIRMAIRE: Notes Leyden Mus., **15:** 54 (Gattungstypus: *violaceipes* FAIRMAIRE, 1893).

1916 *Pseudeucyrtus* PIC: Mélang. exot.-ent., **21:** 14, **syn. n.** (Gattungstypus: *niasensis* PIC, 1916).

violaceipes FAIRMAIRE (1893): Notes Leyden Mus., **15:** 54. — Borneo, Sumatra, Nias, Java

= *niasensis* PIC (1916): Mélang. exot.-ent., **21:** 14 (*Pseudeucyrtus*)

= *subrufus* PIC (1916): Mélang. exot.-ent., **21:** 14 (*Pseudeucyrtus*)

= *ruficornis* PIC (1923): Mélang. exot.-ent., **38:** 27 (*Pseudeucyrtus*)

= *aeneipes* PIC (1923): Mélang. exot.-ent., **38:** 27 (*Pseudeucyrtus*)

marginicollis GEBIEN (1913): Arch. Naturgesch., **79** A (9): 38, Taf. I, Fig. 5 (*Psydus*) — Taiwan, Tonkin

= *substriatus* PIC (1930): Mélang. exot.-ent., **56:** 30 (*Psydus*)

viridicinctus PIC (1924): Mélang. exot.-ent., **41:** 27 (*Psydus*) — Nordvietnam

viridicinctus excellens ssp. n. — Laos, Vietnam

subelongatus PIC (1930): Mélang. exot.-ent., **56:** 34 (*Psydus*) — Vietnam

= *nitidissimus* KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 214 (*Psydus*)

Synonymie

Pseudeucyrtus niasensis PIC (1916): Mélang. exot.-ent., **21:** 14, **syn. n.**
= **Cleomis violaceipes** FAIRMAIRE, 1893

Pseudeucyrtus subrufus PIC (1916): Mélang. exot.-ent., **21:** 14, **syn. n.**
= **Cleomis violaceipes** FAIRMAIRE, 1893

Pseudeucyrtus ruficornis PIC (1923): Mélang. exot.-ent., **39:** 27, **syn. n.**
= **Cleomis violaceipes** FAIRMAIRE, 1893

Pseudeucyrtus aeneipes PIC (1923): Mélang. exot.-ent., **39:** 27, **syn. n.**
= **Cleomis violaceipes** FAIRMAIRE, 1893

Psydus marginicollis GEBIEN (1913): Arch. Naturgesch., **79** (A) 9: 38, Taf. I, Fig. 5.
= **Cleomis marginicollis** (GEBIEN, 1913), **comb. n.**

Psydus substriatus PIC (1930): Mélang. exot.-ent., **56:** 30, **syn. n.**
= **Cleomis marginicollis** (GEBIEN, 1913)

Pseudeucyrtus subelongatus PIC (1930): Mélang. exot.-ent., **56:** 34
= **Cleomis subelongatus** (PIC, 1930), **comb. n.**

Psydus nitidissimus KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 214, **syn. n.**
= **Cleomis subelongatus** (PIC, 1930)

Holotypen und Lectotypen der Taxa der Gattung *Cleomis* FAIRMAIRE, 1893

Cleomis violaceipes FAIRMAIRE, 1893: Borneo, Schwaner, Lectotypus ♂ (design. Z. KASZAB, 1982) (Museum Paris, coll. FAIRMAIRE).

Pseudeucyrtus niasensis PIC, 1916: G^ng Sitoli, Nias, R. MITSCHKE [Île Nias] Holotypus ♂ (Museum Paris, coll. PIC).

Pseudeucyrtus subrufus PIC, 1916: Bedagei. int., Sumatra's O. K. ± 600', 2de Sem. 89. I. Z. KANNEGIETER [Sumatra], Holotypus ♂ (Museum Paris, coll. PIC).

Pseudeucyrtus ruficornis PIC, 1923: B. Proépoe [Java], Holotypus ♂ (Museum Paris, coll. PIC).

Pseudeucyrtus aeneipes PIC, 1923: G^ng Sitoli, Nias, R. MITSCHKE [Île Nias], Holotypus (Geschlecht nicht untersucht) (Museum Paris, coll. PIC).

Psydus marginicollis GEBIEN, 1913: Formosa, Alikang, VI. 1909, H. SAUTER, Lectotypus ♀ (design. Z. KASZAB) (Museum G. FREY).

Psydus subtriatus PIC, 1930: Tonkin, Holotypus ♀ (Museum Paris, coll. PIC).

Psydus viridicinctus PIC, 1924: Tonkin, Hoa Binh [Tonkin], Holotypus ♀ (Museum Paris, coll. PIC).

Cleomis viridicinctus excellens ssp. n.: Laos, Vientiane, Ban Van Eua, 29. III. 1966, leg. J. RONDON, Holotypus ♂ (Museum Paris, coll. P. ARDOIN).

Psydus subelongatus PIC, 1930: Tonkin, Chapa, IV. 1912, R. VITALIS DE SALVAZA [Tonkin], Holotypus ♂ (Museum Paris, coll. PIC).

Psydus nitidissimus KASZAB, 1980: Vietnam, Hoang lien son, Gebirge bei Sa pa, 200 m, 23. V. 1963, KABAKOV, Holotypus ♂ (coll. O. KABAKOV).

Bestimmungstabelle der Arten der Gattung Cleomis Fairmaire, 1893

1 (2) Oberseite des Körpers vollkommen tiefschwarz, hochglänzend, die Längsreihe der Flügeldecken äußerst fein und von der Mitte an vollkommen erloschen, das Ende spiegelglatt. Stirn und Halsschild fast unpunktiert. — Länge: 12—13 mm. Vietnam
subelongatus (PIC, 1930)

2 (1) Oberseite des Körpers meist metallisch, nicht einfarbig schwarz, selten schwarz; die Punktreihen der Flügeldecken sind fein, die sind aber bis zur Spitze entweder gut entwickelt oder allmählich feiner, die Spuren der Punkte gut erkennbar.

3 (6) Der Käfer ist einfarbig dunkel, schwarz oder braun erzfarbig, stark glänzend. Der abgesetzte Rand des Halsschildes und die Flügeldecken nicht abweichend gefärbt.

4 (5) Stirn und Halsschild nur sehr fein und spärlich oder sogar ganz erloschen punktiert. Die Oberfläche dunkelbraun mit Bronzeglanz. — Länge: 9—10,5 mm. Borneo, Sumatra, Java, Nias
violaceipes FAIRMAIRE, 1893

5 (4) Stirn und Halsschild grob punktiert. Oberfläche schwarz, Halsschild und Flügeldecken mit kaum erkennbarem Erzschein. — Länge: 11—12 mm. Taiwan, Tonkin
marginicollis (GEBIEN, 1913)

6 (3) Der Käfer ist bunt, Oberseite grünlich, etwas violett oder bronzefarbig, der abgesetzte Seitenrand des Halsschildes und die Flügeldecken leuchtend violett, von der Farbe der Oberseite abweichend. Kopf und Halsschild grob punktiert.

7 (8) Kopf glänzend, Halsschild und Flügeldecken am Grund ganz erloschen chagriniert, deshalb ziemlich glänzend. — Länge: 10—11 mm. Vietnam
viridicinctus viridicinctus (PIC, 1924)

8 (7) Kopf glänzend, Halsschild weniger, Flügeldecken am Grund grob chagriniert, deshalb matt. — Länge: 9,5—13 mm. Vietnam, Laos (Abb. 5)
viridicinctus excellens ssp. n.

Cleomis viridicinctus excellens ssp. n. (Abb. 5)

Holotypus ♂: Laos, Vientiane, Ban Van Eua, 29. III. 1966, leg. J. RONDON (Museum Paris, coll. P. ARDOIN). — Allotypus ♀: wie Holotypus (Museum Paris, coll. P. ARDOIN); Paratypen: wie Holotypus (1 ♀, Museum Paris, coll. P. ARDOIN); Laos centre, Packadine, 15. III. 1965, leg. J. RONDON (13 ♂, 1 ♀, Museum Paris, coll. P. ARDOIN), id., 13. V. 1966, leg. J. RONDON (Museum Paris, coll. P. ARDOIN); Laos Vientiane, IV. 1964, leg. J. RONDON (1 ♀, Museum Paris, coll. P. ARDOIN); Tonkin N., Res D'Ha-Giang (H^te Rivière Claire), coll. SIÉBENS-OLIVIER, 1916 (1 ♀, Museum Paris).

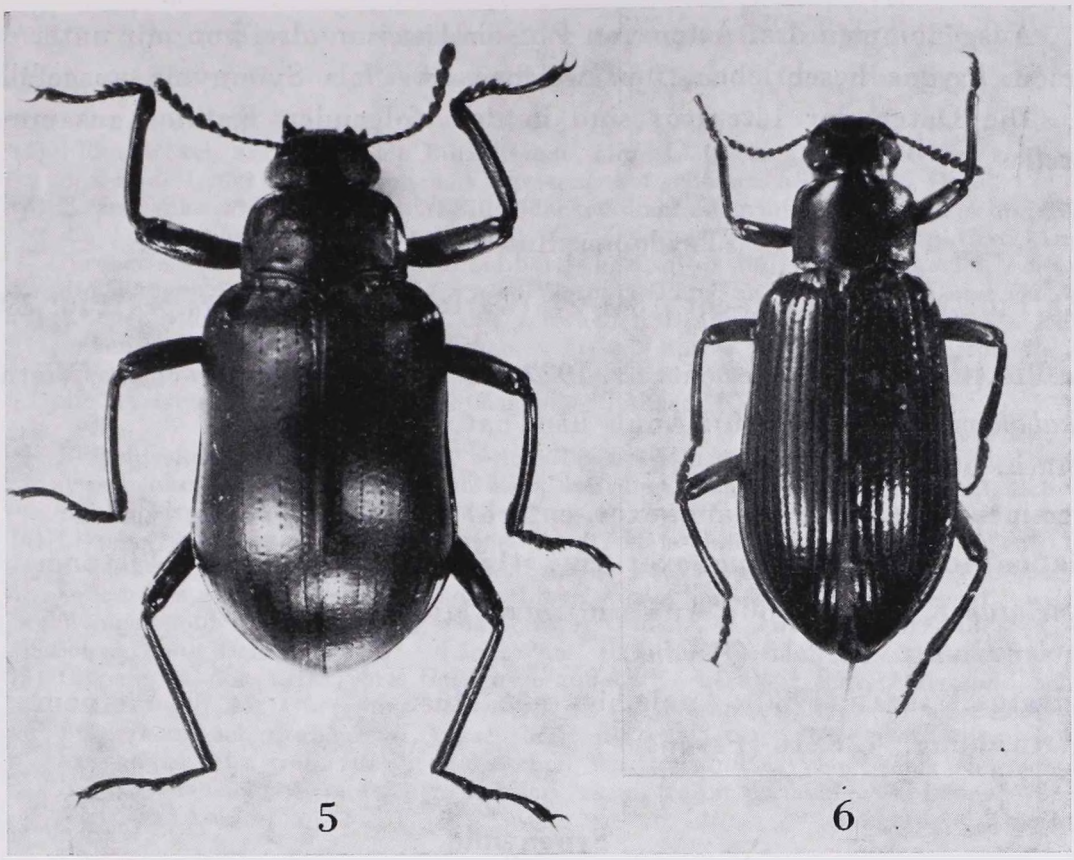

Abb. 5. *Cleomis viridicinctus excellens* ssp. n. — Abb. 6. *Psydomorphus elongatus* (KASZAB, 1980) (Foto: A. KEVE & G. HORVÁTH)

Sie unterscheidet sich von der typischen Form aus Vietnam, Hoa-Binh durch die abweichende Skulptur der Flügeldecken. Bei *C. viridicinctus* (PIC, 1924) ist der Grund glänzend, ganz erloschen und höchstens äußerst fein chagriniert, während der bei der neuen Form grob isodiametrisch genetzt und deshalb matt ist.

3. Die Gattung Psydomorphus Pic, 1921

Die hierher gehörenden Tiere sind äußerlich mit der Gattung *Psydus* PASCOE, 1868 und *Cleomis* FAIRMAIRE, 1893 ähnlich, unterscheiden sich aber von beiden durch wichtige Merkmale. Die auffallendsten Charaktere sind folgende: Seiten des Halsschildes breit und scharf abgesetzt, von der Scheibe durch eine Furche abgetrennt; Basalrand der Flügeldecken zwischen den Längsstreifen 1—6 nicht wulstartig aufgehoben; Flügeldecken am Ende der 7. Längsreihe nicht vertieft und der 8. Zwischenraum daneben nicht scharf kielförmig; Mittel- und Hinterschenkel sind mit einem roten Ring versehen. Vorderschienen des ♂ innen vor dem Ende mit stumpfem Zahn.

Ausgenommen drei Arten von PIC, sind weitere drei von mir unter dem Namen *Psydus* beschrieben, von welchen zwei als Synonyme ausgefallen.

Die Daten der Literatur sind in dem folgenden Katalog zusammengestellt.

Psydomorphus PIC, 1921

1921 PIC: Mélang. exot.-ent., **34:** 24 (Gattungstypus: *diversipes* PIC, 1921)

ater PIC (1922): Bull. Soc. ent. Fr. **1922:** 209 — Laos, Vietnam
= *kabakovi* KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 212 (*Psydus*)

diversipes PIC (1921): Mélang. exot.-ent., **34:** 24 — China

striatus PIC (1924): Mélang. exot.-ent., **41:** 27. — Vietnam
= *striatus* KASZAB (1980): Annls hist.nat. Mus. natn. hung., **72:** 215 (*Psydus*)

elongatus KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 216 (*Psydus*) — Vietnam

Synonymie

Psydus kabakovi KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 212, **syn. n.**
= **Psydomorphus ater** PIC, 1921

Psydus striatus KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 215, **syn. n.**
= **Psydomorphus striatus** PIC, 1924

Psydus elongatus KASZAB (1980): Annls hist.-nat. Mus. natn. hung., **72:** 216
= **Psydomorphus elongatus** (KASZAB, 1980), **comb. n.**

Holotypen und Lectotypen der Taxa der Gattung *Psydomorphus* PIC, 1921

Psydomorphus ater PIC, 1921: Moung Pek, Indochine [M. VITALIS DE SALVAZA], Holotypus ♂ (Museum Paris, coll. PIC).

Psydus kabakovi KASZAB, 1980: Vietnam, Vinh phu, Kurort Tam dao, 900 m, 30. V. 1962, KABAKOV, Holotypus ♀ (coll. O. KABAKOV).

Psydomorphus diversipes PIC, 1921: Kom Tcheon [Chine], Holotypus ♂ (Museum Paris, coll. PIC).

Psydomorphus striatus PIC, 1924: Hoo Binh, Tonkin [Tonkin], Lectotypus ♂ (design. Z. KASZAB) (Museum Paris, coll. PIC).

Psydus striatus KASZAB, 1980: Vietnam, Nge tinh, Muong son, 8. XII. 1971, GY. TOPÁL, Holotypus ♂ (Museum Budapest).

Psydus elongatus KASZAB, 1980: Vietnam, Bac thai, Gebirge 50 km NO Thai nguyen, 300 m, 7. I. 1964, KABAKOV, Holotypus ♂ (coll. O. KABAKOV).

Bestimmungstabelle der Arten der Gattung Psydomorphus Pic, 1921

1 (4) Flügeldecken nur mit feinen Punktreihen, ohne Längsstreifen, die Reihen sind gegen das Ende feiner oder erloschen. Vorderschenkel schwarz, ohne roten Ring.

2 (3) Körper schwarz, ziemlich matt, Flügeldecken dicht chagriniert und seidenschimmernd, die Punktreihen am Ende erloschen, die Zwischenräume fast unpunktiert. Augenfurchen zwar flach, aber gut erkennbar. Augen groß und vortretend, viel breiter als die Wangen. — Länge: 13—14,5 mm. Vietnam, Laos **ater** Pic, 1922

3 (2) Körper schwarz, Flügeldecken mit schwachen Bronzefarben, glänzend, die Punktreihen sind — zwar am Ende feiner — bis zur Spitze gut ausgebildet, und die Zwischenräume sind dicht punktiert. Ohne Augenfurchen. Augen sind kleiner, schmaler, die Wangen kaum breiter als die Augen. — Länge: 11,5 mm. China (Abb. 4) **diversipes** Pic, 1921

4 (1) Flügeldecken mit Längsstreifen, welche bis zur Spitze gut ausgebildet sind. Die Vorderschenkel sind auch mit rotem Ring versehen, welcher aber manchmal nicht gut sichtbar ist.

5 (6) Clypeus vorn gerade. Körper normal breit, Halsschild breit quadratisch, mit breit abgesetzten und flachen Seiten, die Scheibe flach. Fühler mit schwach abgesetzter 6gliedriger Keule. Tarsen einfach, schmal. Augen bei Seitenansicht schmal, zwischen Wangen und Clypeus stärker eingeschnürt. Flache Augenfurche vorhanden. Körper schwarz mit Bronzefarben. — Länge: 9,6—10,2 mm. Vietnam **striatus** Pic, 1924

6 (5) Clypeus in der Mitte vorn tief ausgerandet. Körper gestreckt, Halsschild schmal quadratisch, der Quere nach gewölbt, der abgeflachte Seitenrand auch schmaler. Fühlerkeule scharf abgesetzt. Tarsen breit, die zwei letzten Glieder auffallend schmaler. Augen sehr groß, rundlich, zwischen Wangen und Clypeus wenig eingeschnürt, bei Seitenansicht nierenförmig. Körper braun, kaum erzfarbig. — Länge: 12 mm. Vietnam (Abb. 6) **elongatus** Kaszab, 1980

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Pic, M. (1924): Nouveautés diverses. — Mélang. exot.-ent., **41:** 1—32.

Pic, M. (1925): Nouveautés diverses. — Mélang. exot.-ent., **43:** 1—32.

Pic, M. (1930): Nouveautés diverses. — Mélang. exot.-ent., **56:** 1—36.

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ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
XXIX. 4 1983 p. 389—395

TWO NEW SPECIES OF ARMOURED SCALE-INSECTS FROM HUNGARY (HOMOPTERA, COCCOIDEA: DIASPIDIDAE)

F. Kozár and D. Matile-Ferrero

(Received 7 September, 1982)

Description of *Acanthomytilus jablonowskii* sp. n. and *Rhizaspidiotus balachowskyi* sp. n. from grasses.

Two new grass-feeding armoured scale-insect species were collected in Hungary, during 1981. The present study has been completed with the aid of taxonomic works by Balachowsky (1954), Borchsenius (1966) and Bazarov and Smelev (1971). The specimens were compared with material in the collection of the Zoological Institute in Leningrad and the Muséum National d'Histoire Naturelle in Paris.

Subfamily: DIASPIDINAE

Genus: *Acanthomytilus* Borchsenius, 1947

Type-species: *Lepidosaphes intermittens* Hall, 1924 sensu Borchsenius, 1947 (misidentification) = *Acanthomytilus spinosus* Borchsenius, 1958 by original designation.

Acanthomytilus jablonowskii sp. n. (Fig. 1)

Type-material: holotype, adult female, Hungary, Szársomlyó, on *Chrysopogon gryllus* (upper side of leaves), 18. VI. 1981, collected by M. Kosztarab and F. Kozár (Kozár's collection No. 1527), mounted on slide, deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest. — Paratypes, 3 females on 3 slides, same data; Gyenesdiás (near Lake Balaton), 19. VIII. 1981; Nagykovácsi-Remetehegy, 25. VIII. 1981; Szársomlyó, 26. VIII. 1981, all on the same host collected by F. Kozár. All are dry karstic areas, with steppe vegetation. Deposited in the Research Institute for Plant Protection, Budapest. One female of paratype deposited in the Museum National d'Histoire Naturelle, Paris.

Description of species: Test of adult female elongate, oystershell-shaped, brownish yellow, with 2 exuviae at pointed end, 2—3 mm long and 0.5 mm wide. Ventral test thin and white. Test of male whitish, parallel-sided, 1—1.5 mm long. Eggs white.

Slide-mounted adult female elongate-oval, 1.2—1.8 mm long, body colour of female whitish. Widest at 2nd abdominal segment. Body membranous, except for pygidium. Each antenna with 2 large setae and 2 coeloconic sensillae. Stylet loop reaches middle of mesothorax. Anterior spiracles with a group of 4—8 trilocular pores.

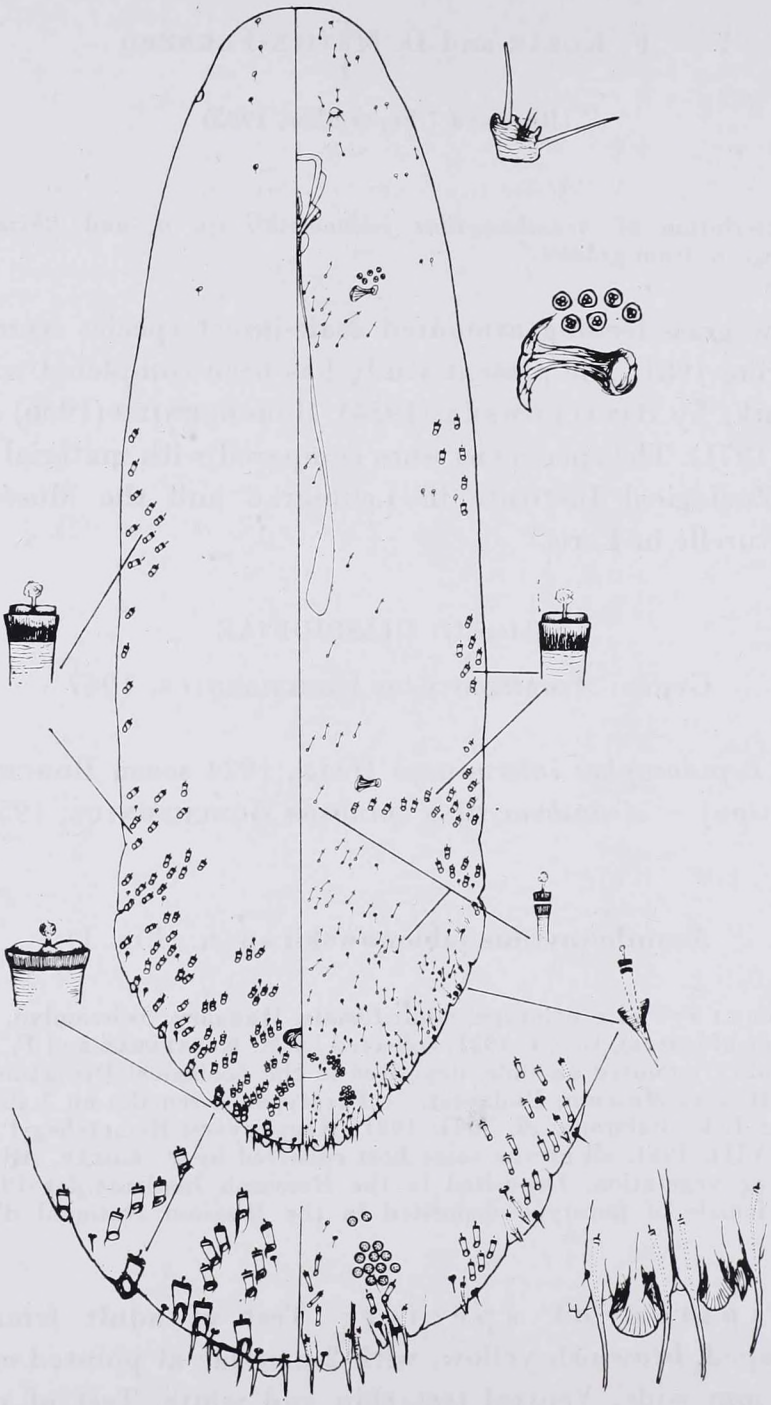

Fig. 1. *Acanthomytilus jablonowskii* sp. n., adult female

Pygidium rounded, slightly sclerotized, with 2 pairs of lobes. Median space subequal to width of L_1. Median lobes (L_1) prominent, rounded, without distinct notches. Second lobes (L_2) bilobed, inner lobules of same shape as median lobes but smaller, sometimes slightly notched, outer lobules (L_3) barely perceptible, triangular and finely pointed. Gland spines long and slender, present in pairs on pygidium, 1 pair between median lobes, 1 pair between L_1 and L_2, 1 pair laterad of L_2. Gland spines at least twice the length of median lobes. Minute gland spines obscurely visible on prepygidial segments II to VI.

Dorsally, marginal macroducts (BALACHOWSKY's "mégapore") numbering 1, 2, 1 on each side. Submarginal macroducts numbering 2—3 on segment VII and 4—7 on segment VI. Pygidial segment V, and prepygidial segments I—IV with 3 to 7 submarginal macroducts. Submedian macroducts numbering 1—3 on segment VII and 3—7 on segment VI. Pygidial segment V and prepygidial segments III—IV with 3 to 5 submedian macroducts. Macroducts also present around submargins of meso- and metathorax.

Ventrally, grandular tubercles absent on segment I. Macroducts of same size as dorsal ones, present in a submarginal group on segment I. 1 macroduct marginally on segment II. Relatively large number on metathorax transversally from margin to posterior spiracle. Same ducts present on submargin of mesothorax. Microducts numerous from segment I to VIII. Longitudinal row of 4—8 submedian and submarginal microducts on VIII. Sparsely distributed elsewhere. Perivulvar pores in 5 groups as follows: 4—10, (9—14), 7—13. Anal opening at anterior border of segment VI. Body setae short and slender.

This species comes close to *A. intermittens* (HALL, 1924) and *A. sacchari* (HALL, 1923) as tabulated below:

	A. intermittens			*A. sacchari*	*A. jablonowskii*
	Egypt type-loc. 1♀	Iran 10♀	Tunisia 12♀	Egypt paratype 1♀ Guinea 19♀	Hungary types 29♀
L_2 bilobed	+	+	+	—	+
Gland spines laterad of L_2	2	2	2	3	2
Minute gland spines on segm. II to VI	+ (obscure)	+	+	+ (obscure)	+ (obscure)
Dorsal macroducts					
on segm. VII,					
submarg.	1	1—2	1—2	1— 4	2—3
submed.	0	0—1	0	2— 8	1—3
on segm. VI,					
submarg.	1	1—5	1—3	2—13	4—7
submed.	2—3	0—6	2—4	7—15	3—7
Ventral gland tuberc. on segm. I	7—8	0—8	2—9	2— 7	0
Ventral microducts on segm. VIII	2—3	1—3	2—3	7— 9	4—8

The exclusive character of *A. jablonowskii* is the absence of ventral grandular tubercles on segment I. *A. jablonowskii* differs from *A. intermittens* in possessing a higher number of dorsal submedian macroducts on segment VII, of dorsal submarginal and submedian macroducts on VI and of ventral microducts on VIII. *A. jablonowskii* differs from *A. sacchari* in possessing only 2 gland spines laterad of L_2 and by the presence of bilobed L_2.

This species is named in honour of JÓZSEF JABLONOWSKI, the famous agricultural entomologist in Hungary at the beginning of this century. He published several research papers on scale-insects, among them a substantial one on scale-insects pests of grape vine and other plants (JABLONOWSKI, 1916).

Subfamily: ASPIDIOTINAE

Genus: *Rhizaspidiotus* McGILLIVRAY, 1921

Type-species: *Aspidiotus* (*Targionia*) *helianthi* PARROTT, 1899 = *Aspidiotus dearnessi* COCKERELL, 1898, by original designation, monotype.

Rhizaspidiotus balachowskyi sp. n. (Fig. 2)

Type-material: holotype, adult female. Hungary, Szársomlyó, on *Chrysopogon gryllus* (roots), 26. VIII. 1981, collected by F. KOZÁR (coll. No. 1655), mounted on slide, deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest. — Paratypes, same data, 4 females on 4 slides, deposited in the Research Institute for Plant Protection, Budapest; 1 female deposited in the Zoological Institute, Leningrad; 1 female deposited in the Muséum National d'Histoire Naturelle, Paris.

Description of species: Test of adult female broad-oval, strongly convex, black, exuviae subcentral; ventral scale thick, uniting with the dorsal scale to form an almost closed capsule. Diameter, 1.5—2 mm. Test of male of the same shape and colour as of female, but smaller. Living female whitish.

Slide-mounted adult female piriform, subcircular, slightly longer than wide, about 1 mm long. Body membranous, except for pygidium. Each antenna with 1 seta and 2 coeloconic sensillae. Stylet loop as long as body. Spiracles wide, without associated pores but surrounded by a distinct sclerotized area bearing small microducts.

Pygidium wide, margin very thick and crenulate. L_1 not protruding, rounded, without notches. Other lobes scarcely developed, not discernible from thick margin. Tubular ducts small, abundant, of same size on both surfaces.

Dorsally, numerous marginal and submarginal macroducts present on abdominal segments I to VIII and along head and thorax. Two submarginal macroducts on each side of segment VIII. Submedian and median macroducts

absent on segments V to VII. Submedian macroducts present, but sparse on segments I to IV. One robust marginal seta on pygidial segments V to VIII. On segment VIII this seta about twice the length of others and a solitary one emerging from thick margin. Submarginal bosses present on segments I to V, sometimes not discernible.

Ventrally, also numerous submarginal and submedian microducts of same size as dorsal macroducts, present on segments I to VI. Some submarginal

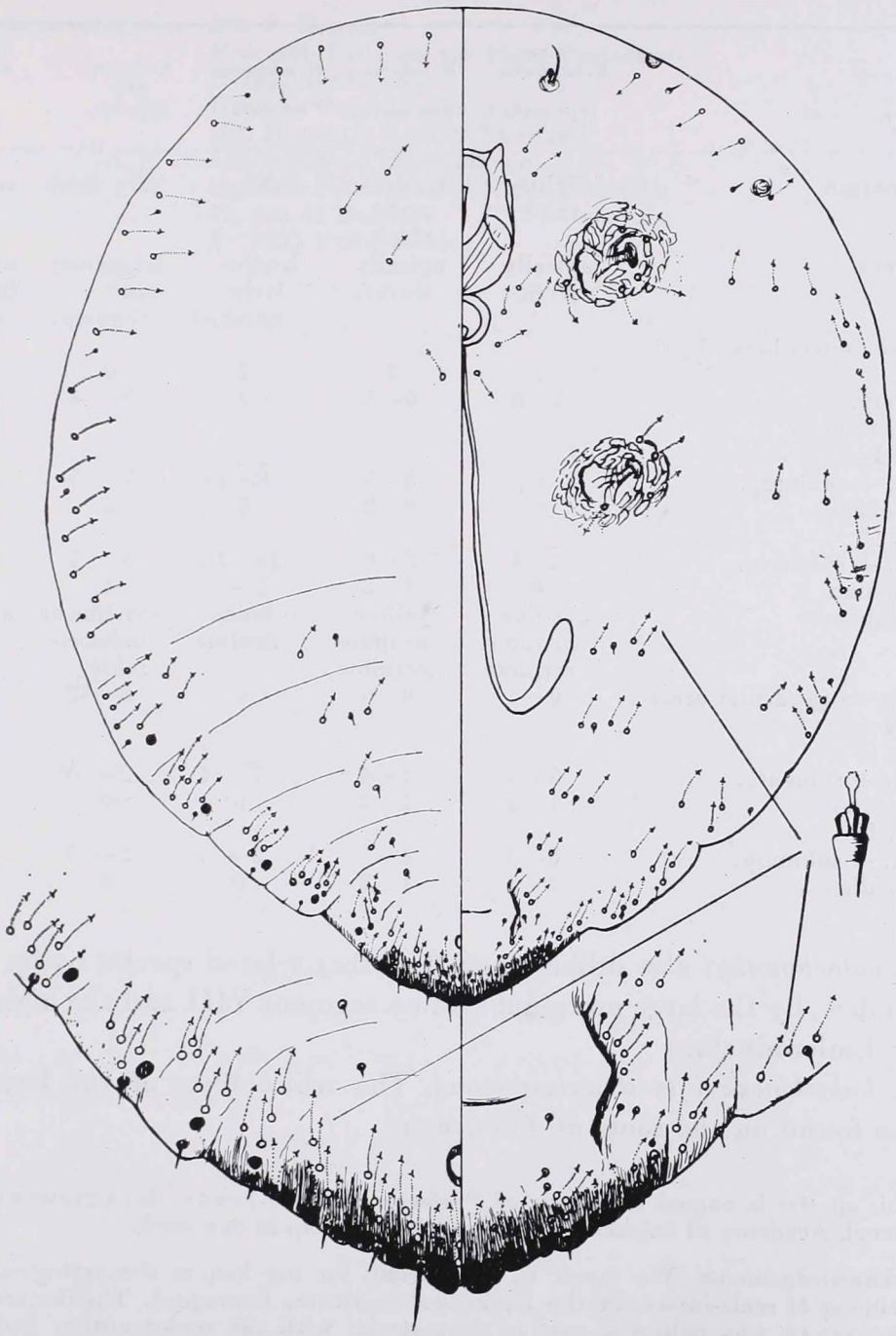

Fig. 2. *Rhizaspidiotus balachowskyi* sp. n., adult female

ducts present sparsely on head and thorax. One large marginal seta on each side of segments VI and VII. Perivulvar pores absent. Anal opening circular, situated at posterior third of pygidium. Eyes perceptible. Thoracic tubercle present, eye-like. Body setae short and slender.

R. balachowskyi comes close to *R. bivalvatus* (GOUX, 1937) [= *R. festucae* (KIRITSHENKO, 1940)], *R. caraganae* (KIRITSHENKO, 1940) and *R. donacis* (LEONARDI, 1920) as tabulated below:

	R. bivalvatus 5♀ type-mat.	*R. festucae* 5♀ type-mat.	*R. caraganae* 13♀ type-loc.	*R. donacis* 23♀ type-loc.	*R. balachowskyi* sp. n. 6♀ types
Pygidial margin	slightly thick	moderately thick	thick	very thick	very thick
Median lobes	apically serrate	apically serrate	irregularly notched	triangular and converg.	not projecting rounded
Dorsal macroducts betw. L_1					
marg.	1	2	2	0	0
submarg.	5—6	0—5	3	2— 4	2
Dorsal macroducts on segm. I					
marg. + submarg.	0	3—5	8—14	3— 5	5—10
submedian	0	0—2	0	3	1— 2
on segm. II					
marg. + submarg.	2—4	5—6	16—18	3— 7	4— 6
submedian	0	1—2	1— 3	4	1— 2
Thoracic tubercle	eye-like or indiscernible	eye-like or indiscernible	biden-ticulate	eye-like or indiscernible	eye-like or indiscernible
Microducts on spiracular areas	0—6	0—6	0	8—32	4— 8
Ventral ducts on segm. I					
marg. + submarg.	3—4	3—4	7— 4	2— 5	3—10
submedian	1—3	1—2	0	0	3
on segm. II					
marg. + submarg.	3—5	3—5	2— 5	2— 7	6— 8
submedian	2—3	1—2	0	0	4

R. balachowskyi also differs from the other related species by its rounded median lobes, by the large marginal seta on segment VIII and the high number of ventral microducts.

R. balachowskyi is ovoviviparous. The white tests of the first instars were also found on the roots of *Festuca* sp.

This species is named in honour of Professor ALFRED SERGE BALACHOWSKY, Member of the French Academy of Sciences, for his continuous help in our work.

Acknowledgements. We thank E. M. DANZIG for her help in comparing our material with specimens of scale-insects in the Zoological Institute, Leningrad. Thanks are also due to M. KOSZTARAB who collected part of the material with the senior author and reviewed our manuscript. We appreciate the work of R. A. VIKTORIN, for preparing the slides and HÉLÈNE LERUYET for the illustrations.

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ACTA ZOOLOGICA ACADEMIAE SCIENTIARUM HUNGARICAE
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ORIBATIDS FROM THE EASTERN PART OF THE ETHIOPIAN REGION (ACARI). III

S. Mahunka

(Received 26 November, 1982)

Taxonomic examinations on the Oribatid fauna from the eastern part of the Ethiopian Region. Herewith the description of 30 new species and two new genera from Tanzania is given.

In the first and second parts of this series of papers I indicated the study of the Oribatids of the eastern part of the Ethiopian Region, with especial regard to the zoogeographical relations of the high mountains. This part enumerates 30 new species from Tanzania, either from the Uluguru or from the Kilimandjaro mountains. All the material was collected by Dr. T. Pócs, the renown bryologist (Budapest).

LIST OF LOCALITIES

No. 175. Tanzania, Mts. Uluguru, 2100 m. 1. January, 1980, leg. T. Pócs. — Berlese sample from litter with humus from stones.
No. 178. Tanzania, Mts. Kilimandjaro, 2850 m. 19. September, 1972, leg. T. Pócs. — Berlese sample from *Sphagnum* of *Erica* arborea wood, near Umbwe.
No. 181. Tanzania, Mts. Uluguru, Mts. Mnyera peak, 211 m. 1. January, 1973, leg. T. Pócs. — Berlese sample from dwarf forest, from epiphytic moss.

PHTHIRACARIDAE Perty, 1841

Hoplophorella subciliata sp. n.

Measurements. — Length of aspis: 363 μm, length of notogaster: 706 μm, height of notogaster: 440 μm.

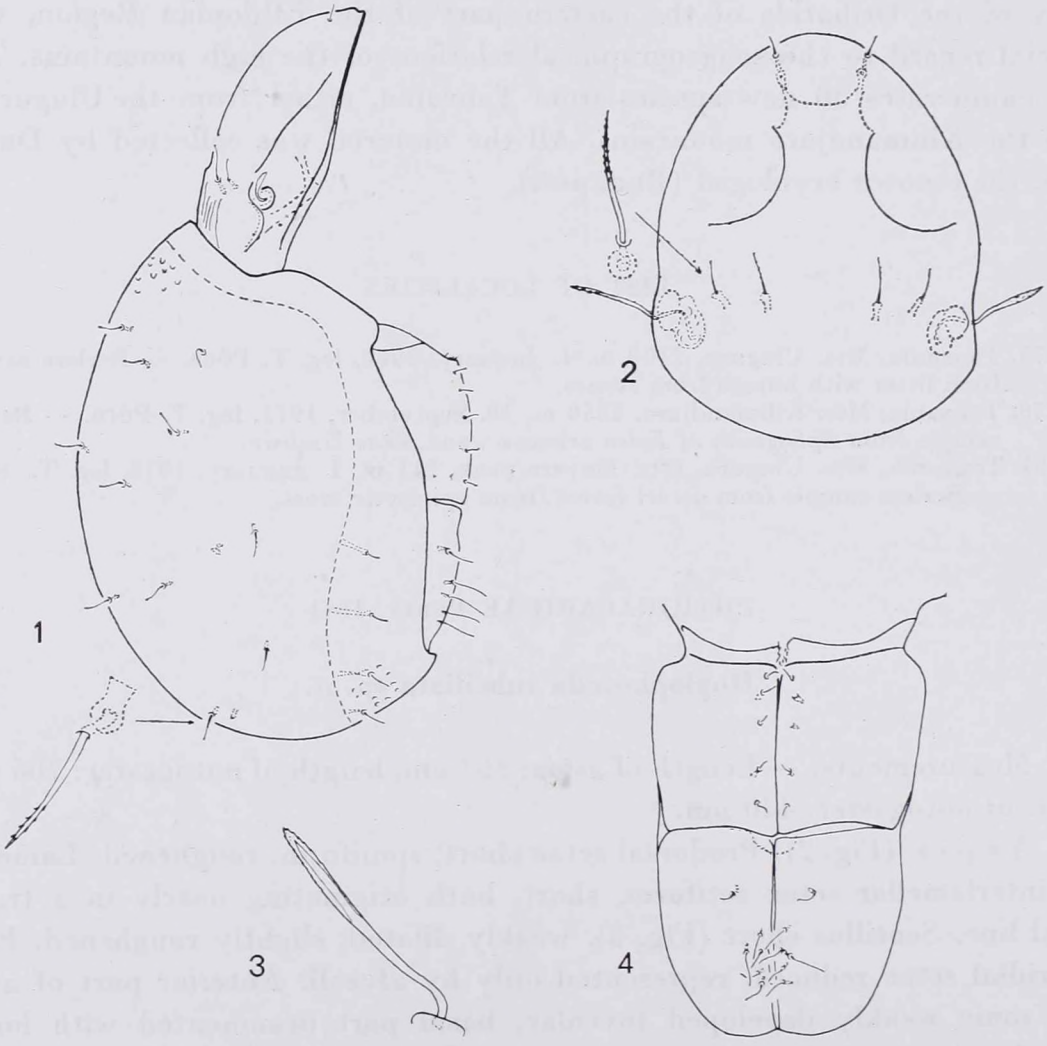
A s p i s (Fig. 2): Prodorsal setae short, spiniform, roughened. Lamellar and interlamellar setae setiform, short, both originating nearly in a transversal line. Sensillus short (Fig. 3), weakly dilated, slightly roughened. Exobothridial setae reduced, represented only by alveoli. Anterior part of aspis with some weakly developed foveolae, basal part ornamented with longitudinal wrinkles. Lateral surface between short carina and short lateral rim smooth.

Notogaster (Fig. 1): Surface weakly sculptured, fine foveolae hardly, only on lateral part more clearly visible. Fourteen pairs of short, slightly curved, setiform and roughened notogastral setae present. All equal in length. Setae c_1 and c_2 standing very far from collar line.

Anogenital region (Fig. 4): Nine pairs of spiniform genital setae. All ano-adanal setae apicate, ad_1 originating near to inner margin of ano-adanal plate, in a similar longitudinal line as in anal ones. Setae ad_2 slightly longer, ad_1 slightly shorter than other ones.

Material examined: Holotypus (771-HO-82): Afr. 178; deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest.

Remarks: The extraordinarily long and especially the setae of notogaster well distinguish the new species from all known congeners.



Figs 1—4. *Hoplophorella subciliata* sp. n. 1 = Lateral view of body, 2 = aspis, 3 = sensillus, 4 = anogenital region

Hoplophthiracarus peracutus sp. n.

Measurements. — Length of aspis: 440—632 μm, length of notogaster: 836—1184 μm, height of notogaster: 612—890 μm.

Aspis (Fig. 8): Lateral margin anteriorly, from lateral side strongly excavate. Lateral rim narrow, carina weakly developed, but well visible. A weak and low crest present. Ratio of the prodorsal setae as $ro < le < ex < in$. Rostral and lamellar setae slightly pilose, erectile interlamellar and all notogastral setae squamose (Fig. 9). Sensillus long, straight and bacilliform, slightly squamose, too (Fig. 6). Surface ornamentation consisting of weak foveolae.

Notogaster (Fig. 5): Well chitinized, darkish brown. Fourteen pairs of notogastral setae present, great differences existing between them. Three pairs of *c* setae (c_2, c_3 and c_p) long, filiform (Fig. 9), all others apicate (Fig. 9), but h_3, ps_3 and ps_4 much shorter than the others.

Anogenital region (Fig. 7): Nine pairs of short genital and 5 pairs slightly dilated ano-adanal setae of different lengths. Setae ad_3 short, spiniform, originating far from other 4 setae, which inserted on inner margin of the ano-adanal plates.

Material examined: Holotypus (772-HO-82): Afr. 178; 3 paratypes from the same sample. Holotypus and 2 paratypes (772-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

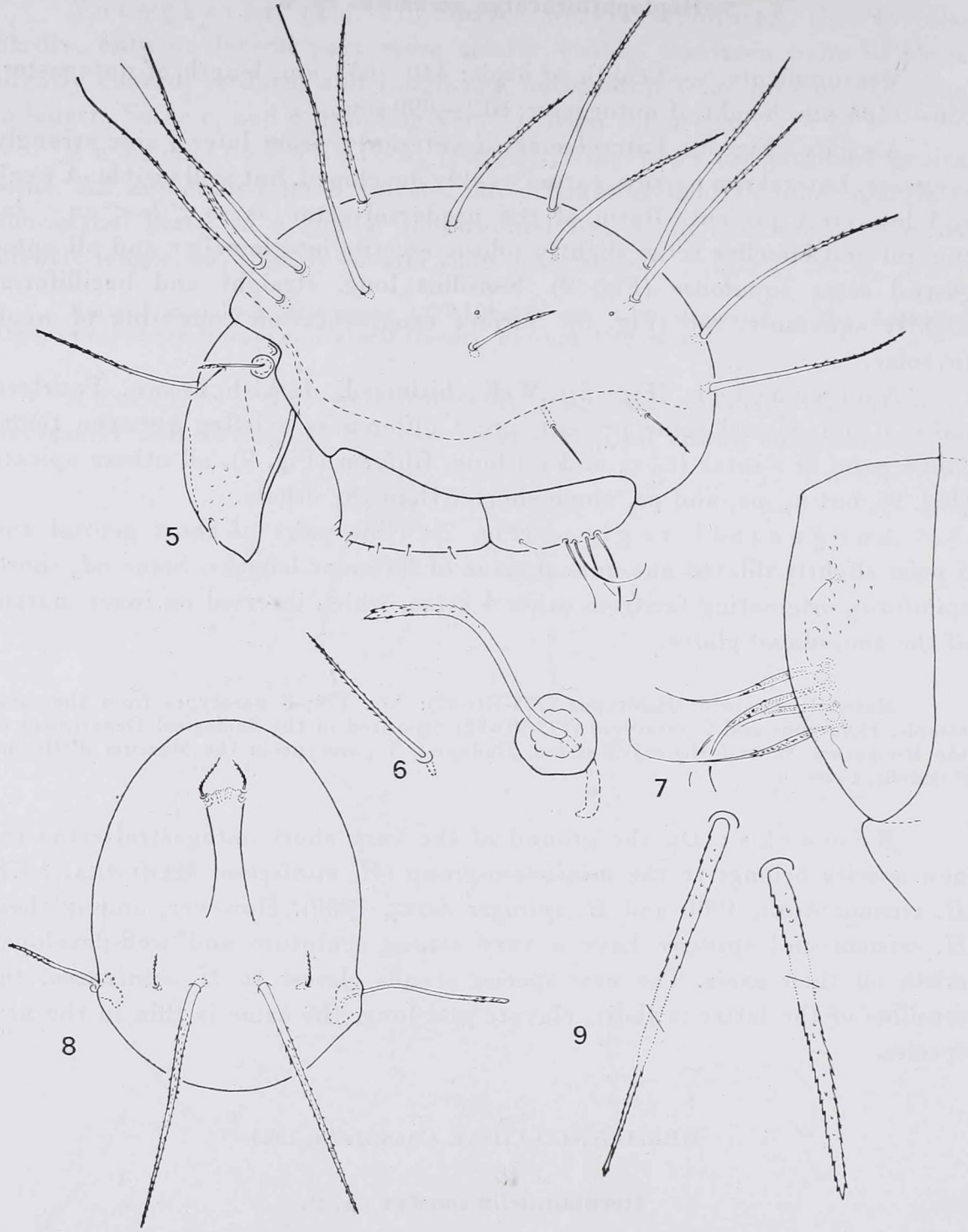
Remarks: On the ground of the very short notogastral setae the new species belongs to the *minisetosa*-group (*H. minisetosa* MAHUNKA, 1978, *H. cristata* AOKI, 1980 and *H. spiniger* AOKI, 1980). However, among them *H. cristata* and *spiniger* have a very strong sculpture and well-developed crista on their aspis. The new species stands closest to *H. minisetosa*, the sensillus of the latter is short, clavate and long, the same is thin in the new species.

HERMANNIELLIDAE GRANDJEAN, 1943

Hermanniella mastyx sp. n.

Measurements. — Length: 571—632 μm, width: 350—433 μm.

Dorsal side (Fig. 10): Rostrum widely rounded, rostral setae short arising laterally. Lamellar and interlamellar setae flagellate, preceding pairs arising on a pair of small tubercles. Dorsal surface of prodorsum granulated. Sensillus (Fig. 12) simple, distinctly barbed. Entire body surface covered by secretion arranged into tubercles. Notogastral setae of different types, twelve



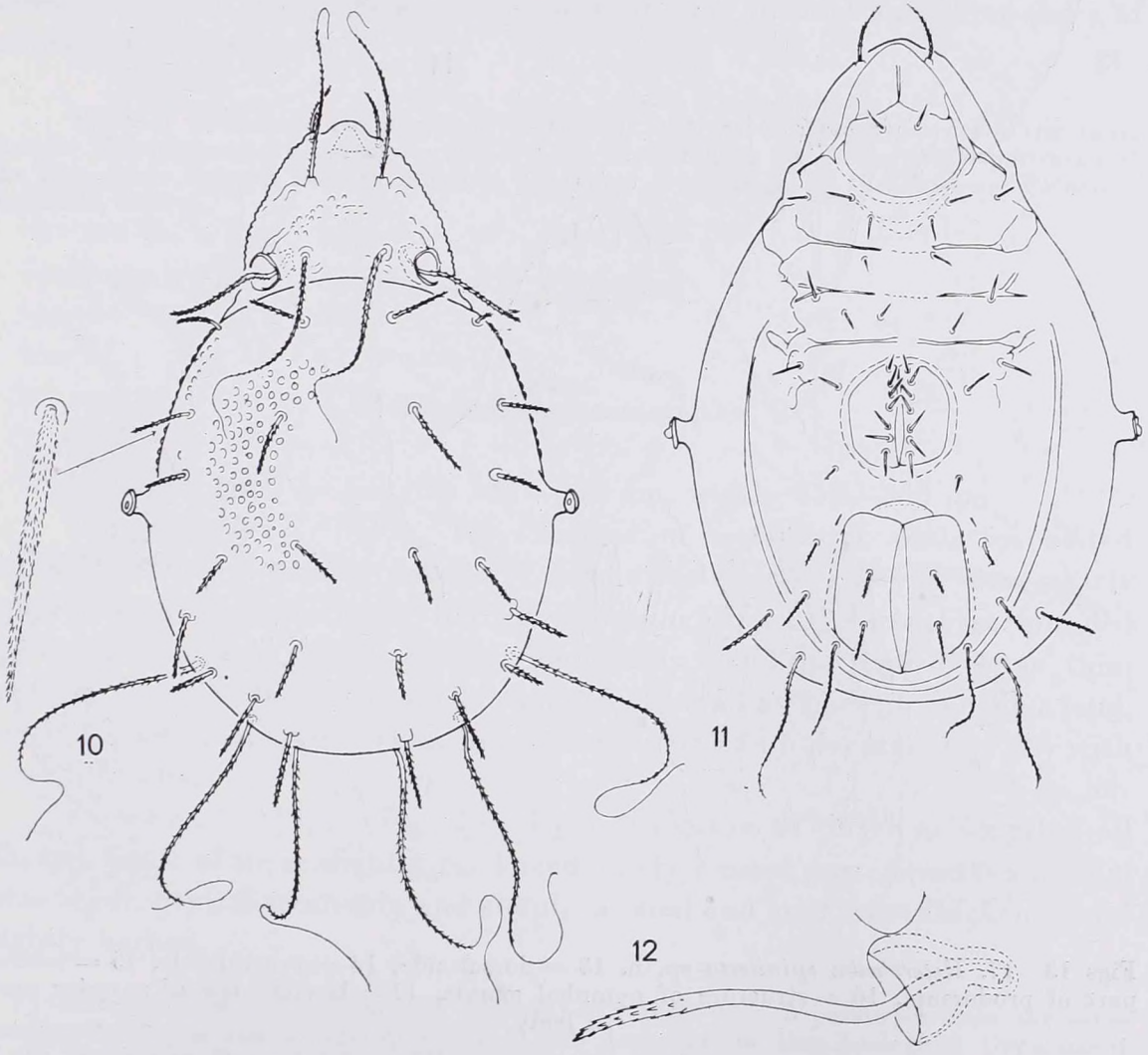
Figs 5—9. *Hoplophthiracarus peracutus* sp. n. 5 = lateral view of body, 6 = sensillus and seta *le*, 7 = anogenital region, 8 = aspis, 9 = setae of notogaster

pairs of short, slightly spiniform, distinctly barbed setae, *ps* very long, flagellate.

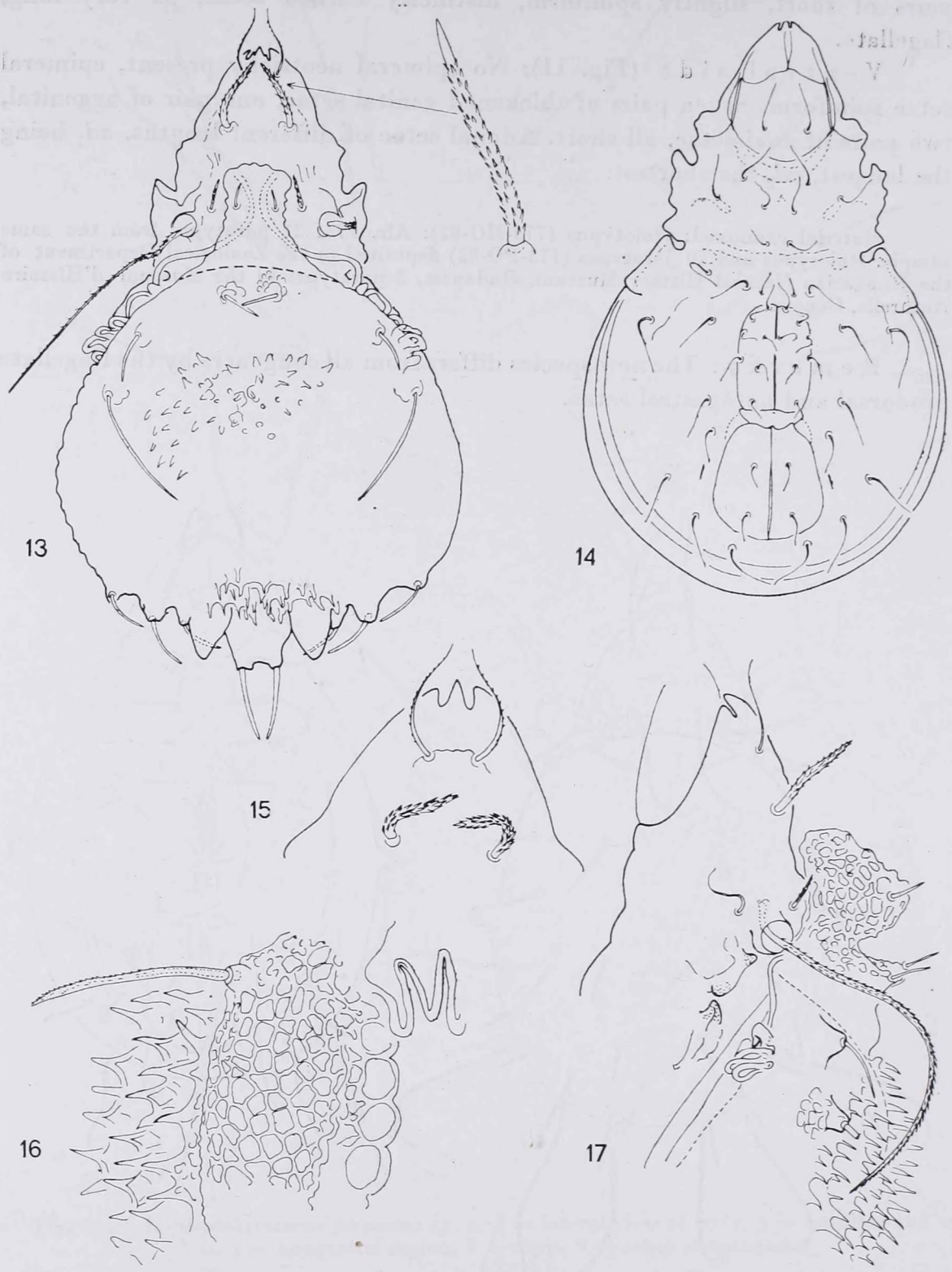
V e n t r a l s i d e (Fig. 11): No epimeral neotrichy present, epimeral setae spiniform. Seven pairs of thickened genital setae, one pair of aggenital, two pairs of anal setae, all short. Adanal setae of different lengths, ad_1 being the longest, ad_3 the shortest.

Material examined: Holotypus (773-HO-82): Afr. 175; 22 paratypes from the same sample. Holotypus and 20 paratypes (773-PO-82) deposited in the Zoological Department of 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 differs from all congeners by the flagellate prodorsal and notogastral setae.



Figs 10—12. *Hermanniella mastyx* sp. n. 10 = dorsal side, 11 = ventral side, 12 = sensillus



Figs 13—17. *Heterobelba spinitecta* sp. n. 13 = dorsal side, 14 = ventral side, 15 = rostral part of prodorsum, 16 = structure of nymphal exuvia, 17 = lateral view of anterior part of body

HETEROBELBIDAE Balogh, 1961

Heterobelba spinitecta sp. n.

Measurements. — Length: 315—335 μm, width: 195—210 μm.

Dorsal side (Fig. 13): Body covered with exuvia of characteristic shape and sculpture (Fig. 16), projecting anteriorly over prodorsum into a wide, angular and marginally waved appendage, latter divided by tubercles (Fig. 17) and ornamented by laths forming polygonal figures. Posterior part with large spines. Setae finely barbed. Rostrum divided by two deep incisions, median apex narrower than lateral ones (Fig. 15). Rostral setae thin, simply ciliated, lamellar and interlamellar setae thickened and barbed, latter conspicuously short. Sensillus very long, setiform, well ciliated.

Ventral side (Fig. 14): Apodemes weakly developed. Epimeral setae simple, slightly thickened only at bases. No epimeral neotrichy. Seven pairs of genital, two pairs of aggenital, two pairs of anal and three pairs of adanal setae present.

Material examined: Holotypus (774-HO-82): Afr. 175; 7 paratypes from the same sample. Holotypus and 6 paratypes (774-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: See after the next species.

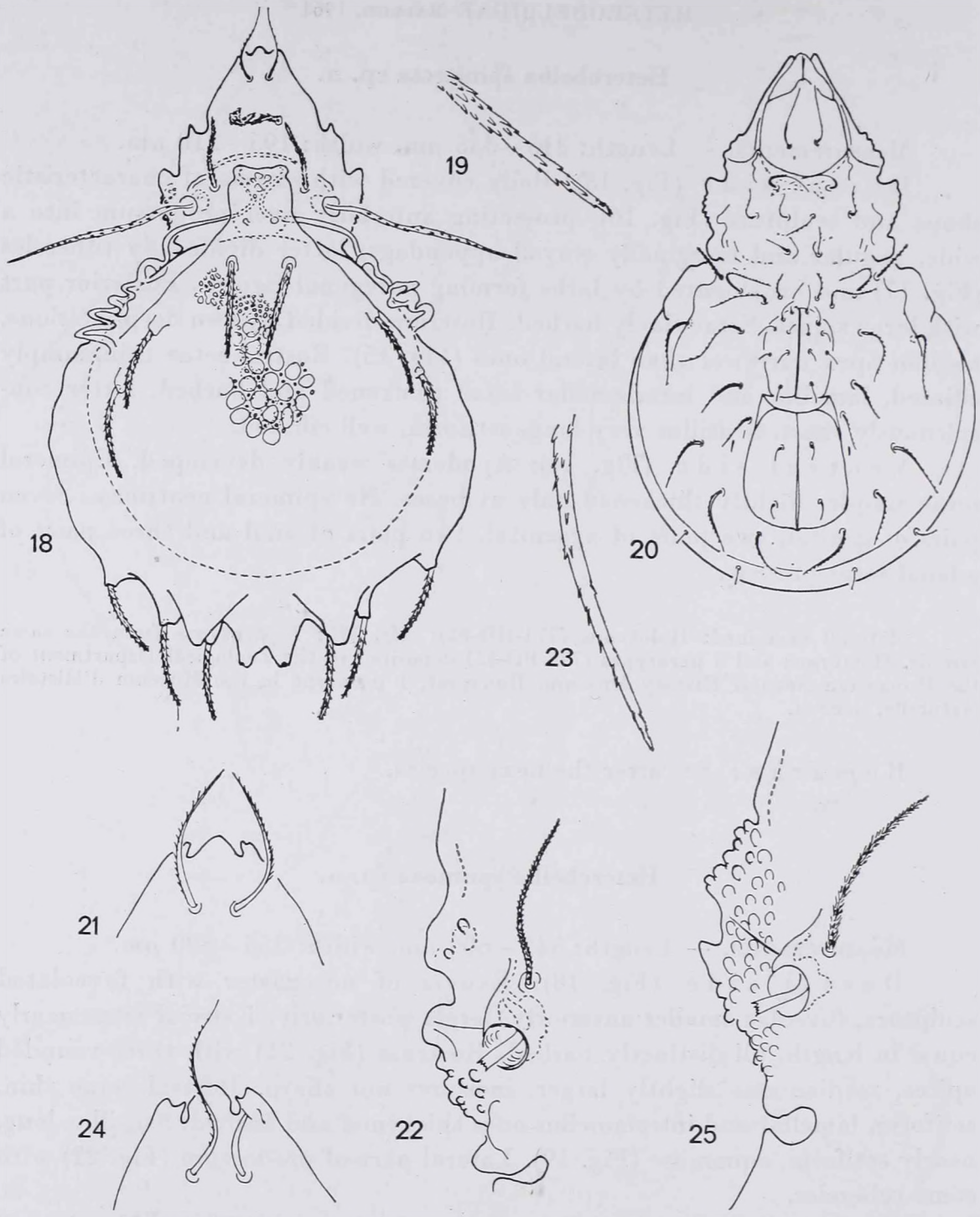
Heterobelba spumosa sp. n.

Measurements. — Length: 542—600 μm, width: 355—380 μm.

Dorsal side (Fig. 18): Exuvia of notogaster with foveolated sculpture, foveolae smaller anteriorly, larger posteriorly. Exuvial setae nearly equal in length, all distinctly barbed. Rostrum (Fig. 21) with three rounded apices, median one slightly larger, incisures not sharp. Rostral setae thin, setiform, lamellar and interlamellar ones thickened and barbed. Sensillus long, nearly setiform, squamose (Fig. 19). Lateral part of prodorsum (Fig. 22) with some tubercles.

Ventral side (Fig. 20): Epimeral setae of different lengths, all ciliated. Some of them slightly thickened on their basal part. Genital and anal setae short, genital setae thin and simple, adanal and anal setae thickened and slightly barbed.

Material examined: Holotypus (775-HO-82): Afr. 175; 3 paratypes from the same sample. Holotypus and 2 paratypes (775-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.



Figs 18—22. *Heterobelba spumosa* sp. n. 18 = dorsal side, 19 = distal end of sensillus, 20 = ventral side, 21 = rostrum, 22 = marginal part of prodorsum. — Figs 23—25. *Heterobelba africana* Balogh, 1958 (typus) 23 = end of sensillus, 24 = rostrum, 25 = marginal part of prodorsum

Remarks: So far only one *Heterobelba* BERLESE, 1913 species from Africa (*H. africana* BALOGH, 1958) has been known. The recently described species can be distinguished from one another by the following key:

1 (2) Interlamellar setae short, much shorter than the lamellar or rostral ones. Exuvia with spines **spinitecta** sp. n.
2 (1) Interlamellar setae long, longer, or as so long as lamellar or rostral ones. Exuvia foveolated or of polygonal reticulation.
3 (4) Exobothridial part of prodorsum and pedotecta 1 (Fig. 25) completely covered with tubercles. Rostrum as shown in Fig. 24. Sensillus sparsely pilose (Fig. 23) **africana** BALOGH, 1958
4 (3) Exobothridial part only with some tubercles, pedotecta 1 (Fig. 22) with 2—3 tubercles. Rostrum as shown in Fig. 21. Sensillus densely squamose (Fig. 19) **spumosa** sp. n.

LIACARIDAE SELLNICK, 1928

Liacarus tanzicus sp. n.

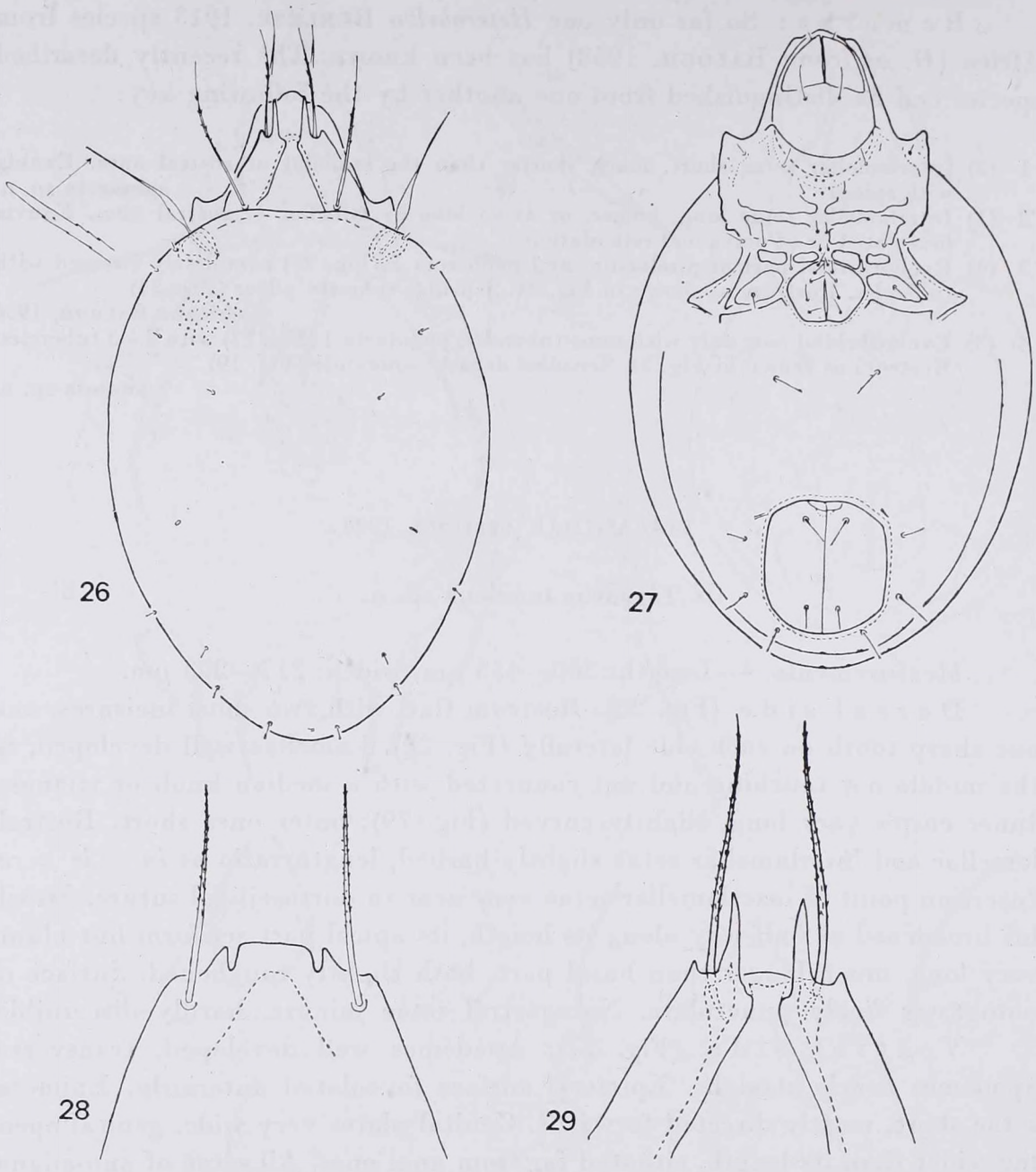
Measurements. — Length: 360—455 μm, width: 217—293 μm.

Dorsal side (Fig. 26): Rostrum flat, with two short incisures, and one sharp tooth on each side laterally (Fig. 28). Lamellae well developed, in the middle not touching and not connected with a median knob or triangle. Inner cuspis very long, slightly curved (Fig. 29): outer ones short. Rostral, lamellar and interlamellar setae slightly barbed, length ratio as *in* > *le* > *ro*. Insertion point of interlamellar setae very near to dorsosejugal suture. Sensillus broadened at half-way along its length, its apical part setiform but blunt, very long, much longer than basal part, both slightly roughened. Surface of notogaster finely punctulate. Notogastral setae minute, hardly discernible.

Ventral side (Fig. 27): Apodemes well developed, transversal apodemes nearly straight. Epimeral surface foveolated anteriorly. Epimeral setae short, mostly directed forwards. Genital plates very wide, genital opening wider than its length, situated far from anal ones. All setae of ano-adanal region straight, ad_1 in postanal, ad_2 and ad_3 in paraanal position. Pori *iad* arranged nearly transversally, near to anterior corner of anal opening.

Material examined: Holotypus (776-HO-82): Afr. 178; 11 paratypes from the same sample. Holotypus and 9 paratypes (776-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well characterized by the separated lamellae. On this ground it stands nearest to *L. internodentatus* KULIJEW, 1962, however, the sensillus of the latter is much shorter and the shape of lamellae is different too.



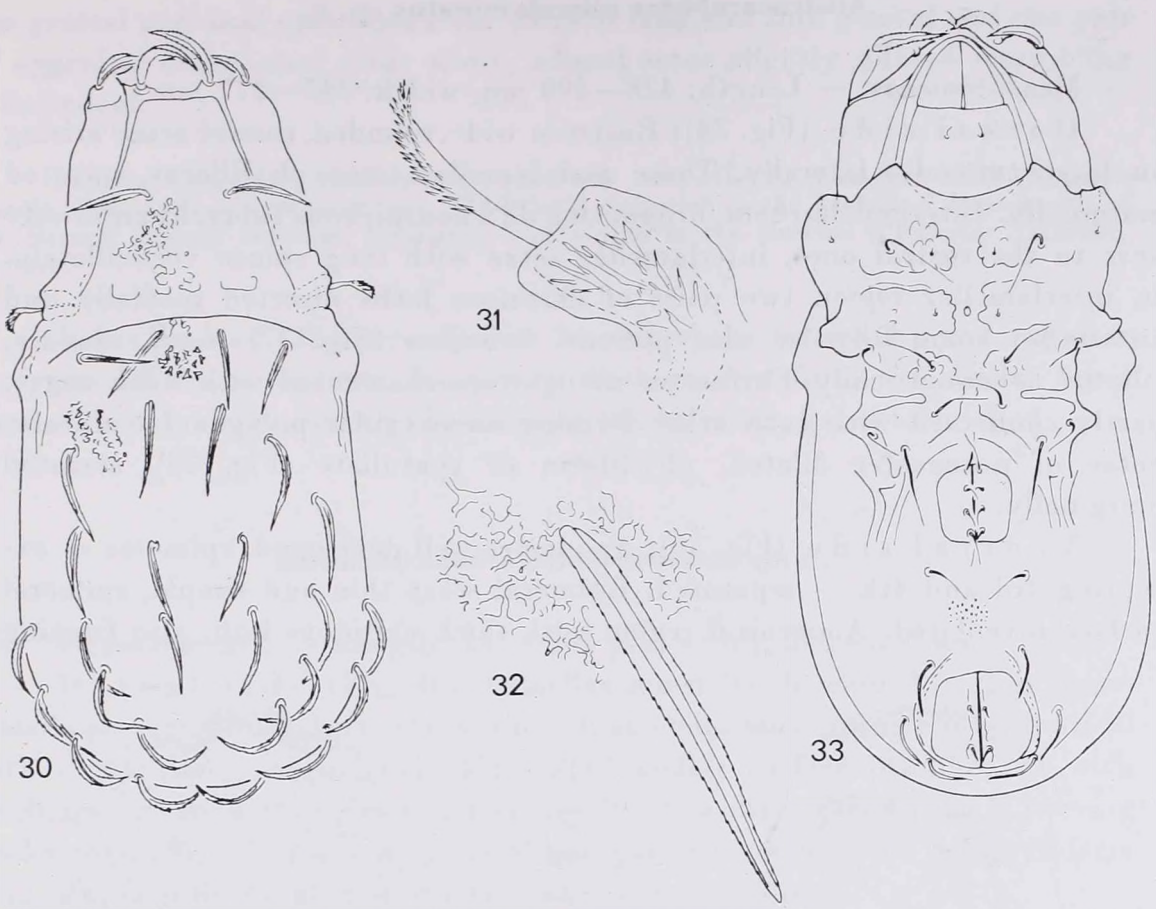
Figs 26—29. *Liacarus tanzicus* sp. n. 26 = dorsal side, 27 = ventral side, 28 = rostrum, 29 = end of lamellae

CARABODIDAE C. L. Koch, 1837

Austrocarabodes crenellatus sp. n.

Measurements. — Length: 460—483 μm, width: 202—225 μm.

Dorsal side (Fig. 30): Rostrum rounded, rostral setae arising far from rostral apex, originating on a pair of tubercles connected by a transversal lath, resembling a translamella. Rostral and lamellar setae similar in shape



Figs 30—33. *Austrocarabodes crenellatus* sp. n. 30 = dorsal side, 31 = sensillus, 32 = sculpture and seta of notogaster, 33 = ventral side

and size, both pairs thin but filiform, slightly serrated marginally. Interlamellar setae wider, phylliform. Interlamellar surface with irregular spots medially and basally. Sensillus (Fig. 31) very short, clavate, spinulose asymmetrically. Notogaster with fourteen phylliform setae, all equal in length, finely serrated marginally. Surface ornamented with very fine rugae (Fig. 32).

V e n t r a l s i d e (Fig. 33): Apodemes well developed, epimeral surface ornamented with large foveolae. Epimeral setae very long and thin. Near genital opening a well-developed chitinous lath reaching posteriorly. Four pairs of long genital, one pair of aggenital setae present, anal setae very short, adanal ones long and slightly thickened.

Material examined: Holotypus (777-HO-82): Afr. 175; 27 paratypes from the same sample. Holotypus and 25 paratypes (777-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

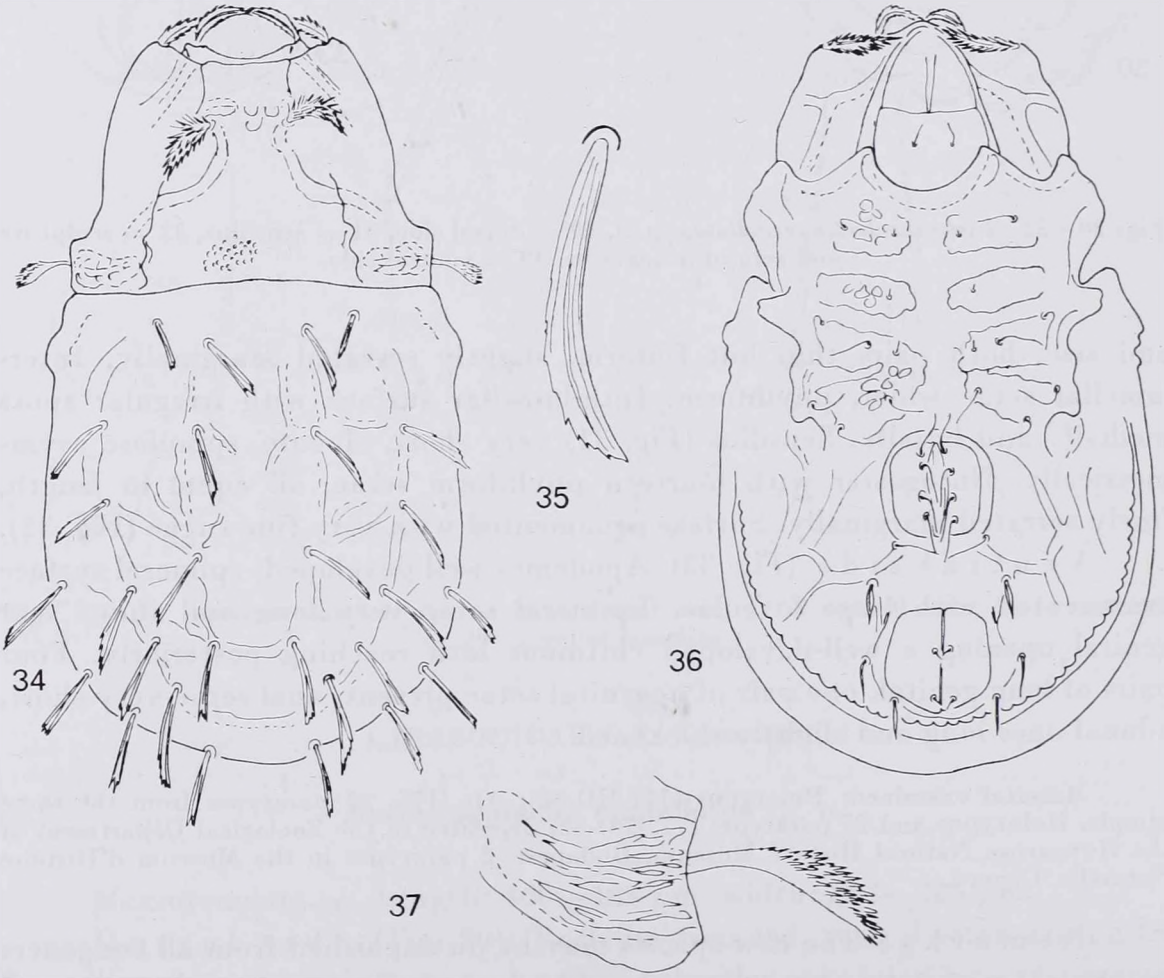
R e m a r k s : The new species may be distinguished from all congeners by the characteristic ornamentation of body and the position of the rostral and lamellar setae.

Austrocarabodes microlaminatus sp. n.

Measurements. — Length: 428—490 μm, width: 245—277 μm.

D o r s a l s i d e (Fig. 34): Rostrum wide, rounded, rostral setae arising on large tubercles laterally. These and lamellar setae phylliform, serrated marginally. Interlamellar seta originating on a conspicuous tubercle anteriorly near to the rostral ones, interlamellar setae with long spines verticillately. In interlamellar region two pairs of chitinous laths directed medially and anteriorly, some foveolae also present. Sensillus (Fig. 37) small, clavate, ciliated asymmetrically. Surface of notogaster ornamented with weak rugae, partly connected with each other forming an irregular polygonal sculpture. Setae of notogaster dilated, phylliform or spatullate (Fig. 35), serrated marginally.

V e n t r a l s i d e (Fig. 36): Apodemes well developed, epimeres — excepting 3rd and 4th — separated. Epimeral setae thin and simple, epimeral surface foveolated. Anogenital region with thick chitinous lath, also framing



Figs 34—37. *Austrocarabodes microlaminatus* sp. n. 34 = dorsal side, 35 = notogastral seta, 36 = ventral side, 37 = sensillus

the genital and anal openings. Four pairs of long and thin genital and one pair of aggenital setae, anal setae short, adanal setae slightly dilated resembling a *Salix*-leaf.

Material examined: Holotypus (778-HO-82): Afr. 175; 22 paratypes from the same sample. Holotypus and 20 paratypes (778-PO-82) deposited in the Zoological Department of the Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well characterized by the rugulose sculpture of the notogaster. It may be distinguished from the similar other species by the shape and the position of the interlamellar setae.

Austrocarabodes sinuosociliatus sp. n.

Measurements. — Length: 445—504 μm, width: 268—320 μm.

Dorsal side (Fig. 38): Lamellae normally developed, a thin translamella present. Rostral setae thin, smooth, lamellar ones strong and cylindrical with denticulate margin (Fig. 42). Interlamellar surface ornamented with swellings, except a thin, smooth area basally. Sensillus (Fig. 41) long, curving backwards, ciliated. Fourteen pairs of notogaster setae present. All phylliform (Fig. 40), slightly roughened. Surface as that of prodorsum.

Ventral side (Fig. 39): Mentum foveolated, surface of epimeres punctulated, anogenital region with various wrinkles and other ornamentation. Epimeral setal formula: 3—1—3—3, epimeral setae displaying great differences in length, *1a* and *1c* much shorter than *1b*. Four pairs of thick genital setae. Setae ad_3 originating far from anal plates, in paraanal position.

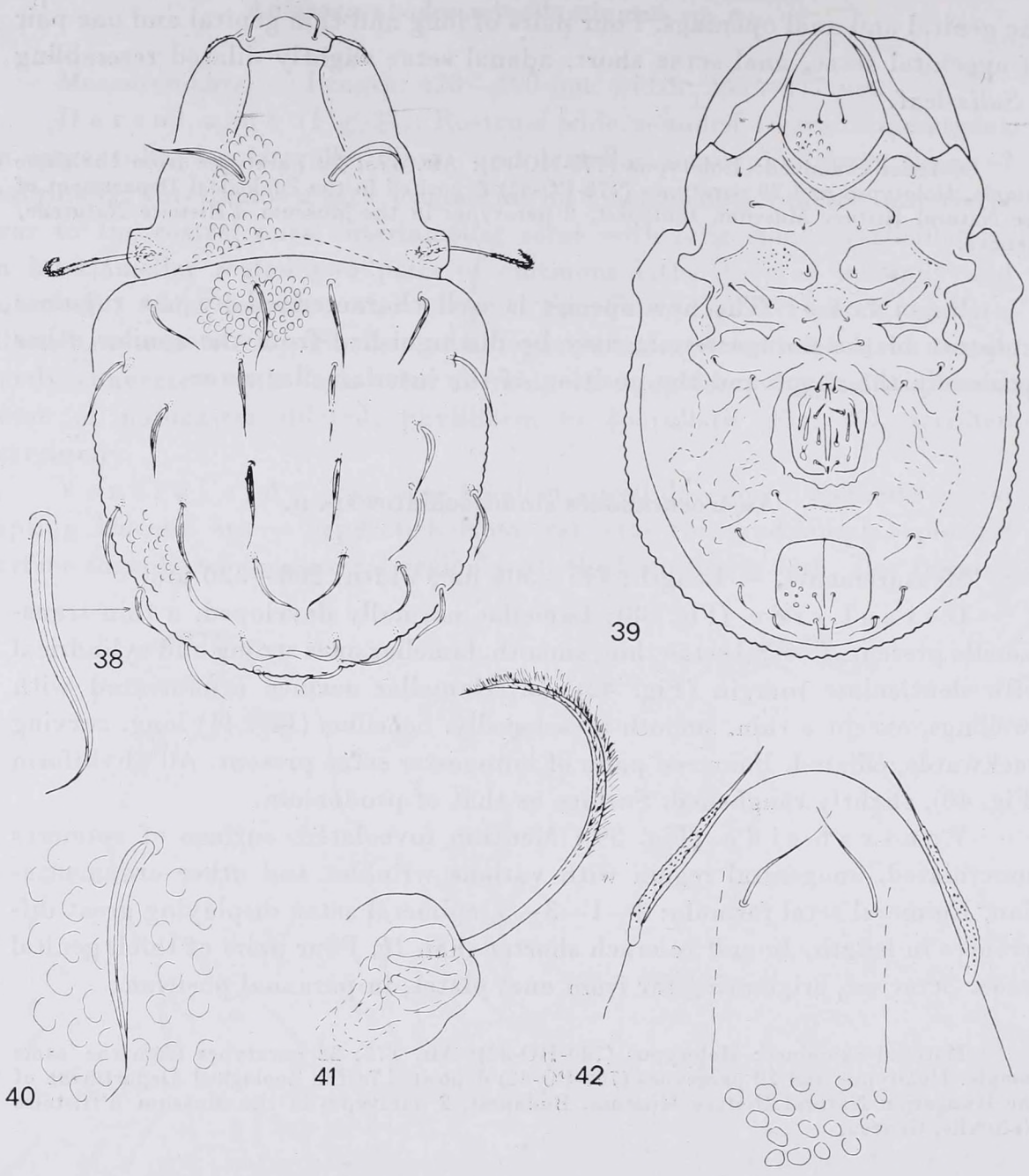
Material examined: Holotypus (780-HO-82): Afr. 178; 22 paratypes from the same sample. Holotypus and 20 paratypes (780-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species belongs to the "*Austrocarabodes*"-group. It is distinguished from the other congeners by the long and denticulate lamellar and thin, smooth rostral setae.

Carabodes pocsi sp. n.

Measurements. — Length: 432 μm, width: 202 μm.

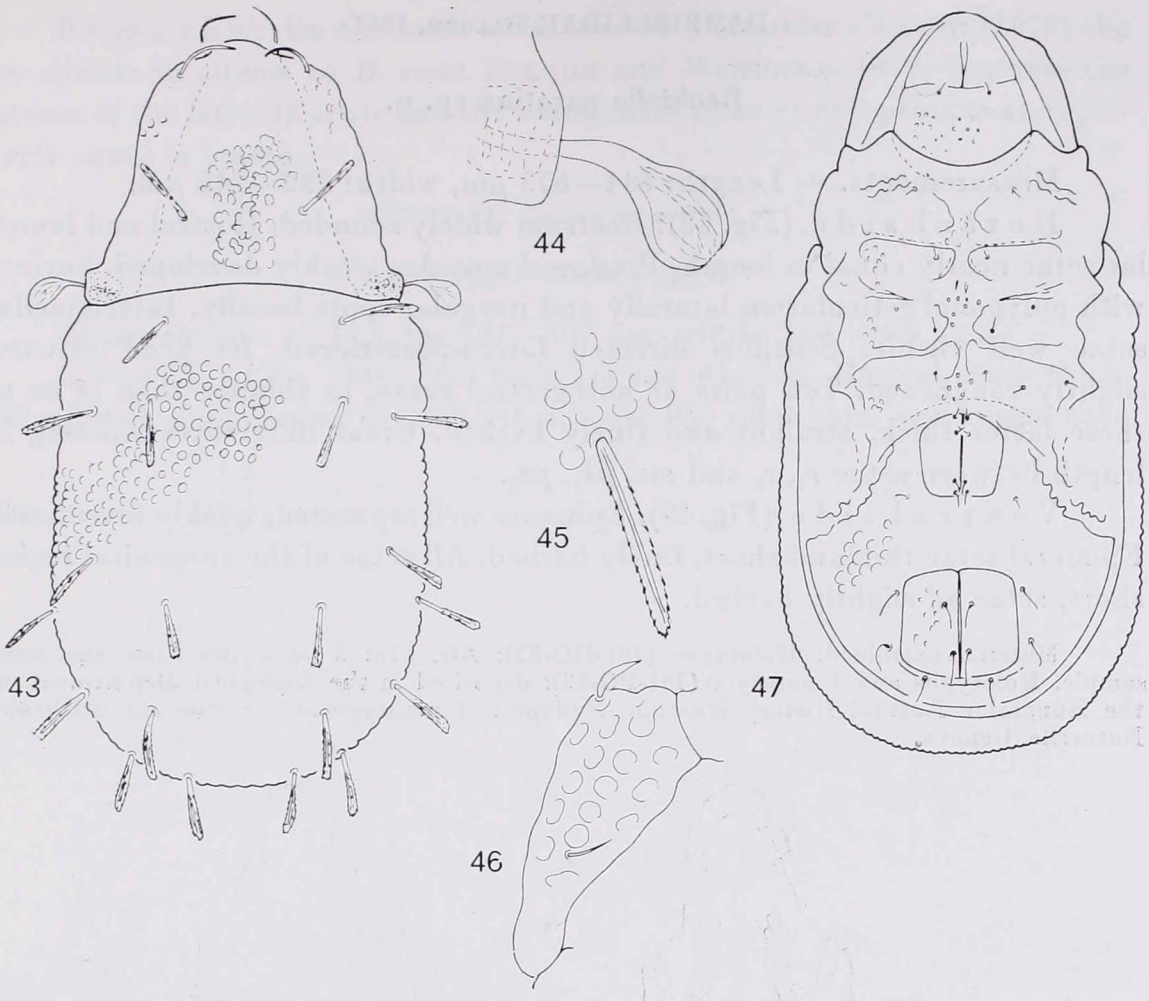
Dorsal side (Fig. 43): Lamellae narrow translamella absent, lamellar setae arising on lamellar surface. Rostral and lamellar setae weakly dilated,



Figs 38—42. *Austrocarabodes sinuosociliatus* sp. n. 38 = dorsal side, 39 = ventral side, 40 = sculpture of notogaster and notogastral seta, 41 = sensillus, 42 = rostrum from anteriorly

sharply pointed. Interlamellar setae phylliform or spatulate, densely serrated or slightly barbed. Interlamellar region with irregular tubercles, lamellae foveolated. Sensillus (Fig. 44) short, clavate, nearly calyciform. Surface of notogaster with round tubercles. Ten pairs of notogastral setae (Fig. 45), all equal in length, resembling interlamellar setae.

V e n t r a l s i d e (Fig. 47): All four pairs of apodemes well developed, ap. 4 curved before genital opening. Epimeral surface irregularly foveolated.



Figs 43—47. *Carabodes pocsi* sp. n. 43 = dorsal side, 44 = sensillus, 45 = notogastral seta, 46 = femur of leg II, 47 = ventral side

Epimeral setae minute. Four pairs of genital setae present, these and aggenital ones also very short. Anal and adanal setae thin much longer than preceding ones. Ad_2 and ad_3 in paraanal position.

L e g s : The joint of legs ornamented with large foveolae (Fig. 46).

Material examined: Holotypus (779-HO-82): Afr. 175; deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest.

R e m a r k s : The new species belongs to the species-group, characterizable by the short, phylliform, notogastral setae of equal length, the short, clavate sensillus, tuberculate notogaster and by the thin ano-adanal setae. It stands closest to *Carabodes willmanni* BERNINI, 1975, however the notogastral setae of the latter are much thinner and its notogastral tubercles slightly larger.

DAMFIELLIDAE Balogh, 1961

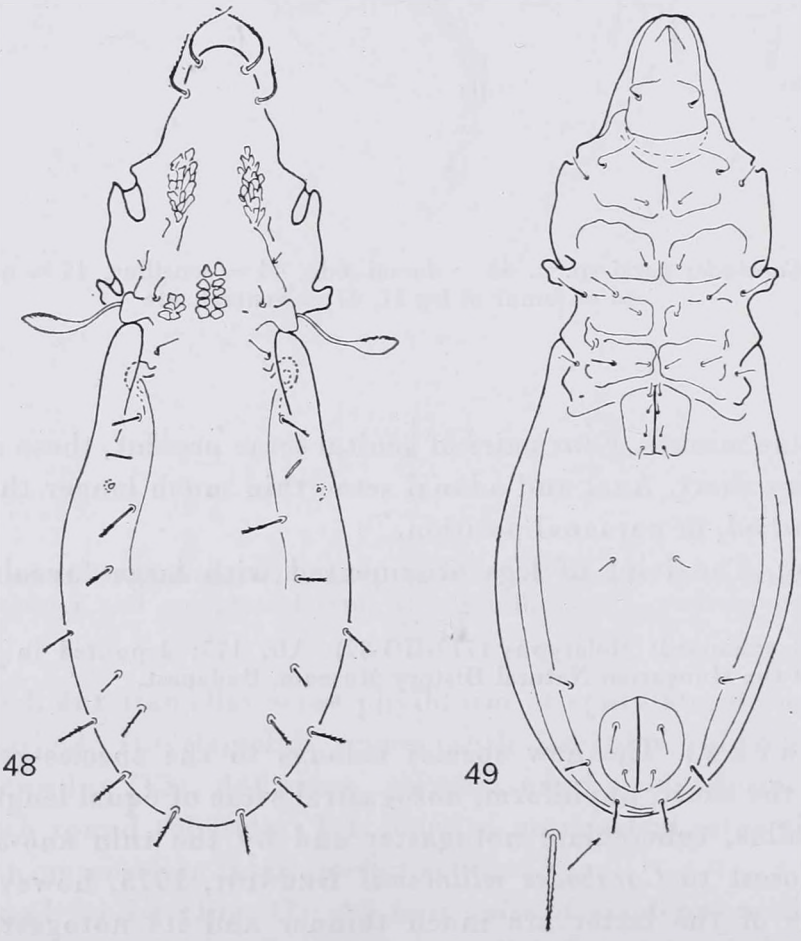
Beckiella paratina sp. n.

Measurements. — Length: 644—673 μm, width: 232—245 μm.

Dorsal side (Fig. 48): Rostrum widely rounded. Rostral and lamellar setae nearly equal in length. Prodorsal costulae weakly developed. Surface with polygonal reticulation laterally and irregular spots basally. Interlamellar setae well visible. Sensillus directed latero-posteriorad, its head clavate, slightly roughened. Ten pairs of notogastral setae, *ta* thinner than *te* or *ti*, these latter thick, straight and finely barbed. Great differences existing in length between setae r_1, r_2 and *ms*, ps_1, ps_2.

Ventral side (Fig. 49): Epimeres well separated, weakly foveolated. Epimeral setae thin and short, finely barbed. All setae of the anogenital region short, setae *ad* slightly barbed.

Material examined: Holotypus (781-HO-82): Afr. 178; 2 paratypes from the same sample. Holotypus and 1 paratype (781-PO-82): deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.



Figs 48—49. *Beckiella paratina* sp. n. 48 = dorsal side, 49 = ventral side

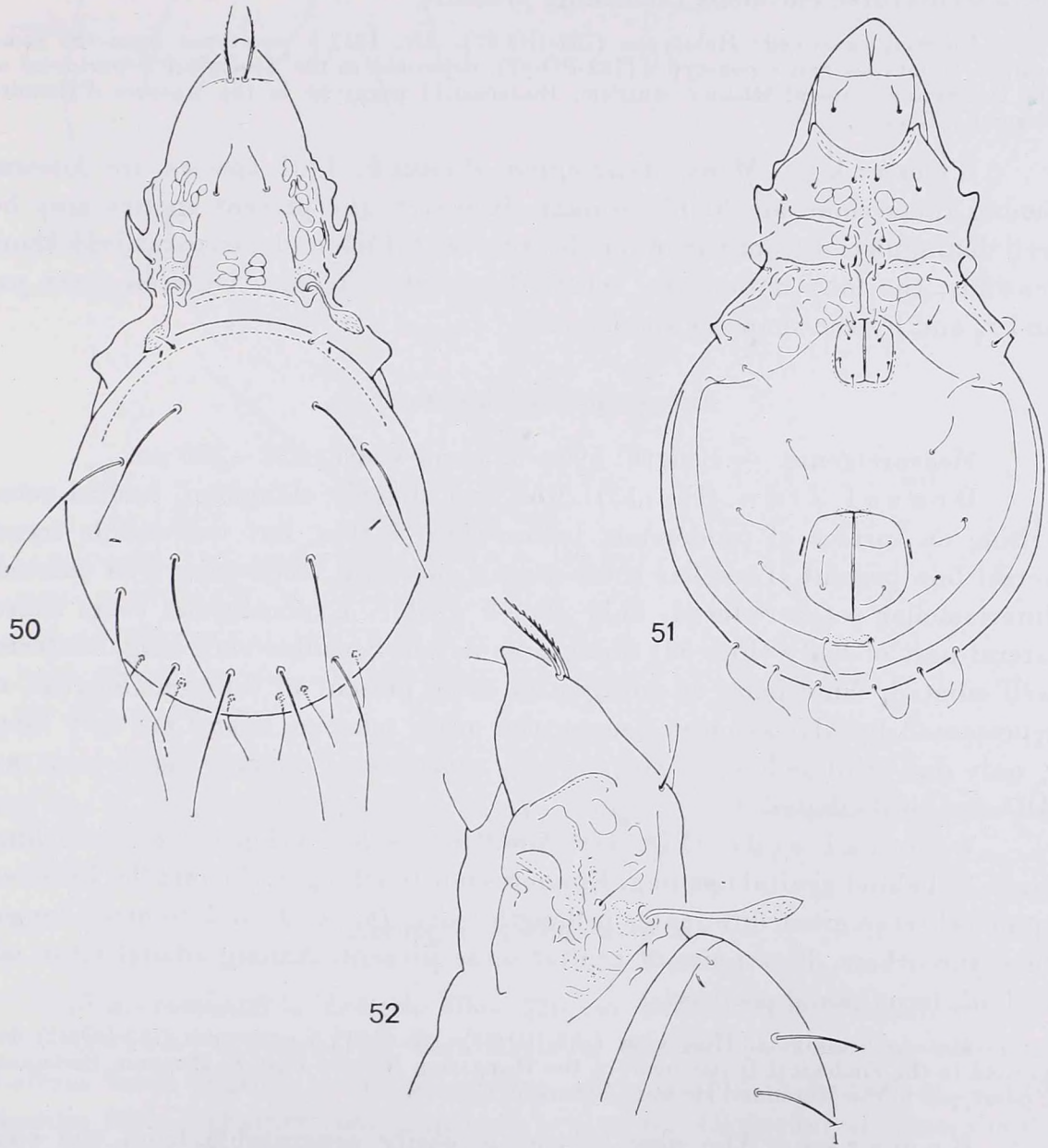
R e m a r k s : On the basis of BALOGH and MAHUNKA's work (1979) the new species in closest to *B. recta* BALOGH and MAHUNKA, 1979, however the rostrum of the latter is acute and the notogastral setae — excepting *ta* and r_3 — nearly equal in length.

OPPIIDAE GRANDJEAN, 1954

Amerioppia extrusa sp. n.

Measurements. -- Length: 291—307 μm, width: 160—168 μm.

D o r s a l s i d e (Fig. 50): Rostrum not divided. Rostral setae thick, well ciliated, arising near to each other. Lamellar setae thin, not longer than



Figs 50—52. *Amerioppia extrusa* sp. n. 50 = dorsal side, 51 = ventral side, 52 = prodorsum from lateral side

exobothridial ones. Costulae absent, but a thin line reaching to the visible lamellar setae. On prodorsum laterally and in interbothridial position some large spots present, lateral part of prodorsum (Fig. 52) granulated, too. Stalk of sensillus comparatively short, its head very large, slightly barbed. Ten pairs of notogastral setae present, *ta* very short, *te*, *ti*, *ms*, r_1 and r_2 long, finely ciliated, ps_1—ps_3 much shorter than latter ones, nearly half as long as these.

Ventral side (Fig. 51): Apodemes simple, weakly developed, ap. 4 especially thin. Epimeral surface ornamented with large spots. Epimeral and five pairs of genital setae short and simple. Aggenital, anal and adanal setae comparatively long, ad_1 in postanal, ad_3 in paraanal position. Between setae ad_1 a well-visible chitinous thickening present.

Material examined: Holotypus (782-HO-82): Afr. 181; 5 paratypes from the same sample. Holotypus and 4 paratypes (782-PO-82): deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: Many *Amerioppia* HAMMER, 1961 species are known, among them some are highly similar. However, the present species may be well distinguished from the others by the very thick and comparatively short sensillus, the long notogastral setae, the great difference between setae ps_1 and r_1 and by the shape of apodemes.

Antennoppia trichoseta sp. n.

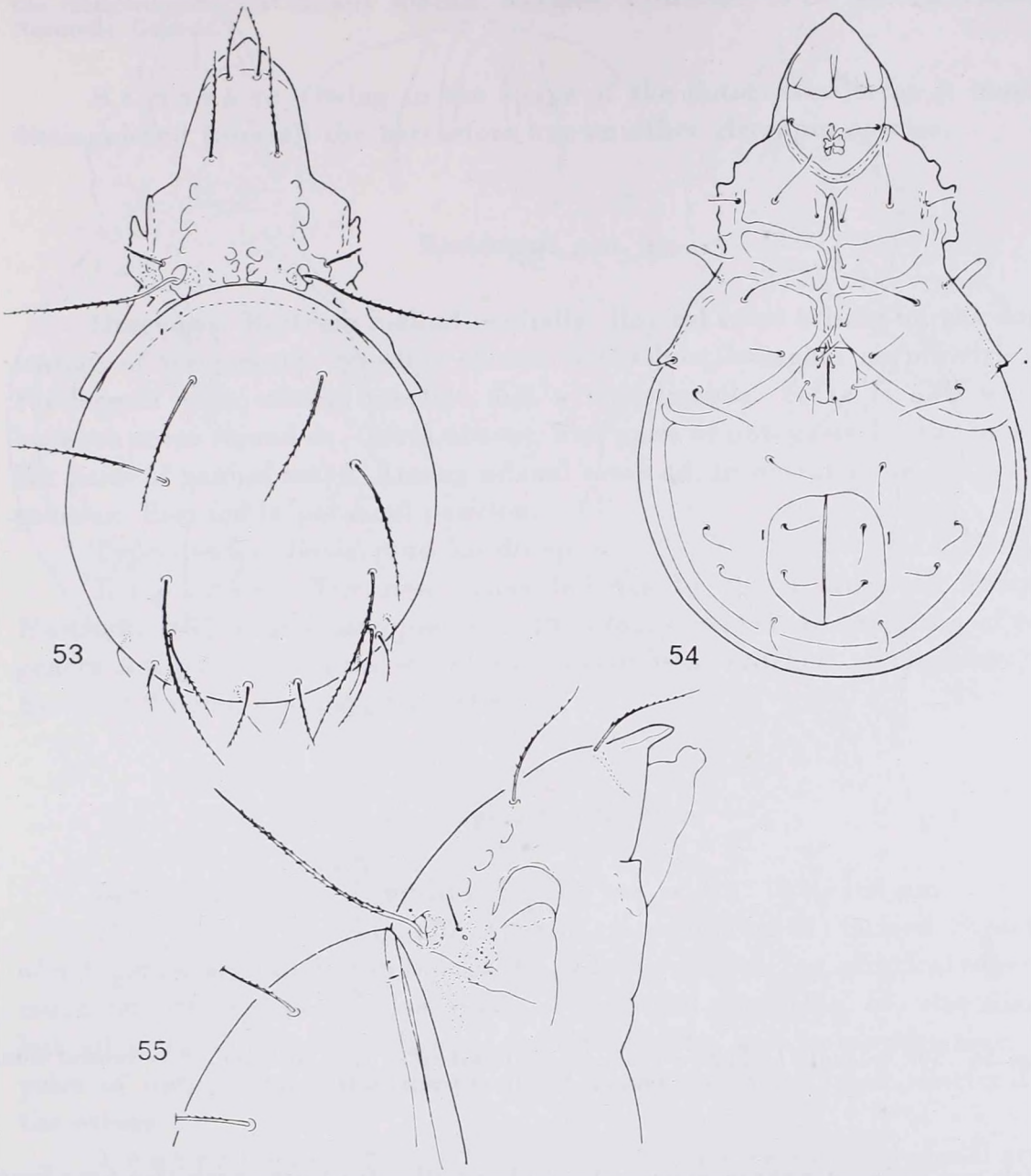
Measurements. — Length: 590—623 μm, width: 232—250 μm.

Dorsal side (Fig. 53): Rostrum slightly elongated, rostral setae arising on surface of prodorsum, before them a thin, but well-visible transversal line present. Lamellar setae strong and long, both pairs well ciliated. Interlamellar setae reduced, only alveoli visible. Exobothridial setae short, lateral part of body (Fig. 55) finely granulated. Sensillus very long, setiform, well ciliated. Nine pairs of notogastral setae present of different lengths, *ta* represented by alveoli only. Among the other setae *te*, *ti* and *ms* very long, r_1 only one-third as long as *ms*, ps_1—ps_3 short, not a quarter length than *ms*. All setae well ciliated.

Ventral side (Fig. 54): Apodemes well developed, ap. 4 reaching far back behind genital opening. Epimeres not touching in the middle. Between epimeral setae great differentes in length exist, *1b*, *3b*, *3c* and *4b* much longer than the others. Five pairs of genital setae present. Among adanal setae ad_2 and ad_3 in paraanal position.

Material examined: Holotypus (783-HO-82): Afr. 181; 8 paratypes (783-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is easily separatable from the congeners by its reduced interlamellar setae.

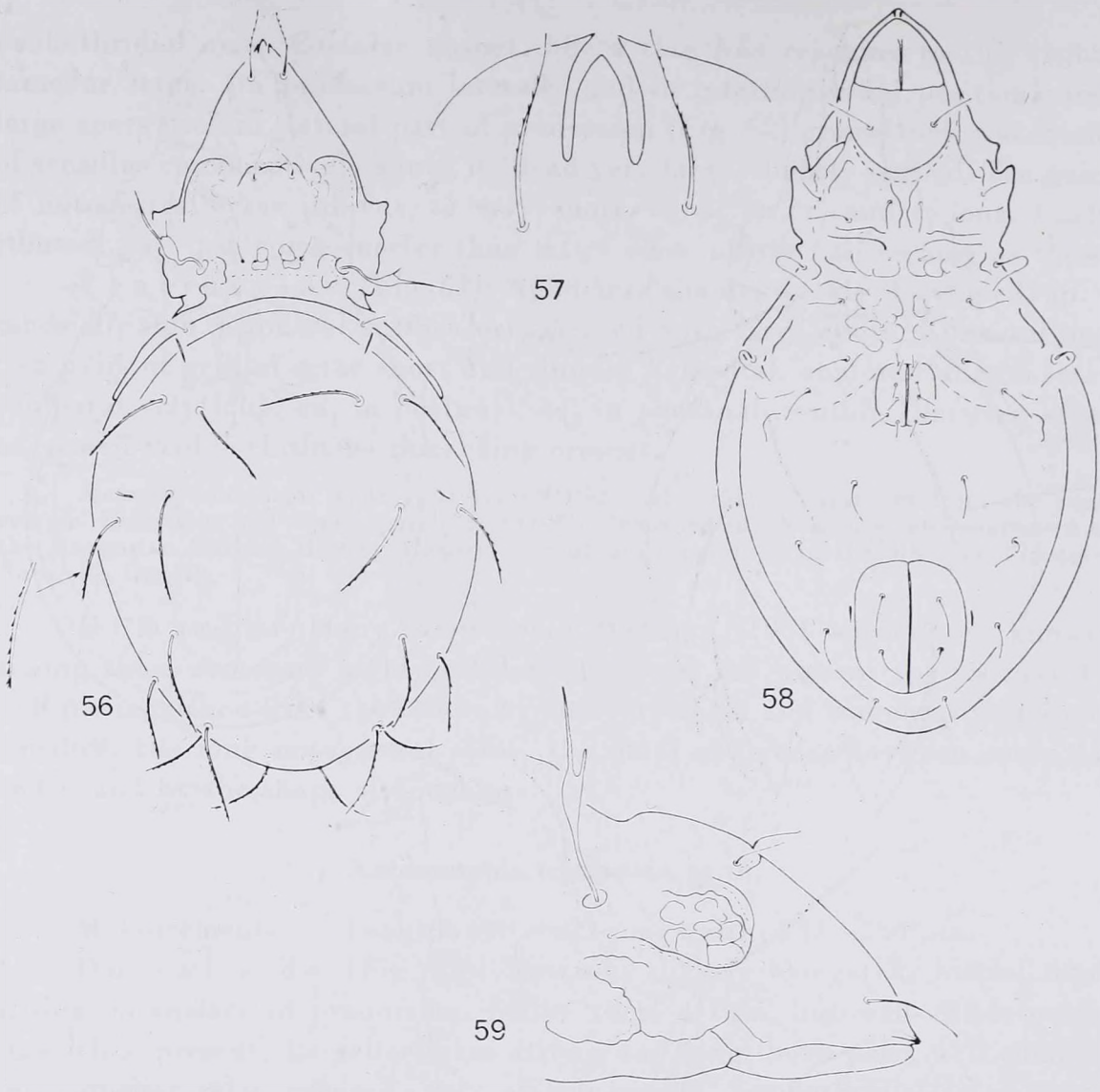


Figs 53—55. *Antennoppia trichoseta* sp. n. 53 = dorsal side, 54 = ventral side, 55 = prodorsum from lateral side

Arcoppia bacilligera sp. n.

Measurements. — Length: 400—426 μm, width: 205—221 μm.

Dorsal side (Fig. 56): Rostrum divided by two long incisions. Lateral teeth sharphy pointed, curving inwards (Fig. 57). Surface of prodorsum with a characteristic chitinous sculpture. All prodorsal setae simple, rostral setae longer than lamellar and interlamellar ones. Interbothridial region



Figs 56—59. *Arcoppia bacilligera* sp. n. 56 = dorsal side, 57 = rostrum, 58 = ventral side, 59 = prodorsum from lateral side

with two pairs of lighter spots. Head of sensillus fusiform, with two (one long and one much shorter) branches (Fig. 59). Exobothridial region granulate. Ten pairs of notogastral setae present. Setae *ta* short and thin, other 9 pairs much longer and thicker, nearly stout, strongly ciliated.

Ventral side (Fig. 58): Apodemes normally developed, epimeres with a weak polygonal ornamentation. Epimeral setae simple, *1b* longer than *1c*. Six pairs of short genital, 1 pair of long aggenital setae present. Among adanal setae ad_1 in postanal, ad_3 in preanal position, latter pair laterally, far removed from each other.

Material examined: Holotypus (784-HO-82): Afr. 178; 7 paratypes from the same sample. Holotypus and 5 paratypes (784-PO-82) deposited in the Zoological Department of

the Hungarian Natural History Museum, Budapest, 2 paratypes in the Museum d'Histoire Naturelle, Geneva.

Remarks: Owing to the shape of the notogastral setae it may be distinguished from all the heretofore known other *Arcoppia* species.

Basidoppia gen. n.

Diagnosis: Rostrum incised medially. Rostral setae arising on the dorsal surface of prodorsum. Sensillus clavate with short branches asymmetrically. Prodorsum with strong lamellae and a translamella. Setae *le* half way in between setae *ro* and *in*. Crista absent. Ten pairs of notogastral setae present. Six pairs of genital setae. Among adanal setae ad_1 in postanal, ad_3 in preanal position. Pori *iad* in paraanal position.

Type-species: *Basidoppia basidii* sp. n.

Remarks: The new genus belongs to the alliance of *Arcoppia* HAMMER, 1977 and *Austroppia* BALOGH, 1982, however, the rostrum of both genera is tripartite, and the sensillus of *Arcoppia* is branched, while *Austroppia* has only 9 pairs of notogastral setae.

Basidoppia basidii sp. n.

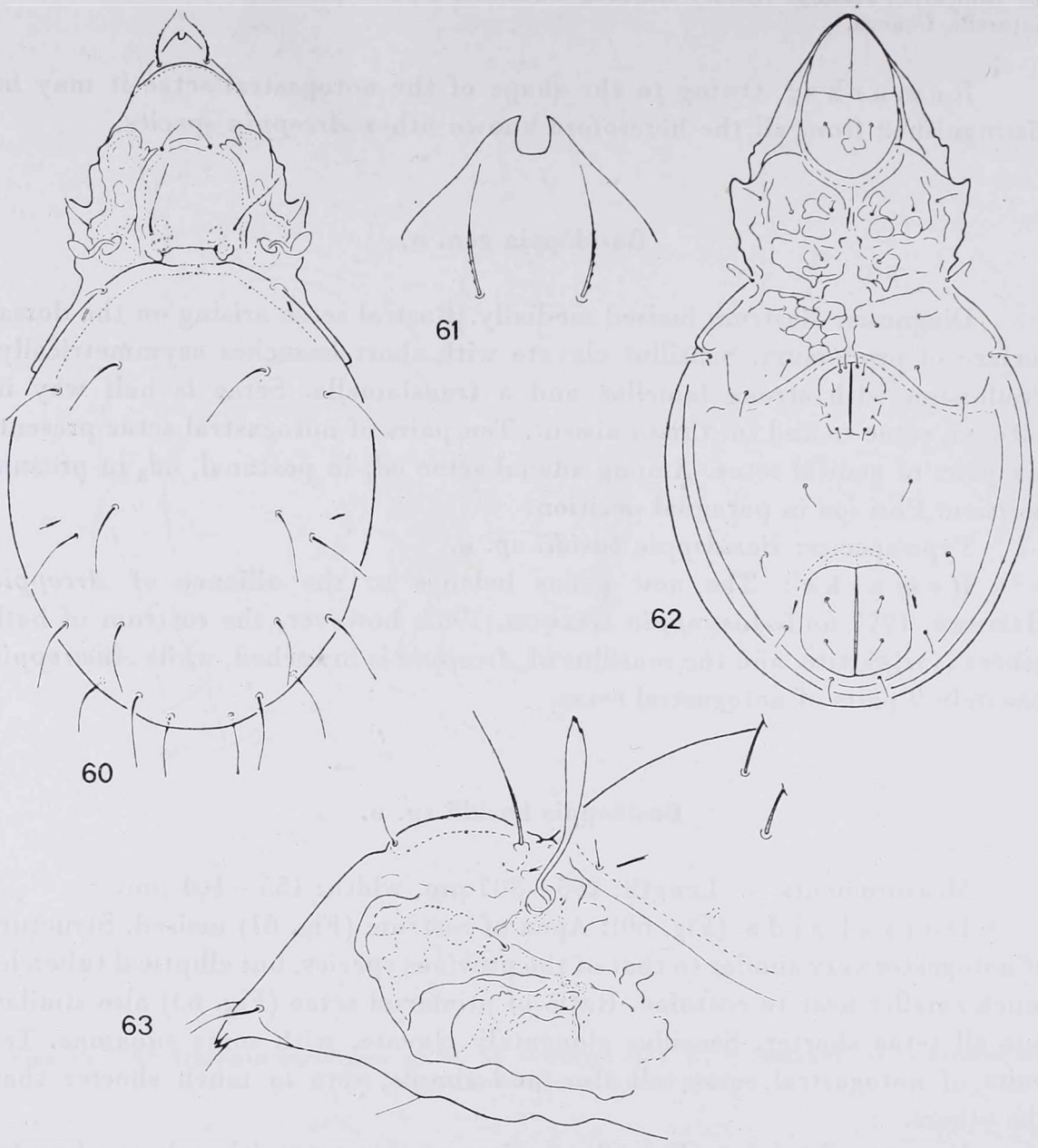
Measurements. — Length: 295—307 μm, width: 155—164 μm.

Dorsal side (Fig. 60): Apex of rostrum (Fig. 61) incised. Structure of notogaster very similar to that of the previous species, but elliptical tubercles much smaller near to costulae. Ratio of prodorsal setae (Fig. 63) also similar, but all setae shorter. Sensillus elongately clavate, with some squamae. Ten pairs of notogastral setae, all thin and simple, seta *ta* much shorter than the others.

Ventral side (Fig. 62): Surface of epimeres with polygonal sculpture. Apodemes well developed and divided by tubercles or rugae. Epimeral setae thin and simple. Six pairs of short genital, one pair of aggenital setae present. Setae ad_1 in postanal, ad_3 in preanal position.

Material examined: Holotypus (785-HO-82): Afr. 181; 4 paratypes from the same sample. Holotypus and 3 paratypes (785-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: It comes very near to the following species: *Basidoppia psyla* sp. n., but the sensillus of the latter is longer and its prodorsal and notogastral setae are much shorter.

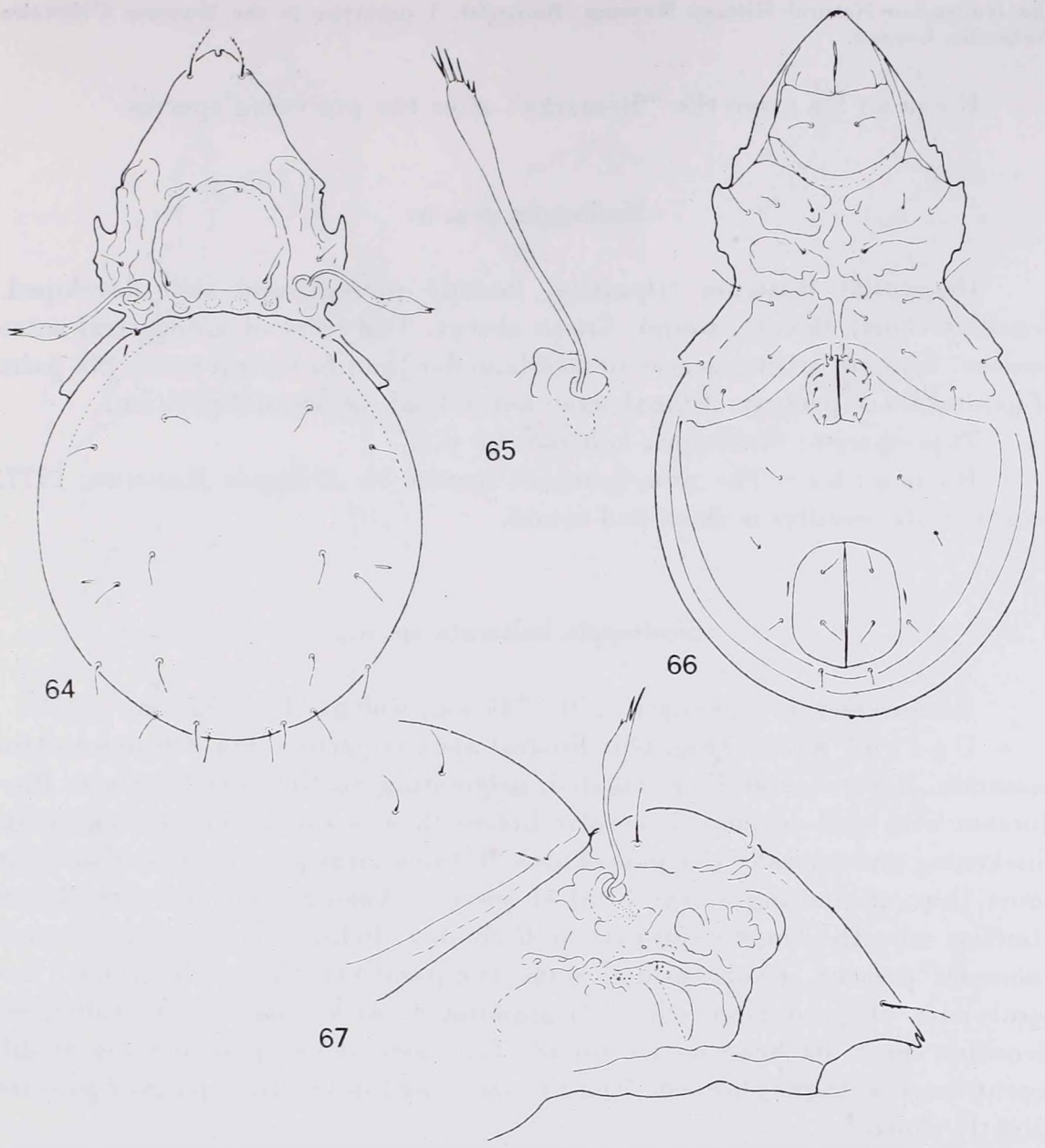


Figs 60—63. *Basidoppia basidii* sp. n. 60 = dorsal side, 61 = rostrum, 62 = ventral side, 63 = prodorsum from lateral side

Basidoppia psyla sp. n.

Measurements. — Length: 261—265 μm, width: 142—147 μm.

Dorsal side (Fig. 64): Rostrum incised medially. Rostral setae slightly longer and thicker than other prodorsal setae, well ciliated, originating rather close to lateral margin. Lamellar setae are the shortest prodorsal setae, arising at the bend of costulae. Interbothridial region well framed, with one pair of tubercles. Sensillus (Fig. 65) long its head fusiform



Figs 64—67. *Basidoppia psyla* sp. n. 64 = dorsal side, 65 = sensillus, 66 = ventral side, 67 = prodorsum from lateral side

with some short bristles. Lateral part of prodorsal surface (Fig. 67) granulated and with some rugae scattered.

V e n t r a l s i d e (Fig. 66): Apodemes excepting sternal one well developed, all thick. Sternal apodeme not continuous. Epimeral setae thin and simple, those in marginal position much longer than median ones. Setae *in* anogenital region also short and simple, six pairs of genital setae present.

Material examined: Holotypus (787-HO-82): Afr. 175; 11 paratypes from the same sample. Holotypus and 10 paratypes (787-PO-82) deposited in the Zoological Department of

the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: see the "Remarks" after the preceding species.

Similoppia gen. n.

Diagnosis: Rostrum tripartite. Costula present and well developed. Sensillus short, clavate, round. Crista absent. Ten pairs of notogastral setae present. Setae *la* arising nearer to interlamellar than to rostral setae. Six pairs of genital setae present. Adanal setae normal, ad_3 in preanal position.

Type-species: *Similoppia halterata* sp. n.

Remarks: The new genus is nearest to *Arcoppia* HAMMER, 1977, however, its sensillus is short and round.

Similoppia halterata sp. n.

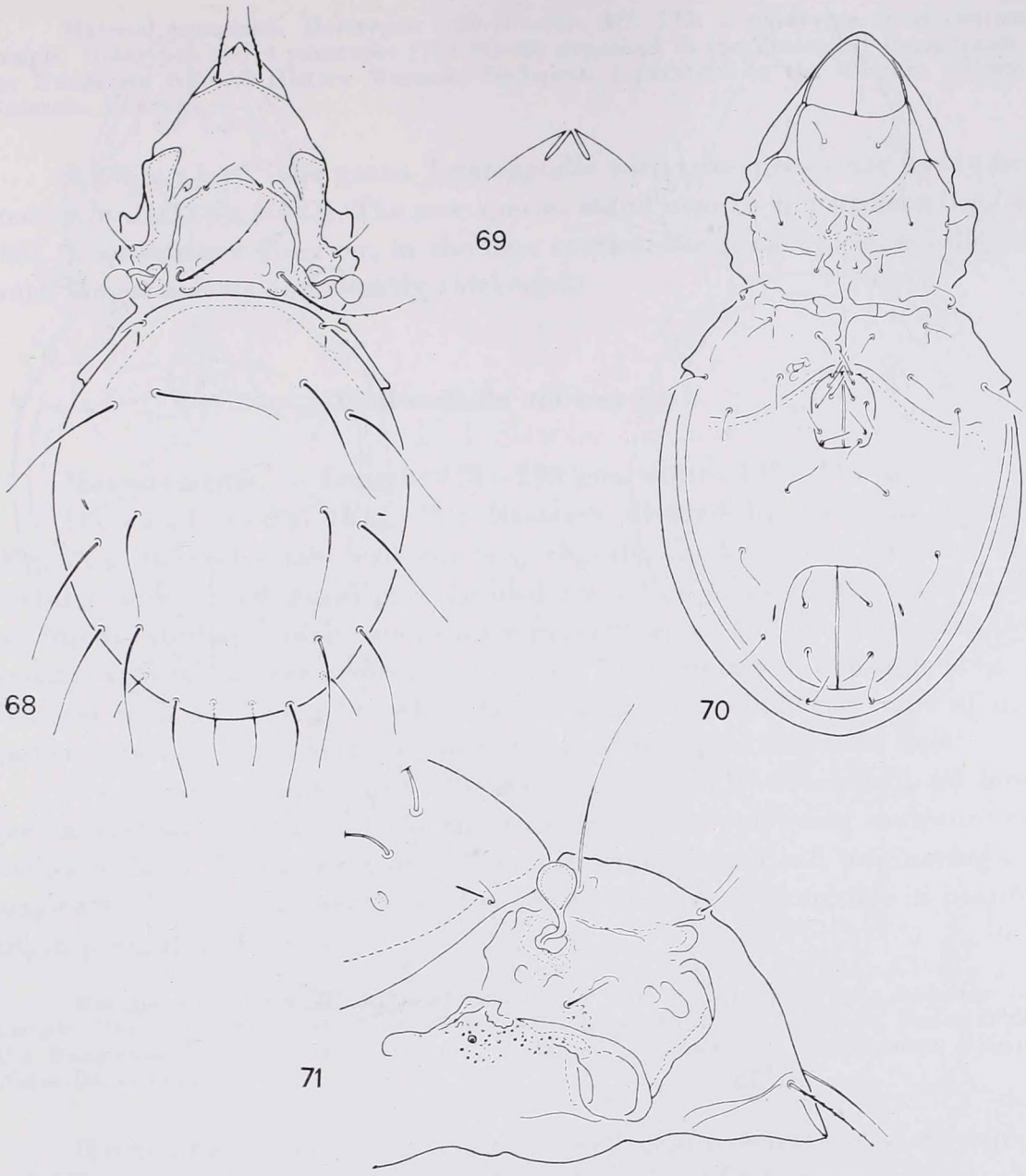
Measurements. — Length: 270—287 μm, width: 143—152 μm.

Dorsal side (Fig. 68): Rostral apex tripartite (Fig. 69) due to two incisions. Rostral setae long, ciliated, originating on the dorsal surface. Prodorsum with well-developed costulae before them a small, elliptical chitinous thickening and laterally one pair of arched, thick laths present. Lamellar setae short thin, originating at the bend of costula. Among prodorsal setae interlamellar ones the longest (58 μm), well ciliated. Behind them a pair of small tubercles present. Exobothridial setae comparatively long and thick. Lateral part of prodorsum (Fig. 71) granulated, with some smaller tubercles. Sensillus short, its head nearly round. Ten pairs of notogastral setae of different lengths, *ta* the shortest, 7 pair nearly equal in length, 2 pairs of *ps* setae slightly shorter.

Ventral side (Fig. 70): Surface of epimeres weakly sculptured, only a weak polygonal ornamentation visible consisting of smaller spots. Apodemes well developed, but sternal ones not contigues. Epimeral setae comparatively long, all thin and simple.

Material examined: Holotypus (786-HO-82): Afr. 181; 2 paratypes from the same sample. Holotypus and 1 paratype (786-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: On the basis of BALOGH's (1983) work, the new species cannot be relegated to any of the up to now described genera. But the shape and the chaetotaxy of prodorsum — excepting the sensillus — are highly similar to the other taxa of *Arcoppia* HAMMER, 1977.

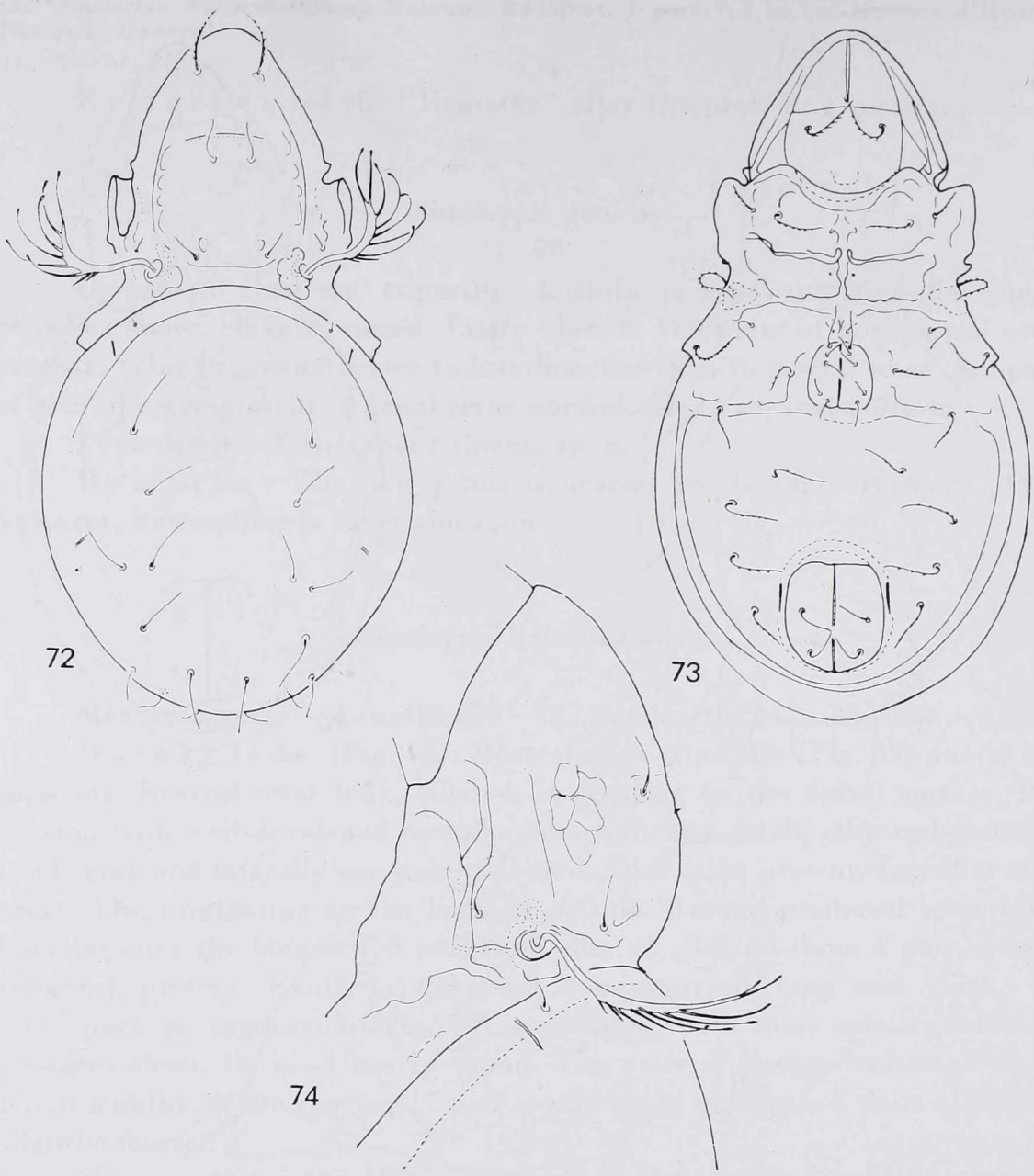


Figs 68—71. *Similoppia halterata* sp. n. 68 = dorsal side, 69 = rostrum, 70 = ventral side, 71 = prodorsum from lateral side

Teratoppiella fimbriata sp. n.

Measurements. — Length: 228—233 μm, width: 114—123 μm.

D o r s a l s i d e (Fig. 72): Rostrum widely rounded. Rostral setae long, ciliated, much stronger than the other prodorsal setae. On the surface of prodorsum some weak spots and a transversal line, before the lamellar setae, present. Sensillus (Fig. 74) large, with 6—7 long and 2—3 short branches,



Figs 72—74. *Teratoppiella fimbriata* sp. n. 72 = dorsal side, 73 = ventral side, 74 = prodorsum from lateral side

their end finely thickened. Ten pairs of comparatively long notogastral setae, in typical situation, *ta* minute, ps_1—ps_3 shorter than the other notogastral ones.

Ventral side (Fig. 73): Apodemes well developed, ap. 4 in conspicuously transverse position behind genital opening. Epimeral setae different in lengths, *1b* longer than *1c*, *1a*, *2a* and *3a* minute. Five pairs of long genital setae present, among adanal setae ad_1 and ad_2 paraanal, ad_3 in preanal position.

Material examined: Holotypus (789-HO-82): Afr. 175; 5 paratypes from the same sample. Holotypus and 4 paratypes (789-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

R e m a r k s : The genus *Teratoppiella* with two species has newly been erected by BALOGH (1983). The new species stand near to *T. pectinata* BALOGH, 1961 (East Africa), however, in the new species, the branches of sensillus are much longer and its end slightly thickened.

Wallworkella vibrissa sp. n.

Measurements. — Length: 278—295 μm, width: 139—145 μm.

D o r s a l s i d e (Fig. 75): Rostrum divided by two thin incisions (Fig. 76). Rostral setae well ciliated, slightly thicker than lamellar ones. Costulae short, their basal part divided by a line of granules, transversally not fused. Interbothridial region with some large spots and one pair of tubercles basally. Lateral surface of prodorsum (Fig. 79) granulated. Sensillus (Fig. 77) fusiform with 4—5 long branches, latter with small cilia. Ten pairs of notogastral setae, *ta* very short, *to* and *ti* originating on a transverse line.

V e n t r a l s i d e (Fig. 78): Apodemes weakly developed, no homogenous sternal apodeme developed. Surface with a polygonal sculpture consisting of large fields. Six pairs of genital setae present, all originating on a longitudinal line. Anal and adanal setae comparatively long, ad_1 in postanal, ad_3 in preanal position.

Material examined: Holotypus (788-HO-82): Afr. 175; 12 paratypes from the same sample. Holotypus and 11 paratypes (788-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

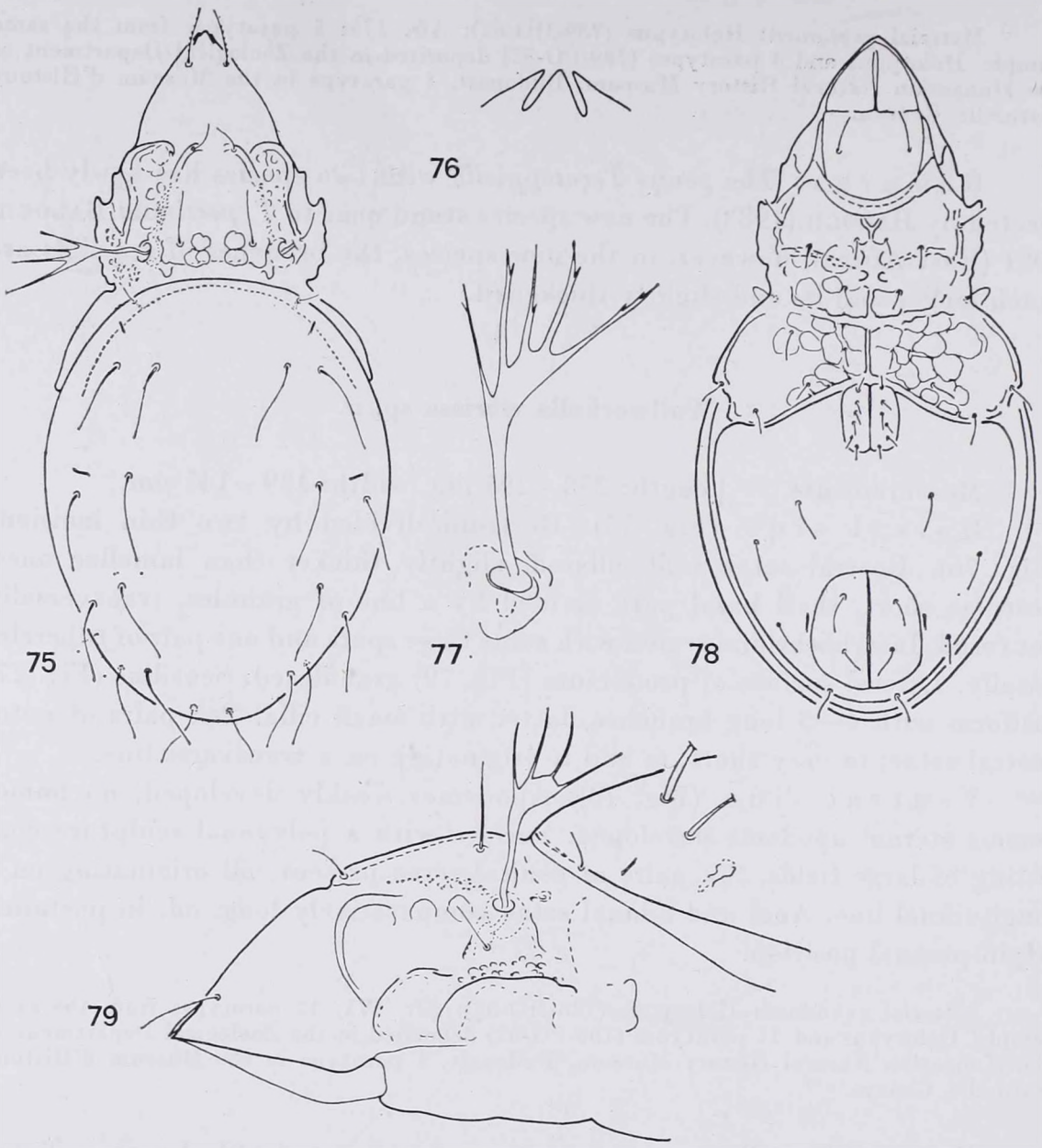
R e m a r k s : The new species is well characterizable by the ciliated branches of sensillus and the granulated lines in the place of costulae, these may readily distinguish it from all its congeners.

SUCTOBELBIDAE GRANDJEAN, 1954

Suctobelbella ruzsinszkyi sp. n.

Measurements. — Length: 208—214 μm, width: 100—104 μm.

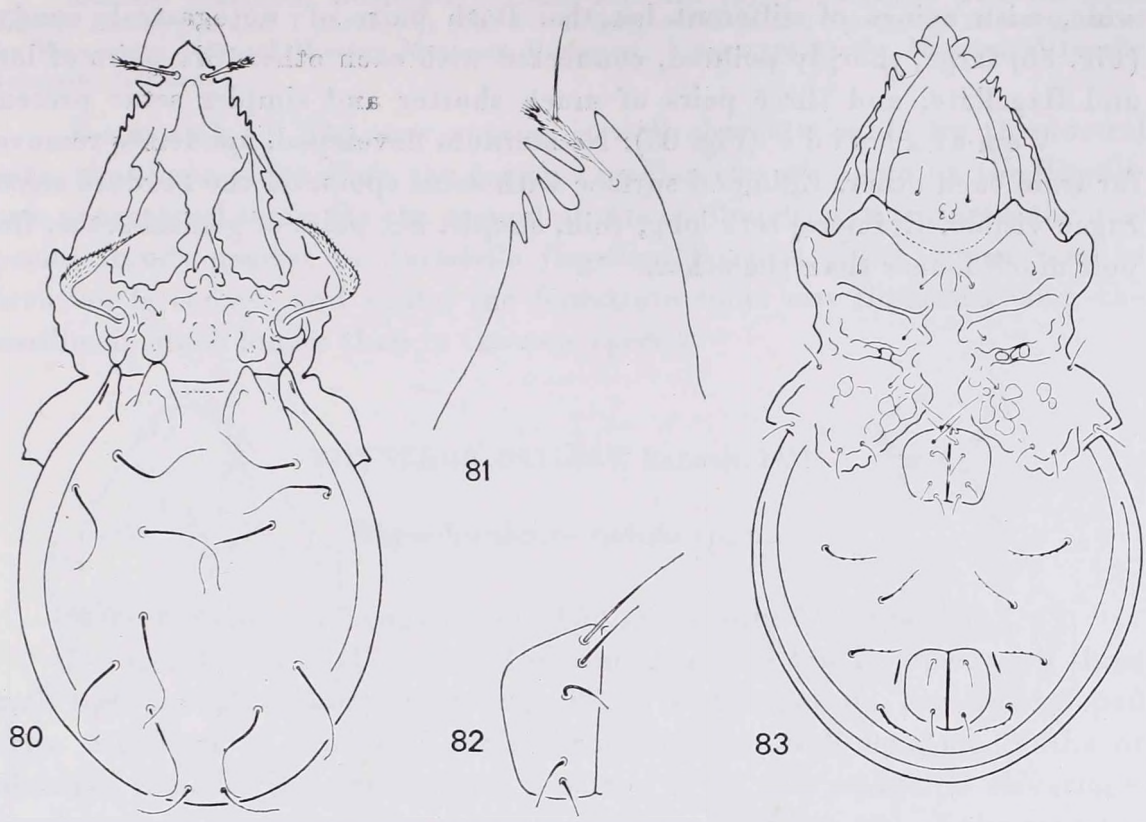
D o r s a l s i d e (Fig. 80): Rostrum nasiform, with sharp apex medially, two larger and three smaller teeth (Fig. 81) laterally, excision between larger and smaller teeth wide. Fenestrate spots elongated in rostral view, well framed,



Figs 75—79. *Wallworkella vibrissa* sp. n. 75 = dorsal side, 76 = rostrum, 77 = sensillus, 78 = ventral side, 79 = prodorsum from lateral side

their outer margin thick. Lamellar setae comparatively long, arising on the margin of the median unpaired tubercle. It is wider than long. Sensillus with a barbed fusiform head. Basal tubercles large and wide, anterior tubercles of notogaster also large, inner pair wider than outer one. Seven pairs of long and curved notogastral setae present.

Ventral side (Fig. 83): Formation of apodemes and epimeres generic in type. Epimeral setae short, surface with a polygonal sculpture. Six pairs of genital (Fig. 82) setae of different lengths, aggenital and adanal setae slightly ciliated, all other smooth.



Figs 80—83. *Suctobelbella ruzsinszkyi* sp. n. 80 = dorsal side, 81 = rostral teeth, 82 = genital plate, 83 = ventral side

Material examined: Holotypus (790-HO-82): Afr. 175; 4 paratypes from the same sample. Holotypus and 3 paratypes (790-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

I dedicate the new species to my friend Mr. J. RUZSINSZKY (Budapest).

R e m a r k s : The new species is satisfactorily characterized by its elongated "nasute" rostrum. It stands nearest to the species of the "*subtrigona*"-group, however, it may be distinguished from all by the medially sharply acute rostral apex.

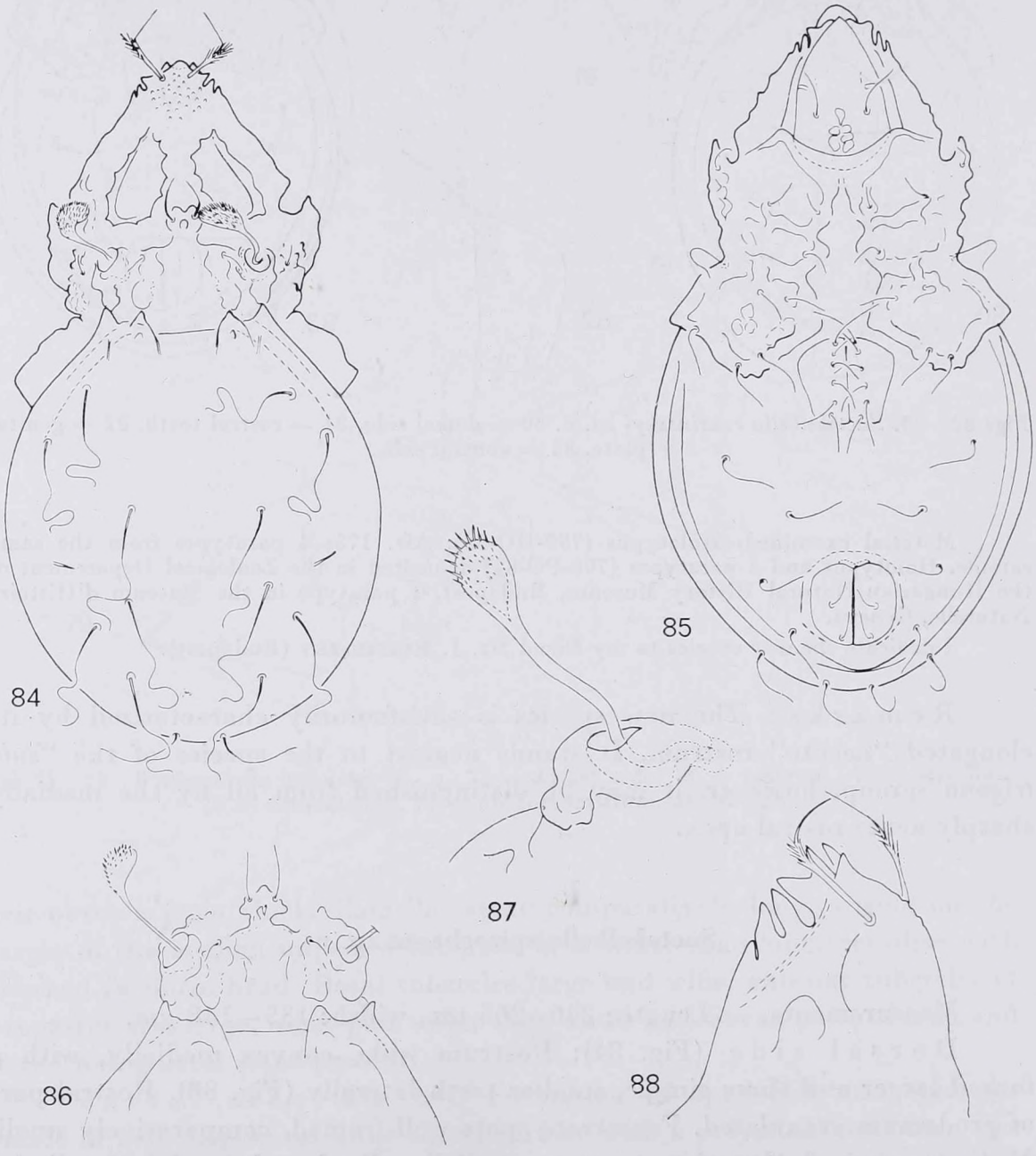
Suctobelbella spirochaeta sp. n.

Measurements. — Length: 246—265 μm, width: 135—148 μm.

D o r s a l s i d e (Fig. 84): Rostrum wide, convex medially, with a forked larger and three simple, smaller teeth laterally (Fig. 88). Rostral part of prodorsum granulated. Fenestrate spots well framed, comparatively small. Median unpaired elevation concave medially. Prodorsal condyles well developed, exobothridial region with granules. Sensillus (Fig. 87) large, its head

wide, with spines of different lengths. Both pairs of notogastral condyli (Fig. 86) large, sharply pointed, connected with each other. Six pairs of long and flagellate, and three pairs of much shorter and simpler setae present.

V e n t r a l s i d e (Fig. 85): No sternum developed, apodemes removed far from each other. Epimeral surface with some spots, on the bordure strong rugae visible. Epimeral seta long, thin, simple. Six pairs of genital setae, first pair much longer than the other.



Figs 84—88. *Suctobelbella spirochaeta* sp. n. 84 = dorsal side, 85 = ventral side, 86 = basal part of prodorsum and notogastral teeth, 87 = sensillus, 88 = rostral teeth

Material examined: Holotypus (791-HO-82): Afr. 181; 8 paratypes from the same sample. Holotypus and 7 paratypes (791-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well characterizable by the rostral teeth, the shape of sensillus, the concave median elevation and by the flagelliform notogastral setae. On the ground of this combination of features, the new species stands nearest to *Suctobella flagellata* BALOGH, 1959, whose median elevation is convex and acute, the fenestrate spots are elongated and the sensillus is much longer than in the new species.

RHYNCHORIBATIDAE BALOGH, 1961

Rhynchoribates radula sp. n.

Measurements. — Length: 848—850 μm, width: 530—592 μm.

Dorsal side (Fig. 89): Rostrum elongated but its apex with three small tips, though looking blunt (Fig. 92), laterally with 6—7 well-developed teeth. Structure of prodorsal surface consisting of well-developed laths or tubercles, lamellar setae arising on a pair of large and separated elevations. Interlamellar setae very long, much longer than lamellar one or the setiform sensillus. Ten pairs of mostly long notogastral setae of different lengths all blunt at tip (Fig. 91).

Ventral side (Fig. 90): Epimeral setae long, thin, curved, a weak epimeral neotrichy on 4th epimere (6—7 setae). Six pairs of thin genital, and two pairs of anal setae, one pair of aggenital and three pairs of adanal setae slightly dilated. Pori *iad* not parallel with anal opening.

Material examined: Holotypus (792-HO-82): Afr. 175; 3 paratypes from the same sample. Holotypus and 2 paratypes (792-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

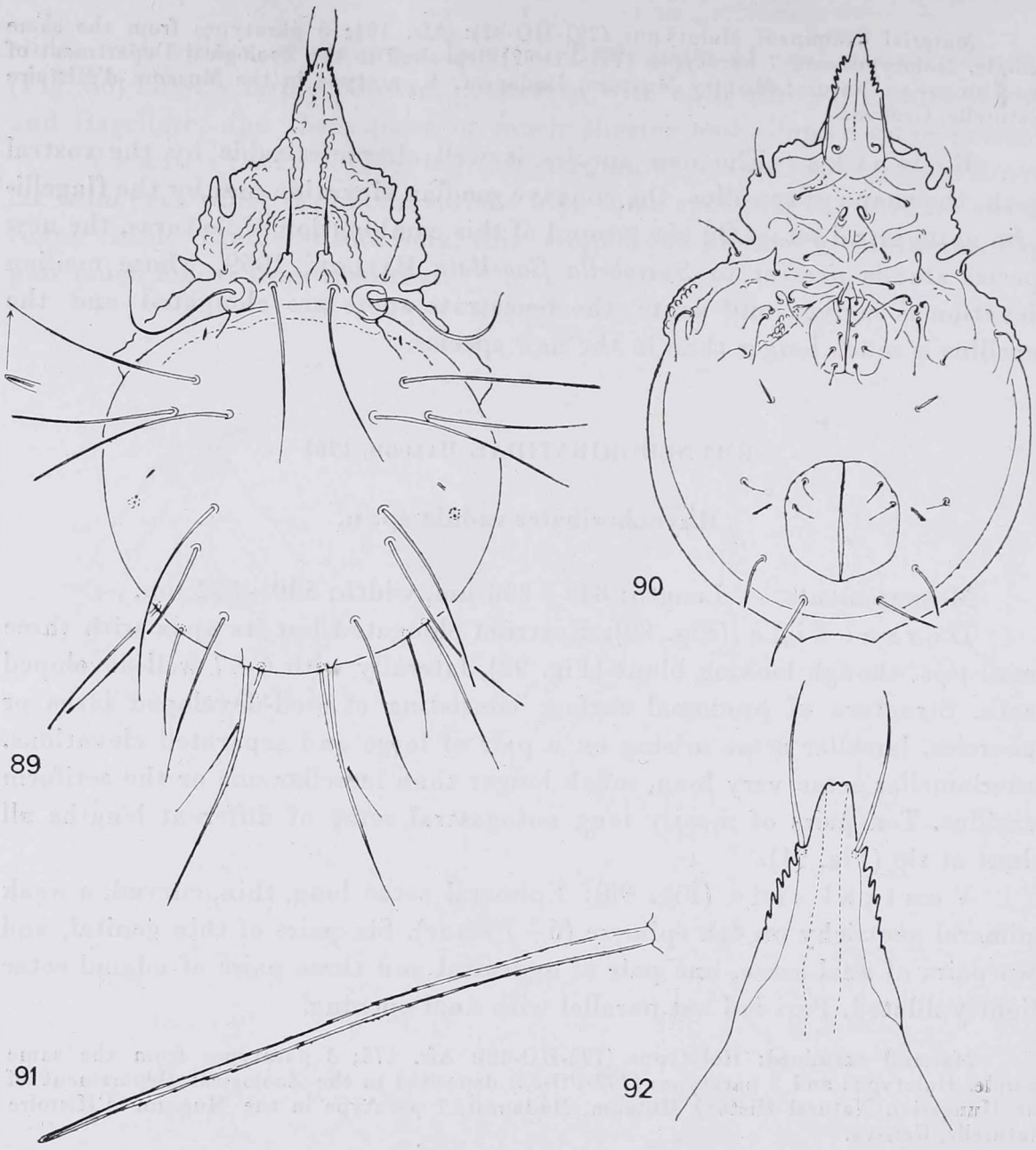
Remarks: The known African species was summarised by BALOGH (1962). The new species is close to *Rhynchoribates serratus* BALOGH, 1958, however, the latter has not a large lamellar elevation and its rostral apex is acute.

MICREREMIDAE GRANDJEAN, 1954

Micreremus faviger sp. n.

Measurements. — Length: 302 μm, width: 196 μm.

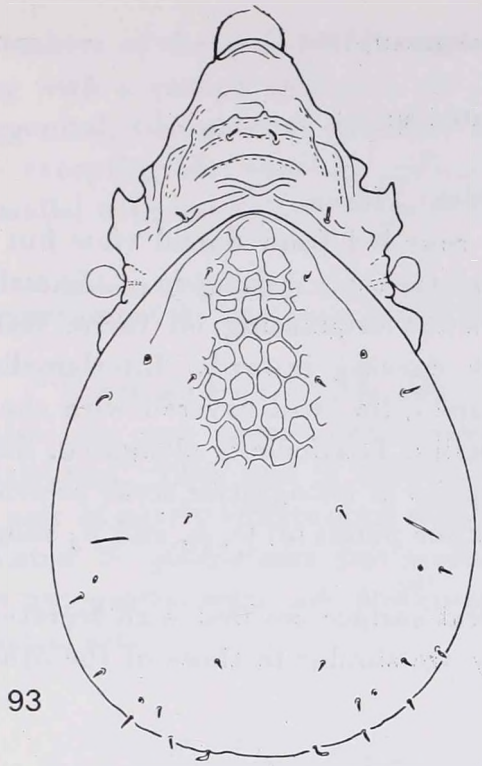
Dorsal side (Fig. 93): Rostrum rounded, rostral setae thin, comparatively long, finely ciliated, originating marginally. Lamellar and inter-

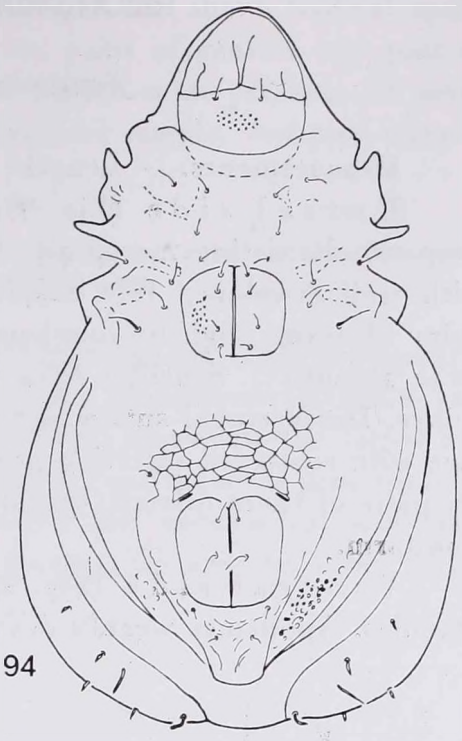


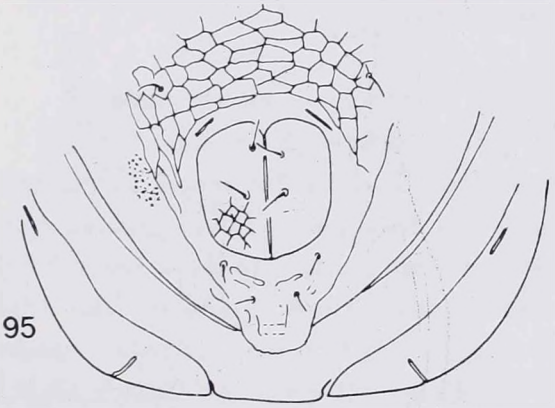
Figs 89—92. *Rhynchoribates radula* sp. n. 89 = dorsal side, 90 = ventral side, 91 = notogastral seta, 92 = rostrum

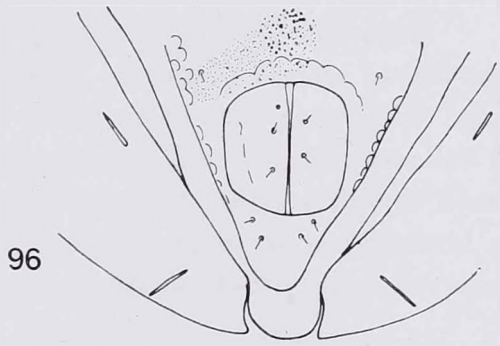
lamellar setae short, slightly thickened. Surface of prodorsum with transversal rugae. Sensillus round. Notogaster with a strong polygonal sculpture. Thirteen pairs of short, spiniform or slightly fusiform notogastral setae present.

Ventral side (Fig. 94): Ornamentation very characteristic, mentum densely foveolated, surface of epimeres also foveolated, but the form and position of foveolae irregular, genital plates with small and oblong foveolae. Anogenital region (Fig. 95) polygonated, surface of anal plates with some rugae, too. Epimeral setae comparatively long and thin. Four pairs of genital,









Figs 93—95. *Micreremus faviger* sp. n. 93 = dorsal side, 94 = ventral side, 95 = posterior part of ventral side. — Fig. 96. *Micreremus africanus* BALOGH, 1963 (typus), posterior part of ventral side

no aggenital, two pairs of anal and three pairs of adanal setae present, ad_1 and ad_2 postanal, ad_3 in preanal position. *Iad pori* also in preanal position.

L e g s : Tibia and tarsus of all legs verticillately wrinkled.

Material examined: Holotypus (793-HO-82): Afr. 181, deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest.

R e m a r k s : On the ground of the notogastral surface, the new species stands quite close to *Micreremus africanus* BALOGH, 1963, but the ano-adanal ornamentation of the latter species (Fig. 96) is foveolated and the shape of the ventral plates also distinguishes it from the new one.

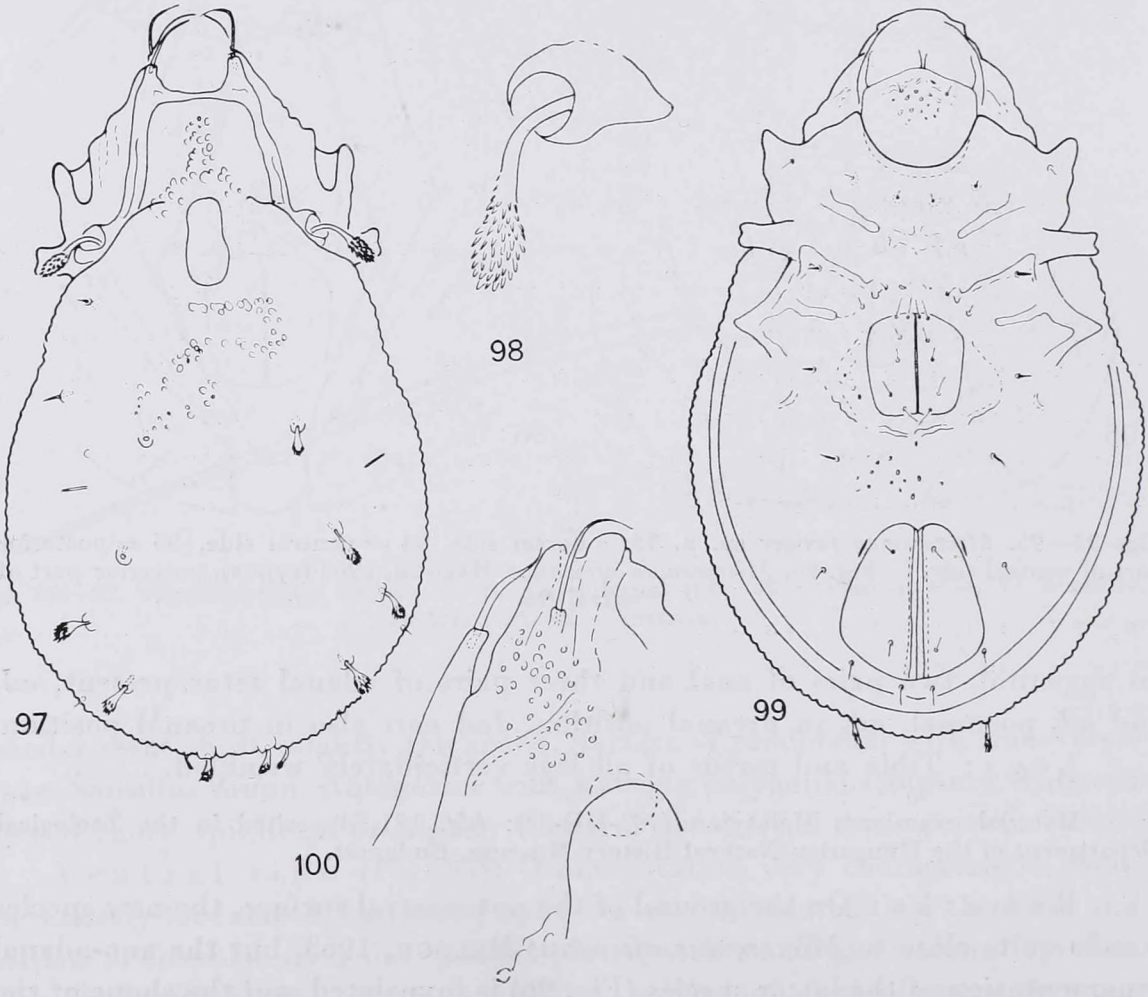
SCUTOVERTICIDAE GRANDJEAN, 1954

Scutovertex marginatus sp. n.

Measurements. — Length: 558 μm, width: 326 μm.

D o r s a l s i d e (Fig. 97): Rostrum rounded from dorsal view but a deep canal existing marginally (Fig. 100), rostral seta arising in it. Lamella with well developed free cuspis, lamellar setae originating on them. Both pairs of setae slightly roughened, strongly curving inwards. Interlamellar setae absent (?). Sensillus (Fig. 98) club-shaped, its head covered with short spines. Dorsosejugal suture not visible medially. Lenticule is elongated. Surface with scattered secretion granules. Ten pairs of notogastral setae present, six pairs of them dilated, clavate, barbed. Four pairs: *ta*, *te*, p_2 and p_3 short, spiniform.

V e n t r a l s i d e (Fig. 99): All ventral surface covered with secretion granules. Apodemes weakly developed (they are similar to those of the other



Figs 97—100. *Scutovertex marginatus* sp. n. 97 = dorsal side, 98 = sensillus, 99 = ventral side, 100 = rostral part of prodorsum from lateral view

members of the genus). All epimeral setae spiniform and short. Genital opening with a curved chitinous rib posteriorly. Six pairs of genital, one pair of aggenital, two pairs of anal and three pairs of adanal setae present. All setae — excepting the spiniform adanal ones — thin and simple. *Iad pori* aligned parallel with the rim of the anal openings.

Material examined: Holotypus (794-HO-82): Afr. 181; deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest.

Remarks: On the basis of the characteristic shape of the notogastral setae, the new species stands close to *Scutovertex glandulosus* BALOGH and MAHUNKA, 1965 and *S. fossatus* WALLWORK, 1967. However, the latter has a pair of nearly longitudinal ridges on its notogaster and all setae penicillately, dilated *S. glandulosus* has much longer sensillus and notogastral setae and its notogastral setae are posteromarginal in position as are the other notogastral setae.

ORIBATULIDAE THOR, 1929

? Dometorina sicata sp. n.

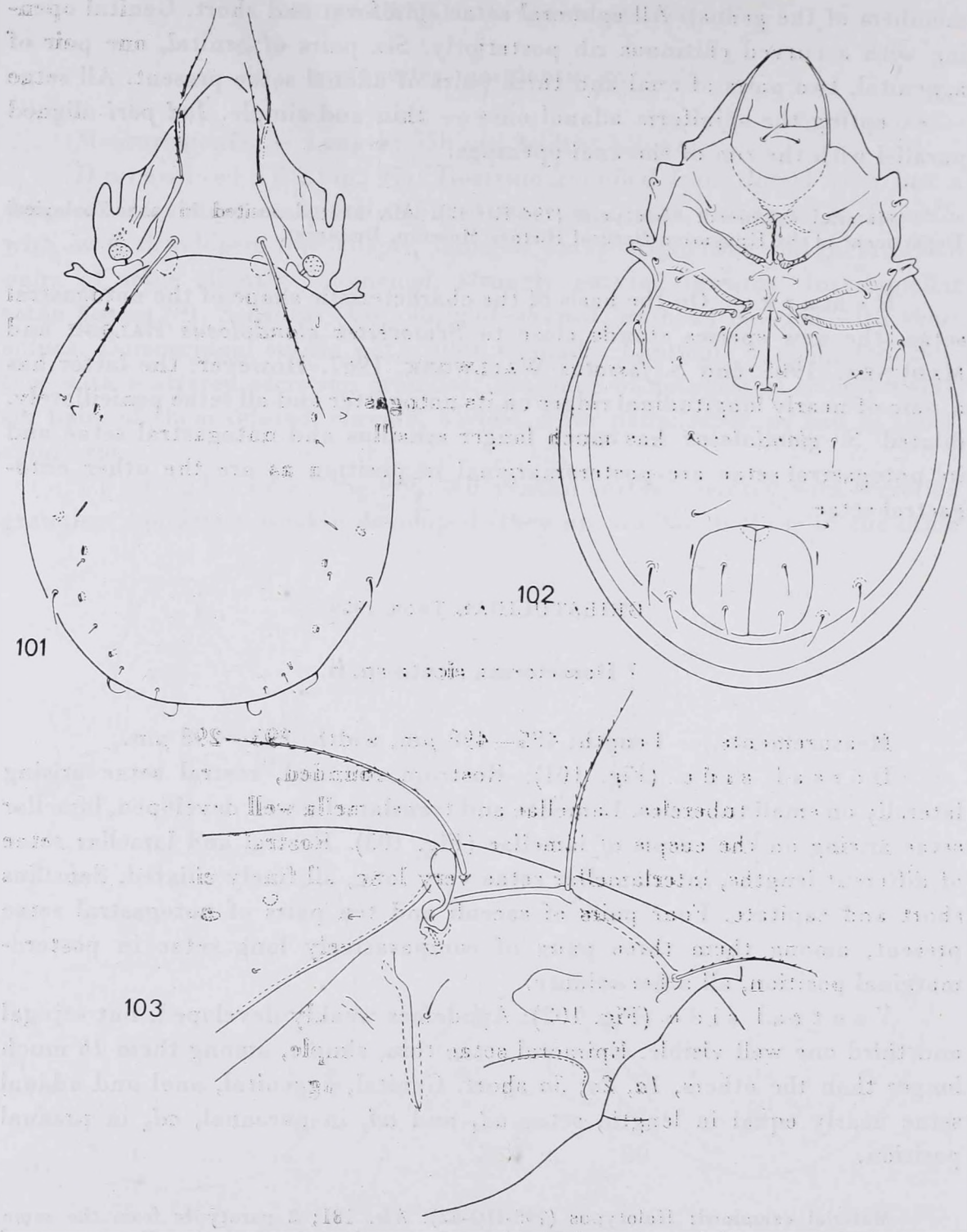
Measurements. — Length: 485—498 μm, width: 293—298 μm.

Dorsal side (Fig. 101): Rostrum rounded, rostral setae arising laterally on small tubercles. Lamellae and translamella well developed, lamellar setae arising on the cuspis of lamellae (Fig. 103). Rostral and lamellar setae of different lengths, interlamellar setae very long, all finely ciliated. Sensillus short and capitate. Four pairs of sacculi and ten pairs of notogastral setae present, among them three pairs of comparatively long setae in posteromarginal position, all other minute.

Ventral side (Fig. 102): Apodemes weakly developed, but sejugal and third one well visible. Epimeral setae thin, simple, among them *1b* much longer than the others, *1a*, *2a*, *3a* short. Genital, aggenital, anal and adanal setae nearly equal in length, setae ad_1 and ad_2 in paraanal, ad_3 in preanal position.

Material examined: Holotypus (795-HO-82): Afr. 181; 2 paratypes from the same sample. Holotypus and 1 paratype (795-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well characterized by the notogastral setae of different lengths and the very long interlamellar ones. These features readily distinguish the new species from its congeners.



Figs 101—103. ? *Dometorina sicata* sp. n. 101 = dorsal side, 102 = ventral side, 103 = prodorsum from lateral view

Hammerabates nasalis sp. n.

Measurements. — Length: 338—367 μm, width: 220—241 μm.

Dorsal side (Fig. 104): Rostrum elongated, its apex truncated. Rostral setae arising on an apophysis laterally, essentially shorter than lamellar ones. Lamellae well developed, lamellar setae originating on their cuspis. A thin line transversally, and a short weakly developed prolamella observable. Interlamellar seta nearly as long as lamellar ones, both pairs well ciliated. Stalk of sensillus short, its head large, aciculated, in dorsal view rounded, in lateral view (Fig. 106) clavate. Notogaster with four pairs of reniform sacculi, nine pairs of conspicuous alveoli and one pair (*ps*) of setae present.

Ventral side (Fig. 105): Surface of epimeres with some large, irregular spot. Epimeral setae thin and simple. Three pairs of short genital setae present. Adanal setae similar to epimeral ones, ad_3 in preanal position.

All legs tridactylous, tarsus of leg I (Fig. 107) normally developed, elongated.

Material examined: Holotypus (796-HO-82): Afr. 181; 4 paratypes from the same sample. Holotypus and 3 paratypes (796-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: Differental diagnosis is given after the next species.

Hammerabates rotundus sp. n.

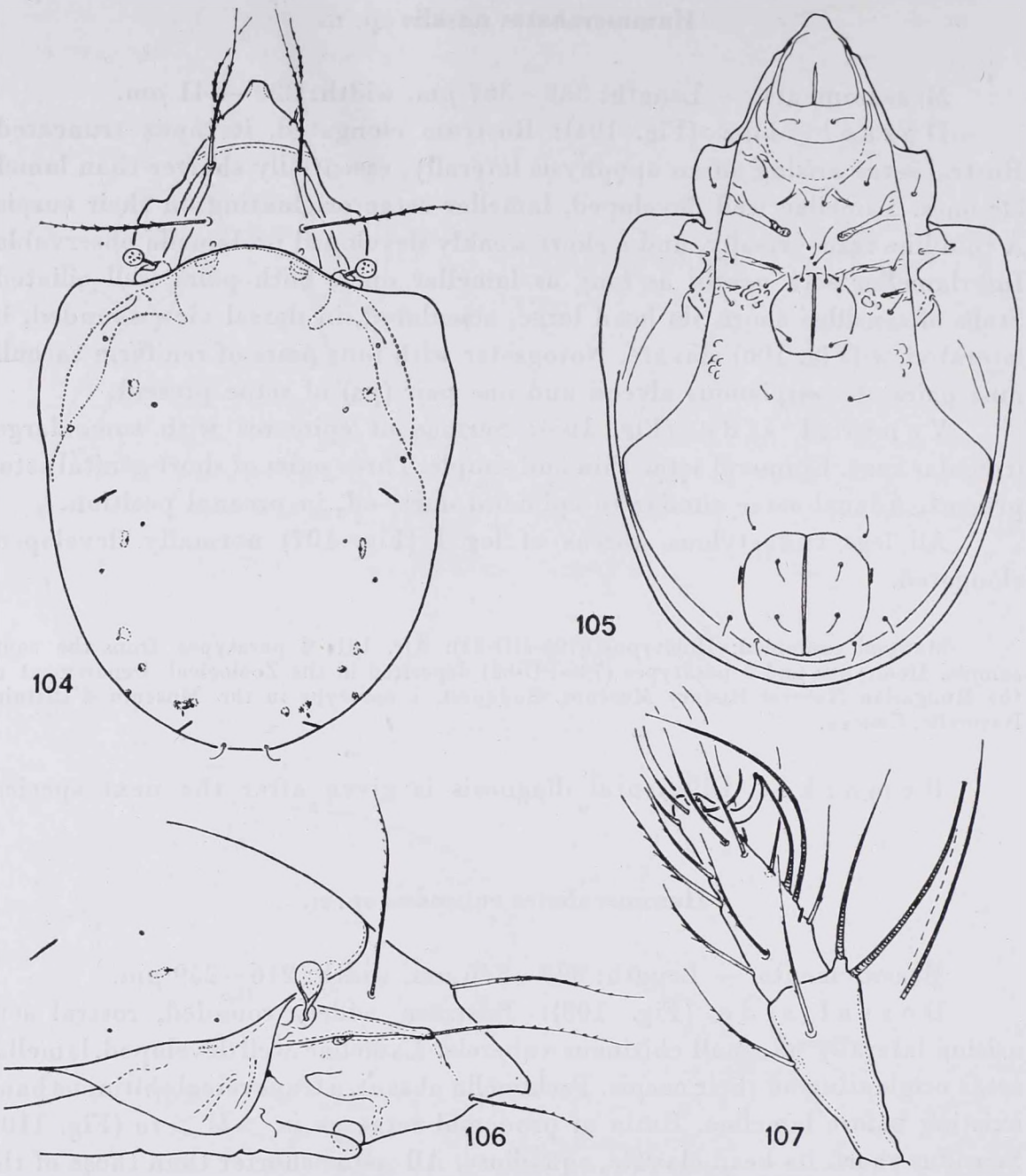
Measurements. — Length: 328—346 μm, width: 216—239 μm.

Dorsal side (Fig. 108): Rostrum widely rounded, rostral seta arising laterally on small chitinous tubercle. Lamellae well developed, lamellar setae originating on their cuspis. Prelamella absent, a transversal chitinous band existing before lamellae. Ratio of prodorsal setae as $in > le > ro$ (Fig. 110). Sensillus short, its head clavate, squamose. All setae shorter than those of the preceding species. 10 pairs of notogastral setae minute, but well visible. Four pairs of sacculi round.

Ventral side (Fig. 109): Apodemes weakly developed, epimeres opened, surface ornamented with irregular spots. Epimeral setae short, simple. Three pairs of short genital setae and one pair of aggenital setae present. Setae of ano-adanal region also simple, ad_3 in preanal position.

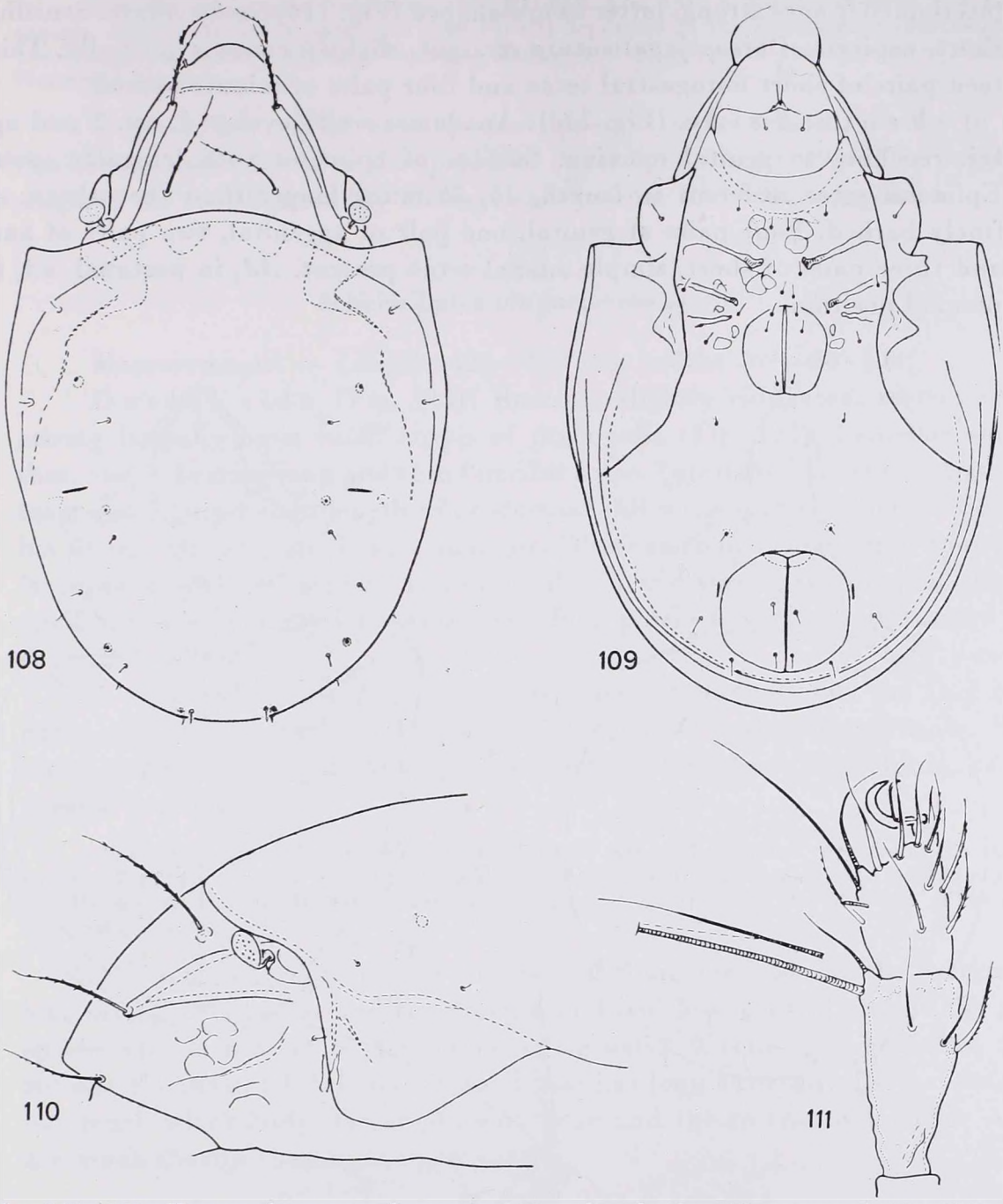
Legs: Tarsus of leg I (Fig. 111) short, compressed longitudinally.

Material examined: Holotypus (797-HO-82): Afr. 181; 5 paratypes from the same sample. Holotypus and 4 paratypes (797-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.



Figs 104—107. *Hammerabates nasalis* sp. n. 104 = dorsal side, 105 = ventral side, 106 = prodorsum from lateral view, 107 = end of leg I

Remarks: The generic relegation of the two new species is problematic, a complete revision is needed. However, both new species could probably be assigned to the genus *Hammerabates* Balogh, 1970 owing to their three pairs of genital setae and the shape of sensillus, both differing from the type-species, by the much larger and wider body, and the length of prodorsal setae. The two new species differ from each other by the shape of rostrum and the form of tarsus.



Figs 108—111. *Hammerabates rotundus* sp. n. 108 = dorsal side, 109 = ventral side, 110 = prodorsum from lateral view, 111 = end of leg I

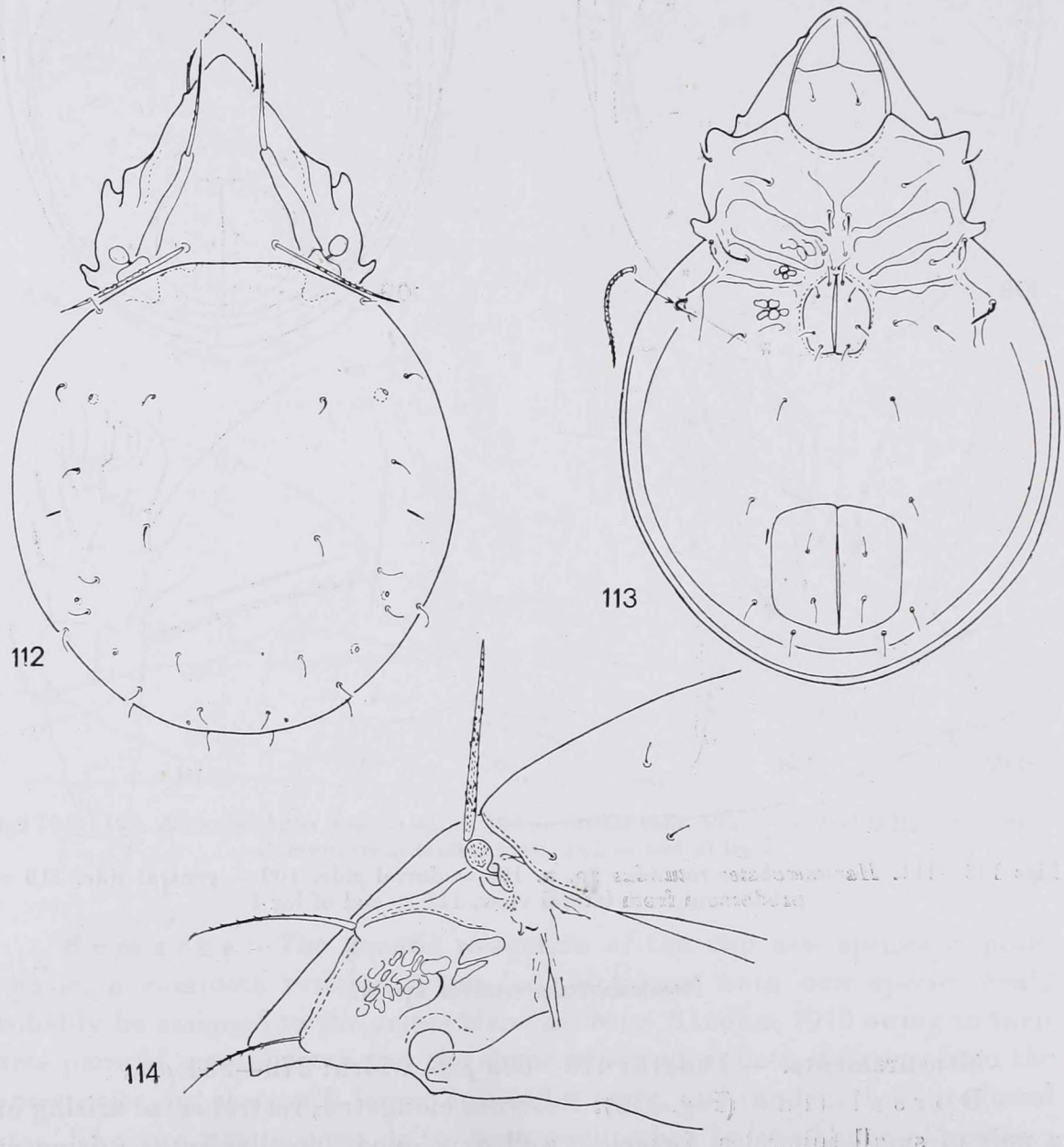
Nesoribatula ensifer sp. n.

Measurements. — Length: 470—603 μm, width: 270—334 μm.

D o r s a l s i d e (Fig. 112): Rostrum elongated, rostral setae arising on a pair of small tubercles. Lamellae well developed, lamellar setae arising on their cuspis. Rostral setae setiform, curved, pilose, lamellar and especially

interlamellar ones strong, latter sword-shaped (Fig. 114) finely ciliate. Sensillus short, capitate. Dorsosejugal suture straight, slightly concave medially. Thirteen pairs of short notogastral setae and four pairs of minute sacculi.

V e n t r a l s i d e (Fig. 113): Apodemes well developed, ap. 3 and ap. sej. reaching to genital opening. Surface of epimeres with irregular spots. Epimeral setae different in length, *1b*, *3b* much longer than the others, all finely barbed. Four pairs of genital, one pair of aggenital, two pairs of anal and three pairs of short, simple adanal setae present. Ad_1 in postanal, ad_3 in preanal position.



Figs 112—114. *Nesoribatula ensifer* sp. n. 112 = dorsal side, 113 = ventral side, 114 = prodorsum from lateral view

Material examined: Holotypus (798-HO-82): Afr. 181; 4 paratypes from the same sample. Holotypus and 3 paratypes (798-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species appears to be related, owing to its chaetotaxy and habitus to the species of *Nesoribatula* Aoki, 1964. The peculiar shape of the sensillus readily distinguishes it from all known congeners.

Scheloribates uluguruensis sp. n.

Measurements. — Length: 426—448 μm, width: 269—285 μm.

Dorsal side (Fig. 115): Rostrum slightly elongated, rostral setae arising laterally on a small cuspis of prelamella (Fig. 117). Lamellae short, thin, cuspis bearing long and thin lamellar setae. Interlamellar setae extremely long, much longer than length of prodorsum. All setae sparsely ciliated. Sensillus short, clavate, its head squamose. Pteromorphae small and rounded. Notogaster with seven pairs of minute alveoli and three pairs of setae (latter ones in posteromarginal position) and four pairs of very small, hardly recognizable alveoli.

Ventral side (Fig. 116): Apodemes thin, short but the thin bordures well visible. Surface of epimeres ornamented with scattered spots. Epimeral setae thin, simple. Among adanal setae ad_1 and ad_2 in postanal, ad_3 in preanal position.

Material examined: Holotypus (799-HO-82): Afr. 181; 2 paratypes from the same sample. Holotypus and 1 paratype (799-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.

Remarks: The new species is well characterizable by the extremely long interlamellar setae and the short, round sensillus. On this ground the new species stands nearest to *Scheloribates flagellatus* Wallwork, 1966 and *Sch. striatus* Hammer, 1958, however, the latter has long notogastral setae, *striatus* has much wider body, larger pteromorphae and the rostral or lamellar setae are much shorter than in the new species.

HAPLOZETIDAE Grandjean, 1936

Peloribates hirsutus sp. n.

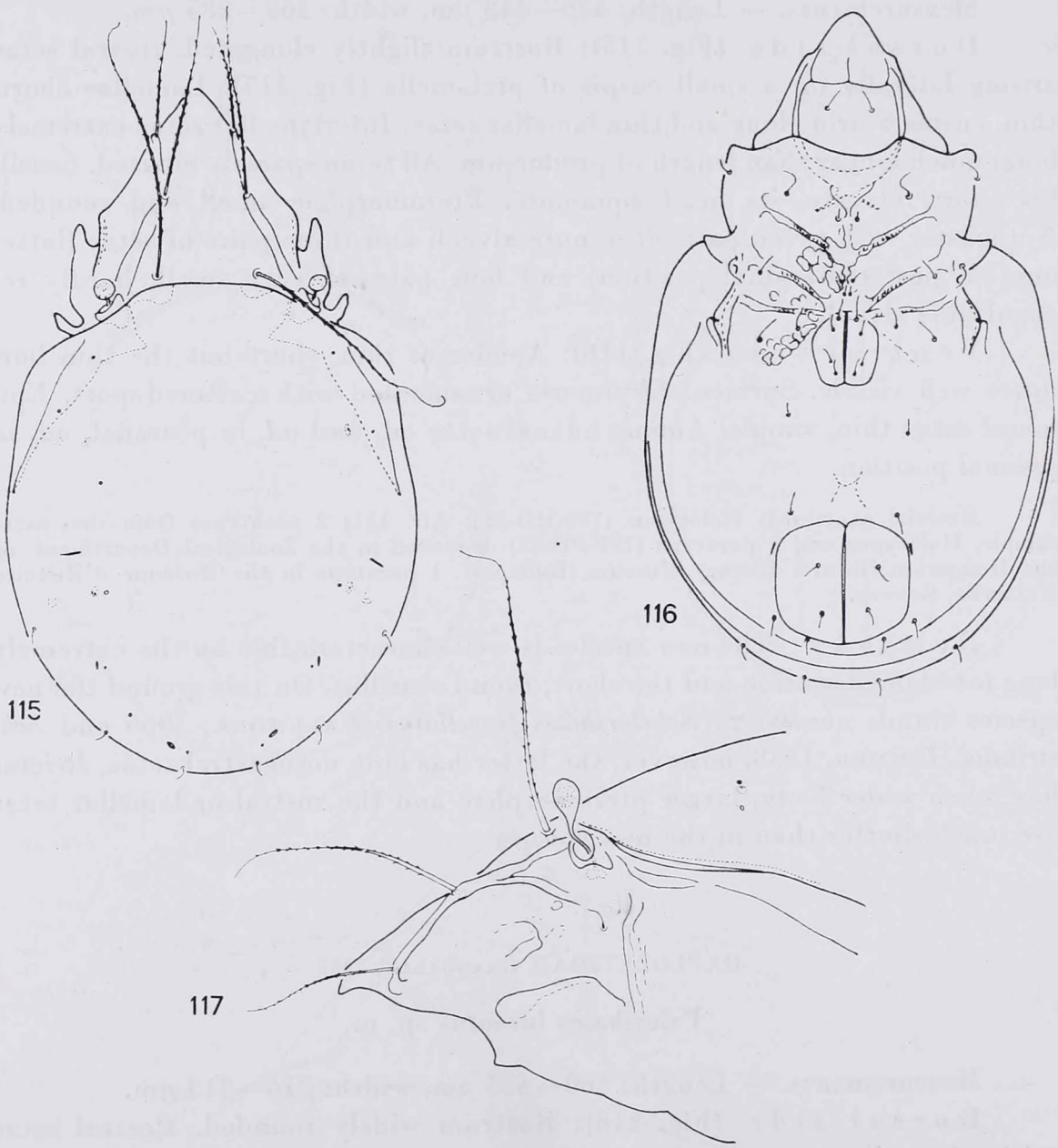
Measurements. — Length: 460—484 μm, width: 216—313 μm.

Dorsal side (Fig. 118): Rostrum widely rounded. Rostral setae arising laterally, normal in length, distinctly ciliated. Lamellar and especially interlamellar setae long, distinctly ciliated (Fig. 119). Sensillus short, clavate,

directed posteriorly. Fourteen pairs of very long notogastral setae, their end flagelliform. Surface foveolated.

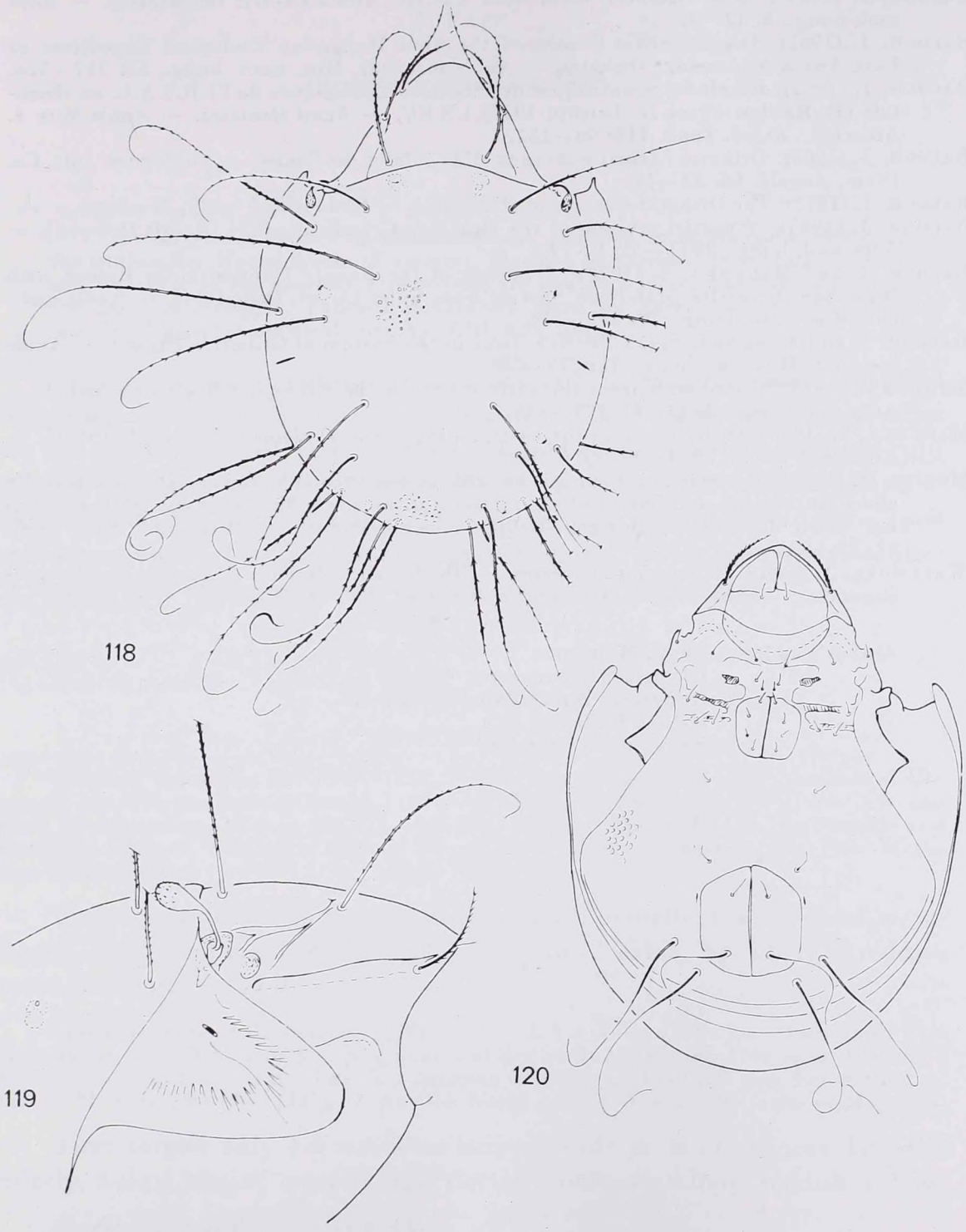
V e n t r a l s i d e (Fig. 120): Epimeral setae short, simple, epimeral surface with large spots. Four pairs of short genital and aggenital setae present, all equal in length. Among anal and adanal setae great differences exist in size, ad_3 and an_2 comparatively short, an_1 and ad_1, ad_2 very long.

Material examined: Holotypus (800-HO-82): Afr. 181; 3 paratypes from the same sample. Holotypus and 2 paratypes (800-PO-82) deposited in the Zoological Department of the Hungarian Natural History Museum, Budapest, 1 paratype in the Museum d'Histoire Naturelle, Geneva.



Figs 115—117. *Scheloribates uluguruensis* sp. n. 115 = dorsal side, 116 = ventral side, 117 = prodorsum from lateral view

R e m a r k s : The new species has the longest notogastral setae among the so far known *Peloribates* BERLESE, 1908 species. On this ground it is well distinguished from all its congeners.



Figs 118—120. *Peloribates hirsutus* sp. n. 118 = dorsal side, 119 = prodorsum from lateral view, 120 = ventral side

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BRACONIDAE (HYMENOPTERA) FROM MONGOLIA. IX*

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(Received 9 November, 1982)

Twenty-three species of Braconidae are recorded from Mongolia belonging to the subfamilies Homolobinae (3 species), Blacinae (5 species), Doryctinae (2 species) and Exothecinae (13 species). Two species are new to science, and fifteen are new to the fauna of Mongolia. Faunistical data are given for every species, and some are completed with taxonomical remarks. With 8 figures.

Besides the contributions in the abstract a remark seems justified concerning the enumeration of the localities. The locality-names and other data are word for word copy of the published reports of the collecting-trips made in Mongolia by the collector DR. Z. KASZAB, and not the data of the labels attached to the insects. This uncustomary citation we follow upon the instruction of DR. Z. KASZAB himself. For every species the localities are enumerated in the sequence of their increasing numbering.

1. List of species

HOMOLOBINAE

Charmon cruentatus HALIDAY, 1833. — 2 ♀: Bulgan aimak: Namnan ul Gebirge, **23** km NW von Somon Chutag, 1150 m, 21. VII. 1968 (No. 1137); 1 ♀: 7 km NW von Somon Chanžargalant, 1350 m, 22. VII. 1968 (No. 1140). — Distributed in the Nearctic and Palaearctic Regions, Ethiopian Region: Ivory Coast, Union of South Africa. New to the fauna of Mongolia.

First tergite twice as long as wide at hind. Scutellum, meso- and metapleuron, meso- and metasternum reddish yellow (2 ♀: loc. No. 1137) or reddish brown (1 ♀: loc. No. 1140).

Charmon extensor (LINNAEUS, 1758). — 1 ♀: Uvs aimak: 4 km OSO vom Pass Ulaan davaa, zwischen dem See Örög nuur und der Stadt Ulaangom, 1700 m, 6. VII. 1968 (No. 1072). — 1 ♀: Bulgan aimak: Namnan ul Gebirge, 23 km NW von Somon Chutag, 1150 m, 21. VII. 1968 (No. 1137). — An Old World species. New to the fauna of Mongolia.

First tergite only 1.6 times as long as wide at hind. Thorax laterally entirely, below almost entirely and dorsally only scutellum reddish yellow.

Charmon paloratus sp. n.: see p. 444.

* Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei, Nr. 476.

BLACINAE

Blacus ambulans macropterus HAESELBARTH, 1973. — 1 ♀: Central aimak: Bogdo ul, Bugijn až achuj, 36 km SW von Ulan-Baator im Bogdo ul Gebirge, 1650 m, 10. VI. 1968 (No. 941). — In the western Palaearctic Region frequent to common. New to the fauna of Mongolia.

Antenna with 20 joints. Frons polished. First tergite 1.65 times longer than wide at hind. In lateral view ovipositor sheath slightly longer than first tergite.

Blacus conifer TOBIAS, 1977. — 1 ♀: Central aimak: Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1500 m, 20. VII. 1967 (No. 928); 1 ♀: 11 km OSO Somon Bajancogt, 1600 m, 13. VI. 1968 (No. 947). — Described from Shiliyn-Bogdo-ul, Suche-Baator aimak within Mongolia. The present locality data are the second contribution of its distribution.

This species is very closely related to *B. mammilanus* RUTHE, 1861 (Europe), thus its specific validity requires confirmation.

Blacus filicornis HAESELBARTH, 1973. — 1 ♀: Chovd aimak: Mongol Altaj Gebirge, cca 35 km N von Somon Uenč, 1750 m, 8. VII. 1966 (No. 646); 1 ♀: Jamatin Dolon, cca 40 km N von Somon Manchan, an SW Ecke des Sees Char us nuur, 1200 m, 11. VII. 1966 (No. 673). — Reported first from Mongolia by HAESELBARTH (l.c.).

My two females, contrary to HAESELBARTH (1973b), are quite identical with the "typical" forms from Hungary.

Blacus instabilis RUTHE, 1861. — 1 ♀: Gobi Altaj aimak: Chasagt chajrchan ul, cca 20 km S von Somon Žargalan, 2400 m, 15—16. VII. 1966 (No. 693). — Distributed from Ireland to Turkmenia (USSR). New to the fauna of Mongolia.

Blacus paganus HALIDAY, 1835. — 1 ♂: Archangaj aimak: Changaj Gebirge, 8 km W von Somon Urdtamir, 1620 m, 21. VII. 1966 (No. 724). — Sporadic to frequent in Europe. New to the fauna of Mongolia.

My single male specimen does not deviate from the European representatives of this species. Antenna 19-jointed.

DORYCTINAE

Spathius brevicaudis RATZEBURG, 1844. — 1 ♀: Bulgan aimak: zwischen Somon Chischig-Öndör und Somon Orchon, 23 km NNO von Chischig-Öndör, 1390 m, 15. VI. 1968 (No. 961). — Distributed in the Palaearctic Region, in Europe frequent. New to the fauna of Mongolia.

Spathius phymatodis FISCHER, 1966. — 1 ♀: Central aimak: Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1700—1900 m, 23—24. VII. 1967 (No. 926a). — 1 ♂: Bulgan aimak: Namnan ul Gegirbe, 23 km NW von Somon Chutag, 1150 m, 17. VI. 1968 (No. 973). — Described from France, reported from the southern part of the European USSR. New to the fauna of Mongolia.

EXOTHECINAE

Clinocentrus exsertor (NEES, 1812). — 1 ♀: Central aimak: SO von Somon Bajancogt, 1600 m, 11. VI. 1966 (No. 519); 1 ♀ + 3 ♂: Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1700—1900 m, 23—24. VII. 1967 (No. 926a); 1 ♀: Ulan-Baator, Zaisan im Bogdo ul Gebirge, 5 km S vom Zentrum, 1600 m, 11. VI. 1968 (No. 942). — Frequent in the Palaearctic Region.

Colastes flavitarsis (THOMSON, 1891). — 1 ♀: Central aimak: Tosgoni ovoo, 5—10 km von Ulan-Baator, 1700—1900 m, 23—24. VII. 1967 (No. 926a). — Distribution in Europe (Sweden, Finland, Germany, Czechoslovakia, Hungary, European USSR). New to the fauna of Mongolia.

Colastes nuptus sp. n.: see p. 447.

Gnaptodon bachmeieri FISCHER, 1957. — 1 ♂: Central aimak: Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1500—1700 m, 19—20. and 23—24. VII. 1967 (No. 926), 1 ♀: same data (No. 926a). — Distribution in Holland, Germany, Austria, Hungary, Italy, USSR (European part, West Siberia). New to the fauna of Mongolia.

Hormisca tatianae TELENGA, 1941. — 3 ♀ + 1 ♂: Uburchangaj aimak: am halben Weg zwischen Somon Bajanleg und Somon Bulgan, cca 130 km OSO von Bajanleg, 1150 m, 3. VII. 1967 (No. 882). — 1 ♀: Mittelgobi aimak: 8 km NW von den Ruinen des Klosters Oldoch Chijd, 54 km NNW von Somon Zogt-Ovoo, 1350 m, 9. VII. 1967 (No. 905). — Widely distributed in the arid-semiarid zones of the Palaearctic Region (Morocoo, Iran, USSR). New to the fauna of Mongolia.

1 ♀ (from loc. No. 882) with vein *cuqu1*, this vein usually absent. — I cannot accept TOBIAS' synonymization (TOBIAS 1974) of the genus *Hormisca* TELENGA, 1941 with *Hormius* NEES, 1834, the short radial cell is a good generic feature of the former genus.

Hormius moniliatus (NEES, 1812). — 1 ♀: Central aimak: Ulan-Baator, Nucht im Bogdo ul, 1880 m, 9. VI. 1966 (No. 507); 1 ♀: cca 30 km O von Somon Nalajch, 1530 m, 14. VI. 1966 (No. 523); 2 ♀: 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 von Zentrum: 1500—1600 m, 21. VII. 1967 (No. 931). — 1 ♂: Archangaj aimak: Changaj Gebirge, bei Somon Urdtamir, cca 1600 m, 18. VI. 1966 (No. 536). — 2 ♀ + 1 ♂: Bulgan aimak, 7 km NW von Somon Chanzargalant. 1350 m, 16. VI. 1968 (No. 967). — 1 ♂: Chövsgöl aimak: 8 km W von Somon Burenchaan, am Fluss Delger mörön, 1450 m, 16. VII. 1968 (No. 1115); 1 ♂: N von Somon Chatgal am SW-Ecke des Sees Chövsgöl nuur, 1650 m, 18. VII. 1968 (No. 1123). — Common in the Palaearctic Region.

1 ♀ (from loc. No. 389) was named by me as "*Xenarcha brevicauda* TOBIAS" (PAPP 1971), this was a misidentification, the specimen represents the species indicated.

1 ♀ (loc. No. 507) with unusual venation, *r1* and *r2* equal in length, usually *r2* 1.5—2 times longer than *r1*.

Noserus similis (SZÉPLIGETI, 1896). — 1 ♂: Central aimak: 11 km S vom Pass Zosijn davaa (cca 90 km S von Ulan-Baator), 1650 m, 7. VI. 1967 (No. 771); 1 ♂: Tosgoni ovoo, 6—10 km N von Ulan-Baator, 1700 m, 7—8. VI. 1968 (No. 938). — 1 ♀: Bulgan aimak: cca 20 km W von Somon Bajannuur (220 km W von Ulan-Baator), 1100 m, 18. VI. 1966 (No. 531); 2 ♀: 30 km NNW von Somon Daschinčilen, 1200 m, 15. VI. 1968 (No. 959). — 1 ♀ + 1 ♂: Chövsgöl aimak: 84 km W von Stadt Mörön, cca 10 km NO vom Fluss Delger mörön, 1650 m, 20. VI. 1968 (No. 987).

Owing to the taxonomical problems of this species its distribution is unknown. Up to now listed in Hungary. New to the fauna of Mongolia.

Oncophanes laevigatus (RATZEBURG, 1852) (= *O. lanceolator* NEES, 1834 nec FABRICIUS, 1804). — 1 ♀: Central aimak: Ulan-Baator, Nucht im Bogdo ul, 12 km SO vom Zentrum, 1600 m, 27. VIII. 1965 (No. 486). — 1 ♀: Bulgan aimak: zwischen Somon Chischig.

Öndör und Somon Orchon, 23 km NNO von Chischig-Öndör, 1390 m, 15. VI. 1968 (No. 961.) — Frequent to common in the Palaearctic Region. New to the fauna of Mongolia.

Pambolus biglumis HALIDAY, 1836. — 1 ♂: No. 262 (named previously as *Centistes* cf. *ater* NEES, PAPP 1967). — Listed in France and Sweden. New to the fauna of Mongolia.

Phaenodus rugulosus HELLÉN, 1927, ♂ novus. — 1 ♂: Südgobi aimak: Tachilga ul Gebirge, zwischen Somon Cogt-Ovoo und Somon Dalanzadgad, 68 km S von Cogt-Ovoo, 1550 m, 12. VI. 1967 (No. 792). — Its sporadic localities were listed from Finland and the USSR (European part, Kazakhstan). New to the fauna Mongolia.

The male sex is similar to the female. Antenna 26-jointed. Ground colour of body reddish brown to brown; head above, mesonotum and sternum black, propodeum medially blackish. Body 2.8 mm long.

Phanomeris catenator (HALIDAY, 1836). — 6 ♀: Central aimak: Tosgoni ovoo, 5—10 km N von Ulan-Baator, 1700—1900 m, 23—24. VII. 1967 (No. 926a); 1 ♀: Ulan-Baator, Nucht im Bogdo ul, 12 km SO vom Zentrum, 1600 m, 21. VII. 1967 (No. 932). — In Europe frequent and listed from many countries. New to the fauna of Mongolia.

1 ♀ (from loc. No. 932) with *r2* hardly longer than *cuqul*, stigma issuing radial vein distal from its middle.

Rhysipolis hariolator (HALIDAY, 1836). — 1 ♂: Central aimak: SO von Somon Bajancogt, 1600 m, 11. VI. 1966 (No. 519); 6 ♀: 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 Zentrum, 1500—1600 m, 21. VII. 1967 (No. 931). — 2 ♀ + 2 ♂: Südgobi aimak: Gurban Sajchan ul Gebirge, 15 km S von der Stadt Dalanzadgad, cca 1750 m, 13. VI. 1967 (No. **794**). — A Palaearctic species. New to the fauna of Mongolia.

Rhysipolis major (SZÉPLIGETI, 1896) (= *Xenarcha major* SZÉPLIGETI, 1896; = *Colastes major* SZÉPLIGETI, 1898). — 1 ♀: Chentej aimak: 20 km SW Somon Batnorov, 1000 m, 20. VIII. 1965 (No. 456). — 1 ♀ + 1 ♂: Central aimak: Ulan-Baator, Nucht im Bogdo ul, 12 km SO vom Zentrum, 1650—1950 m, 4. VI. 1966 (No. 494); 7 ♀: SO von Somon Bajancogt, 1600 m, 11. VI. 1966 (No. 519); 1 ♀: Tosgoni ovoo, 6—10 km N von Ulan-Baator, 1700 m, 4. VI. 1968 (No. 934), 3 ♀: same locality, 7—8. VI. 1968 (No. 933); 2 ♀: Bogdo ul, Bugijn až achuj, 1650 m, 10. VI. 1968 (No. 939). — 1 ♀: Chövsgöl aimak: 8 km N von Somon Burenchaan, am Flusse Delger mörön, 1450 m, 20. VI. 1968 (No. 990). — Reported from Mongolia by me, however, locality data (No. 456) were not given owing to my mistake (PAPP, 1971).

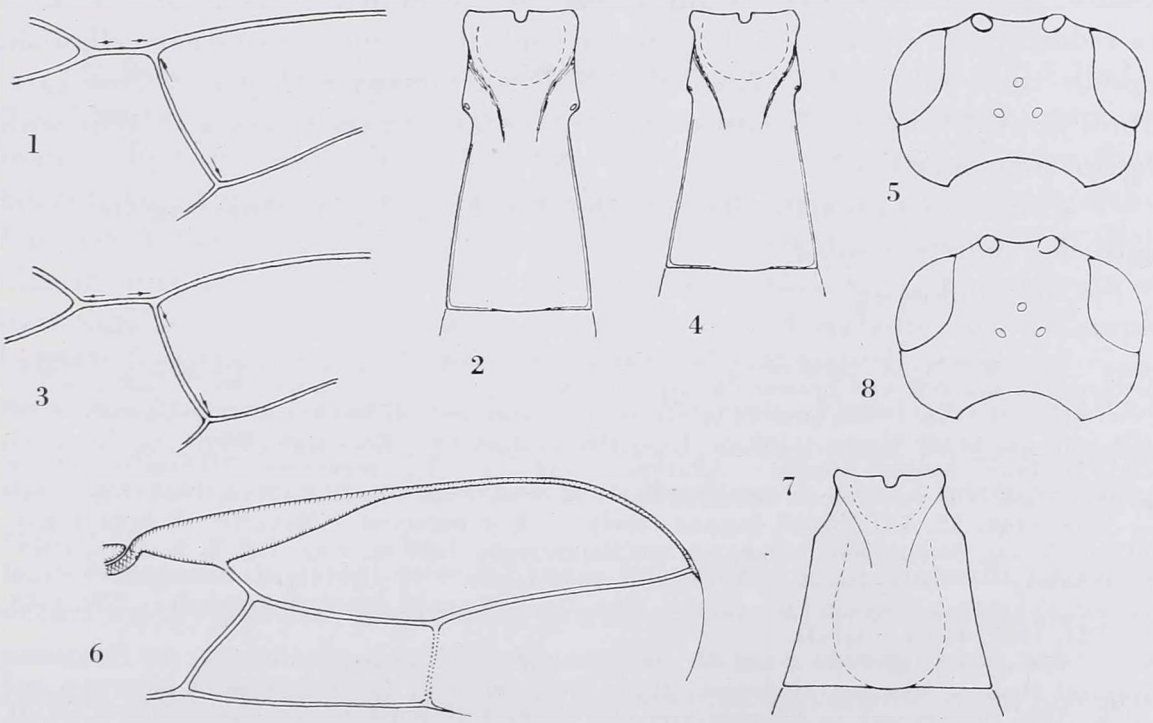
2. Description of the new species

Charmon paloratus sp. n. ♀♂
(Figs 1—2)

♀. Body 7—7.5 mm long. Head in dorsal view 1.8 times broader than long, eye protruding from outline of head and twice longer than temple, latter contracted behind eye. Eye in lateral view 1.3—1.4 times higher than wide, and thrice wider than temple. Ocelli elliptic, hind ocellus 1.5 times longer than wide, distance between hind two ocelli 1.5—1.6 times as long as greatest diameter of an ocellus, OOL 1.2—1.3 times as long as diameter indicated. Face without clypeus 1.7 times wider than high, inner margin of eyes (sub-

parallel. Base of mandible twice as long as cheek. Clypeus trapezium-like, twice wider below than high medially. Mandible apically bifid. Maxillar palp distinctly longer than height of head. Face above and medially rugo-uneven, otherwise sporadically subpunctate and shiny. Clypeus also subpunctate, shiny. Otherwise head polished. Antenna somewhat longer than body, with 48—50 joints. First flagellar joint 7 times as long as broad at middle, further joints gradually becoming shorter and attenuating so that penultimate joint twice as long as broad.

Mesosoma in lateral view 1.6 times as long as high. Pronotum medially with a transverse, narrow and finely crenulated suture-like furrow, otherwise pronotum polished. Notaulix present on disc of mesonotum, gradually weakening on its anterior declivous part, very finely to indistinctly crenulated. Mesonotum, scutellum, meso- and metapleuron and sternum polished. Propodeum medially rather longitudinally uneven-rugulose to almost smooth, otherwise polished, above lunule always densely rugulose with rather longitudinal elements. Prepectal carina present on mesopleuron, sternaulix indistinct. Sutures between several parts of thorax crenulated to finely crenulated. — Legs long and thin. Hind coxa as long as first tergite. Hind femur thrice to almost thrice longer than broad. Hind tibia one-sixth times longer than tarsus. Two



Figs 1—2. *Charmon paloratus* sp. n.: 1 = nervellus and first section of *n. cubit.* of hind wing, 2 = first tergite. — Figs 3—4. *Charmon cruentatus* HALIDAY: 3 = nervellus and first section of *n. cubit.* of hind wing, 4 = first tergite. — Figs 5—7. *Colastes nuptus* sp. n.: 5 = head in dorsal view, 6 = distal part of right fore wing (stigma, radial cell, cubital cells 1—3), 7 = first tergite. — Fig. 8. *Colastes subquadratus* PAPP: head in dorsal view

spurs of hind tibia equal in length, about one-third to one-fourth as long as hind basitarsus.

Fore wing 7—7.5 mm long, as long as body. Stigma 2.8 times as long as wide, issuing radial vein distally from its middle. Radial vein ending before tip of wing. *r1* somewhat shorter than width of stigma, *cuqu1* longer than *r1*. Discoidal cell (*D*) 1.2—1.3 times wider than high, *n. bas.* 1.7—1.8 times longer than *n. rec.* Basella of hind wing distinctly, usually twice, longer than first section of *n. cubit.* (*cu1*), nervellus 2.3—2.5 times longer than *cu1* (Fig. 1).

Metasoma as long as head and mesosoma together. First tergite (Fig. 2) twice as long as wide at hind, moderately broadening posteriorly, its spiracles near to its base and relatively strongly protruding laterally; its surface shiny and weakly and longitudinally striate-unevenly sculptured. Second tergite one-fifth to one-sixth as long as wide, either polished or (postero-)medially and rather longitudinally rugulo-uneven to almost smooth. Further tergites transverse and polished. Ovipositor sheath, 9—10 mm long, straight, one-third longer than body. Dorso-apical end of ovipositor notched.

Body black, legs reddish yellow. Clypeus, cheek, mandible (except its black apex), and palpi reddish yellow. Vertex beside eye with yellowish to brownish tint. Face frequently with brownish suffusion. Scape and pedicel more or less reddish, flagellum black. Tegula yellow, reddish yellow or brownish yellow. Pronotum, scutellum and rarely mesopleuron with more or less rusty to reddish yellow suffusion. Fore femur and tibia sometimes rather yellowish, middle tibia pale yellow, hind tibia blackish fumous with pale yellow base. Tarsi faintly fumous. Wings subhyaline; stigma, parastigma and vein with brown pigmentation.

♂. Similar to female. Body 6—6.5 mm long. Light colour together with suffusion more extended.

Host unknown.

Localities — Holotype ♀ + 10 ♀ paratypes: "Mongolia: Bulgan aimak, Namnan ul Gebirge, 23 km NW von Somon Chutag, 1150 m, Exp. Dr. Z. Kaszab, 1968" (first label) — "Nr. 1137, 21. VII. 1968" (second label). — 1 ♀ paratype: "Mongolia: Chövsgöl aimak, 4 km NW von der Stadt Mörön, 1500 m, Exp. Dr. Z. Kaszab, 1968" (first label) — "Nr. 1128, 19. VII. 1968" (second label). — Allotype ♂ and 7 ♀ + 1 ♂ paratypes: "Mongolia: Bulgan aimak, 7 km NW von Somon Chanžargalant, 1350 m, Exp. Dr. Z. Kaszab, 1963 (first label) — "Nr. 1140, 22. VII. 1968" (second label). — 1 ♂ paratype: "Mongolia: Bulgan aimak, 11 km W von Somon Bajannuur, am See Bajan nuur, 1000 m, Exp. Dr. Z. Kaszab, 1968" (first label) — "Nr. 1144, 24. VII. 1969" (second label). — 1 ♀ paratype: "Mongolia: Central aimak, 25 km O von Somon Lun, 1200 m, Exp. Dr. Z. Kaszab, 1968" (first label) — "Nr. 1148, 25. VII. 1968" (second label).

Holotype ♀, allotype ♂ and 18 paratypes (16 ♀ + 2 ♂) are deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 5317 (holotype), 5318 (allotype) and 5319—5336 (paratypes). — 1 ♀ paratype each in the Rijksmuseum van Natuurlijke (Leiden), Zoologisches Museum (Berlin) and Zoological Institute (Leningrad).

The genus *Charmon* Haliday is represented in the Holarctic Region by two species, *Ch. cruentatus* Haliday, 1833 and *Ch. extensor* Linné, 1758. The

new species is related with them and they are differentiated by the following features:

Ch. paloratus sp. n.	**Ch. cruentatus** HAL. and **Ch. extensor** L.
1. Body 7—7.5 mm long.	1. Body 4.5—5.5 mm long.
2. First tergite (Fig. 2) twice as long as wide at hind; spiracle more protruding laterally.	2. First tergite (Fig. 4) usually 1.5—1.7 times, exceptionally 1.8(—1.9) times (*Ch. cruentatus*), as long as wide at hind; spiracle less protruding laterally.
3. Nervellus of hind wing 2.3—2.5 times as long as first section of *n. cubit.* (Fig. 1).	3. Nervellus of hind wing 1.8—2 times as long as first section of *n. cubit.* (Fig. 3).
4. Mesosoma black and only exceptionally with rusty to reddish yellow suffusion (pronotum!).	4. Mesosoma reddish yellow, dorsally usually black or with rusty to reddish yellow suffusion.
5. Stigma brown, blackish brown.	5. Stigma opaque pale yellow.
6. Ocelli relatively large, distance between hind two ocelli 1.5—1.6 times as long as greatest diameter of an ocellus; OOL short, 1.2—1.3 times as long as diameter indicated.	6. Ocelli relatively small, distance between hind two ocelli 1.6—1.8 times as long as greatest diameter of an ocellus; OOL long, 1.6—1.5 times as long as diameter indicated.

Colastes nuptus sp. n. ♀
(Figs 5—7)

♀. Body 2.7 mm long, usual in form. Head in dorsal view (Fig. 5) 1.7—1.8 times broader than long, behind eye temple rounded, eye 1.8 times longer than temple. Eye in lateral view 1.4 times higher than wide, and 1.8 times than temple. Ocelli small, forming an isosceles triangle, distance between fore and hind ocelli twice as long as greatest diameter of elliptic hind ocellus. OOL almost twice as long as POL. Face 1.5 times wider than high, inner margin of eyes parallel. Cheek distinctly longer than width of mandible base. Temple behind margined, occiput immargined. Head polished, face uneven, subrugulose. Antenna longer than body, with 34 joints. First flagellar joint 2.5 times as long as broad and 1.25 times as long as second joint. Further flagellar joints gradually becoming shorter so that penultimate joint 1.5 times as long as broad.

Mesosoma in lateral view 1.7 times longer than high. Notaulix on mesonotum evenly distinct. Prescutellar furrow narrow, without crenulation. Propodeum on its medio-longitudinal surface uneven-subrugulose, otherwise smooth, shiny. Mesonotum, scutellum, mesopleuron and mesosternum polished. Hind femur four times longer than broad. Hind tarsus one-fifth longer than hind tibia.

Fore wing somewhat longer than body, 3 mm long. Stigma (Fig. 6) five times as long as wide, issuing radial vein from its basal third; *r1* as long as

width of stigma, *r2* 1.6 times as long as *cuqul*, *r3* almost 1.4 times as long as *r2* and reaching tip of wing. *dl* and nervulus equal in length; *n. rec.* antefurcal.

Metasoma in lateral view as long as head and mesosoma together. First tergite (Fig. 7) as long as wide at hind, distinctly broadening posteriorly and twice wider behind than at base, its surface longitudinally rugose. Second tergite twice wider behind than long medially, its median surface rugo-rugulose, laterally uneven to smooth, shiny. Further tergites distinctly transverse and polished. Ovipositor sheath in lateral view as long as first tergite.

Head, mesosoma and first tergite black, further tergites dark brown; mesopleuron below with dark brownish suffusion. Scape brownish, flagellum black. Mandible dirty yellow. Palpi, tegula and legs yellow; tarsi fumous, claws black. Wings subhyaline, stigma and venation with yellowish pigmentation.

♂ and host unknown.

Locality — Holotype ♀: "Mongolia: Central aimak, SO von Somon Bajanzogt, 1600 m, Exp. Dr. Z. Kaszab, 1966" (first label) — "Nr. 749, 27. VII. 1966" (second label).

Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 5337.

From among the European *Colastes* species the new species is nearest to *C. pubicornis* (Thomson, 1891) and *C. subquadratus* Papp, 1975. They specific differentation is tabulated below:

C. nuptus sp. n.	**C. pubicornis** Thoms.
1. First tergite as long as wide at hind, strongly broadening posteriorly (Fig. 7).	1. First tergite 1.15(—1.2) times longer than wide at hind, less strongly broadening posteriorly.
2. *r2* 1.6 times longer than *cuqul* (Fig. 6).	2. *r2* 1.2—1.3 times longer than *cuqul*.
3. First flagellar joint only 1.25 times longer than second joint.	3. First flagellar joint 1.5 times longer than second joint.
4. Tergite 1 black, further tergites dark brown.	4. Tergites 1—2 blackish brown, further tergites yellow.

C. nuptus sp. n.	**C. subquadratus** Papp
1. Head in dorsal view (Fig. 5) somewhat more transverse, 1.6—1.7 times broader than long.	1. Head in dorsal view (Fig. 8) less transverse, 1.5 times broader than long.
2. Second tergite medially distinctly rugo-rugulose.	2. Second tergite polished.
3. Antenna with 34 joints.	3. Antenna with 25 joints.
4. Body less gracile (or usual) in form, 2.7 mm long.	4. Body gracile in form, 2.2 mm long.

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THREE NEW SPECIES OF ELACHISOMA RONDANI, 1880 (DIPTERA: SPHAEROCERIDAE)

L. PAPP

(Received 1 December, 1982)

Three new species of the sphaerocerid genus *Elachisoma* ROND. are described (*E. afrotropicum* sp. n., Nigeria; *E. braacki* sp. n., South Africa and *E. bajzae* sp. n., Hungary, Europe). Discussion on some other species and a key for the Old World species are given. With 19 figures.

The smallest species of the higher Diptera belong to the sphaerocerid genus *Elachisoma* RONDANI, 1880 (or to this subgenus if we regard it as a subgenus of *Leptocera* OLIVIER, 1813). Owing to their minuteness, they are comparatively seldom collected and rather little known. The species of *Elachisoma* inhabit mainly the Old World (only one species *E. approximatum* MALL. is known from the USA, see below); hitherto all those species were described from the Palaearctic Region, namely *E. pilosum* has been reported from the Oriental Region (HACKMAN, 1977) and *E. aterrimum* from the Afro-tropical Region, no species has been known from the Neotropical and Australian regions (RICHARDS, 1967, 1973). The present author published a short paper on the taxonomic position of *E. kerteszi* (DUDA) and an attempt was made to fix generic characteristics for *Elachisoma* and *Trachyopella* (PAPP, 1971). All points of differentiation given there seem still valid but it can be supplemented by the following features:

Male abdomen without sterna 1 and 2, sterna 3 and 4 usually large, sternum 5 with numerous pecularities (Figs 4, 6, 8), female abdomen with 6 visible segments, cerci with moderately long but comparatively thick hairs.

The species of *Elachisoma* have repeatedly been considered as coprophagous but one of the new species (*E. bajzae*) was collected on rotten hay and vegetable refuse and another species (*E. euphorbiae*) has been reared from similar substrate. I think their larvae feed upon fungi of various decaying matter.

I am sincerely grateful to L. E. O. BRAACK (Kruger National Park, Skukuza, South Africa) and to DR. J. ROHÁČEK (Slezské Muzeum Opava) for sending me Elachisoma specimens for study.

Elachisoma afrotropicum sp. n.

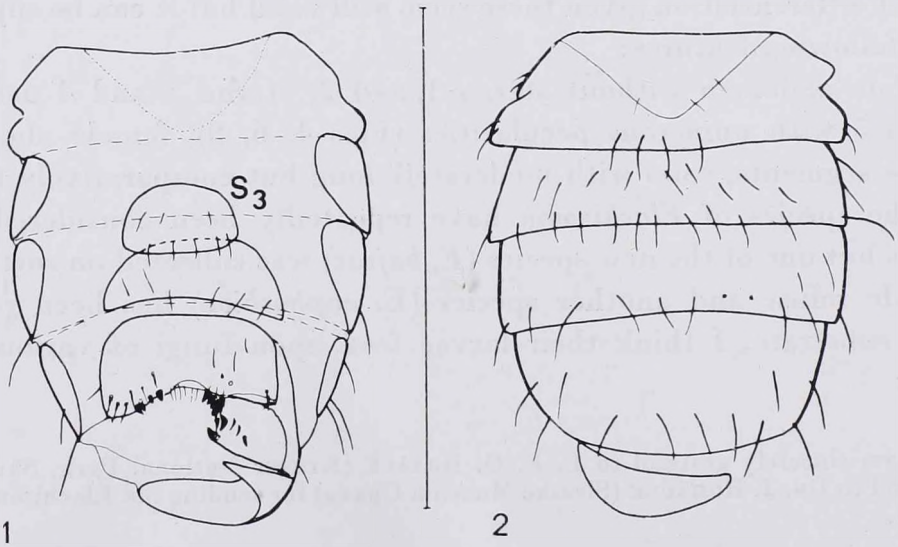
Body and legs dark brown, wings light brown, veins brown only costa darker.

Length of body: 0.75 mm (holotype male), 0.84 mm (paratype female).

Length of head 0.12 mm, height 0.21 mm, width 0.24 mm, i.e. as wide as thorax. Head bristles short, largely as in *E. kerteszi*, ocellar pair almost perpendicular to frons, 6—7 pairs of very short interfrontals, arista short (c. 0.26 mm), elongately plumose, its cilia 0.015 mm or a little longer. Length of eyes 0.12 mm, genae at narrowest 0.045 mm. Mouth edge projecting in profile, like in *kerteszi*.

Thorax moderately convex dorsally, scutellum 0.18 mm wide, only 0.085 mm long, apical scutellar bristles 0.08 mm, lateral scutellars 0.065 mm only. Legs short and thick, somewhat shorter and thicker than in *kerteszi*, e.g. length of hind femur shorter than width of wings (0.24—0.25 mm). Hind tibia dorsally with 3—4 long bristles of 0.040—0.055 mm, other bristles on hind tibia not longer than 0.025 mm.

Wing measurements: 0.65×0.28 (holotype male), 0.74×0.29 mm (paratype female), length of second costal section (mg_2) 0.135, 0.157 mm, third costal section (mg_3) 0.140, 0.146 mm, i.e. costal index 0.96—1.08, radial index (length of wings per length of mg_2 and mg_3 combined, i.e. length of costal vein from the inversion point of conjointment with r_1 to conjointment with r_{4+5}) 2.37, 2.44. Vein $r_{2+?}$ meeting costa in a very acute angle, width of subcostal cell 0.08 mm, anal vein hardly discernible, like in *kerteszi*, section t_a—t_p 0.056 mm, t_p 0.051 mm. Costal bristles perpendicular to alar plane comparatively



Figs 1—2. *Elachisoma kerteszi* (DUDA), male abdomen. 1 = ventral view; 2 = dorsal view (S_3: sternum 3). Scale: 0.5 mm

short, only one 0.025 mm, other bristles shorter than 0.02 mm. Knob of halteres elongate, dark brown, stalk ochreous, rather short.

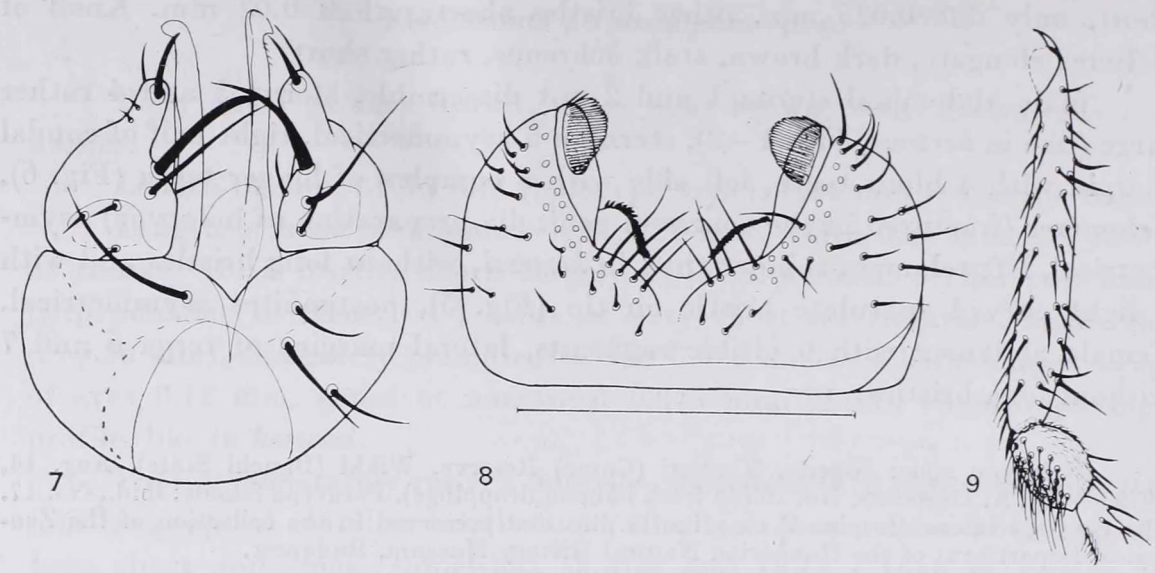
Male abdominal sterna 1 and 2 not discernible, sterna 3 and 4 rather large (like in *kerteszi*, Figs 1—2), sternum 5 asymmetrical, right half of caudal margin with 4 blunt teeth, left side with a complex of longer teeth (Fig. 6). Telomeres (fractured in the course of genitalia preparation of holotype) asymmetrical, left telomere thinner than in *kerteszi*, without long bristles and with a light curved spatulate bristle on tip (Fig. 5), postgonites asymmetrical. Female abdomen with 6 visible segments, lateral margins of terga 6 and 7 without long bristles.

Holotype male: Nigeria, Yankari (Game) Reserve, Wikki (Bauchi State), Aug. 14, 1978. — leg. A. DEMETER, No. 19 (on fresh baboon droppings). Paratype female: ibid., No. 17. The type-specimens are pinned on minutia pins and preserved in the collection of the Zoological Department of the Hungarian Natural History Museum, Budapest.

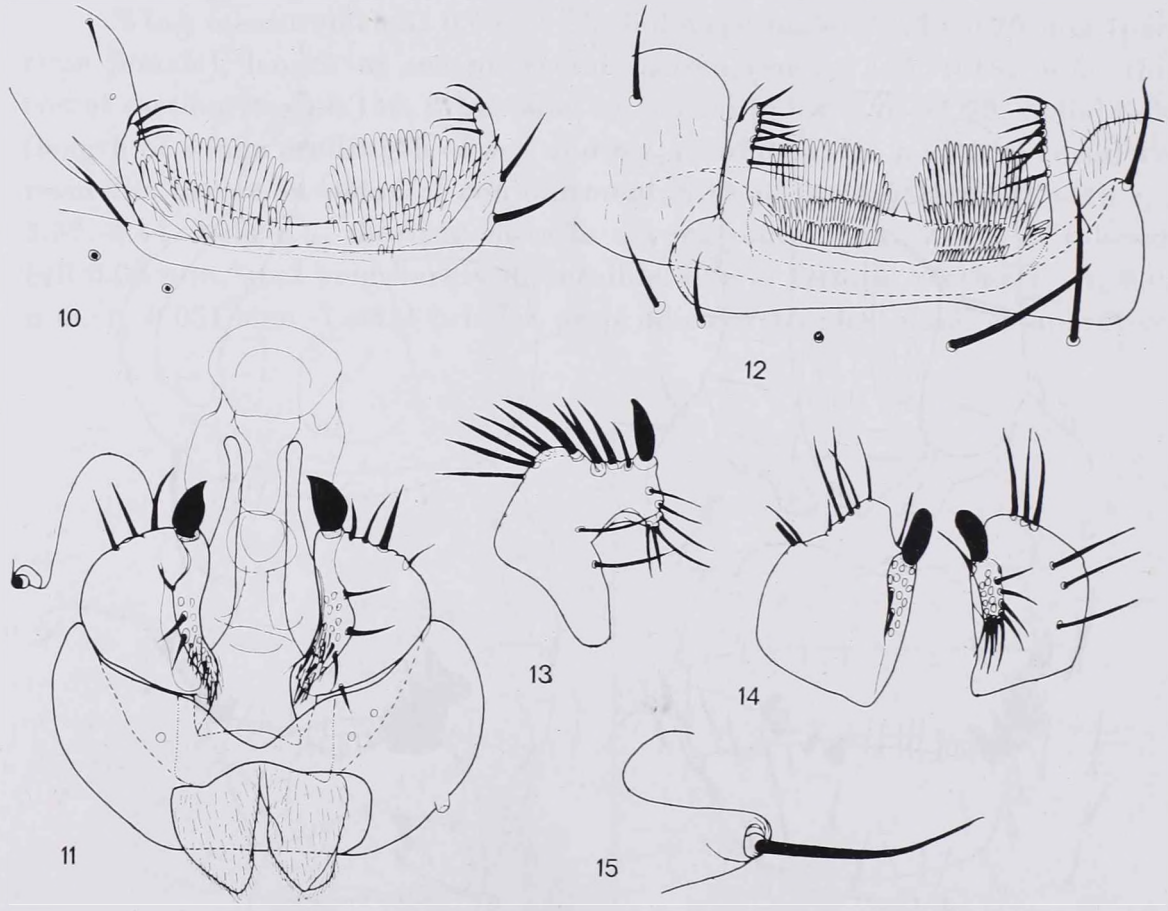
Elachisoma afrotropicum sp. n. is closely related to *E. kerteszi* (DUDA, 1924) but it differs from the latter in features given in the key below.



Figs 3—6. Genitalia of *Elachisoma* males. 3—4. *E. kerteszi* (DUDA): 3 = telomeres and postgonites, ventral view, 4 = sternum 5; 5—6. *E. afrotropicum* sp. n.: 5 = left telomere, ventral view. 6 = sternum 5 (scale same as for Figs 16—19)



Figs 7—10. 7—8. *Elachisoma pilosum* (DUDA), male: 7 = periandrium, telomeres and postgonites, subventral view, 8 = sternum 5; 9 = *E. bajzae* sp. n., hind tibia and metatarsus, inner view. Scale: 0.2 mm



Figs 10—15. Genitalia of *Elachisoma* males. 10—11. *E. braacki* sp. n.: 10 = sternum 5, 11 = periandrium, telomeres and postgonites, subventral view; 13—14. *E. aterrimum* (HALID.): 12 = sternum 5, 13 = telomere, lateral view, 14 = telomeres, ventral view; 15 = *E. braacki* sp. n., pregenital bristle. Scale same as for Figs 16—19

Elachisoma braacki sp. n.

Body and legs dark brown, wings hyaline. Length of body: 0.87 mm (holotype female), 0.80—0.87 mm (paratypes).

Head semispherical, four pairs of very short interfrontals; aristal hairs comparatively long (0.02 mm).

Scutellum 0.21 mm wide, 0.12 mm long; apical scutellar pair 0.11 mm. Legs short and thick like in aterrimum. Costal vein and radial veins dark brown, halteres dark brown to black. Costal vein with some long perpendicular bristles, longest one on mg_2 nearly 0.10 mm, other bristles 0.04—0.06 mm, length of second costal section (mg_2) 0.08 mm (holotype female), 0.067 mm (paratype female), 0.056 mm (paratype male), third costal section (mg_3) 0.247, 0.275, 0.28 mm, i.e. costal index 0.32, 0.245, 0.20, wing measurements: 0.84×0.37 mm (holotype), 0.865×0.37 mm, 0.80×0.34 mm, radial index: 2.57 (holotype female), 2.52, 2.37; width of subcostal cell 0.078 mm. Vein r_{2+3} very short and very close to costal vein, vein r_{4+5} rather much upcurving, similarly to *E. bajzae* sp. n., anal vein geniculate, hind crossvein 0.09 mm, section $t_a—t_p$ only 0.022 mm.

Male abdomen with short sternum 5, its lateral arms (Fig. 10) rather thin, its blunt thorns in three rows on both sides, and less numerous than in the related species (Fig. 10, cf. Figs 12, 16). Pregenital bristle on right side of abdomen (Fig. 15) very long. Telomeres (Fig. 11) rather short, with some moderately long bristles and with a comparatively short, pointed apical thorn. Female terga 4 and 5 with long lateral marginal bristles, terga 6 and 7 laterally with several very long marginal bristles.

Holotype female: South Africa: Transvaal, n. Kruger National Park, Pafuri 22°27′ S, 31°17′ E, 20. 9. 1979, L. BRAACK, ex *Impala carcass* — Sp. L. Paratypes: 2 ♂, 1 ♀: data same as for holotype. The type-specimens are glued by Canada balsam to the tip of tipped glue-labels. The holotype female and a well-preserved paratype male are deposited in the Kruger National Park insect collection at Skukuza (South Africa); one paratype female and male each are in the Zoological Department of the Hungarian Natural History Museum, Budapest. This latter specimen came off from glue during transportation and thereby its head fell off; genitalia preparation was carried out on this specimen.

Elachisoma braacki sp. n. is a characteristic species of the *aterrimum*-group; its differentiating features are given in the key below.

I dedicate this new species to its collector, MR. L. E. O. BRAACK, who collected also highly valuable sphaerocerid material in the course of his studies on insect population of carcasses.

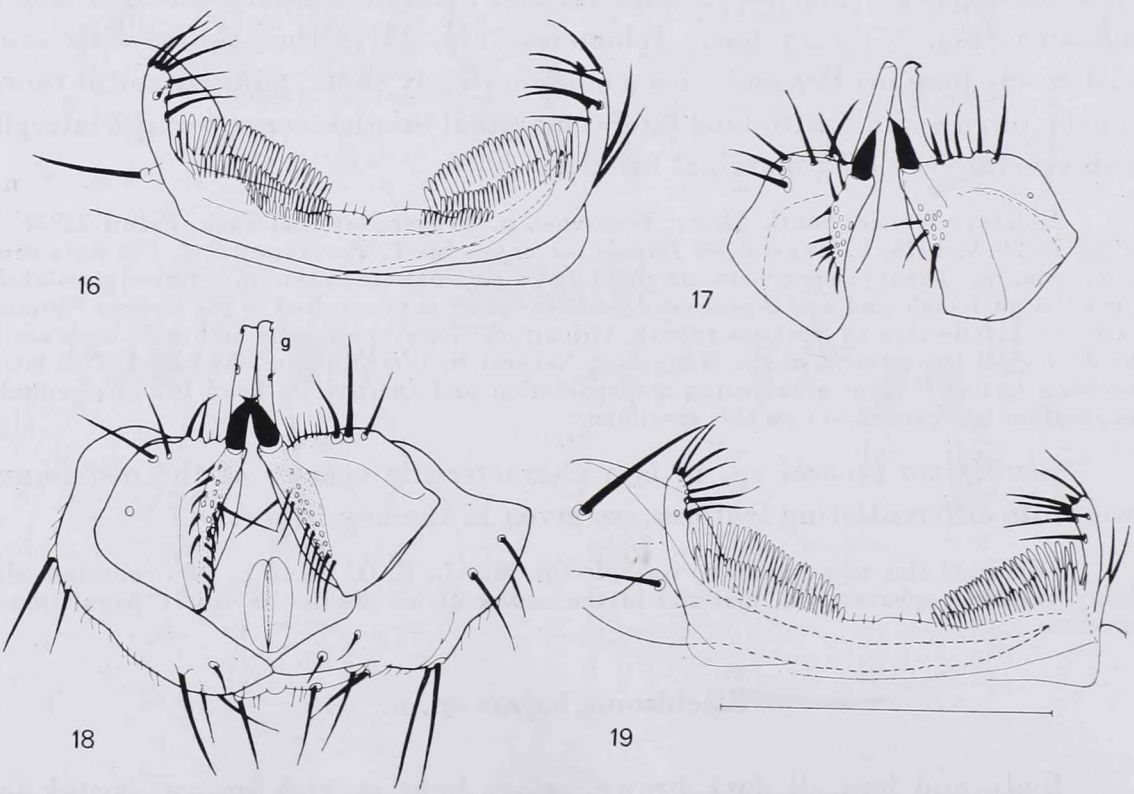
Elachisoma bajzae sp. n.

Body and legs all dark brown, wings light greyish brown, costal and radial veins brown to light brown, other veins concolorous with wings.

Length of body: holotype male: 0.82 mm, paratypes: 0.80—0.91 mm.

Length of head 0.18 mm, height 0.22 mm, width 0.29 mm, i.e. same as width of thorax. Cephalic and thoracic bristles as in *E. aterrimum*. 4—5 pairs of very short interfrontal hairs. Third antennal joint with dense long hairs apically, arista 0.247—0.26 mm, aristal cilia 0.02 mm. Length of eyes 0.14 mm, genae at narrowest 0.055—0.06 mm. Vibrissae rather weak, only 0.06 mm, peristoma with other 2 bristles of about half length. Wing measurements: 0.86×0.37 mm (holotype male), 0.82—0.88×0.34—0.37 mm (paratypes). Second costal section (mg_2) 0.11 mm (holotype male), (0.07), 0.09—0.11 mm (paratypes) third costal section 0.27 mm (holotype), 0.258—0.28 mm (paratypes), costal index 0.42 (holotype), 0.32—0.42 (paratypes), radial index 2.25 (holotype), 2.25—2.34 (paratypes). Vein r_{4+5} thicker than in *aterrimum*, anal vein geniculate, hind marginal cilia long, 0.022 mm. Bristles perpendicular to alar plane similar to those of *aterrimum*, a long bristle of 0.08 mm on mg_2 section, other bristles 0.04—0.045 mm, and not numerous (6—7). Hind crossvein 0.07 mm, section $t_a - t_p$ 0.015 (holotype). Knob of halteres elongated, blackish brown, stalk brown, short and thick. Legs short and thick, hind tibia with some moderately long dorsal bristles only (Fig. 9).

Male abdominal sternum 5 almost symmetrical, lateral arms apically with a small black thornlet each (right one bigger); mediocaudal part almost bare, its blunt thorns comparatively short (shorter than in *braacki*) and



Figs 16—19. *Elachisoma bajzae* sp. n., male genitalia. 16 = sternum 5 of a paratype, 17 = telomeres and postgonites, ventral view, 18 = periandrium, telomeres and postgonites of another paratype, 19 = sternum 5 of another paratype (g = postgonites). Scale: 0.1 mm

arranged into two rows on both sides (Figs 16, 19), a third incomplete row of some small thorns present in some specimens. Telomeres (Figs 17, 18) similar to those of *aterrimum* but apical black thorn with an acute apex. Female terga with moderately long but not numerous bristles.

Holotype male: Hungary: Börzsöny hg., Magyarkút — erdő — leg. PAPP L., 1980. VII. 6. Paratypes: 1 ♂, 1 ♀: ibid., rothadó szénáról, tölgyes [on rotten hay, oakwoods] — 1980. VIII. 14., leg. PAPP L.; 1 ♀: ibid., tölgyes — 1980. VIII. 15., leg. PAPP L.; 4 ♀: ibid., patakvölgy [creek-valley] — 1978. VIII. 5. — leg. BAJZA Zs.—PAPP L.; 3 ♂, 2 ♀: Őriszentpéter, Lugosi erdészház, vegyes lucos, rothadó szénáról [mixed spruce forest, on rotten hay], 29. VII.—2. VIII. 1980, leg. L. PAPP; 1 ♂: Aranyosgadány, trágyatelep [dung heap], 4. IV. 1972, leg. PAPP L.; 1 ♀: Csévharaszt, borókás, lótrágyáról [on horse droppings], 9. VIII. 1972, leg. BAJZA; Czechoslovakia: 5 ♂, 1 ♀: Slovakia or., Slovensky kras, Brzotín nr. Rožnava J. ROHÁČEK leg. — on refuse heap, 4. 9. 1980; 1 ♀: ibid., on cow excrement; Greece: 1 ♂: Grekl, Kreta, Malia 1 km S om. I fruktodling loc. 3., 10. V. 1979, leg. R. DANIELSSON. The latter seven paratypes are deposited in the collection of the Slezské Muzeum Opava, the holotype and other paratypes are in the Zoological Department of the Hungarian Natural History Museum, Budapest.

Elachisoma bajzae sp. n. is closely related to *E. aterrimum*, their differentiating features are summarized in the key.

I dedicate the new species to my wife, SUSAN BAJZA, who collected a part of this type-series, and who has supported my collecting and scientific activity in various ways.

Key for the Old World species of Elachisoma Rondani, 1880

1 (2) Bigger species, body-length 1.00—1.15 mm, length of wings 1.15—1.22 mm. Vein r_{4+5} very long, third costal section 0.50—0.63 mm, thus radial index very low, 1.51—1.60; costal index not low, since also second costal section comparatively long (0.185—0.25 mm). Head bristles, thoracic bristles and perpendicular costal bristles longest among the species of *Elachisoma* (Canary Is.) **E. euphorbiae** L. PAPP, 1977

2 (1) Smaller species, 0.7—1.0 mm. Vein r_{4+5} shorter, third costal section at most 0.35 mm radial index at least 1.85.

3 (4) Radial index 1.87—1.91, costal index 0.77—0.93, i.e. both second and third costal sections of wings longer than in other species (0.25—0.30 mm, 0.31—0.34 mm). Male abdominal sternum 3 very long and wide (quadrate), sternum 4 very short (shorter than sternum 5 sagittally), sternum 5 with a very deep medial emargination (Fig. 8), latero-caudally with a comb of blunt bristles on both sides. Telomeres (Fig. 7) with a strikingly strong ventromedial bristle (Europe from Great Britain to Hungary, Afghanistan, Oriental Region, Malaya, Java) **E. pilosum** (DUDA, 1924)

4 (3) Radial index 1.87—2.57 but costal index 0.20—0.90 with second costal section always shorter than 0.25 mm. Male abdominal sternum 3 smaller than sternum 4 (Fig. 1). Male sternum 5 at most slightly emarginate (Figs 4, 16). Male telomeres shaped otherwise.

5 (8) Costal bristles perpendicular to alar plane short, longest bristles only 0.025—0.03 mm. Male sternum 5 with asymmetrically placed black thorns and withour combs of blunt bristles (Figs 4, 6). Telomeres asymmetrical and comparatively long (Figs 3, 5).

6 (7) Legs slightly longer and less thick, length of hind femur longer than or as long as width of wings. Male sternum 5 as in Fig. 4. Telomeres (Fig. 3) thicker with some strong bristles and with blunt apex (Europe: Hungary, Spain, ?Bulgaria)
— — **E. kerteszi** (DUDA, 1924)

7 (6) Legs shorter and thicker, length of hind femur shorter than width of wings. Male sternum 5 as in Fig. 6. Telomeres (Fig. 5) thinner with weak bristles, left telomere tapering apically and somewhat shorter than in *kerteszi*. Radial index of wing 2.37—2.44 (Africa: Nigeria) **E. afrotropicum** sp. n.

8 (5) Costal bristles perpendicular to alar plane long, longest bristles 0.080—0.095 mm. Male sternum 5 symmetrical, without robust black thorns (Figs 10, 16) but with combs of blunt bristles. Telomeres symmetrical (Figs 11, 18) and short.

9 (10) Radial index of wings 2.37—2.57. Male abdominal sternum 5 with less numerous bristles in combs (Fig. 10). Pregenital bristles on right side of abdomen (Fig. 15) very long. Telomeres with comparatively short apical thorn (Fig. 11). Female terga 6 and 7 laterally with several very long marginal bristles. Costal index 0.20—0.32 (South Africa) **E. braacki** sp. n.

10 (9) Radial index of wings 1.87—2.34. Male abdominal sternum 5 with numerous bristles in combs (Figs 12, 16, 19). Pregenital bristle on right side of abdomen shorter. Telomeres with long apical thorn (Figs 13, 18). Female terga 6 and 7 laterally with the usual bristles. Costal index 0.32—0.90.

11 (12) Radial index of wings 1.87—2.08, second costal section 0.20—0.22 mm, costal index 0.68—0.90. Male sternum **5** with 3—4 combs on each side, median bare space narrow, bristles in caudal combs longer (Fig. 12). Telomeres with blunt apical thorns (Fig, 13, 14). Distribution: Europe, Asia (USSR: Tadzhikistan, Afghanistan), Canary Is., it has been reported from the Azores, St. Helena, Egypt and Zaire (RICHARDS, 1980) but these records need corroboration **E. aterrimum** (HALIDAY, 1833)

12 (11) Radial index 2.25—2.34, second costal section 0.09—0.11 mm (sometimes only 0.07 mm), costal index 0.32—0.42. Male sternum 5 with 2—3 combs on each side. Median bare area wide (Figs 16, 19). Telomeres with acute apical thorns (Figs 17, 18). Distribution: Europe: Czechoslovakia, Hungary, Greece (Crete) **E. bajzae** sp. n.

As it has been noted (PAPP, 1983), *Elachisoma spinicosta* COLLIN, 1966 must be an obscurous species; it seems probable that it is a species of the *Thoracochaeta brachystoma* species-group. The only New World species, *Elachisoma approximatum* (MALLOCH, 1913) seems close to the *aterrimum*-group. In the collection of the Hungarian Natural History Museum there are two specimens (♂, ♀ in poor condition) from St. Lucia (Antilles) which may also belong to this latter species.

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