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39/1993

Acta Zoologica Hungarica

VOLUME 39, NUMBERS 1-4, 1993

(20)

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ACTA ZOOL. HUNG. 39 (1-4) 1-342 (1993) HU ISSN 0236-7130

ACTA ZOOLOGICA HUNGARICA

A QUARTERLY OF THE HUNGARIAN ACADEMY OF SCIENCES

Acta Zoologica is published in yearly volumes of four issues by

AKADÉMIAI KIADÓ

Publishing House of the Hungarian Academy of Sciences
H-1117 Budapest, Prielle K. u. 19–35

Subscription information

Orders should be addressed to

AKADÉMIAI KIADÓ
H-1519 Budapest, P.O. Box 245

Subscription price for Volume 39 (1993) in 4 issues US\$ 84.00, including normal postage,
airmail delivery US\$ 20.00.

“This periodical is included in the document delivery program THE GENUINE ARTICLE of the Institute of Scientific Information, Philadelphia. The articles published in the periodical are available through *The Genuine Article* at the Institute for Scientific Information, 3501 Market Street, Philadelphia PA 19104.”

Acta Zoologica Hungarica is abstracted/indexed in AGRICOLA, Biological Abstracts, Bibliography of Agriculture, Chemical Abstracts, Current Contents — Agriculture, Biology and Environmental Sciences, Excerpta Medica, Horticultural Abstracts, Hydrex — Index, Plant Breeding Abstracts, Nutrition Abstracts and Reviews, Zoological Records.

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Acta Zoologica Hungarica 39 (1-4), pp. 1-12, 1993

IN MEMORIAM DR. ÁRPÁD SOÓS (1912-1991)

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(Received 16 March 1992)



**Dr. Árpád Soós
(1912-1991)**

ÁRPÁD SOÓS was born on the 20th of September 1912 in Budapest. His father, LAJOS SOÓS, was one of the greatest Hungarian zoologists in the first half of this century, so he had exceptionally good opportunity for an

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excellent education in science. He graduated from a famous secondary school of Budapest, "Eötvös József Reáliskola" and entered the Budapest University (Pázmány Péter, later Eötvös Loránd University), Faculty of Science and Arts at Budapest in 1930. He graduated in 1935 and he also obtained a diplom of "doctor rerum naturalis" in that year (majoring in zoology and taking exams also in botany and mineralogy). In 1942 he was qualified as a lecturer in the theme of the systematics of invertebrates. He earned the "Margó Award" of the Hungarian Royal Society of Natural History in 1942. He was the representative of the lecturers in the senate of the faculty for years.

From 1935 to 1939 he served as an unpaid assistant in the Department of General Zoology of the Budapest University. In the meantime he accepted a similarly unpaid position in the Hungarian Natural History Museum in 1936 where he worked uninterruptedly until his death (i.e. for 55 years). In 1940 he was offered a position of a paid museum assistant, in 1942 was appointed as assistant curator. First he curated the Collection of Vermes, later the Collection of Diptera and from 1950 to 1976 he was the curator of the Collection of Rhynchota in the Zoological Department. From 1950 to 1963 he served as the Deputy Director of the Zoological Department.

He visited the Limnological Institute of Tihany at Lake Balaton for several times conducting research on leeches, mosquitoes, etc. In 1942 he earned a Humboldt Scholarship for studies in Breslau (Wrocław) with Prof. F. PAX. He conducted research and collected insects during his numerous study trips in Belgium, Germany, Austria, Poland, Czechoslovakia, Yugoslavia, Roumania, Bulgaria and the Soviet Union.

His research interest covered histology, nematology, malacology, parasitology (leeches), dipterology and homopterology/hemipterology. His way of research was not the way of the polyhistors: his research interest changed a couple of times during his long and fruitful scientific career but he worked always with the standard and rigorousness of the specialists.

The career was begun – after completing his thesis on Molluscs – with free living Nematodes. Beyond basic faunistic works he made the first modern ecological research in Hungarian zoology and had set up the standard for many of later zooecologists. When a young zoologist begun the work on this group, he turned toward another neglected group of animals, the leeches.

He worked on Hirudinea for several decades, between 1939 and 1972. During this time he published 21 papers, most of them in English. His first research was a faunistical study of the Hirudinea of the county Bars, however, he has quite soon tackled the taxonomy, systematics and nomenclature of Euhirudinea (a subclass of Hirudinea) consisting of more than 700 species.

His collection – housed in the Zoological Department of the Hungarian Natural History Museum – is particularly important. Besides numerous series of species living in the Danube catchment area, it contains specimens of almost all taxa described up to about 1970, hence it is even today the most valuable leech collection in Europe.

Special emphasis should be given to his scientific work. He was the first who revised all genera and species of this old group of animals which are distributed in marine, freshwater and terrestrial habitats. He elaborated an identification key of all leech taxa known at that time and critically revised the generic and specific features. Based on his precise zoological investigations, he presented a complete overview of Euhirudinea, summarizing the large quantity of smaller and widely scattered papers. For the first time his publications contained a complete synonymy of each taxon and were helpful in clarifying the formerly confused nomenclature. Without his work the present-day level of hirudinology would not have been attained.

His work done on Homoptera and Heteroptera may seem not to be very voluminous, since altogether only 13 scientific papers were published on these two insect orders. This is by no means in harmony with the overall appreciation he earned among homopterists and heteropterists of Europe. The reason is, that most of his work on these groups was made in and on the collection of GÉZA HORVÁTH, the eminent hemipterist. When L. TÓTH, HORVÁTH's successor left Hungary after the Second World War, Soós took the responsibility of the collection and began to form a modern collection of it. The material was, according to the customs of many entomologists, in smaller-larger boxes, in an order none could easily understand. It took 4 years to arrange the collection which then could serve as a good basis for many entomologists in Hungary and abroad.

By this time his first papers on Homoptera were published: completions of the *Fauna Regni Hungariae*, the first faunistic survey of Hungary, published in 1897. Recognizing the fact that without good knowledge of the Palaearctic species one cannot be a good specialist he made revisionary works on Palaearctic scale. His research on Homoptera (as well as in other groups of animals) was accompanied by his assistance to the work of some Hungarian zoologists. In a late paper in 1976 he could describe a new genus from Spain and name the species in honour of the founder of the collection: G. HORVÁTH.

As with Homoptera, in Heteroptera he also began with a completion of *Fauna Regni Hungariae*. The first group he studied in more details was the aquatic bugs, and after publishing a synopsis of Palaearctic *Callicorixa* species he completed the first Heteroptera part in the series *Fauna Hungariae*. His 1973 paper shows that he prepared another part: *Lygaeidae*. In the fifties and sixties repeated explorations were made at Lake Balaton

and Lake Velencei. Recognizing the call of times he summarized these results in a lecture on the effect of human impact on the aquatic bug fauna in Leningrad, in 1977. From this time on his interest turned back from Homoptera and Heteroptera to his most beloved group: Diptera.

It is probably the science of dipterology where ÁRPÁD Soós achieved the most in results and in recognition. He was a specialist of several acalyptrate families, like Sepsidae, Piophilidae, Clusiidae, etc. (see also below). He built up excellent collections describing numerous new taxa.

His main work and greatest endeavour was the Catalogue of Palaeartic Diptera (C.P.D.). The C.P.D. was initiated by him and L. PAPP; they proposed it in the appropriate place and time (at the 7th Symposium of the Societas Internationalis Entomofaunisticae Europae Centralis which was held in Leningrad on September 19–24, 1977). More than half of the potential (and later actual) authors of the Catalogue attended this convention and had assembled in a special workshop to discuss the proposal. The Section of Biological Sciences of the Hungarian Academy of Sciences supported the initiative and the Publishing House of the Hungarian Academy of Sciences, Budapest (Akadémiai Kiadó) undertook publication and ÁRPÁD Soós was appointed as Editor-in-Chief. During publication, the C.P.D. Board of Editors did not function according to the original plan, e.g. the Board was never able to convene with the majority of members present. Soós's numerous travels and his consultations largely supplemented the meetings of an unhindered Board.

In December 1978 he sent out the first circular letter (later other four circulars were sent out until 1983; for details see Soós & PAPP 1992).

After all, Vols 9 and 10 were published on 15th October, 1984; they were followed irregularly by other ones, until he arrived, before Christmas 1990, to the completion of the *manuscript* of Vol. 13, the last but two in the order of publication. In the last weeks of his active time he worked on the introductory part of Volume 1 and made some preparatory editorial work on that volume (which was completed by P. OOSTERBROEK and L. PAPP; and since the publication of Vol. 13 was suspended by the Akadémiai Kiadó in the summer of 1991, Vol. 1 was issued earlier than Vol. 13; Vol. 14, comprising the cumulative index can be finished after having a clean proof for Vol. 13).

The Catalogue contains the basic taxonomic, nomenclatorial and distribution data of all species described from the Palaeartic Region, and also of those known from it (besides the fundamental morphological features of the majority of fly groups). The period of the Catalogue extends from 1758 to 31 December, 1982.

Since in the several volumes of the C.P.D. no *publicatum* had been expressly given, the Editors arbitrarily considered the date of publication as

the day on which the Volume concerned could first be purchased in the bookshops of Budapest. The dates of publication thus "defined" are as follows:

- Vol. 1: April 30, 1992
- Vol. 2: November 30, 1990
- Vol. 3: March 15, 1988
- Vol. 4: December 1, 1986
- Vol. 5: January 1, 1988
- Vol. 6: March 1, 1989
- Vol. 7: April 25, 1991
- Vol. 8: September 20, 1988
- Vol. 9: October 15, 1984
- Vol. 10: October 15, 1984
- Vol. 11: March 1, 1986
- Vol. 12: March 1, 1986
- Vol. 13: see publicatum on the last page of the volume
- Vol. 14: see publicatum on the last page of the volume.

The greatest difficulty in editing the C.P.D. was the fact that there was never a technical staff at Soós's disposal (he had at most one technical assistant); the shaping and publication of the Catalogue took 15 years – and is not yet completed. He was open to any criticism which was addressed partly to exceeding consistency and rigid adherence to the established forms, and partly (and quite contrarily) the inconsistency of the Editors in allowing – by reference to authorship licence – headstrong authors to deviate from these very forms. He said repeatedly: "The most deserving recognition of our work would be the complete unveiling of all the mistakes and lacks of the Catalogue in revisions and in papers, as soon and as completely as possible." He had never aimed at a consummate Great Opus, only the accomplishment of a usable tool and thus serving the science of dipterology. Regrettably, it is the obligation of the survivors to complete the C.P.D. He was also the author of numerous parts, namely:

Micropezidae, Neridae, Tanypezidae, Psilidae, Pyrgotidae, Platystomatidae, Otitidae, Dryomyzidae, Neottiophilidae, Clusiidae, Trixoscelididae, Chyromyidae, Opomyzidae, Tethinidae; as co-author: Cylindrotomidae (jointly with P. OOSTERBROEK), Scenopinidae (jointly with L. P. KELSEY), Hippoboscidae, Nycteribiidae, Streblidae (jointly with K. HÜRKA), Gasterophiliidae, Oestridae, Hypodermatidae (jointly with J. MINÁR).

He was the editor of several journals: *Fragmenta Faunistica Hungarica, Állattani Közlemények, Egyetemek Biológiai Évkönyve [Annales of Universities, Biology], Folia Entomologica Hungarica*. From 1959 to 1984 he edited the journal *Acta Zoologica Hungarica*.

He was active in many professional societies, and was honoured by many of them:

Zoological Committee of the Hungarian Academy of Sciences (member for numerous years and its secretary from 1955 to 1957), Hydrobiological Committee of the Hungarian Academy of Sciences (from 1970 to 1987), Zoological Section of the Hungarian Biological Society (member for decades, its president from 1970 to 1974, the Society presented him the Gelei József Award), Hungarian Society of Parasitologists (member of its Board from 1963 to 1975), Hungarian Entomological Society (President from 1963 to 1969). He was awarded the Gold Medal of the "Frivaldszky Memorial Plaque" and was a member of the Society for more than 50 years!). He also received the medal "In scientia entomofaunistica excellenti" from the Societas Internationalis Entomofaunisticae Europae Centralis in 1988.

He passed away on 1st of June 1991. He was survived by his wife, three daughters, three sons and sixteen grandchildren.

SCIENTIFIC PUBLICATIONS OF DR. Á. SOÓS ACCORDING TO ANIMAL GROUPS

Mollusca

- 1934: A *Tropidiscus carinatus* Müll. magyarországi előfordulása. [The occurrence of *Tropidiscus carinatus* Müll. in Hungary.] – *Állattani Közlem.* **31:** 213–214.
 1935: A magyarországi Planorbis-félék ivarkészülékének alak- és szövettana. (Morphologie und Histologie des Geschlechtsapparates der ungarischen Planorbis-Arten.) – *Állattani Közlem.* **32:** 21–46.
 1937: Az *Anisus septemgyratus* rendszertani helye. (Die systematische Stellung von *Anisus septemgyratus*.) – *Állattani Közlem.* **34:** 83–87.
 1950: Puhatestűek – Mollusca. – In: L. MÓCZÁR (ed.): *Állathatározó*, Tankönyvkiadó, Budapest, pp. 712–729.

Vermes

- 1936: Magyarország mohában élő fonalférgeiről. I. (Über die mossbewohnenden Nematoden Ungarns I.) – *Állattani Közlem.* **33:** 53–64.
 1936: A hőmérésklet ökológiai jelentősége a mohában élő fonalférgek életében. (Die Temperatur als ökologischer Faktor im Leben der mossbewohnenden Fadenwürmer.) – *Állattani Közlem.* **33:** 160–173.
 1937: Magyarország mohában élő fonalférgeiről. II. (Über die moosbewohnenden Nematoden Ungarns.) – *Állattani Közlem.* **34:** 42–46.
 1937: *Pseudorhabdolaimus limnophilus* n.g. n. sp., eine neue, freilebende Nematode. – *Zool. Anz.* **118:** 323–325.
 1938: A magyarországi tőzegmoha-lápok fonalférgeiről. (Die Nematoden der ungarischen Sphagnummoore.) I. – *Állattani Közlem.* **35:** 61–83.
 1938: Zwei neue typhobionte Nematoden-Arten. – *Zool. Anz.* **124:** 281–286.
 1940: Über die Nematoden eines neuen, bisher unbekannten Sphagnum-Vorkommen. – *Fragm. Faun. Hung.* **3:** 17–18.
 1940: A magyarországi tőzegmoha-lápok fonalférgeiről. (Die Nematoden der ungarischen Sphagnummoore). II. – *Állattani Közlem.* **37:** 71–91.

- 1940: Beiträge zur Kenntnis der moosbewohnenden Nematoden Ungarns. – *Fragm. Faun. Hung.* **3**: 38–71.
- 1940: Magyarország szabadonélő fonálférgeinek jegyzéke. (Verzeichnis der freilebenden Nematoden Ungarns.) – *Annls hist.-nat. Mus. natn. hung.* **33** (pars zool.): 79–97.
- 1941: A magyarországi tőzegmoha-lápolon élő fonálférgeiről. III. (Die Nematoden der ungarischen Sphagnummoore.) III. – *Állattani Közlem.* **38**: 35–48.
- 1941: Über die Nematoden eines neuen Sphagnum-Vorkommens in Ungarn. – *Fragm. Faun. Hung.* **4**: 52.
- 1941: Rhabditis carpathicus spec. nov., eine neue in Sphagnum-Mooren lebende Nematode. – *Fragm. Faun. Hung.* **4**: 115–116.
- Soós Á. & F. PAX (1943): Die Nematoden der deutschen Schwefelquellen und Thermen. – *Arch. f. Hydrobiol.*, Aug. Thienemann Festband, **40**: 123–183.
- 1943: Süßwasser-Nematoden aus dem Komitat Bars. – *Fragm. Faun. Hung.* **6**: 29.
- 1943: Adatok a Crenobia alpina, Euplanaria gonocephala és Polycelis cornuta hazai elterjedéséhez. (Beiträge zur Kenntnis der Verbreitung von Crenobia alpina, Euplanaria gonocephala und Polycelis cornuta in Ungarn.) – *Annls hist.-nat. Mus. natn. hung.* **36**: 25–33.
- 1944: A szabadon élő fonálférgek (Nematoda) gyűjtése és konzerválása. [Collecting and conservation of free living nematods.] – *Fragm. Faun. Hung.* **7**: 63–73.
- 1948: Szabadon élő fonálférgek – Nematoda [Free living nematods.] – in E. DUDICH (ed.): *Az állatok gyűjtése* **1**: 79–87.
- Soós Á. & PAX, F. (1950): Nematoden aus mitteleuropäischen Mineralquellen. – *Zool. Anz.* **145**: 92–100.
- 1950: Véglények – Protozoa. – in L. MÓCZÁR (ed.): *Állathatározó*, Tankönyvkiadó, Budapest, pp. 17–24.
- 1950: Szivacsok – Porifera. Csalánozók – Cnidaria. – in L. MÓCZÁR (ed.): *Állathatározó*, Tankönyvkiadó, Budapest, pp. 25–28.
- 1950: Féregk – Vermes. – in L. MÓCZÁR (ed.): *Állathatározó*, Tankönyvkiadó, Budapest pp. 28–48.
- 1950: Féreglábúak – Archipodiata, Tapogatókoszorúsok – Tentaculata. – in L. MÓCZÁR (ed.): *Állathatározó*, Budapest, pp. 49–52.
- 1953: Bátorliget szabadonélő fonálféreg-faunája – Nematoda [Free-living nematods in Bátorliget.] – in V. SZÉKESSY: *Bátorliget élővilága*, Akadémiai Kiadó, Budapest, pp. 163–172.
- 1962: Szabadon élő “féreg” csoportok és féreglábúak – Platylhelminthes, Nemathelmintes, Aschelminthes, Camptozoa, Annelida, Archipodiata. – In: L. MÓCZÁR (ed.): *Állatok gyűjtése*, Tankönyvkiadó, Budapest, pp. 42–66.

Hirudinoidea

- 1939: Hirudineen aus dem Komitat Bars. – *Fragm. Faun. Hung.* **2** (3): 44–46.
- 1940: A Tihanyi-félsziget piócafauánáról. (Über die Blutegel-Fauna der Halbinsel Tihany.) – *Magyar Biol. Kut. Int. Munk.* **12**: 290–295.
- 1958: New data to the ecology and distribution in the Carpathian Basin of Trocheta Bykovskii Gedr. (Hirudinea). – *Annls hist.-nat. Mus. natn. hung.* (ser. nov.) **50** (9): 173–177.
- 1963: New leeches (Hirudinea) from the fauna of Hungary. – *Annls hist.-nat. Mus. natn. hung.* **55**: 285–292.
- 1963: Identification key to the species of the genus Diana R. Blanchard, 1892 (emend. Mann, 1952) (Hirudinea: Erpobdellidae). – *Acta Univ. Szegediensis, Acta biol. N.S.* **9** (1–4): 253–261.
- 1964: Milyen piócafajok várhatók még a magyar faunában? (Leech species to be shown in the Fauna of Hungary.) – *Állattani Közlem.* **51**: 125–133.
- 1964: A revision of the Hungarian fauna of Rhynchobdellid leeches (Hirudinea). – *Opusc. zool. Budapest* **5** (1): 107–112.
- 1965: Identification key to the leech (Hirudinoidea) genera of the world, with a catalogue of the species. I. Family: Piscicolidae. – *Acta Zool. Hung.* **11** (3–4): 417–463.

- 1966: Identification key to the leech (Hirudinoidea) genera of the world, with a catalogue of the species. II. Families: Semiscolecidæ, Trematobdellidæ, Americobdellidæ, Diestecostomatidæ. – *Acta Zool. Hung.* **12** (1–2): 145–160.
- 1966: Identification key to the leech (Hirudinoidea) genera of the world, with a catalogue of the species. III. Family: Erpobdellidæ. – *Acta Zool. Hung.* **12** (3–4): 371–407.
- 1966: On the genus *Glossiphonia* Johnson, 1816, with a key and catalogue to the species (Hirudinoidea: Glossiphoniidæ). – *Annls hist.-nat. Mus. natn. hung.* **58**: 271–279.
- 1967: Identification key to the leech (Hirudinoidea) genera of the world, with a catalogue of the species. IV. Family: Haemadipsidæ. – *Acta Zool. Hung.* **13** (3–4): 417–432.
- 1967: On the genus *Batracobdella* Viguier, 1897, with a key and catalogue to the species (Hirudinoidea: Glossiphoniidæ). – *Annls hist.-nat. Mus. natn. hung.* **59**: 243–257.
- 1967: On the genus *Hemiclepsis* Vejdovsky, 1884, with a key and catalogue of the species (Hirudinoidæ: Glossiphoniidæ). – *Opusc. zool. Budapest* **7** (1): 233–240.
- 1967: On the leech fauna of the Hungarian beach of the Danube (Danubialia Hungarica, XLII). – *Opusc. zool. Budapest* **5** (2): 241–257.
- 1968: A new leech genus: Richardsonianus gen. nov. (Hirudinoidea: Hirudinidæ). – *Acta Zool. Hung.* **14** (3–4): 455–459.
- 1968: Identification key to the species of the genus *Erpobdella* de Blainville, 1818 (Hirudinoidea: Erpobdellidæ). – *Annls hist.-nat. Mus. natn. hung.* **60**: 141–145.
- 1969: Identification key to the leech (Hirudinoidea) genera of the world, with a catalogue of the species. V. Family: Hirudinidæ. – *Acta Zool. Hung.* **15** (1–2): 151–201.
- 1969: Identification key to the leech (Hirudinoidea) genera of the world, with a catalogue of the species. VI. Family: Glossiphoniidæ. – *Acta Zool. Hung.* **15** (3–4): 397–454.
- 1970: A zoogeographical sketch of the freshwater and terrestrial leeches (Hirudinoidea). – *Opusc. zool. Budapest* **10** (2): 313–324.
- 1973: Az európai szárazföldi piócák (On the European land leeches.) (Hirudinoidea: Xerobdellidæ). – *Állattani Közlem.* **60**: 103–109.

Homoptera

- 1950: Rhynchota. – In: L. MÓCZÁR (ed.): *Állathatározó*, Tankönyvkiadó, Budapest, pp. 619–675.
- 1954: Revision und Ergänzungen zum Homopteren-Teil des Werkes “Fauna Regni Hungariae”. II. 4. Issidae, 5. Tropiduchidae, 6. Tettigometridæ. – *Ann. hist.-nat. Mus. natn. hung.* (ser. nov.) **5**: 423–431.
- 1954: Bestimmungstabelle der paläarktischen Cixiiden-Gattungen (Homoptera, Fulgoroidea). – *Annls hist.-nat. Mus. natn. hung.* (ser. nov.) **5**: 419–421.
- 1954: Revision und Ergänzungen zum Homopteren-Teil des Werkes “Fauna Regni Hungariae”. II. 4. Issidae, 5. Tropiduchidae, 6. Tettigometridæ. – *Ann. hist.-nat. Mus. natn. hung.* (ser. nov.) **5**: 423–431.
- 1956: Revision und Ergänzungen zum Homopteren-Teil des Werkes “Fauna Regni Hungariae”. III. 7. Cicadidae, 8. Membracidae, 9. Ulopidae – *Folia Ent. Hung.* **9** (19): 411–421.
- 1962: Poloskák és kabócák – Heteroptera, Homoptera. – In: L. MÓCZÁR (ed.): *Állatok gyűjtése*, Tankönyvkiadó, Budapest, pp. 272–287.
- YOUNG, D. A. & SOÓS, Á. (1964): Types of Cicadellinae (Homoptera: Cicadellidae) in the Hungarian Natural History Museum. – *Annls hist.-nat. Mus. natn. hung.* **56**: 465–467.
- 1969: Kabócák – Homoptera. – In: L. MÓCZÁR (ed.): *Állathatározó*, Tankönyvkiadó, Budapest, pp. 319–348.
- 1976: Spenidius horvathi gen. n., sp. n. aus Spanien (Homoptera: Issidae). – *Folia. Ent. Hung.* **29** (1): 87–91.
- 1976: Új és ritka sarkantyúskabóca fajok a magyar faunában I. (Homoptera: Delphacidae, Criomorphinae) (Neue und wenig bekannte Delphaciden aus Ungarn. I.) – *Folia Ent. Hung.* **29** (1): 93–102.

Heteroptera

- 1969: Poloskák – Heteroptera. – In: L. MÓCZÁR (ed.): *Állathatározó*, Tankönyvkiadó, Budapest, pp. 260–318.
- 1959: Revision und Ergänzungen zum Heteropteren-Teil des Werkes “Fauna Regni Hungariae”. I. I. Corixidae. – *Annls hist.-nat. Mus. natn. hung.* **51**: 429–441.
- 1961: Redescription of *Callicorixa caspica* Horv., and notes on *Callicorixa bellula* Horv. (Heteroptera, Corixidae). – *Annls hist.-nat. Mus. natn. hung.* **53**: 499–504.
- 1961: Synopsis of the Palaearctic Species of *Callicorixa* B. White s.l. (Heteroptera: Corixidae). – *Acta Zool. Hung.* **7**: 467–476.
- 1962: Poloskák és kabócák – Heteroptera, Homoptera. – In: L. MÓCZÁR (ed.): *Állatok gyűjtése*, Tankönyvkiadó, Budapest, pp. 272–287.
- 1963: Poloskák VIII., Heteroptera VIII. – in: *Magyarország Állatvilága, Fauna Hungariae*, Akadémiai Kiadó, Budapest, XVII. 8, pp. 48.
- 1973: Uj és ritka bodobács fajok a magyar faunában. I. (Neue und wenig bekannte Lygaeiden-Arten aus der ungarischen Fauna I.) (Heteroptera). – *Folia Ent. Hung.* **26** (2): 373–384.
- 1979: Veränderungen der Wasserhemipterenfauna des Balaton- und des Velenceer-Sees durch menschliche Einwirkungen. – *Verh. VII. SIEEC*, Leningrad, pp. 143–146.

Diptera

(in the consequence of papers in Dr. Á. Soós's own list)

- 1938: Die Bohrfliegen des historischen Ungarns. I. Subfamilia: Trypetinae. – *Fragm. Faun. Hung.* **1** (1): 5–8.
- 1938: Die Bohrfliegen des historischen Ungarns. II. Subfamilia: Terellinae. – *Fragm. Faun. Hung.* **1** (4): 83–85.
- 1940: Die Phryneiden Ungarns (Dipt.). – *Fragm. Faun. Hung.* **3** (4): 123–124.
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A TAXONOMIC SURVEY OF THE FAMILY MONONCHIDAE (NEMATODA)

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(Received 20 April 1992)

This paper, first one of a series, draws a taxonomic picture of the family Mononchidae. It presents 11 genera grouped into two subfamilies: *Mononchus*, *Paramononchus*, *Nigronchus*, *Coomansus*, *Clarkus*, *Prionchulus*, *Actus*, *Sporonchulus*, *Judonchulus* (Mononchinae) and *Cobbonchus*, *Comiconchus* (Cobbonchinae). 100 valid species are enumerated and characterized in form of identification keys. Four species, *Mononchus pulcher*, *Coomansus splendidus*, *Prionchulus mordax* and *Cobbonchus pleiades* spp. n., are described as new to science. With 9 (53) original figures.

The superfamily Mononchoidea CHITWOOD, 1937 is one of the most characteristic and attractive groups of the free-living Nematoda. Its representatives are common in having a spacious, heavily sclerotized buccal cavity provided with various sorts of teeth or denticles. They are, one and all, predaceous – capturing predominantly other nematodes – and are at home in all parts of the globe, in every zone and habitat.

Notwithstanding that they are comparatively large-sized animals and consequently easy to study, their systematization seems to be a hard nut to crack. Most of the nematologists agree that these nematodes belong to the order Dorylaimida and form – in company with another superfamily, Bathyodontoidea CLARK, 1961 – a suborder, Mononchina JAIRAJPURI, 1969. Their closer system is however a real Procrustes' bed. So far, not less than six families, ten subfamilies, 43 genera and nearly 400 species have been described under the Mononchoidea or ordered to that. Both in outlining the genera and higher taxa and in recognizing the species we often have to face difficulties. The present paper, as well as two planned ones, wish to lend a helping hand in orientation within the group.

As for the history of the Mononchoidea – commonly the mononchs – I do not want to go here into details. Nevertheless, some main steps of that should be mentioned. Well, it was BASTIAN (1865) who established the type genus, *Mononchus*, and described some first species. COBB (1916) called the attention to these fascinating animals, and gave a fundamental revision in his classic paper (1917). So far, this latter one is perhaps the most valuable contribution having ever been written in the subject. Then many years had

to go by, until ANDRÁSSY (1958) published his new revision. While COBB outlined one genus with some subgenera only, ANDRÁSSY already recognized eleven separate genera. So putting them in "order" several further authors began studying the mononchids. CLARK (1960 to 1963) redescribed numerous species and discussed the phylogeny and systematics of the Mononchida with modern eyes. MULVEY is the next in turn; his genus revisions (1963 to 1967) and a view on the group (1978) are valuable works today, too. Several contributions of COETZEE (1965 to 1968) as well as of JAIRAJPURI (1969 to 1971) enriched our knowledge. ANDRÁSSY (1976) systematized the Mononchoidea again, and distinguished three families and 24 genera. However, we have to thank JAIRAJPURI and KHAN (1982) for the most voluminous and up-to-date monograph. A good number of further names ought to be mentioned but let us now content ourselves with those who are enumerated in the literature list of the present paper.

To come to the point, I do not think to be on the wrong way if I distinguish three large groups within the Mononchoidea: 1) forms with oblong and at the base tapering buccal cavity bearing large subventral teeth, or in longitudinal ridges arranged or scattered denticles, and with simple posterior end of oesophagus; 2) those with broad and at the base flattened buccal cavity bearing large subventral teeth, or in longitudinal ridges arranged or scattered denticles, but with tuberculate posterior end of oesophagus; 3) those with ovoid, at the base strongly tapering buccal cavity showing an especially large, claw-like dorsal tooth, rasp-like subventral denticles grouped in transverse rows, and with no tubercles at the posterior end of oesophagus. Each of these groups represents a family (in order as above): the Mononchidae CHITWOOD, 1937, Anatongidae JAIRAJPURI, 1969 and Mylonchulidae JAIRAJPURI, 1969.

These three families are acknowledged by me as valid and natural units within the Mononchoidea. I want to show them in details in the present article and two subsequent ones.

Family **MONONCHIDAE** CHITWOOD, 1937

Mononchina, Mononchoidea. Medium-sized to large animals, generally well over 1 mm. Buccal cavity spacious, more or less oval, tapering at base, and armed at least with a large dorsal tooth predominantly located in the anterior part of stoma, and pointing forward. Subventral walls either smooth or provided with large teeth or small denticles arranged in longitudinal ridges or scattered irregularly. Oesophago-intestinal junction simple, not tuberculate.

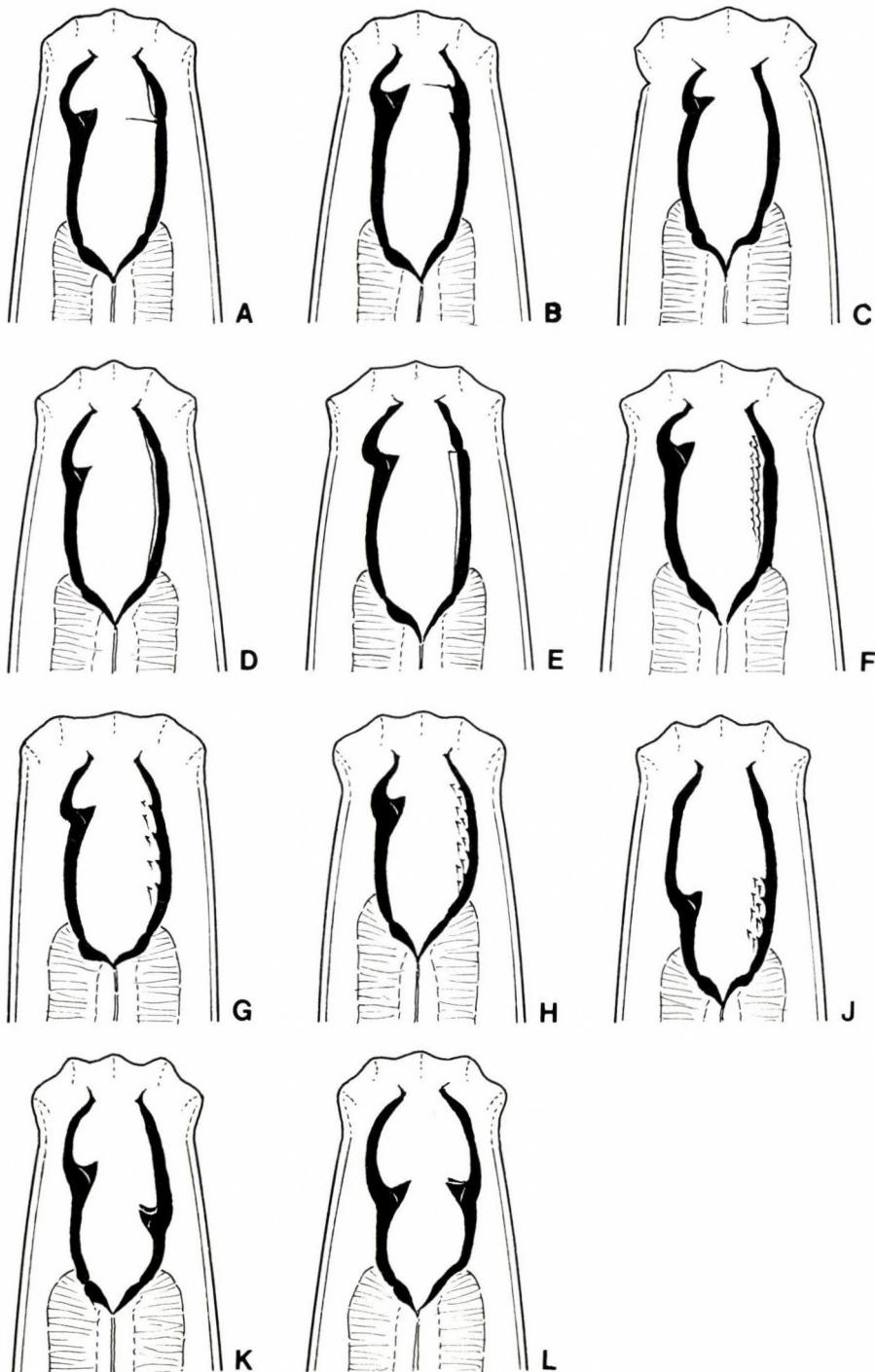


Fig. 1. Buccal cavities of the genera in the family Mononchidae (A–J = Mononchinae; K–L = Cobbonchinae): A = *Mononchus*, B = *Paramononchus*, C = *Nigronchus*, D = *Coomansus*, E = *Clarkus*, F = *Prionchulus*, G = *Actus*, H = *Sporonchulus*, J = *Judonchulus*, K = *Cobbonchus*, L = *Comiconchus*

The shape of buccal cavity (Fig. 1), shape and arrangement of teeth or denticles and the non-tuberculate posterior end of oesophagus serve as main characters of the family. It differs from Anatonchidae JAIRAJPURI, 1969 in having an oval, posteriorly tapering buccal cavity and a simple oesophago-intestinal junction, from Mylonchulidae JAIRAJPURI, 1969 in having a more barrel-shaped buccal cavity, a less developed and other-shaped dorsal tooth and denticles never arranged in transverse rows.

The eleven genera may be grouped in two subfamilies: Mononchinae CHITWOOD, 1937 (with 9 genera) and Cobbonchinae JAIRAJPURI, 1969 (with 2 genera).

Subfamily **MONONCHINAE** CHITWOOD, 1937

Mononchidae. Dorsal wall of buccal cavity armed with a large tooth predominantly situated in the anterior part, rarely near the mid-region of stoma and directed forward. Subventral walls without large teeth but generally with smooth or serrate longitudinal ridges or small denticles.

Nine genera (with 72 species):

<i>Actus</i> BAQRI et JAIRAJPURI, 1974	<i>Prionchulus</i> COBB, 1916
<i>Clarkus</i> JAIRAJPURI, 1970	<i>Mononchus</i> (<i>Prionchulus</i> COBB, 1916)
<i>Coomansus</i> JAIRAJPURI et KHAN, 1977	<i>Sporonchulus</i> COBB, 1917
<i>Judonchulus</i> ANDRÁSSY, 1958	<i>Mononchus</i> (<i>Sporonchulus</i> COBB, 1917)
<i>Mononchus</i> BASTIAN, 1865	<i>Sporonchuloides</i> MOHANDAS et PRABHOO, 1982 (syn. n.)
<i>Nigronchus</i> SIDDIQI, 1984	
<i>Paramononchus</i> MULVEY, 1978	

KEY TO GENERA

- 1 Dorsal tooth opposed by plain walls or smooth transverse or longitudinal ribs; subventral denticles absent 2
- Dorsal tooth opposed by serrate longitudinal ridges or regularly/irregularly arranged small denticles 5
- 2 Head sharply offset by a constriction; female prodelphic **Nigronchus** SIDDIQI
- Head not or hardly offset; female amphidelphic (in one species opisthodelphic) 3
- 3 Subventral walls of stoma with two fine transverse ribs levelling with dorsal tooth; caudal glands and terminal porus conspicuous **Mononchus** BASTIAN
- Subventral walls of stoma either smooth or showing a longitudinal ridge 4
- 4 Ventral ridge originating abruptly by a tooth-like anterior projection **Clarkus** JAIRAJPURI
- Ventral ridge – if present – originating gradually without a tooth-like projection **Coomansus** JAIRAJPURI et KHAN
- 5 Subventral walls with two closely arranged serrate or denticulate longitudinal ribs 6
- Subventral walls with small denticles not arranged on longitudinal ribs 7

- 6 Subventral ribs short, level with dorsal tooth and armed with two pairs of small denticles situated at an equal distance from each other; tail elongate, cylindroid, terminal porus present
Paramononchus MULVEY
- Subventral ribs longer, mostly reaching to the posterior half of stoma, densely serrate (denticles contiguous); tail short, conoid, terminal porus absent
Prionchulus COBB
- 7 Dorsal tooth midway in stoma or farther back; tail elongate, cylindroid
Judonchulus ANDRÁSSY 8
- Dorsal tooth far anterior in stoma; tail conoid
- 8 Subventral denticles in two irregular rows, 8–12 in number
Actus BAQRI et JAIRAJPURI
- Subventral denticles in four irregular rows, 20–25 in number
Sporonchulus COBB

Genus **Mononchus** BASTIAN, 1865

Mononchidae, Mononchinae. Body length varying between 1 and 6 mm. Buccal cavity oval, twice to thrice as long as wide, armed with a well developed dorsal tooth lying in the anterior third to sixth of stoma and pointed forward. Opposite to the dorsal tooth each subventral wall showing a thin transverse rib. A short and weak longitudinal rib may be present in the anterior third of buccal cavity. Posterior end of oesophagus not tuberculate. Female amphidelphic, in one species opisthodelphic, vulva at mid-region, in 46 to 62% of body length. Males known for the greater part of species. Spicula long and slender. Supplementary papillae 10 to 47 in number. Tails of both sexes similar, either short and obtuse or elongate, cylindroid, as long as 1.2 to 8 anal body diameters. Caudal glands and terminal spinneret always distinct.

Type species: *Mononchus truncatus* BASTIAN, 1865.

In comparison with other genera in the subfamily, the fine transverse ribs on the subventral walls, the well developed caudal glands and spinneret and the long and thin spicula are characteristic for this genus.

Predominantly aquatic animals; devouring their preys in toto. The genus is distributed over the world; Europe is represented by 7, Asia by 7, Africa by 3, North America by 8, South America by 3 and Australia by 2 species. The most common one of them is *Mononchus truncatus* recorded from 42 countries or states hitherto.

Fourteen species:

- | | |
|---|---------------------------------------|
| <i>M. angarensis</i> GAGARIN, 1984 | <i>M. maduei</i> SCHNEIDER, 1925 |
| <i>M. aquaticus</i> COETZEE, 1968 | <i>M. mulveyi</i> ANDRÁSSY, 1985 |
| <i>M. clarki</i> ALTHERR in ALTHERR et DELAMARE DEBOUTTEVILLE, 1972 | Mononchus maduei apud MULVEY, 1978 |
| <i>M. italicus</i> ANDRÁSSY, 1959 | <i>M. niddensis</i> SKWARA, 1921 |
| Clarkus italicus (ANDRÁSSY, 1959) JAIRAJPURI, 1970 | <i>M. nudus</i> GAGARIN, 1991 |
| | <i>M. pulcher</i> sp. n. |
| | <i>M. sinensis</i> SONI et NAMA, 1983 |

<i>M. superbus</i> MULVEY, 1978	Mononchus tenuicaudatus STEFANSKI, 1914
<i>M. tajmiris</i> GAGARIN, 1991	Mononchus megalaimus COBB, 1917
<i>M. truncatus</i> BASTIAN, 1865	Mononchus brevicavatus KREIS, 1924
<i>Mononchus macrostoma</i> BASTIAN, 1865	Mononchus fusiformis EROSHENKO, 1972
<i>Mononchus longicaudatus</i> COBB, 1893	Mononchus scutarius EROSHENKO, 1972 <i>(syn. n.)</i>
<i>Mononchus macrostoma longicaudatus</i> COBB, 1893 (MICOLETZKY, 1922)	Mononchus bellus ANDRÁSSY, 1985 (<i>syn.</i> <i>n.</i>)
<i>Mononchus macrostoma armatus</i> DADAY, 1894	<i>M. tunbridgensis</i> BASTIAN, 1865

Remarks

1) Not less than 147 species have been described under the generic name *Mononchus*, and three further ones transferred to that from other genera (from *Enoplus* and *Oncholaimus*; the DUJARDIN's species). Of these 150 "Mononchus" species however only the fourteen ones enumerated above can be retained, more than 90% must be either transferred to other genera or synonymized or regarded as inquirendae.

2) Owing to the meagre descriptions the following species or subspecies should be regarded as inquirendae: *Mononchus allgeni* MEYL, 1957, *M. macrostoma filicaudatus* SCHNEIDER, 1937, *M. macrostoma pseudoparvus* MICOLETZKY, 1922, *M. neotunbridgensis* KANNAN, 1961 and *M. obtusus* COBB, 1917.

3) *Mononchus bellus* ANDRÁSSY, 1985. – In a short paper (ANDRÁSSY, 1985) I called the attention to that the most frequent form, *M. truncatus* BASTIAN, 1865, can be divided into two separate species: the type one, *M. truncatus*, and an other which I named then *M. bellus*. These sibling species may be distinguished by the position of dorsal tooth: the apex is located in 22–26% of stoma at *truncatus* and in 30–33% at *bellus*. In the former the tooth apex lies before, in the latter behind the subventral rib. When I spoke about "truncatus" I meant the form described and characterized by BASTIAN, (1865), CLARK (1960a–c) and MULVEY (1967a–b, Fib. 19). On the basis of specimens collected in BASTIAN's type locality CLARK redescribed *truncatus* and selected a neotype. However in his illustration (Fig. 1) the exact position of the dorsal tooth and the correlation between tooth apex and transverse ribs are not quite clear. In the original drawings of BASTIAN (*truncatus* and *macrostoma*) the apices were illustrated in a very anterior position within the buccal capsule, in quite the same manner as at my species "truncatus". That is all right – but COOMANS & KHAN (1981) redrewed the neotype of CLARK more exactly. Their fine picture (Fig. 1 D) shows unambiguously the situation I illustrated at my "bellus". That means that the neotype – the real *truncatus* – and *bellus* are one and the same species!

Well, but what about the species I called ‘‘*truncatus*’’? To answer this question I went through the descriptions or redescriptions of *M. truncatus* as well as of its synonyms once more. I found that my form of 1985 (that with anterior tooth apex) was although mentioned by some authors under the names *truncatus* or *longicaudatus* but nowhere was regarded and named as a separate species. As a consequence, this ominous sibling of the real *truncatus* must be then provided with a specific name. The description of *Mononchus pulcher* sp. n. (syn. *M. truncatus* apud ANDRÁSSY, 1985) is to be found in the second part of the present paper.

4) *Mononchus clarki* ALTHERR in ALTHERR & DELAMARE DEBOUTTEVILLE, 1972. – ALTHERR described this species on the basis of a single female which showed a strikingly short tail (one and a half anal diameter only). Maybe it was an abnormal specimen of *M. truncatus*. When redescribed the latter species, CLARK illustrated (1960, Fig. 1 I) a similar abnormal tail, too. SMALL & GROOTAERT (1978) observed short and blunt tails in some exemplars of *M. aquaticus* as well. On the other hand, we do know *Mononchus* species which definitely and consistently show a short and obtuse tail, e.g. *M. maduei*, *italicus*, *tajmiris*, *nudus*.

5) *Mononchus italicus* ANDRÁSSY, 1958. – See the ‘‘Comments’’ in ANDRÁSSY, 1985.

6) *Mononchus scutarius* EROSHENKO, 1972. – I already noted in my previous paper (1985) that this species was probably identical with *M. truncatus*. After evaluating EROSHENKO’s description again I do not hesitate any more synonymizing both names.

7) *Mononchus sinensis* SONI et NAMA, 1983. – A good species! It resembles *M. aquaticus* COETZEE, 1968 very much but clearly differs from that in the structure of vulva. While the internal lips of vulva are conspicuously sclerotized in *M. aquaticus*, they are unsclerotized in *M. sinensis*. Besides, the vulval orifice of the former species is transverse-oval, that of the latter one is longitudinal-oval. I have got some specimens originated from India in my collection which are definitely *sinensis*. The vulval structures of *M. aquaticus* and *M. sinensis* can be compared in Fig. 3 D–E.

KEY TO THE SPECIES OF *MONONCHUS*

1 Large species, 2.7 to 6 mm	2
– Smaller species, 0.9 to 2.4 mm	7
2 Tail short, as long as 2–3 anal diameters	3
– Tail longer, as long as 5–8 anal diameters	6
3 Posterior third of tail in both sexes digitate and ventrally bent. – ♀: L=2.8–3.4 mm; a=35–44; b=2.8–3.3; c=16–20; V=50–60%; c'=2.5. ♂: L=2.7–3.0 mm; a=30–33; b=3.1–3.3; c=20–23; PO: 22–26+6. (Canada.)	mulveyi ANDRÁSSY
– Posterior third of tail not digitate and more or less straight	4

- 4 Male supplements less than 30 (22–27). – ♀: L = 3.5–5.3 mm; a = 24–29; b = 4–5; c = 18–23; V = 55–62%; c' = 2. ♂: L = 3.4–4.3 mm; a = 28–34; b = 4.2–4.6; c = 26–39; PO: 22–27. (Germany, Russia, Lithuania.) **maduei** SCHNEIDER
– Male supplements more than 30 (37–47) 5
- 5 Buccal cavity 100–120 µm, almost thrice as long as wide. – ♀: L = 3.2–4.4 mm; a = 17–18; b = 3.2–3.5; c = 13–20; V = 55–60%; c' = 1.9–2.5. ♂: L = 3.4–4.2 mm; a = 18–21; b = 3.4–3.9; c = 16–20; PO: 41–47. (Russia [Asian].) **tajmiris** GAGARIN
– Buccal cavity 80–90 µm, almost twice as long as wide. – ♀: L = 5.1–5.6 mm; a = 37–43; b = 4.6–5.3; c = 16–19; V = 48–59%; c' = 3. ♂: L = 3.6–4.8 mm; a = 29–45; b = 3.5–4.0; c = 17–24; PO: 37–39. (Russia [Asian].) **angarensis** GAGARIN
- 6 Body very long, 5–6 mm; apex of dorsal tooth in 23–24% of buccal cavity; female tail about 400 µm long. – ♀: L = 5.0–5.6 mm; a = 44–47; b = 3.8–4.5; c = 13; V = 51–53%; c' = 5. ♂: L = 4.5–6.0 mm; a = 39–46; b = 4.0–4.6; c = 19–24; PO: 36–40 + 7–9. (Canada.) **superbus** MULVEY
– Body 3.5 mm or shorter; apex of dorsal tooth in 12–17% of buccal cavity; female tail about 200 µm. – ♀: L = 2.7–3.5 mm; a = 32–43; b = 3.8–4.2; c = 12–15; V = 51–54%; c' = 7–8. ♂: L = 3.1 mm; a = 36; b = 3.7; c = 17; PO: 29–33. (Germany, Czechoslovakia, Poland, Denmark, Russia, Canada.) **niddensis** SKWARA
- 7 Female monodelphic, ovary posterior to vulva; tail short and plump. – ♀: L = 1.1 mm; a = 28; b = 3.7; c = 15; V = 54%; c' = 2.4. ♂ unknown. (Italy.) **italicus** ANDRÁSSY
– Female didelphic; tail generally long, exceptionally short 8
- 8 Tail very short, 1.5 times as long as anal diameter, bluntly rounded; spinneret of caudal glands subdorsal. – ♀: L = 1.8 mm; a = 25; b = 3.5; c = 33; V = 59–60%; c' = 1.2. ♂ unknown. (United States [Massachusetts].) **clarki** ALTHERR in ALTHERR et DELAMARE DEBOUTTEVILLE
– Tail elongated, 3 to 8 times as long as anal diameter; spinneret of caudal glands terminal 9
- 9 Buccal cavity unusually small and narrow, 18–20 µm long with almost straight walls; apex of dorsal tooth quite close to the beginning of buccal capsule. – ♀: L = 0.9–1.4 mm; a = 20–35; b = 4.2–5.3; c = 8.3–10.3; V = 51–55%; c' = 4–6. ♂: L = 1.2–1.3 mm; a = 34; b = 4.6–4.9; c = 13; PO: 16–17. (Holland, Great Britain, Switzerland, Czechoslovakia, Russia, Georgia, India, Japan, South Africa, Canada, United States [Alabama, Virginia], Surinam, Australia.) **tunbridgensis** BASTIAN
– Buccal cavity normal, 25 to 50 µm long, with concave walls; apex of dorsal tooth in 20–33% of buccal capsule 10
- 10 Tail short, 3–4 anal diameters. – ♀: L = 1.6–2.1 mm; a = 22–35; b = 3.9–4.6; c = 9–12; V = 49–57%; c' = 2.8–4.1. ♂ unknown. (Russia [Asian].) **nudus** GAGARIN
– Tail longer, 5–8 anal diameters 11
- 11 Buccal cavity 40–50 µm long, apex of dorsal tooth in about 30% of stoma. – ♀: L = 1.6–2.4 mm; a = 26–40; b = 3.3–4.3; c = 5.5–8.6; V = 48–56%; c' = 6–8. ♂: L = 1.7–2.2 mm; a = 32–45; b = 3.9–4.1; c = 9–10; PO: 15–21. (Cosmopolitan. Europe: Holland, Belgium, Germany, Denmark, Great Britain, Ireland, Finland, Poland, Switzerland, Austria, Czechoslovakia, Hungary, Yugoslavia, Spain, France, Italy, Russia, Belorussia; Asia: Georgia, Kirghizia, Uzbekistan, Tadzhikistan, Mongolia, Nepal, Japan, Sumatra; Africa: Ivory Coast, Ghana, Uganda, Zaire, Kenya, South Africa, Mauritius; Americas: Canada, United States [Hawaii], Mexico, Puerto Rico, Columbia, Venezuela, Argentina, Peru; Australia.) **truncatus** BASTIAN
– Buccal cavity 25–38 µm long, apex of dorsal tooth in about 20% of stoma 12

- 12 Vulval lips unsclerotized. – ♀: L = 1.3–1.8 mm; a = 32–38; b = 4.0–4.6; c = 7.2–8.7; V = 47–50%; c' = 5–7. ♂ unknown. (India). *sinensis* SONI et NAMA
– Vulval lips sclerotized 13
- 13 Buccal cavity 32–38 µm, twice as long as wide at middle; tail about 200 µm long. – ♀: L = 1.7–2.1 mm; a = 35–38; b = 4.4–4.8; c = 8.7–9.7; V = 49–52%; c' = 6–7. ♂ unknown. (Hungary, United States [California], Chile.) *pulcher* sp. n.
– Buccal cavity 25–30 µm, two and a half times as long as wide at middle; tail 100–150 µm long. – ♀: L = 1.2–1.8 mm; a = 19–37; b = 4–5; c = 8–12; V = 46–59%; c' = 5–7. ♂: L = 1.7–2.0 mm; a = 26–32; b = 4.3–4.9; c = 11–26; PO: 10–13. (Hungary, Great Britain, Italy, Russia, Kirghizia, India, Nigeria, South Africa, Mauritius, Mexico, St. Lucia.)
aquaticus COETZEE

Genus *Paramononchus* MULVEY, 1978

Mononchidae, Mononchinae. Big animals, 2.5 to 4 mm. Buccal cavity oblong, more than twice as deep as wide, armed with a large dorsal tooth situated in the anterior fourth of stoma and pointed forward. Opposite to it each subventral wall bearing a fine transverse rib connected with a short longitudinal ridge armed with two pairs of small toothlets. Proximal end of oesophagus not tuberculate. Female didelphic, vulva in 50–56% of body length. Male unknown. Tail elongate, in posterior part cylindrical, 7–8 anal diameters long. Caudal glands and terminal porus distinct.

Type species: *Paramononchus arcticus* MULVEY, 1978.

Within the subfamily, this genus may be characterized by the fine transverse and longitudinal ribs on subventral walls, two pairs of small denticles opposite to the dorsal tooth, the elongated tail and the well developed caudal glands. It is very close to *Mononchus* BASTIAN, 1865 but the presence of the denticulated longitudinal ribs distinguishes it from that.

Aquatic species, Holarctic in distribution; one species occurs in Asia, one in North America.

Two species:

P. alimovi TSALOLIKHIN, 1990

P. arcticus MULVEY, 1978

Remarks. – Both the above species resemble each other very much; it is not impossible that *P. alimovi* is a smaller subspecies or vicariant of *P. arcticus*.

KEY TO THE SPECIES OF *PARAMONONCHUS*

- 1 Bigger species, 3.5–4 mm; tail 300–400 µm long. – ♀: L = 3.5–4.0 mm; a = 40–44; b = 3.9–4.7; c = 9–11; V = 50–54%; c' = 7–8. ♂ unknown. (Canada.) *arcticus* MULVEY
– Smaller species, 2.5–2.9 mm; tail 260–290 µm long. – ♀: L = 2.5–2.9 mm; a = 32–39; b = 3.8–4.3; c = 9.7–10; V = 56%; c' = 7–8. ♂ unknown. (Russia [Far East].) *alimovi* TSALOLIKHIN

Genus **Nigronchus** SIDDIQI, 1984

Mononchidae, Mononchinae. Body small, 0.6–0.7 mm. Lip region wider than adjacent body and sharply separated by a constriction. Buccal cavity oblong with nearly parallel walls, armed with a sole dorsal tooth located in the anterior fourth of stoma and pointed forward. No other teeth or ribs. Posterior end of oesophagus not tuberculate. Female genital organ prodelphic. Male unknown. Tail elongate, about 7 anal diameters long. Caudal glands and spinneret conspicuous.

Type species: *Nigronchus parvus* SIDDIQI, 1984.

Although some tubercle-like structures were illustrated in SIDDIQI's Fig. D, he definitely characterized the genus as being non-tuberculate. The slender, parallel-walled stoma also makes it probable that *Nigronchus* does belong to the family Mononchidae (not to the Anatongidae). Among its relatives this genus is unique in showing a sharply separate head. Moreover, the small body, the smooth (unarmed) ventral wall of stoma, the prodelphic female gonad as well as the elongate tail characterize *Nigronchus*.

Soil inhabiting nematodes, known in Africa.

One species: *N. parvus* SIDDIQI, 1984

— ♀: L = 0.6–0.7 mm; a = 23–27; b = 3.4–4.4; c = 6.3–6.8; V = 52–56%; c' = 6.8–7.6. ♂ unknown. (*Nigeria*.)

parvus SIDDIQI

Genus **Coomansus** JAIRAJPURI et KHAN, 1977

Mononchidae, Mononchinae. Body 0.7 to 5.8 mm long. Buccal cavity oblong, mostly as long as labial width. Dorsal tooth of medium size, varying in position in anterior or posterior half of stoma; its apex located between 10 and 64% of buccal cavity. Longitudinal ridge opposite to dorsal tooth generally present but weak and gradually merging anteriorly into the ventral wall. Posterior third of oesophagus ventral with pearl-shaped structure. Oesophago-intestinal junction non-tuberculate. Female didelphic, vulva often back in position, in 45 to 75% of body length. Males known for 60 per cent of species. Spicula comparatively short, supplementary papillae 8 to 28 in number. Tail conoid, ventrally arcuate, 2–6 anal body diameters long, in males somewhat shorter than in females. Caudal glands rudimentary, terminal duct absent.

Type species: *Mononchus parvus* DE MAN, 1880 = *Coomansus parvus* (DE MAN, 1880) JAIRAJPURI et KHAN, 1977.

Coomansus can be characterized among the Mononchinae in having a dorsal tooth varying within wide ranges in position, a weak longitudinal ridge, a pearl-shaped structure on the proximal oesophageal wall and a

ventrally bent tail without terminal orifice. (*Coomansus gerlachei* [DE MAN, 1904] and *C. major* [COBB, 1893] were described as having caudal spinneret; whether their "spinnerets" are functioning indeed?) *Coomansus* resembles *Clarkus* JAIRAJPURI, 1970 very much both in the buccal and in the oesophageal structure, both in the shape of tail and in the reduction of caudal glands. In location of the dorsal tooth there is some difference between them but only in the case if we look at the mean values. The apex of the dorsal tooth varies in location between 10 and 50% of buccal length in *Clarkus* and is 21% in average of the 9 species, while it varies between 10 and 64% in *Coomansus* and is 40% in average of the 25 species. The only concrete difference between *Coomansus* and *Clarkus* can be found in the structure of the ventral ridge opposite to the dorsal tooth. In *Coomansus* this ridge is weak and begins gradually on the anterior wall of stoma (Fig. 4 A-D), in *Clarkus* it may be somewhat stronger and begins abruptly at level of the dorsal tooth showing there a small tooth-like projection (Fig. 4 E-G). To tell the truth, I had vacillated for long considering *Coomansus* and *Clarkus* as two different genera but finally I came to the point of view that the very small difference mentioned above may be still enough to separate them. I suppose the tooth-like ending of the ventral ridge in *Clarkus* does have some function in alimentation (in capturing the prey or in crushing it), while that ridge in *Coomansus* does not play such a role but is simply a suture in the junction of both subventral walls of the stoma.

It is noteworthy that often there is a great similarity between *Coomansus* (of the Mononchidae) and *Iotonchus* (of the Anatonchidae) as well. There are species in both genera showing quite the same type in general habit and morphological details, too. An essential difference, however, does exist between them: the proximal end of oesophagus is simple in *Coomansus* but tuberculate in *Iotonchus*. These genera serve as a good example of a parallel evolution.

Terricolous forms, distributed over the world, present in the Antarctic as well. Europe is represented by 6, Asia by 13, Africa by 4, North America by 4, South America by 4, Australia by 6 and the Antarctic by 2 species. The most frequent species is *Coomansus parvus* recorded from 26 countries or states.

Twenty-five species:

- | | |
|---|---|
| <i>C. acuticaudatus</i> (EROSHENKO, 1975) LOOF et WINISZEWSKA-SLIPINSKA, 1993 | <i>C. campbelli</i> (ALLGÉN, 1929) JAIRAJPURI et KHAN, 1977 |
| <i>Iotonchus acuticaudatus</i> EROSHENKO, 1975 | <i>Mononchus campbelli</i> ALLGÉN, 1929 |
| <i>C. arvensis</i> (EROSHENKO, 1972) JAIRAJPURI et KHAN, 1977 | <i>Clarkus campbelli</i> (ALLGÉN, 1929) JAIRAJPURI, 1970 |
| <i>Clarkus arvensis</i> EROSHENKO, 1972 | <i>C. cobbi</i> (EROSHENKO, 1975) LOOF et WINISZEWSKA-SLIPINSKA, 1993 |
| | <i>Iotonchus cobbi</i> EROSHENKO, 1975 |

- C. composticola* (CLARK, 1960) JAIRAJPURI et KHAN, 1977
Mononchus composticola CLARK, 1960
Clarkus composticola (CLARK, 1960) JAIRAJPURI, 1970
- C. fletcherensis* MULVEY, 1978
- C. gerlachei* (DE MAN, 1904) JAIRAJPURI et KHAN, 1977
Mononchus gerlachei DE MAN, 1904
Clarkus gerlachei (DE MAN, 1904) JAIRAJPURI, 1970
- C. indicus* JAIRAJPURI et KHAN, 1982
- C. intestinalis* (VINCIGUERRA et LA ROSA, 1990) comb. n.
Clarkus intestinalis VINCIGUERRA et LA ROSA, 1990
- C. kastrolli* (ALTHERR, 1958) JAIRAJPURI et KHAN, 1977
Mononchus kastrolli ALTHERR, 1958
Clarkus kastrolli (ALTHERR, 1958) JAIRAJPURI, 1970
- C. major* (COBB, 1893) LOOF et WINISZEWSKA-SLIPINSKA, 1993
Mononchus major COBB, 1893
Clarkus major (COBB, 1893) JAIRAJPURI, 1970
- C. menzeli* LOOF et WINISZEWSKA-SLIPINSKA, 1993
- C. mesadenus* (CLARK, 1960) JAIRAJPURI et KHAN, 1977
Mononchus mesadenus CLARK, 1960
Clarkus mesadenus (CLARK, 1960) JAIRAJPURI, 1970
- C. monticola* (EROSHENKO, 1975) LOOF et WINISZEWSKA-SLIPINSKA, 1993
Iotonchus monticola EROSHENKO, 1975
- C. mucronatus* (EROSHENKO, 1975) LOOF et WINISZEWSKA-SLIPINSKA, 1993
Iotonchus mucronatus EROSHENKO, 1975
- C. obliquoris* (ROSHENKO, 1972) JAIRAJPURI et KHAN, 1977
Clarkus obliquoris EROSHENKO, 1972
- C. ouinnensis* (YEATES, 1992) comb. n.
Clarkus ouinnensis YEATES, 1992
- C. paraamphigonius* (EROSHENKO, 1975) LOOF et WINISZEWSKA-SLIPINSKA, 1993
Iotonchus paraamphigonius EROSHENKO, 1975
- C. parvus* (DE MAN, 1880) JAIRAJPURI et KHAN, 1977
Mononchus parvus DE MAN, 1880
Clarkus parvus (DE MAN, 1880) JAIRAJPURI, 1970
Mononchus cobbi CASSIDY, 1931
Mononchus parvus cobbi CASSIDY, 1931 (CASSIDY 1933)
Mononchus mauiensis OLIVEIRA, 1940
Clarkus parvulus COETZEE, 1968
Coomansus parvulus (COETZEE, 1968) JAIRAJPURI et KHAN, 1977
Iotonchus coomansi BAQRI, BAQRI et JAIRAJPURI, 1978
- C. pretoriensis* (COETZEE, 1968) JAIRAJPURI et KHAN, 1977
Mononchus pretoriensis COETZEE, 1968
Clarkus pretoriensis (COETZEE, 1968) JAIRAJPURI, 1970
- C. silvius* (EROSHENKO, 1975) JAIRAJPURI et KHAN, 1982
Clarkus silvius EROSHENKO, 1975
- C. simmenensis* (KREIS, 1924) LOOF et WINISZEWSKA-SLIPINSKA, 1993
Mononchus simmenensis KREIS, 1924
Mononchus (Iotonchus) simmenensis KREIS, 1924 (SCHNEIDER, 1939)
Iotonchus simmenensis (KREIS, 1924) SCHNEIDER, 1939
- C. splendidus* sp. n.
- C. venezolanus* (LOOF, 1964) JAIRAJPURI et KHAN, 1977
Mononchus venezolanus LOOF, 1964
Clarkus venezolanus (LOOF, 1964) JAIRAJPURI, 1970
- Coomansus iearus* JAIRAJPURI et KHAN, 1982 syn. n.
- C. zschokkei* (MENZEL, 1913) LOOF et WINISZEWSKA-SLIPINSKA, 1993
Mononchus zschokkei MENZEL, 1913
Mononchus (Iotonchus) zschokkei MENZEL, 1913 (COBB, 1917)
Iotonchus zschokkei (MENZEL, 1913) COBB, 1917
Clarkus scopulosus EROSHENKO, 1975 syn. n.
Coomansus scopulosus (EROSHENKO, 1975) JAIRAJPURI et KHAN, 1982

Remarks

- 1) *Coomansus icarus* JAIRAJPURI et KHAN, 1982. – This species agrees with *C. venezolanus* (LOOF, 1964) in the measurements, shape of buccal cavity, position of dorsal tooth, length of tail etc. very well so I regard it as a junior synonym of the latter.
- 2) *Coomansus intestinus* (VINCIGUERRA et LA ROSA, 1990). – See in the second half of the present paper.
- 3) *Coomansus ouinnensis* (YEATES, 1992). – YEATES illustrated a weak ventral ridge and a buccal cavity more resembling to the *Coomansus-* than the *Clarkus*-type.
- 4) *Coomansus parvulus* (COETZEE, 1968). – As already supposed by JAIRAJPURI (1970) COETZEE's species is most probably identical with *C. parvus* (DE MAN, 1880).
- 5) *Coomansus scopulosus* (EROSHENKO, 1975). – I regard this species as a junior synonym of *C. zschokkei* (MENZEL, 1913). Its description fits perfectly that of *zschokkei*, and the measurements are within the limits of those of this latter species.

KEY TO THE SPECIES OF *COOMANSUS*

1	Tooth apex at mid-region of buccal cavity (in 40 to 64% of the sclerotized stoma)	2
–	Tooth apex at anterior region of buccal cavity (in 10 to 35% of the sclerotized stoma)	14
2	Large species, 2.0–3.7 mm; buccal cavity 40–78 µm, tail 100–210 µm long	3
–	Smaller species, 0.7–1.8 mm; buccal cavity 20–40 µm, tail 50–110 µm long	12
3	Buccal cavity 42–60 µm long	4
–	Buccal cavity 65–78 µm long	9
4	Stoma 42–44 µm long, apex of dorsal tooth in 40–46%; vulva at mid-body (in 48–52%). – ♀: L=2.6–3.0 mm; a=28–30; b=5.0–5.6; c=14–17; V=48–52%; c'=3–3.5. ♂ unknown. (Ecuador.)	
	<i>splendidus</i> sp. n.	
–	Stoma 52–60 µm long, apex of dorsal tooth in 50–63%; vulva in 60–72% of body length	5
5	Tip of tail mucronate. – ♀: L=2.9 mm; a=25; b=4; c=20; V=68%; c'=2. ♂: L=1.85 mm; a=24; b=3.2; c=25; PO: 20. (Russia [Far East].)	
–	<i>mucronatus</i> (EROSHENKO)	
–	Tip of tail without muero	6
6	Terminus slender, acute or subacute	7
–	Terminus conspicuously rounded	8
7	Tail 4 times as long as anal diameter; tooth apex in 60% of buccal cavity. – ♀: L=2.8–3.4; a=24–27; b=3.7–4.1; c=16–19; V=63–72%; c'=3.5–4. ♂: L=2.5 mm; a=24; b=3.6; c=18; PO: 24. (Russia [Far East].)	
–	<i>cobbi</i> (EROSHENKO)	
–	Tail 2.5–3.4 times as long as anal diameter; tooth apex in 50% of buccal cavity. – ♀: L=2.5–3.2 mm; a=23–27; b=3.6–4.2; c=14–18; V=62–71%; c'=2.5–3.4. ♂: L=2.7–3.0 mm; a=23–26; b=3.6–3.8; c=18–20; PO: 26–28. (Russia [Far East], Korea.)	
	<i>silvius</i> (EROSHENKO)	

- 8 Tail cylindroid in its posterior third with broadly rounded tip; body slender (a about 40). – ♀: L = 2.3–3.5 mm; a = 37–48; b = 3.8–4.8; c = 29–37; V = 67%; c' = 2–2.5. ♂: L = 2.9 mm; a = 43; b = 4.4; c = 26; PO: 23. (Switzerland, Czechoslovakia, Romania, Yugoslavia, Spain.) **simmenensis** (KREIS)
- Tail uniformly narrowing in its posterior third with finely rounded tip; body not so slender (a about 30). – ♀: L = 2.2–3.0 mm; a = 24–34; b = 3.7–4.3; c = 16–23; V = 59–69%; c' = 2.1–3.2. ♂: L = 2.0–3.0 mm; a = 25–35; b = 3.7–4.4; c = 17–25; PO: 19–24. (Switzerland, Austria, Czechoslovakia, Hungary, Romania, Poland, Spain, Italy, Russia [Far East], Kazakhstan, Korea.) **zschokkei** (MENZEL)
- 9 Body mostly well over 3 mm; tail 150–190 µm long. – ♀: L = 2.8–3.7 mm; a = 24–34; b = 4.2–4.8; c = 15–22; V = 64–69%; c' = 2.2–3.2. ♂: L = 2.5–3.4 mm; a = 23–33; b = 3.8–4.7; c = 17–33; PO: 19–26. (Switzerland, Poland.) **menzeli** LOOF et WINISZEWSKA-ŚLIPINSKA
- Body between 2 and 2.7 mm; tail 90–130 µm long 10
- 10 Tail slightly curved; dorsal tooth rounded in contour. – ♀: L = 2.0–2.4 mm; a = 17–22; b = 3.3–3.5; c = 18–20; V = 70–72%; c' = 1.9. ♂ unknown. (Russia [Far East].) **paraamphigonicus** (EROSHENKO)
- Tail strongly curved; dorsal tooth more or less pointed 11
- 11 Buccal cavity shorter (66 µm); tip of tail acute. – ♀: L = 2.1 mm; a = 24; b = 3.2; c = 22; V = 72%; c' = 1.7. ♂ unknown. (Russia [Far East].) **acuticaudatus** (EROSHENKO)
- Buccal cavity longer (70–75 µm); tip of tail rounded. – ♀: L = 2.2–2.7 mm; a = 20–24; b = 3.2–3.5; c = 17–20; V = 65–75%; c' = 2.5. ♂: L = 1.9–2.0 mm; a = 20–25; b = 3.2; c = 21; PO: 22. (Russia [Far East].) **monticola** (EROSHENKO)
- 12 Body very small, 0.7 mm, and plump; buccal cavity 20 µm long. – ♀: L = 0.7 mm; a = 14; b = 3.2–3.4; c = 11–14; V = 60–66%; c' = 2. ♂ unknown. (Russia [Far East].) **obliquoris** (EROSHENKO)
- Body larger, to 1.8 mm, and less plump; buccal cavity 30–40 µm long 13
- 13 Dorsal wall of stoma strongly arched near tooth; tail 85–110 µm long; body over 1.6 mm. – ♀: L = 1.6–1.8 mm; a = 26–34; b = 3.8–4.0; c = 15–19; V = 60–69%; c' = 2.5–3. ♂: unknown. (India, South Africa.) **pretoriensis** (COETZEE)
- Dorsal wall of stoma not or slightly arched near tooth; tail 65–80 µm long; body under 1.5 mm. – ♀: L = 1.1–1.4 mm; a = 18–24; b = 3.0–3.3; c = 15–19; V = 70–72%; c' = 2–2.6. ♂ unknown. (India.) **indicus** JAIRAJPURI et KHAN
- 14 Small species, shorter than 1.5 mm 15
- Larger species, between 2 and 6 mm 17
- 15 Tooth apex at anterior third of buccal cavity. – ♀: L = 0.7–1.2 mm; a = 17–26; b = 2.9–4.5; c = 10–19; V = 58–67%; c' = 2–3. ♂ unknown. (Holland, Germany, Poland, Austria, Czechoslovakia, Hungary, Romania, Spain, France, Italy, Russia, Belorussia, Lithuania, Georgia, Uzbekistan, Korea, India, Iran, Kenya, South Africa, Canada, United States, Venezuela, Columbia, Brazil, Hawaii.) **parvus** (DE MAN)
- Tooth apex at anterior fourth of buccal cavity 16
- 16 Tail 70 µm, as long as 2–2.5 anal diameters. – ♀: L = 1.1 mm; a = 17–24; b = 3.5; c = 14–16; V = 61–62%; c' = 2–2.5. ♂ unknown. (Russia [Far East].) **arvensis** (EROSHENKO)
- Tail 90–100 µm, as long as 3–3.5 anal diameters. – ♀: L = 1.0–1.1 mm; a = 22–29; b = 3.3–3.9; c = 10–12; V = 62–64%; c' = 3–3.5. ♂ unknown. (New Caledonia.) **ouinnensis** (YEATES)
- 17 Tail comparatively long, 4–6 anal diameters 18
- Tail shorter, 2–3.5 anal diameters 19

- 18 Vulval region with papillae; tail as long as 4–4.5 anal body widths; body longer than 3 mm. – ♀: L = 3.1–3.8 mm; a = 32–40; b = 4–6; c = 10–16; V = 47–55%; c' = 4–4.5. ♂: L = 3.0–3.7 mm; a = 31–41; b = 4.0–4.7; c = 15–22; PO: 9. (New Zealand.)
- mesadenus (CLARK)
- Vulval region without papillae; tail as long as 5.5–6 anal body widths; body shorter than 3 mm. – ♀: L = 2.1–2.6 mm; a = 27–42; b = 3.7–5.2; c = 7–11; V = 45–55%; c' = 5.5–6. ♂: L = 3.2–3.4 mm; a = 35–39; b = 4.5–4.7; c = 18–22; PO: 12. (New Zealand, New Hebrides.)
- composticola (CLARK)
- 19 Buccal cavity 60–75 µm long 20
- Buccal cavity 40–50 µm long 21
- 20 Stoma wide, barrel-shaped; male with 18–20 (+ 10) supplements. – ♀: L = 3.4–3.6 mm; a = 31–37; b = 3.8–4.1; c = 22–25; V = 57–60%; c' = 2.5–3. ♂: L = 3.0–3.5 mm; a = 33–40; b = 3.3–3.9; c = 23–29; PO: 18–20. (Canada.)
- fletcherensis MULVEY
- Stoma oblong; male with 11–15 supplements. – ♀: L = 3.7–5.3 mm; a = 42–68; b = 3.8–4.5; c = 33–47; V = 63–71%; c' = 2. ♂: L = 3.5–5.9 mm; a = 39–50; b = 3.5–4.4; c = 39–59; PO: 11–15. (Germany.)
- kastrolli (ALTHERR)
- 21 Dorsal wall of stoma distinctly arched near tooth, its anterior part broader than posterior.
- ♀: L = 1.9–3.0 mm; a = 27–34; b = 4.0–4.5; c = 10–14; V = 52–57%; c' = 3. ♂: L = 2.1–2.9 mm; a = 29–33; b = 3.7–4.3; c = 17–28; PO: 10–11. (Nigeria, South Africa, New Zealand, Campbell Islands.)
- campbelli (ALLGÉN)
- Dorsal wall of stoma not or only hardly arched near tooth, both parts nearly equal in width 22
- 22 Body 3–4 mm 23
- Body 2–3 mm 24
- 23 Dorsal tooth obtuse, apex in 18% of buccal cavity; stomatal walls thick. – ♀: L = 3.0–4.3 mm; a = 27–40; b = 4.8–5.7; c = 13–20; V = 49–55%; c' = 3–4. ♂: L = 3.1–4.0 mm; a = 34–44; b = 4.7–5.5; c = 18–26; PO: 9–12. (Comor Islands, Canada, Antarctic.)
- gerlachei (DE MAN)
- Dorsal tooth sharp, apex in 25% of buccal cavity; stomatal walls rather thin. – ♀: L = 3.4 mm; a = 34; b = 5.3; c = 20; V = 55%; c' = 3.3. ♂: L = 3.4 mm; a = 34; b = 5.3; c = 20; PO: 12. (Germany, Australia, Tasmania.)
- major (COBB)
- 24 Posterior part of intestine with some constrictions; tooth apex in 17–20% of buccal cavity. – ♀: L = 2.0–2.8 mm; a = 22–26; b = 4.0–5.4; c = 12–14; V = 55–61%; c' = 3.0–3.6. ♂: L = 2.1–2.9 mm; a = 21–27; b = 4.1–5.2; c = 15–19; PO: 8–11. (Chile-Argentina [Tierra del Fuego], Antarctic [South Shetland Islands].)
- intestinus (VINCIGUERRA et LA ROSA)
- Posterior part of intestine without constrictions; tooth apex in 25–27% of buccal cavity. – ♀: L = 2.2 mm; a = 21–34; b = 4.2–4.5; c = 18–19; V = 60–61%; c' = 2.5–3. ♂ unknown. (India, Mexico, Venezuela.)
- venezolanus (LOOF)

Genus **Clarkus** JAIRAJPURI, 1970

Mononchidae, Mononchinae. Medium-sized animals, between 0.7 and 2.7 mm. Buccal cavity barrel-shaped, nearly twice as long as wide. Dorsal tooth well developed, directed forward, in anterior half of buccal cavity; its apex located in the first fifth to third of stoma. Ventral wall showing a moderately developed longitudinal ridge abruptly originated opposite to the dorsal tooth by a pointed, somewhat tooth-like terminus. Posterior ventral

wall of oesophagus with pearl-like structure. Oesophago-intestinal junction not tuberculate. Ovaries paired, vulva between 45 and 69% of body length. Males rare, provided with 10–19 supplements. Spicula comparatively short. Tails similar in both sexes, short, conoid, ventrally arcuate, 1.5 to 6 times as long as anal body width. Caudal glands rudimentary, terminal porus absent.

Type species: *Mononchus papillatus* BASTIAN, 1865 = *Clarkus papillatus* (BASTIAN, 1865) JAIRAJPURI, 1970.

The genus can be distinguished within the subfamily by the anterior position of dorsal tooth, the smooth, anteriorly tooth-like ventral ridge, the presence of pearl-shaped structure on proximal end of oesophagus, the short and arcuate tail and the reduced caudal glands. *Clarkus* is most closely related to *Coomansus* JAIRAJPURI et KHAN, 1977, the only difference between them is in the structure of ventral ridge in stoma (see characterization of *Coomansus*).

Terricolous nematodes occurring in every continent including the Antarctic; in Europe 3, in Asia 4, in Africa 2, in North America 3, in South America 1, in Australia 4 and in the Antarctic 1 species. The most widely distributed species is *Clarkus papillatus* observed in 43 countries or states.

Nine species:

<i>C. diversus</i> ANDRÁSSY, 1983	<i>C. propapillatus</i> (CLARK, 1960) JAIRAJPURI, 1970
<i>C. dorsalis</i> YEATES, 1992	Mononchus propapillatus CLARK, 1960
<i>C. elongatus</i> JAIRAJPURI et KHAN, 1977	<i>C. pulcherrimus</i> ANDRÁSSY, 1985
<i>C. macropapillatus</i> (MULVEY, 1967) JAIRAJPURI, 1970	<i>C. sheri</i> (MULVEY, 1967) JAIRAJPURI, 1970
Mononchus macropapillatus MULVEY, 1967	Mononchus sheri MULVEY, 1967
<i>C. papillatus</i> (BASTIAN, 1865) JAIRAJPURI, 1970	Mononchus jugalis COETZEE, 1968
Mononchus papillatus BASTIAN, 1865	<i>Clarkus jugalis</i> (COETZEE, 1968) JAIRAJPURI, 1970
Mononchus (Prionchulus) papillatus BASTIAN, 1865 (SCHNEIDER, 1939)	<i>C. sveltus</i> (ALTHERR, 1968) JAIRAJPURI et KHAN, 1982
Prionchulus papillatus (BASTIAN, 1865) SCHNEIDER, 1939	Mononchus sveltus ALTHERR, 1968
Mononchus cristatus BASTIAN, 1865	

Remarks

1) *Clarkus jugalis* (COETZEE, 1968). – As I noted in a previous paper (1983) this species of COETZEE agrees with *Clarkus sheri* (MULVEY, 1967) in every respect (measurements, shape and length of buccal cavity, position of anterior margin of ventral ridge, shape of tail etc.).

2) *Clarkus papillatus* (BASTIAN, 1865). – ZELL (1985) supposes on the basis of the – rather superficial – drawings of BASTIAN that the original

“*papillatus*” and the form we generally provide with this name are not conspecific. According to his opinion BASTIAN’s *papillatus* would be a *Prionchulus*, but his arguments are not convicting enough.

3) *Clarkus propapillatus* (CLARK, 1960). – It is very close to *papillatus*, can be distinguished from that by the male only. Further observations are necessary to explain if they are separate species indeed.

KEY TO THE SPECIES OF *CLARKUS*

- | | |
|---|--|
| 1 Tail as long as 6 anal diameters, longer than 200 µm. – ♀: L = 2.0–2.2 mm; a = 31–33; b = 5.2–5.4; c = 9–10; V = 45–46%; c' = 5.7–6. ♂ unknown. (Australia.) | <i>pulcherrimus</i> ANDRÁSSY |
| – Tail as long as 1.5 to 4 anal diameters, shorter than 200 µm | 2 |
| 2 Ventral ridge originating conspicuously anterior to dorsal tooth apex | 3 |
| – Ventral ridge originating level with dorsal tooth apex | 4 |
| 3 Tail 140–180 µm, 3–4 anal diameters long; buccal cavity 45–50 µm. – ♀: L = 2.2–2.5 mm; a = 24–30; b = 3.8–4.6; c = 15–18; V = 60–64%; c' = 3–4. ♂ unknown. (India.) | |
| | <i>elongatus</i> JAIRAJPURI et KHAN |
| – Tail 100–110 µm, 2.5–3 anal diameters long; buccal cavity 35–40 µm long. – ♀: L = 1.5–2.2 mm; a = 21–30; b = 3.9–4.6; c = 14–21; V = 58–64%; c' = 2.5–3. ♂: L = 1.8 mm; a = 33; b = 4.3; c = 22; PO: 10. (India, South Africa, United States, Mexico.) | |
| | <i>sheri</i> (MULVEY) |
| 4 Tail straight, terminus somewhat finger-like. – ♀: L = 1.1–1.2 mm; a = 20–23; b = 3.3–3.5; c = 16–17; V = 62–64%; c' = 2.4–2.5. ♂ unknown. (Hungary.) | |
| | <i>diversus</i> ANDRÁSSY |
| – Tail ventrally curved, not finger-like | 5 |
| 5 Buccal cavity 32–40 µm long; body 2 mm or longer | 6 |
| – Buccal cavity 20–28 µm long; body 1.5 mm or shorter | 8 |
| 6 Tail strongly bent, hooked, 1.5–2 times as long as anal body width. – ♀: L = 1.9–2.0 mm; a = 30; b = 3.8–4.2; c = 14–21; V = 59–64%; c' = 1.5–2. ♂: L = 1.6–2.1 mm; a = 28–40; b = 3.6–4.0; c = 23–32; PO: 13–17. (Canada.) | |
| | <i>macropapillatus</i> (MULVEY) |
| – Tail less bent, not hooked, 2.5–3 times as long as anal body width | 7 |
| 7 Front edge of dorsal tooth curved anteriad. – ♀: L = 2.0–2.7 mm; a = 41–56; b = 3.8–4.7; c = 19–23; V = 65–69%; c' = 2.5–3. ♂: L = 2.0–2.7 mm; a = 41–60; b = 3.2–4.5; c = 19–25; PO: 14–19. (Germany.) | |
| | <i>sveltus</i> (ALTHERR) |
| – Front edge of dorsal tooth straight, perpendicular to body axis. – ♀: L = 1.6–2.1 mm; a = 28–33; b = 3.8–5.2; c = 16–29; V = 57–61%; c' = 2.5–3.2. ♂ unknown. (New Caledonia.) | |
| | <i>dorsalis</i> YEATES |
| 8 Lateral accessory pieces in the spicular apparatus present; supplements 10. – ♀: L = 0.9–1.6 mm; a = 21–36; b = 2.9–3.9; c = 10–19; V = 58–69%; c' = 2–2.5. ♂: L = 1.1 mm; a = 32; b = 3.5; c = 11.5; PO: 10 (India, New Zealand.) | |
| | <i>propapillatus</i> (CLARK) |
| – Lateral accessory pieces in the spicular apparatus absent; supplements 12–16. – ♀: L = 0.7–1.4 mm; a = 17–29; b = 3.1–4.0; c = 12–19; V = 58–68%; c' = 2–3. ♂: L = 1.0–1.1 mm; a = 23–26; b = 3.2–3.4; c = 14–15; PO: 12–16. (Holland, Belgium, Germany, Denmark, Great Britain, Ireland, Norway, Greenland, Switzerland, Austria, Czechoslovakia, Hungary, Poland, Romania, Yugoslavia, Spain, France, Italy, Russia, Lithuania, Moldavia, Georgia, Uzbekistan, Kirghizia, Tadzhikistan, Iran, Nepal, India, Ghana, Zaire, Kenya, Mauritius, Canada, United States, Mexico, Venezuela, Columbia, Brazil, Argentina, Hawaii, Australia, New Zealand, Campbell Islands.) | |
| | <i>papillatus</i> (BASTIAN) |

Genus **Prionchulus** COBB, 1916

Mononchus (Prionchulus) COBB, 1916.

Mononchidae, Mononchinae. Body length varying between 1 and 4 mm. Buccal cavity oblong, large, armed with a well developed dorsal tooth situated in the anterior part (10–25%) of stoma and pointing forward. Opposite to it two closely arranged denticulated longitudinal ridges present. Oesophago-intestinal junction not tuberculate. Female gonads paired, vulva in 54 to 69% of body length. Male rare, known in about 50 per cent of species, bearing 16 to 29 supplementary papillae. Tail conoid, short – 2–5 anal diameters – and always bent ventrad. Caudal glands rudimentary, spinneret absent.

Type species: *Oncholaimus muscorum* DUJARDIN, 1845 = *Prionchulus muscorum* (DUJARDIN, 1845) COBB, 1916.

The genus is distinctive among the Mononchinae in having an anteriorly situated dorsal tooth, subventral serrate ridges, a short, ventrally curved tail and rudimentary caudal glands. The genus *Prionchulus* itself is always easy to recognize, not so its species which are very close to each other. It seems to be characteristic for the genus that the number of supplementary papillae is less constant than in other genera: it may strongly vary within one and the same species (e.g. 17–27, 18–29).

Terrestrial or semi-aquatic nematodes, especially common in mosses. They are distributed over six continents, thus Europe is represented by 10, Asia by 6, Africa by 1, North America by 3, South America by 2 and Australia by 1 species. The most common of them is *P. muscorum* recorded so far from 37 countries or states. The second one is *P. punctatus* known in 18 countries or states.

Twelve species:

- | | |
|--|--|
| <i>P. altherri</i> ZELL, 1985 | Mononchus bastiani DE MAN, 1876 |
| <i>P. auritus</i> ANDRÁSSY, 1985 | Mononchus ctenodentatus TYSOWSKI, 1915 |
| <i>P. bastiani</i> ZELL, 1985 | Mononchus (Prionchulus) longicollis COBB, 1917 |
| <i>P. fagi</i> ZELL, 1985 | Mononchus papillatus macrodon FUCHS, 1930 |
| <i>P. longus</i> (THORNE, 1929) GOODEY, 1951 | Prionchulus medius EROSHENKO, 1975 |
| Mononchus longus THORNE, 1929 | Prionchulus paucidentatus ZELL, 1985
syn. n. |
| Mononchus (Prionchulus) longus THORNE, 1929 (GOODEY, 1951) | <i>P. obtusidentatus</i> VINCIGUERRA, 1984 |
| <i>P. mordax</i> sp. n. | <i>P. oxy cercus</i> ZELL, 1985 |
| <i>P. muscorum</i> (DUJARDIN, 1845) COBB, 1916 | <i>P. punctatus</i> COBB, 1917 |
| Oncholaimus muscorum DUJARDIN, 1845 | Mononchus (Prionchulus) punctatus COBB, 1917 |
| Mononchus muscorum (DUJARDIN, 1845)
BASTIAN, 1865 | |
| Mononchus (Prionchulus) muscorum
(DUJARDIN, 1845) BASTIAN, 1865 (COBB,
1916) | |

Mononchus muscorum macrolaimus COBB, 1916	Mononchus (Prionchulus) spectabilis DITLEVSEN, 1912 (COBB, 1916)
<i>P. spectabilis</i> (DITLEVSEN, 1912) COBB, 1916 Mononchus spectabilis DITLEVSEN, 1912	<i>P. vescus</i> EROSHENKO, 1975 Prionchulus minus ZELL, 1985 syn. n.

Remarks

1) *Prionchulus muscorum* (DUJARDIN, 1845). – ZELL (1985) doubts that DUJARDIN's original species – *Oncholaimus muscorum* – is identical with that redescribed by CLARK (1960) and generally called nowadays as *Prionchulus muscorum*. ZELL advances three arguments for “*Oncholaimus muscorum*” being not a *Prionchulus* but being the same as *Mylonchulus brachyuris* (BÜTSCHLI, 1873): a) He (ZELL) collected nematodes at the locus typicus of DUJARDIN but found no specimen of *Prionchulus*. b) In DUJARDIN's measurements the value of “c” is too high ($c=23$) for *P. muscorum*. c) DUJARDIN speaks about a small opening on the tip of tail (one page before the diagnosis of *O. muscorum*). – I think that these arguments are not convincing enough. Ad a) After passing one and a half hundred years, a locality like the botanical garden in Paris, visited by thousands and thousands of people, has undergone a strong alteration; the lack – or seeming lack – of *Prionchulus muscorum* in that place cannot be accepted as conclusive. Ad b) It is not clear whether DUJARDIN measured the length of tail in curvature (along axis); if he did not so, the shortness of tail is immediately acceptable. Ad c) In the actual diagnosis of *O. muscorum* on page 237 DUJARDIN says nothing about the presence of a spinneret. Moreover, a) *Mylonchulus brachyuris* is much shorter than *O. muscorum* (1.0–1.2 vs. 2.6 mm), and b) DUJARDIN definitely described the presence of two longitudinal (!) denticulate ridges opposite to the dorsal tooth – a typical character for *Prionchulus*!

2) ZELL (1985) divided the type and most common species of *Prionchulus* to seven (!) sibling species: to the typical form, *muscorum* s. str., and six new species. Although this point of view can be strongly queried, I still accept four of his species, at least for the present. The two remained ones, *P. minus* and *P. paudentatus*, are however definite synonyms: the former is identical with *P. vescus* EROSHENKO, 1975, the latter one is with *P. muscorum* (DUJARDIN, 1845). ZELL based his new species predominantly on the different developmental level of the subventral denticles, although these may vary also within one and the same population.

3) *Prionchulus fagi* ZELL, 1985. – Maybe this name also will be a synonym: it is probably identical with *P. bastiani* ZELL, 1985.

4) See also the “Comments” in my previous paper (ANDRÁSSY, 1985).

KEY TO THE SPECIES OF *PRIONCHULUS*

- 1 Female gonads long, uterus elongate with a separate muscular sphincter on each end, spermathecas distinct, ovaries short (shorter than half the length of corresponding branch of gonads) 2
- Female gonads short, uterus as well, without sphincters and spermathecas, ovaries comparatively long (at least half as long as corresponding branch of gonads) 3
- 2 Tail longer ($c = 14-22$); vulva in 61–69% of body length. – ♀: $L = 2.1-3.1$ mm; $a = 24-31$; $b = 3.8-4.6$; $c = 14-22$; $V = 61-69\%$; $c' = 2.5-3$. ♂: $L = 2.0-2.9$ mm; $a = 23-27$; $b = 4.1-3.5$; $c = 20-27$; PO: 17–27. (Italy, Nepal, Canada, United States [Colorado].)
- longus** (THORNE)
- Tail shorter ($c = 24-31$); vulva in 54–57% of body length. – ♀: $L = 2.5-4.0$ mm; $a = 31-42$; $b = 4.4-5.7$; $c = 24-31$; $V = 54-57\%$; $c' = 2.5-3$. ♂: $L = 2.2-4.0$ mm; $a = 35-50$; $b = 4.1-5.3$; $c = 25-45$; PO: 18–29. (Germany, Switzerland, Hungary, Denmark, Greenland, Sweden, Finland, Lithuania.)
- spectabilis** (DITLEVSEN)
- 3 Labial papillae large, conoid, the posterior ones ear-like 4
- Labial papillae low, more rounded, not ear-like 5
- 4 Apex of dorsal tooth in 10% of buccal cavity; subventral ridges weakly serrate; tail short, about 2.5 times as long as anal body diameter. – ♀: $L = 1.6-1.9$ mm; $a = 20-30$; $b = 3.9-4.8$; $c = 12-15$; $V = 58-66\%$; $c' = 2.5$. ♂ unknown. (Germany.)
- altherri** ZELL
- Apex of dorsal tooth in 20% of buccal cavity, subventral ridges strongly serrate; tail longer, more than 3 times as long as anal body diameter. – ♀: $L = 2.2-2.4$ mm; $a = 30-32$; $b = 4.0-4.2$; $c = 13-14$; $V = 59-62\%$; $c' = 3.3-4.2$. ♂ unknown. (Sri Lanka.)
- auritus** ANDRÁSSY
- 5 Large animals, about 3 mm; tip of tail sharply pointed. – ♀: $L = 2.7-3.1$ mm; $a = 23-32$; $b = 4.3-4.6$; $c = 13-15$; $V = 60-64\%$; $c' = 2.5$. ♂: $L = 2.7$ mm; $a = 30$; $b = 4.0$; $c = 16$; PO: 16. (Germany.)
- fagi** ZELL
- Smaller animals, at most 2.5 mm but generally shorter 6
- 6 Dorsal tooth obtuse with broadly rounded apex. – ♀: $L = 2.1-2.4$ mm; $a = 26-27$; $b = 3.8-4.0$; $c = 13-14$; $V = 63-65\%$; $c' = 2.5$. ♂ unknown. (Italy [Sardinia].)
- obtusidentatus** VINCIGUERRA
- Dorsal tooth pointed with sharp apex 7
- 7 Tail terminus narrowly conoid, sharp. – ♀: $L = 1.3-1.7$ mm; $a = 22-24$; $b = 4.1-4.9$; $c = 12-14$; $V = 60-61\%$; $c' = 2.8-3.1$. ♂ unknown. (Korea.)
- mordax** sp. n.
- Tail terminus not so narrow, rounded 8
- 8 Smaller species, 1–1.5 mm. – ♀: $L = 1.1-1.5$ mm; $a = 16-30$; $b = 3.1-4.4$; $c = 12-15$; $V = 59-69\%$; $c' = 2-3$. ♂: $L = 1.2$ mm; $a = 18$; $b = 3.4$; $c = 16$; PO: 16. (Germany, Poland, Russia [Far East].)
- vescus** EROSHENKO
- Bigger species, 2 mm or so 9
- 9 Tail tip subdigitate, somewhat bent dorsally. – ♀: $L = 2.1-2.6$ mm; $a = 21-31$; $b = 3.9-4.5$; $c = 12-15$; $V = 59-66\%$; $c' = 2.5$. ♂ unknown. (Germany.)
- bastianii** ZELL
- Tail tip not subdigitate, ventrally bent 10
- 10 Tail hardly curved; buccal cavity 50–56 μ m long. – ♀: $L = 1.7-2.1$ mm; $a = 19-26$; $b = 3.5-4.2$; $c = 9-12$; $V = 61-63\%$; $c' = 3$. ♂ unknown. (Germany.)
- oxycereus** ZELL
- Tail strongly curved, hook-like; buccal cavity 35–45 μ m long 11
- 11 Egg shell echinulate; tooth apex in 15–20% of buccal cavity. – ♀: $L = 1.5-2.2$ mm; $a = 25-39$; $b = 3.6-4.8$; $c = 14-22$; $V = 59-67\%$; $c' = 2-4$. ♂: $L = 2.0-2.4$ mm; $a = 32-34$; $b = 3.7-4.5$; $c = 20-25$; PO: 18–21. (Holland, Germany, Belgium, Great Britain, Poland, Switzerland, Austria, Romania, Yugoslavia, France, Nepal, Korea, Iran, Canada, United States [Oregon, Wisconsin], Mexico, Columbia.)
- punctatus** COBB
- Egg shell rough but not echinulate; tooth apex in 24–28% of buccal cavity. – ♀: $L = 1.8-2.6$ mm; $a = 25-33$; $b = 3.3-4.4$; $c = 10-18$; $V = 58-67\%$; $c' = 3-5$. ♂: $L = 2.2$ mm; $a = 36-37$;

$b = 4.0\text{--}4.1$; $c = 18\text{--}20$; PO: 16–22. (Holland, Belgium, Germany, Denmark, Great Britain, Sweden, Poland, Switzerland, Austria, Hungary, Romania, Yugoslavia, Spain, France, Italy, Russia [Far East], Iran, Korea, Mongolia, India, China, Hainan, Canary Islands, Egypt, Kenya, Zaire, Mauritius, Canada, United States [California, Florida, Oregon, Wisconsin], St. Lucia, Dominica, Columbia, Brazil, New Zealand.)

muscorum (DUJARDIN)

Genus **Actus** BAQRI et JAIRAJPURI, 1974

Mononchidae, Mononchinae. Smaller species, 0.8–1.5 mm. Buccal cavity ovoid, dorsal tooth in first third of stoma with apex directed anteriorly, opposed by two irregular rows of small denticles (4–6 pairs in number) not arranged on longitudinal ridges. Oesophago-intestinal valve not tuberculate. Female didelphic, vulva in 58–66% of body length. Male unknown. Tail short, as long as 0.8–2.6 anal diameters, ventrally bent. Caudal glands and terminal orifice present.

Type species: *Sporonchulus minutus* MULVEY, 1963 = *Actus minutus* (MULVEY, 1963) BAQRI et JAIRAJPURI, 1974.

This genus is characterized by the anterior position of dorsal tooth, the presence of two longitudinal rows of subventral denticles not arranged on ridges, the small body, short tail and distinct caudal glands. Its representatives belong to the smallest forms of the Mononchidae.

Rare nematodes inhabiting the soil and occurring in North and Central America and Oceania.

Three species:

A. minutus (MULVEY, 1963) BAQRI et JAIRAJPURI, 1974

Sporonechulus minutus MULVEY, 1963

Actus salvadoricus BAQRI et JAIRAJPURI, 1974 syn. n.

A. nanurus SIDDIQI, 1984

A. neocaledonensis YEATES, 1993

Remarks

Actus salvadoricus BAQRI et JAIRAJPURI, 1964. – It differs from *Actus minutus* (MULVEY, 1963) only in location of the amphids which lie a little more anteriorly; this is however not a true difference. In every other respect both species are completely the same.

KEY TO THE SPECIES OF *ACTUS*

- 1 Tail 18–33 µm, about as long as one anal diameter. – ♀: L=0.9–1.1 mm; a=22–28; b=3.2–4.3; c=33–59; V=60–66%; c'=0.8–1.3. ♂ unknown. (Fiji.) **nanurus** SIDDIQI
– Tail 45–72 µm, as long as two to two and a half anal diameters **2**

- 2 Buccal cavity longer than 30 µm (31–36 µm); caudal spinneret obscure. – ♀: L = 1.1–1.5 mm; a = 24–31; b = 3.4–3.9; c = 19–25; V = 58–63%; c' = 1.8–2.6. ♂ unknown. (New Caledonia.)
 – Buccal cavity shorter than 30 µm (22–26 µm); caudal spinneret conspicuous. – ♀: L = 0.8–1.2 mm; a = 20–24; b = 3.1–4.3; c = 17–20; V = 61–65%; c' = 1.8–2.4. ♂ unknown. (Canada, El Salvador, Marianna- and Carolina Islands.)

Genus *Sporonchulus* COBB, 1917

Mononchus (Sporonchulus) COBB, 1917; *Sporonchuloides* MOHANDAS et PRABHOO, 1982 syn. n.

Mononchidae, Mononchinae. Body of middle length, 1.1–1.8 mm. Buccal cavity barrel-shaped, dorsal tooth moderately developed, in anterior part of stoma, pointed forward and opposed by numerous (to about 25) small denticles more or less arranged in four irregular rows. Posterior end of oesophagus non-tuberculate. Female amphidelphic or mono-prodelphic; vulva situated in 55 to 65% of body length. Male known for one species only, showing a dozen supplements. Tail ventrally curved, conoid, short, 1.5–2.5 times as long as anal body width. Caudal glands and terminal porus normal or reduced.

Type species: *Mononchus (Sporonchulus) dentatus* COBB, 1917 = *Sporonchulus dentatus* COBB, 1917.

Terrestrial nematodes inhabiting three continents: Asia (2 species), Africa (2 species) and South America (4 species). They are tropical-subtropical animals, the most widely distributed of them is *S. ibitiensis* recorded from six countries.

Four species:

<i>S. coronatus</i> (CARVALHO, 1956)	ANDRÁSSY, 1958
Mononchus coronatus CARVALHO, 1956	
Sporonchuloides coronatus (CARVALHO, 1956)	MOHANDAS et PRABHOO, 1982
<i>S. dentatus</i> COBB, 1917	

Mononchus (Sporonchulus) dentatus
COBB, 1917

<i>S. ibitiensis</i> (CARVALHO, 1951)	ANDRÁSSY, 1958
Mononchus ibitiensis CARVALHO, 1951	
Sporonchuloides ibitiensis (CARVALHO, 1951)	MOHANDAS et PRABHOO, 1982
<i>S. vagabundus</i> JAIRAJPURI, 1971	

Remarks

1) Both in length of mouth cavity and in shape of tail tip there can occur transitional forms between *S. dentatus* COBB, 1917 and *S. ibitiensis* (CARVALHO, 1951) so their identity is not impossible.

2) MOHANDAS & PRABHOO (1982) suggested a new genus, *Sporonchuloides*, for two species, *Sporonchulus ibitiensis* (CARVALHO, 1951) and *S.*

coronatus (CARVALHO, 1956). On the basis of the illustrations they supposed the subventral denticles to be arranged on longitudinal ribs. That would be the only difference between *Sporonchulus* (denticles free on walls) and *Sporonchuloides* (denticles on ridges). Already MULVEY (1963) pointed out, however, that these denticles may be interpreted from a lateral view as being in connection with ribs, but from a dorsoventral view they are clearly free, not arranged along ribs. To retain *Sporonchuloides* as a separate genus is therefore not justified.

3) *Sporonchulus grandis* PATIL et KHAN, 1982. – No doubt that this species is congeneric with *Hadronchulus shamimi* RAY et DAS, 1983. Its new name is therefore *Hadronchulus grandis* (PATIL et KHAN, 1982) **comb. n.**

4) *Sporonchulus paucidentatus* LORDELLO, 1970 also does not fit into this genus. Owing to the two pairs of subventral toothlets at the posterior end of buccal cavity LORDELLO's species most probably belongs to the genus *Paracrassibucca*: *P. paucidentata* (LORDELLO, 1970) **comb. n.**

KEY TO THE SPECIES OF *SPORONCHULUS*

- 1 Female prodelphic. – ♀: L = 1.1–1.4 mm; a = 17–22; b = 3.3–4.0; c = 20–26; V = 60–65%; c' = 1.5. ♂ unknown. (Brazil.) **coronatus** (CARVALHO) 2
- Female amphidelphic
- 2 Caudal glands and terminal opening conspicuous. – ♀: L = 1.2–1.8 mm; a = 22–36; b = 3.7–4.8; c = 21–27; V = 55–63%; c' = 2–2.5. ♂ unknown. (India, St. Lucia.) **vagabundus** JAIRAJPUR 3
- Caudal glands and terminal opening inconspicuous
- 3 Buccal cavity 20–28 µm long; tip of tail sharply pointed. – ♀: L = 1.2–1.4 mm; a = 24–30; b = 3.9–4.0; c = 23–28; V = 60–63%; c' = 2.5. ♂: L = 1.2–1.3 mm; a = 27–30; b = 3.8–4.0; c = 23–24; PO: 11–12. (India, Sri Lanka, Nigeria, Zaire, Brazil, Argentina.) **ibitiensis** (CARVALHO)
- Buccal cavity 32–35 µm long; tip of tail finely rounded. – ♀: L = 1.1–1.5 mm; a = 26–30; b = 3.4–3.9; c = 19–23; V = 62–64%; c' = 2–2.5. ♂ unknown. (Angola, Mauritius, Venezuela, Brazil.) **dentatus** COBB

Genus *Judonchulus* ANDRÁSSY, 1958

Mononchidae, Mononchinae. Body slender to very slender, varying in length between 1.4 and 5.1 mm. Buccal cavity elongate, large, armed with a large dorsal tooth situated midway or lower in stoma. Opposite to it a great number of scattered denticles are present. Oesophago-intestinal junction not tuberculate. Female genital apparatus didelphic, vulva in 63–65% of body length. Male known only for one species; number of copulatory supplements 9–10. Tail elongate, 4–7 times as long as anal body width, almost cylindrical. Caudal glands and spinneret present.

Type species: *Mononchus (Sporonchulus) recessus* COBB, 1917 = *Judonchulus recessus* (COBB, 1917) ANDRÁSSY, 1958.

The large stoma, posteriorly situated dorsal tooth, numerous subventral denticles, elongate tail and conspicuous caudal glands are the main characters of *Judonchulus*. MULVEY (1963) returned the type species, *recessus*, to the genus *Sporonchulus* and hence he synonymized *Judonchulus* with the former. I prefer to retain *Judonchulus* as a separate genus. The type, *recessus*, as well as a further species listed below differ in five characters from the true *Sporonchulus* species: the buccal cavity is comparatively narrower and longer, the dorsal tooth lies in the posterior half of stoma, the subventral denticles are scattered, not arranged in rows, the tail is cylindrical and the body more slender.

Terrestrial or amphibian nematodes known in the Americas only.

Two species:

J. magnus (ALTHERR, 1977) comb. n.
Sporonchulus magnus ALTHERR, 1977

J. recessus (COBB, 1917) ANDRÁSSY, 1958
Mononchus (Sporonchulus) recessus
COBB, 1917
Sporonchulus recessus COBB, 1917

Remarks

1) *Judonchulus brakenhoffi* ANDRÁSSY, 1958. – This species described by BRAKENHOFF and renamed by me is a species inquirenda.

2) Owing to the strikingly long and very slender body *Judonchulus magnus* (ALTHERR, 1977) differs from every species of the family Mononchidae. It seems to be most closely related to *J. recessus* (COBB, 1917).

KEY TO THE SPECIES OF *JUDONCHULUS*

- 1 Body very large, 4–5 mm, and extremely slender. – ♀: L=4.6–5.1 mm; a=75–95; b=3.9–4.0; c=20–37; V=64%; c'=7. ♂: L=4.4 mm; a=70; b=3.7; c=51; PO: 9–10. (Brazil.)
magnus (ALTHERR)
- Body much smaller, under 2 mm, and not so slender. – ♀: L=1.4–1.6 mm; a=32–40; b=3.3–3.7; c=11–14; V=63–65%; c'=4–5. ♂ unknown. (United States [Florida].)
recessus (COBB)

Subfamily **COBBONCHINAE** JAIRAJPURI, 1969

Mononchidae. Both dorsal and each subventral wall armed with a tooth of nearly equal size and forward pointed apex. Dorsal tooth generally

located in anterior, subventral teeth in posterior part of stoma, rarely all the three teeth lying at the same level in mid-stoma.

Two genera (with 28 species): *Cobbonchus* ANDRÁSSY, 1958 and *Comiconchus* JAIRAJPURI et KHAN, 1982.

KEY TO THE GENERA

- 1 Subventral teeth more or less posterior to dorsal tooth; tail short-conoid, with conspicuous glands
Cobbonchus ANDRÁSSY
- Subventral teeth level with dorsal tooth; tail elongate-conoid, with reduced glands
Comiconchus JAIRAJPURI et KHAN

Genus **Cobbonchus** ANDRÁSSY, 1958

Mononchidae, Cobbonchinae. Body length between 0.8 and 3.9 mm. Buccal cavity oblong, armed with a large dorsal and two similar but generally somewhat smaller subventral teeth. The former located in anterior, both the latter in posterior part of stoma, or, they are all closer to each other at mid-stoma region (the subventral teeth are also in this case a little more posterior than the dorsal one). Oesophago-intestinal junction not tuberculate. Female genital organ amphidelphic or – in about one third of species – prodelphic; vulva back in position, in 58 to 80% of body length. Males known for half the species; supplements 6 to 18 in number. Tail in both sexes similar, short, 0.5–2.3 times as long as anal diameter, conoid to digitate, or blunt, ventrally arcuate. Caudal glands and terminal orifice conspicuous.

Type species: *Mononchus palustris* COBB, 1917 = *Cobbonchus palustris* (COBB, 1917) ANDRÁSSY, 1958.

The genus is characterized by the three large teeth of similar shape but of different level, the short tail and the well developed caudal glands and spinneret.

The representatives of *Cobbonchus* prefer limnic habitats, yet the terrestrial forms live in wet soil or moss. They occur mainly in the Southern Hemisphere but in the temperate zone. The distributions of *Cobbonchus* species are as follows: in Europe 1, in Asia 4, in Africa 13, in North America 2, in South America 4 and in Australia 4 species. The only species recorded from Europe is *Cobbonchus palustris* (Czechoslovakia; ŠÁLY, 1983).

Twenty-seven species:

- | | |
|--|--------------------------------------|
| <i>C. abrupticaudatus</i> (ALTHERR, 1960) | <i>C. altitudinarum</i> YEATES, 1992 |
| GOODEY, 1963 | <i>C. artemisiae</i> COETZEE, 1968 |
| Mononchus abrupticaudatus ALTHERR,
1960 | <i>C. australis</i> CLARK, 1963 |
| | <i>C. charlesi</i> COETZEE, 1966 |

<i>C. chauliodus</i> CLARK, 1961	<i>C. orstomi</i> YEATES, 1992
<i>C. coetzeae</i> ANDRÁSSY, 1970	<i>C. palustris</i> (COBB, 1917) ANDRÁSSY, 1958
<i>C. collaris</i> ANDRÁSSY, 1985	Mononchus palustris COBB, 1917
<i>C. couleensis</i> YEATES, 1992	<i>C. paraindicus</i> RAHMAN et JAIRAJPURI, 1984
<i>C. curvicaudatus</i> TSALOLIKHIN, 1988	<i>C. pleiades</i> sp. n.
<i>C. dianae</i> COETZEE, 1965	<i>C. pounamua</i> CLARK, 1961
<i>C. eurystoma</i> COETZEE, 1965	<i>C. radiatus</i> (COBB, 1917) ANDRÁSSY, 1958
<i>C. heynsi</i> COETZEE, 1965	Mononchus radiatus COBB, 1917
<i>C. indicus</i> BAQRI, BAQRI et JAIRAJPURI, 1978	<i>C. regulus</i> ALTHERR, 1963
<i>C. mauritianus</i> (WILLIAMS, 1958) CLARK, 1960	<i>C. rotundicaudatus</i> COETZEE, 1968
Mononchus mauritianus WILLIAMS, 1958	Cobbonchus ockerti apud COETZEE, 1966
Cobbonchus dzumaci YEATES, 1992	<i>C. soutoi</i> (CARVALHO, 1956) comb. n.
<i>C. megalus</i> COETZEE, 1966	Mononchus soutoi CARVALHO, 1956
<i>C. ockerti</i> COETZEE, 1965	Miconchus soutoi (CARVALHO, 1956) ANDRÁSSY, 1958
	<i>C. thesigeri</i> COETZEE, 1968

Remarks

1) *Cobbonchus abrupticaudatus* (ALTHERR, 1960). – Is very similar to *C. mauritianus* (WILLIAMS, 1958) and perhaps identical with that.

2) *Cobbonchus dzumaci* YEATES, 1992. – This species perfectly agrees with *C. mauritianus* (WILLIAMS, 1958) so that I regard it as a junior synonym of that.

3) *Cobbonchus soutoi* (CARVALHO, 1956). – First (ANDRÁSSY, 1958) I ranged this species in the genus *Miconchus* ANDRÁSSY, 1958, but now I prefer regarding it as a *Cobbonchus*. The shape of buccal cavity, arrangement of teeth and shape of tail all are of *Cobbonchus* type. Only the position of vulva ($V = 35\text{--}36\%$) is strange for our genus. (Whether is it a mistake? Perhaps $V = 53\text{--}63\%?$)

4) *Cobbonchus teres* (COBB, 1917). – COBB described this species on the basis of a single juvenile specimen. It is hardly to recognize, and better to regard it as a species inquirenda.

5) *Cobbonchus incultus* (CARVALHO, 1960). – Does not belong to this genus, even probably not to the family Mononchidae. It differs from every species of *Cobbonchus* in having a very broad, at the base flattened buccal cavity, a long tail and a lacking posterior branch of uterus. Owing to the structure of stoma I suggest transferring it to the genus *Promiconchus*: *P. incultus* (CARVALHO, 1960) comb. n.

6) It is worthwhile of mention that seven of the ten prodelphic species have been described from South Africa, and the other ones from New Zealand and New Caledonia. It seems as if a southern prodelphic line (subgenus?) has evolved within the genus *Cobbonchus*.

KEY TO THE SPECIES OF *COBBONCHUS*

1	Female gonad prodelphic, posterior ovary absent or rudimentary – Female gonad amphidelphic, both ovaries normal	11
2	Large species, more than 3 mm – Smaller species, 1 to 2.4 mm	3 4
3	Dorsal tooth in the first fifth of buccal cavity, large, reaching the centre of stoma. – ♀: $L = 3.3$ mm; $a = 51$; $b = 3.1$; $c = 41$; $V = 70\%$; $c' = 1.5$. ♂ unknown. (New Zealand.)	– ♀: 16. (South Africa.)
		chaulioides CLARK
–	Dorsal tooth in the first third of buccal cavity, not so large. – ♀: $L = 3.4$ – 3.9 mm; $a = 36$ – 50 ; $b = 3$ – 4 ; $c = 33$ – 49 ; $V = 72$ – 76% ; $c' = 2$. ♂: $L = 3.8$ mm; $a = 49$; $b = 4$; $c = 49$; PO: 16. (South Africa.)	melegus COETZEE
4	Dorsal tooth and subventral teeth closely levelled: the former in anterior third of stoma or farther back, the latter close to mid-stoma	5
–	Dorsal tooth and subventral teeth farther to each other: the former in anterior fifth/ fourth, the latter in posterior third of stoma	8
5	Buccal cavity broad, barrel-shaped, dorsal tooth comparatively small; tail short, as long as one anal diameter. – ♀: $L = 1.0$ mm; $a = 24$; $b = 3.5$; $c = 25$; $V = 71\%$; $c' = 1$. ♂: $L = 1.1$ mm; $a = 27$; $b = 3.0$; $c = 21$; PO: 14. (South Africa.)	eurystoma COETZEE
–	Buccal cavity oblong, not so broad, dorsal tooth large; tail distinctly longer than one anal diameter	6
6	Subventral teeth nearly as big as the dorsal one; tail two anal diameters long. – ♀: $L = 1.5$ – 1.8 mm; $a = 37$ – 43 ; $b = 3.2$ – 3.8 ; $c = 23$ – 24 ; $V = 70$ – 74% ; $c' = 2$. ♂: $L = 1.6$ – 1.7 mm; $a = 41$ – 44 ; $b = 3.7$ – 4.0 ; $c = 21$ – 24 ; PO: 15. (South Africa.)	dianae COETZEE
–	Subventral teeth conspicuously smaller than the dorsal one; tail one and a half anal diameters long	7
7	Body 2 mm long; posterior ovary present but very small. – ♀: $L = 2.1$ mm; $a = 46$; $b = 3.0$; $c = 38$; $V = 74\%$; $c' = 1.5$. ♂: $L = 1.9$ mm; $a = 42$; $b = 3.0$; $c = 31$; PO: 18. (India, South Africa.)	artemisiae COETZEE
–	Body shorter than 1.5 mm; posterior ovary completely absent. – ♀: $L = 1.1$ – 1.4 mm; $a = 37$ – 44 ; $b = 3$ – 4 ; $c = 33$ – 39 ; $V = 66$ – 75% ; $c' = 1.3$ – 1.5 . ♂: $L = 1.3$ – 1.4 mm; $a = 40$ – 46 ; $b = 4$; $c = 32$ – 38 ; PO: 16–18. (South Africa.)	charlesi COETZEE
8	Tail 80–90 μ m long, its posterior narrowed part as long as, or longer than anal body diameter. – ♀: $L = 1.9$ – 2.4 mm; $a = 40$ – 42 ; $b = 3.5$ – 3.6 ; $c = 23$ – 25 ; $V = 72$ – 75% ; $c' = 1.8$ – 2.1 . ♂: $L = 1.9$ – 2.3 mm; $a = 40$ – 51 ; $b = 3.4$ – 3.8 ; $c = 22$ – 29 ; PO: 6–8. (New Caledonia.)	couleensis YEATES
–	Tail 30–45 μ m long, its posterior narrowed part conspicuously shorter than anal body diameter	9
9	Buccal cavity unusually narrow with parallel walls; tail shorter than one anal diameter. – ♀: $L = 0.9$ – 1.1 mm; $a = 26$ – 36 ; $b = 3$ – 4 ; $c = 55$ – 67 ; $V = 77$ – 80% ; $c' = 0.7$ – 0.8 . ♂: $L = 0.9$ – 1.3 mm; $a = 40$ – 41 ; $b = 4.2$ – 4.3 ; $c = 40$; PO: 12–14. (South Africa.)	ockerti COETZEE
–	Buccal cavity barrel-shaped with convex walls; tail somewhat longer than one anal diameter	10
10	Dorsal tooth apex at 20% of stoma. – ♀: $L = 1.0$ mm; $a = 23$; $b = 3.6$; $c = 24$; $V = 71\%$; $c' = 1.2$. ♂ unknown. (South Africa.)	heynsi COETZEE
–	Dorsal tooth apex at 30–35% of stoma. – ♀: $L = 1.3$ – 1.5 mm; $a = 35$ – 42 ; $b = 2.9$ – 3.3 ; $c = 31$ – 36 ; $V = 73$ – 75% ; $c' = 1.4$ – 1.6 . ♂: $L = 1.3$ – 1.4 mm; $a = 39$ – 43 ; $b = 3.1$ – 3.4 ; $c = 29$ – 32 ; PO: 12–13. (New Caledonia.)	orstomi YEATES
11	Apex of dorsal tooth at the middle of stoma, all the three teeth nearly at the same level	12
–	Apex of dorsal tooth in the anterior third/fourth of stoma, subventral teeth conspicuously at a larger distance from the former	16

12	Vulva unusually anterior in position, in 35–36% of body length, each gonad about twice as long as body diameter. – ♀: L = 2.3–2.8 mm; a = 28–33; b = 3.1–3.4; c = 30; V = 35–36%; c' = 1.8–2. ♂ unknown. (Brazil.)	soutoi (CARVALHO)
–	Vulva normal in position, well posterior to mid-body; each gonad more than thrice as long as body diameter	13
13	Tail blunt with broadly rounded tip. – ♀: L = 1.9 mm; a = 33; b = 3.4; c = 38; V = 65%; c' = 1.2. ♂ unknown. (Brazil.)	curvicaudatus TSALOLIKHIN
–	Tail tapering with narrowly rounded tip	14
14	Tail finger-like in its posterior two-third and strongly bent ventrad, anterior anal lip overhanging; each gonad as long as 7–8 body diameters. – ♀: L = 2.2 mm; a = 47; b = 4; c = 42; V = 65%; c' = 2–2.3. ♂ unknown. (South Africa.)	coetzeae ANDRÁSSY
–	Tail not finger-like in its posterior part, straight or dorsally bent; each gonad as long as 3–4 body diameters	15
15	Tail shorter than anal diameter; body length near 1 mm. – ♀: L = 1.0–1.2 mm; a = 29–31; b = 3.2–3.5; c = 48–64; V = 65–70%; c' = 0.5–0.7. ♂ unknown. (New Caledonia.)	altitudinarum YEATES
–	Tail longer than anal diameter; body length near 1.5 mm. – ♀: L = 1.4–1.6 mm; a = 30–33; b = 4; c = 33–42; V = 70%; c' = 1.2. ♂ unknown. (South Africa.)	thesigeri COETZEE
16	Body about 3 mm long. – ♀: L = 2.9 mm; a = 44; b = 3.7; c = 34; V = 59%; c' = 1.5–1.7. ♂: L = 2.2–2.9 mm; a = 46–53; b = 3.4–4.0; c = 27–34; PO: 16–18. (New Zealand.)	pounamua CLARK*
–	Body 2 mm or shorter	17
17	Tail uniformly narrowing, as long as two anal diameters or so	18
–	Tail first conoid with a ventral flexure then cylindroid, short and blunt	21
18	Head rounded, lip region as wide as adjacent body. – ♀: L = 1.4 mm; a = 37; b = 3.3; c = 33; V = 62%; c' = 2.2. ♂ unknown. (Czechoslovakia [?], United States [Wisconsin].)	palustris (COBB)
–	Head angular, lip region wider than adjacent body	19
19	Vulva in 74% of body length; buccal cavity hardly one and a half times as long as labial diameter. – ♀: L = 0.8 mm; a = 35; b = 3.3; c = 20; V = 74%; c' = 2. ♂ unknown. (Uzbekistan [?], United States [New Jersey].)	radiatus (COBB)
–	Vulva in 60% of body length; buccal cavity nearly twice as long as labial diameter	20
20	Tail conspicuously pressed on dorsal side, anterior anal lip large, overhanging. – ♀: L = 1.38 mm; a = 34; b = 3.6; c = 26; V = 58%; c' = 2.2. ♂ unknown. (Tanzania.)	pleiades sp. n.
–	Tail not pressed on dorsal side (uniformly contoured), anterior anal lip small, not overhanging. – ♀: L = 1.6 mm; a = 42–44; b = 3.3–3.4; c = 24–25; V = 60%; c' = 2.2–2.3. ♂ unknown. (Brazil.)	collaris ANDRÁSSY
21	Tail quite short, at most one anal diameter long	22
–	Tail distinctly longer than one anal diameter	25
22	Tail sharply constricted at middle. – ♀: L = 1.0–1.1 mm; a = 24–26; b = 3.0–3.2; c = 48–53; V = 62–67%; c' = 0.7. ♂: L = 1.2 mm; a = 32; b = 3.3; c = 45; PO: 16. (India.)	paraindicus RAHMAN et JAIRAJPURI
–	Tail not or only slightly constricted at middle	23
23	Female tail only half as long as anal body diameter, tip of male tail broadly rounded. – ♀: L = 1.0 mm; a = 29; b = 4; c = 51; V = 72%; c' = 0.5. ♂: L = 0.9–1.2 mm; a = 30–37; b = 4; c = 43–52; PO: 16–17. (South Africa.)	rotundicaudatus COETZEE
–	Female tail about as long as anal body diameter, tip of male tail narrowly rounded	24

* *Cobbonchus regulus* ALTHERR, 1963 described on a male and a juvenile specimen from South America is very similar to *C. pounamua*.

- 24 Copulatory supplements 6, two of them level with spicula; dorsal tooth and subventral teeth far from each another. – ♀: L = 1.1 mm; a = 37; b = 3.4; c = 49; V = 66%; c' = 1–1.2.
♂: L = 1.1 mm; a = 45; b = 3.4; c = 43; PO: 6. (India.)
- indicus** BAQRI, BAQRI et JAIRAJPURI
- Copulatory supplements 14–18, four to five of them level with spicula; dorsal tooth and subventral teeth closer. – ♀: L = 1.9 mm; a = 34–46; b = 3.3–3.9; c = 31–34; V = 63–66%;
c' = 1. ♂: L = 1.4–1.9 mm; a = 36–39; b = 3.4–3.6; c = 35–30; PO: 14–18. (New Zealand,
Campbell Islands.)
- australis** CLARK
- 25 Head rounded. – ♀: L = 1.1–1.3 mm; a = 28–38; b = 3.1–3.6; c = 29–35; V = 63–64%;
c' = 1.7. ♂ unknown. (Cameroon.)
- abrupticaudatus** (ALTHERR)
- Head angular. – ♀: L = 1.1–1.3 mm; a = 32; b = 3.2; c = 24; V = 63%; c' = 1.8. ♂ unknown.
(Mauritius, New Hebrides, New Caledonia.)
- mauritianus** (WILLIAMS)

Genus **Comiconchus** JAIRAJPURI et KHAN, 1982

Mononchidae, Cobbonchinae. Body 3–4 mm long. Buccal cavity barrel-shaped, armed with three equal teeth of the same level in mid-stoma. Oesophago-intestinal junction not tuberculate. Female gonads amphidelphic, vulva in 60–64% of body length. Male not known. Tail elongate conoid, 3–4 times as long as anal body width. Caudal glands reduced, spinneret absent.

Type species: *Mononchus trionchus* THORNE, 1924 = *Comiconchus trionchus* (THORNE, 1924) JAIRAJPURI et KHAN, 1982.

This genus is distinctive within the subfamily Cobbonchinae in having dorsal and subventral teeth of equal size and similar level in middle part of stoma, an elongate tail and rudimentary caudal glands.

In wet moss and soil. Distributed in Europe and North America.

One species:

C. trionchus (THORNE, 1924) JAIRAJPURI et KHAN, 1982

Mononchus trionchus THORNE, 1924

Mononchus (Iotonchus) trionchus THORNE, 1924 (MICOLETZKY, 1927)

Miconchus trionchus (THORNE, 1924) ANDRÁSSY, 1958

Remarks

The single species belonging here was first ranged by me (ANDRÁSSY, 1958) to the genus *Miconchus* ANDRÁSSY, 1958. In fact, THORNE's species is in general quite *Miconchus* like, but MULVEY (1962) did not find a tuberculate structure in oesophagus on his specimens. This was the reason that JAIRAJPURI & KHAN (1982) created a separate genus, *Comiconchus*, for *trionchus*.

– ♀: L = 2.7–4.1 mm; a = 26–36; b = 3.9–5.1; c = 15–24; V = 60–64%; c' = 4–5. ♂ unknown.
(Russia, Canada, United States [Utah].)

DESCRIPTIONS OF SOME NEW AND RARE SPECIES

Mononchus pulcher sp. n.
(Fig. 2 A–F)

Mononchus truncatus apud ANDRÁSSY, 1985 (Fig. 2 B). Probably: *Mononchus truncatus* apud MULVEY, 1967 (Figs 17 and 19); *Mononchus longicaudatus* apud WILLIAMS, 1958 (Figs 3–4).

Chilean population, ♀: $L = 1.72\text{--}2.04$ mm; $a = 35\text{--}39$; $b = 4.5\text{--}4.8$; $c = 9.2\text{--}9.7$; $V = 50\text{--}52\%$; $c' = 6\text{--}6.5$.

Hungarian population, ♀: $L = 1.94\text{--}2.10$ mm; $a = 35\text{--}38$; $b = 4.4\text{--}4.8$; $c = 8.7\text{--}9.4$; $V = 49\text{--}51\%$; $c' = 6\text{--}7$.

Body slender, 51–56 µm wide at middle. Cuticle smooth and thin, 1.5–2 µm. Head 23–25 µm wide, not offset, lips and papillae moderately protruding. Body at posterior end of oesophagus twice as wide as head. Amphids caliciform with oval opening, level with beginning of buccal capsule or situated somewhat more posteriad.

Buccal cavity (the sclerotized capsule of stoma) 35–38 µm long and 16–18 µm wide at the middle (type population), or 32–33 µm long and 16–17 µm wide (Hungarian population), strongly sclerotized with conspicuously arched wall in front of the dorsal tooth, thickened in the anterior third on ventral side, and tapering at base. Dorsal tooth fairly large with apex situated in 20–22% of stoma (measured from the anterior end of the sclerotized capsule). There is a short longitudinal ridge on the anterior third of ventral wall. Transverse subventral ribs fine, posterior to tooth apex. Stoma 1/11–1/12 of oesophagus length. Oesophagus 384–410 µm long, always shorter than the distance between cardia and vulva. Oesophago-intestinal junction not tuberculate. Intestine thick-walled. Rectum nearly as long as anal body width.

Vulva transverse with sclerotized internal lips. Vagina about 1/3 of corresponding body width, fairly thin and characteristically spotted in its anterior part. Gonads amphidelphic, each 4.5–5.5 times as long as mid-body width. Distance between vulva and anus 3.6–3.8 times as long as tail. Egg 98–100 × 42–44 µm, 1.7–1.8 times as long as body width.

Tail 186–225 µm, 6–7 times as long as anal diameter, completely cylindrical in its posterior half (9–10 µm wide in this cylindrical portion). Tip of tail sometimes slightly swollen, finely rounded, provided with a pair of small papillae. Caudal glands and terminal opening conspicuous.

Male not known.

Brief characteristics: Body medium-sized, slender, buccal cavity of middle length, twice as long as wide with arched dorsal wall, tooth apex in

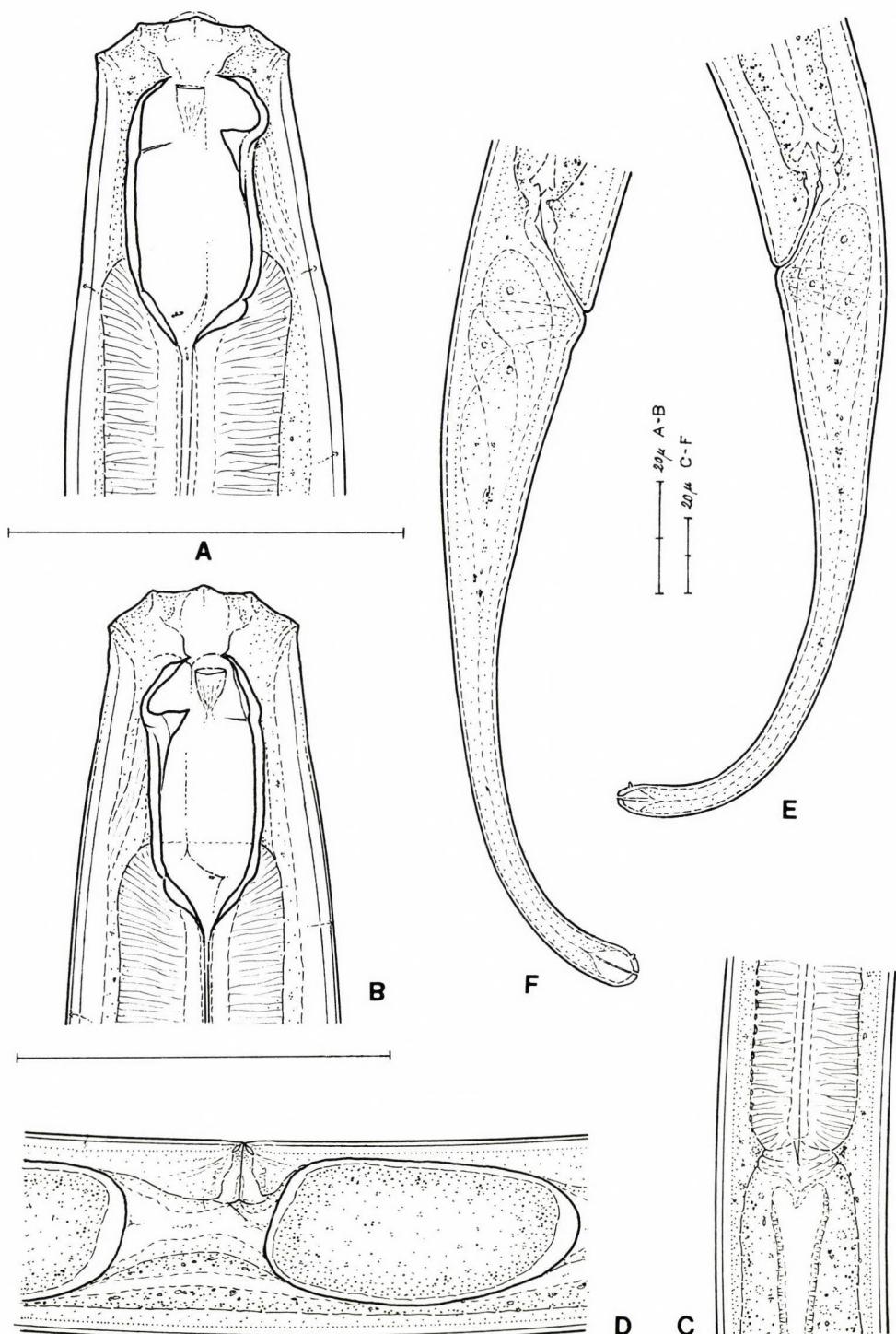


Fig. 2. *Mononchus pulcher* sp. n.: A = anterior end, with body diameter at proximal end of oesophagus (from the Chilean population), B = the same (from the Hungarian population), C = cardial region, D = vulval region, E = female tail (from the Chilean population), F = the same (from the Hungarian population)

1/5 of stoma, transverse ribs posterior to tooth apex, vulva strongly sclerotized, vagina spotted, tail long and cylindroid.

Holotype: ♀ on the slide No. 10723 in the collection of the author. – Paratypes: 6 ♀ and 3 juveniles.

Type locality: Lago di Chungara (a lake) in the northern part of Chile close to the Bolivian border on the Altiplano, in about 4500 m above sea level; moss from the water, collected in November 1965 by the author.

Other localities: Lake Balaton, Hungary, different littoral zones, collected in various months of the years 1990 and 1991. San Francisco, California, United States, small pools close to the town, May 1991, collected by A. FODOR.

In 1985 I already published a drawing on the anterior end of this species under the name "*Mononchus truncatus*" (Fig. 2 B). But in the "Remarks" of the present paper (pages 18–19) I pointed out that *M. truncatus* of 1985 was not identical with *truncatus* in our recent sense. That species is herein described and named as *M. pulcher* sp. n. In length of body and especially in length of stoma, *M. pulcher* takes an intermedial place between *M. truncatus* BASTIAN, 1865 and *M. aquaticus* COETZEE, 1968. As for body length, *truncatus* is 1.6–2.2 mm, *pulcher* 1.8–2.1 mm, *aquaticus* 1.2–1.8 mm; as for stoma length, *truncatus* is 40–50 µm, *pulcher* 32–38 µm, *aquaticus* 25–30 µm. In location of dorsal tooth and transverse ribs as well as in the dorsal arch of stomatal wall the new species is closer to *M. aquaticus*. It can be distinguished from *aquaticus* in length and shape of stoma (twice as long as wide in *pulcher*, 2.4–2.5 times as long as wide in *aquaticus*) and structure of vulva-vagina (the sclerotized pieces in vulva are of different shape in both species, the vagina is conspicuously swollen in *aquaticus*, narrow and finely spotted in *pulcher*). Besides, there is a good difference in length of tail as well: it is 94–160 µm long in *aquaticus*, and 186–225 µm long in *pulcher*.

Mononchus sinensis SONI et NAMA, 1983
(Fig. 3 A–D)

♀: L = 1.33–1.79 mm; a = 32–38; b = 4.0–4.6; c = 7.2–8.7; V = 47–50%; c' = 6.2–6.7.

Body 41–44 µm wide at middle. Head 20–22 µm wide, not set off, lips hardly protruding. Body at proximal end of oesophagus 1.8–2.2 times as wide as head. Amphids caliciform, located between the anterior end of the sclerotized stoma and the tooth apex.

Buccal cavity moderately sclerotized, 29–33 µm long and 15–16 µm broad at middle, 1/11–1/12 of oesophagus length, 1.4–1.5 times as long as labial diameter, or twice as long as wide. Proximal end of stoma funnel-

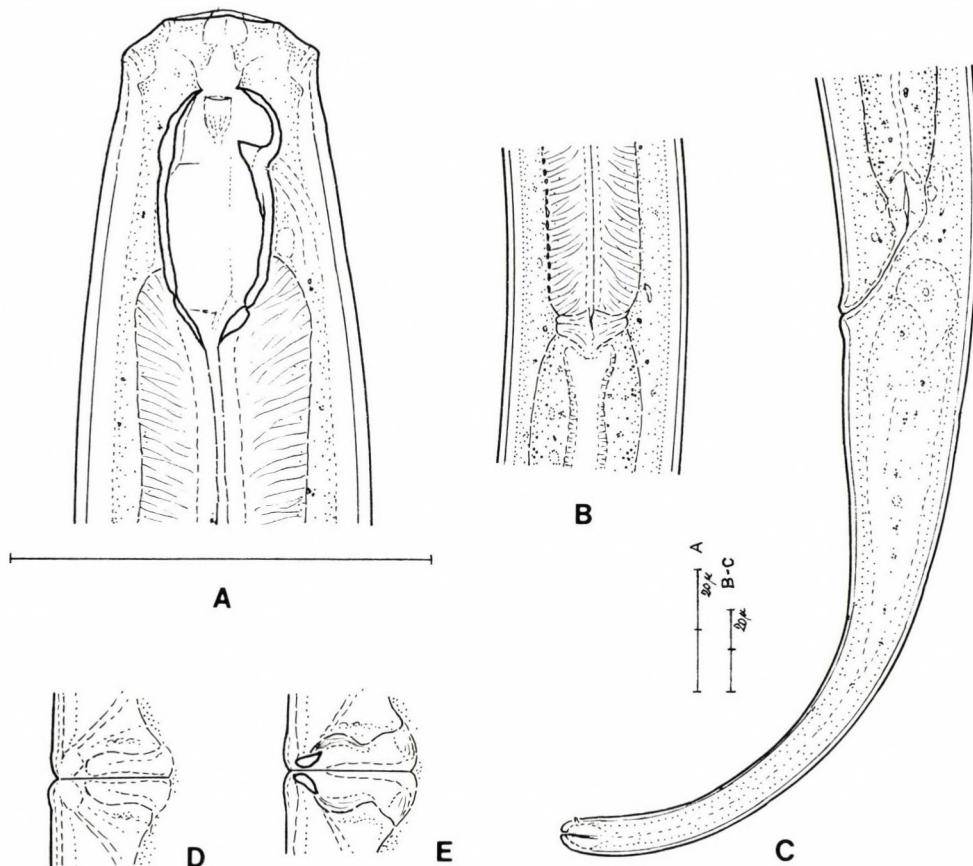


Fig. 3. *Mononchus sinensis* SONI et NAMA, 1983 (A–D): A = anterior region, with body diameter at posterior end of oesophagus, B = cardial region; C = female tail, D = vulva and vagina. – E = *Mononchus aquaticus* COETZEE, 1968: vulva and vagina

shaped. Dorsal tooth well developed, its anterior margin slightly oblique, its apex located in 20–23% of buccal cavity. Transverse ribs on subventral walls weak, posterior to dorsal tooth apex. Oesophagus 335–375 μm long with transverse tripes; posterior end not tuberculate. Distance between cardia and vulva 0.9–1.3 times as long as oesophagus. Rectum about equal with anal body width.

Vulval lips not sclerotized, vagina about 2/5 of corresponding body width. Each gonad as long as 2.5–4 body diameters. Distance between vulva and anus 2.8–3.3 times as long as tail.

Tail 180–205 μm long, 11–13% of body length, or 6.2–7 times as long as anal diameter; gradually tapering in its anterior half then becoming almost cylindrical. Tip of tail rounded or somewhat conoid with a pair of

minute papillae. Caudal glands well developed, all the three nuclei located close to the anal opening (not farther than one anal diameter from that). Terminal orifice distinct.

Locality: Chandigarh, India, Punjab University, wet soil with grass roots, January 1986, collected by A. FODOR (8 ♀, 3 juveniles).

This is the first record of *Mononchus sinensis* after the original description. The present specimens completely fit to the characterization by SONI & NAMA (1983) both in morphological relations and in measurements. *M. sinensis* is very similar to *M. aquaticus* COETZEE, 1968 but it can be certainly differentiated from that by the unsclerotized vulva. The vulval lips of *M. aquaticus* were described and illustrated by COETZEE (1968) as being well sclerotized, and BAQRI & JAIRAJPURI (1974) who redescribed the species in details also defined the vulva showing a sclerotized structure. I have several *M. aquaticus* specimens in my collection all having sclerotized vulval lips (Fig. 3 E).

Coomansus splendidus sp. n.
(Fig. 5 A-G)

Nono, Ecuador (type population); ♀: L = 2.64–3.02 mm; a = 28–30; b = 5.0–5.6; c = 14–17; V = 48–52%; c' = 3–3.5.

Paschooa, Ecuador; ♀: L = 3.00–3.28 mm; a = 26–28; b = 5.5–6.0; c = 16–17; V = 47–58%; c' = 3.4–3.7.

Body large, ventrally curved after fixation, 87–100 µm wide at the middle. Cuticle smooth, 2.5–3 µm thick. Head not offset, 35–38 µm wide, lips hardly projected. Body at posterior end of oesophagus 2.2–2.6 times as wide as head. Amphids caliciform with oval opening, located somewhat posterior to the beginning of the sclerotized buccal capsule.

Buccal cavity (the sclerotized part) 42–44 µm long and 22–23 µm wide, strong-walled, tapering at base. Dorsal tooth well developed, at middle region of stoma, with apex located in 40–46% of buccal cavity (measured from the anterior end). Stoma 1/12 of oesophagus length. A thin longitudinal ridge opposite to dorsal tooth present, originated at beginning of ventral wall. Oesophagus 520–550 µm long; distance between cardia and vulva 1.6–1.8 times as long as oesophagus. Excretory duct and opening conspicuous, at a distance of 175–185 µm from anterior body end, in 32–34% of oesophagus. Cardia with a narrow tongue-shaped projection. Oesophago-intestinal junction not tuberculate. Intestine composed of large penta- or hexagonal cells. Posterior to the middle of distance between vulva and anus the intestine shows two or three distinct constrictions; they are in 74–78, 80 and 83–85% of body length.

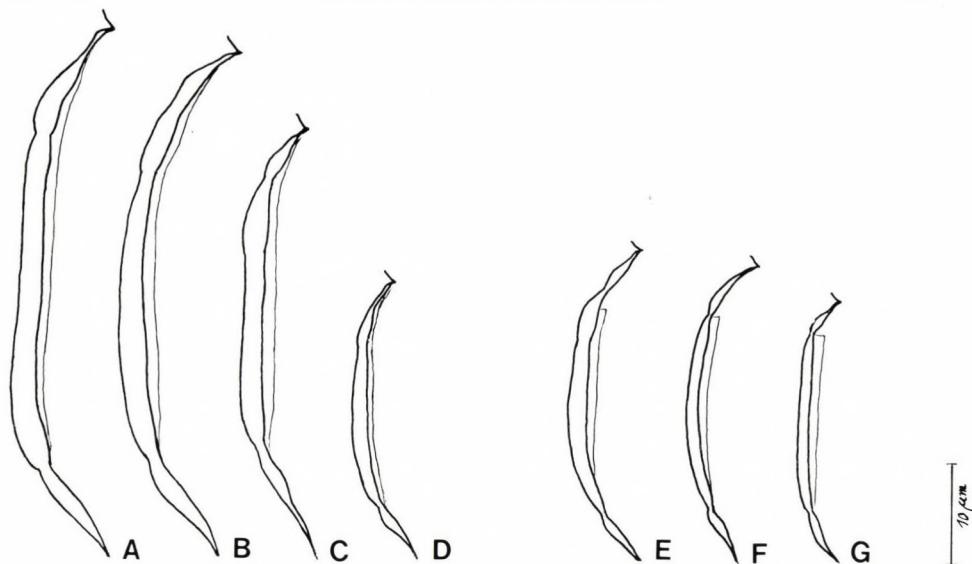


Fig. 4. Ventral walls of buccal cavity in the genus *Coomansus* (A–D) and *Clarkus* (E–G): A = *Coomansus zschorkei* (MENZEL, 1913); B = *Coomansus silvius* (EROSHENKO, 1975), C = *Coomansus splendidus* sp. n., D = *Coomansus parvus* (DE MAN, 1880), E = *Clarkus pulcherrimus* ANDRÁSSY, 1985, F = *Clarkus diversus* ANDRÁSSY, 1983, G = *Clarkus papillatus* (BASTIAN, 1865)

Vulva transverse with strongly sclerotized lips; vagina 40–46 μm long, about 2/5 of corresponding width of body. Gonads paired, each 2.5–4 times as long as body diameter. Uterus narrow with S-like curvatures on both ends. One female contained five eggs in the uterus; eggs spherical with a diameter of 90–96 μm . Distance between vulva and anus 5.8–8 times as long as tail.

Tail 186–210 μm , 3–3.7 times as long as anal body diameter, conoid, somewhat hook-shaped, with finely rounded tip. Caudal glands rudimentary, terminal opening absent.

Male unknown.

Brief characteristics: Body large, stoma well sclerotized, dorsal tooth midway in buccal cavity, excretory porus conspicuous, oesophagus comparatively short, intestine with constrictions, vulva sclerotized, eggs globular, tail hooked.

In length of body and in shape of stoma and tail, *Coomansus splendidus* sp. n. is closest to *C. silvius* (EROSHENKO, 1975). Its head is, however, narrower (35–38 vs. 54–55 μm), the buccal cavity shorter (42–44 vs. 52–55 μm), the vulva situated in the mid-body region (48–58 vs. 62–71%) not

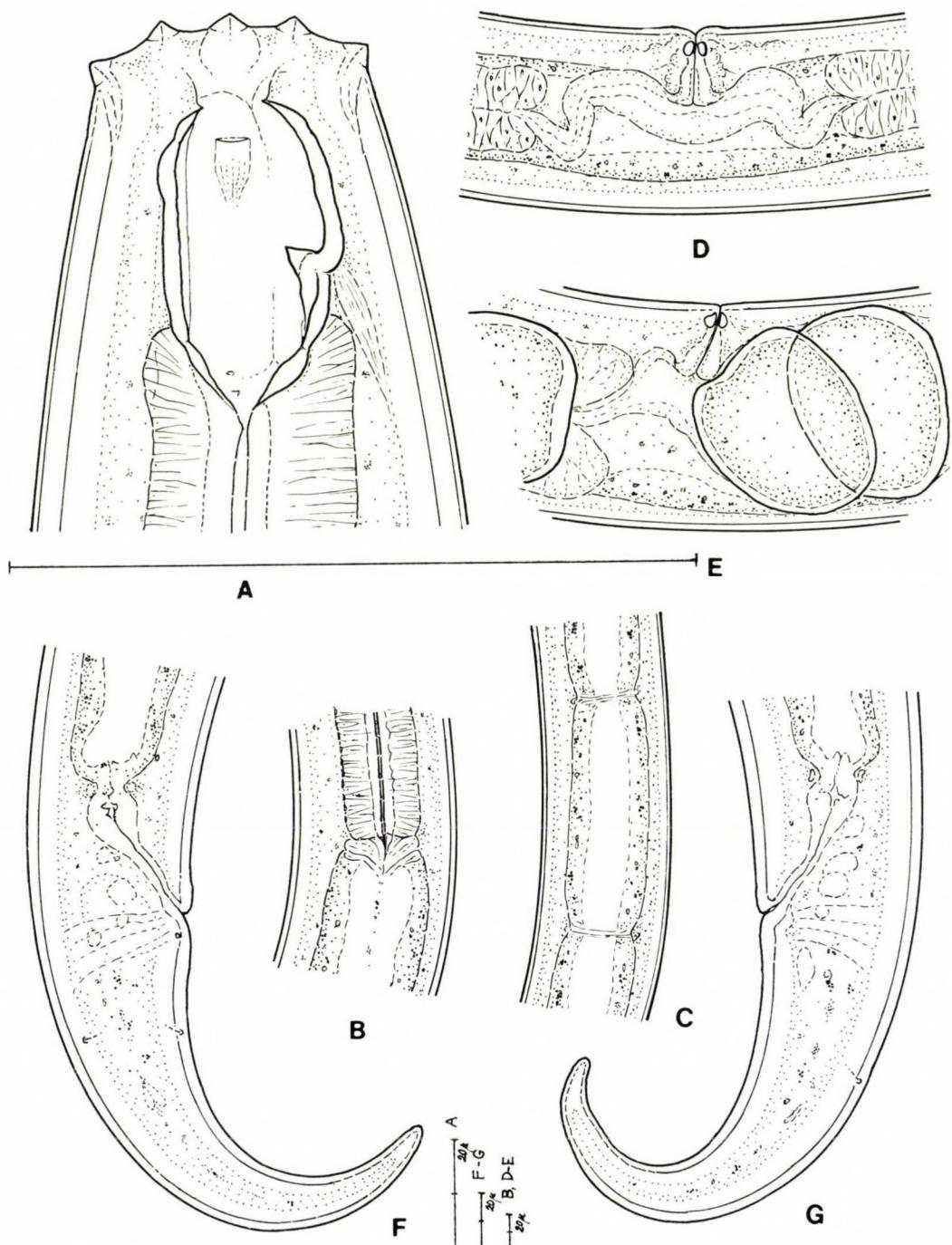


Fig. 5. *Coomansus splendidus* sp. n.: A = anterior end, with body diameter at proximal end of oesophagus, B = cardial region, C = a part of intestine showing two constrictions, D-E = vulval regions of two females, F-G = tails of two females

showing ad vulval papillae, the tail rounded on tip and the eggs are of other shape. Besides, *C. splendidus* shows characteristic constrictions on the intestine.

Holotype: ♀ on the slide No. 11772 in the collection of the author. — Paratypes: 4 ♀ and 2 juveniles. — Other population: 2 ♀ and 3 juveniles.

Type locality: Mount Nono in Ecuador, 2300 m above sea level, fallen leaves from a gallery rain-forest, collected in October 1985 by I. LOKSA et A. ZICSL. — Other locality: Mount Paschoa, Ecuador, in about 300 m above sea level, wet litter from a primary rain-forest, collected as above.

In my collection I have a single female from Bolivia (Caranavi, mosses from rock) similar to this new species but somewhat shorter, showing a smaller buccal cavity, a dorsal tooth located somewhat posteriad and other sclerotized pieces in vulva. $L = 2.3$ mm; $a = 24$; $b = 4.6$; $c = 15$; $V = 52\%$; buccal cavity 35×23 μm , head 33 μm wide, dorsal tooth in 50% of stoma, tail 150 μm long.

Coomansus silvius (EROSHENKO, 1975) JAIRAJPURI et KHAN, 1982
(Fig. 6 A—D)

♀: $L = 2.49\text{--}2.55$ mm; $a = 24\text{--}25$; $b = 3.9\text{--}4.2$; $c = 14\text{--}15$; $V = 62\text{--}64\%$; $c' = 3.2\text{--}3.3$.

Body large and rather plump, measuring $100\text{--}105$ μm as mid-diameter. Cuticle smooth, about 3 μm thick. Head $48\text{--}52$ μm wide, not offset, labial papillae conoid. Body at proximal end of oesophagus $1.8\text{--}1.9$ times as wide as head. Amphids level with anterior end of the sclerotized stoma or located somewhat more posteriad.

Buccal cavity well sclerotized, $54\text{--}55$ μm long and $30\text{--}31$ μm wide at middle, nearly 9% of oesophagus length, $1.7\text{--}1.8$ times as long as head diameter. Dorsal tooth rather small, oblique on its anterior margin with apex situated in $50\text{--}55\%$ of stoma. Longitudinal ridge on ventral wall weak, gradually beginning on anterior end of stoma. Oesophagus $600\text{--}630$ μm long; distance between posterior end of oesophagus and vulva $1.4\text{--}1.6$ times as long as oesophagus. On the posterior ventral wall of oesophagus a characteristic pearl-like structure is present consisting of $40\text{--}50$ "pearls". Oesophago-intestinal junction not tuberculate. Rectum about as long as anal body width. Excretory porus conspicuous, $218\text{--}222$ μm or $4\text{--}4.5$ labial widths posterior to anterior body end, or, in $35\text{--}36\%$ of oesophagus.

Vulva strongly sclerotized, vagina almost $1/2$ of body width. Female amphidelphic, each gonad $3.3\text{--}3.5$ times as long as body diameter. Spermathecas present, filled with small ovoid spermatozoa. Each female contained one egg in the uterus; $110\text{--}126 \times 66\text{--}68$ μm , $1\text{--}1.2$ times as long as body width.

Distance between vulva and anus $4\text{--}4.2$ times as long as tail. The latter $180\text{--}186$ μm , $3.2\text{--}3.3$ anal diameters long, or about 7% of body length,

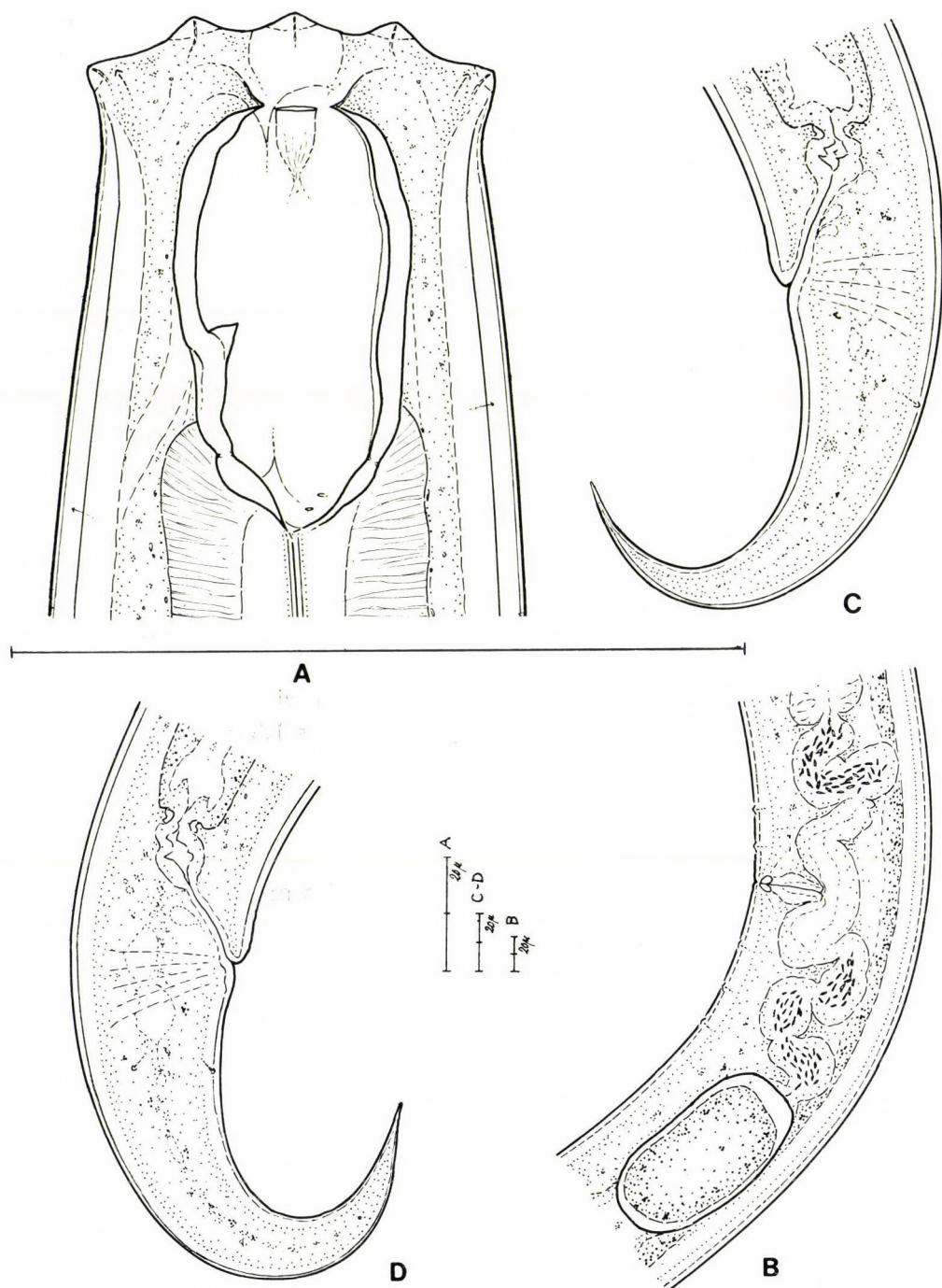


Fig. 6. *Coomansus silvius* (EROSHENKO, 1975) JAIRAJPURI et KHAN, 1982: A = anterior end, with body diameter at cardial region; B = vulval region, C-D = tails of two females

conoid, gradually tapering to its sharp tip, strongly bent ventrally. Caudal glands rudimentary, terminal porus absent.

Locality: Korea, Paekdu Mountains, Prov. Ryanggang, moory soil from a pine wood, July 1988, collected by S. ANDRIKOVICS.

EROSHENKO described this species from the Far Eastern part of Russia. My specimens agreed very well with the original description (in general measurements, size of buccal cavity, position of dorsal tooth, presence of vulval papillae, shape and length of tail, etc.), they were only somewhat shorter (2.5 vs. 2.7–3.2 mm).

Coomansus intestinus (VINCIGUERRA et LA ROSA, 1990) **comb. n.**
(Fig. 7 A–D)

♂: L = 2.87 mm; a = 33; b = 5.2; c = 20; c' = 2.

Body 85 µm wide at mid-region. Cuticle smooth, 3 µm thick. Head 36 µm wide, lips and papillae hardly protruding. Body at posterior end of oesophagus 2.3 times as wide as head. Amphids level with dorsal tooth.

Buccal cavity, in comparison with body length, small, 40 µm long (the sclerotized capsule), strongly arched in front of dorsal tooth. Tooth large with apex located in 17% of stoma. Opposite to the tooth a narrow longitudinal ridge is present, gradually originating at beginning of ventral wall. Oesophagus 550 µm long; posterior end not tuberculate. Intestine mainly with hexagonal cells. On the posterior part of intestine, in 70, 75 and 85% of body length, three conspicuous constrictions can be observed.

Testes paired, long. Spermatozoa elongate, 10 µm long, about as long as 1/8 body width. Spicula 120 µm long, fairly robust. Tail 138 µm, twice as long as anal body width. Eight well developed and two small supplementary papillae present; the first of the large ones located at 200 µm, the last at 50 µm from the cloaca. Between the cloaca and the hindmost supplement there is a ventral papilla. Tail showing 3 pairs of subventral and 3 pairs of subdorsal papillae. Caudal glands reduced, terminal opening absent.

VINCIGUERRA & LA ROSA (1990) described this species as *Clarkus intestinus*. They noted however that “the ventral ridge is weakly protruding”. That ridge illustrated in Fig. 1B shows in fact not the *Clarkus*- but the *Coomansus*-type. At my request, DR. M. T. VINCIGUERRA was so kind to check the buccal structure of the type animals once more, and verified they being representatives rather of the genus *Coomansus* than *Clarkus*.

My animal perfectly agrees with the male described by the Italian authors, both in morphological details and in measurements. Only the tail

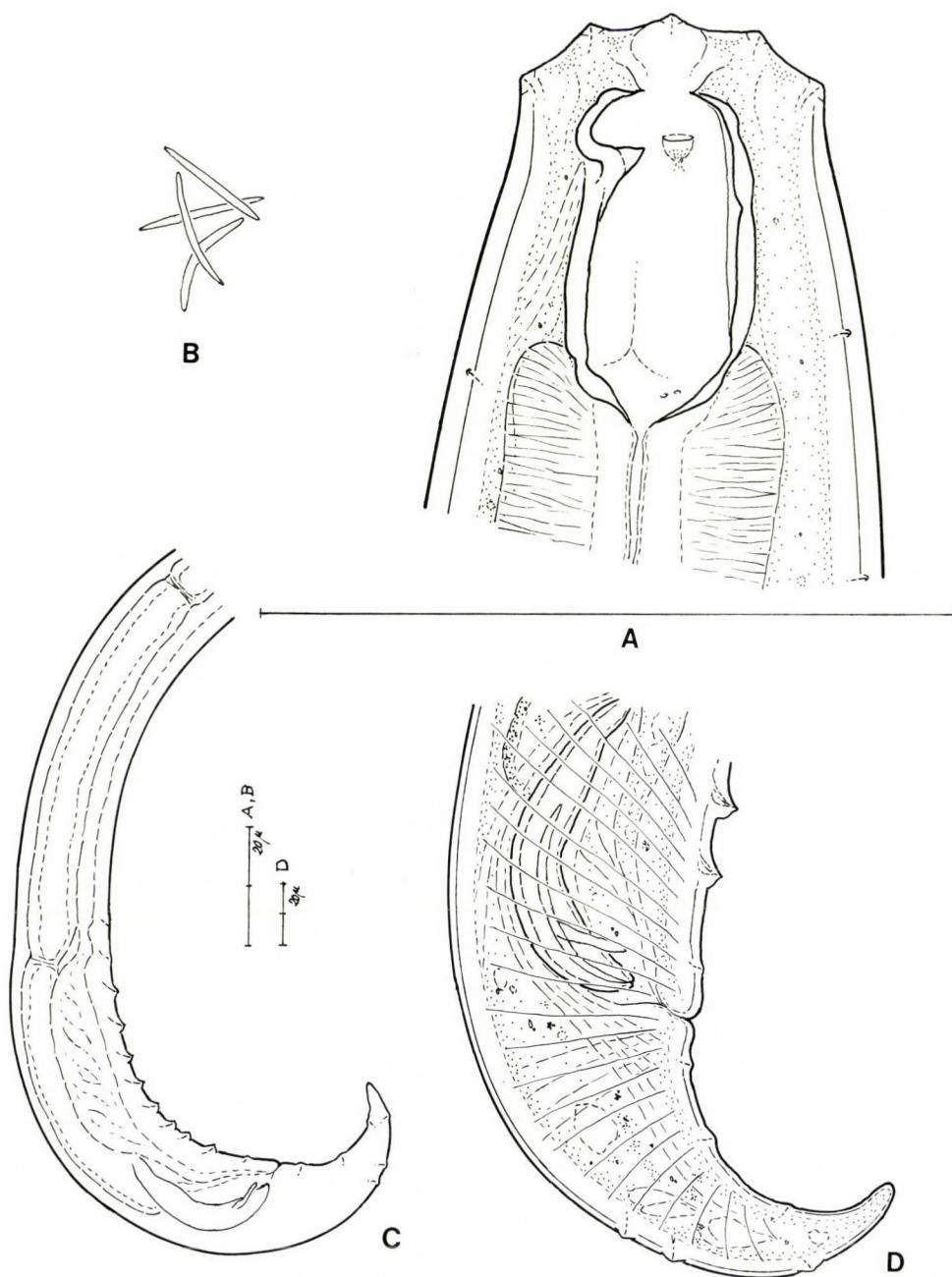


Fig. 7. *Coomansus intestinus* (VINCIGUERRA et LA ROSA, 1990): A = anterior end, with body diameter at proximal end of oesophagus, B = spermatozoa, C = posterior body of male (intestine with two constrictions), D = posterior end of male

is somewhat more slender than in the illustration. *Coomansus intestinus* was described from the Tierra del Fuego of South Chile and Argentina; it was found now in one of the Antarctic Islands.

Locality: Deception Island in the South Shetland Islands, Antarctic, moss, collected in 1961 by E. JANETSCHKEK.

Prionchulus mordax sp. n.
(Fig. 8 A-E)

♀: L = 1.30–1.67 mm; a = 22–24; b = 4.1–4.9; c = 12–14; V = 60–61%; c' = 2.8–3.1.

Body arched, rather plump, 66–76 μm at mid-region. Cuticle smooth, 2–2.5 μm thick. Head 34–35 μm wide, lips conoid but low. Body at proximal end of oesophagus 1.7–2 times as wide as head. Amphids caliciform, level with anterior part of stoma.

Buccal cavity 33–34 μm long and 18–20 μm broad, more or less ovoid, in its anterior part wider than in posterior, about as long as labial diameter, or, 1/10–1/11 of oesophagus length. Dorsal tooth strong with sharp apex located in 16–18% of buccal capsule. Subventral denticles moderately developed or weak, 9–11 on each ridge. Oesophagus 340–390 μm long, on proximal end with a pearl-like ventral structure. Distance between cardia and vulva 1.5–2 times as long as oesophagus. Oesophago-intestinal junction not tuberculate. Excretory opening conspicuous, 145–150 μm from anterior body end or in 37–42% of oesophagus. Intestinal cells large, rectum about equal in length with anal body diameter.

Vulva transverse with plum-shaped sclerotized pieces; vagina about 2/5 body width. Each gonad 3.2–3.5 times as long as body diameter. Uterus with one or two eggs; 70–77 \times 40–50 μm . Distance between vulva and anus 4–4.8 times as long as tail.

Tail 110–128 μm , 2.8–3.1 anal body widths long, conoid or hooked with fairly sharp terminus. Caudal glands reduced, terminal porus absent. In the last third/fourth of tail a pair of subventral papillae is present.

Male not known.

Brief characteristics: A smaller species with plump body, lips hardly protruding, buccal cavity comparatively short, subventral denticles weak, vulva strongly sclerotized, gonads short, tail strongly bent with sharp tip.

Holotype: ♀ on the slide No. 12492 in the collection of the author. – Paratypes: 4 ♀. – Other specimens: 3 ♀.

Type locality: Korea, Myohyang Mountains, Prov. Pjongan, Isonnan Cataract, moss, collected in July 1988 by S. ANDRIKOVICS. Other localities: Korea, Hyangsan, Chang-chon River, soil; Korea, Paekdu Mountains, moory soil from a pine wood.

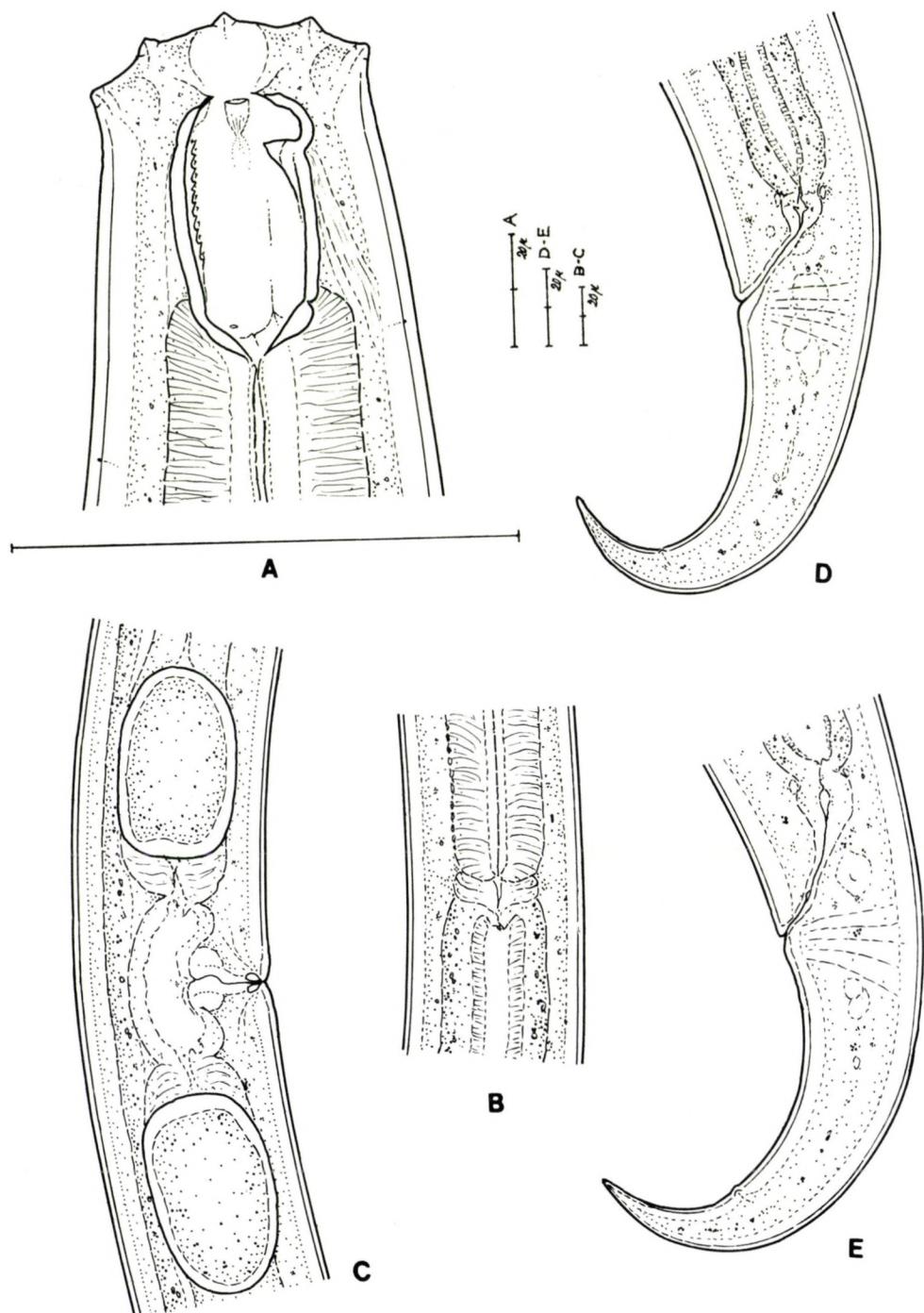


Fig. 8. *Prionchulus mordax* sp. n.: A = anterior end, with body diameter at proximal end of oesophagus, B = cardial region, C = vulval region, D-E = tails of two females

This new species is well characterized by its strongly tapering, sharply pointed tail. In comparing with the sibling species *Prionchulus muscorum* (DUJARDIN, 1845) and *P. punctatus* COBB, 1917, our new species differs from them in having a shorter body, a smaller buccal cavity, weakly denticulated subventral ridges in stoma and a well-pointed tail.

Cobbonchus pleiades sp. n.
(Fig. 9 A-E)

♀: L = 1.38 mm; a = 34; b = 3.6; c = 26; V = 58%; c' = 2.2.

Body strongly bent after fixation, 40 µm wide at mid-region. Cuticle smooth, 1–1.5 µm thick, with very fine transverse striation on anterior end of body. Head 23 µm wide, lips low, conoid. Body at proximal end of oesophagus 1.6 times as wide as head. Amphids elongate-caliciform with oval opening located between the anterior end of buccal capsule and the dorsal tooth.

Buccal cavity (the sclerotized capsule) 35 µm long and 17 µm wide, elongate-ovoid, twice as long as wide or 1.5 times as long as labial diameter, 1/11 of oesophagus length. Dorsal tooth somewhat bigger than the subventral ones, with apex located in 27% of buccal cavity. Anterior margins of subventral teeth more oblique than that of the dorsal tooth; apices in 57% of stoma. (In the juvenile specimens, dorsal tooth apex located in 25–26%, subventral teeth apices in 56–58% of buccal cavity.) Oesophagus 386 µm long, 28% of body length. Posterior end of oesophagus not tuberculate. Distance between cardia and vulva a little longer than oesophagus. Rectum shorter than anal diameter.

Vulva transverse, not sclerotized, vagina short, hardly longer than 1/4 body width. Each gonad thrice as long as body diameter. Uterus short, without eggs. Distance between vulva and anus 10 times as long as tail.

Tail 52 µm, as long as 2.2 anal diameters, characteristic in shape: nearly gradually tapering, ventrally bent, in its anterior fourth showing a weak dorsal pression, in posterior part cylindroid with rounded terminus. Anterior lip of anus large, overhanging. Caudal glands well developed, spinneret terminal.

Male unknown.

Brief characteristics: Body smaller, buccal cavity oblong, subventral teeth far from the dorsal one, vulva not sclerotized, tail of characteristic shape.

Cobbonchus pleiades sp. n. belongs to that group of species which have a comparatively short body, a gradually narrowed and arcuate tail and teeth arranged far from each other. These species are *C. palustris* (COBB,

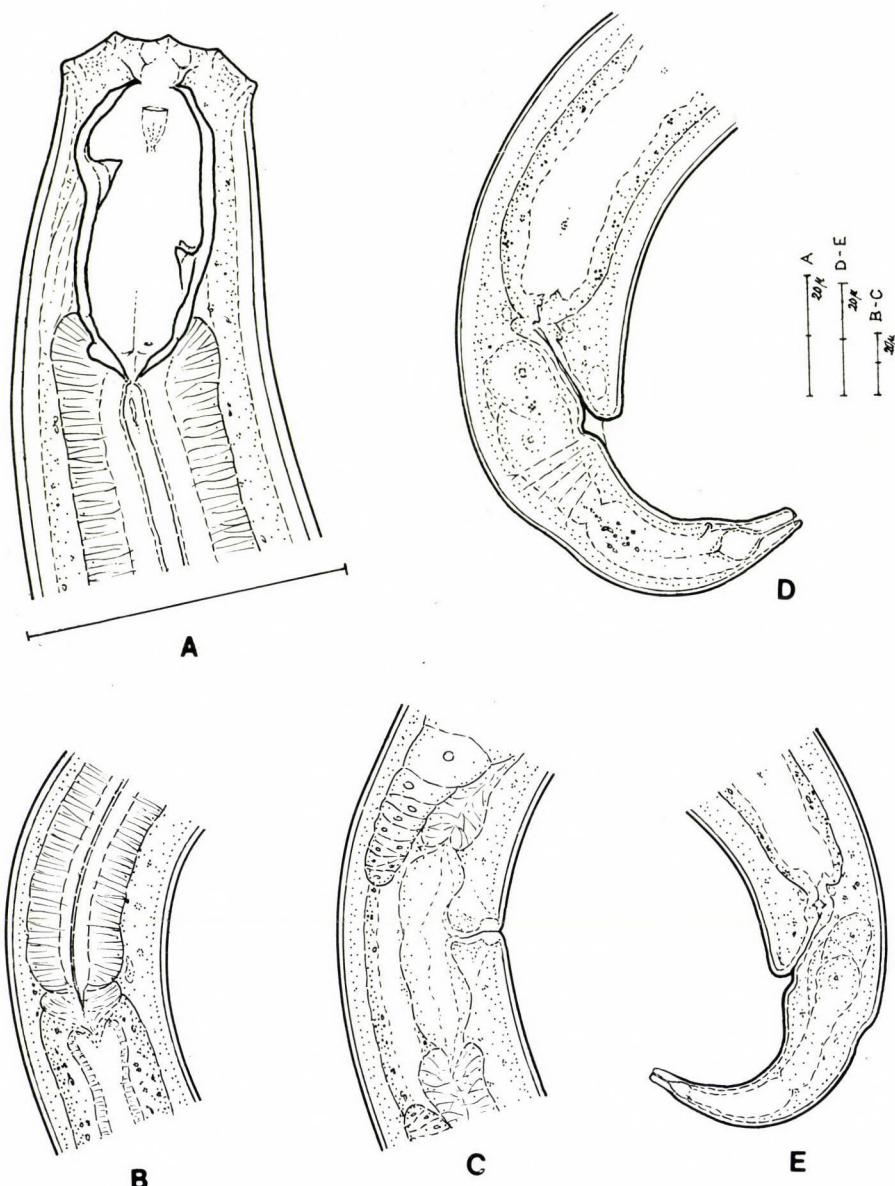


Fig. 9. *Cobbonchus pleiades* sp. n.: A = anterior end, with body diameter at proximal end of oesophagus, B = cardial region, C = vulval region, D = tail of female, E = tail of a young animal

1917), *C. radiatus* (COBB, 1917) and *C. collaris* ANDRÁSSY, 1985. The new species differs from them by the special pression on dorsal side of tail and the large, overhanging anterior anal lip. Besides, it differs from *palustris* by the angular labial lips, from *radiatus* by the vulva located anteriad (58 vs. 74%).

Holotype: ♀ on the slide No. 12497 in the collection of the author. – Paratypes: 12 juveniles.

Type locality: Tanzania, Kwamsambia Forest Reserve, Tanga Region, 1050 m above sea level, primary rain-forest, fallen leaves, collected in February 1987 by S. MAHUNKA and A. ZICSI.

The specific name refers to the well-known stellar configuration "Pleiades" in which a great number of small stars (here: juveniles) are grouped around a bigger one (here: female).

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ÜBER DIE TAXONOMISCHEN PROBLEME
EINIGER AMPHIATLANTISCHER
REGENWURM-GATTUNGEN (OLIGOCHAETA,
OCTOCHAETIDAE).
REGENWÜRMER AUS SÜDAMERIKA 18

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(Eingegangen am 11. Mai 1992)

(On the taxonomical problems of some amphiatlantic earthworm genera [Oligochaeta, Octochaetidae]. Earthworms of South America 18.) A new earthworm subgenus is described: *Pickfordia* (*Omodeoscolex*) subgen. n., and a revision of generic characters of the Octochaetid genera, having the calciferous glands in 14-15. segment, are given. With 2 original maps.

Von Sammlern der Ungarischen Bodenzoologischen Expedition sind aus der Kongo-Region (BALOGH, ENDRÖDY-YOUNGA & ZICSI 1965), Paraguay (ANDRÁSSY, BALOGH, LOKSA, MAHUNKA & ZICSI 1967), Ekuador (ZICSI und LOKSA 1986 und 1987) und von Herrn DR. J. M. THIBAUD, Paris (Gaudeloupe Insel, 1987) u. a. auch interessante, der Familie Octochaetidae angehörende Regenwurm-Arten gesammelt worden, deren gemeinsames Kennzeichen das Vorhandensein von Kalkdrüsen im 14. u. 15. Segment war. Eine generische Einreihung der Arten stößt jedoch wegen Überdeckung der übrigen Merkmale auf Schwierigkeiten, so daß eine Merkmalbegrenzung der in Frage stehenden Gattungen vorerst durchgeführt werden mußte.

Mit der Bekanntmachung dieser Aufsammlungen wurde in einer vorausgehenden Arbeit (CSUZDI & ZICSI 1989) bereits begonnen. An dieser Stelle sollen die aus verschiedenen Kontinenten und Ländern stammenden Arten bekannt gegeben werden.

Für die Überlassung des Materials spreche ich Herrn PROF. DR. A. ZICSI auch an dieser Stelle meinen besten Dank aus.

BEARBEITUNG DES MATERIALS

In der einschlägigen Literatur sind bisher 4 Gattungen beschrieben worden, deren Vertreter im 14. und 15. Segment Kalkdrüsen mit Ausbuchstungen besitzen. Die Gattung *Wegeneriella* wurde von MICHAELSEN (1933) mit der Typusart *Notiodrilus ?valdiviae* MICHAELSEN, 1902 aus Kamerun aufgestellt. Es wurde ihr auch die aus Suriname stammende *W. beauforti* MICHAELSEN, 1933 zugestellt. Kennzeichnend für die Gattung sind die paarigen Kalkdrüsen im 14. und 15. Segment, die unpaarigen medioventralen

Samentaschen und der im 6. Segment befindliche, das ganze Segment einnehmende Muskelmagen. MICHAELSEN (1933, p. 127) konnte bei der Typusart das Exkretionssystem nicht genau bestimmen, bei *W. beauforti* fand er es meronephridisch.

Etwas später wurde von ČERNOSVITOV (1934) die Gattung *Neogaster* mit der Typusart *N. americanus* beschrieben. Diese unterscheidet sich durch die paarigen Samentaschen von den Vertretern der Gattung *Wegeneriella*. Das Exkretionssystem wurde von ČERNOSVITOV meronephridisch bezeichnet.

PICKFORD (1937) stellte fest, daß die Typusart der Gattung *Wegeneriella* ein holonephridisches Exkretionssystem besitzt, während die südamerikanischen Arten dieser Gattung über meronephridische Exkretionsorgane verfügen. Deswegen wurde erstere in die Gattung *Eodrilus* MICHAELSEN, 1905, die letzteren der Gattung *Howascolex* MICHAELSEN, 1901 eingereiht.

ČERNOSVITOV (1939) stimmte mit der Einreichung von *W. valdiviae* zu *Eodrilus* überein, das Einreihen der südamerikanischen meronephridischen Arten zur Gattung *Howascolex* hingegen konnte er nicht annehmen. Für diese Arten stellte er eine neue Gattung: *Wegeneriona* ČERNOSVITOV, 1939 auf.

Für die afrikanischen Arten mit holonephridischem Exkretionssystem wurde von OMODEO (1955) die Gattung *Wegeneriella* zurückgestellt. Die Gattung *Wegeneriona* wurde als Untergattung von *Wegeneriella* betrachtet. Ferner beschrieb OMODEO (1955) auch 2 *Neogaster*-Arten aus Afrika, die im Gegensatz zur Typusart Holonephridien besaßen. Ebenfalls zur Gattung *Neogaster* zählte er auch die holonephridische Art *Notiodrilus divergens* COGNETTI, 1905, die aus Panama bekannt gegeben wurde. Dadurch wurden in der Gattung *Neogaster* zwei afrikanische und eine südamerikanische holonephridische Art (Typusart) vereint.

Etwas später stellte ebenfalls OMODEO (1958) aufgrund von Arten aus Afrika die Gattung *Pickfordia* auf, die sich von den afrikanischen *Neogaster*-Arten durch die Divertikel der paarigen Samentaschen unterschieden.

RIGHI & CABALLERO (1970) waren der Meinung, daß die holonephridischen *Neogaster*-Arten entweder in die Gattung *Pickfordia* einzureihen sind, oder es müßte eine neue Gattung für diese aufgestellt werden, da diese sich nicht nur durch das holonephridische Exkretionssystem von der Typusart der Gattung *Neogaster* unterscheiden, sondern auch dadurch, daß der Muskelmagen rudimentär ist.

JAMIESON (1974) revidierte die Art *Notiodrilus divergens* COGNETTI, 1905 und emendierte die Gattung *Wegeneriella*. Dadurch wurden sämtliche holonephridischen Arten, die von OMODEO (1955) zu *Neogaster* gereiht worden sind (*N. divergens* COGNETTI, 1905, *N. cisatlantica* OMODEO, 1955 und *N. africana* OMODEO, 1955), zur Gattung *Wegeneriella* gezählt. Die Gattung *Wegeneriella* enthielt dadurch eine mittelamerikanische und 4 afrikanische holonephridische Arten. Hinsichtlich der Samentaschen waren sich die Ar-

ten nicht einheitlich, da Vertreter mit unpaarigen und paarigen Organen vorhanden waren. Die beiden meronephridischen Arten der Gattung *Neogaster* sind von JAMIESON hingegen nicht erwähnt worden. Da er der Paarigkeit bzw. Unpaarigkeit von Samentaschen keinen generischen Wert zumißt,



Abb. 1. Verbreitung der Arten und Gattungen aus der Familie Octochaetidae in Mittel- und Südamerika die über paarige Kalkdrüsenausbuchtungen im 14. und 15. Segment verfügen.—Numerierung entspricht der in Tabelle 1 angegeben Nummern

müßten seiner Auffassung nach die Arten *N. americana* ČERNOSVITOV, 1934 und *N. gavrilovi* RIGHI & CABALLERO, 1970 in die Gattung *Wegenerionia* eingereiht werden, da die meronephridischen südamerikanischen Arten von ihm anerkannt wurden.

Seit der letzten Revision von JAMIESON (1974) wurde eine weitere holonephridische Art mit unpaarigen Samentaschen aus Afrika (*Wegeneriella congica* ZICSI & CSUZDI, 1989) und zwei holonephridische Formen mit paarigen Samentaschen aus Südamerika beschrieben (*Wegeneriella tocaya* RIGHI, AYRES & BITTENCOURT, 1978, *Wegeneriella divergens itapecu* RIGHI, AYRES & BITTENCOURT, 1978). Außerdem wurden aus Südamerika seither auch meronephridische Arten mit unpaarigen (*Wegenerionia belenensis* RIGHI, 1988) und paarigen Samentaschen (*Neogaster aidae* RIGHI, 1975, *Neogaster angeloi* RIGHI, 1988) bekannt gegeben.

Wie aus der vorausgehenden Zusammenstellung ersichtlich, zeigen aufgrund der vorausgehenden Revisionsarbeiten allein die Arten der Gattung *Wegenerionia* hinsichtlich ihrer anatomischen Merkmale und ihrer geographischen Verbreitung ein einheitliches Bild (meronephridisches Exkretionsystem, unpaarige Samentaschen und neotropische Verbreitung). Es wäre zu bestreben dies auch bei den Vertretern der anderen supraspezifischen Taxa zu erreichen. Deswegen wird einerseits vorgeschlagen die afrikanische Verbreitung aufweisenden, holonephridischen und unpaarige Samentaschen besitzenden Arten der Gattung *Wegeneriella* im engeren Sinne (ZICSI & CSUZDI 1989) zuzustellen, andererseits die mit paarigen Samentaschen bislang der Gattung *Wegeneriella* angehörten Arten in die von OMODEO (1958) aufgestellte Gattung *Pickfordia* zu reihen. Die Gattung *Pickfordia* müßte in zwei Untergattungen unterteilt werden in *Pickfordia* (*Pickfordia*) OMODEO, 1958 und in *Pickfordia* (*Omodeoscolex*) subg. n. Der Untergattung *Pickfordia* würden die Arten aus Afrika angehören bei denen die Samentaschen Divertikel besitzen, der Untergattung *Omodeoscolex* subg. n. die amphiatlantisch verbreiteten Arten, bei denen die Samentaschen keine Divertikel besitzen. Die Gattung *Neogaster* muß im Sinne von ČERNOSVITOV (1934) zurückgestellt werden, dieser sollen sämtliche Arten mit paarigen Samentaschen und meronephridischen Exkretionsapparat sowie südamerikanischer Verbreitung angehören (Tabelle 1).

Wie bereits OMODEO (1955, 1958) darauf hingewiesen hat, ist der Ursprung dieser Gattungen auf das Zeitalter der gemeinsamen Kontinente (Afrika und Südamerika-West Gondwana) zurückzuführen. Nach der Kontinentenverschiebung in der unteren Kreide (vor cca. 100 Millionen Jahren) haben sie einen selbständigen Weg der Entwicklung eingeschlagen. So haben sich auf dem südamerikanischen Kontinent Arten mit meronephridischen (Gattung *Wegenerionia*, *Neogaster*), in Afrika solche mit holonephridischem Exkretionssystem (*Wegeneriella*, *Pickfordia*) entwickelt.



Abb. 2. Verbreitung der Arten und Gattungen aus der Familie Octochaetidae in Afrika die über paarige Kalkdrüsenausbuchtungen im 14. und 15. Segment verfügen.—Nummerierung entspricht der in Tabelle 1 angegeben Nummern

Allein bei der Untergattung *Pickfordia* (*Omodeoscolex*) subg. n. hat sich diese Trennung nicht vollzogen, da zwei Arten in Afrika und zwei Arten in Südamerika mit den gleichen Kennzeichen angetroffen werden konnten. Im Gegensatz zur Auffassung von JAMIESON (1974) ist dies Vorkommen ein fester Beweis der Kontinentenzusammengehörigkeit (Abb. 1 und 2).

Tabelle 1

Verbreitung der Arten und Gattungen aus der Familie Octochaetidae in Afrika bzw. Mittel- und Südamerika die über paarige Kalkdrüsenausbuchtungen im 14. und 15. Segment verfügen

AFRIKA

Gattung *Wegeneriella* MICHAELSEN, 1933 emend. ZICSI et CSUZDI 1989

Exkretionssystem holonephridisch, 1 Muskelmagen vor dem Hodensegment. Samentaschen unpaarig, ohne Divertikel.

1. *congica* ZICSI et CSUZDI, 1989
2. *monotheca* OMODEO, 1955
3. *valdiviae* (MICHAELSEN, 1902)

Gattung *Pickfordia* (*Pickfordia*) OMODEO, 1958

Exkretionssystem Holonephridisch, Muskelmagen fehlt. Samentaschen paarig, Divertikel vorhanden.

4. *ditheca* OMODEO, 1958
5. *hemibalantina* OMODEO, 1958
6. *magnisetosa* OMODEO, 1958
7. *pseudoplanaria* OMODEO, 1958

Gattung *Pickfordia* (*Omodeoscolex*) subgen. n.

Exkretionssystem Holonephridisch. Muskelmagen fehlt. Samentaschen paarig, ohne Divertikel.

8. *africana* (OMODEO, 1955)
9. *cisatlantica* (OMODEO, 1955)

MITTEL- und SÜDAMERIKA

Gattung *Wegeneriona* ČERNOSVITOV, 1939

Exkretionssystem meronephridisch. Ein Muskelmagen vor dem Hodensegment. Samentaschen unpaarig, ohne Divertikel.

1. *beauforti* (MICHAELSEN, 1933)
2. *belenensis* RIGHI, 1988
3. *brasiliiana* ČERNOSVITOV, 1939
4. *cernosvitovi* RIGHI et CABALLERO, 1970
5. *michaelseni* (ČERNOSVITOV, 1934)

Gattung *Neogaster* ČERNOSVITOV, 1934

Exkretionssystem meronephridisch, ein Muskelmagen vor dem Hodensegment. Samentaschen paarig, ohne Divertikel.

6. *aidae* RIGHI, 1975
7. *americana* ČERNOSVITOV, 1934
8. *angeloi* RIGHI, 1988
9. *gavrilovi* RIGHI et CABALLERO, 1970

Gattung **Pickfordia** OMODEO, 1958 emend. CSUZDI

Borstenanordnung lumbricin. Muskelmagen nicht vorhanden. Zwei Paar Kalkdrüsen mit lamellenförmigen Divertikel im 14. und 15. Segment. Exkretionssystem holonephridisch. Männliche Geschlechtsorgane acanthodrilin, Lage der Prostataporen eventuell verschoben. Samentaschen paarig mit oder ohne Divertikel.

Typusart: *Pickfordia magnisetosa* OMODEO 1958.

Subgenus *Pickfordia* OMODEO, 1958: Samentaschen mit Divertikel.

Subgenus *Omodeoscolex* subg. n.: Samentaschen ohne Divertikel.

Typusart: *Notiodrilus divergens divergens* COGNETTI, 1905.

Verbreitung: Amphiatlantisch.

Die Untergattung *Omodeoscolex* wird zu Ehren von Herrn PROF. P. OMODEO, Rom, dem bekannten Oligochaeten Fachmann benannt.

Pickfordia (Omodeoscolex) divergens divergens (COGNETTI, 1905)

Syn. *Wegeneriella divergens* (COGNETTI, 1905) JAMIESON 1974.

Seit der Erstbeschreibung aus Panama wurde diese Art jetzt zuerst wieder gesammelt. Die Tiere entsprechen vollkommen der bekannten Beschreibung von COGNETTI.

Fundort: Ecuador AF/1159. 3 Ex. Prov. Napo, Archidona, XII. 1986. leg. J. NARANJA.

Pickfordia (Omodeoscolex) divergens itapecu RIGHI, AYRES & BITTENCOURT 1978

Diese Unterart wurde ebenfalls jetzt zuerst wieder gesammelt.

Fundorte: Gaudeloupe Insel AF/1183 2 Ex. La Madelein, 12. XI. 1987 leg. THIBAUD. – Paraguay AF/1167 7 Ex. Puerto Presidente Stroessner, 6. I. 1966 leg. ZICSI & MAHUNKA.

Gattung **Wegeneriona** ČERNOSVITOV, 1939

Borstenanordnung lumbricin. Ein gut entwickelter Muskelmagen vor dem Hodensegment. Zwei Paar Kalkdrüsen mit lamellenförmigen Ausbuchungen im 14. und 15. Segment. Exkretionssystem meronephridisch. Männliche Geschlechtsorgane acanthodrilin. Samentaschen unpaarig, medioven-

tral gelegen, ohne Divertikel, von verschiedener Zahl im 4/5–8/9 Segment gelegen.

Typusart: *Wegeneriona brasiliiana* ČERNOSVITOV, 1939

Verbreitung: Neotropisch.

Wegeneriona ?cernosvitovi RIGHI & CABALLERO, 1970

Von dieser Art liegt nur ein juveniles Tier vor, so daß eine genaue Bestimmung auf Schwierigkeiten stößt. Mit 5 Samentaschen wurden bisher nur zwei Arten beschrieben: *W. beauforti* (MICHAELSEN, 1933) und *W. cernosvitovi* RIGHI & CABALLERO, 1970. Die erste Art wurde aufgrund eines juvenilen Tieres beschrieben. Bei diesem Tier fehlten die Samensäcke, die weiblichen Poren waren paarig, Länge der Penialborsten 0,65 mm. Bei der anderen Art waren die weiblichen Poren unpaarig, zwei Paar Samensäcke lagen im 9. u. 12. Segment, Länge der Penialborsten 0,445 mm. Bei unserem Exemplar waren die weiblichen Poren unpaarig, es konnten 3 Paar Samensäcke im 9., 10. und 12. Segment erkannt werden. Länge der Penialborsten 0,35 mm.

Fundort: Ekuador. AF/1228. 1 Ex. Prov. Imbabura, San José de Minas. 21. IV. 1987 leg. ZICSI et LOKSA.

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NEUE TAXA AUS DER GATTUNG ORTHOSIA
OCHSENHEIMER, 1816 (s. l.) II.
(LEPIDOPTERA, NOCTUIDAE)

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H-2030 Érd, Somfa u. 15, Ungarn

(Eingegangen am 15. April 1992)

(New taxa of the genus *Orthosia* Ochsenheimer, 1816 s. l. II., Lepidoptera: Noctuidae.) Description of *Orthosia (Monima) imitabilis* sp. n., *O. (M.) sordencens* sp. n., *O. (M.) cruda illustris* ssp. n., und *Dioszeghyana* gen. n., *Dioszeghyana schmidtii pinkeri* ssp. n.. Designation of lectotypus of *Orthosia dalmatica* (WAGNER, 1909), sp. bona, stat. n.. With 24 original photos and 45 original figures.

Einführung – In den letzten Jahren sind mehrere Publikationen, die sich mit den Arten der *Orthosia* (s. l.) beschäftigen, erschienen. Einerseits wurden neu gefundene Arten beschrieben (SUGI 1982, 1984, 1986; KONONENKO 1988; GYULAI im Druck), andererseits wurden sie in mehrere Subgenera verteilt und dementsprechend publiziert (BERIO, 1980, FIBIGER & HACKER 1990). Die letzteren Arbeiten bedürfen einer Überprüfung, da diese Einordnung nicht vollständig begründet ist. Nachdem die Mehrzahl der Arten und die Urformen in dem südostlichen Teil der Paläarktis bzw. in den davon südlich gelegenen Gebieten leben, müßte man ihre subgenerische Einordnung dementsprechend anpassen.

Eine Einordnung dem Genus *Orthosia* bildet keine leichte Aufgabe. Manche Arten ähneln sich sehr auf Grund ihrer äußeren Morphologie, bei anderen stimmen die einzelnen Merkmale der Genitalien überein, obwohl die Arten auf Grund ihrer äußeren Morphologie wenig Ähnlichkeit zeigen.

Bei *Orthosia* (s. l.) stehen wir einem zusammengesetzten Komplex gegenüber, wo es sehr schwer ist die einzelnen Teile abzutrennen, nachdem die für das Genus charakteristischen Merkmale bei den Arten sehr unterschiedlich ausgeprägt sind. In diesem Fall ist dies auch so. Im östlichen Teil von Asien leben mehrere, der *cerasi* nahe verwandte Arten, so z.B.: *O. paromoea* (HAMPSON, 1905), *O. coniortota* (FILIPJEV, 1927), *O. alishana* SUGI, 1986, *O. lushana* SUGI, 1986. In ihrer äußeren Morphologie scheinen sie sehr ähnlich zu sein, obwohl ihre Genitalstrukturen – bezüglich ihrer Valven und Vesica – größere Unterschiede zeigen. Gleichzeitig charakterisiert die etwas nahe stehende *cedermarki* (BRYK, 1949) die einfach zurückgedrehte Vesica, die bei *cerasi* (FABRICIUS, 1775) auch zu beobachten ist, während ihr Fangap-

parat individuell ist und in ihrer äußereren Erscheinung eher *miniosa* ähnelt ([DENIS et SCHIFFERMÜLLER], 1775). *Miniosa* steht auf Grund ihrer Valvenform *cerasi* und nicht *cedermarki* näher. Gleichzeitig sind die Vesica bei *alishana* und *lushana* einfach zurückgedreht, wobei Diverticulum und Dornenfeld bei *cruda* eine ähnliche Stellung zu besitzen scheint. Ihre Valvenformen ähneln am meisten der in dieser Publikation beschriebenen *O. sordes-cens* sp. n.. Mit diesen Beispielen möchte ich die Komplexität der Gruppe andeuten und die Meinung aussprechen, daß es nicht zweckmäßig ist, durch Betonung einzelner Merkmale Gruppen zu trennen oder Subgenera zu beschreiben, bis ihre phylogenetische Abstammung und ihr taxonomischer Wert nicht klargestellt worden ist.

In dieser Arbeit versuche ich nicht, eine subgenerische Einteilung des Genus *Orthosia* durchzuführen, hier wird nur die Einordnung der untersuchten Arten (z.B. *Microrthosia* BERIO, 1980) überprüft.

Abkürzungen:

NHMW – Naturhistorisches Museum, Wien

UNWM – Ungarisches Naturwissenschaftliches Museum, Budapest

ZSM – Zoologische Staatssammlung, München

ORTHOSIA (MONIMA) (S. STR.) CERASI ARTENGRUPPE

In diese Artengruppe teile ich die in der West-Palaearktis lebenden, *cerasi* nahe stehenden Arten ein. Ich beschäftige mich nicht mit den in Ost-Asien lebenden, in der Einführung erwähnten Arten, weil sie in einzelnen Details der Genitalien (z.B. Gestaltung der Vesica) etwas abweichen. Die Arten dieser Gruppe stehen *cerasi* auf Grund ihrer äußereren Morphologie sehr nahe, man kann sie nur mit Genitaluntersuchungen sicher abtrennen.

Die Artengruppe *cerasi* gehört zum Subgenus *Monima*, nachdem ihre Arten mit deren Typusart, *miniosa* ([DENIS et SCHIFFERMÜLLER], 1775), in naher Verwandtschaft stehen. Das Subgenus *Cuphanaea* HÜBNER, [1821], dessen Typusart *cerasi* ist, halte ich für das Synonym von *Monima* HÜBNER, [1821]. Die Richtigkeit des Subgenus *Monima* wurde von mir nicht untersucht, da die Beurteilung ihres taxonomischen Wertes nur in einer Revision des *Orthosia*-Komplexes durchführbar ist. Wahrscheinlich wird sie noch weitere Komplikationen verursachen, da *miniosa* die Typusart von *Monima* ist.

Welche Arten gehören zu der behandelnden Artengruppe? Lange Zeit war nur *Orthosia cerasi* (FABRICIUS, 1775), (syn. *stabilis* ([DENIS et SCHIFFERMÜLLER], 1775), bekannt. Auf Grund der großen Variabilität ihrer äußereren morphologischen Merkmale wurden mehrere Varietäten, Formen und Aber-

rationen aus Europa beschrieben. Aber sie wurden ausnahmslos für Synonyme gehalten. Die zweite Art der Artengruppe, *O. boursini* RUNGS, 1972, wurde aus Nord-Afrika beschrieben. Danach kam die Beschreibung von *O. ivani* GYULAI (im Druck) aus der Türkei. Nachdem diese schon die zweite Art aus dem Mittelmeerraum war, hielt ich es für begründet neuere, südeuropäische Exemplare zu untersuchen. Zuerst habe ich von Herrn FIBIGER, danach von Frau VARTIAN Exemplare aus Griechenland dieser Gruppe zur Untersuchung erhalten, die sich von *cerasi* unterschieden. Anschließend habe ich das Material des Naturwissenschaftlichen Museums in Wien durchgesehen und einen der Cotyphen von *O. stabilis* var. *dalmatica* (WAGNER, 1909) gefunden. Diesen habe ich untersucht und festgestellt, daß dieser der erste, von *cerasi* unterschiedlich beschriebene Taxon ist. So haben meine Untersuchungen in der Artengruppe *cerasi* begonnen.

Nach der Untersuchungen von mehr als 200 Exemplaren bin ich zu dem Entschluß gekommen, daß neben *O. cerasi* im Mittelmeerraum (Nord-Afrika, Balkan, Türkei) oft auch eine andere Art zu finden ist. Dagegen kommt im nördlichen Teil von Europa und Asien bis zur östlichen Grenze der Paläarktis nur *cerasi* vor.

Im Frühling 1991 haben wir in Turkmenien zwei *Orthosia* Exemplare gefangen, die zur dieser Gruppe gehören und unbeschrieben sind.

Die Arten dieser Gruppe stehen sehr nahe zueinander, weshalb ihre Unterscheidung keine leichte Aufgabe bereitet. Was ihre äußere Morphologie anbelangt, passen sie in die große Variationsbreite von *cerasi* hinein, so daß eine sichere Trennung nur mit Genitaluntersuchungen möglich ist. Die türkischen Exemplare sind kleiner und dunkler als die gewöhnlichen *cerasi*. Die Einordnung der untersuchten griechischen Exemplare war schwierig, weil sie in ihrer Morphologie und Genitalstruktur zwischen *dalmatica* (WAGNER, 1909) und *ivani* GYULAI (im Druck) liegen, in manchen Fällen (z.B. die Exemplare aus Kreta) hatten sie zusätzliche charakteristische Kennzeichen.

Die Genitalstruktur der Artengruppe ist sehr einheitlich. Uncus ist flach, seine Breite variiert. Tegumen ist breit, Vinculum ist abgerundet. Die Transtellen sind mit Ausnahme einer Art zusammengewachsen. Die Valven sind verlängert, ihre Enden sind spitz oder abgerundet. Vom verschiedenen Abstand ihrer Spitze ist an der äußeren Seite der Pollex zu finden, dessen Stellung (Entspringen und Vorsprung) charakteristisch ist. Clavus ist abgerundet, Pulvillus ist unentwickelt. Ampulla ist bestimmt, ihr mittlere Teil ist verschieden verdickt, gekörnt bzw. leicht dornig. Die Basis der Harpe ist gut entwickelt. Aedeagus ist ein leicht geschwungenes, glattes Rohr. Carina ist entwickelt, daran sind keine Dorne zu finden (Abb. 1–14). Vesica ist dicker als Aedeagus, ähnelt einem doppelt zurückgedrehten Rohr, woran ein oder zwei kleine Diverticula zu finden sind. Davon ist die distale Spitze fein sklerotisiert (Abb. 22–27). Unter den Arten sind Unterschiede in den Valvenformen, dem Uncus und der Ampulla.

Die Genitalstruktur der Weibchen ist folgende: Ovipositor kurz, leicht sklerotisiert. Apophysen sind kurz, Ostium gut entwickelt. Ductus bursae ist lang, dick und stark sklerotiert.

siert. Apex bursae ist ein sich aufwindendes, aufgeblasenes Rohr, das leicht sklerotisiert ist. An der Bursa sind vier dünne, lange Signa zu finden. Die Arten der Gruppe unterscheiden sich in der Form des Ostium (Abb. 34–38).

Die Taxa der *cerasi*-Artengruppe sind folgende:

Orthosia (Monima) cerasi (FABRICIUS, 1775)

Noctua cerasi FABRICIUS, 1775, Syst. Ent.: 600, (Syntypen: England, Deutschland);

Noctua stabilis [DENIS et SCHIFFERMÜLLER], 1775, Ank. Syst. Werk. Schmett. Wien: 76, (Syntypen Umg. Wien, zerstört.)

Untersuchtes Material: 1 ♂ Spanien, Madrid Nr. 2643; 1 ♂ Spanien, Granada Nr. 2662; 2 ♂ 2 ♀ Spanien, P. Gerona Nr. 2677, 2686, 2935, 2936; 1 ♂ Italien, Rom Nr. 2672; 1 ♂ Ungarn, Nagykovácsi Nr. 2273; 3 ♂, 2 ♀ Ungarn, Budapest Nr. 2279, 2634, 2635, 2937, 2938; 1 ♀ Ungarn, Budaörs Nr. 2641; 1 ♂ Ungarn, Szentdomonkos Nr. 2282; 1 ♂ Ungarn, Budakeszi; 1 ♂ Ungarn, Sopron, Nr. 2635, 1 ♂ Ungarn, Erdősmeckske Nr. 2637; 1 ♂ Rumänien, Herkulesfürdő Nr. 1636; 1 ♀ Tschechoslowakei, Samorin Nr. 2640; 1 ♂ Ukraine, Krim Nr. 2705; 1 ♂ Estland, Puka Nr. 2969; 3 ♂ Kroatiens, Brezec Nr. 2663, 2644, 2645; 1 ♀ Kroatiens, Selce Nr. 2958; 1 ♂ Kroatiens, Rovinj Nr. 2959; 2 ♂ Mazedonien, Prilep Nr. 2646, 2647; 3 ♂, 1 ♀ Mazedonien, Vardar-Tal, Nr. 3098, 3099, 3102, 3104, 2 ♂ Griechenland, Evro Nr. 2648, 2649; 1 ♂ Griechenland, Louthos Nr. 2976; 1 ♀, Türkei, P. Adana Nr. 2934; 1 ♂ Türkei, P. Antalya Nr. 2961; 2 ♂ Türkei, P. Burdur Nr. 2980, 2981; 1 ♂ Israel, Jaffa Nr. 2659; 1 ♂ Iran, Chalus Nr. 2654; 2 ♂, Grusien, Kaspi Nr. 2964, 2969; 1 ♀ Aserbaidschan, Aurora Nr. 2965; 1 ♀ Transkaukasien Nr. 2966; 2 ♂, 1 ♀ Kasachstan, Dzhanabek Nr. 2723, 2724, 2725; 3 ♂ Russland, Stavropol, Nr. 2790, 2791, 2792; 1 ♀ Rußland, Krasnojarsk Nr. 2954; 1 ♂ Rußland, Novosibirsk Nr. 2642; (coll. THÖNY, VARTIAN, ORTNER, HACKER, FIBIGER, UNWM, ZSM, NHMW, HREBLAY)

Die Art ist von der westlichen bis zur östlichen Grenze der Paläarktis verbreitet.

Die Charakterisierung der Genitalien: beim Männchen ist der Uncus breit, Valven gleichmäßig dick, Enden abgerundet. Ampulla schlank, kontinuierlich verdünnt (Abb. 1–5, 22, 23). Beim Weibchen distaler Rand der dorsalen Lamella am Ostium abgerundet (Abb. 34).

Orthosia (Monima) dalmatica (WAGNER, 1909)

Orthosia (Monima) dalmatica dalmatica (WAGNER, 1909)

Taeniocampa cerasi var. *dalmatica* WAGNER, 1909, Ent. Z. 23: 18, (Dalmatien, Syntypen in Wien).

Lectotypus: 1 ♂ Dalmatia, Zara, Genital-Präp. HREBLAY Nr. 2614 (coll. NHMW, Wien).

Untersuchtes Material: 3 ♂, 3 ♀, Dalmatia, Gravosa Nr. 2615, 2616, 2617, 2618, 2619, 2669; 1 ♂, 1 ♀, Kroatiens, Rovinj Nr. 2670, 2960; 1 ♂, Kroatiens, Selce Nr. 2967; 11 ♂, 4 ♀, Mazedonien, Vardar Nr. 2977, 3091, 3092, 3093, 3094, 3095, 3096, 3097, 3100, 3102, 3103, 3105, 3106, 3107, 3108; (coll. NHMW, ORTNER, HREBLAY)

Die Art ist in der Türkei und am Balkan verbreitet, sie ist in zwei Unterarten verteilt. *Dalmatica dalmatica* lebt im nordwestlichen Teil des Balkans, von Dalmatien bis Mazedonien.

Die Beschreibung der Genitalien: Beim Männchen ist der Uncus dünner als bei *cerasi*. Die Valven sind kürzer, distal allmählich schlanker, ihre Abschlüsse sind spitz. Der mittlere Teil der Ampulla ist ein wenig ausgebuchtet, um sich dann plötzlich zu verdünnen (Abb. 6–7, 24). Der distale Rand der dorsalen Lamelle des Ostium ist beim Weibchen leicht geschwungen oder gerade (Abb. 35).

Orthosia (Monima) dalmatica ivani GYULAI (im Druck) stat. n.

Untersuchtes Material: 2 ♂, 2 ♀ Türkei, P. Bursa, Biga

Paratypen: Nr. 2280, 2719, 2997, 2998; 2 ♂, 1 ♀ Türkei P. Aydin Nr. 2661, 2721; 2722; 1 ♀, Türkei, P. Antalya Nr. 2962; 1 ♀, Türkei P. Burdur Nr. 2982; 3 ♂, Griechenland, Kreta Nr. 2971, 2972, 2973; 1 ♂, 1 ♀, Griechenland, Louthos Nr. 2974, 2975; 1 ♂, 1 ♀, Griechenland, Larissa Nr. 2978, 2979; 1 ♂, Griechenland, Strymon Delta, Nr. 2281; 1 ♂, Griechenland, Thermopylae Nr. 2658; 1 ♂, Griechenland, Kavala Nr. 2963; (coll. FIBIGER, VARTIAN, GYULAI, HACKER, ORTNER, THÖNY, UNWM, ZSM, HREBLAY).

Die Unterart ist in der West-Türkei und in Griechenland verbreitet. Sie ist auf Grund ihrer äußereren Morphologie kleiner und dunkler als *dalmatica*.

Charakterisierung der Genitalien: Sie stimmen überwiegend mit jenen von *dalmatica dalmatica* überein. Beim Männchen ist der Uncus etwas dünner, die Ampulla verbreitet sich mehr (Abb. 8–11, 25). Der distale Rand der dorsalen Lamelle am Ostium ist beim Weibchen gerade (Abb. 36).

Orthosia (Monima) boursini RUNGS, 1972

Orthosia boursini RUNGS, 1972, Bull. Mus. nat. Hist. Paris, 3(60): 676, Taf. 1:12, (Holotypus: Marokko, Ifrane, MNHN, Paris).

Untersuchtes Material: 1 ♀, Marokko, Reraya-Tal Nr. 2953; 2 ♂ Marokko, Tizi-N-Test Nr. 2970, Gen. Präp. Behounek Nr. 4152; 1 ♀, Algerien, Col Melab Nr. 2955; 1 ♀, Tunesien, Ain Draham Nr. 3010; (coll. THÖNY, PEKS, BEHOUNEK, KRUSEK, HREBLAY).

Die Art ist im Nord-Afrika, im Atlas-Gebirge verbreitet.

Charakterisierung der Genitalien: Beim männlichen Genitalapparat ist der Uncus dünn. Die Valven verdünnen sich kontinuierlich, enden in einer Spitze, Pollex liegt nahe zur Spitze. Mitte der Ampulla verdickt und verdünnt sich im distalen Bereich (Abb. 12, 26).

Die Genitalie des Weibchen ähnelt jenem von *dalmatica ivani*. Der dorsale Rand des Ostium schließt sich gerade, an der ventralen Seite ist er geschwungen ausgeschnitten (Abb. 37).

Orthosia (Monima) boursini rifana RUNGS, 1972

Orthosia boursini rifana RUNGS, 1972, Bull. Mus. nat. Hist. Paris, 3(60): 677, (Holotypus: Marokko, Ketama, MNHN, Paris).

Von diesem Taxon stand mir kein, zur Untersuchung geeignetes Exemplar zur Verfügung.

***Orthosia (Monima) imitabilis* sp. n.**

Holotypus: 1 ♂, "USSR, Turkmenia, Kopet-Dag Mts., 800–900 m, 5 km NW of Tutlikala, 56°44'E, 38°26'N, 22. IV. 1991. leg. G. CSORBA, Gy. FÁBIÁN, B. HERCZIG, M. HREBLAY, G. RONKAY", Nr. 2720 (coll. M. HREBLAY). – Paratypen: 1 ♂, "USSR, Turkmenia, Kopet-Dag Mts., 600–1000 m, Aidere, 56°47'E, 38°19'N, 21–23. IV. 1991. leg. G. CSORBA, Gy. FÁBIÁN, B. HERCZIG, M. HREBLAY, G. RONKAY", Nr. 2705; 4 ♀, N-Iran, S. v. Chalus 2000 m, 31. V. 1963, leg. KASY et VARTIAN, Nr. 2655, 3086, 3087 (coll. E. VARTIAN). Große Serie, Turkmenistan, Kopet-Dagh Mts, 6 km S of Ipaj-Kala, 1600 m 8–12 IV 1993, 57°07'E, 38°17'N, No L86, leg. M. HREBLAY, Gy. LASZLÓ et A. PODLUSSÁNY. Gen. Präp. Nr. 4092, 4097, 4098, 4099, 4100 (coll. M. HREBLAY, G. RONKAY, UNWM),

Beschreibung und Differentialdiagnose. – Die Flügelspannweite bei Männchen beträgt 31–32 mm, bei Weibchen 39 mm. Die Körpergrundfarbe stimmt mit der Vordelflügelgrundfarbe überein. Die Kopfstruktur gleicht jener von anderen Mitgliedern der Artengruppe aber die Fühler sind bei Männchen länger gekämmt. Die Fühler der Weibchen sind fadenförmig. Die Vorderflügelzeichnungen stimmen mit jenen von *cerasi* überein, die Ring- und Nierenmakel sind hell umrandet, der Zapfenmakel ist kaum zu sehen. Die Querlinien sind verloschen, die helle, an der Innenseite dunkel bestaubte Wellenlinie, verläuft gerade. An der Stelle der mittleren Querlinie ist ein dickerer, dünnerer, mit der Grundfarbe übereinstimmender breiter Streifen zu beobachten. Die Fransenfarbe stimmt mit der Flügelgrundfarbe überein. Die Hinterflügel sind dunkel, ohne Zeichnungselemente. Die Adern sind an den Hinterflügeln kaum heller. An der Unterseite der Vorderflügel der Männchen ist nur der Nierenmakel zu sehen, andere Zeichnungselemente sind darauf nicht zu finden (die Exemplare waren abgeflogen). Beim Weibchen ist die äußere Querlinie an beiden Flügeln angedeutet, die Mondflecken sind gut zu sehen.

Von den Schwesternarten kann man *O. imitabilis* nur auf Grund ihrer Genitalstruktur trennen. In der VARTIAN-Sammlung habe ich ein, von *cerasi* genitalic unterschiedliches weibliches Exemplar gefunden, welches wegen seiner relativen Nähe zum Fundort zu dieser Art eingeordnet wird.

Beschreibung der Genitalien. – Der Uncus ist gleichmäßig dünn, die Fulturen sind nicht zusammengewachsen. Die Valven verdünnen sich und enden spitz. Der Pollex ist kurz, liegt nah zur Spitze. Die Ampulla hat einen bestimmten Griff, sie ist länger als bei den verwandten Arten (Abb. 13–14). Proximales Diverticulum an der Vesica fehlt (Abb. 27).

Der Genitalaufbau beim Weibchen ähnelt dem der anderen Arten in der Artengruppe. Der Ovipositor ist kurz und leicht sklerotisiert. Apophysen sind kurz, Ostium hat einen Hals. Ductus bursae ist lang, dick und stark sklerotisiert. Apex bursae ist ein sich zurückdrehendes aufgeblasenes Rohr, das leicht sklerotisiert ist. An der Bursa sind vier dünne lange Signa zu finden (Abb. 38).

Die männlichen Genitalien unterscheiden sich von den anderen Arten im schlanken Uncus, am langen, dünnen Hals sitzender Ampulla, und das proximale Diverticulum an der Vesica fehlt.

Die Weibchen kann man von jenen der anderen Arten auf Grund ihrer verschiedenenförmigen Ostia trennen, nur bei dieser Art ist das Ostium mit einem Hals zu beobachten (Abb. 38).

Die Art ist in Turkmenien (Kopet-Dag) und im Iran (Elburs-Gebirge) verbreitet.

DIE ORTHOSIA (*MONIMA*) CRUDA ARTENGRUPPE

BERIO, (1980) hat *cruda* in einem eigenen Subgenus eingereiht. Damit hat er angedeutet, daß sich *cruda* von den *Orthosia*-Arten, die in der West-Paläarktis leben, stark unterscheidet. Wenn wir auch die ost-paläarktischen Arten untersuchen, ist die Lage nicht mehr so einfach, weil wir solche Arten finden können, die einen Übergang zu anderen Gruppe bilden. Solche Arten sind z.B. *O. lizetta* BUTLER, 1878, *O. alishana* SUGI, 1986 oder *O. lushana* SUGI, 1986. Nachdem ich diese Arten schon bei der *cerasi* Gruppe erwähnt habe, ist eine Verbindung zwischen diesen zwei Artengruppen zu sehen. Nachdem sich der Aufbau der einzelnen Genitalmerkmale bei *cruda* (die Gestaltung von Ampulla und Harpe, die Vesicastruktur) nicht mehr unterscheidet, als von jenen, zur Subgenus *Monima* gehörenden Arten, halte ich *Microrthosia* BERIO, 1980, für **syn. n.**

In der West-Paläarktis war *cruda* die einzige bekannte Art der Artengruppe (*schmidtii* (DIÓSZEGHY, 1935), die schon in mehreren Publikationen erwähnt wurde, gehört nicht hierzu). In dieser Arbeit werde ich die zweite westpaläarktische Art dieser Gruppe beschreiben.

Genitalstruktur der Artengruppe. – Der Uncus ist dünn, das Tegumen ist breit und ausgebuchtet. Die Spitze vom Vinculum ist abgerundet. Die Transtillen sind schmal. Die Valve ist länglich, ihr Abschluß verbreitert sich etwas. Die Ampulla ist lang und gerade, verdünnt sich kontinuierlich und schmiegt sich an die Valve. Die abgerundete Harpe ist meistens daran angewachsen (Abb. 15–19). Der Aedeagus ist ein langes, glattes Rohr, woran eine gut entwickelte Carina zu finden ist, die in einem kleinen Dorn endet. In deren Verlängerung an der Vesica sind einige kleinere

Dornen zu finden. Die Breite der rohrförmigen Vesica stimmt mit jenem von Aedeagus überein und dreht sich im Winkel von 180 Grad um. Daran sind ein oder zwei Diverticula zu finden, auf seinem distalen Teil befindet sich ein Feld mit kleinen Dornen. Enddorn ist nicht zu beobachten (Abb. 28–31).

Beim Weibchen sind der Ovipositor und der Ductus bursae lang, dünn und leicht sklerotisiert. Apex bursae ist kurz, ist mit der Bursa zusammen gewachsen und leicht sklerotisiert. An der Bursa sind zwei Signa zu finden (Abb. 39–41).

Orthosia (Monima) cruda ([DENIS et SCHIFFERMÜLLER], 1775)

Noctua cruda [DENIS et SCHIFFERMÜLLER], 1775, Ank. Syst. Werk. Schmett. Wien: 77, (Typen: Umg. Wien, zerstört). Syn: *Bombyx pulverulenta* ESPER, 1787, Schmett. Abb. n. Nat. 3: 386, Taf. 76: 5, 6

Untersuchtes Material: 1 ♂, 1 ♀, Ungarn, Nagykováesi, Nr. 2079, 2080; 1 ♂, 2 ♀, Spanien, Gerona, Nr. 2942, 2943, 2944; 1 ♂, Griechenland, Kreta, Gen. Präp. HACKER Nr. 3112; 3 ♂, 1 ♀, Türkei, P. Ankara Nr. 1192, 2945, 2946, 2947; 1 ♂ Türkei, P. Elazig Nr. 2949; 1 ♂, 1 ♀, Marokko, Ifrane Nr. 2950, 2951; 1 ♂, Rußland, Saratov/Don Nr. 2985; 2 ♂, 1 ♀ Kazachstan, Dzhanabek Nr. 2726; (coll. KRUŠEK, HACKER, THÖNY, HREBLAY).

Die Art ist von Europa, Nord-Afrika bis Siberien verbreitet.

Charakterisierung der Genitalien. – Beim Männchen ist der Uncus dünn, das Tegumen ist breit und ausgebuchtet. Die Spitze des Vinculum ist abgerundet. Die Transtellen sind schmal. Die Valve ist langförmig, ihr Abschluß verbreitert sich etwas. Die Ampulla ist lang, gerade, ver dünnt sich kontinuierlich und schmiegt sich an die Valve. Die Harpe ist meistens daran angewachsen, abgerundet (Abb. 15–16). Der Aedeagus ist ein langes, glattes Rohr, woran eine gut entwickelte Carina zu finden ist, die in einem kleinen Dorn endet. In deren Verlängerung, an der Vesica sind einige wenige, kleinere Dornen zu finden. Die Breite der rohrförmigen Vesica stimmt mit jenem von Aedeagus überein und dreht sich im Winkel, von 180 Grad um. Daran ist ein Diverticulum zu finden, auf seinem distalen Teil befindet sich ein Feld mit kleinen Dornen. Kein Enddorn vorhanden (Abb. 28).

Beim Weibchen ist der Ovipositor und der Ductus bursae lang, dünn und leicht sklerotisiert. Apex bursae ist kurz, ist mit der Bursa zusammen gewachsen, leicht sklerotisiert. An der Bursa sind zwei Signa zu finden (Abb. 39).

Orthosia (Monima) cruda illustris ssp. n.

Holotypus: 1 ♂, Türkei, P. Adana, 5 km W of Damlama, 15. IV. 1990, leg. M. HREBLAY, Nr. 2929, (coll. M. HREBLAY). – Paratypen: 17 ♂, 2 ♀, Türkei, P. Adana, 5 km W of Damlama, 15. IV. 1990, leg. M. HREBLAY, Nr. 1193, 2077, 2078, 2927, 2928, 2930;

1 ♂, Türkei P. Urfa Halfeti 7. IV. 1990, leg. M. HREBLAY; 1 ♂, Türkei P. Denizli, Cardar 800 m, 18. IV. 1987, leg. THÖNY Nr. 2241; 1 ♂ 7 ♀, Türkei, P. Aydin, Orthoklar, 100 m, 23. III. 1986, leg. ORTNER; 4 ♂, 4 ♀, Türkei, P. Antalya, Termessos, 300–500 m, 26. III. 1986, leg. ORTNER; 3 ♂, 12 ♀, Türkei, P. Aydin, Orthoklar, 100 m, 23. III. 1989, leg. ORTNER; 4 ♂, 7 ♀ Türkei, P. Aydin, Orthoklar 600 m, 28. IV. 1989, leg. THÖNY; 5 ♀, Türkei, P. Canakale, Troja 50 m, 18. III. 1989, leg. ORTNER; 1 ♂, Türkei, P. Adana, Karatepe, 4. IV. 1990, leg. PODLUSSANY (coll. M. HREBLAY, H. THÖNY, S. ORTNER, G. RONKAY).

Beschreibung. – Die Flügelspannweite beträgt bei Männchen 30–31 mm, bei Weibchen 30–32 mm, sie ist wenig größer als bei *cruda cruda*. Die Körperfarbe stimmt mit der Vorderflügelgrundfarbe überein und kann von karamelbraun bis zu rotbraun reichen. Es ist charakteristisch, daß die Grundfarbe durch gleichfarbige Schuppen gebildet ist, nicht so, wie bei *cruda cruda*, wo die Grundfarbe durch die mosaikartige Stellung der dunkleren und helleren Schuppen gebildet wird. So sieht sie einheitlicher aus, und dementsprechend sind die Zeichnungselemente an den Flügeln besser zu sehen. Der Nierenmakel ist groß, dunkel und gut zu sehen. Ring- und Zapfenmakel fehlen. Die Punktlinie der äußeren Querlinie ist dunkel und stark gezeichnet. Manchmal sind der Streifen der mittleren Querlinie und die Punktlinie der inneren Querlinie zu finden. Die Hinterflügel und die Unterseite stimmen mit jener von *cruda cruda* überein.

Die neue Unterart unterscheidet sich von der Stammform in ihrer Farbe, der Einheitlichkeit der Grundfarbe und der Kontrastzeichnungen. – Die Genitalien stimmen mit jenen von *cruda cruda* überein, manchmal sind die Valven gedehnter, der Cucullus spitzer (Abb. 17, 29, 40).

Die beschriebene Unterart lebt in der Türkei, an den südlichen Abhängen des Taurus-Gebirges.

Orthosia (Monima) sordescens sp. n.

Holotypus: 1 ♂, USSR, N-Kaukasus, Stavropol, 14, IV. 1988, leg. TIKHANOV, Nr. 2784, (coll. M. HREBLAY). – **Paratypen:** 2 ♂, 2 ♀ u. a. Nr. 2785, 2786, 2787, 2789, (coll. UNWM, Gy. FÁBIÁN, M. HREBLAY, G. RONKAY). 2 ♂, Turkmenistan, Kopet-Dagh Mts, 6 km S of Ipaj-Kala, 1600 m, 8–12 IV 1993, 57°07'E, 38°17'N, No L86, leg. M. HREBLAY, Gy. LÁSZLÓ et A. PODLUSSÁNY. Gen. Prep. No. 4088, 4089 (coll. M. HREBLAY).

Beschreibung. – Die Spannweite bei Männchen beträgt 26–27 mm, beim Weibchen 27–31 mm. Die Körperfarbe stimmt mit jener der Vorderflügel überein, kann von verschiedener Art von grau mit geringem braunen Anteil sein. Der Kopfaufbau stimmt mit jenem von *cruda* überein, aber die Fühler sind länger gekämmt. Die Spitze des Vorderflügel ist leicht abgerundet. Die Art hat hinsichtlich der Zeichnung zwei Parallelformen, entweder einfarbig dunkel, wobei der Rand der Rund- und Nierenmakel hell gezeichnet ist (diese Exemplare errinnern etwas an *schmidtii*), oder hell

gefärbt sein, wobei hier der Flügel marmoriert und der Nierenmakel dunkel eingefaßt ist. Die Querlinien sind nicht zu sehen. Der Hinterflügel ist dunkel und einfarbig, in Saumrichtung noch ein wenig dunkler, der Zellfleck ist zu sehen. An der Unterseite sind die Mondflecken gut zu sehen.

Von den anderen *Orthosia*-Arten kann man sie auf Grund ihrer kleineren Größe, von *schmidii* und *cruda* auf Grund der länger gekämmten Fühler und der Form der Vorderflügel trennen. Auf Grund des Genitalaufbaues ist sie von diesen Arten mit Sicherheit zu trennen.

Beschreibung der Genitalien. – Der Uncus ist dünn und lang, das Tegumen ist breit und ausgebuchtet. Das Vinculum ist spitz und sein Abschluß ist abgerundet. Die Transtillen sind durch eine dünne Brücke mit Fultura inferior zusammengewachsen, deren dorsale Seite sich in dreieckiger Form ausschneidet, die ventrale Seite ist spitz. Die Valve ist lang und gerade, in Richtungsende verdünnt sie sich kontinuierlich. Der Pollex ist dreieckig und hat eine schmale Basis. Clavus ist breit und abgerundet, die Ampulla ist lang und gerade, verdünnt sich kontinuierlich und schmiegt sich an die Valve. Die Basis der Harpe ist gut entwickelt, ihr Fortsatz ist breit und abgerundet (Abb. 18–19). Aedeagus ist ein langes, flaches Rohr. Die Carina ist gut entwickelt, am Abschluß ist ein kleiner Dorn zu beobachten, in deren Fortsetzung zerstreut weitere 3–4 Dornen zu finden sind. Die rohrförmige Vesica ist so dick wie der Aedeagus und biegt sich im Winkel von 180 Grad zurück. An ihrer Rundung sind zwei Diverticula zu finden, von denen das distal gelegene viel größer, das andere viel kleiner ist als bei *cruda*. Am Ende der Vesica ist ein, von kleinen Dornen besetztes Feld zu beobachten, welches jedoch keinen Enddorn besitzt (Abb. 30–31).

Die männliche Genitalie ähnelt sehr jener von *cruda*, unterscheidet sich aber im Zusammenwachstum von Fultura inferior-Trastillen, im Pollex und dadurch, daß in der Vesica zwei Diverticula zu finden sind.

Beim Weibchen ist der Ovipositor und der Ductus bursae lang, dünn, leicht sklerotisiert. Apex bursae ist kurz, ist mit Bursa zusammengewachsen, leicht sklerotisiert. An der Bursa sind zwei Signa zu finden (Abb. 41). Von *cruda* unterscheidet sie sich in ihrem kurzeren Ductus bursae.

Die beschriebene Art lebt in den nördlichen Hängen des Kaukasus.

Dioszeghyana gen. n.

Typenart: *Monima schmidii* DIÓSZEGHY, 1935, Mitt. Siebenbürg. Ver. Nat. Weiss. 83–83: 128, Taf. 1:10 (Typen: "Rumänien, Transsylvanien, Borosjenő" (= Ineu)).

In der meisten bisher erschienenen Literatur (z.B. FIBIGER & HACKER 1990), wird aber oft falsch angenommen, daß *schmidii* (DIÓSZEGHY, 1935)

die nächste Verwandte von *cruda* sei. Diese Art ähnelt *cruda* aber nur in ihrem äußerem Erscheinungsbild. Es würde sich aber lohnen zu überlegen, ob sie nicht zum *Orthosia*-Komplex gehört und wenn ja, wie? In der männlichen Genitalie kann man nämlich bedeutende Unterschiede finden.

Beschreibung. – Das beschriebene Genus ist monotypisch, seine Typusart ist *Monima schmidti* DIÓSZEGHY, 1935. Sie gehört zum *Orthosia*-Komplex, unterscheidet sich aber von seinem bisher beschriebenen Subgenus in folgenden Merkmalen: Der Cucullus hat eine von mehreren kleinen Dornen bestehende Corona. Die Ampulla ist gut entwickelt und endet spitz. Die Valvenlamelle ist in der dorsalen Richtung zurückgebogen und in ihrer äußeren Ecke befinden sich kleine Dornen.

In diesen letzten Eigenschaften unterscheidet sie sich sicher von allen bekannten *Orthosia*-Arten und ihr Wert entspricht dem Status eines Genus, *Dioszeghyana schmidti* (DIÓSZEGHY, 1935).

Untersuchtes Material: 2 ♂, Tschechoslowakei, Sahy, Nr. 2605, 2788; 1 ♂, Ungarn, Síkfökút Nr. 3011; 1 ♀, Ungarn, Szécsény Nr. 3020; 1 ♀, Ungarn, Csopak, Nr. 3023; 5 ♂, Ungarn, Síkfökút Gen. Präp. VARGA Nr. 999, 1000, 1560, 1900. (coll. HREBLAY, VARGA).

Die Art ist in Ungarn, in der Tschechoslowakei und in Rumänien verbreitet.

Dioszeghyana schmidti ssp. n. HREBLAY et VARGA

Holotypus: 1 ♀, Türkei, P. Ankara, Dütözü Köyü, 1300 m, 32°30'E, 40°13'N, 1. V. 1989, leg. HREBLAY, Genital Präp. HREBLAY Nr. 3012, (coll. HREBLAY). – Paratypen: 1 ♂, Türkei P. Ankara, Dütözü Köyü, 1300 m, 32°30'E, 40°13'N, 1. V. 1989, leg. HREBLAY, Genital Prap. HREBLAY Nr. 2604, (coll. HREBLAY); 1 ♀, Türkei P. Ankara, Dütözü Köyü, 1300 m, 32°30'E, 40°13'N, 23. IV. 1989, leg. L. FABIÁN et G. RONKAY, Genital Präp. HREBLAY Nr. 3024, (coll. G. RONKAY); 1 ♂, Türkei, P. Adiyaman, Maltepe 1000 m, 29.4.1987, leg. u. coll. THÖNY; 1 ♂, 44 ♀, Türkei, P. Ankara, Kizileahamam 1000 m, 13. 5. 1985, leg. THÖNY et HUBER (coll. THÖNY, HUBER, ORTNER); 20 ♂, 27 ♀, Türkei, P. Bursa, Ulu Dag, 30 km SO von Bursa, Keles, 4–6. IV. 1989, leg. I. GYULAI, (coll. P. GYULAI); 5 ♂, 2 ♀, Türkei, P. Bursa, Biga, 3. IV. 1989, leg. I. GYULAI, (coll. P. GYULAI); 5 ♂, 1 ♀, Türkei, P. Ankara, Kizilcahamam, 1–4. V. 1967, leg. FRIEDEL, (coll. ZSM); 8 ♂, Türkei, P. Ankara, Kizilcahamam, E. V. 1973, leg. PINKER, Gen. Präp. BEHOUNEK Nr. 3053, Gen. Präp. VARGA Nr. 1001, 1561, 1582, 1583 (coll. BEHOUNEK, VARGA); 1 ♂, Türkei, P. Ankara, Kizilcahamam, E. IV. 1976, leg. PAVLAS, (coll. BEHOUNEK).

Beschreibung. – Die beschriebene Unterart stimmt in ihrem Aufbau und den Zeichnungselementen mit *schmidti* *schmidti* überein. Die Farbe der Vorderflügel und des Körpers ist rötlich, wobei verschiedene Tönungen auftreten können. Die beschriebene Unterart unterscheidet sich von der Stammform in ihrer Farbe.

Die Charakterisierung der Genitalien. – Beim Männchen stimmt die Struktur des Fangapparates mit jenem von *schmidti*

schmidtii überein (Abb. 20–21). Das mittlere Diverticulum der Vesica ist kleiner als bei der Stammform (Abb. 32–33). Der Genitalaufbau des Weibchen stimmt mit jenem der Stammform im wesentlichen überein, unterscheidet sich nur im schmäleren Ductus bursae, im größeren Ausschnitt der ventralen Lamelle des Ostium und im größeren Anhang vom VIII. Sternit (Abb. 42–45).

Die beschriebene Unterart lebt in der West-Türkei.

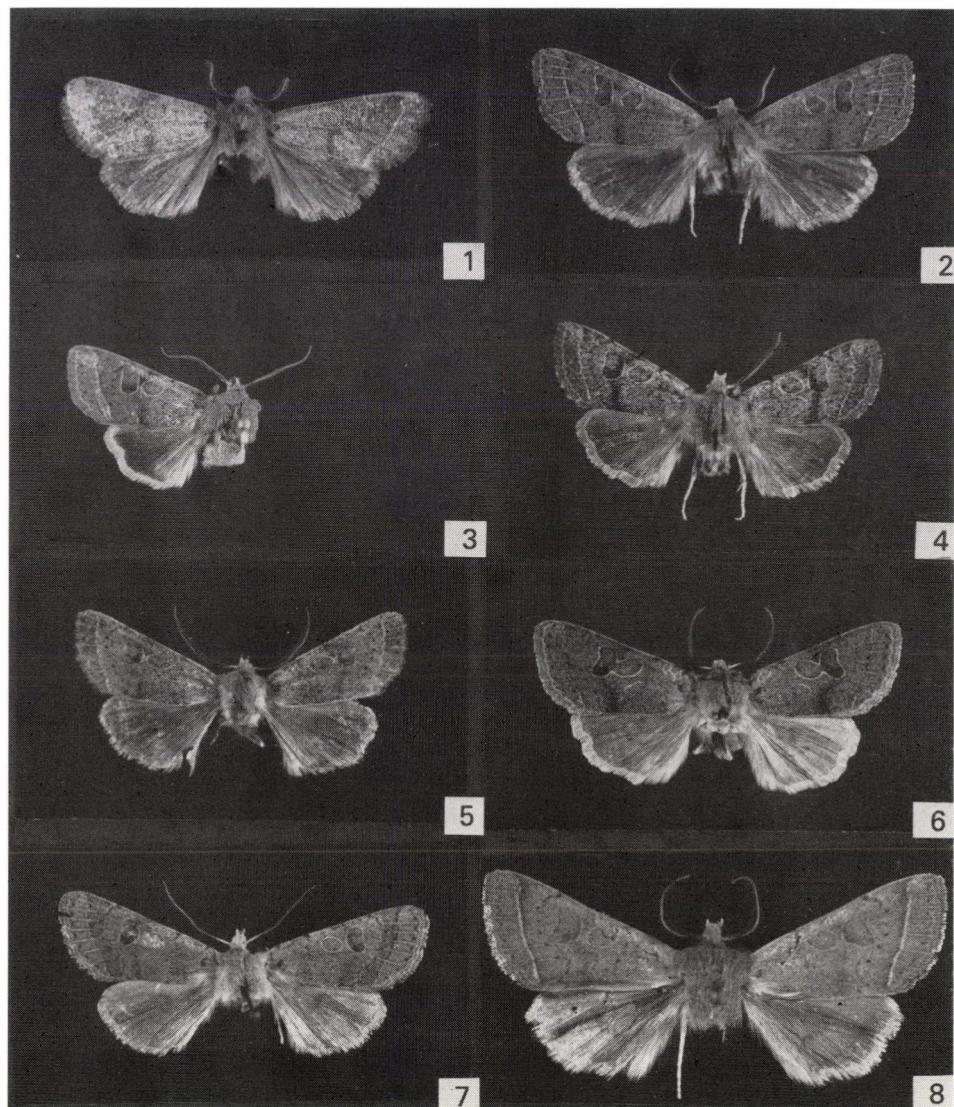
* * *

Danksagung – Der Verfasser spricht seinen Dank Frau E. VARTIAN (Wien), den Herren Dr. W. DIERL, (ZS, München), Dr. M. LÖDL, (NHMW, Wien), H. THÖNY (Ingolstadt), G. BEHOUNEK, (Deisenhofen), H. HACKER, (Staffelstein), S. ORTNER, (Bad-Ischl), G. RONKAY, (Budapest), Dr. P. GYULAI, (Miskolc), Dr. A. VOJNITS (UNWM, Budapest) für die Überlassung der Typusexemplare und des Vergleichsmaterials aus. Herrn Dr. L. RONKAY (Budapest) wird für geleistete Hilfe bei den Themen, Herrn A. KEVE (Budapest) für die Anfertigung der Photos gedankt. – Die Forschung wurde von der OTKA-Stiftung (OTKA 3181) (Budapest) unterstützt.

SCHRIFTTUM

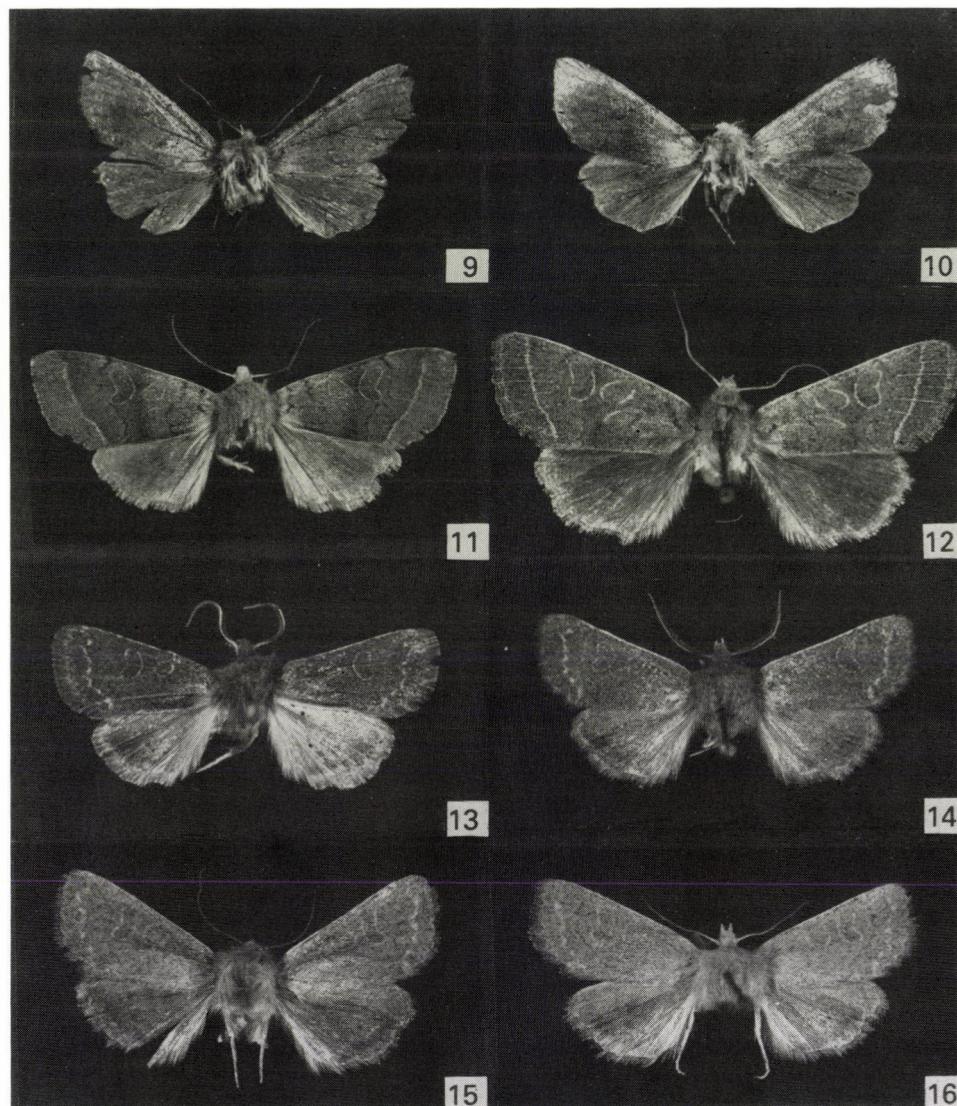
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Tafel I



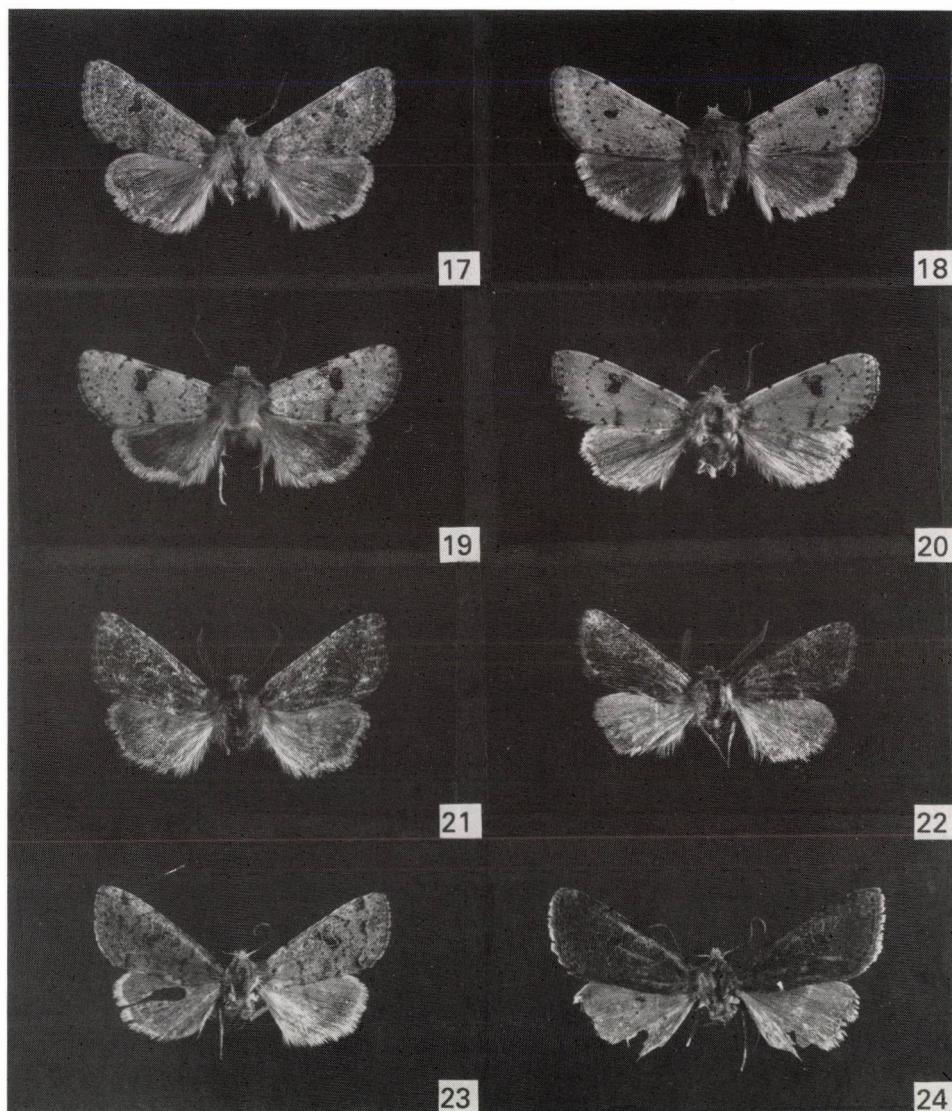
1–2 = *Orthosia (Monima) cerasi* FABRICIUS: 1 = N-Iran, 2 = Rußland, Novosibirsk. – 3 = *O. (M.) dalmatica* WAGNER; Lectotypus, Kroatien, Zara. – 4–7 = *O. (M.) dalmatica ivani* GYULAI; 4 = Paratypus, Türkei, P. Biga, 5 = Griechenland, Thermopilae, 6 = Türkei, P. Aydin, 7 = Türkei, P. Bursa. – 8. = *O. (M.) boursini* RUNGS: Marokko, Tizin

Tafel II



9–11 = *Orthosia (Monima) imitabilis* sp. n.: 9 = Holotypus, Turkmenien, Tutlikala,
10 = Paratypus, Turkmenien, Aidere, 11 = Paratypus, N-Iran, Chalus. – 12 = *O. (M.) bourssi* RUNGS: Marokko, Tizin. – 13–14 = *Dioszeghyana schmidti* (Diószeghy): 13 = Ungarn,
Csopak. 14 = Slowakien, Sahy. – 15–16 = *Dioszeghyana schmidti pinkeri* spp. n.: 15 = Holotypus, Türkei, P. Ankara, 16 = Paratypus, Türkei, P. Ankara

Tafel III



17 = *Orthosia (Monima) cruda* DENIS et SCHIFFERMÜLLER: Ungarn, Nagykovácsi. – 18–20 (*M.*) *cruda illustris* ssp. n.: 18 = Holotypus, Türkei, P. Adana, 19 = Paratypus, Türkei, P. Denizli, 20 = Paratypus, Türkei, P. Adana. – 21–23 = *Orthosia (Monima) sordescens* sp. n.: 21 = Holotypus, Rußland, Stavropol, 22–24 = Paratypen, Rußland, Stavropol

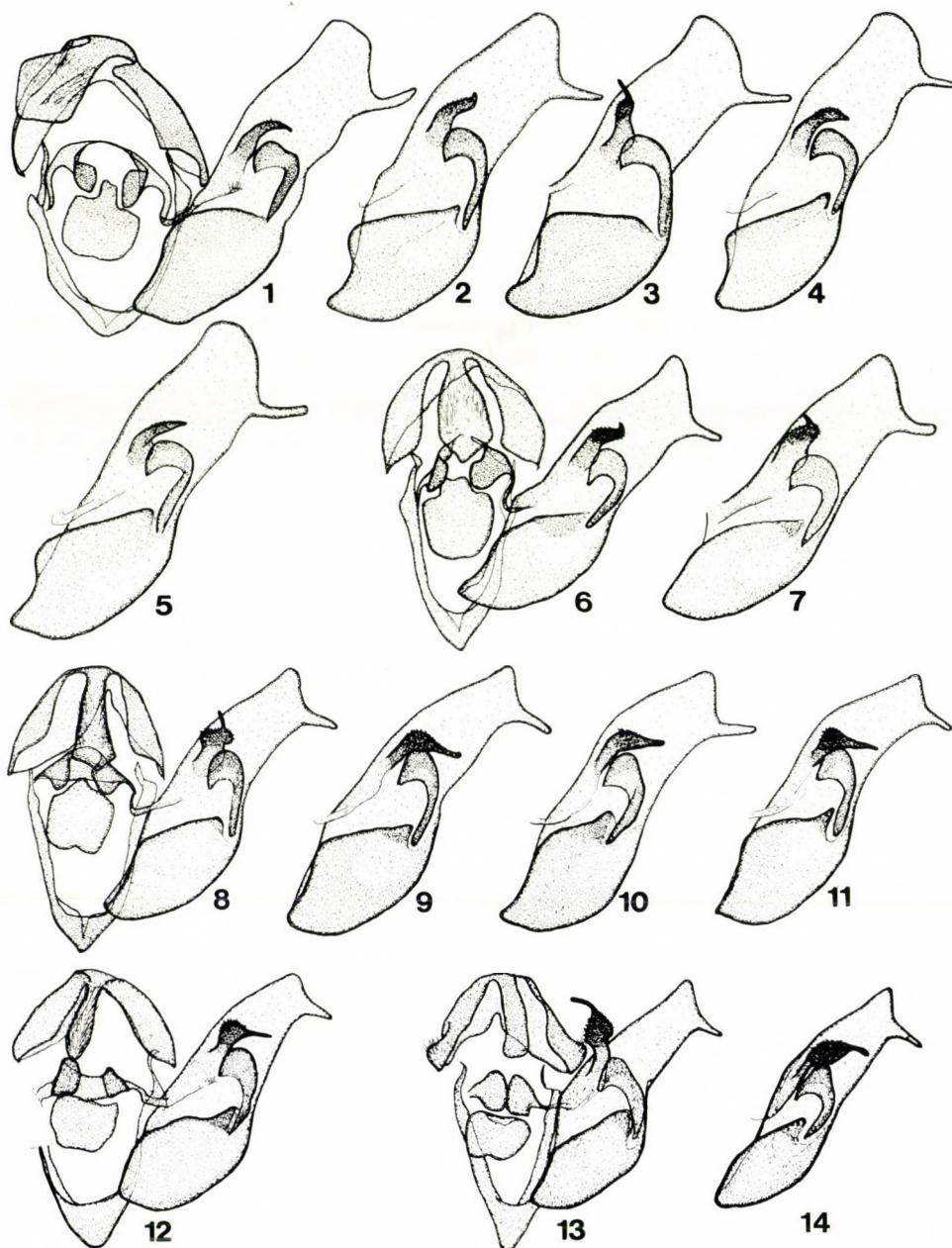


Abb. 1–14. 1–5 = *Orthosia (Monima) cerasi* FABRICIUS: 1 = Ungarn, Budapest, 2 = Spanien, Granada, 3 = Ukraine, Krim, 4 = N-Iran, 5 = NW-Kazachstan, Dzhanebek. – 6–7 = *O. (M.) dalmatica* WAGNER: 6 = Lectotypus, Kroatien, Zara, 7 = Kroatien, Gravosa. – 8–11 = *O. (M.) dalmatica ivani* GYULAI: 8 = Paratypus, Türkei, P. Bursa, 9 = Türkei, P. Aydin, 10 = Griechenland, Strymon-Delta, 11 = Griechenland, Thermopilae. – 12 = *O. (M.) boursini* RUNGS: Marokko, Tizin. – 13–14 = *O. (M.) imitabilis* sp. n.: 13 = Holotypus, Turkmenien, Tutlikala, 14 = Paratypus, Turkmenien, Aidere

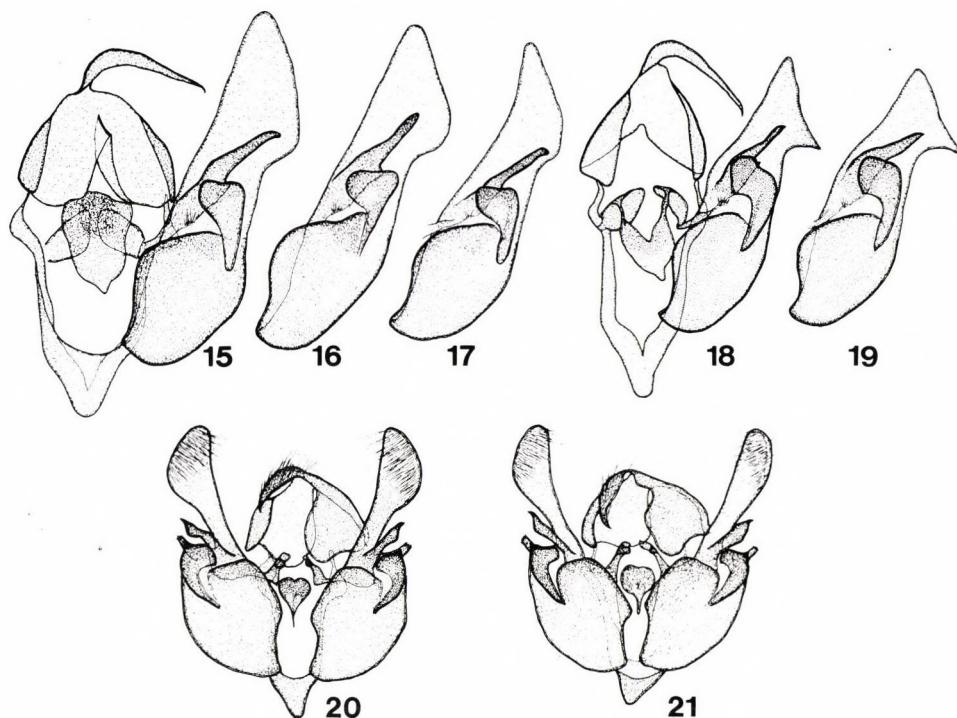


Abb. 15–21. 15–16 = *Orthosia (Monima) cruda* DENIS et SCHIFFERMÜLLER: 15 = Ungarn, Nagykovácsi, 16 = NW-Kasachstan, Dzhanebek. – 17 = *O. (M.) cruda illustris* ssp. n.; Paratypus, Türkei, P. Adana. – 18–19 = *O. (M.) sordescens* sp. n.: 18 = Holotypus, Rußland, Stavropol. 19 = Paratypus, Rußland, Stavropol. – 20 = *Dioszeghyana schmidti* (DiÓSZEGHY): Slowakien, Sahy. – 21 = *D. schmidti pinkeri* ssp. n.: Türkei, P. Ankara

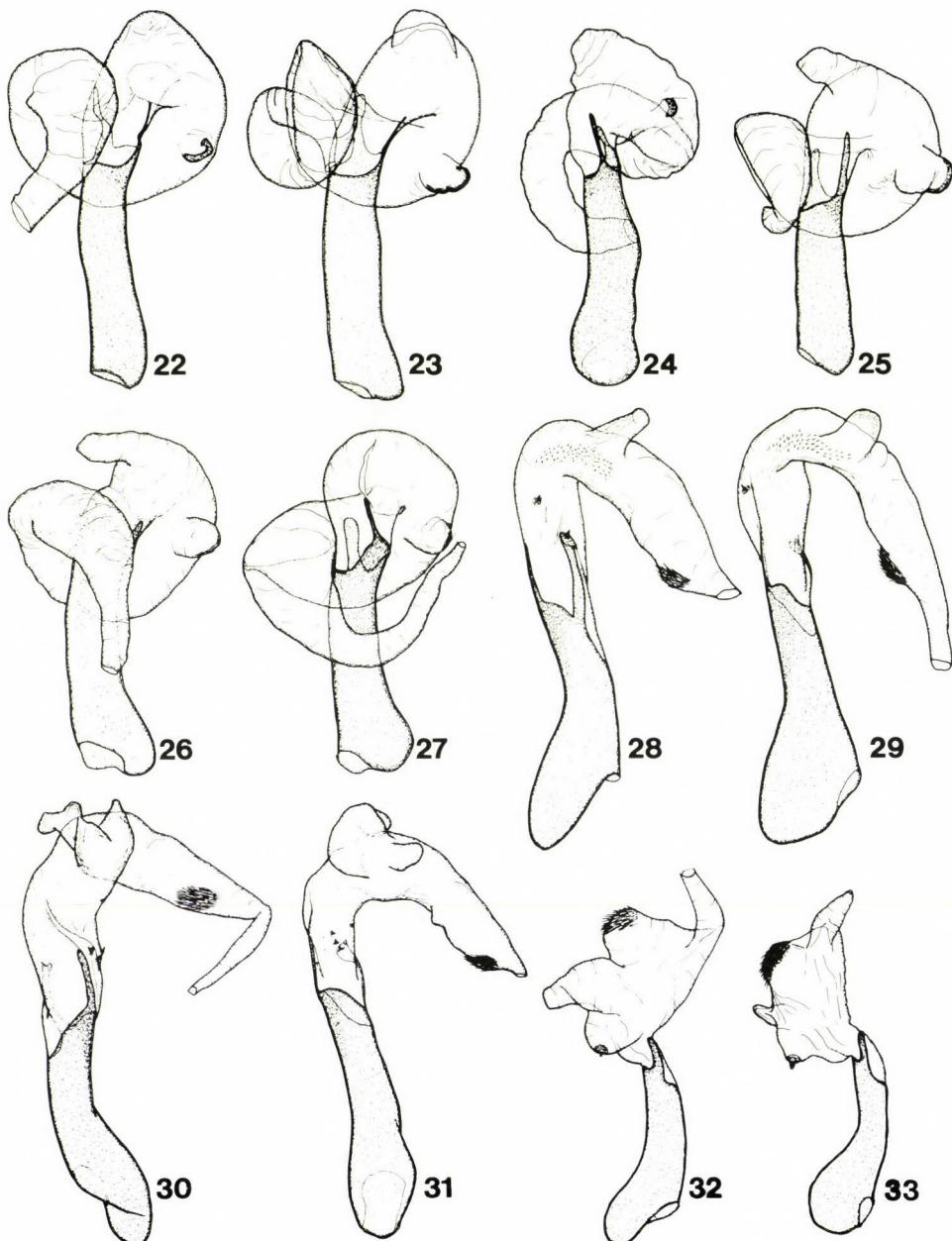


Abb. 22–23. 22–23 = *Orthosia (Monima) cerasi* FABRICIUS: 22 = Ukraine, Krim, 23 = NW-Kasachstan, Dzhanebek. – 24 = *O. (M.) dalmatica* WAGNER: Lectotypus, Kroatien, Zara. – 25 = *O. (M.) dalmatica ivani* GYULAI: Paratypus, Türkei, P. Bursa. – 26 = *O. (M.) boursini* RUNGS: Marokko, Tizin. – 27 = *O. (M.) imitabilis* sp. n.: Paratypus, Turkmenien, Aidere. – 28 = *O. (M.) cruda* DENIS et SCHIFFERMÜLLER: Ungarn, Nagykováesi. – 29 = *O. (M.) cruda* *illustris* ssp. *ll.*: Paratypus, Türkei, P. Adana. – 30–31 = *O. (M.) sordescens* sp. n.: 30 = Paratypus, Rußland, Stavropol, 31 = Holotypus, Rußland, Stavropol. – 32 = *Dioszeghyana schmidti* (DIÓSZEGHY): Slowakien, Sahy, 33 = *Diószegehyana schmidti* ssp. *pinkeri* ssp. n.: Türkei, P. Ankara

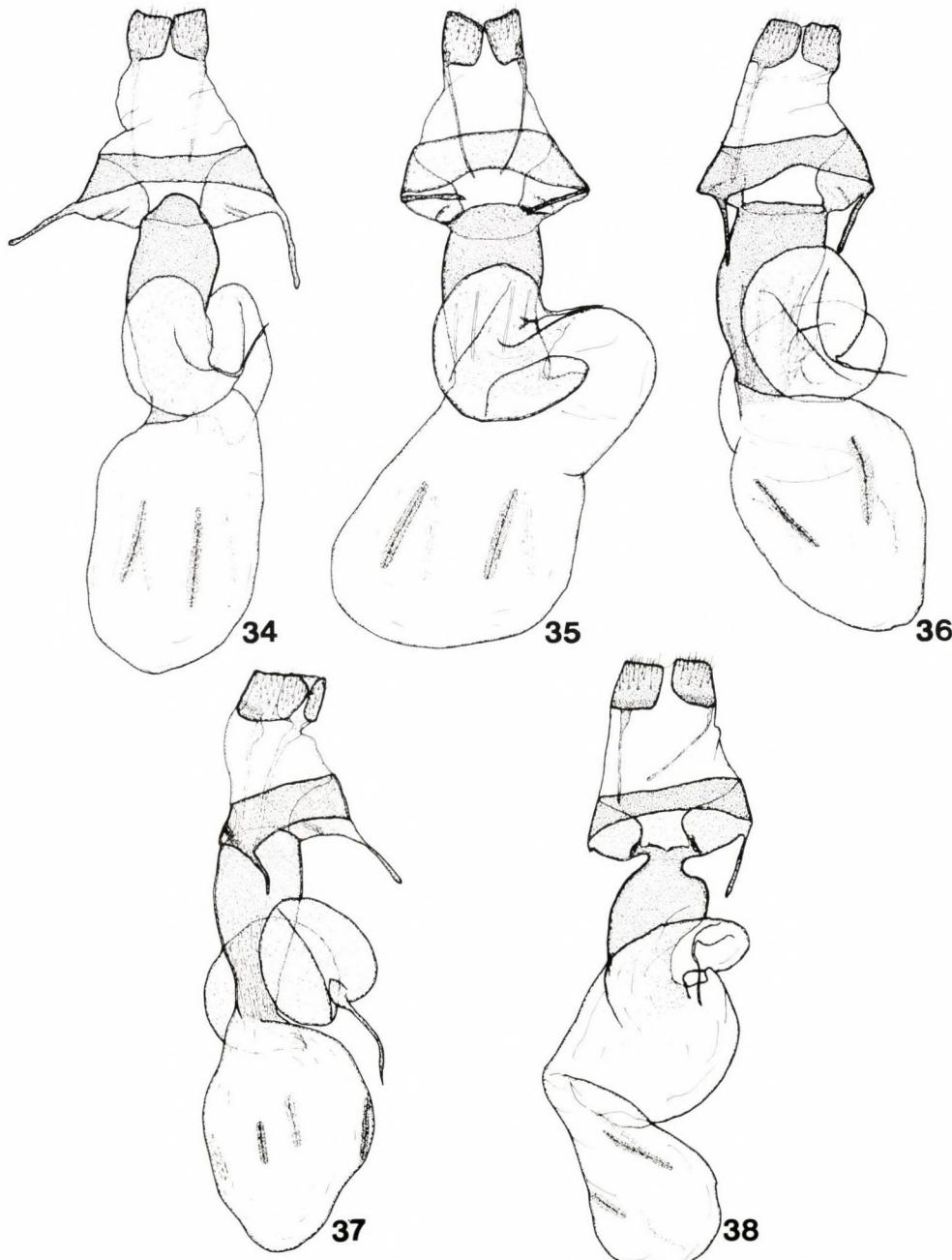


Abb. 34–38. 34 = *Orthosia (Monima) cerasi* FABRICIUS: Transkaukasien. – 35 = *O. (M.) dalmatica* WAGNER: Kroatien, Gravosa. – 36 = *O. (M.) dalmatica ivani* GYULAI, Türkei, P. Aydin. – 37 = *O. (M.) boursini* RUNGS: N-Algerien. – 38 = *O. (M.) imitabilis* sp. n.: Iran, Chalus

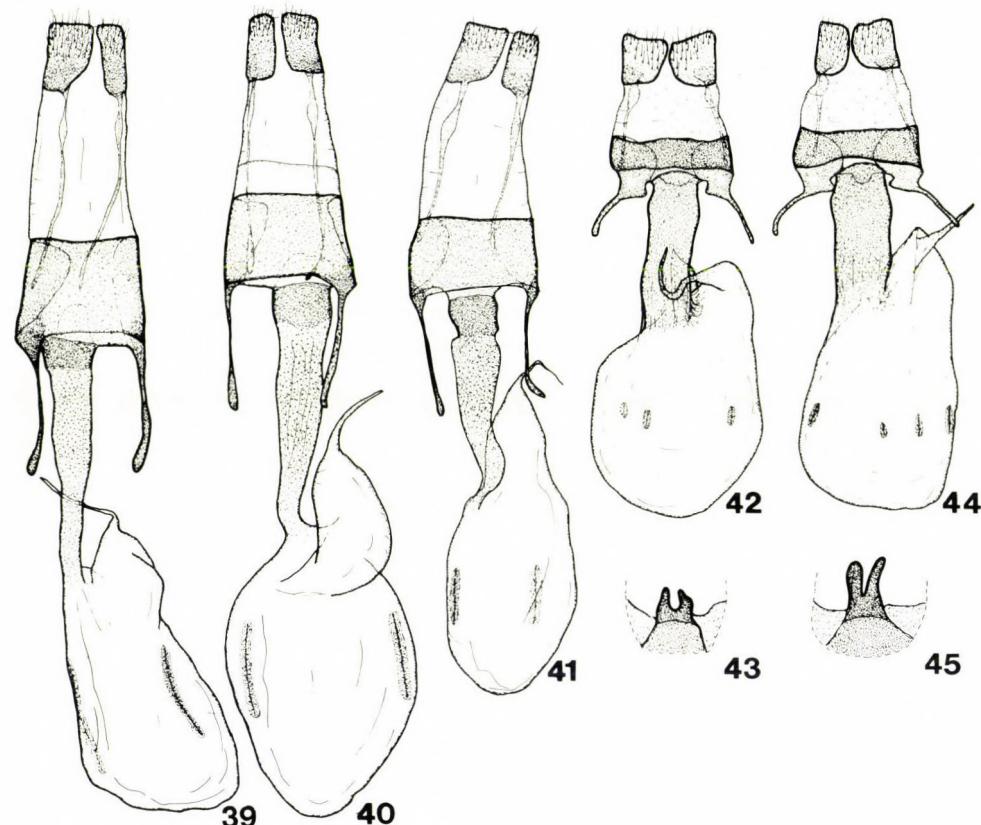


Abb. 39–45. 39 = *Orthosia (Monima) cruda* DENIS et SCHIFFERMÜLLER: Ungarn, Nagykovácsi. – 40 = *O. (M.) cruda illustris* ssp. n.: Türkei, P. Adana. – 41 = *O. (M.) sordescens* sp. n.: Rußland, Stavropol. – 42–43 = *Dioszeghyana schmidti* (Diószeghy): Ungarn, Szécsény. – 44–45 = *D. schmidti pinkeri* ssp. n.: Holotypus, Türkei, P. Ankara

A NEW SERIES OF PUBLICATION
ON NEW OR LITTLE KNOWN
ORIBATID TAXA FROM AFRICA (ACARI), I.

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(Received 13 May 1992)

Eleven Oribatid species are listed from Tanzania. Ten species are new to science. Recent study of the types of *Basidoppia* MAHUNKA, 1983 species. With 63 original figures.

I have been working on the African (Ethiopian) Oribatids for long time. In the last two or three years I obtained new materials from East Africa (Tanzania, Kenya) and Madagascar, collected mostly by DR. T. PÓCS, DR. A. VOJNITS and myself. These materials contain a lot of new or little known (the type material only) species, which I plan to publish in this new series. In addition, I will give information on earlier determined, but yet unpublished data. I think the new localities are very important for future zoogeographical analysis of this region.*

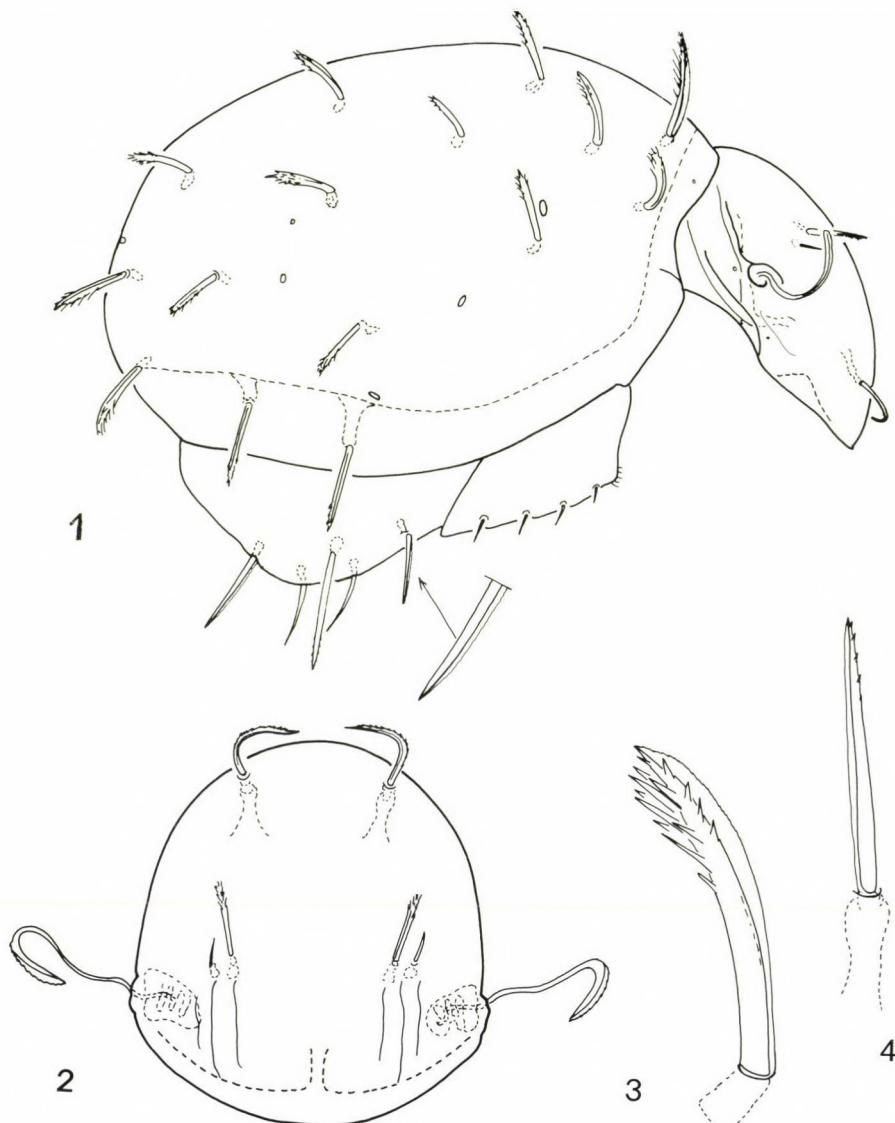
In this part I describe now 10 species which are new to science and I give some additional characters to one taxon described earlier.

Hoplophthiracarus (Plonaphacarus) tanzicus sp. n.
(Figs 1–7)

Measurements. — Length of aspis: 146–170 µm, length of notogaster: 230–312 µm, height of notogaster: 126–193 µm.

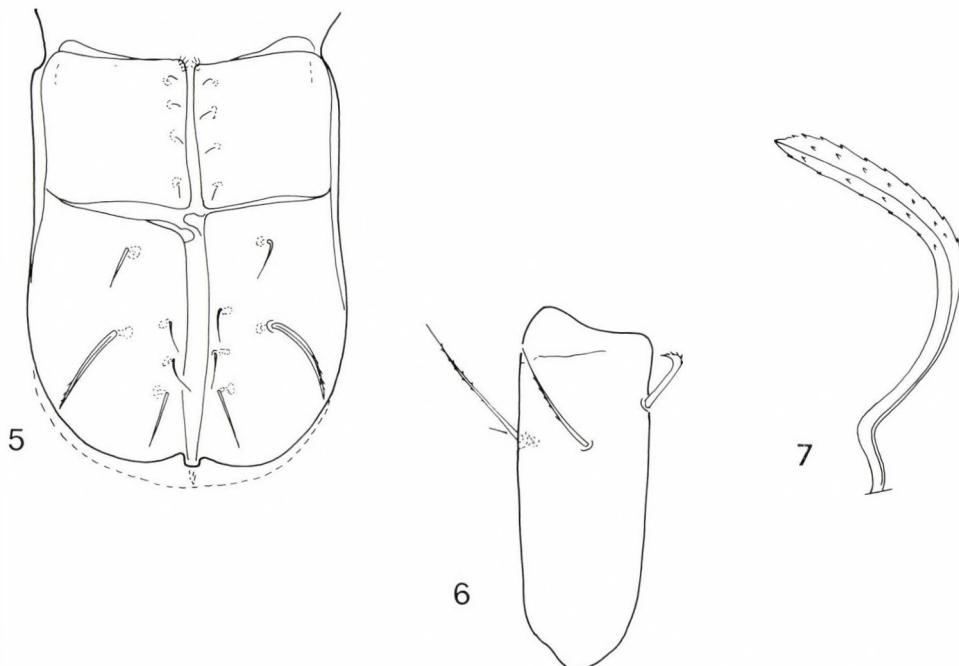
Aspis: Surface – with the exception of 2–3 pairs of basal ribs – nearly smooth, no foveolae observable. Lateral carina absent, lateral margin very short. Rostral setae arising far from each other, long, bent inwards (Fig. 2). Interlamellar setae strong, erect, on their distal end asymmetrically spiculate. Lamellar setae originating near to the preceding ones, much smaller, also slightly dilate. Setae *ex* reduced, alveoli observable. Sensillus long, curved, its distal part (Fig. 7) with thin velum, spiculate.

* This publication was supported by the Hungarian grant OTKA 3165.



Figs 1–4. *Hoplophthiracarus (Plonaphacarus) tanzicus* sp. n.: 1 = body in lateral aspect, 2 = aspis in dorsal aspect, 3 = seta c_1 , 4 = seta p_4

Notogaster: Surface with very weak foveolae, mostly difficult to observe. All notogastral setae similar to the interlamellar ones, strong, mostly erect with assymmetrical sharp edge (Figs 3–4) anteriorad and some strong spines on their distal part. Great difference exist in their length and/or thickness. Setae c_1 and p_1 longest of all, setae p_3 the thinnest, d_2



Figs 5-7. *Hoplophthiracarus (Plonaphacarus) tanzicus* sp. n.: 5 = anogenital region, 6 = femur, 1, 7 = sensillus

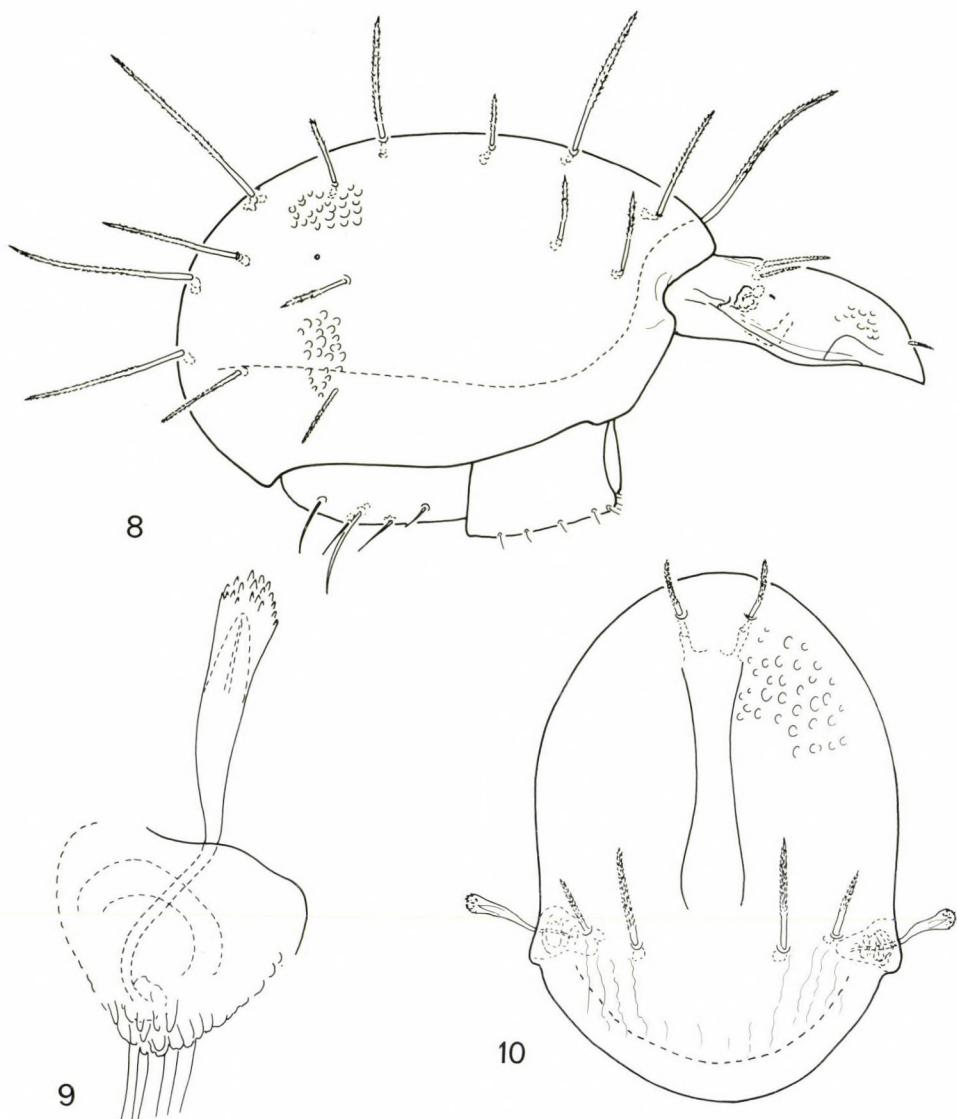
and e_2 the shortest of all. Four pairs of well-developed lyrifissures and alveoli of setae f_1 and f_2 also present.

Anogenital region: Genital setae arising in two longitudinal rows, g_9-g_6 much longer than the others, distance between g_6 and g_5 much greater than g_5 and g_4 . Insertion of the latter two setae touching. Surface of ano-adanal and genito-aggenital plates similar to the notogastral surface. Ano-adanal plates well convex in lateral view. Ratio of the ano-adanal setae: $ad_2 > ad_1 > ad_3 > an_1 = an_2$. All setae strong, sword-shaped, with edge sometimes spiculate.

Legs: Femur of leg I as shown in Fig. 6.

Material examined: Holotype (1437-HO-92): No. 103; 4 paratypes from the same sample; 2 paratypes: No. 105. Holotype and 3 paratypes (1437-PO-92) are deposited in the HNHM and 1 paratype in the MHNG.

Remarks: On the basis of the peculiar form of the notogastral setae the new species is well characterised. On the basis of the 4 pairs of lyrifissures the new species is nearest to *H. (P.) machadoi* (BALOGH, 1958), however, its notogastral setae are simple and long.

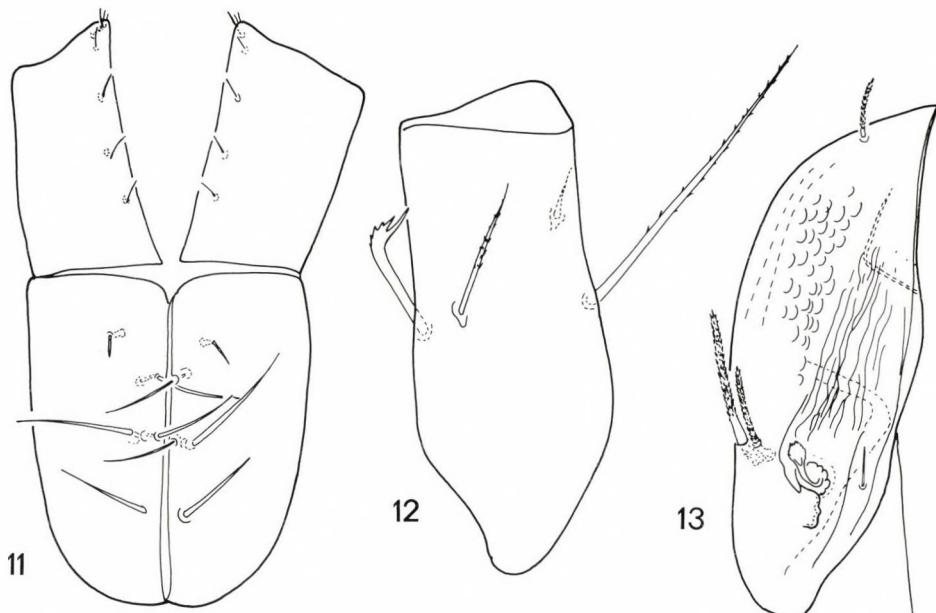


Figs 8–10. *Notophthiracarus lineolatus* sp. n.: 8 = body in lateral aspect, 9 = sensillus, 10 = aspis in dorsal aspect

***Notophthiracarus lineolatus* sp. n.**
(Figs 8–13)

Measurements. — Length of aspis: 277–416 µm, length of notogaster: 569–833 µm, height of notogaster: 360–431 µm.

Aspis: A very weak median crista present, it is hardly observable in lateral (Fig. 13) or dorsal aspect (Fig. 10). Lateral carina absent, lateral



Figs 11–13. *Notophthiracarus lineolatus* sp. n.: 11 = anogenital region, 12 = femur I, 13 = aspis in lateral aspect

rim normal, sinus line conspicuously developed. Dorsal surface heavily foveolated, lateral part ornamented by fine, disintegrated, longitudinal lines, in basal part some weak rugae also present. Bothridial squama sinuous basally. All four pairs of prodorsal setae present, the three dorsal pairs distinctly pilose, setae *ex* smooth. Interlamellar setae approximately twice longer than the lamellar ones, setae *ro* the shortest of all. Sensillus (Fig. 9) short, its distal end spiculate or spinose.

Notogaster: Surface with heavy sculpture. Fifteen pairs of notogastral setae of different lengths present, all spiculate or barbed on their distal part (Fig. 8). Owing to the heavy sculpture I was not able to verify the number and position of lyrifissures. The alveoli of seta *f*₂ visible.

Anogenital region: Genital setae arranged in one longitudinal row. Anal setae shorter than seta *ad*₁, seta *ad*₂ arising very near to *an*₁ (Fig. 11).

Legs: Seta *d* on femur I inserted far from the anterior margin, its distal end conspicuously bifurcate (Fig. 12). Setae *d* of tibia IV minute, coupled with the solenidium. The legs' chaetotaxy is of the "complete type", with setal formulae:

$$\begin{aligned} \text{I: } & 1-4-2+2-5+1-17+3-1 \\ \text{IV: } & 2-1-1-2+1-10-1 \end{aligned}$$

Material examined: Holotype (1438-HO-1992): Tanzania, Morogoro, 1990. Leg. T. Pócs. 10 paratypes from the same sample. Holotype and 8 paratypes (1438-PO-11992) are deposited in the HNHM, 1 paratype in the MHNG, 1 paratype in CN.

Remarks: On the basis of the heavy heterotrichy of the notogaster the new species stands closest to *Notophthiracarus aokii* (MAHUNKA, 1983). It is distinguished from the latter by the long and ciliate lamellar setae (simple, minute in *N. aokii*) and the very short and comparatively wide sensillus (much longer and slender in *N. aokii*).

Phthiracarus (Archiphthiracarus) pocii (MAHUNKA) comb. n.

Archiphthiracarus pocii MAHUNKA, 1983: 151.

Additional characters. – Body: Sensillus often rounded distally and the lateral teeth (spicules) smaller than were shown in the original figure. The alveoli of setae f_2 and f_1 (between and behind setae h_1) also well observable. Setae ad_1 and ad_2 not only shorter, but thinner than the anal ones.

Legs: Chaetotaxy is of the reduced type. Setae a' and a'' absent, femur of leg I with 3 setae (v' absent). Legs setal formulae:

$$\begin{aligned} \text{I: } & 1 - 3 - 2 + 2 - 4 + 2 - 16 + 3 - 1 \\ \text{IV: } & 2 - 1 - 0 - 2 + 1 - 8(!) - 1 \end{aligned}$$

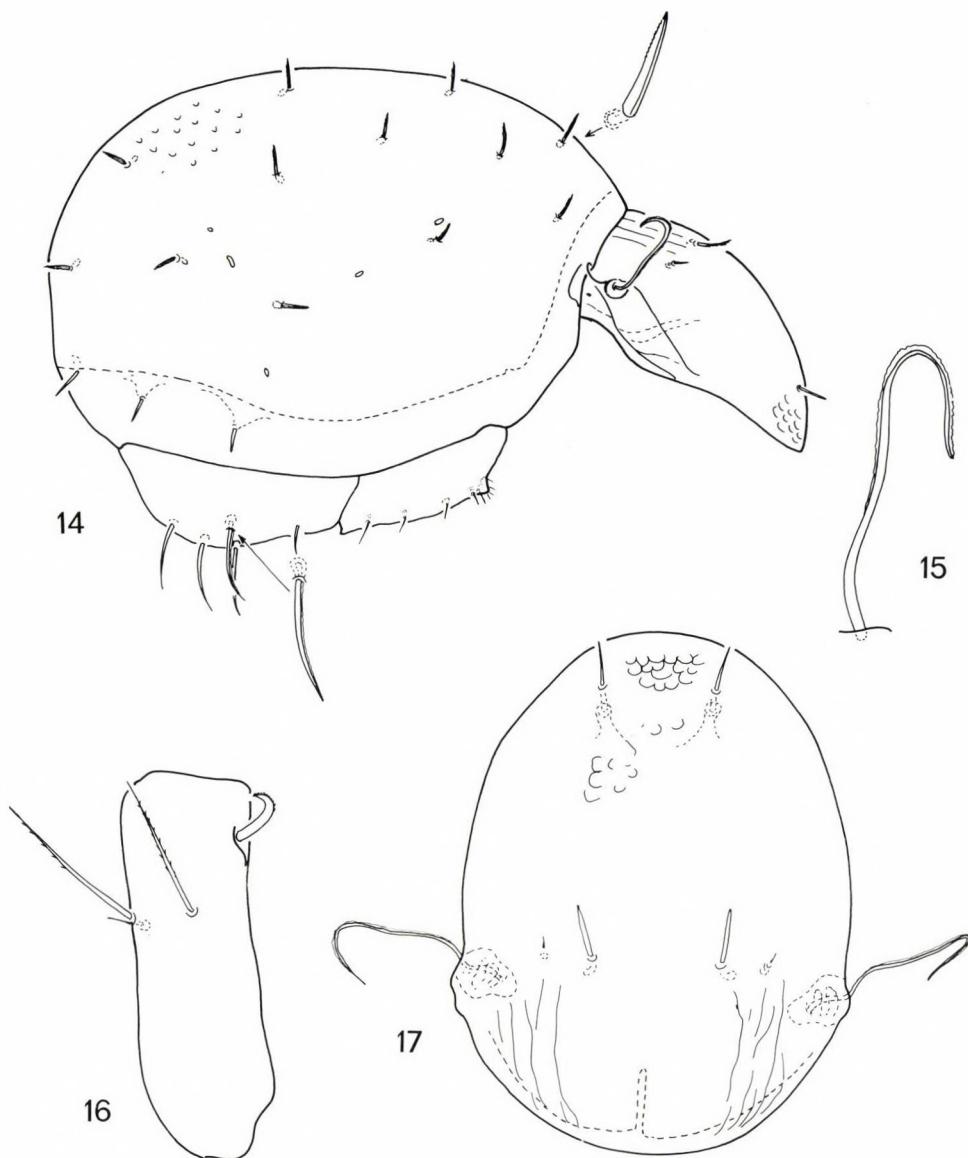
Material examined: Tanzania, Morogoro, 14 May 1990, leg. T. Pócs (4 specimens).

Rhacaplacearous spiniferus sp. n. (Figs 14–19)

Measurements. – Length of aspis: 184–256 µm, length of notogaster: 303–483 µm, height of notogaster: 200–344 µm.

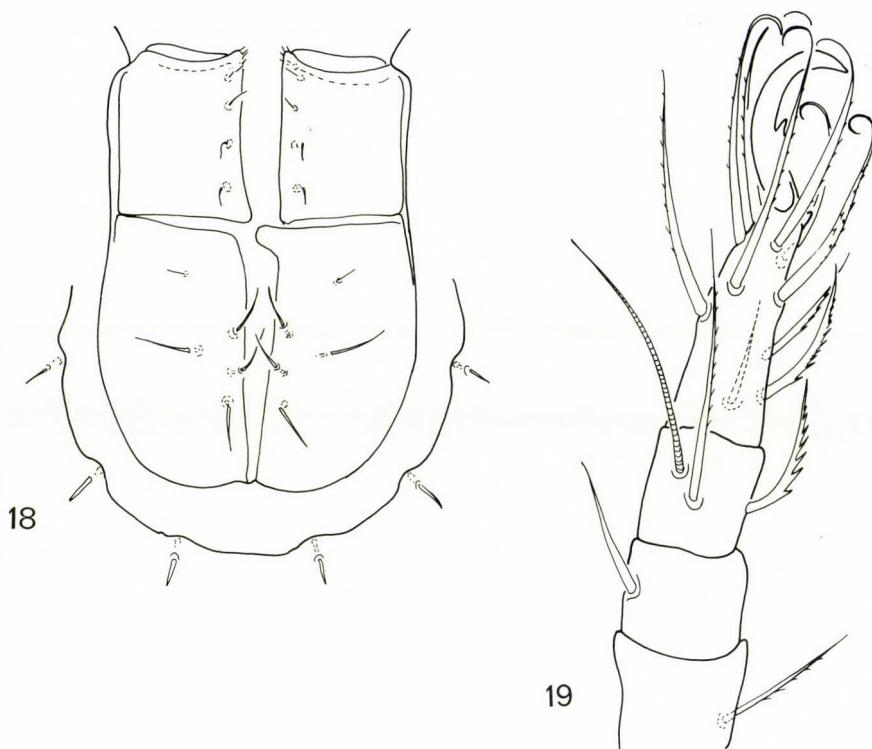
Aspis: Anterior part well sculptured lateral and median part nearly smooth, basal part ornamented by some rugae (Fig. 17). Lateral carina short and fine, not reaching to the likewise short lateral margin (Fig. 14). All prodorsal setae – with the exception of reduced exobothridial ones – thick, spiniform, but short. Setae *in* longer than *ro*, setae *le* the shortest of all. Sensillus long, S-shaped, with a serrate velum on its distal part (Fig. 15).

Notogaster: Surface ornamented by weak alveoli. Fifteen pairs of short, thick, spiniform notogastral setae present all have this edge anteriored and some small spines on their distal part (Fig. 14). Four pairs lyrifissures and the alveoli of setae f_1 and f_2 visible, setae f_1 originating between setae and before h_1 .



Figs 14–17. *Rhacaplagarus spiniferus* sp. n.: 14 = body in lateral aspect, 15 = sensillus, 16 = femur I, 17 = aspis in dorsal aspect

Anogenital region: Genital setae arranged in two longitudinal rows, setae g_6 arising behind g_5 . Anoadaanal setae short, sword-shaped, no essential difference among them, only setae ad_3 shorter than the others (Fig. 18).



Figs 18–19. *Rhacaplacecarus spiniferus* sp. n.: 18 = anogenital region, 19 = leg 4

Legs setal formulae:

$$\begin{aligned} \text{I: } & 1 - 4 - 2 + 2 - 5 + 1 - 16 + 3 - 1 \\ \text{IV: } & 2 - 1 - 1 - 2 + 1 - 10 - 1 \end{aligned}$$

Setae *d* on femur I inserted near to the distal margin, strongly curved. Setae *d* on tibia IV very long (Fig. 19), independent from the solenidium.

Material examined: Holotype (1439-HO-92): Tanzania, Morogoro; 2 paratypes from the same sample. Holotype and 1 paratype (1439-PO-92) are deposited in the HNHM and 1 paratype in the MHNG.

Remarks: On the basis of the very short notogastral setae the new species stands very near to *H. sacyae* MAHUNKA, 1983. However, the latter is distinguished from the new species by the notogastral sculpture (flower-shaped foveolae by *sacyae*) and by the form of the sensillus (without serrated velum by *sacyae*).

Baloghodes secundus sp. n.
(Figs 20–29)

Measurements. — Length of body: 555–624 μm , width of body: 294–348 μm .

Integument: A well-developed waxy layer covers the whole surface, except the legs and most of the setae. Cuticle generally with very fine microsculpture; nevertheless, some irregular spots in the interlamellar region and well pustulate surfaces behind the shoulders also present.

Prodorsum: Rostrum rounded, rostral setae arising on the rostral surface, near to each other, their surface finely roughened. Lamellae with rounded but well-developed free cuspis, lamellar setae wide phylliform, with serrate margin; both pairs of setae bent inwards (Fig. 23). Interlamellar setae (Fig. 24) directed outwards, much longer than the preceding ones. In cross-section V-shaped, margins serrate. Sensillus very short, its head dilate, with digitiform bristles on its outer surface (Fig. 22).

Notogaster: Dorsosejugal region normal, dorsosejugal suture slightly convex, shoulder protruding anteriorly (Fig. 20). Fourteen pairs of characteristic notogastral setae present, 10 pairs among them long, strongly curved, their margins more or less serrate. Setae $c_2 > la$ and da arising in a transversal line, near the dorsosejugal suture. All the others, except $p_1 - p_4$, thinner than these former ones and inserted in two groups, on the anterior half of the notogaster. Setae p are much shorter than these and arising in posteromarginal position.

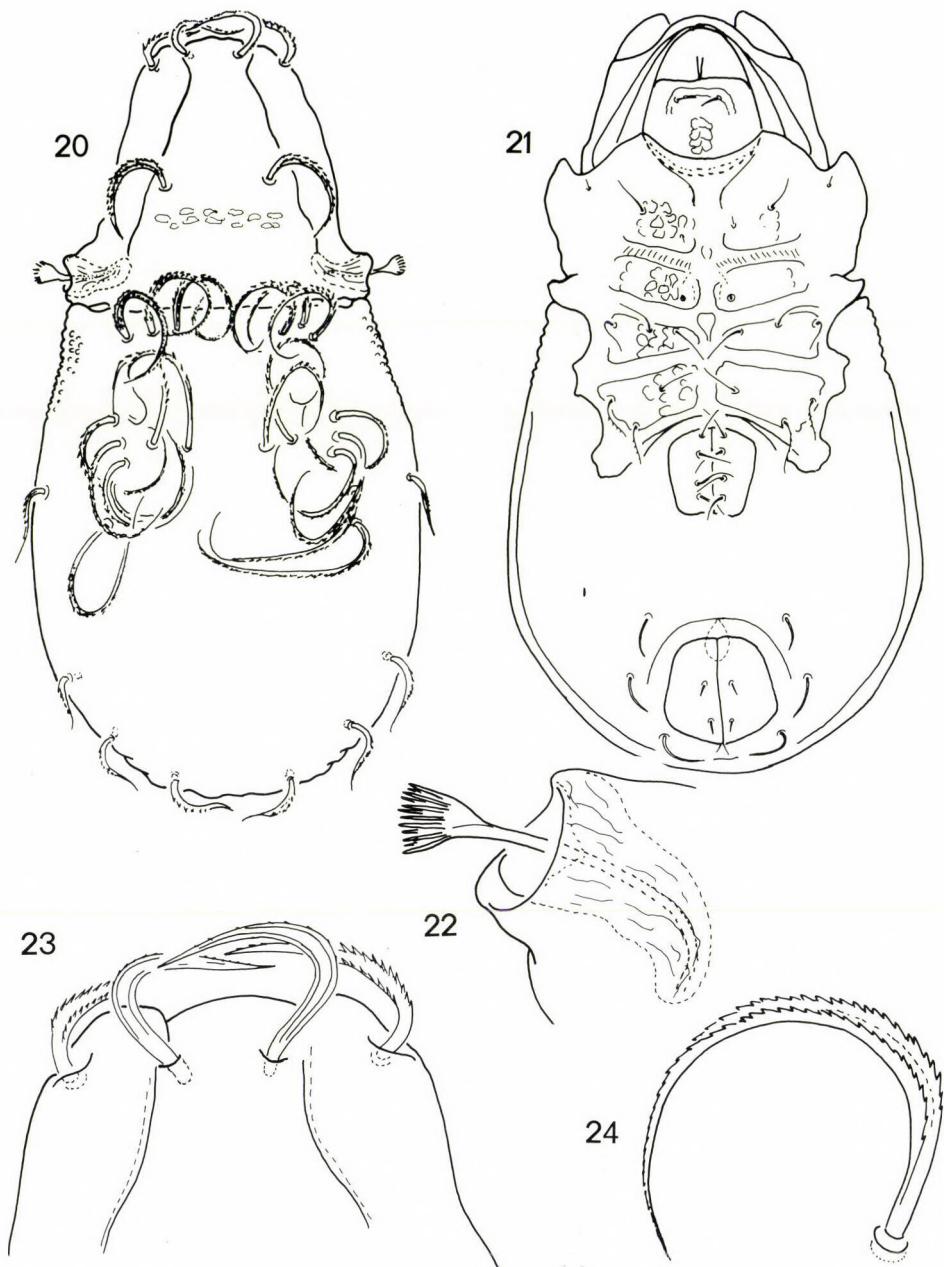
Lateral part of podosoma: Tutorium well observable, it is an arched, isolated lath, without cusp. Pedotectum angulate anteriorly, convex medially in lateral aspect discidum small.

Gnathosoma: Mentum with a strong transverse medial ridge, setae h arising on its inner margin.

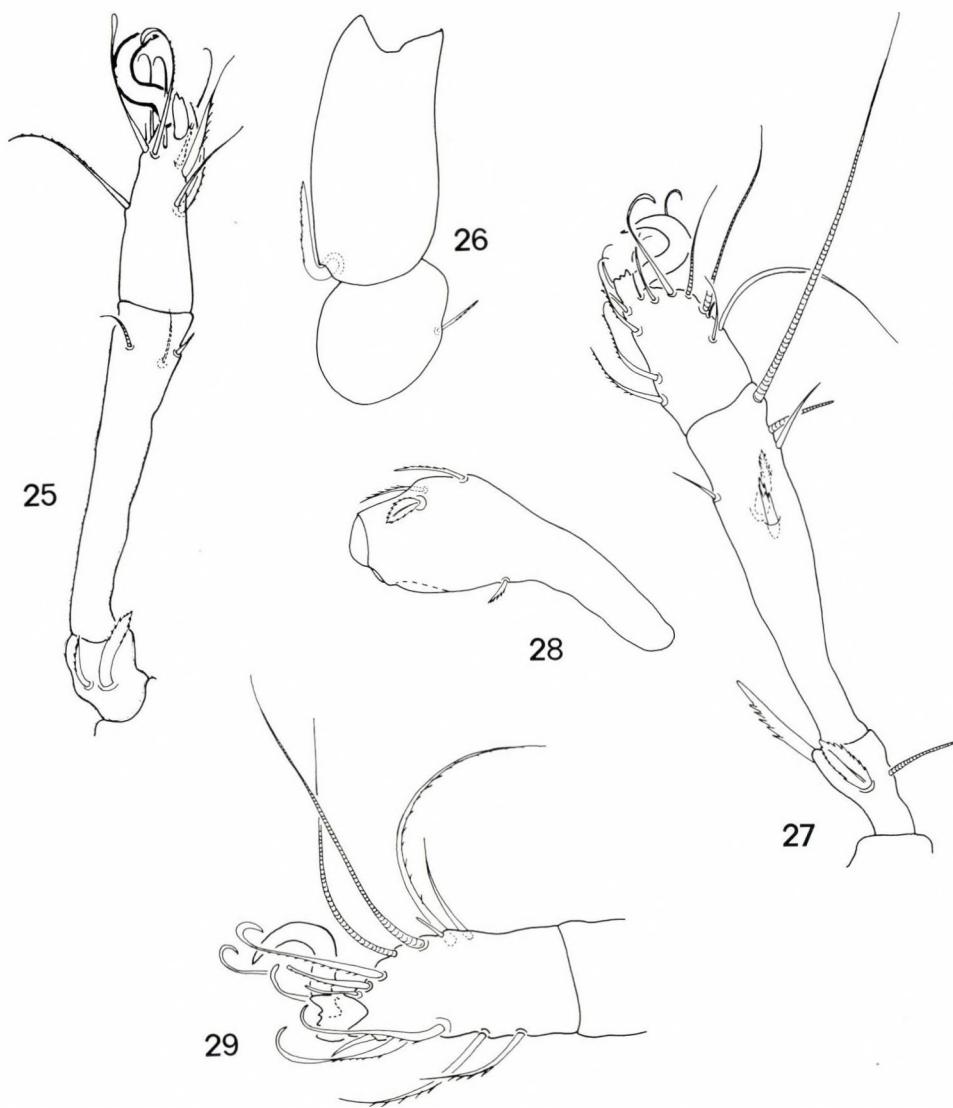
Epimeral region: Well divided by epimeral borders, all four pairs of epimeres separated from each other. Irregular spots on the surface also observable. Most of epimeral setae — except $1a$, $1c$, $2a$ — long, thin, finely ciliate. Epimeral setal formula: 3—1—3—3.

Anogenital region: Anogenital setal formula: 4—0—2—3. Genital setae setiform, much longer than the others, anal setae the shortest of all, bacilliform, adanal setae narrow phylliform (Fig. 21). Aggenital setae absent, lyrifissures iad very small, hardly observable, and placed very far from the anal plates.

Legs: Setae u (Fig. 29) on all tarsi strongly modified, dilate, setae s conspicuously short. Legs with particular chaetotaxy (e.g. setae v' on femora III and IV, a' on tarsus IV absent) so legs setal formulae are:



Figs 20–24. *Baloghodes secundus* sp. n.: 20 = dorsal aspect, 21 = ventral aspect, 22 = sensillus, 23 = rostrum, 24 = seta in



Figs 25–29. *Baloghodes secundus* sp. n.: 25–26 = leg 4, 27–28 = leg I, 29 = tarsus of leg 1

- I: 1–4–3+1–4+2–16(!)+2–1 (Figs 25, 28)
 III: 1–2–1+1–2+1–14–1
 IV: 1–1(!)–1+1–2+1–11(!)–1 (Figs 26, 27)

Material examined: Holotypus (1440-HO-1992): Kenya, Mt. Kenya, December 1991, leg. A. VOJNITS, 6 ex. (1440-PO-1992) 4 paratypes from the same sample. Holotype and 4 paratypes in the HNHM, 1 paratype in the MHNG 1 paratype in the CN.

29-1993
 ACTA ZOOLOGICA HUNGARICA
 E. B. Vojnits

Remarks: The new species is the second species of the genus *Baloghodes* MAHUNKA, 1986. The type species of the genus (*B. heterotrichus* MAHUNKA, 1986) was described also from Tanzania. The new species is distinguished from the latter by the position and form of the notogastral setae (*da* and *la* arising behind *c₂* and wider in *B. heterotrichus*), by the smooth interlamellar region (pustulate in *B. heterotrichus*) and by the absence of the aggenital setae (present in *B. heterotrichus*). The legs of the *B. heterotrichus* are very similar to the new species (modified setae *u*, absence of setae *v'*, *a'* on leg IV, etc.).

Uluguroides minitricha sp. n.
(Figs 30–33)

Measurements. – Length of body: 501–598 µm, width of body: 278–311 µm.

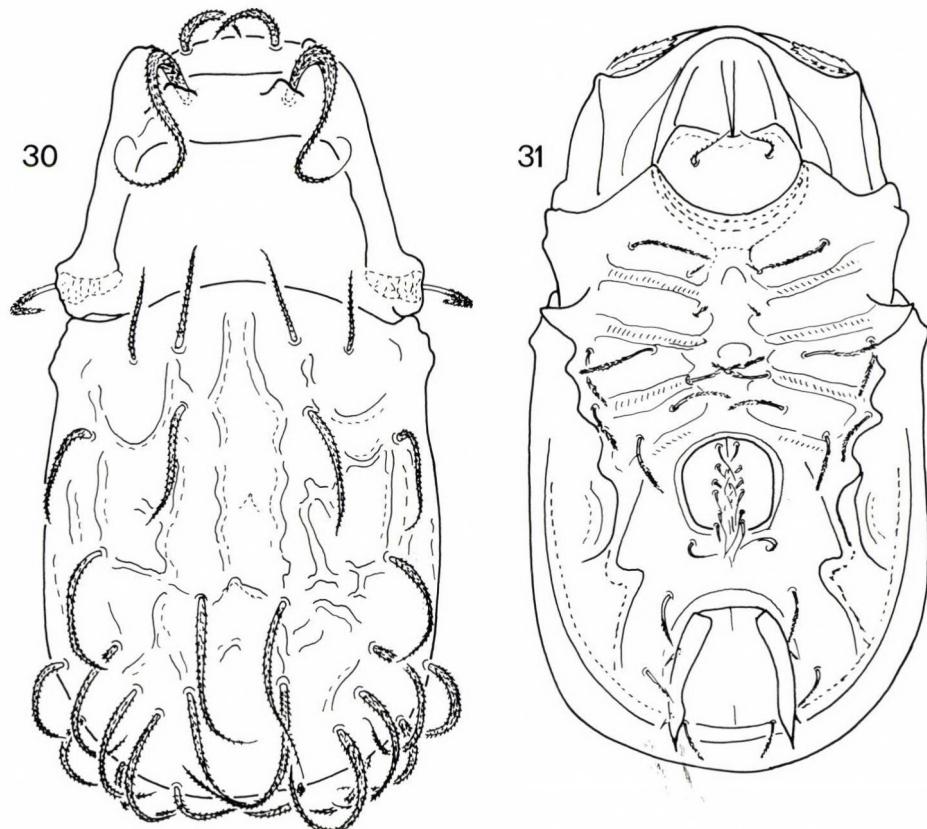
Integument: The whole body covered with thick, amorphous cerotegument, it consists of waxy layer and granulations and adhering filaments – mostly among the dorsal setae. Some very large wrinkles present on the notogaster, forming an irregular network.

Prodorsum: Rostrum widely rounded, rostral setae arising far from each other, directed medially, phylliform with crossing attenuate tips. Form of lamellae typical for the genus, without sharp cuspis. Lamellar setae wide, margin serrate. A strong transversal elevation (median ridge) present, interlamellar setae inserted on its anterior margin. These setae are very long, with flagellate distal end (Fig. 30). Basal part of prodorsum trapezoid, slightly grooved, without any sculpture. Sensillus setiform but slightly incrassate medially, curved inwards an upwards, relatively short. All setae and the sensilli barbed.

Notogaster: Dorsosejugal depression narrow, circumgastric depression absent, well-separated shoulder observable. Fourteen pairs of notogastral setae slender, slightly dilated basally, well barbed. Two anterior pairs of them directed forwards, they are shorter than the rest of setae on the posterior part of the notogaster.

Epimeral region: Epimeral borders broad and well observable connected by a thick, longitudinal (sternal) one. Anteriorly and in the sejugal region small hollows observable. Epimeral setae well ciliate (Fig. 31), epimeral setal formula: 2–1–3–3.

Anogenital region: Anogenital setal formula: 6–1–2–3. Genital setae conspicuously long, anal setae very short. I was not able to find the lyrifissures *iad*.



Figs 30–31. *Ulugurooides minitricha* sp. n.: 30 = dorsal aspect, 31 = ventral aspect

Legs: Legs setal formulae:

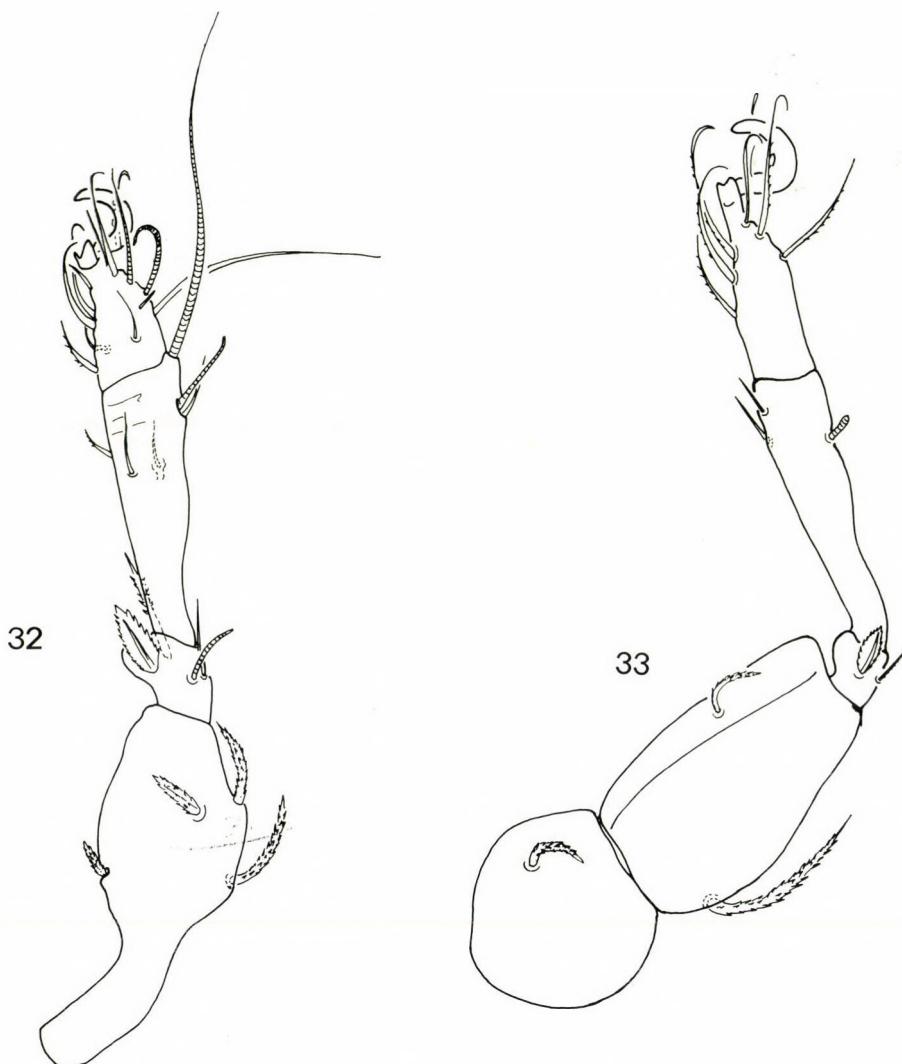
I: 1–4–3+1–4+2–18+2–1 (Fig. 32)

IV: 1–2–2–2+1–10–1 (Fig. 33)

Setae *s* on all legs very wide, medially incised. Setae *d* on leg I stand very near to the solenidium. Solenidium ω_1 conspicuously short and stout.

Material examined: Holotype (1441-HO-1992): Tanzania, Samba Hills, September 1990, leg. S. MAHUNKA et L. MAHUNKA-PAPP. 5 paratypes from the same sample. Holotype and 3 paratypes (1441-PO-1992) in the HNHM, 1 paratype in the CN, 1 paratype in the MHNG.

Remarks: The new species is well characterised by the long and flagellately ended interlamellar setae. It is distinguished from the type species of the genus by the ratio and length of the notogastral setae.

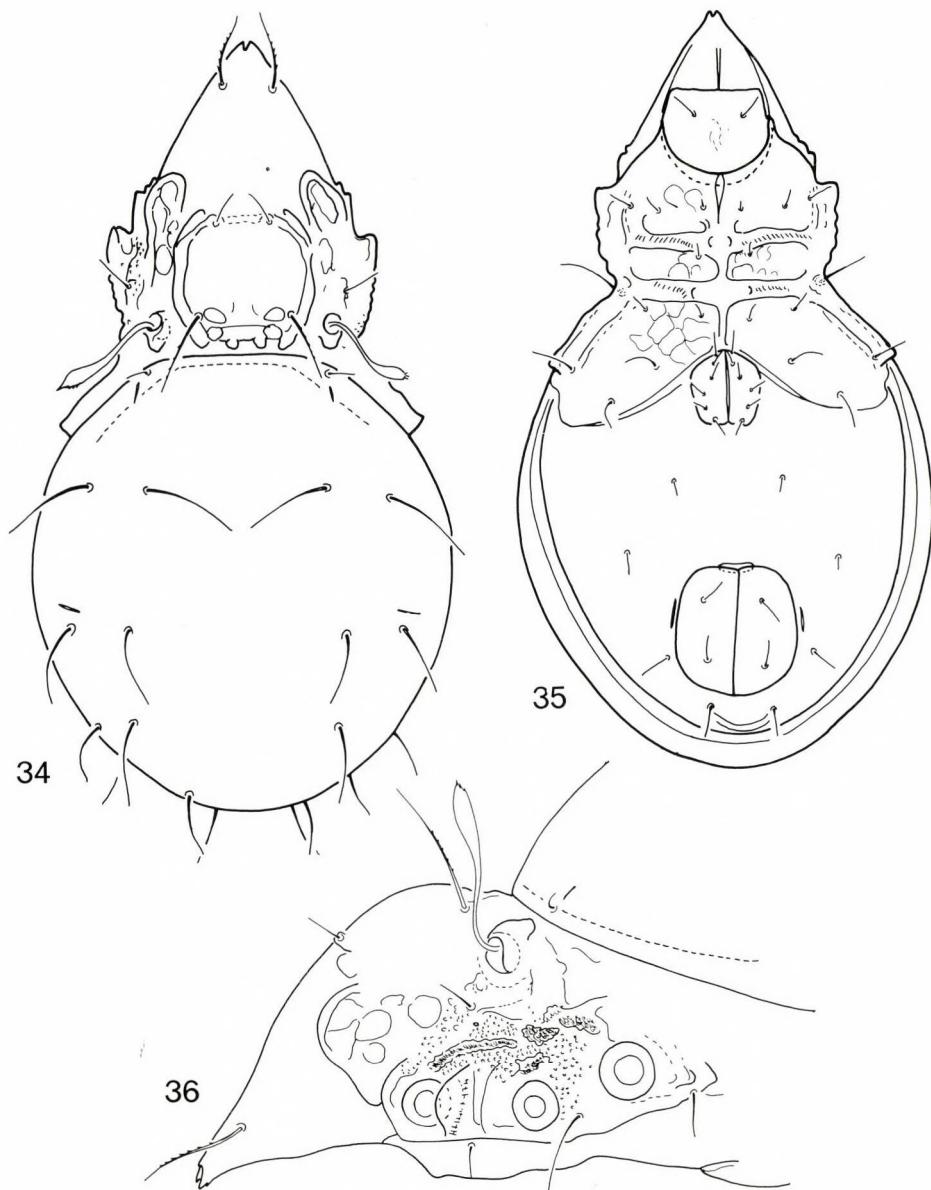


Figs 32–33. *Ulugurooides minitricha* sp. n.: 32 = leg I, 33 = leg 4

Basidoppia pocsorum sp. n.
(Figs 34–36)

Measurements: — Length of body: 308–323 μm , width of body: 177–186 μm .

Prodorsum: Rostral apex characteristically incised. Median part of prodorsum with a quadrangular costula (Fig. 34), indicating a transversal costula anteriorly and basally. Anterior part thinned medially, basal part



Figs 34–36. *Basidoppia pocsorum* sp. n.: 34 = dorsal aspect, 35 = ventral aspect, 36 = podosoma in lateral aspect

with two pairs of strong tubercles. Two pairs of light spots present in the interbothridial region. In front of the costula a pair of tubercles and a strong, arched lateral costula present. Rostral setae arising on the dorsal

surface, lamellar one on a tubercle. Ratio of these setae: *in* > *ro* > *le*. Interlamellar and rostral ones well ciliate, lamellar ones smooth. Sensillus cylindrical, with very short distal spines. Bothridium with a basal tubercle.

Notogaster: Anterior margin of notogaster straight. Ten pairs of notogastral setae observable, setae *c*₂ very short.

Lateral part of podosoma: Pedotecta 1 small, pedotecta 2 absent, discidium triangular. Exobothridial region (Fig. 36) with strong sculpture, surface granulate, some stronger tubercles or lath also visible.

Ventral regions: Epimeral surface ornamented by polygonal sculpture, epimeral borders well observable. Between the two *bo*₂ and *bo*. *sej.* a weak hollow present. All epimeral setae short and simple, setae *1c* arising far from pedotecta 1. Genital and anal setae and their position characteristic for this genus (Fig. 35). Behind the anal aperture a well-developed, thickened arch observable.

Legs: Setal formulae are:

$$\begin{aligned} \text{I: } & 1-5-2+1-4+2-20+2-1 \text{ (Fig. 40)} \\ \text{IV: } & 1-2-2-3+1-10 \text{ (Fig. 41)} \end{aligned}$$

Material examined: Holotype (1442-HO-1992): Tanzania, Morogoro, May 1990, leg. T. Pócs. 4 paratypes from the same sample. Holotype and 2 paratypes (1442-PO-1992) in the HNHM, 1 paratype in the MHNG, 1 paratype in the NC.

Remarks: The new species – with three earlier described ones: *B. basidii* MAHUNKA, 1983, *B. demeteri* (MAHUNKA, 1982) and *B. psyla* MAHUNKA, 1983 – belongs to the genus *Basidoppia* MAHUNKA, 1983. All four species are known from East Africa. These four species stand quite near to one another, therefore, for their easy recognition a study of the types of all species concerned is necessary.

On this basis the generic diagnosis is in need of some corrections and complements: The costulae form a quadrangular structure with at least one pair of strong tubercles. A pair of separated tubercles between the median and lateral costulae and two pairs of light spots in the interbothridial region always present.

On the basis of the form of the sensillus, the four known species could be divided into two groups: 1. sensillus having long distal spines (*B. demeteri* and *B. psyla*); 2. sensillus having very short distal spines (*B. basidii* and *B. pocsorum*). On the other hand, *B. psyla* and *B. basidii* have only one pair of basal tubercles on the costulae in the interbothridial position. *B. demeteri* has two or three weak, and the new species two pairs of strong tubercles. Some differences exist in the ratio of the prodorsal setae (see Figs 37–39), and in the length of the body and the length of the notogastral setae. The size of the body is also characteristic (it is well visible when studying the

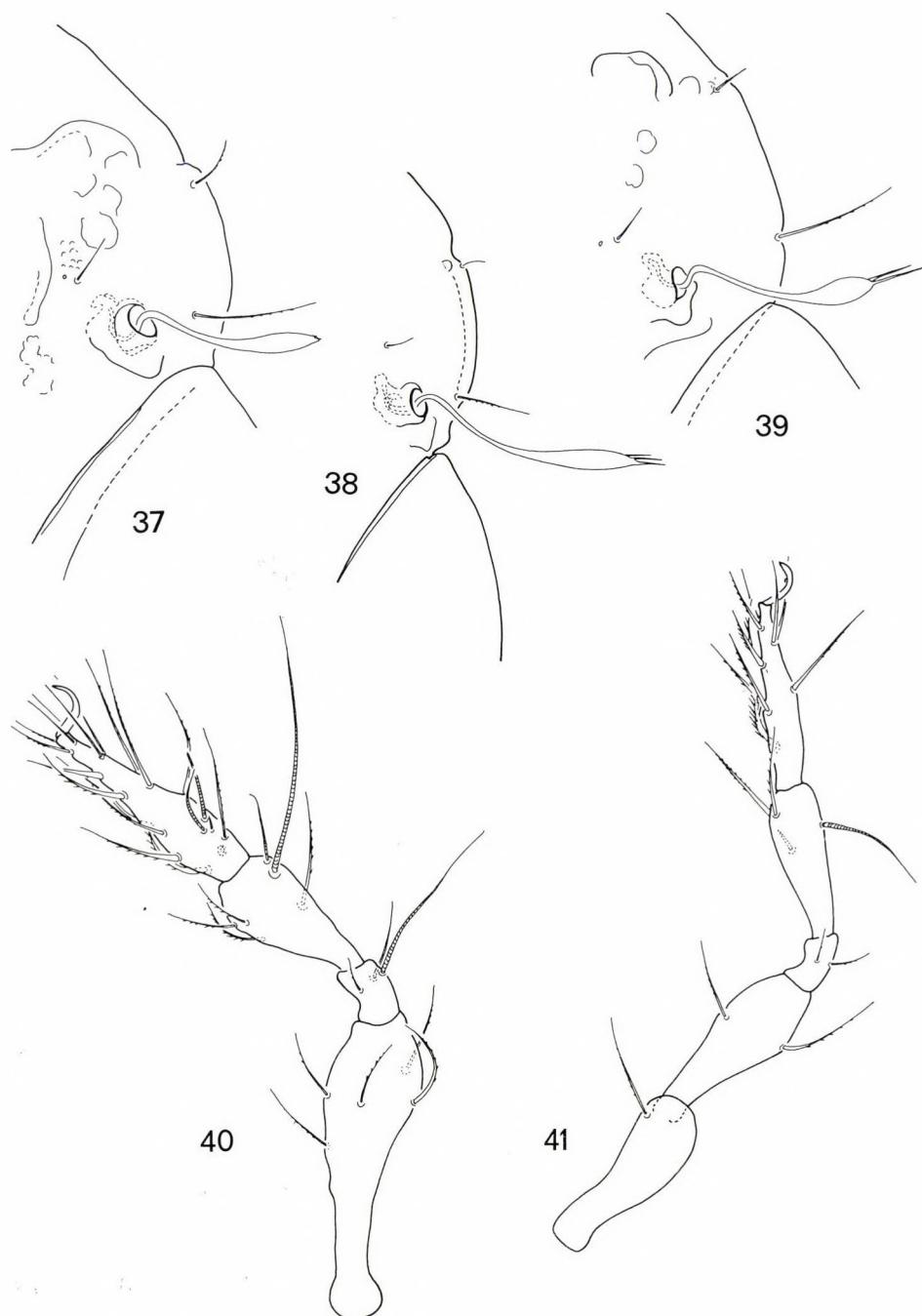


Fig. 37. *Basidoppia basidii* MAHUNKA, 1986: – Fig. 38. *Basidoppia psyla* MAHUNKA, 1986: – Fig. 39. *Basidoppia demeteri* (MAHUNKA, 1983): – Figs 40–41. *Basidoppia pocsorum* sp. n.: 40 = leg I, 41 = leg 2

types): *B. psyla* is much smaller, *B. pocsorum* is much bigger than the other species. *B. demeteri* and *B. basidii* are nearly equal in length.

I dedicate the new species to PROF. DR. T. Pócs and his wife S. Pócs for their intensive help in my work.

Drepanopippia koki sp. n.
(Figs 42–47)

Measurements. – Length of body: 299–332 µm, width of body: 165–185 µm. Females slightly larger than the males.

Prodorsum: Rostrum conical, rounded. Prodorsal surface with heavy lateral and well-developed transversal ridges (Fig. 42). A weaker transversal line observable in the interbothridial region. Two pairs of indistinct light spots also present there. Three-four pairs of spots are anteriorly to the trichobothrium. Rostral setae arising dorsolaterally, slightly thicker and longer than the lamellar ones, both finely and sparsely ciliate. Interlamellar setae short, exobothridial setae minute. Sensillus (Fig. 44) long, mostly characteristically curved medially, tips acuminate, not or scarcely dilated in its median part, bearing some short spines.

Lateral part of podosoma: Exobothridial region well granulated, this sculpture present only in a narrow band (Fig. 45) and extending only from pedotecta 1 to the sejugal region. Pedotecta 1 small, pedotecta 2–3 absent. Discidium beak-shaped and sharply pointed.

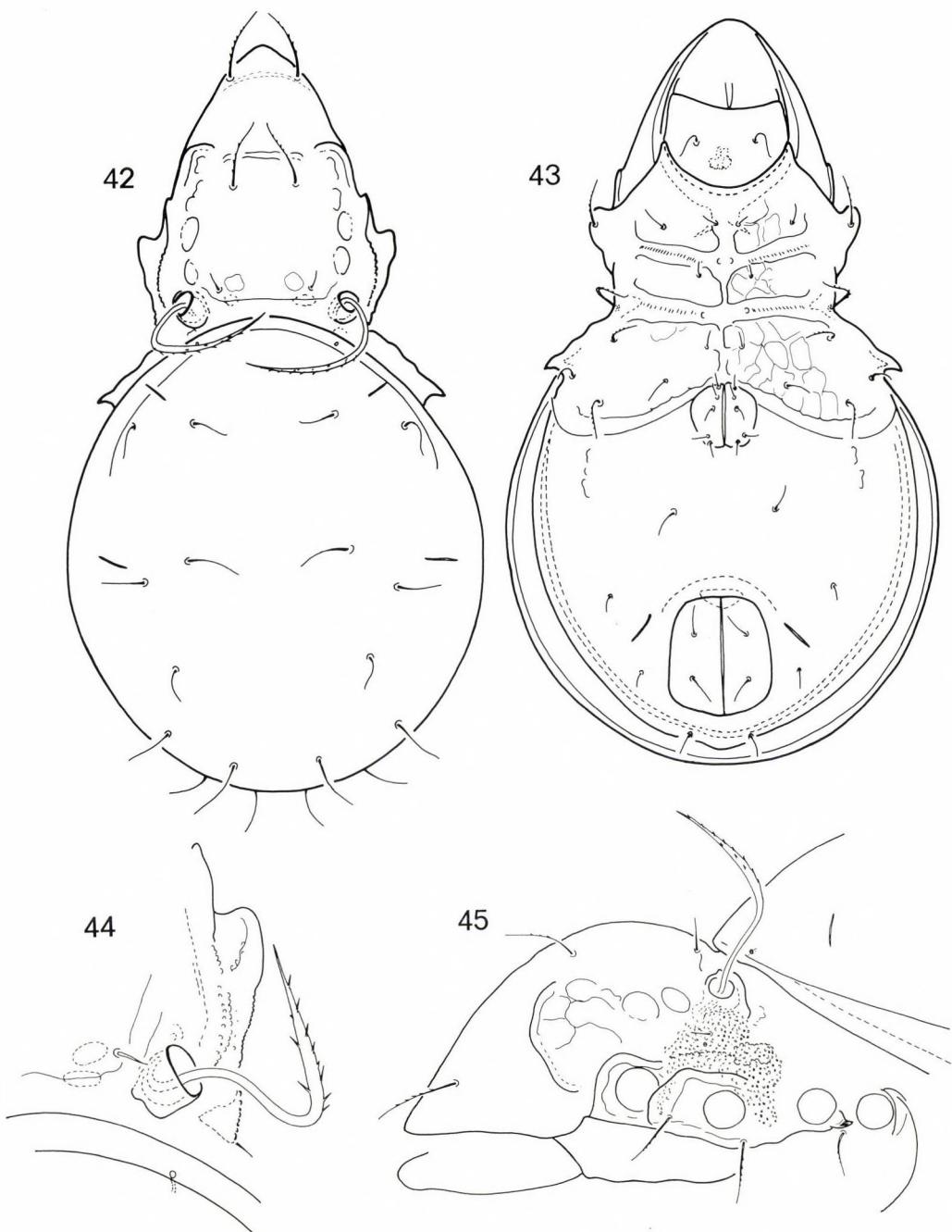
Notogaster: Nine pairs of (Fig. 42) notogastral setae present, and the tenth pair (*c*) represented only by their alveoli. Setae *la* and *lm* arising nearly in one transversal line, setae *lp* stand always more anteriorly than *h*₃. Lyrifissures *ia* and *im* conspicuously long. No essential difference among the lengths of notogastral setae.

Ventral side (Fig. 43): All epimeral borders broad, epimeral surface with polygonal sculpture. On borders 2 and sejugal ones, one pair of small dimple observable. Epimeral setae short, mostly finely ciliate. Seta *1a* arising on pedotecta 1 and directed forwards. Anogenital setal formula: 5–1–2–3. Lyrifissures *iad* very long and located in inverse apoanal position.

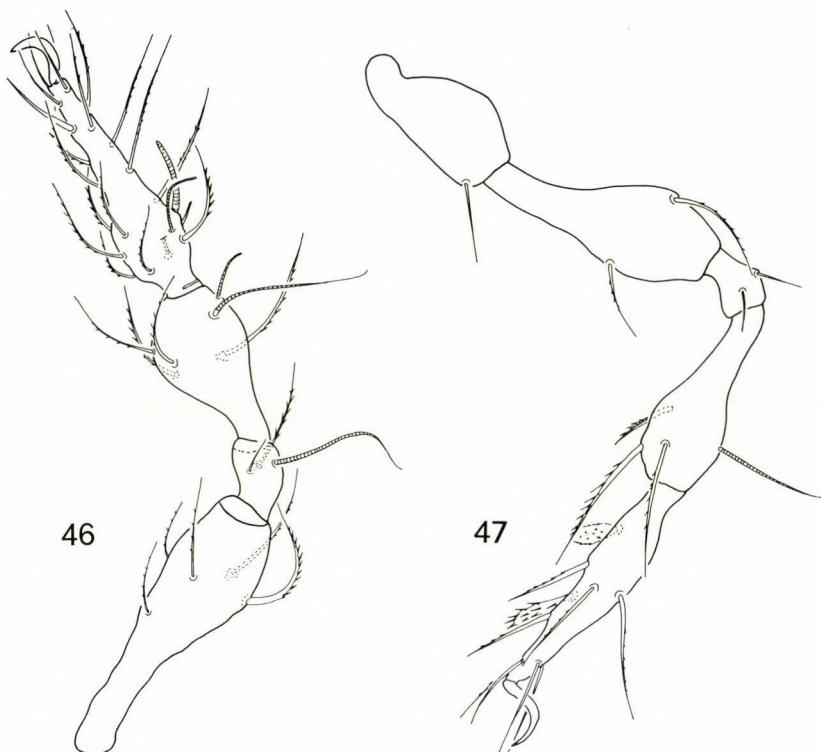
Legs: With normal oppiod characters. Setal formulae:

$$\begin{aligned} \text{I: } & 1 - 5 - 2 + 1 - 4 + 2 - 20 + 2 - 1 \text{ (Fig. 46)} \\ \text{IV: } & 1 - 2 - 2 - 3 + 1 + 10 - 1 \text{ (Fig. 47)} \end{aligned}$$

Solenidium φ_1 of leg I three times longer than φ_2 . Setae *a'* and *pv'* dilated, phylliform.



Figs 42–45. *Drepanoppiella koki* sp. n.: 42 = dorsal aspect, 43 = ventral aspect, 44 = trichobothrium, 45 = podosoma in lateral aspect



Figs 46–47. *Drepanoppia koki* sp. n.: 46 = leg I, 47 = leg 4

Material examined: Holotype (1443-HO-1992): Tanzania, Morogoro, leg. T. Pócs. 3 paratypes (1443-PO-1992) from the same sample. Holotype and 1 paratype in the HNHM, 1 paratype in the MHNG, 1 paratype in the CN.

Remarks: The new species is very closely related to the type species of the genus *Drepanoppia* BALOGH, 1983 (*D. falxa* KOK, 1967) from South Africa. The similarity is so great that this form could only be a subspecies of *D. falxa*. The differences (without the study of *D. falxa*) are:

D. falxa

1. Setae *la* arising for anteriorly from setae *lm*.
2. Discidium triangular.
3. Sensillus strongly broadened.
4. Measurements: 234–242 × 122–130.

D. koki

1. Setae *la* and *lm* arising in one transversal row.
2. Discidium beak shaped.
3. Sensillus scarcely broadened.
4. Measurements: 299–328 × 165–185.

I dedicate the new species to DR. D. J. KOK, one of the first explorers of the South African Oribatida fauna.

Setobates tanzanicus sp. n.
(Figs 48–52)

Measurements: Length of body: 452–512 µm, width of body: 299–338 µm.

Prodorsum: Rostrum conical, with beak-shaped apex in lateral aspect. Lamellae well developed, prelamella present. Rostral and lamellar setae arising on their surface (Fig. 48). Rostral setae setiform, lamellar and interlamellar ones conspicuously strong, with blunt tip. Sensillus bent backwards and outwards, with asymmetrically cylindrical head. Some spines on this part stand in longitudinal rows.

Notogaster: Dorsosejugal suture concave medially (Fig. 48). Thirteen pairs of short, but basally strong, notogastral setae and four pairs of small and round sacculi present.

Lateral part of podosoma: Pedotecta 1, pedotecta 2 and the discidium well developed (Fig. 52). Seta 1c arising on the basis of the pedotecta 1.

Ventral regions (Fig. 49): Sejugal and third epimeral borders connected medially. Epimeral surface ornamented by irregular spots. All epimeral setae minute. Ventral plate with fine, weak sculpture. Anogenital setal formula: 4–1–2–3. All setae – excepting the anterior genital one – short and simple.

Legs: Solenidium φ_1 and φ_2 arising on a small tubercle (Fig. 50). Seta d on femur IV strong and long (Fig. 51). Legs setal formulae:

$$\begin{array}{ll} \text{I: } & 1-5-3+1-4+2-20+2-3 \\ \text{IV: } & 1-2-2-3+1-12-1 \end{array}$$

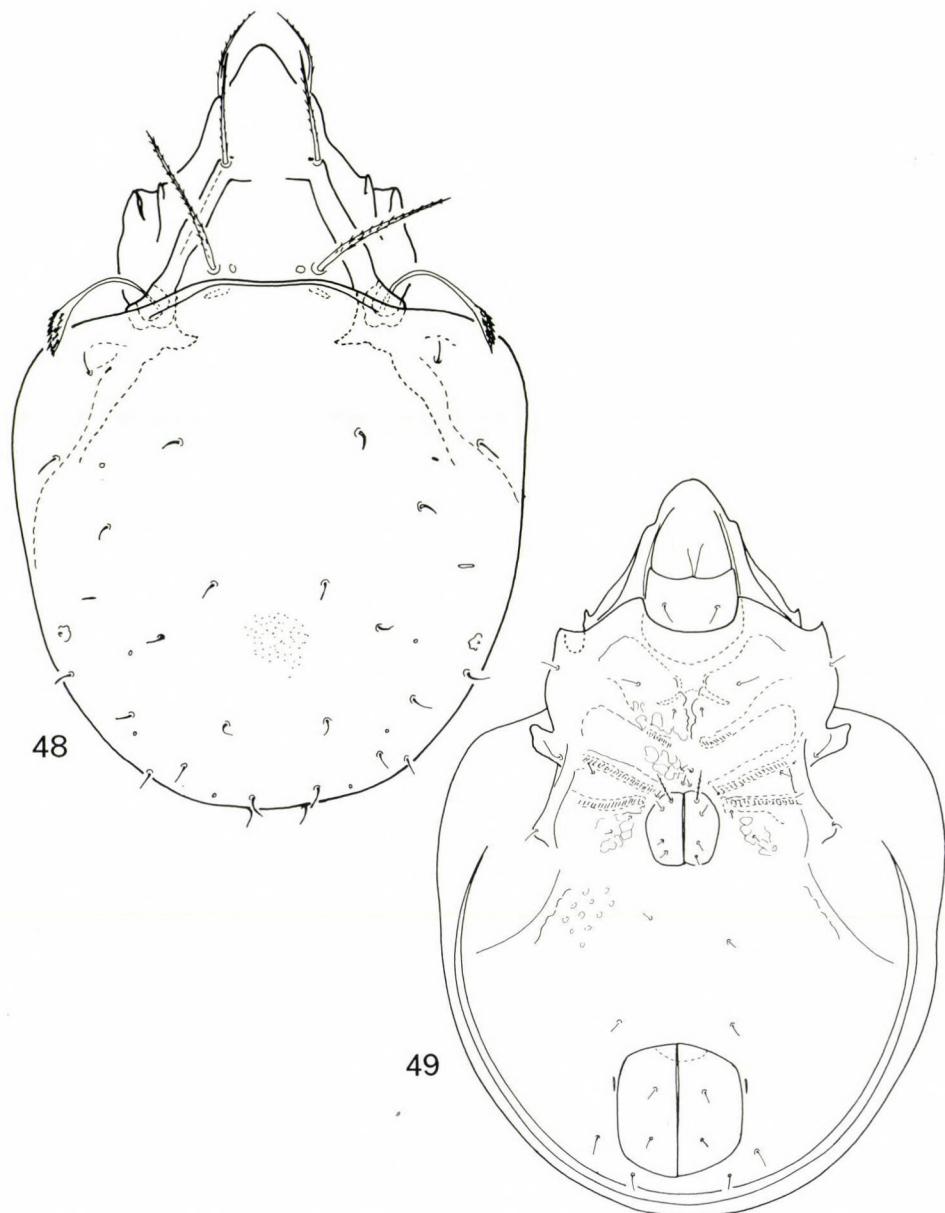
Material examined: Holotype (1444-HO-92): Tanzania, Morogoro, leg. T. Pócs. 3 paratypes (1444-PO-92) from the same sample. Holotype and 1 paratype in the HNHM, 1 paratype in the MHNG, 1 paratype in the CN.

Remarks: The new species is well distinguishable from all known *Setobates* BALOGH, 1962 species by its characteristically strong notogastral setae.

Allogalumna vojnitsi sp. n.
(Figs 53–57)

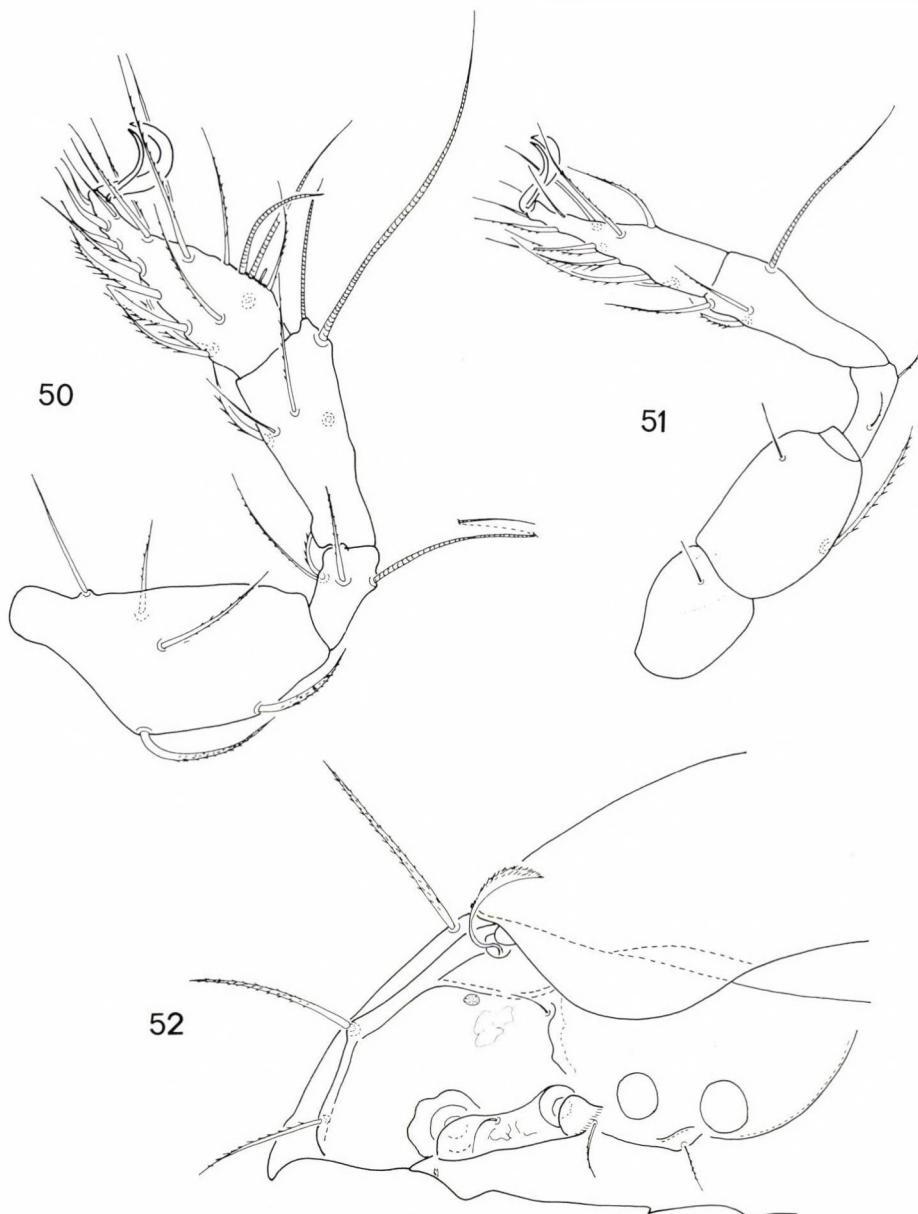
Measurements. – Length of body: 288–316 µm, width of body: 218–235 µm.

Cerotegument: Waxy layer scarcely visible, excepting a small part. Cuticle quite smooth (under normal light microscope).



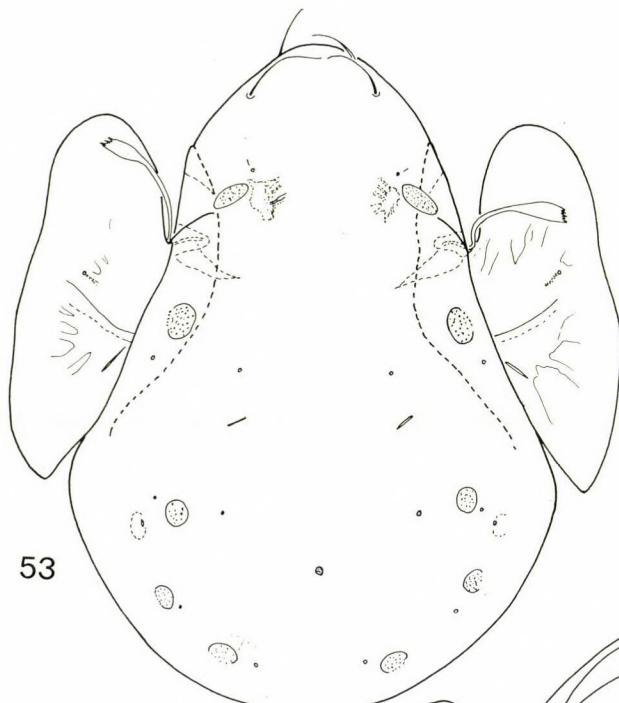
Figs 48–49. *Setobates tanzanicus* sp. n.: 48=dorsal aspect, 49=ventral aspect

Prodorsum: Rostrum widely rounded is dorsal aspect and arching elongated and pointed in lateral aspect. Ridge *S* well developed and observable. Among the prodorsal setae one pair (*in*) minute, two pairs (*le*>*ro*) simple, relatively long. Sensillus with a long peduncle and a well-

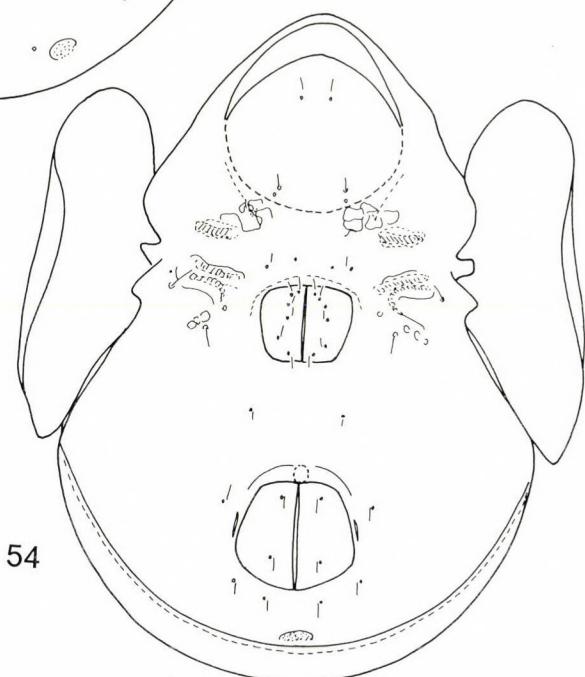


Figs 50–52. *Setobates tanzanicus* sp. n.: 50 = leg I, 51 = leg IV, 52 = podosoma in lateral aspect

separated head. The outer margin of the head with 4 (3–5) comparatively strong spines. Dorsosejugal areae porosae very large and transversally elongated.

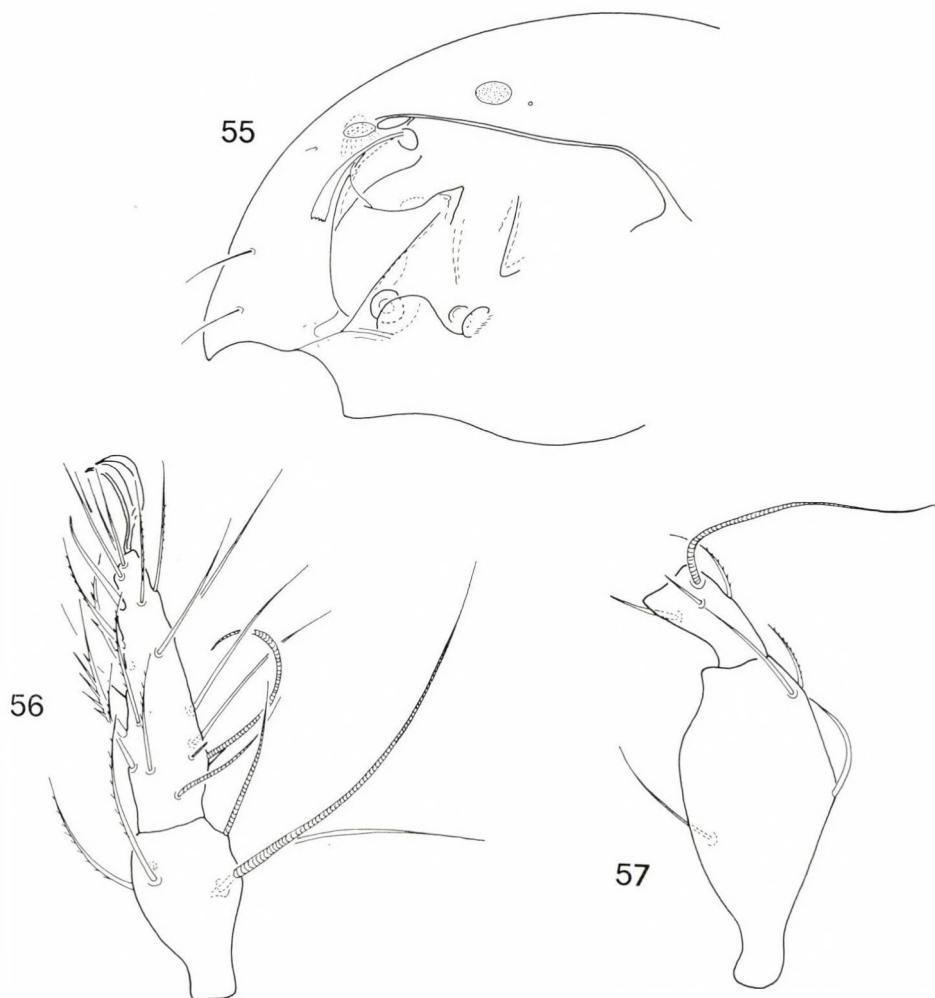


53



54

Figs 53-54. *Allogalumna vojnitsi* sp. n.: 53=dorsal aspect, 54=ventral aspect



Figs 55–57. *Allogalumna vojnitsi* sp. n.: 55 = podosoma in lateral aspect, 56 = tarsus and tibia of leg 1, 57 = femur and genu of leg I

Notogaster: Dorsosejugal suture lacking medially. Dorsophragmatic apophyses conspicuously large, with digitiform extension in deeper layer. Ten pairs of reduced notogastral setae in usual position and 4 pairs of areae porosae. Lyrifissures and the glandular openings are present, their position given in Fig. 53. Areae porosae *Aa* larger than the others, all of them more or less round. Median pori present. Lyrifissures *im* located near to each other in median field.

Lateral part of podosoma: The characters are shown in Fig. 55.

Ventral regions (Fig. 54): Epimeral surface and other characters have normal galumnoid structures. Only 4 pairs of epimeral setae present, but all conspicuously long. Anogenital setal formula: 6–1–2–4. Anterior margin of genital plates with only one pair of setae, the others set behind it longitudinally.

Legs: All legs tridactylous, chaetotaxy and the morphology of legs have the normal galumnoid characters. Setal formulae are:

$$\begin{aligned} \text{I: } & 1-5-3+1-4+2-20-3 \text{ (Figs 56-57)} \\ \text{IV: } & 1-2-2-3+1-12-3 \end{aligned}$$

Material examined: Holotype (1445-HO-1992): Tanzania, Ngorongoro, leg. A. VOJNITS, May 1991. 8 paratypes in the same sample. Holotype and 6 paratypes (1445-PO-1992) in the HNHM, 1 paratype in the MHNG, 1 paratype in CN.

Remarks: The new species stands nearest to *A. margaritata* BALOGH, 1961, however, the sensillus is much wider than in the new species and clear differences exist also in the forms of the notogastral and sejugal areae porosae.

I dedicate the new species to my colleague and friend, DR. A. VOJNITS, who collected in East Africa some very interesting soil samples.

Tranchygalumna margaritae sp. n. (Figs 58–63)

Measurements. – Length of body: 327–358 µm, width of body: 245–256 µm.

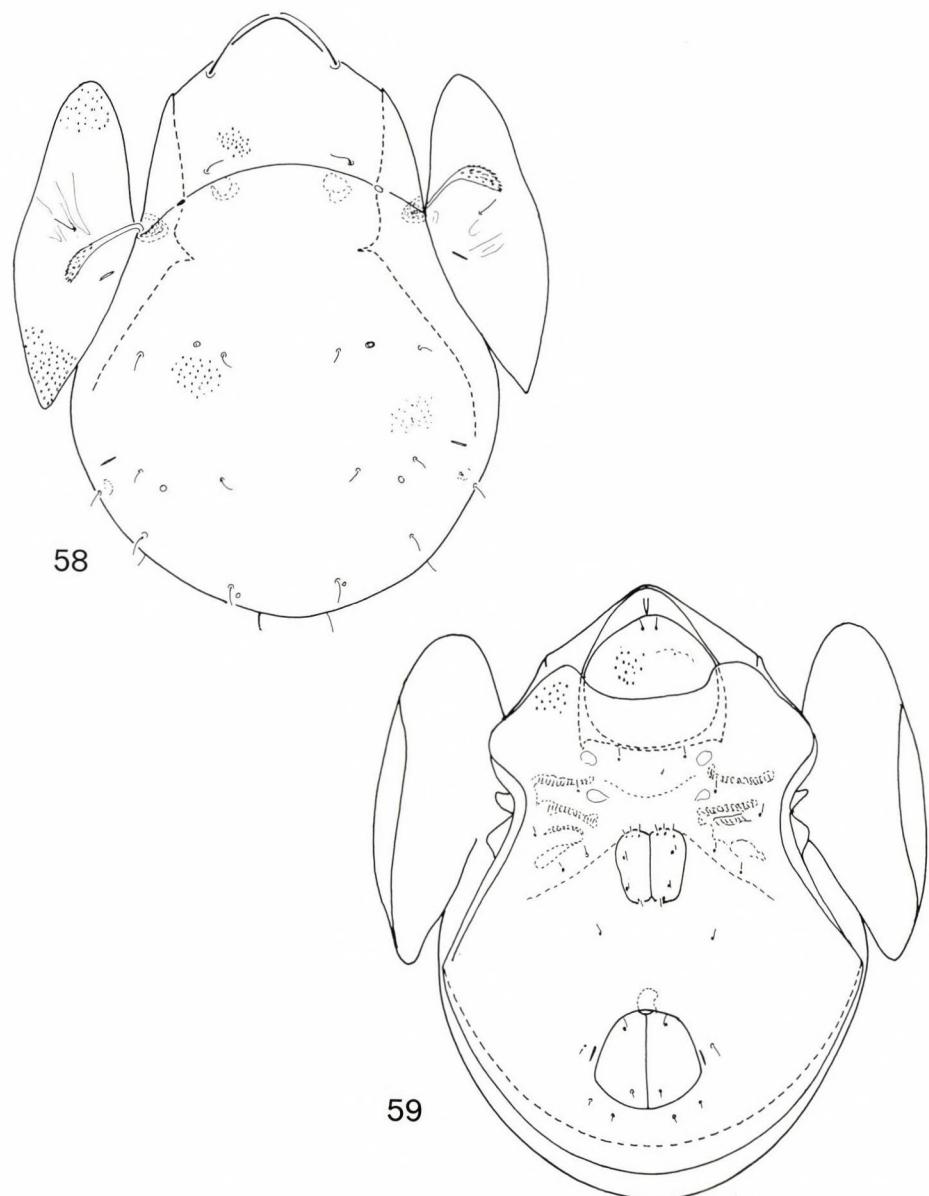
Prodorsum: Rostral setae minute, hardly observable. Lamellar setae normal, interlamellar setae very thin. Whole surface punctate. Sensillus short, with dilated head, this part distinctly pilose.

Notogaster: Dorsosejugal suture complete. Sejugal and three pairs of notogastral pori minute. Notogastral and pteromorphal surface well punctate. This sculpture is slightly stronger on the pteromorphae. Ten pairs of well-visible notogastral setae present (Fig. 58).

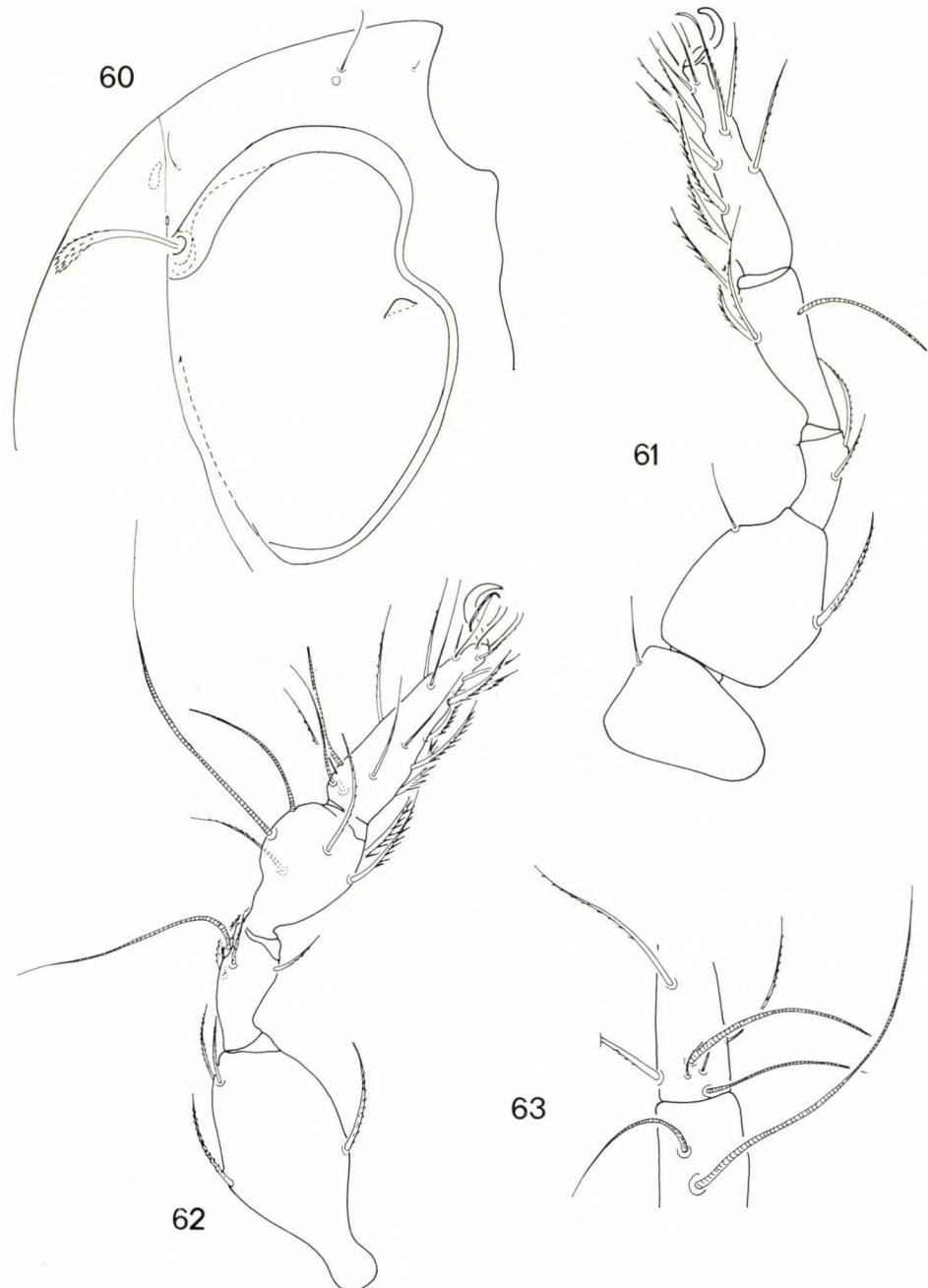
Ventral regions (Fig. 59): All setae minute. Epimeral surface also punctate. Three pairs of setae arising on the anterior margins of the genital plates.

Legs: Solenidium ω_p originating very near to the basal part of the tarsus, the position of the solenidial group is shown in Fig. 63. Legs setal formulae are:

$$\begin{aligned} \text{I: } & 1-4-3+1-4+2-20+2-3 \text{ (Fig. 62)} \\ \text{IV: } & 1-2-2-3+1-12-1 \text{ (Fig. 61)} \end{aligned}$$



Figs 58–59. *Trachygalumna margaritae* sp. n.: 58=dorsal aspect, 59=ventral aspect



Figs 60–63. *Trachygalumna margaritae* sp. n.: 60 = podosoma in lateral aspect, 61 = leg IV, 62 = leg I, 63 = solenidial group of leg I

Material examined: Holotype (1446-PO-92): Tanzania, Ngorongoro, May 1991, leg. A. VOJNITS. 10 paratypes from the same sample. Holotype and 8 paratypes in the HNM, 1 paratype in the MHNG, 1 paratype in the CN.

Remarks: The new species stands nearest to *Trachygalumna microporosa* MAHUNKA, 1986. The latter is distinguished from the new species by the stronger sculpture and the strong dorsosejugal suture.

I dedicate the new species to my assistant MRS. MARGIT NAGY, for her help in my work.

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**POECILUS (ANGOLEUS) KEKESIENSIS SP. N.
(COLEOPTERA, CARABIDAE)
FROM HUNGARY**

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(Received 1 October 1991)

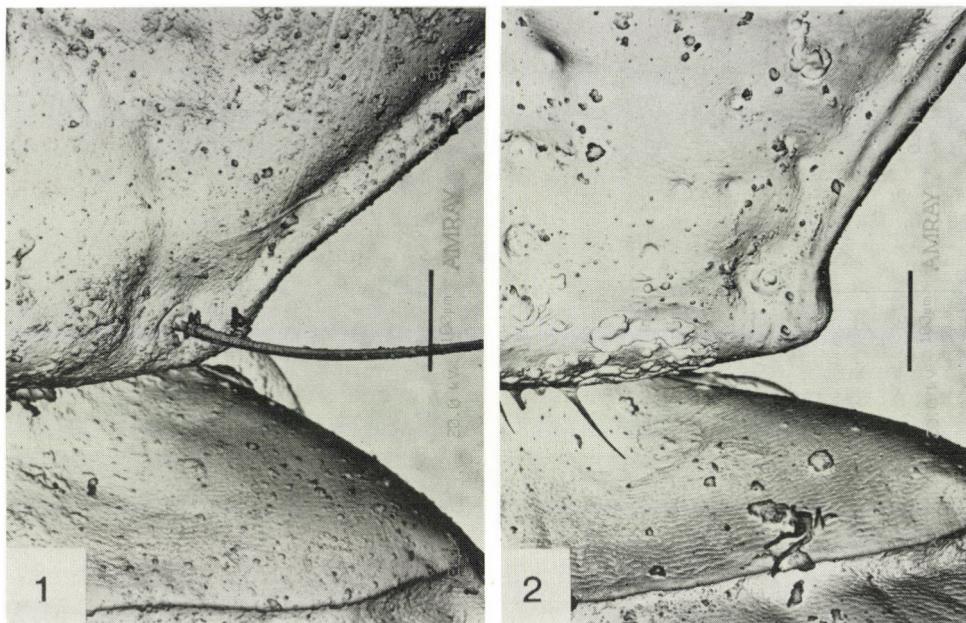
A new species, *Poecilus (Angoleus) kekensiensis* sp. n. is described from the alkaline and salty steppes of the Hortobágy National Park, Hungary. Considering its morphological features the new species is nearest to *Poecilus puncticollis* DEJEAN. Several morpho-ecological and phylogenetic phenomena indicate the possible time of the origin of this species. With 8 original photos.

Introduction – The description of the new species was preceded by a three-year investigation based on pitfall trap collecting. My studies were carried out in different alkaline and salty steppes in the strictly protected areas of the Hortobágy National Park. The investigations covered seven different habitats the alkaline characters of which gradually changed from alkaline to very salty. To be able to define the new species Wild M420 macroscope and Amray 1830I electronmicroscope were used.

**Poecilus (Angoleus) kekensiensis sp. n.
(Figs 1–8)**

Type material – Holotype: ♂, HUNGARY: Kékes, Hortobágy National Park, 89.16 m, 47°37'N, 21°21'E, 15. VIII.–1. IX. 1988., leg. DR. I. NYILAS, No. 1830. Deposited in coll. DR. NYILAS I. (Dep. Zool. Univ. Debrecen, Hungary). – Paratypes (131 specimens), HUNGARY: 36 ♂ + 51 ♀: Kékes (Hortobágy National Park), 1. 04.–3. 11. 1987; 10 ♂ + 18 ♀: Kékes (HNP), 1. 04.–4. 10. 1988, 2 ♂ + 2 ♀: Zám (HNP), 28. 04.–1. 07. 1988; 3 ♀: Bogárzó (HNP), 1.–14. 07. 1988; 1 ♂: Kunmadaras (HNP), 19. 09.–4. 10. 1988; 4 ♂ + 3 ♀: Kékes (HNP), 31. 03.–22. 08. 1989; 1 ♀: Kékes (HNP), 28. 03. 1991; in coll. DR. I. NYILAS, Dept. Zool., Univ. Debrecen (50 males and 75 females); in coll. DR. S. HORVATOVICH, J. Pannónius Múzeum, Pécs (1 male and 1 female); in coll. HNHM, Budapest (1 male and 1 female); coll. G. HEGYESSY, Sátoraljaújhely (1 male and 1 female).

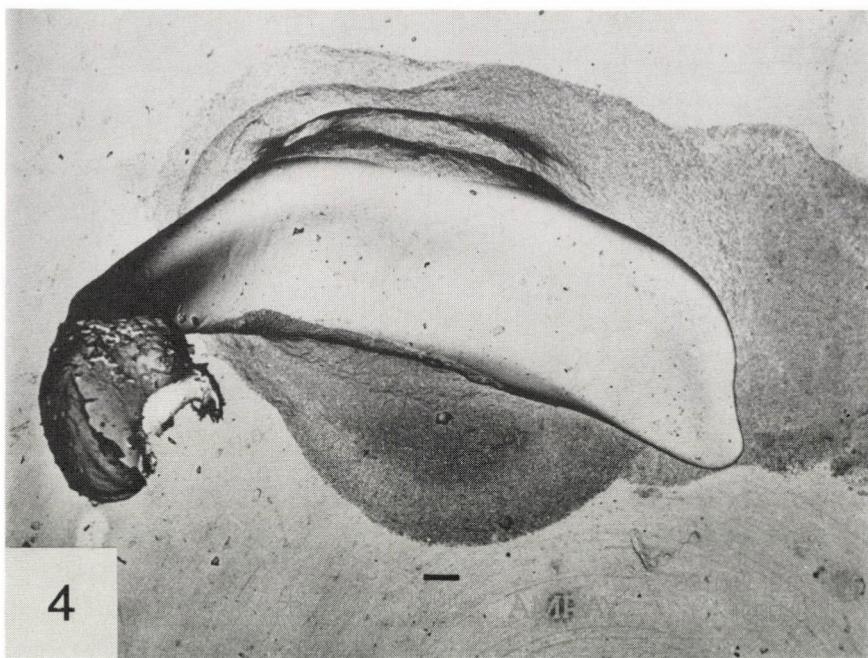
Description. – Length 10.24 mm, width of prothorax 2.83 mm, width of upper side 1.97 mm, width of lower side 1.85 mm. The length of prothorax at midline 2.30 mm, the depth of the groove on the side of the head 0.12 mm. The length of the head 1.85 mm, widest part at the eyes 0.85 mm, width of the head at the prothorax 1.48 mm. The third segment of the



Figs 1–2. The basal angle of the prothorax of *Poecilus kekensiensis* sp. n. male (Fig. 1) and *P. puncticollis* male (Fig. 2); 200 \times , 100 μ m

antenna is depressed at the base. There are no bristles or thorns on the lower side of the last tarsus on the first pair of legs (subgenera *Angoleus* VILLA 1833 and *Ancholeus* CHAUDOIR 1870). The animal is pitch-black, moderately glittering. The dorsal parts of the head and prothorax are not punctuated along the midline, but plain. The basal fovea of the prothorax is only a slightly depressed little groove with few punctures. The basal angles of the prothorax are obtuse angled (Fig. 1). The rim of the prothorax is getting thinner towards the rear angles. The animal is relatively narrow, the widest part is 3.57 mm. The elytral striae are less deep at lower part of the body. The distance between the punctures at the base of the elytrum is 160 μ m, at the middle 110 μ m. At the lower part of the elytrum the punctures are less visible, the distance between them is 108 μ m. The prosternum on the abdominal side is plain, the pro-episterna is definitely punctate. The epimerons of the meso- and metasternums are with stronger punctuation. The abdominal sternites are less densely punctate, more can be found near the edge. The pro-coxa is relatively flat, the meta-coxa is stronger. The tibiae of the first pair of legs are also stronger.

The penis (Fig. 3) 2.12 mm long and its widest part is 0.66 mm. The right and left parameres are presented in Figs 5 and 7.



Figs 3–4. The penis of *Poecilus kekensiensis* sp. n. (Fig. 3) and *P. puncticollis* (Fig. 4); 50 \times , 100 μ m

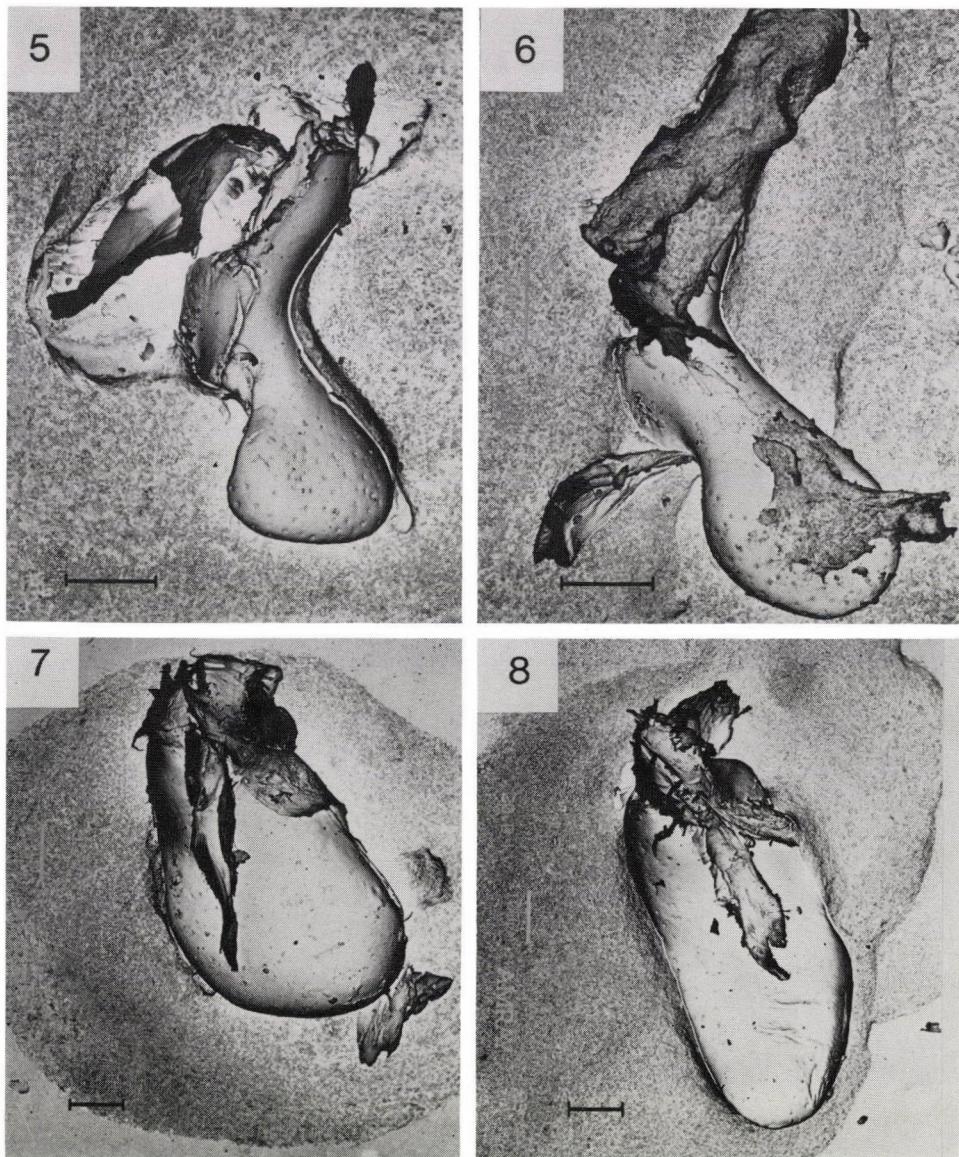
Differential diagnosis. — *Poecilus kekensiensis* sp. n. is closest to *P. puncticollis* DEJEAN 1828. *P. puncticollis* is strongly punctuated at the base and along the midline of the prothorax, has a much deeper basal fovea on its prothorax, which is situated longitudinally, it has more and deeper punctures than *P. kekensiensis* sp. n. The rim of the prothorax does not become so thin near the angles which are almost perpendicular (Fig. 2). The punctures in the elytral striae are less deep. The forelegs of *P. puncticollis* are weaker than those of *P. kekensiensis* sp. n.

The penis of *P. puncticollis* is much smaller (1.80 mm) and narrower (0.44 mm), there are differences in its shape too (Fig. 4). Its parameres are clearly different from those of *P. kekensiensis* sp. n. (Figs 6 and 8).

Distribution. — Individuals of *P. kekensiensis* sp. n. have been found only in different regions of Hortobágy (Kékes, Zám, Bogárzó, Kunmadaras). The habitat data of 132 species have been elaborated up till now. In consequence, it can be stated that this species occurs in dry and alkaline steppes and doesn't like the more salty (salt content is higher than 0.3%) territories. This species could be in the same locality as *P. puncticollis* several times. *P. kekensiensis* sp. n. prefers the semi-desert like *Artemisio-Festucetum pseudovinae* association, while *P. puncticollis* prefers humid, salty habitats and marshy margins. Where the two habitats overlap, sympatric occurrence can be observed.

P. puncticollis is common at and near the seaside, inland it occurs mainly in marshy places with higher salt content. *P. puncticollis* is distributed at the Mediterranean Sea in France, Spain, Italy, on the Balkan Peninsula, in Central Europe and in the Crimea and Caucasus in the late Soviet Union, and in Syria (CHAUDOIR 1876, APFELBECK 1904, CSIKI 1928–1931, HORION 1941, JEANNE 1965, MAGISTRETTI 1965, BONADONA 1971, FREUDE et al., 1976). The most continental distribution of *P. puncticollis* is in the Carpathian Basin. During my three-year investigations 90 specimens of *P. puncticollis* have been caught in the territory of Hortobágy National Park. In previous literature *P. puncticollis* had been noted from several localities in the Trans-Tisza region (Debrecen, Makó) and in the plain between the Danube and Tisza (CSIKI 1905–1908). It should be noted, however, that investigations carried out in these regions have not confirmed the present occurrence of this species. It can be concluded that in Hungary the biggest populations of *P. puncticollis* occur in Hortobágy.

Morpho-ecological notes. — I have found that *P. kekensiensis* sp. n. is less sensitive to lower salt content and occurs in much drier and harder soils, while *P. puncticollis* lives in humid marshy soils with high salt content (e.g. 1.62% total salt content). The habitat selection analyses have



Figs 5–8. The right paramera of *Poecilus kekensiensis* sp. n. (Fig. 5) and *P. puncticollis* (Fig. 6); 170 \times , 100 μm . The left paramera of *P. kekensiensis* sp. n. (Fig. 7) and *P. puncticollis* (Fig. 8); 100 \times , 100 μm

shown that considering its ecological character *P. kekensiensis* sp. n. is xero-halophilic, while *P. puncticollis* is rather hygro-halophilic.

P. kekensiensis sp. n. came into existence during adjustment to very solid clayey alkaline soils. The solid dry soil lead to the strengthening of

certain parts of the body. Two morpho-ecological differences have been found during the comparison of the two species. The tibiae of the first pair of legs are stronger in the case of *P. kekensiensis* sp. n., and the meta-coxae of the third pair of legs are also much stronger.

Phylogenetic notes. – *P. kekensiensis* sp. n. differentiated from *P. puncticollis* and this may have started as soon as the formation of present alkaline steppe habitats had been completed. The alkaline soils in Hortobágy can be characterized by such soil chemical processes the time definition of which gives us information about when the habitat may have been formed (NYILAS 1991). This indicates how long the specification has been going on. In this case, on the basis of radiocarbon calibration the time of the starting point of specification can be put at least at 5380 years BP. As the occurrence of *P. kekensiensis* sp. n. is not known in other territories, in spite of the fact that I examined different collections, the formation of this species can be considered to have taken place in close connection with the changes in the natural conditions of Hortobágy. The territory of Hortobágy was regularly flooded wetland at the end of the Pleistocene. In the Holocene, during the climatic and hydrographical changes the extension of marshy territories greatly decreased, natural alkalinization became stronger. These conditions made it possible for this species to come into existence and distribute. It is clear that the anthropogenic activities, mainly in the 19th and 20th centuries, resulted in the extension of alkaline steppes. This meant further potential territories for this species.

* * *

Acknowledgments – Thanks are due to DR. S. HORVATOVICH (Janus Pannonius Museum, Pécs), DR. E. HERTELENDI (Institute of Nuclear Research of the Hungarian Academy of Sciences, Debrecen), DR. M. JAECH and DR. SCHÖNMANN (Natural History Museum, Wien), DR. Gy. SZÉL (Hungarian Natural History Museum, Budapest) and S. J. HINE (Natural History Museum, London) for giving effective help in my investigations. – My work was supported by the Hungarian Academy of Sciences, Hungarian Saving Bank and Hungarian Trade Bank.

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FIRST SURVEY OF THE TRIASPIDINI SPECIES
OF THE INDO-AUSTRALIAN REGION
(HYMENOPTERA, BRACONIDAE: CALYPTINAE)
III. THE GENUS SCHIZOPRYMNUS FOERSTER, 2.

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(Received 30 April 1992)

Seventeen species of the genus *Schizoprymnus* FOERSTER are described as new to science from the Indo-Australian and Pacific Region, their distribution is shown in parentheses: *Sch. aramus* sp. n. (Malaysia), *Sch. bicticus* sp. n. (Fiji Islands), *Sch. calurus* sp. n. (Laos, Viet Nam), *Sch. deversus* sp. n. (Malaysia), *Sch. eminens* sp. n. (Indonesia, Papua New Guinea), *Sch. fijicus* sp. n. (Fiji Islands), *Sch. granatus* sp. n. (Malaysia), *Sch. imitatus* sp. n. (Taiwan), *Sch. maai* sp. n. (Malaysia), *Sch. odrinus* sp. n. (Viet Nam), *Sch. orangus* sp. n. (Fiji Islands, Papua New Guinea), *Sch. pernegrus* sp. n. (New Guinea), *Sch. phytattus* sp. n. (Malaysia), *Sch. pinsapo* sp. n. (Thailand), *Sch. puellaris* sp. n. (Philippines), *Sch. umbofer* sp. n. (Papua New Guinea) and *Sch. vuptus* sp. n. (Papua New Guinea). Redescription of *Sch. (Muriella) concisa* (FULLAWAY, 1919). A key and a checklist are presented to the *Schizoprymnus* species of the Indo-Australian and Pacific Region. With 131 original figures.

***Schizoprymnus (Schizoprymnus) aramus* sp. n. ♀**
(Figs 1–8)

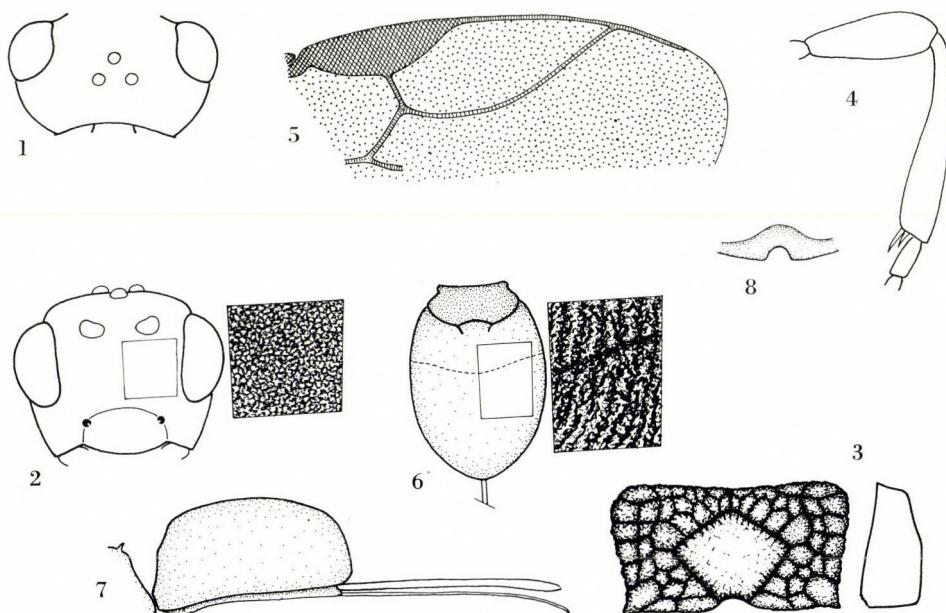
Description of the holotype ♀. – Body 3 mm long. Head in dorsal view transverse (Fig. 1), somewhat less than twice as broad as long, eye a bit longer than temple, latter in its outline nearly straight contracted. Ocelli round, large and near to one another, distance between fore and a hind ocellus as long as OD, POL almost twice as long as OD and OOL 1.7 times as long as POL. In lateral view eye a bit wider than temple. Malar space one-fifth longer than basal width of mandible. Face rugose (Fig. 2), vertex and temple strongly punctate, interspaces about size of punctures and polished. – Antennae damaged, right antenna with eight and left antenna with seven antennomeres.

Mesosoma in lateral view stout, 1.28 times as long as high. Mesonotum punctate, punctuation of median lobe somewhat denser than that of lateral lobes. Notaulix evenly deep, finely crenulated. Propodeum on its declivous hind part with a large median areola, surface of areola smooth

and shiny, otherwise propodeum rugo-areolated (Fig. 3). Precoxal suture indistinct. – Legs somewhat unusually thick, hind femur (Fig. 4) three times as long as broad at middle; hind tibia thickening and distally from its middle evenly broad, i.e. one-third less broad than hind femur (Fig. 4); hind tarsus one-fifth shorter than tibia, hind basitarsus as long as tarsal segments 2–4.

Fore wing as long as body. Pterostigma (Fig. 5) three times as long as wide, issuing radial vein from its middle. Radial cell as long as pterostigma, distal end of metacarp approaching tip of wing, second section of metacarp twice as long as r_1 ; $cuqu_1$ twice as long as r_1 . D_1 somewhat wider than high; d_1 distinct, i.e. nervulus clearly postfurcal (cf. Fig. 77 in PAPP 1991: 95).

Carapace globose, in dorsal view (Fig. 6) 1.4 times as long as broad at its middle; in lateral view twice as long as high medially and its upper outline moderately convex (Fig. 7). First suture faintly distinct. Apical rim of carapace almost semicircularly emarginate, emargination itself small (Fig. 8). Carapace evenly, longitudinally and roughly rugose. – Ovipositor sheath one-fifth longer than carapace and nearly twice as long as hind tibia.



Figs 1–8. *Schizoprymnus (S.) aramus* sp. n.: 1 = head in dorsal view, 2 = head in frontal view with indication of facial sculpture, 3 = propodeum in dorsal and in lateral view, 4 = hind femur and tibia, 5 = distal part of right fore wing, 6 = carapace in dorsal view with indication of its sculpture, 7 = carapace in lateral view, 8 = apical emargination of carapace

Body blackish brown. Legs brown to dark brown, hind tibia basally whitish. Wings brownish fumous, pterostigma brown, veins light brown.

♂ and host unknown.

Type material. — Holotype ♀: British North Borneo (or Malaysia), Tenompok, 15 February 1959, leg. T. C. MAA. — Holotype is deposited in the Bernice P. Bishop Museum, Honolulu.

Distribution: Malaysia (Northern Borneo).

The new species, *Schizoprymnus (S.) aramus* sp. n., is differentiated from all Indo-Australian *Schizoprymnus* species by the combination of its rugose face, thick legs, globose carapace and brownish fumous wings; see also couplets 55 (48)–57 (48) in the key on p. 169.

***Schizoprymnus (Muiriella) bicticus* sp. n. ♀♂**
(Figs 9–19)

Description of the holotype ♀. — Body 2.3 mm long. Head in dorsal view (Fig. 9) transverse, twice as broad as long, eye twice as long as temple, latter constricted. Ocelli elliptic, small and far from one another (Fig. 9), distance between fore and a hind ocellus 1.5 times as long as greatest diameter of an ocellus, POL twice as long as OD and OOL one-fifth longer than POL. In lateral view eye wider than temple, latter evenly broad behind eye (Fig. 10). Malar space as long as basal width of mandible. Head polished. — Antenna with 21 antennomeres. First flagellomere four times as long as broad apically flagellomere 8–11(–12) cubic, further flagellomeres attenuating so that penultimate flagellomere 1.66 times as long as broad.

Mesosoma in lateral view 1.5 times as long as high. Mesonotum and scutellum polished, notaulix evenly deep and finely crenulated. Pro-podeum rugose, with a median and a pair of lateral pointed tubercles. Precoxal suture indistinct, mesopleuron nearly entirely polished. — Hind femur 3.5 times as long as broad (Fig. 12). Hind tibia and tarsus equal in length. Hind basitarsus as long as tarsal segments 2–4.

Fore wing as long as body. Pterostigma (Fig. 13) four times as long as wide, issuing radial vein just distally from its middle, r_1 just shorter than width of pterostigma, $cuqu_1$ 1.75 times as long as r_1 . Radial cell short, along metacarp one-fourth shorter than pterostigma, distal end of metacarp reaching tip of wing; second section of metacarp a bit longer than r_1 . D_1 somewhat wider than high; d_1 distinct, i.e. nervulus clearly postfurcal.

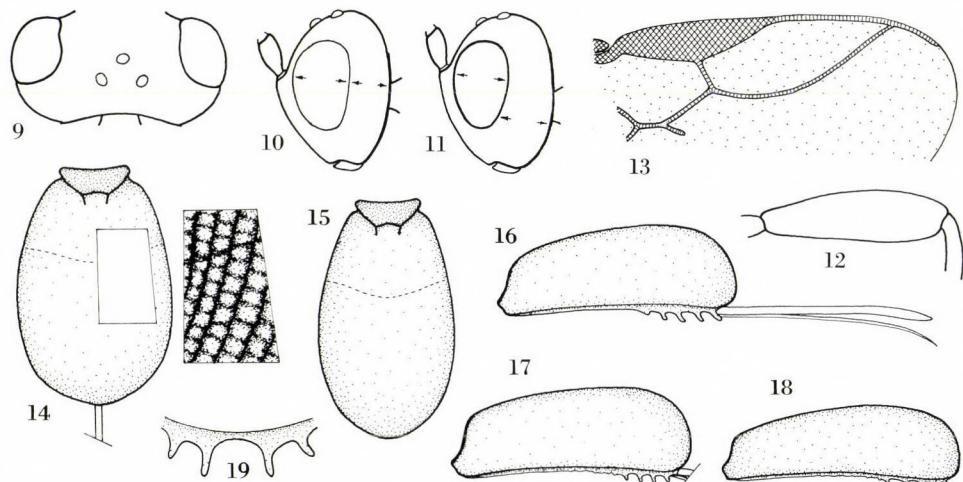
Carapace in dorsal less globose (Fig. 14), 1.51 times as long as broad beyond its middle; in lateral view (Fig. 16) less convex, 2.47 times as

long as high distally from its middle and hardly curving downwards. First suture faintly distinct. Apical rim of carapace emarginate (Fig. 19), rim behind (in lateral view) with distinct denticles (Fig. 16). Carapace with longitudinal and posteriorly converging striation, interstiations intermittently with transverse rugulose elements and small smooth fields (Fig. 14).

— Ovipositor sheath long, as long as carapace.

Head and mesosoma blackish brown, carapace testaceous. Legs yellow, femora with brownish tint. Scape and pedicel brownish, flagellum darkening brown. Palpi pale yellow. Tegula brown. Wings subhyaline, pterostigma and veins opaque brownish.

Description of the female paratype (1 ♀). — Similar to the holotype. Body 2.4 mm long. Head in dorsal view 1.87 times as broad as long as temple. Temple in lateral view just broadening ventrally, behind eye as wide as eye (Fig. 11, see arrows). Antenna damaged, i.e. flagellum missing. Mesosoma in lateral view 1.48 times as long as high. Hind femur 3.6 times as long as broad. Pterostigma 3.75 times as long as wide, issuing radial vein indistinctly distally from its middle. r_1 short, hardly as long as half width of pterostigma. Radial cell short, along metacarp nearly one-third shorter than pterostigma. Carapace in lateral view 2.7 times as long as high, rim behind with somewhat less distinct denticulation (Fig. 17). Longitudinal striation of carapace somewhat less distinct, with several anastomoses.



Figs 9–19. *Schizoprymnus (Muiriella) bicticus* sp. n.: 9 = head in dorsal view, 10–11 = head in lateral view (10 = ♀, 11 = ♂), 12 = hind femur, 13 = distal part of right fore wing, 14 = carapace of female in dorsal view with indication of its sculpture, 15 = carapace of male in dorsal view, 16–18 = carapace in lateral view (16 = holotype ♀, 17 = ♀, 18 = ♂), 19 = apical emargination of carapace

Ovipositor sheath less long, one-fifth shorter than carapace. Head blackish brown, mesosoma and carapace brown. Legs yellow, femora without brownish tint. Tegula yellow.

Description of the male paratypes (5 ♂♂). – Similar to the female. Body 2.2–2.4 mm long (2.2: 2 ♂♂, 2.3: 1 ♂, 2.4: 2 ♂♂). Head in dorsal view 1.95–2 times as broad as long (1.95: 3 ♂♂, 2: 2 ♂♂). Eye 1.7–1.75 times as long as temple. Temple in lateral view either indistinctly broadening ventrally (Fig. 11, see arrows) or evenly just to one-fourth less broad than eye (Fig. 10). Antenna with 19–20 antennomeres (19: 1 ♂, 20: 1 ♂, antenna of 3 ♂♂ damaged); penultimate flagellomere 1.66 times as long as broad. Pterostigma 3.85–4.5 times as long as wide (3.85: 2 ♂♂, 4.1: 1 ♂, 4.3: 1 ♂, 4.5: 1 ♂), issuing radial vein just distally from its middle. *rI* and radial cell similar to that of female paratype. Carapace in dorsal view 1.6 times as long as broad near beyond its middle (Fig. 15); in lateral view (Fig. 18) 2.7–3.1 times as long as high (2.7: 1 ♂, 2.9: 2 ♂♂, 3: 2 ♂♂), rim of carapace weakly denticulate behind. Head and mesosoma brownish black (3 ♂♂) or black (2 ♂♂), carapace brown (3 ♂♂) to blackish brown (2 ♂♂), legs evenly yellow.

Non-paratypic males (6 ♂♂). – They are heavily damaged: flagellum either entirely or partly missing, legs more or less damaged: without tarsus (-si) or without tarsus(-si) + tibia(-ae) etc. Carapace in lateral view 2.7–3 times as long as high (2.7: 2 ♂♂, 2.8: 1 ♂, 2.9: 2 ♂♂, 3: 1 ♂).

Host unknown.

Type material. – Holotype ♀: Fiji Islands, Viti Levu, Lami, 20–200 m, March 1976, leg. N. L. H. KRAUSS. – Paratypes (1 ♀ + 5 ♂♂): Fiji Islands, Viti Levu, Lami, April 1951 (1 ♀ + 2 ♂♂) and May 1951 (3 ♂♂), leg. N. L. H. KRAUSS. – Non-paratypic males (6 ♂♂): Fiji Islands, Viti Levu, Lami, April 1951, leg. N. L. H. KRAUSS.

Holotype (♀) + 4 ♂ paratypes + 5 ♂♂ are deposited in the Bernice P. Bishop Museum, Honolulu; 1 ♀ + 1 ♂ paratypes + 1 ♂ in the Hungarian Natural History Museum, Budapest, Hym. Typ. Nos 7479–7480.

Distribution: Fiji Islands.

The new species, *Schizoprymnus (Muiriella) bicticus* sp. n., is related to *S. (M.) concisa* (FULLAWAY, 1919) by their common features: head in dorsal view about twice as broad as long, temple constricted, pterostigma 3.4–3.5 times as long as wide, carapace in dorsal view 1.5–1.6 times as long as broad. The two species are distinguished by a few features only, however these are easy to recognize:

S. (M.) bicticus sp. n.

1. Radial cell short, along metacarp its length one-third to one-fifth shorter than pterostigma.

S. (M.) concisa (FULLAWAY)

1. Radial cell long, along metacarp clearly longer than pterostigma (Fig. 30).

2. Pterostigma issuing radial vein slightly to indistinctly distally from its middle (Fig. 13).
3. Ocelli relatively small, distance between fore and a hind ocelli 1.5 times as long as OD (Fig. 9).
4. Penultimate flagellomere 1.6 times as long as broad (♀).
5. Rim of male carapace behind weakly denticulate (Fig. 18).
6. Ground colour of body brownish black to brown.
2. Pterostigma issuing radial vein clearly distally from its middle (Fig. 30).
3. Ocelli relatively large, distance between fore and a hind ocelli as long as or a bit longer than OD.
4. Penultimate flagellomere cubic (♀).
5. Rim of male carapace behind distinctly denticulate (Fig. 37).
6. Ground colour of body black.

For further distinction of the two species in question see key couplets 62 (1)–72 (63), p. 169–170.

The new species is also related to *S. (M.) pernegrus* sp. n. (New Guinea), their distinction is given in the key couplets 69 (66)–71 (70), p. 170.

***Schizoprymnus (Schizoprymnus) calurus* sp. n. ♀♂**
(Figs 20–27)

Description of the holotype ♀. – Body 3.8 mm long. Head in dorsal view (cf. Fig. 1) less transverse, 1.8 times as broad as long, eye one-fourth longer than temple, latter contracted. Ocelli large, fore ocellus round, hind pair of ocelli elliptic in form, distance between fore and a hind ocellus somewhat shorter than OD, POL one-sixth longer than OD and OOL one-third longer than POL. In lateral view eye as wide as temple, latter evenly broad behind eye. Clypeus wide, 2.4 times as wide as high, its lower margin faintly bisinuate (Fig. 20). Malar space about as long as basal width of mandible. Head polished, face with disperse and fine punctuation. – Antenna with 27 antennomeres. First flagellomere 2.6 times as long as broad apically, flagellomeres 8–26 transverse, i.e. broader than long (cf. Fig. 57 in PAPP 1991: 90).

Mesosoma in lateral view 1.57 times as long as high. Mesonotum, scutellum and mesopleuron polished; median lobe of mesonotum dispersely subpunctate. Notaulix evenly deep, finely crenulated. Propodeum rugose. Precoxal suture distinct, crenulated. – Hind femur 3.84 times as long as broad distally. Hind tibia and tarsus equal in length; hind basitarsus as long as tarsal segments 2–3 and half of 4.

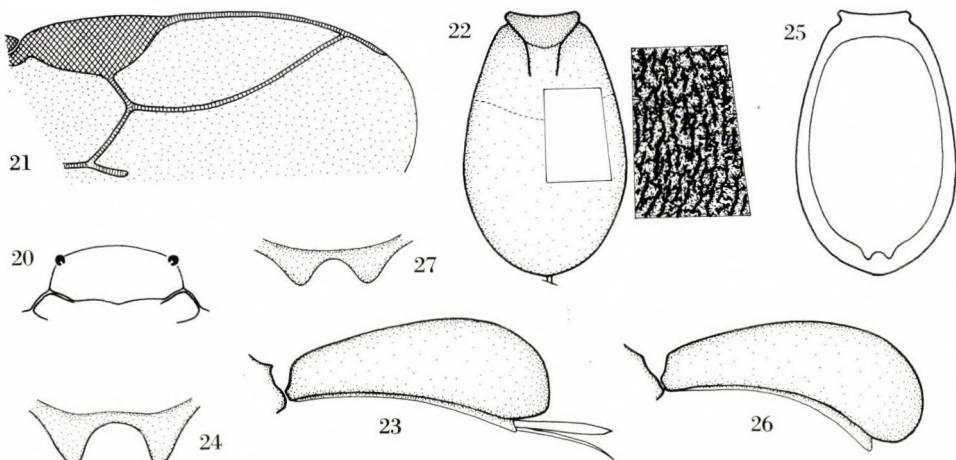
Fore wing somewhat shorter than body. Pterostigma (Fig. 21) 2.64 times as long as wide, issuing radial vein distally from its middle, r_1 half as long as width of pterostigma, cu_{qu1} slightly more than twice as long as r_1 . Radial cell long, along metacarp one-sixth longer than (or 1.2 times as

long as) pterostigma, distal end of metacarp approaching tip of wing. D_1 somewhat wider than high; d_1 distinct, i.e. nervulus clearly postfurcal.

Carapace in dorsal view rather elongate and less globose, 1.76 times as long as broad somewhat posteriorly from its middle, rugose with striate elements (Fig. 22); in lateral view 2.7 times as long as high posteriorly, somewhat downcurving and its upper outline less convex (Fig. 23). First suture indistinct. Apical rim of carapace semicircularly emarginate (Fig. 24). Carapace apico-ventrally incurved, i.e. ventral cavity one-sixth shorter than carapace itself (Fig. 25). – Ovipositor sheath short, in latero-ventral view one-fourth shorter than hind tibia.

Body black. Palpi and legs yellow. Scape, pedicel and flagellomeres 1–3 rusty, flagellomeres 4–7 darkening so that further flagellomeres blackish. Tegula brown. Wings subhyaline, pterostigma brown, veins light brownish.

Description of the female paratypes (3 ♀♀). – Similar to the holotype. Body 3.7–4 mm long (3.7: 1 ♀, 3.8: 1 ♀, 4: 1 ♀). Head in dorsal view transverse, 1.85–1.88 times as broad as long (1.85: 2 ♀♀, 1.88: 1 ♀). Temple in lateral view either as wide as temple (2 ♀♀) or slightly less wide (1 ♀). Antenna with 28 antennomeres (1 ♀; flagellum of 2 ♀♀ damaged). Hind femur 3.6 times (1 ♀) and 3.84 times (2 ♀♀) as long as broad. Pterostigma 2.33 times (1 ♀), 2.35 times (1 ♀) and 2.64 times (1 ♀) as long as wide. Carapace in dorsal view 1.66 times (2 ♀♀) and 1.8 times (1 ♀) as long as broad; in lateral view 2.38 times (1 ♀), 2.5 times (1 ♀) and 2.75 times (1 ♀) as long as high. First suture distinct (2 ♀♀) to indistinct (1 ♀). Legs yellow to rusty yellow.



Figs 20–27. *Schizoprymnus (S.) calurus* sp. n.: 20 = elypeus, 21 = distal part of right fore wing, 22 = carapace in dorsal view with indication of its sculpture, 23 = carapace of female in lateral view, 24 = apical emargination of female carapace, 25 = carapace in ventral view,

26 = carapace of male in lateral view, 27 = apical emargination of male carapace

Description of the male paratypes (3 ♂♂). — Similar to the female. Body 3.9–4 mm long (3.9: 2 ♂♂, 4: 1 ♂). Head in dorsal view transverse, 1.82–1.92 as broad as long (1.82: 1 ♂, 1.85: 1 ♂, 1.92: 1 ♂). Temple in lateral view either slightly less wide than (2 ♂♂) or as wide as eye (1 ♂). Antenna with 28 antennomeres (1 ♂; flagellum of 2 ♂♂ damaged). Hind femur 3.7–4.1 times as long as broad (3.7: 1 ♂, 4: 1 ♂, 4.1: 1 ♂). Pterostigma 2.5–2.85 times as long as wide (2.5: 1 ♂, 2.64: 1 ♂, 2.85: 1 ♂). Carapace in dorsal view 1.56–1.82 times as long as broad posteriorly (1.56: 1 ♂, 1.73: 1 ♂, 1.82: 1 ♂); in lateral view 2.75–3 times as long as high posteriorly, in comparison to female somewhat more downcurving and its upper outline more convex (Fig. 26). Apical rim of carapace, in comparison to that of female, less emarginate (Fig. 27). Legs yellow to rusty yellow.

Host unknown.

Type material. — Holotype: ♀: Viet Nam, Mt. Lang, Bian, 1500–2000 m, 19 May–8 June 1961, leg. N. R. SPENCER. — Paratypes (3 ♀♀ + 3 ♂♂): 2 ♀♀ + 3 ♂♂: same data as holotype. 1 ♀: Laos, Vientiane Province, Ban Van Eue, Malaise-trap, 15–31 May 1965, leg. ? ("Native Collector").

Holotype (♀) and 2 ♀ + 2 ♂ paratypes are deposited in the Bernice P. Bishop Museum, Honolulu; 1 ♀ + 1 ♂ paratypes in the Hungarian Natural History Museum, Budapest, Hym. Typ. Nos 7481–7482.

Distribution: Laos, Viet Nam.

The new species, *Schizoprymnus (S.) calurus* sp. n., is nearest to *S. (S.) imitatus* sp. n. (Taiwan) by its less transverse head, elongate carapace, long radial cell, black body and yellow legs; their distinction is keyed in couplets 29 (32)–31 (30) for males and 39 (42)–41 (40) for females, p. 166 and p. 167.

***Schizoprymnus (Muiriella) concisa* (FULLAWAY) ♀ ♂** (Figs 28–37)

Muiriella concisa FULLAWAY, 1919, J. Straits Brch R. Asiat. Soc. 80: 47 ♀, type locality: "Larat", Tanimbar Islands, Indonesia. — Holotype ("Type") in the Bernice P. Bishop Museum, Honolulu (No. 5593); examined.

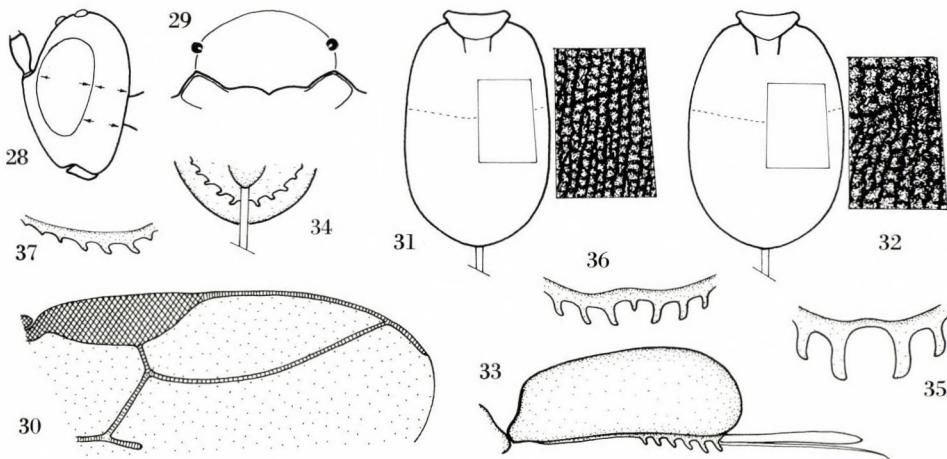
Description of the holotype ♀. — Body 2.8 mm long. Head transverse, in dorsal view (cf. Fig. 9) 2.1 times as broad as long, eye twice as long as temple, latter contracted. Ocelli small and elliptic, distance between fore and a hind ocellus a bit longer than OD, POL 1.53 times as long as OD and POL=OOL. In lateral view eye 1.53 times as wide as temple, latter faintly broadening ventrally (Fig. 28, see arrows). Clypeus not wide, 1.7–1.8 times as wide as high, its lower margin medially pointed (Fig. 29). Malar space about one-fifth longer than basal width of mandible. Head

polished, face medially finely punctate. — Antenna with 21 antennomeres; first flagellomere three times as long as broad apically, flagellomeres 11–13 (–14) somewhat transverse, penultimate flagellomere cubic.

Mesosoma in lateral view 1.44 times as long as high. Pronotum, mesonotum, scutellum and mesopleuron polished; notaulex evenly deep and finely crenulated, precoxal suture crenulated. Propodeum rugose, median tubercle small, pair of lateral tubercles large. — Hind femur 3.3 times as long as broad distally. Hind tibia as long as hind tarsus; hind basitarsus as long as tarsal segments 2–4.

Fore wing as long as body, Pterostigma (Fig. 30) less wide, 3.5 times as long as wide, issuing radial vein distally from its middle, r_1 just longer than half width of pterostigma, $c_{uqu}1$ 2.7 times as long as r_1 . Radial cell long, along metacarp somewhat longer than pterostigma, distal end of metacarp reaching tip of wing, second section of metacarp 1.43 times as long as r_1 . D_1 just wider than high, d_1 distinct.

Carapace globose, in dorsal view (Fig. 31) 1.6 times as long as broad medially, longitudinally costate with a few anastomoses, intercostate surface rugo-rugulose, first suture faintly distinct to indistinct; in lateral view (Fig. 33) 2.47 times as long as high medially, its upper outline convex; apically slightly incurved (Fig. 34), i.e. ventral aperture of carapace slightly shorter than carapace itself. Carapace apically emarginate (Fig. 35), rim of carapace behind denticulate (Fig. 1 in PAPP 1984: 138, Fig. 33). — Ovi-



Figs 28–37. *Schizoprymnus (Muiriella) concisa* (FULLAWAY): 28 = head in lateral view, 29 = clypeus, 30 = distal part of right fore wing, 31–32 = carapace in dorsal view with indication of its sculpture (31 = holotype ♀, 32 = ♀), 33 = carapace in lateral view, 34 = ventro-apical end of female carapace, 35–36 = apical end of carapace with median emargination (35 = ♀, 36 = ♂), 37 = denticulate rim of carapace in latero-apical view

positor sheath 0.77 times as long as carapace or as long as hind tibia + half basitarsus.

Body rusty brown. Mandible brownish yellow, palpi yellow. Scape, pedicel and first flagellomere yellow, further three-four flagellomeres darkening so that rest of flagellum blackish brown. Legs yellow, hind tibia apically and hind tarsus entirely faintly darkening. Wings hyaline, pterostigma brown, veins opaque light brown.

Description of the female (9 ♀♀). – Similar to the holotype ♀. Body 2.3–3 mm long (2.3: 1 ♀, 2.5: 1 ♀, 2.7: 3 ♀♀, 2.8: 2 ♀♀, 3: 2 ♀♀). Head in dorsal view 2.1–2.2 times as broad as long (2.1: 8 ♀♀, 2.2: 1 ♀). Antenna with 19–22 antennomeres (19: 1 ♀, 21: 3 ♀♀, 22: 1 ♀; antenna of 4 ♀♀ damaged or missing). Median tubercle of propodeum somewhat stronger than that of holotype but more or less smaller than pair of lateral tubercles (6 ♀♀). Pterostigma 3.3–3.75 times as long as wide (3.3: 3 ♀♀, 3.5: 1 ♀, 3.6: 1 ♀, 3.7: 2 ♀♀, 3.75: 2 ♀♀). Proportional length of *r1* variable, i.e. 0.6–0.8 times as long as width of pterostigma (0.6: 5 ♀♀, 0.62: 1 ♀, 0.63: 2 ♀♀, 0.7: 1 ♀, 0.8: 1 ♀). Carapace in dorsal view 1.4–1.65 times as long as broad medially (1.4: 1 ♀, 1.42: 1 ♀, 1.44: 1 ♀, 1.46: 2 ♀♀, 1.5: 1 ♀, 1.62: 1 ♀, 1.65: 1 ♀; carapace of 1 ♀ missing). Carapace in lateral view 2.2–2.75 times as long as high (2.2: 1 ♀, 2.28: 1 ♀, 2.29: 2 ♀♀, 2.32: 2 ♀♀, 2.5: 1 ♀, 2.7: 1 ♀, 2.75: 1 ♀). Sculpture of carapace somewhat rougher, costate elements less parallel (7 ♀♀, Fig. 32). Apical end of carapace denticulate (Fig. 36). Body black (7 ♀♀) or blackish brown (2 ♀♀), legs yellow (6 ♀♀) or rusty yellow (3 ♀♀). Tegula brown.

Description of the male (3 ♂♂). – Similar to the female. Body somewhat less strong, 2.2–2.4 mm long (2.2: 1 ♂, 2.4: 2 ♂♂). Head in dorsal view transverse, 1.94–2.1 times as broad as long (1.94: 1 ♂, 2.1: 2 ♂♂). Antenna with 20–21 antennomeres (20: 1 ♂, 21: 1 ♂; antenna of 1 ♂ damaged). Carapace somewhat less globose, 1.57–1.7 times as long as broad medially (1.57: 1 ♂, 1.67: 1 ♂, 1.7: 1 ♂). Body rusty brown (1 ♂) to brown (2 ♂♂). Tegula brown (2 ♂♂) to dark brown (1 ♂). Legs yellow (2 ♂♂) or brown (1 ♂).

Localities – 1 ♀: West New Guinea (or Irian, Indonesia), Central Mts, Archbold Lake, 760 m, light trap, 26 November–3 December 1961, leg. S. et L. QUATE. 1 ♀: Papua New Guinea, Morobe District, Wasu, 0–100 m, September 1968, leg. N. L. H. KRAUSS. 1 ♀: Papua New Guinea, Madang, 0–100 m, August 1968, leg. N. L. H. KRAUSS. 1 ♀ (in Budapest): Papua New Guinea, Korifeigu, 22 km SE Goroka, 1500 m, 1 May 1959, leg. C. D. MICHENER. 1 ♀ (in Budapest): Papua New Guinea, Wau, Hospital Ck., 1250 m, Malaise trap, 22 May 1965, leg. J. SEDLACEK. 1 ♀: Papua New Guinea, Kar Kar I., Kurum, 0–100 m, August 1968, leg. N. L. H. KRAUSS. 1 ♂: Papua New Guinea, Bisianumu, E of Port Moresby, 500 m, 24 September 1955, leg. J. L. GRESSITT. 1 ♂ (in Budapest): Papua New Guinea, Mt. Hagen, 1600–1700 m, November 1971, leg. N. L. H. KRAUSS. – 1 ♀: Solomon Islands, Vella Lavella, Mt. Arewana, 100–400 m, 16 November 1963, leg. L. et M. GRESSITT. 1 ♀: Solomon Islands, Quadaleanal I., Honiara, 0–200 m, November 1976, leg. N. L. H. KRAUSS. – 1 ♂: New Britain, Vunakana, Gazella Peninsula, taken from Alpinia sp., 16 May 1956, leg. J. L. GRESSITT. 1 ♀: New Britain, Gazella Peninsula, Gaulim, 130 m, 28 October 1962, leg. J. SEDLACEK.

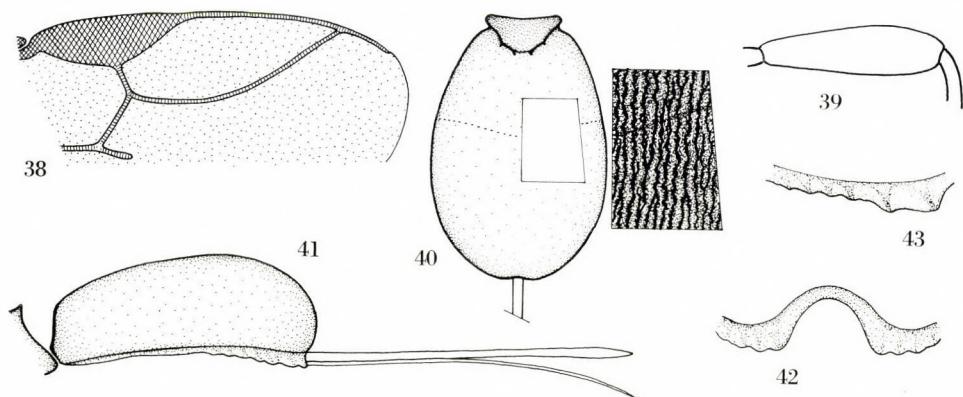
Distribution: Indonesia, New Britain, New Guinea, Solomon Islands.

Schizoprymnus (Muiriella) concisa (FULLAWAY) is related to *S. (M.) bucculus* PAPP, 1984 (New Britain, Papua New Guinea), their specific distinction is given in the key couplets 80 (79)–82 (81), p. 171.

***Schizoprymnus (Muiriella) deversus* sp. n. ♀**
(Figs 38–43)

Description of the holotype ♀. – Body 3.7 mm long. Head in dorsal view (cf. Fig. 1 in PAPP 1991: 76) transverse, 1.87 times as broad as long, eye just less than one-third longer than (or 1.35 times as long as) temple, latter strongly rounded. Ocelli large and elliptic, distance between fore and a hind ocellus just shorter than OD, POL as long as OD and OOL twice as long as POL. In lateral view eye 1.29 times as wide as temple, latter evenly broad behind eye (cf. Fig. 10). Clypeus less wide, 1.5 times as wide as high. Malar space somewhat shorter than basal width of mandible. Head densely rugulose and dull, face with confluent (medially somewhat less confluent) punctation, clypeus punctate and interspaces shiny. – Antenna with 20 antennomeres, first flagellomere 3.5 times as long as broad apically, further flagellomeres shortening so that flagellomeres 10–17 cubic.

Mesosoma in lateral view 1.35 times as long as high. Middle lobe of mesonotum punctate, interspaces smaller than punctures; pair of lateral



Figs 38–43. *Schizoprymnus (Muiriella) deversus* sp. n.: 38 = distal part of right fore wing, 39 = hind femur, 40 = carapace in dorsal view with indication of its sculpture, 41 = carapace in lateral view, 42 = apical emargination of carapace, 43 = denticulate rim of carapace in latero-apical view

lobes finely punctate, interspaces larger than punctures, mesonotum shiny. Scutellum polished. Propodeum rather transversely rugose, with a median and a pair of lateral tubercles. Mesopleuron punctate, shiny; precoxal suture rugo-crenulated. — Hind femur 3.8 times as long as broad distally (Fig. 39). Hind tibia somewhat longer than hind tarsus, hind basitarsus as long as tarsal segments 2–4.

Fore wing as long as body. Pterostigma (Fig. 38) 2.84 times as long as wide, issuing radial vein somewhat distally from its middle, r_1 half as long as width of pterostigma, c_{uqu1} twice as long as r_1 . Radial cell long, along metacarp somewhat longer than pterostigma; distal end of metacarp almost reaching tip of wing, second section of metacarp twice as long as r_1 . D_1 somewhat wider than high, d_1 less distinct.

Carapace globose, in dorsal view (Fig. 40) 1.42 times as long as broad behind, longitudinally strio-rugose; in lateral view (Fig. 41) 2.35 times as long as high at its hind third, not downcurving, its upper outline convex. First suture almost indistinct. Carapace apically deeply emarginate (Fig. 42). Rim of carapace behind weakly denticulate (Fig. 43). — Ovipositor sheath as long as carapace + propodeum or almost twice as long as hind tibia.

Body black. Mandible rusty, palpi brownish. Antenna blackish; scape, pedicel and first flagellomere with rusty tint. Tegula black. Legs 1–2 brownish yellow, leg 3 rusty brown, coxae black, distal two-thirds of hind tibia and entire hind tarsus blackish fumous. Wings faintly brownish fumous, pterostigma and veins opaque brown.

♂ and host unknown.

Type material. — Holotype ♀: British North Borneo (now Malaysia), Tenompok, 10–19 February 1959, leg. T. C. MAA. — Holotype is deposited in the Bernice P. Bishop Museum, Honolulu.

Distribution: Malaysia (Northern Borneo).

The new species, *Schizoprymnus (Muiriella) deversus* sp. n., is nearest to *S. (M.) pinsapo* sp. n. (Thailand), their distinction is given in the key couplets 73 (76)–75 (74), p. 170.

***Schizoprymnus (Schizoprymnus) eminens* sp. n. ♀♂
(Figs 44–48)**

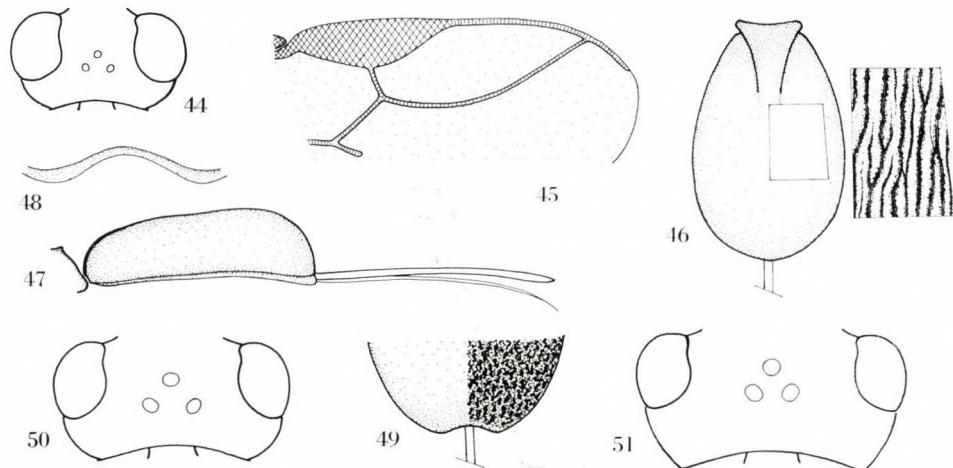
Description of the holotype ♀. — Body 1.8 mm long. Head in dorsal view (Fig. 44) less transverse, 1.76 times as broad as long, eye large and two-thirds (or 3.16 times) longer than temple, latter constricted.

Ocelli small and round, distance between fore and a hind ocelli one-quarter longer than OD, POL 1.66 times as long as OD, OOL slightly longer than POL. Toruli far from each other, distance between them twice as long as distance between inner margin of eye and a torulus, or distance between torulus and inner margin of eye as long as basal breadth of first flagellomere. Malar space short, a bit more than half as long as basal width of mandible. Head polished. — Antenna with 19 antennomeres. First flagellomere four times as long as broad apically, penultimate flagellomere 1.66 times as long as broad.

Mesosoma in lateral view 1.33 times as long as high. Mesonotum, scutellum, propodeum and mesopleuron polished, propodeum medially uneven. Notaulix evenly deep, suberrenulated. — Hind femur four times as long as broad medially. Hind tibia as long as hind tarsus, hind basitarsus as long as tarsal segments 2–4.

Fore wing somewhat longer than body. Pterostigma (Fig. 45) three times as long as wide, issuing radial vein somewhat distally from its middle; r_1 about half as long as width of pterostigma, cu_1q_1 2.4 times as long as r_1 . Radial cell short, along metacarp as long as pterostigma, distal end of metacarp reaching tip of wing, second section of metacarp twice as long as r_1 . D_1 somewhat wider than high, d_1 short though distinct, i.e. nervulus moderately postfurcal.

Carapace globose, in dorsal view (Fig. 46) 1.47 times as long as broad medially, first suture indistinct, longitudinally costulate with anasto-



Figs 44–48. *Schizoprymnus (S.) eminens* sp. n.: 44 = head in dorsal view, 45 = distal part of right fore wing, 46 = carapace in dorsal view with indication of its sculpture, 47 = carapace in lateral view, 48 = apical emargination of carapace (♀♂). — Fig. 49. *S. (S.) deres* PAPP: hind part (or third tergite) of carapace with indication of its sculpture. — Fig. 50. *S. (S.) subutus* PAPP: head in dorsal view. — Fig. 51. *S. (S.) torreador* PAPP: head in dorsal view

moses; in lateral view (Fig. 47) 3.2 times as long as high, its upper outline less convex. Apical rim of carapace moderately emarginate (Fig. 48). — Ovipositor sheath as long as carapace or hind tibia + basitarsus.

Head black, face and clypeus brownish black, mesosoma and carapace reddish yellow. Scape and pedicell yellow, flagellomeres 1–3(–4) darkening brown, rest of flagellum dark brown. Palpi and legs yellow. Wings hyaline, pterostigma opaque light brownish, veins opaque yellowish.

Description of the male paratype (1 ♂). — Similar to holotype. Body 1.8 mm long. Carapace in dorsal view 1.5 times as long as broad, in lateral view three times as long as high.

Host unknown.

Type material. — Holotype ♀: New Guinea "Neth." (= Dutch New Guinea or Irian), Swart Valley, light trap, 10 November 1958, leg. J. L. GRESSITT. — 1 ♂ paratype: New Guinea (NE) (= Papua New Guinea), Maprik, 160 m, light trap, 15 October 1957, leg. J. L. GRESSITT.

Holotype is deposited in the Bernice P. Bishop Museum, Honolulu; 1 ♂ paratype is in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7483.

Distribution: Indonesia (Irian), Papua New Guinea.

The new species, *Schizoprymnus* (*S.*) *eminens* sp. n., is nearest to *S.* (*S.*) *sedlacekorum* PAPP, 1991 (New Hebrides), their distinction is given in the key couplets 49 (52)–51 (50), p. 168.

***Schizoprymnus (Muiriella) fijicus* sp. n. ♀**
(Figs 52–56)

Description of the holotype ♀. — Body 2.8 mm long. Head in dorsal view (Fig. 52) less transverse, 1.9 times as broad as long, eye 1.55 times as long as temple, latter rounded. Ocelli small and near to each other, fore ocellus round and smaller than hind pair of elliptic ocelli, distance between fore and a hind ocellus somewhat shorter than hind OD, POL also somewhat shorter than hind OD, OOL 2.6 times as long as POL. In lateral view eye one-fifth wider than temple, latter indistinctly broadening ventrally behind eye. Clypeus three times as wide as high. Malar space one-third longer than basal width of mandible. Head polished. — Antenna with 27 antennomeres. First flagellomere 4.5 times as long as broad apically, flagellomeres 11–14 transverse, penultimate flagellomere 1.3 times as long as broad.

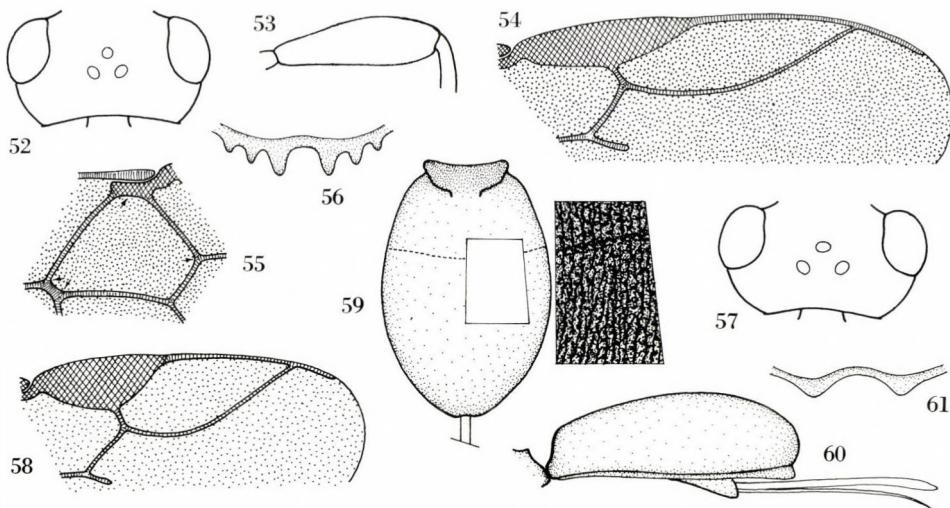
Mesosoma in lateral view 1.44 times as long as high. Pronotum, mesonotum, scutellum and mesopleuron polished; notaux evenly deep, finely crenulated, precoxal suture crenulated. Propodeum rugose, with a

median and a pair of lateral tubercles. – Hind femur 3.4 times as long as broad at its distal half (Fig. 53); hind tibia as long as hind tarsus, hind basitarsus as long as tarsal segments 2–4.

Fore wing as long as body. Pterostigma (Fig. 54) long, four times as long as wide, issuing radial vein from its middle, r_1 slightly less than half as long as width of pterostigma, c_{u1} 3.2 times as long as r_1 . Radial cell short, along metacarp 0.89 times as long as pterostigma, distal end of metacarp reaching tip of wing, second section of metacarp four times as long as r_1 . D_1 one-fifth wider than high, $n.$ *bas.* and c_1 relatively more diverging posteriorly, d_1 short (Fig. 55, see arrows).

Carapace globose, in dorsal view (cf. Fig. 31) 1.4 times as long as broad medially, longitudinally costate with a few anastomoses, intercostates rugo-rugulose, first suture hardly distinct, in lateral view (cf. Fig. 33) 2.35 times as long as high medially, its upper outline convex, apically hardly incurved. Carapace apically not emarginate, rim of carapace denticulate (Fig. 56). – Ovipositor sheath long, almost as long as carapace + mesosoma together or twice as long as hind tibia.

Head and mesosoma reddish yellow, carapace blackish. Antenna dark. Legs also reddish yellow, hind tibia behind and tarsus with blackish suffusion. Wings brownish fumous, pterostigma and veins opaque brown.



Figs 52–56. *Schizoprymnus (Muiriella) fijicus* sp. n.: 52 = head in dorsal view, 53 = hind femur, 54 = distal part of right fore wing, 55 = discoidal cell (or D_1), 56 = apical end of female carapace with median emargination. – Figs 57–61. *S. (S.) granatus* sp. n.: 57 = head in dorsal view, 58 = distal part of right fore wing, 59 = carapace in dorsal view with indication of its sculpture, 60 = carapace in lateral view, 61 = apical emargination of female carapace

Description of the female paratype (1 ♀). – Similar to holotype. Body 2.5 mm long. r_1 one-third as long as width of pterostigma. Ovipositor sheath less long, as long as carapace.

♂ and host unknown.

Type material. – Holotype ♀: Fiji Islands, Viti Levu, Lami, 0–200 m, February 1977, leg. N. L. H. KRAUSS. – 1 ♀ paratype: same locality, February 1951, leg. N. L. H. KRAUSS.

Holotype is deposited in the Bernice P. Bishop Museum, Honolulu; 1 ♀ paratype in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7484.

Distribution: Fiji Islands.

The new species, *Schizoprymnus (Muiriella) fijicus* sp. n., is related to *S. (M.) orangus* sp. n. (Fiji, Papua New Guinea), their specific distinction is given in the key couplets 66 (69)–68 (67), p. 169–170.

Schizoprymnus (Schizoprymnus) granatus sp. n. ♀ (Figs 57–61)

Description of the holotype ♀. – Body 3 mm long. Head in dorsal view (Fig. 57) rather transverse, 1.91 times as broad as long, eye 1.4 times as long as temple, latter constricted. Ocelli medium-sized and elliptic, distance between fore and a hind ocelli as long as OD, POL twice as long as OD, OOL somewhat longer than POL. In lateral view eye somewhat wider than temple, temple evenly wide behind eye (i.e. not narrowing ventrally). Malar space just shorter than basal width of mandible. Face dispersely subpunctate, interspaces shiny; clypeus punctate; vertex medially rather rugose and laterally rather punctate, otherwise head polished. – Antennae damaged, right antenna with 6 and left antenna with 22 antennomeres. First flagellomere just less than four times as long as broad apically, flagellomeres 10–22 cubic.

Mesosoma in lateral view 1.3 times as long as high. Mesonotum finely punctate, shiny, median lobe of mesonotum behind rugulo-rugose, notaulex evenly deep and crenulated. Scutellum and mesopleuron polished. Precoxal suture wide and crenulated. Propodeum rugose, with median (smaller) and a pair of lateral tubercles. – Hind femur three times as long as broad medially. Hind tibia as long as hind tarsus, hind basitarsus as long as tarsal segments 2–4.

Fore wing as long as body. Pterostigma (Fig. 58) 2.5 times as long as wide, issuing radial vein distally from its middle; r_1 short, one-third as long as width of pterostigma, $cuqu_1$ 3.5 times as long as r_1 . Radial cell short, along metacarp as long as pterostigma, distal end of metacarp ap-

proaching tip of wing, second section of metacarp just less than three times as long as r_1 . D_1 somewhat wider than high medially, d_1 short.

Carapace globose, in dorsal view (Fig. 59) 1.5 times as long as broad medially, strio-rugose, first suture distinct and subcrenulated; in lateral view (Fig. 60) 2.75 times as long as high, its upper outline convex. Carapace apically moderately emarginate (Fig. 61). — Ovipositor sheath one-fourth shorter than carapace or a bit longer than hind tibia.

Body black, legs rusty. Mandible and palpi rusty. Scape and pedicell rusty, flagellomeres 1–3 darkening rusty to blackish, rest of flagellum blackish. Tegula blackish brown. Wings faintly brownish fuscous, pterostigma brown, veins opaque light brown.

♂ and host unknown.

Type material. — Holotype ♀: British North Borneo (now Malaysia), Tenompok, Jesselton, 48 km E, 1460 m, 26–31 January 1959, leg. T. C. MAA. — Holotype is deposited in the Bernice P. Bishop Museum, Honolulu.

Distribution: Malaysia (Northern Borneo).

The new species, *Schizoprymnus (S.) granatus* sp. n., is closely related to *S. (S.) tortilis* PAPP, 1984 (Laos, Viet Nam), they are distinguished by not easily recognizable features, see key couplets 59 (56)–61 (60), p. 169.

***Schizoprymnus (Schizoprymnus) imitatus* sp. n. ♀** (Figs 62–68)

Description of the holotype ♀. — Body 4 mm long. Head in dorsal view (Fig. 62) 1.83 times as broad as long, eye one-third longer than temple, latter rounded. Ocelli small and almost round, distance between fore and a hind ocelli slightly longer than OD, POL almost twice as long as OD and equal with OOL. In lateral view eye a bit wider than temple, latter evenly broad behind eye. Clypeus (Fig. 63) less wide, twice as wide as high, its lower margin truncate. Malar space one-fourth longer than basal width of mandible. Head polished; face and clypeus finely punctate (punctates of clypeus somewhat rougher), interspaces of face about as large as punctures. — Antenna with 28 antennomeres, first flagellomere four times as long as apically broad, further flagellomeres gradually shortening so that flagellomeres 12–25 cubic.

Mesosoma in lateral view 1.43 times as long as high. Mesonotum finely punctate (similar to that of face), shiny. Scutellum and mesopleuron polished. Notaulix deep and finely crenulated. Propodeum rugose. Pre-

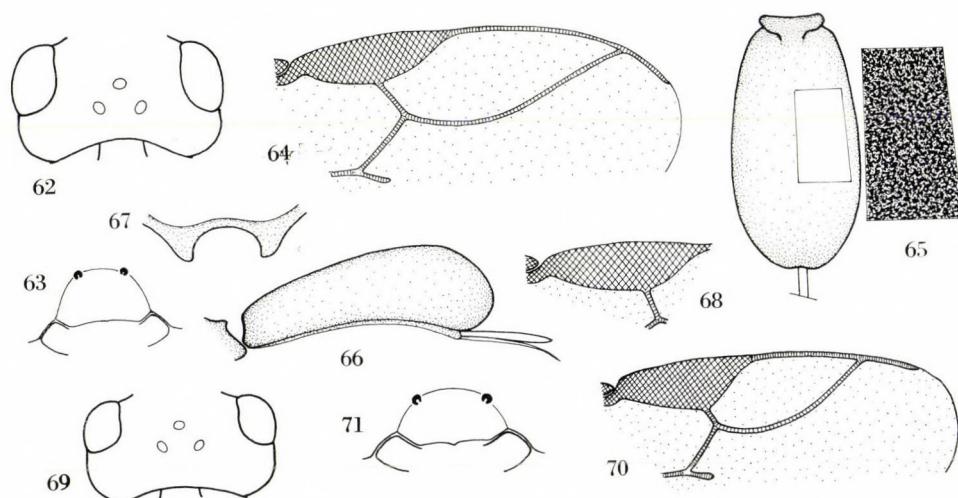
scutellar suture wide, rugo-crenulated. — Hind femur 4.1 times as long as broad distally. Hind tibia somewhat longer than tarsus; hind basitarsus as long as tarsal segments 2–4.

Fore wing as long as body. Pterostigma (Fig. 64) 3.27 times as long as wide, issuing radial vein somewhat distally from its middle, *r1* about one-third shorter than width of pterostigma, *cuqu1* twice as long as *r1*. Radial cell long, along metacarp slightly longer than pterostigma, distal end of metacarp reaching tip of wing. *D1* one-fourth wider than high; *d1* just distinct, i.e. nervulus just postfurcal.

Carapace in dorsal view (Fig. 65) elongate and less globose, almost twice as long as broad somewhat posteriorly from its middle, rugose-rugulose; in lateral view (Fig. 66) three times as long as high posteriorly, downcurving and its upper outline less convex. First suture indistinct. Apical rim of carapace semicircularly emarginate (Fig. 67). Carapace apico-ventrally incurved, i.e. cavity one-sixth shorter than carapace itself. — Ovipositor sheath short, in latero-ventral view one-fourth shorter than hind tibia.

Body black. Palpi, tegula and legs yellow. Scape, pedicel and first flagellomere yellow, further flagellomeres darkening yellow to brownish and brown. Wings hyaline, pterostigma and veins opaque brownish.

Description of the female paratype (1 ♀). — Similar to the holotype. Body 4 mm long. Head in dorsal view 1.9 times as broad as



Figs 62–68. *Schizoprymnus (S.) imitatus* sp. n.: 62 = head in dorsal view, 63 = clypeus, 64 = distal part of right fore wing of holotype ♀, 65 = carapace in dorsal view with indication of its sculpture, 66 = carapace in lateral view, 67 = apical emargination of carapace, 68 = pterostigma of paratype ♀. — Figs 69–71. *S. (S.) rufipes* (HERRICH-SCHÄFFER): 69 = head in dorsal view, 70 = distal part of right fore wing, 71 = clypeus

long. Pterostigma issuing radial vein distinctly distally from its middle (Fig. 68). Hind femur 3.84 times as long as broad medially. Carapace in lateral view 2.87 times as long as high posteriorly.

♂ and host unknown.

Type material. — Holotype ♀: Northern Taiwan, Tsaoshan (Sozan), 200–300 m, 4–5 August 1963, leg. T. C. MAA. — 1 ♀ paratype: Taiwan, Wulai, near Taipei, 300–500 m, 12 April 1960, sweeping, leg. T. C. MAA.

Holotype (♀) is deposited in the Bernice P. Bishop Museum, Honolulu; 1 ♀ paratype in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7485.

Distribution: Taiwan.

The new species, *Schizoprymnus (S.) imitatus* sp. n., is related to *S. (S.) calurus* sp. n., their common and distinctive features are given under *S. calurus* sp. n. p. 134 and in the key couplets 39 (42)–41 (40) p. 167. Also similar to the Palaearctic species *S. (S.) rufipes* (HERRICH-SCHÄFFER, 1838), they are distinguished by the following features:

S. (S.) imitatus sp. n. ♀

1. Eye in dorsal view somewhat longer than temple, latter rounded (Fig. 62).
2. Flagellomeres 12–25 cubic; flagellum with 26 flagellomeres.
3. Radial cell along metacarp slightly though distinctly longer than pterostigma; distal end of metacarp reaching tip of wing (Fig. 64).
4. Clypeus less wide, somewhat less than twice as wide as high, its lower margin truncate (Fig. 63). Face finely and less densely punctate.
5. Legs entirely yellow. Tegula yellow.

S. (S.) rufipes (HS.) ♀

1. Eye in dorsal view as long as temple, latter moderately rounded (Fig. 69).
2. Flagellomeres longer than broad, at most penultimate two flagellomeres subcubic to cubic; flagellum with 20–24 flagellomeres.
3. Radial cell along metacarp slightly though distinctly shorter than pterostigma; distal end of metacarp approaching tip of wing (Fig. 70).
4. Clypeus wide, 2.3 times as wide as high, its lower margin faintly pointed at its middle (Fig. 71). Face densely punctate.
5. Legs yellow to reddish yellow, at least hind and middle coxae blackish to black. Tegula brown or black.

***Schizoprymnus (Schizoprymnus) maaei* sp. n. ♀** (Figs 72–76)

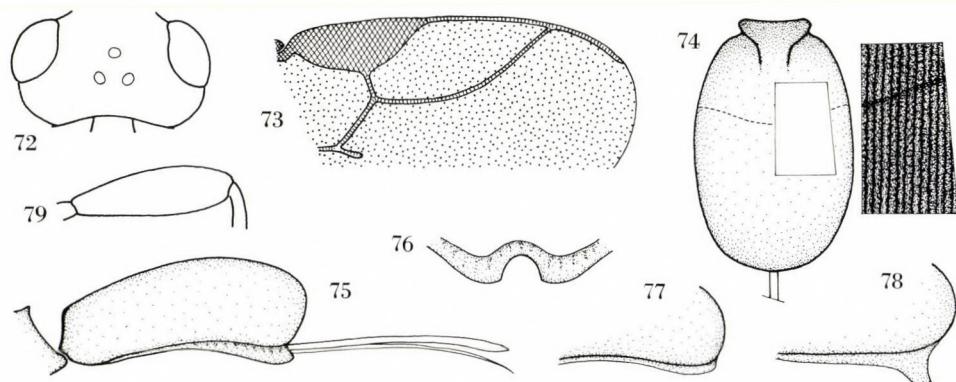
Description of the holotype ♀. — Body 2.3 mm long. Head in dorsal view (Fig. 72) less transverse, 1.79 times as broad as long, eye 1.6 times as long as temple, latter rounded. Ocelli small and hardly elliptic, distance between fore and a hind ocellus just longer than OD, POL as long as OD, OOL twice as long as POL. In lateral view eye 1.54 times wider than temple, latter evenly broad behind eye. Malar space as long as basal width

of mandible. Clypeus wide, 2.3 times as wide as high. Face and clypeus punctate, face laterally near to eye subpunctate, interspaces more or less larger than punctures, head otherwise polished. – Antenna with 21 antennomeres. First flagellomere three times as long as broad apically, flagellomeres 8–14 cubic, flagellomeres 15–18 1.25 times as long as broad.

Mesosoma in lateral view 1.4 times as long as high. Mesonotum subpunctate, interspaces larger than punctates and shiny. Scutellum polished. Mesopleuron with disperse subpunctation, shiny, precoxal suture wide and costate. Propodeum rugose, with a median and a pair of lateral tubercles. – Hind femur three times as long as broad distally. Hind tibia slightly longer than hind tarsus, hind basitarsus a bit shorter than tarsal segments 2–4.

Fore wing as long as body. Pterostigma (Fig. 73) 2.64 times as long as wide, issuing radial vein from its middle, *r1* clearly half as long as width of pterostigma, *cug1* 2.4 times as long as *r1*. Radial cell short, along metacarp somewhat shorter than pterostigma, distal end of metacarp reaching tip of wing, second section of metacarp relatively long, three times as long as *r1*. *D1* somewhat wider than high, *d1* distinct, i.e. nervulus clearly postfurcal.

Carapace globose, in dorsal view (Fig. 74) 1.45 times as long as broad medially, longitudinally costulated, intercostulate surface rugulose, first suture distinct; in lateral view (Fig. 75) 2.4 times as long as high, its upper outline convex. Carapace apically deeply semicircularly emarginate (Fig. 76). – Ovipositor sheath in latero-ventral view about as long as carapace or as long as hind tibia + tarsal segments 1–2.



Figs 72–76. *Schizoprymnus (S.) maai* sp. n.: 72 = head in dorsal view, 73 = distal part of right fore wing, 74 = carapace in dorsal view with indication of its sculpture, 75 = carapace in lateral view, 76 = apical emargination of female carapace. – Fig. 77. *S. (S.) bimus* PAPP: hind part of carapace with its rim in lateral view. – Figs 78–79. *S. (S.) tortilis* PAPP: 78 = hind part of carapace with its rim in lateral view, 79 = hind femur

Body black, carapace reddish yellow. Legs yellow. Scape, pedicel and flagellomeres 1–2 yellow, flagellomeres 3–4 darkening rusty to blackish, rest of flagellum blackish. Tegula yellow. Wings faintly brownish fumous, pterostigma brown, veins opaque light brown.

Description of the female paratype (1 ♀). – Similar to the holotype. Body 2.6 mm long. Head in dorsal view 1.82 times as broad as long, eye 1.4 times as long as temple. Pterostigma 2.8 times as long as wide. Carapace in dorsal view 1.55 times as long as broad. Ovipositor sheath in latero-ventral view one-third shorter than carapace or as long as hind tibia. Carapace black, first tergite reddish yellow.

Type material. – Holotype ♀: British North Borneo (now Malaysia), Tenompok, 13 February 1959, leg. T. C. MAA. – 1 ♀ paratype: same locality, 10–19 February 1959, leg. T. C. MAA.

Holotype (♀) is deposited in the Bernice P. Bishop Museum, Honolulu; 1 ♀ paratype in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7486.

Etymology. – The new species is dedicated to Mr. T. C. MAA (Honolulu) dipterist and enthusiastic collector of the insects of the Indo-Australian and Pacific Region.

Distribution: Malaysia (Northern Borneo).

The new species, *Schizoprymnus (S.) maai* sp. n., is related to *S. (S.) puellaris* sp. n. (Philippines), their specific distinction is given in the key couplets 52 (49)–54 (53), p. 168–169.

***Schizoprymnus (Muriella) odrinus* sp. n. ♀** (Figs 80–86)

Description of the holotype ♀. – Body 3 mm long. Head in dorsal view (Fig. 80) transverse, 2.1 times as broad as long, eye 1.66 times as long as temple, latter constricted. Ocelli round and small, distance between fore and a hind ocellus 1.4 times as long as OD, POL clearly twice as long as OD and POL = OOL. In lateral view eye 1.53 times as wide as temple, latter evenly broad behind eye. Clypeus 2.28 times as wide as high. Malar space as long as basal width of mandible. Face with dense and discrete punctuation, interspaces smaller than punctures; clypeus with somewhat rougher and somewhat less dense punctuation. Frons up to hind pair of ocelli rugose, occiput and temple polished. – Antenna with 25 antennomeres. First flagellomere 2.5 times as long as broad, flagellomeres 11–19 (–20) cubic, penultimate flagellomere 1.5 times as long as broad.

Mesosoma in lateral view 1.27 times as long as high. Anterior half of pronotum rugose, posterior half polished. Mesonotum with shallow and rather disperse punctuation, interspaces shiny. Notaulix relatively wide

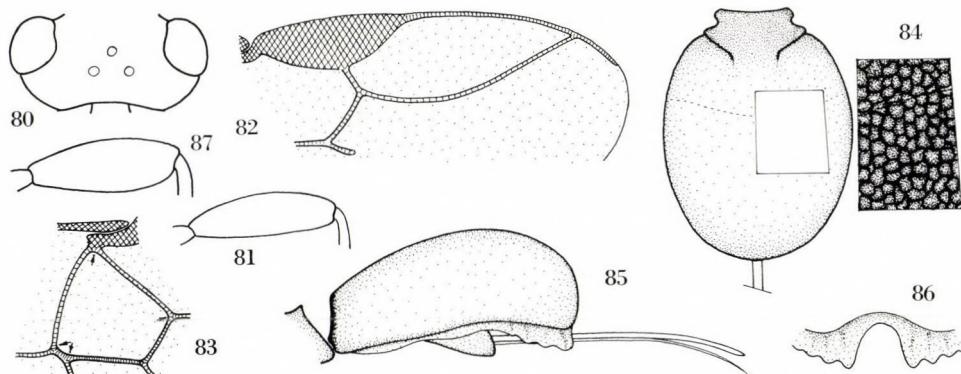
and evenly deep, subcrenulated. Scutellum polished. Mesopleuron with discrete punctation, precoxal suture wide and crenulated. Propodeum scabrous with a median and a pair of lateral small tubercles. – Hind femur (Fig. 81) 3.3 times as long as broad at its middle. Hind tibia one-fifth longer than hind tarsus, hind basitarsus as long as tarsal segments 2–3.

Fore wing as long as body. Pterostigma (Fig. 82) 2.73 times as long as wide, issuing radial vein distally from its middle, r_1 half as long as width of pterostigma, cu_{qu1} 2.44 times as long as r_1 . Radial cell long, along metacarp one-fifth longer than pterostigma, distal end of metacarp reaching tip of wing, second section of metacarp twice as long as r_1 . D_1 slightly wider than high, d_1 short (Fig. 83, see arrows).

Carapace globose, in dorsal view (Fig. 84) 1.3 times as long as broad at its middle, evenly areolated, areolate surface themselves rugulose, first suture hardly distinct; in lateral view (Fig. 85) 2.2 times as long as high posteriorly, its upper outline convex, apically not incurved. Carapace apically semicircularly emarginate (Fig. 86), rim of carapace behind weakly denticulate (Fig. 85). – Ovipositor sheath in ventro-lateral view as long as carapace or as long as hind tibia + basitarsus.

Body tricoloured: its ground colour blackish, pro- and mesonotum as well as tegula testaceous, legs yellow. Palpi yellow, mandible rusty. Scape and pedicel yellow, flagellomeres darkening rusty to blackish, rest of flagellum blackish. Wings hyaline, pterostigma brown, veins opaque yellowish.

♂ and host unknown.



Figs 80–86. *Schizoprymnus (Muiriella) odrinus* sp. n.: 80 = head in lateral view, 81 = hind femur, 82 = distal part of right fore wing, 83 = discoidal cell (or D_1), 84 = carapace in dorsal view with indication of its sculpture, 85 = carapace in lateral view, 86 = apical emargination of carapace. – Fig. 87. *S. (S.) subutus* PAPP: hind femur

Type material. — Holotype ♀: Viet Nam, DiLinh (Djiring), 1200 m, 22–28 April 1960, leg. S. et L. QUATE. — Holotype is deposited in Bernice P. Bishop Museum, Honolulu.

Distribution: Viet Nam.

The new species, *Schizoprymnus (Muiriella) odrinus* sp. n., is related to *S. (M.) concisa* (FULLAWAY, 1919), the two species are distinguished by the following features:

S. (M.) odrinus sp. n.

1. Face densely punctate.
2. Rim of carapace behind weakly denticulate (Fig. 85).
3. Pterostigma wide, 2.75 times as long as wide (Fig. 82).
4. Carapace relatively more globose, in lateral view 1.77 times as long as high (Fig. 85).
5. Flagellomeres 11–14 cubic.
6. Pro- and mesonotum testaceous, otherwise mesosoma black.

S. (M.) concisa (FULLAWAY)

1. Face smooth.
2. Rim of carapace behind denticulate (Figs 33 and 37).
3. Pterostigma less wide, 3.3–3.75 times as long as wide (Fig. 30).
4. Carapace relatively less globose, in lateral view 2–2.75 times as long as high (Fig. 33).
5. Flagellomeres 11–14 transverse.
6. Entire mesosoma black to blackish, at most rusty brown.

The new species resembles *S. (S.) subutus* PAPP, 1991 (Philippines) in several respects (distinctly transverse head, globose carapace, long radial cell, colour of body), however, it is clearly differentiated by the following features:

S. (M.) odrinus sp. n.

1. Rim of carapace behind weakly denticulate (subgeneric difference, Fig. 85).
2. Flagellomeres 8–14 at most cubic.
3. Hind femur not thick, 3.3 times as long as broad (Fig. 81).
4. Mesosoma black, pro- and mesonotum testaceous.
5. Body less strong, 3 mm long.

S. (S.) subutus PAPP

1. Rim of carapace behind not denticulate (subgeneric difference).
2. Flagellomeres 8–14 transverse.
3. Hind femur thick, 2.7 times as long as broad (Fig. 87).
4. Mesosoma testaceous except brownish propodeum.
5. Body strong, 3.5 mm long.

***Schizoprymnus (Muiriella) orangus* sp. n. ♀♂**
(Figs 88–93)

Description of the holotype ♀. — Body 3 mm long. Head in dorsal view (cf. Fig. 52) less transverse, 1.86 times as broad as long, eye one-third longer than (or 1.57 times as long as) temple, latter rounded. Ocellus round and medium-sized, distance between fore and a hind ocelli as long as OD, POL = OD and OOL 2.4 times as long as POL. In lateral view eye a bit wider than temple, latter slightly broadening ventrally (cf. Fig. 11).

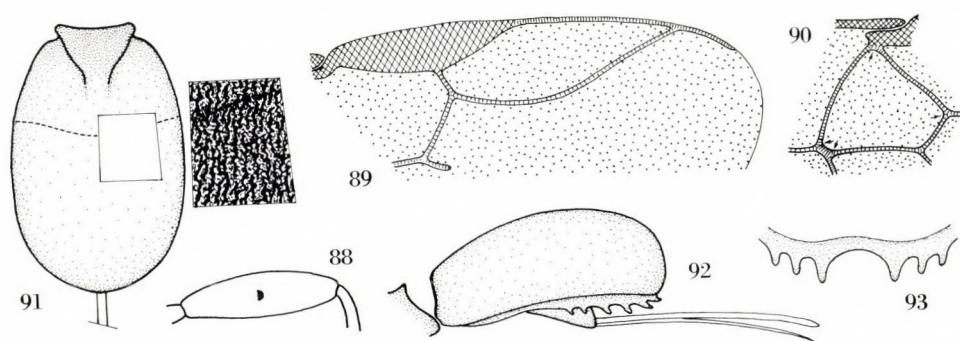
Clypeus twice as wide as high. Malar space almost twice as long as basal width of mandible. Head polished. — Antenna with 25 antennomeres. First flagellomere 3.4 times as long as apically broad, flagellomeres 11–15 transverse, penultimate flagellomere 1.2 times as long as broad.

Mesosoma in lateral view 1.5 times as long as high. Pronotum, mesonotum, scutellum and mesopleuron polished; notaulex evenly deep and finely crenulated, precoxal suture wide and crenulated. Propodeum rugose, with a median and a pair of lateral tubercles, median one smaller than lateral ones. — Hind femur 3.75 times as long as broad at about its middle (Fig. 88). Hind tibia one-fifth longer than hind tarsus; hind basitarsus a bit longer than tarsal segments 2–4.

Fore wing just shorter than body. Pterostigma (Fig. 89) 3.77 times as long as wide, issuing radial vein distally from its middle, r_1 half as long as width of pterostigma, $cu_1 + r_1$ 3.1 times as long as r_1 . Radial cell short, along metacarp somewhat shorter than pterostigma, distal end of metacarp reaching tip of wing, second section of metacarp distinctly twice as long as r_1 . D_1 slightly wider than high, $n. bas.$ and cu_1 relatively less diverging posteriorly, d_1 short (Fig. 90, see arrows).

Carapace globose, in dorsal view (Fig. 91) 1.5 times as long as broad, longitudinally rugose, first suture distinct; in lateral view (Fig. 92) 2.42 times as long as high medially, its upper outline convex, apically hardly incurved. Carapace apically moderately emarginate (Fig. 93), rim of carapace behind denticulate (Fig. 92). — Ovipositor sheath as long as carapace or hind tibia + half basitarsus.

Body, legs, mandible, palpi and tegula yellow. Scape and pedicel darkening yellow, flagellomeres 1–2 darkening, rest of flagellum blackish.



Figs 88–93. *Schizoprymnus (Muiriella) orangus* sp. n.: 88 = hind femur, 89 = distal part of right fore wing, 90 = discoidal cell (or DI), 91 = carapace in dorsal view with indication of its sculpture, 92 = carapace in lateral view, 93 = apical end of carapace with its median emargination

Apex of hind tibia and entire hind tarsus blackish. Wings subhyaline, pterostigma and veins opaque yellow.

Description of the male paratype (1 ♂). — Similar to female. Body 3.1 mm long. Head in dorsal view 1.86 times as broad as long, eye 1.64 times as long as temple. Antenna with 26 antennomeres, first flagellomere 3.4 times as long as broad, further flagellomeres gradually shortening so that penultimate flagellomere 1.66 times as long as broad. Hind femur four times as long as broad. Carapace longitudinally costulated with a few anastomoses, intercostulate surface crenulose.

Host unknown.

Type material. — Holotype ♀: Papua New Guinea (NE), Wau, Morobe District, 1200 m, Malaise-trap, 21 January 1963, leg. J. SEDLACEK. — 1 ♂ paratype: Fiji Islands, Viti Levu, Lami, 20–200 m, March 1976, leg. N. L. H. KRAUSS.

Holotype (♀) and 1 ♂ paratype are deposited in the Bernice P. Bishop Museum, Honolulu.

Distribution: Fiji Islands, Papua New Guinea.

The new species, *Schizoprymnus (Muiriella) orangus* sp. n., is related to *S. (M.) fijicus* sp. n. (Fiji Islands), their specific distinction is given in the key couplets 66 (69)–68 (67), p. 169–170.

Schizoprymnus (Muiriella) pernegrus sp. n. ♀
(Figs 94–98)

Description of the holotype ♀. — Body 2.3 mm long. Head in dorsal view (cf. Fig. 80) transverse, twice as broad as long, eye twice as long as temple, latter constricted. Ocelli small and round, distance between fore and a hind ocellus 1.25 times as long as OD, POL clearly twice as long as OD, POL=OOL. In lateral view eye 1.7 times as wide as temple, latter evenly broad behind eye. Clypeus three times as wide as high. Malar space just longer than basal width of mandible. Head polished, face medially with fine and disperse punctation. — Antenna damaged, both antennae with 3 antennomeres (scape, pedicel and first flagellomere). First flagellomere three times as long as broad.

Mesosoma in lateral view 1.37 times as long as high. Pronotum, mesonotum, scutellum and mesopleuron polished. Notaulix evenly deep, suberenuled. Hind half of median lobe of mesonotum rugulose. Propodeum rugose, with a small median and a pair of lateral tubercles. Precoxal suture wide, crenulated. — Hind femur thick, 2.85 times as long as broad medially (Fig. 94). Hind tibia as long as hind tarsus, hind basitarsus as long as tarsal segments 2–4.

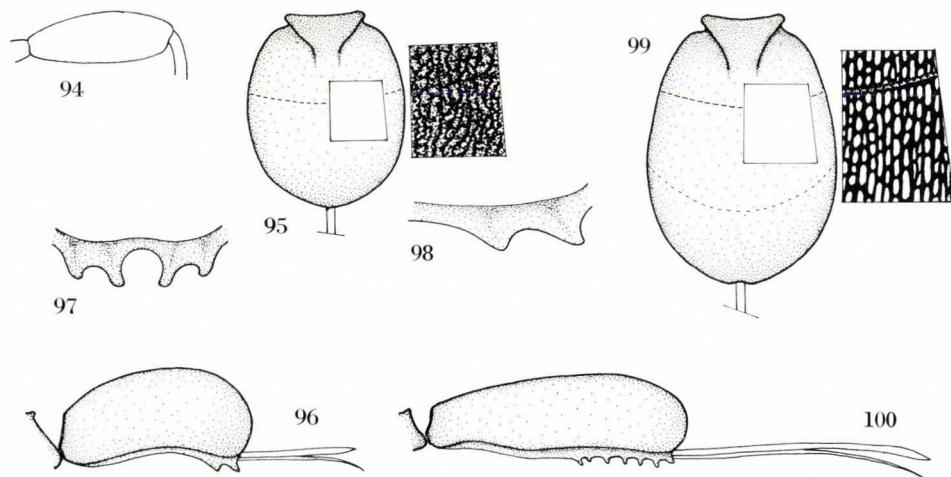
Fore wing as long as body. Pterostigma (cf. Fig. 58) 2.42 times as long as wide, issuing radial vein distally from its middle, r_1 0.28 times as long as width of pterostigma, c_{uqu1} 3.5 times as long as r_1 . Radial cell short, pterostigma somewhat longer than radial cell along metacarp, distal end of metacarp approaching tip of wing, second section of metacarp almost four times as long as r_1 . D_1 somewhat wider than high, d_1 short.

Carapace globose, in dorsal view (Fig. 95) 1.19 times as long as broad medially, longitudinally rugose with costate elements, first suture distinct; in lateral view (Fig. 96) 2.1 times as long as high behind, its hind half downcurving, its upper outline convex, apically just incurved. Carapace apically as in Fig. 97, rim of carapace behind less strongly denticulate (Fig. 98). – Ovipositor sheath short, 0.6 times as long as carapace or as long as hind tibia.

Head and mesosoma black, carapace brownish black, legs yellow, coxae + trochanters brownish yellow. Mandible rusty, palpi pale. Scape, pedicel and first flagellomere yellow. Tegula rusty. Wings hyaline, pterostigma brown, veins opaque brown.

♂ and host unknown.

Type material. – Holotype ♀: Papua New Guinea (SE), Kokoda, 400 m, light trap, 15–20 November 1965, leg. J. et M. SEDLACEK. – Holotype is deposited in the Bernice P. Bishop Museum, Honolulu.



Figs 94–98. *Schizoprymnus (Muiriella) pernegrus* sp. n.: 94 = hind femur, 95 = carapace in dorsal view with indication of its sculpture, 96 = carapace in lateral view, 97 = apical emargination of carapace, 98 = denticulate rim of carapace in latero-apical view. – Figs 99–100. *S. (M.) bucculus* PAPP: 99 = carapace in dorsal view with indication of its sculpture, 100 = carapace in lateral view

Distribution: Papua New Guinea.

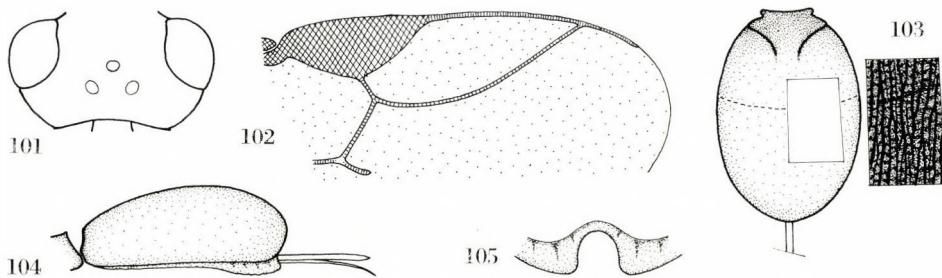
The new species, *Schizoprymnus (Muiriella) pernegrus* sp. n., is nearest to *S. (M.) bicticus* sp. n. (Fiji Islands), their specific distinction is given in the key couplets 69 (66)-71 (70), p. 170.

***Schizoprymnus (Schizoprymnus) phyrtattus* sp. n. ♀**
(Figs 101-105)

Description of the holotype ♀. — Body 2.5 mm long. Head in dorsal view (Fig. 101) transverse, 1.86 times as broad as long, eye almost twice as long as temple, latter constricted. Ocelli medium-sized and elliptic, distance between fore and a hind ocellus as long as OD, POL somewhat longer than OD and somewhat shorter than OOL. In lateral view eye distinctly twice as wide as temple, latter moderately broadening ventrally. Malar space one-fourth longer than basal width of mandible. Clypeus twice as wide as high. Head polished; face with fine and disperse hairpunctures, interspaces clearly larger than punctures. — Antenna with 20 antennomeres. First flagellomere four times as long as apically broad, flagellomeres 8-12 subcubic, penultimate flagellomere 1.66 times as long as broad.

Mesosoma in lateral view stout, 1.1 times as long as high. Median lobe of mesonotum shiny with very fine and disperse hairpunctures, pair of lateral lobes and scutellum polished; precoxal suture crenulated. Propodeum rugose, its median and pair of lateral tubercles small. — Hind femur 3.6 times as long as broad. Hind tibia somewhat longer than hind tarsus, hind basitarsus as long as tarsal segments 2-4.

Fore wing as long as body. Pterostigma (Fig. 102) 2.4 times as long as wide, issuing radial vein from its middle; *r1* short, just more than



Figs 101-105. *Schizoprymnus (S.) phyrtattus* sp. n.: 101 = head in dorsal view, 102 = distal part of right fore wing, 103 = carapace in dorsal view with indication of its sculpture, 104 = carapace in lateral view, 105 = apical emargination of carapace

one-third as long as width of pterostigma, *cuqu1* three times as long as *r1*. Radial cell long, along metacarp somewhat though distinctly longer than pterostigma, distal end of metacarp almost reaching tip of wing, second section of metacarp somewhat more than twice (or 2.33 times) as long as *r1*. *D1* slightly wider than high; *d1* short, about as long as its own width.

Carapace globose, in dorsal view (Fig. 103) 1.44 times as long as broad, longitudinally costulate with anastomoses, intercostulate surface rugo-rugulose, first suture distinct; in lateral view (Fig. 104) 2.57 times as long as medially high, its upper surface convex. Carapace apically semicircularly emarginate (Fig. 105). – Ovipositor sheath in latero-ventral view half as long as carapace.

Body black; pronotum, mesonotum and tegula testaceous. Legs yellow. Hind tibia distally dark. Scape, pedicel and first flagellomere reddish yellow, flagellomeres 2–4 darkening yellow to blackish, rest of flagellum blackish. Wings hyaline, pterostigma brown, veins opaque light brown.

♂ and host unknown.

Type material. – Holotype ♀: British North Borneo (now Malaysia), Tenompok, Jesselton, 30 miles E, 1460 m, 2–4 February 1959, leg. T. C. MAA. – Holotype is deposited in the Bernice P. Bishop Museum, Honolulu.

Distribution: Malaysia (Northern Borneo).

The new species, *Schizoprymnus (S.) phyrtattus* sp. n., is nearest to *S. (S.) doryphorus* PAPP, 1991 (Viet Nam), the two species are distinguished by the features expounded in the key couplets 42 (39)–44 (43) p. 167. Also near to *S. (S.) maai* sp. n. (Malaysia: Northern Borneo) and they are separated by the following features:

S. phyrtattus sp. n.

1. Temple in dorsal view (Fig. 101) constricted.
2. Radial cell long, along metacarp somewhat longer than pterostigma (Fig. 102).
3. Ovipositor sheath short, as long as half carapace (Fig. 104).
4. Body black, pro- and mesonotum testaceous.

S. maai sp. n.

1. Temple in dorsal view (Fig. 72) rounded.
2. Radial cell short, along metacarp somewhat shorter than pterostigma (Fig. 73).
3. Ovipositor sheath long, almost as long as carapace (Fig. 75).
4. Body black, carapace entirely or partly reddish yellow.

***Schizoprymnus (Muiriella) pinsapo* sp. n. ♀**
(Figs 106–112)

Description of the holotype ♀. – Body 4 mm long. Head in dorsal view (Fig. 106) transverse, distinctly twice as broad as long, eye somewhat longer than temple, latter strongly rounded. Ocelli large and

elliptic, distance between fore and a hind ocellus one-fifth shorter than OD, POL 1.4 times as long as OD and OOL 1.43 times as long as POL. In lateral view eye unusually high, i.e. twice as high as wide, temple behind eye evenly broad and somewhat less wide than eye (Fig. 107, see arrows). Clypeus wide, 2.7 times as wide as high. Malar space short, basal width of mandible 1.5 times as wide as length of malar space. Clypeus, face, frons and vertex punctate, interspaces more or less as large as punctures, shiny; temple and occiput dispersely subpunctate, shiny. — Antennae damaged, right antenna with 12 and left antenna with 22 antennomeres. First flagellomere twice as long as broad, flagellomeres 16–19 cubic.

Mesosoma in lateral view 1.5 times as long as high. Mesonotum shiny, evenly and rather finely punctate, interspaces about as large as punctures. Scutellum polished. Notaulix evenly deep, finely crenulated. Propodeum rugose with a median and a pair of lateral and less conspicuous tubercles. Mesopleuron punctate-rugose, shiny, precoxal suture wide and rugo-crenulated. — Hind femur three times as long as broad at its middle (Fig. 108). Hind tibia clearly longer than hind tarsus, hind basitarsus as long as tarsal segments 2–3.

Fore wing as long as body. Pterostigma (cf. Fig. 82) 2.62 times as long as wide, issuing radial vein distally from its middle, r_1 0.6 times as long as width of pterostigma, c_{uqu1} twice as long as r_1 . Radial cell long, along metacarp one-fifth longer than pterostigma, distal end of metacarp almost reaching tip of wing, second section of metacarp a bit longer than r_1 . D_1 less wide, just higher than wide; d_1 distinct, i.e. nervulus distinctly postfurcal.

Carapace clearly globose, in dorsal view (Fig. 109) 1.14 times as long as broad medially, strio-rugose, first suture hardly distinct; in lateral view (Fig. 110) high, 1.33 times as long as high medially, its upper outline convex, its hind half moderately downcurved. Carapace apically moderately emarginate (Fig. 111). Rim of carapace behind less distinctly denticulate (Fig. 112). — Ovipositor sheath in latero-ventral view as long as carapace and propodeum or hind tibia and tarsal segments 1–4.

Body black. Mandible rusty, palpi brown. Tegula blackish. Scape and pedicel rusty, flagellomeres 1–2(–3) rusty with dark fumous tint, rest of flagellum blackish to black. Legs yellow, coxae 1–2 brown, coxa 3 black to blackish. Wings hyaline, pterostigma opaque brown, veins opaque yellowish.

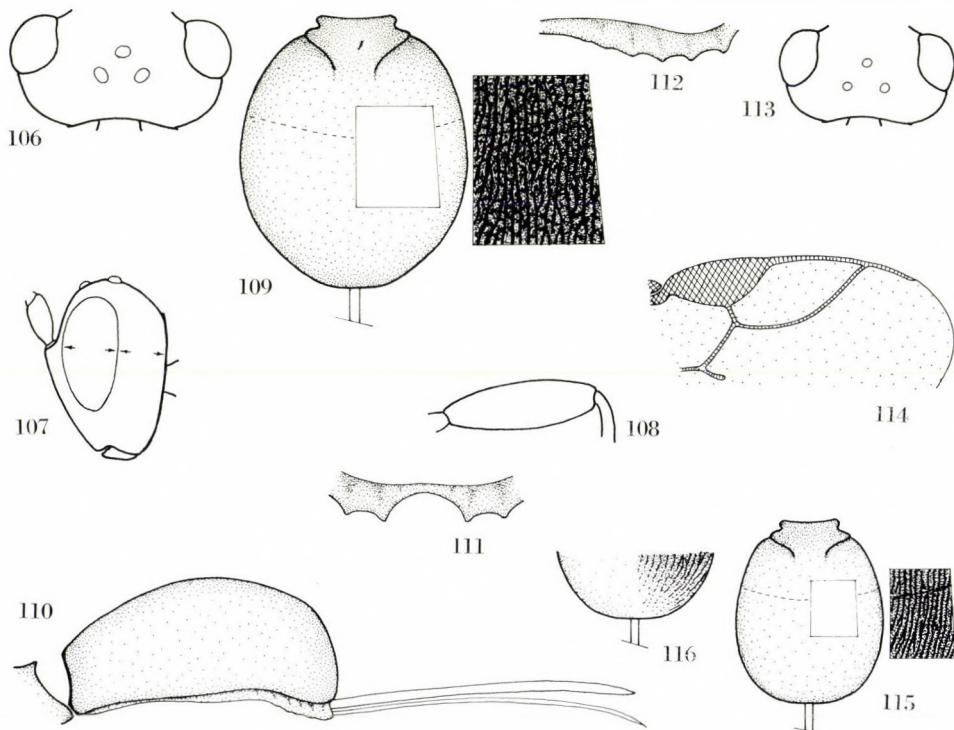
Description of the female paratype (1 ♀). — Similar to the holotype. Body 3.8 mm long. Head in dorsal view 2.16 times as broad as long. Antennae damaged, right antenna with 16 and left antenna with 10 antennomeres. Mesopleuron above precoxal suture less punctate. Hind

femur 3.1 times as long as broad. Pterostigma 2.66 times as long as wide. Carapace a bit more globose, in dorsal view 1.19 times as long as broad. ♂ and host unknown.

Type material. — Holotype ♀+1 ♀ paratype: Thailand, Chiangmai Province, Doi Suthep, 1–5 April 1958, leg. T. C. MAA. — Holotype (♀) is deposited in the Bernice P. Bishop Museum, Honolulu; 1 ♀ paratype in the Hungarian Natural History Museum, Budapest, Hym. Typ. No. 7487.

Distribution: Thailand.

The new species, *Schizoprymnus (Muiriella) pinsapo* sp. n., is nearest to *S. (M.) deversus* sp. n. (Malaysia: Northern Borneo), their distinction is given in the key couplets 73 (76)–76 (73), p. 170.



Figs 106–112. *Schizoprymnus (Muiriella) pinsapo* sp. n.: 106 = head in dorsal view, 107 = head in lateral view, 108 = hind femur, 109 = carapace in dorsal view with indication of its sculpture, 110 = carapace in lateral view, 111 = apical emargination of carapace, 112 = denticulate rim of carapace in latero-apical view. — Figs 113–116. *S. (S.) puellaris* sp. n.: 113 = head in dorsal view, 114 = distal part of right fore wing, 115 = carapace in dorsal view with indication of its sculpture, 116 = hind part of carapace in dorsal view

Schizoprymnus (Schizoprymnus) puellaris sp. n. ♀
 (Figs 113–118)

Description of the holotype ♀. – Body 1.7 mm long. Head in dorsal view (Fig. 113) less transverse, 1.9 times as broad as long, eye 1.66 times as long as temple, latter rounded. Ocelli small and round, distance between fore and a hind ocellus 1.66 times as long as OD, POL almost three times as long as OD, OOL = POL. In lateral view eye slightly wider than temple, latter evenly broad behind eye. Malar space slightly shorter than basal width of mandible. Clypeus twice as wide as high. Head polished. – Antenna with 19 antennomeres. First flagellomere three times as long as broad apically, flagellomeres 8–12(–13) cubic.

Mesosoma in lateral view 1.26 times as long as high. Mesonotum shiny to polished; median lobe of mesonotum with disperse and fine punctation. Scutellum and mesopleuron polished, precoxal suture rugo-crenulated. Propodeum rugose, its median and pair of lateral tubercles small. – Hind femur 2.9 times as long as broad distally. Hind tibia one-fourth longer than hind tarsus, basitarsus as long as tarsal segments 2–3.

Fore wing as long as body. Pterostigma (Fig. 114) 2.54 times as long as wide, issuing radial vein from its middle; r_1 short, just more than one-third as long as width of pterostigma, $c_{uqu}1$ 3.2 times as long as r_1 . Radial cell short, along metacarp somewhat shorter than pterostigma, distal end of metacarp approaching tip of wing, second section of metacarp three times as long as r_1 . D_1 as wide as high; d_1 short, about as long as its own breadth.

Carapace globose, in dorsal view (Fig. 115) 1.23 times as long as broad medially, longitudinally costulate with anastomoses, intercostulate surface rugo-rugulose, sculpture of hind third of carapace (or third tergite) weakening (Fig. 116), first suture distinct; in lateral view (Fig. 117) 1.94 times as long as high, its hind half downcurved. Carapace apically semicircularly emarginate (Fig. 118). – Ovipositor sheath in latero-ventral view one-sixth shorter than carapace or as long as hind tibia and half basitarsus.

Body tricoloured: head and mesosoma rusty brown to dark brown, carapace rusty, legs yellow. Wings hyaline, pterostigma opaque light brown, veins opaque pale.

♂ and host unknown.

Type material. – Holotype ♀: Philippines, Albay Province, Libon, Caguscios, 200 m, light trap, 13 May 1965, leg. H. M. TORREVILLAS. – Holotype is deposited in the Bernice P. Bishop Museum, Honolulu.

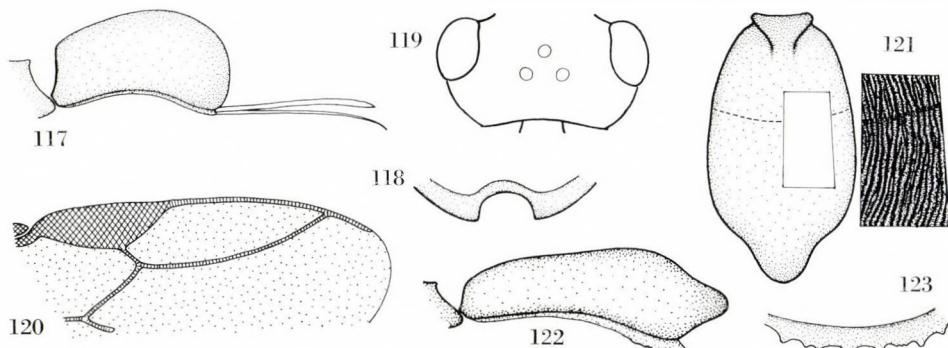
Distribution: Philippines.

The new species, *Schizoprymnus (S.) puellaris* sp., n., is related to *S. (S.) maai* sp. n. (Malaysia: Northern Borneo), for the distinction of the two species see the key couplets 52 (49)–54 (53). p. 168–169.

***Schizoprymnus (Muiriella) umbofer* sp. n. ♂**
(Figs 119–123)

Description of the holotype ♂. – Body 2.9 mm long. Head in dorsal view (Fig. 119) transverse, 1.95 times as broad as long, eye almost twice as long as temple, latter constricted. Ocelli small and round, distance between fore and a hind ocelli as long as OD, POL a bit longer than OD and half as long as OOL. In lateral view eye somewhat wider than temple, latter slightly though clearly broadening ventrally. Clypeus 2.45 times as wide as high. Malar space twice as long as basal width of mandible. Head polished. – Antenna with 29 antennomeres. First flagellomere four times as long as broad apically, further flagellomeres gradually shortening so that penultimate flagellomere 1.33 times as long as broad.

Mesosoma in lateral view 1.44 times as long as high. Pronotum, mesonotum, scutellum as mesopleuron polished; notaulix evenly deep and finely crenulated, precoxal suture indistinct. Propodeum rugose with a median and a pair of lateral tubercles, latter rather small, median one even smaller than lateral ones. – Hind femur 3.5 times as long as broad



Figs 117–118. *Schizoprymnus (S.) puellaris* sp. n.: 117 = carapace in lateral view, 118 = apical emargination of carapace. – Figs 119–122. *S. (S.) umbofer* sp. n.: 119 = head in dorsal view, 120 = distal part of right fore wing, 121 = carapace in dorsal view with indication of its sculpture, 122 = carapace in lateral view, 123 = denticulate rim of carapace in latero-apical view

distally. Hind tibia one-fifth longer than hind tarsus; hind basitarsus nearly as long as tarsal segments 2–5.

Fore wing as long as body. Pterostigma (Fig. 120) three times as long as wide, issuing radial vein distally from its middle, *r1* slightly shorter than half width of pterostigma and directed to tip of wing, *cumqu1* four times as long as *r1*. Radial cell long, along metacarp one-seventh longer than pterostigma, distal end of metacarp almost reaching tip of wing, second section of metacarp twice as long as *r1*. *D1* somewhat wider than high; *d1* unusually long, i.e. as long as nervulus.

Carapace less globose, in dorsal view (Fig. 121) 1.8 times as long as broad somewhat distally from its middle, first suture distinct; shiny, tergites 1–2 longitudinally striate with anastomoses, interstriae rugulose; tergite 3 umbiliform, laterally uneven, medially smooth. Carapace in lateral view (Fig. 122) downcurved and broadening posteriorly, 2.8 times as long as high at its hind third. Carapace apically distinctly incurved (Fig. 122), i.e. ventral cavity of carapace distinctly shorter than carapace itself. Rim of carapace behind weakly denticulate (Fig. 123).

Body black. Mandible rusty, palpi pale. Scape and pedicel brownish yellow, flagellomeres 1–2 darkening brownish to blackish, rest of flagellum blackish. Tegula brownish black. Legs yellow, coxae brownish, hind tibia blackish. Wings faintly brownish fuscous, pterostigma and veins opaque brown.

♀ and host unknown.

Type material. — Holotype ♂: Papua New Guinea, Mt. Suckling, Mayu, 500 m, 13–16 July 1972, leg. J. L. GRESSITT. — Holotype is deposited in the Bernice P. Bishop Museum, Honolulu.

Distribution: Papua New Guinea.

The new species, *Schizoprymnus (Muiriella) umbofer* sp. n., differs from all *Schizoprymnus* species by its umbiliform third tergite (Figs 121–122), see also in key couplets 78 (77)–79 (80), p. 170–171.

Schizoprymnus (Schizoprymnus) vuptus sp. n. ♂ (Figs 124–129)

Description of the holotype ♂. — Body 2.6 mm long. Head in dorsal view (Fig. 124) transverse, 1.93 as broad as long, eye as long as temple, latter rounded. Ocelli medium-sized and elliptic, distance between fore and a hind ocellus as long as OD, POL nearly twice as long as OD, OOL=POL. In lateral view temple just wider than eye and evenly broad behind eye. Malar space one-sixth longer than basal width of mandible.

Clypeus 2.5 times as wide as high, its lower margin faintly pointed. Head polished, face smooth and shiny with very fine and disperse hairpunctures.

— Antenna with 22 antennomeres. First flagellomere four times as long as broad apically, penultimate flagellomere 1.37 times as long as broad.

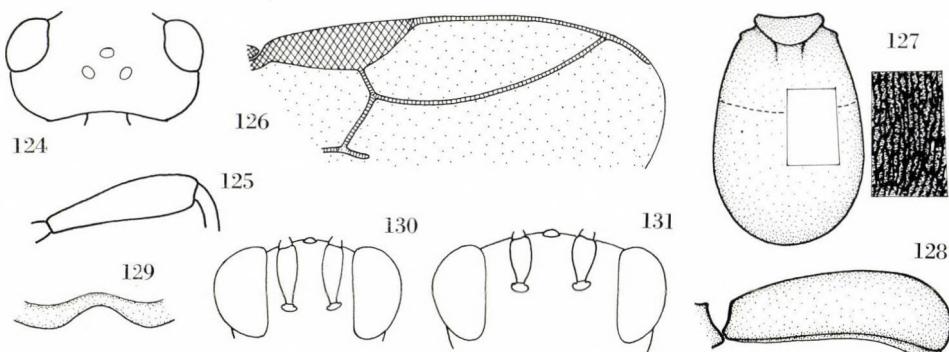
Mesosoma in lateral view 1.5 times as long as high. Mesosoma smooth and shiny; notalix evenly deep and crenulated, precoxal suture short, narrow, crenulated; propodeum rugose, with a median and a pair of lateral tubercles. — Hind femur 3.7 times as long as broad distally (Fig. 125). Hind femur slightly longer than hind tibia, hind basitarsus as long as tarsal segments 2–4.

Fore wing as long as body. Pterostigma (Fig. 126) long, 3.3 times as long as wide, issuing radial vein distally from its middle; r_1 short, 0.55 times as long as width of pterostigma, c_{uqu1} twice as long as r_1 . Radial cell long, one-seventh longer than pterostigma, distal end of metacarp reaching tip of wing, second section of metacarp as long as width of pterostigma. D_1 one-sixth wider than high, d_1 relatively long, as long as r_1 .

Carapace less globose, in dorsal view (Fig. 127) 1.6 times as long as broad at its hind third, shiny, longitudinally costulated with several anastomoses, intercostulate surface subcrenulated, first suture distinct; in lateral view (Fig. 128) 3.3 times as long as high behind, somewhat down-curved. Apical rim of carapace moderately emarginate (Fig. 129).

Body black. Mandible rusty, palpi pale. Scape, pedicel and flagellomere(s) 1(–2) dark brown to blackish, flagellum blackish. Tegula brown. Ground colour of legs brown; trochanters, apex of femora and base of tibiae yellow, hind tibia and tarsus dark brown. Wings hyaline, pterostigma and veins opaque brown.

♀ and host unknown.



Figs 124–129. *Schizoprymnus (S.) ruppus* sp. n.: 124 = head in dorsal view, 125 = hind femur, 126 = distal part of right fore wing, 127 = carapace in dorsal view with indication of its sculpture, 128 = carapace in lateral view, 129 = apical emargination of carapace. — Figs 130–131. Upper half of head in frontal view: 130 = *S. (S.) eminens* sp. n., 131 = *S. (S.) sedlacekorum* PAPP

Type material. — Holotype ♂: New Guinea (NE), Banz, Wagni Valley, 1100 m, 11 July 1955, leg. J. L. GRESSITT. — Holotype is deposited in the Bernice P. Bishop Museum, Honolulu.

Distribution: Papua New Guinea.

The new species, *Schizoprymnus* (*S.*) *vuptus* sp. n., runs in my key to the male of *S.* (*S.*) *calurus* sp. n. (Laos, Viet Nam), see couplets 29 (32)–31 (30), p. 166.

**KEY TO THE INDO-AUSTRALIAN AND PACIFIC SPECIES
OF THE GENUS *SCHIZOPRYMNUS* FOERSTER**

The key was constructed for thirty-five *Schizoprymnus* species distributed in South-East Asia, Australia and the western Pacific Islands. Frequently the species are identifiable by features which are not easy to recognize, thus a special practice is required in determining the species in question. Several species are keyed in more than one couplet owing to the transitional forms as well as variations of the features adopted for determination. The species are divided in two groups corresponding to their subgeneric arrangement (*Schizoprymnus* FOERSTER and *Muirella* FULLAWAY*).

- 1 (62) Rim of carapace behind (or third tergite below) not denticulate (Figs 23, 26, 47, 75, 77, 104), at most with a denticule apically (Fig. 78) (subgenus *Schizoprymnus* FOERSTER, 1862). — If rim incidentally and only more or less (indistinctly) denticulate (Figs 43, 112) then representatives of the subgenus *Muirella* FULLAWAY.
 - 2 (17) Third tergite or second and third tergites polished.
 - 3 (4) Tergites 2–3 polished, second tergite medially uneven. For further details see couplet 8 (9) in PAPP 1984: 141. **S. (*S.*) *politus*** PAPP, 1984
 - 4 (3) Only tergite 3 polished and at most with a fine to very fine and longitudinally arranged punctuation/subpunctuation restricted rather laterally on tergite or tergite 3 with longitudinal stroio-rugulosity, polished interspaces (much) larger than sculpture elements.
 - 5 (6) Carapace in lateral view deeply incurved ventrally (Fig. 48 in PAPP 1991: 88), i.e. ventral cavity about one-fourth shorter than carapace itself (Fig. 49 l.c.). Carapace in dorsal view rather elongate, 1.8–1.85 times as long as broad (Fig. 47 l.c.). Radial cell short (Fig. 45 l.c.), along metacarp shorter than pterostigma. Antenna with 21 (♀) or 23 antennomeres (♂). Head in dorsal view 1.84–1.88 times as broad as long, eye slightly longer than temple (Fig. 44 l.c.). Ovipositor sheath as long as hind tibia or hind tibia and half basitarsus (Fig. 48 l.c.). Head and mesosoma brown to blackish, carapace brown, legs yellowish brown. ♀♂: 2.4–2.6 mm. — New Hebrides. **S. (*S.*) *reflexus*** PAPP, 1991

* The genus *Muirella* FULLAWAY had been synonymized with the genus *Triaspis* Haliday by CLARE R. BALTAZAR (1966: 218). Supposedly she followed J. ŠNOFLÁK'S (1953) conception in this way of the synonymization who considered the taxon *Schizoprymnus* as a subgenus of *Triaspis*. Since her time the taxon *Schizoprymnus* is accepted as an independent genus closely related to *Triaspis* and with transitional forms towards this genus.

- 6 (5) Carapace not or at most slightly incurved ventrally (Figs 12, 19, 43, 66, 80 in PAPP 1991: 76, 79, 88, 93, 95), i.e. ventral cavity as long as carapace itself. Carapace in dorsal view rather globose, 1.4–1.5 times as long as broad (Figs 24, 42 in PAPP 1991: 83, 88) and at most 1.7 times as long as broad (Fig. 16 in PAPP 1991: 79). Radial cell usually long (Figs 15, 40 in PAPP 1991: 79, 85), along metacarp at least as long as pterostigma (except *S. belairi* and *S. szelenyi*).

7 (10) Radial cell short, along metacarp at least one-quarter shorter than pterostigma (Figs 10, 64 in PAPP 1991: 76, 93).

8 (9) Head in dorsal view transverse, twice (i.e. 1.96) as broad as long, temple one-third shorter than eye and strongly rounded (Fig. 7 in PAPP 1991: 76). Antenna with 15 flagellomeres, latter gradually shortening (and not attenuating) so that penultimate (or 14th) flagellomere just longer than broad. Radial cell along metacarp somewhat longer than half length of pterostigma (Fig. 10 l.c.). Legs relatively short, femora thick, hind femur 2.3 times as long as broad (Fig. 9 l.c.). Carapace in lateral view somewhat less convex, 2.6 times as long as high at its hind third, apically slightly incurved (Fig. 12 l.c.). Legs blackish brown to brown, tibiae with yellow pattern. Only male known. ♂: 2 mm. – Australia **S. (S.) belairi** PAPP, 1991

9 (8) Head in dorsal view less transverse, 1.78 times as broad as long, temple hardly shorter than eye and less strongly rounded (Fig. 63 in PAPP 1991: 93). Antenna with 19 flagellomeres, flagellomeres 1–9 gradually shortening, 10–13 cubic and further ones attenuating so that penultimate (or 19th) flagellomere 1.25 times as long as broad. Radial cell along metacarp one-quarter shorter than pterostigma (Fig. 64 l.c.). Legs usual in length, femora not thick, hind femur 3.75 times as long as broad (cf. Fig. 39 in PAPP 1991: 85). Carapace in lateral view more convex, 3.12 times as long as high about its middle, apically not incurved (Fig. 66 l.c.). Leg yellow, hind tibia and middle + hind tarsi dark. ♀: 2.4 mm. – Australia **S. (S.) szelenyi** PAPP, 1991

10 (7) Radial cell long, along metacarp at least as long as pterostigma (Figs 15, 40 in PAPP 1991: 79, 85).

11 (14) Pterostigma issuing radial vein from its middle (Fig. 40 in PAPP 1991: 85).

12 (13) Frons without appendages. Head in dorsal view (Fig. 36 in PAPP 1991: 85) subcubic, 1.6–1.7 times as broad as long, temple and eye equal in length. Antenna with 19 antennomeres. Ovipositor sheath long, as long as mesosoma and carapace together. Hind femur 3.8 times as long as broad. Second section of metacarpal vein (beyond apex of radial cell) three times as long as *r1* (Fig. 40 l.c.). Apical rim of carapace moderately emarginate and without denticule (cf. Fig. 66 in PAPP 1984: 156). Femora yellow. ♀: 2.4–2.5 mm. – Viet Nam **S. (S.) irreptus** PAPP, 1991

13 (12) Frons with a median cornicule and a pair of lateral tubercles (Fig. 20 in PAPP 1991: 79). Head in dorsal view transverse, 1.9–1.94 times as broad as long, eye almost twice as long as temple. Antenna with 22–26 antennomeres. Ovipositor sheath not long, shorter than carapace and about as long as hind tibia. Hind femur 3.1 times as long as broad (Fig. 22 l.c.). Apical rim of carapace semicircularly emarginate (Fig. 23 l.c.). Second section of metacarp twice as long as *r1*. Femora brown. Tergite 3 either polished with very fine and disperse hairpunctures (Fig. 89 in PAPP 1991: 98) or medially on a narrow band polished otherwise with posteriorly weakening and linear-like punctuation (Fig. 90 l.c.). Body either blackish brown or testaceous. See also couplets 17 (2) and 35 (34). ♀: 2.7–3 mm. – Australia (Queensland) **S. (S.) corniculiger** PAPP, 1991

14 (11) Pterostigma issuing radial vein distally from its middle (Figs 75 in PAPP 1991: 95).

- 15 (16) Head in dorsal view (Fig. 63 in PAPP 1991: 93) somewhat less transverse, 1.65–1.8 times as broad as long, eye only slightly longer than temple, latter less rounded. In lateral view (Figs 73–74 in PAPP 1991: 95) temple more or less wider than eye. Radial cell along metacarp as long as pterostigma (Fig. 75 l.c.). Antenna with 19–22 antennomeres. Tergites 1–2 striated (Fig. 79 l.c.). Ground colour of body brown to dark brown, pterostigma yellow. ♂: 2.4–2.5 mm. – Philippines
S. (S.) urticus PAPP, 1991
- 16 (15) Head in dorsal view (cf. Fig. 7 in PAPP 1991: 76) transverse, 1.8–1.9 times broader than long, eye distinctly 1.5–1.6 times as long as temple, latter more rounded. In lateral view eye one-fourth wider than temple (Fig. 14 in PAPP 1991: 79). Radial cell along metacarp clearly longer than pterostigma, *r1* relatively long, *cuqu1* twice as long as *r1* (Fig. 15 l.c.). Antenna with 24–25 antennomeres. Tergites 1–2 rugo-striated (Fig. 16 l.c.). Ground colour of body black with dark brown pattern, pterostigma brown. ♂: 2.8–3 mm. – Philippines
S. (S.) bimus PAPP, 1991
- 17 (2) Third tergite weakly to strongly sculptured, at most medially with a narrow and longitudinal polished streak.
- 18 (27) Head in dorsal view distinctly transverse, i.e. at least twice as broad as long (Figs 25, 56, 68 in PAPP 1991: 83, 90, 93).
- 19 (22) Radial cell short, along metacarp at most as long as pterostigma (Fig. 68 in PAPP 1984: 156, Fig. 28 in PAPP 1991: 83). Legs yellow or reddish yellow.
- 20 (21) Head in dorsal view just twice to just less than twice as broad as long, temple either constricted (*S. sedlacekorum* Fig. 50 in PAPP 1991: 88) or strongly rounded (*S. tortilis* Fig. 67 in PAPP 1984: 156). For further details see couplets 51 (50) (*S. sedlacekorum*), 54 (53) (*S. puellaris*) and 60 (61) (*S. tortilis*).
- 21 (20) Head clearly twice (i.e. 2.1 times) as broad as long, temple constricted (Fig. 25 in PAPP 1991: 83); in lateral view eye 1.5–1.6 times as wide as temple (Fig. 26 l.c.). Hind femur three times as long as broad (Fig. 27 l.c.). Carapace rugose (Fig. 30 l.c.), in lateral view (Fig. 32 l.c.) 2.2–2.3 times as long as high behind. In ventral view ovipositor sheath as long as hind tibia and tarsal segments 1–2. Antenna with 26–27 antennomeres. Ground colour of body black. ♀: 3.3–3.5 mm. – Laos
S. (S.) deres PAPP, 1991
- 22 (19) Radial cell long, along metacarp longer than pterostigma (Fig. 58 in PAPP 1991: 90 and Fig. 126). Legs brown or blackish brown.
- 23 (24) Face smooth and shiny with very fine hairpunctures, otherwise head polished. Head just less than twice as broad as long (Fig. 124). Further details see at couplet 30 (31)
S. (S.) vuptus sp. n.
- 24 (23) Face densely punctate to rugose, head not polished.
- 25 (26) In dorsal view temple short, eye twice as long as temple (Fig. 56 in PAPP 1991: 90). Antenna with 30 antennomeres, flagellomeres 8–13–14 conspicuously transverse, 1.8 times broader than long (Fig. 57 l.c.). *r1* relatively short, *cuqu1* nearly three times as long as *r1* (Fig. 58 l.c.). Ovipositor sheath short, in latero-ventral view as long as hind tibia. Apical rim of carapace moderately (or widely) emarginate (Fig. 60 l.c.). In dorsal view carapace (Fig. 61 l.c. p. 93) more globose, 1.45 times as long as broad, rugose and, in comparison to next species, with relatively less longitudinal elements. Head and carapace blackish brown, mesosoma testaceous, propodeum brownish, hind femur brown. ♀: 3.5 mm. – Philippines
S. (S.) subutus PAPP, 1991
- 26 (25) In dorsal view temple less short, only just shorter than eye (Fig. 51). Antenna with 36 antennomeres, flagellomeres 11–15–16 less transverse, 1.1–1.3 times broader than

long (Fig. 70 in PAPP 1991: 95). Ovipositor sheath long, in latero-ventral view three times as long as hind tibia. Apical rim of carapace semicircularly emarginate (Fig. 69 in PAPP 1991: 93). In dorsal view carapace rather elongated, 1.7 times as long as broad, rugose and, in comparison to previous species, with relatively more longitudinal elements (Fig. 72 in PAPP 1991: 95). Body black, legs blackish brown. ♀: 5 mm. – Malaysia (Northern Borneo)

S. (S.) torreador PAPP, 1991

27 (18) Head in dorsal view less transverse i.e. less than twice as broad as long (Fig. 1 in PAPP 1991: 76; Figs 1, 44, 57, 62, 72, 101, 113, 124).

28 (45) Radial cell long, along metacarp longer (or just longer) than pterostigma (Fig. 84 in PAPP 1991: 98; Figs 21, 102, 126).

29 (32) Males.

30 (31) Temple in dorsal view rounded (Fig. 124). Antenna with 22 antennomeres, every flagellomere longer than broad, penultimate flagellomere 1.2–1.3 times as long as broad. In lateral view carapace (Fig. 128) less downcurved, 3.3 times as long as high at its posterior third, longitudinally costulate with anastomoses (Fig. 127); its apical rim moderately emarginate (Fig. 129). Pterostigma 3.3 times as long as wide, in comparison to next species issuing radial vein more distally from its middle (Fig. 126). Legs brownish to brown; trochanters, apex of femora and base of tibiae pale yellow. ♂: 2.6 mm, only male known. – Papua New Guinea **S. (S.) vuptus** sp. n.

31 (30) Temple in dorsal view constricted (cf. Fig. 1). Antenna with 28 antennomeres, flagellomeres 27–20–19 cubic. In lateral view carapace more downcurved, 2.4–2.6 times as long as high at its posterior third (Fig. 26), strongly rugose (Fig. 22); its apical rim nearly semicircularly emarginate (Fig. 24). Pterostigma 2.1–2.6 times as long as wide, in comparison to previous species issuing radial vein less distally from its middle (Fig. 21). Legs reddish yellow, hind tibia and tarsus brownish to blackish, tibia basally yellowish. ♂: 3.8–4 mm. ♀ see couplet 40 (41). – Viet Nam

S. (S.) calor sp. n.

32 (29) Females.

33 (36) Body testaceous with more or less dark (blackish, brownish) pattern. If body mostly dark then frons with appendages (Fig. 20 in PAPP 1991: 79).

34 (35) Frons without appendages. In dorsal view temple strongly rounded (Fig. 1 in PAPP 1991: 76). Flagellomeres 8–14 transverse and thickening, 1.8–1.16 times as broad as long. Carapace in dorsal view globose, 1.3 times as long as broad, in comparison to next species with rough rugosity (Fig. 4 l.c.). Apical rim of carapace moderately emarginate (Fig. 5 l.c.). Ovipositor sheath as long as hind tibia and tarsal segments 1–2. Body reddish yellow, head blackish, clypeus and mandible yellow; hind half of carapace dark. ♀: 3.6 mm. – Malaysia (Northern Borneo)

S. (S.) admirabilis PAPP, 1991

35 (34) Frons in dorsal view (Fig. 20 in PAPP 1991: 79) with appendages: with a median cornicule and a pair of lateral tubercles. In dorsal view temple rounded (cf. Fig. 63 in PAPP 1991: 93). Flagellomeres 9–19 cubic or flagellomeres 12–16–17 somewhat transverse, i.e. 1.2 times as broad as long. Carapace in dorsal view (Fig. 24 in PAPP 1991: 83) less globose, 1.5 times as long as broad, in comparison to previous species with less rough rugosity or rugose to punctate. Tergite 3 either polished with fine to (medially) very fine and disperse hairpunctures (Fig. 89 in PAPP 1991: 98) or medially on a narrow band polished otherwise with posteriorly weakening and linear-like punctuation (Fig. 90 l.c.). Apical rim of carapace semicircularly emarginate (Fig. 23 in PAPP 1991: 79). Ovipositor sheath as long as hind tibia. Body blackish brown to testaceous. ♀: 2.7–3 mm. See also couplet 13 (12). – Australia (Queensland)

S. (S.) corniculiger PAPP, 1991

- 36 (33) Body black, at most with brownish black suffusion or pro- and mesonotum testaceous; legs either reddish yellow or dark brown.
- 37 (38) Legs dark brown, body black. Pterostigma 3.4 times as long as wide, radial cell slightly longer along metacarp than pterostigma (Fig. 84 in PAPP 1991: 98). Anterior two-thirds of carapace with parallel striation, i.e. striation with a few anastomoses; carapace itself 1.4–1.5 times as long as broad, broadest posteriorly (Fig. 85 l.c.). Apical rim of carapace hardly emarginate (Fig. 87 l.c.). Ovipositor sheath in lateroventral view somewhat shorter than hind tibia. Antenna with 27 antennomeres, penultimate two flagellomeres cubic. ♀: 2.5 mm. – Papua New Guinea
S. (S.) vissas PAPP, 1991
- 38 (37) Legs yellow, hind tibia and tarsus brownish or blackish, base of hind tibia pale. Pterostigma 2.3–2.6 times as long as wide, radial cell clearly longer along metacarp than pterostigma (Fig. 21).
- 39 (42) Carapace in dorsal view less globose (Figs 22, 65), 1.6–2 times as long as broad, rugose to strongly rugose; in lateral view (Figs 23, 66) moderately downcurved, 2.3–3 times as long as high posteriorly (Figs 23, 66); apico-ventrally incurved (Fig. 23), apical rim of carapace semicircularly emarginate (Figs 24, 67). Ovipositor sheath in lateroventral view more or less shorter than hind tibia.
- 40 (41) Carapace in dorsal view less elongate, 1.6–1.8 times as long as broad, its surface rugose with striate elements (Fig. 22). Pterostigma wide, 2.3–2.7(–2.8) times as long as wide, issuing radial vein clearly distally from its middle (Fig. 21). Clypeus relatively wide, (2.3)–2.4 times as wide as high, its lower margin slightly bisinuate (Fig. 20). Flagellomeres 8–26 of female transverse, i.e. somewhat broader than long. Tegula brown, legs yellow to rusty yellow. ♀♂: 3.7–4 mm. ♂ see at couplet 31 (30). – Laos, Viet Nam
S. (S.) calurus sp. n.
- 41 (40) Carapace in dorsal view elongate, twice as long as broad, its surface less rugose and without striate elements (Fig. 65). Pterostigma less wide, 3.2 times as long as wide issuing radial vein somewhat distally from its middle (Fig. 64). Clypeus relatively less wide, twice as wide as high, its lower margin truncate (Fig. 63). Flagellomeres 12–25 cubic. Tegula and legs yellow. ♀: 4 mm. – Taiwan
S. (S.) imitatus sp. n.
- 42 (39) Carapace in dorsal view globose (Fig. 34 in PAPP 1991: 85; Fig. 103); in lateral view less downcurved and three times to nearly three times as long as high at its posterior third (Fig. 35 l.c.; Fig. 104).
- 43 (44) Temple in dorsal view strongly rounded, eye one-third longer than temple (cf. Fig. 1 in PAPP 1991: 76). Malar space long, twice as long as basal width of mandible, thus head in frontal view somewhat elongated (Fig. 33 in PAPP 1991: 85). Ovipositor sheath long, as long as body. Apical rim of carapace emarginate (cf. Fig. 41 l.c.). Striate sculpture of carapace weakening posteriorly (Fig. 34 l.c.). Body brownish black, tegula brown. ♀: 3 mm. – Viet Nam
S. (S.) doryphorus PAPP, 1991
- 44 (43) Temple in dorsal view constricted, eye almost twice as long as temple (Fig. 101). Malar space less long, one-fourth longer than basal width of mandible, thus head in frontal view not elongated. Ovipositor sheath short, as long as half carapace or two-thirds of hind tibia. Apical rim of carapace semicircularly emarginate (Fig. 105). Costulate sculpture of carapace evenly strong (Fig. 103). Body blackish, pro- and mesonotum testaceous, tegula also testaceous. ♀: 2.5 mm. – Malaysia (Northern Borneo)
S. (S.) phytattus sp. n.
- 45 (28) Radial cell short, along metacarp more or less shorter than pterostigma (Figs 5, 73) or at most as long as pterostigma (Figs 45, 58, 114).

- 46 (47) Radial cell just or indistinctly longer than pterostigma (cf. Fig. 40 in PAPP 1991: 85). Frons in dorsal view (Fig. 20 in PAPP 1991: 79) with appendages: with a median cornicule and a pair of lateral tubercles. Further details see at couplet 35 (34)
S. (S.) corniculiger PAPP, 1991
- 47 (46) Radial cell usually short, at most as long as pterostigma.
- 48 (55) At least carapace reddish yellow or brown, i.e. not black(ish). Legs always reddish yellow.
- 49 (52) Temple in dorsal view (Fig. 50 in PAPP 1991: 88, Fig. 44) constricted and about half as long as eye. Pterostigma less wide, three times as long as wide, issuing radial vein distally from its middle (Fig. 51 in PAPP 1991: 90, Fig. 45).
- 50 (51) Mesosoma stout, in lateral view 1.33 times as long as high. Radial cell relatively long, its length along metacarp as long as pterostigma, distal end of metacarp reaching tip of wing (Fig. 45). Antenna with 17 flagellomeres. Carapace in dorsal view globose (Fig. 46), 1.5 times as long as broad, longitudinally costulated with anastomoses, intercostulate surface uneven to smooth. Eye relatively large, its inner margin near to torulus, i.e. distance between them as long as basal breadth of first flagellomere (Fig. 130); ocelli small, OOL slightly longer than POL (Fig. 44). Body reddish yellow, head blackish to dark brown. ♀♂: 1.8 mm. – Papua New Guinea
S. (S.) eminens sp. n.
- 51 (50) Mesosoma less stout, in lateral view 1.57 times as long as high. Radial cell relatively short, its length along metacarp one-fourth shorter than pterostigma, distal end of metacarp rather approaching tip of wing (Fig. 51 in PAPP 1991: 90). Antenna with 21 flagellomeres. Carapace in dorsal view less globose, 1.68 times as long as broad, strongly striated, interstriae finely crenulated (Fig. 53 1.c.). Eye relatively less large, its inner margin far from torulus, i.e. distance between them clearly as long as twice basal breadth of first flagellomere (as usually); ocelli medium sized, OOL twice as long as POL (Fig. 50 in PAPP 1991: 88). Head and mesosoma dark brown to brown, carapace brown. ♂: 2.5 mm. – New Hebrides **S. (S.) sedlacekorum** PAPP, 1991
- 52 (49) Temple in dorsal view (Figs 72, 113) rounded, more than half as long as eye, eye not large, usual in size. Pterostigma wide, 2.4–2.6 times as long as wide, issuing radial vein from its middle (Figs 73, 114). Ovipositor sheath in lateral view as long as hind tibia and basitarsus. Ground colour of body brown to black, carapace partly to entirely reddish yellow.
- 53 (54) Radial cell relatively long, distal end of metacarp reaching tip of wing (Fig. 73). Mesosoma somewhat elongate, in lateral view 1.4–1.5 times as long as high. Carapace less globose, in dorsal view 1.4–1.6 times as long as broad (Fig. 64); in lateral view 2.2–2.4 times as long as high (Fig. 75). Antenna with 21–22 antennomeres, flagellomeres (8)-9-14(-15) cubic. Head in dorsal view about 1.8 times as broad as long; hind pair of ocelli near to each other, OOL twice as long as POL (Fig. 72). Apical emargination of carapace relatively deep, as deep as wide (Fig. 76). Ground colour of body black, carapace either entirely or partly reddish yellow. Wings brownish fumous. ♀: 2.3–2.6 mm. – Northern Borneo **S. (S.) maaei** sp. n.
- 54 (53) Radial cell relatively short, distal end of metacarp approaching tip of wing (Fig. 114). Mesosoma not elongate, usual in size, in lateral view 1.25 times as long as high. Carapace globose, in dorsal view 1.2 times as long as broad (Fig. 115); in lateral view twice as long as high (Fig. 117). Antenna with 19 antennomeres, flagellar segments 8–12(-13) cubic. Head in dorsal view 1.9 times as broad as long (Fig. 113), transitional in size considering couplets 18 (27) and 27 (18), see also couplet 20 (21). Hind pair of ocelli far from each other, OOL as long as POL (Fig. 113). Apical emargination of

carapace relatively less deep, about half as deep as wide (Fig. 118). Ground colour of body rusty brown to dark brown, carapace rusty. Wings hyaline. ♀: 1.7 mm. – Philippines **S. (S.) puellaris** sp. n.

55 (48) Body black. Legs usually reddish yellow.

56 (59) Face rugose (Fig. 2).

57 (58) Carapace globose, in dorsal view (Fig. 6) 1.4 times as long as broad, roughly rugose; in lateral view (Fig. 7) twice as long as high medially, its upper outline moderately convex (Fig. 7). Legs somewhat unusually thick, hind femur three times as long as broad, hind tibia distally from its middle evenly broad, hind tarsus one-fifth shorter than hind tibia (Fig. 4). Temple in dorsal view almost as long as eye (Fig. 1). Ovipositor sheath nearly twice as long as hind tibia. Body blackish brown, legs brown, hind tibia basally whitish. Wings brownish fumous. ♀: 3 mm. – Malaysia (Northern Borneo) **S. (S.) aramus** sp. n.

58 (57) Carapace less globose, in lateral view 2.5–3 times as long as high, its upper outline less convex. Legs not thick, usual in their size, hind femur 3.2–3.5 times as long as broad (Fig. 79). Temple shorter than eye (Fig. 67 in PAPP 1984: 156). Wings hyaline. Face either rugose to rugulose (cf. Fig. 2) or smooth with fine punctuation, see also couplet 60 (61)

S. (S.) tortilis PAPP, 1984

59 (56) Face smooth and at most with fine punctuation to subpunctuation. Carapace rugose or strio-rugose (Fig. 59); in dorsal view less globose, at least 1.5 times as long as broad (Fig. 69 in PAPP 1984: 156, Fig. 59); in lateral view at least 2.5 times as long as high (Fig. 60). Legs not thick, usual in form and size.

60 (61) Temple in dorsal view strongly rounded (Fig. 67 in PAPP 1984: 156). Antenna with 20–21 antennomeres. Apical rim of carapace with a pair of denticles (Figs 70–71 l.c.). Pterostigma issuing radial vein hardly distally from its middle (Fig. 68 l.c.). Legs reddish yellow, hind tibia distally and tarsus variably infuscate to blackish. ♀: 2.2–2.7 mm. See also couplet 58 (57). – Laos, Viet Nam

S. (S.) tortilis PAPP, 1984

61 (60) Temple in dorsal view constricted (Fig. 57). Antenna with 24 antennomeres. Apical rim of carapace without a pair of denticles (Fig. 61). Pterostigma issuing radial vein distinctly distally from its middle (Fig. 58). Otherwise very similar to previous species. – Laos, Malaysia (Northern Borneo), Viet Nam **S. (S.) granatus** sp. n.

62 (1) Rim of carapace behind (or third tergite below) more or less denticulate (Figs 16, 33, 37, 43, 85, 92, 98) (subgenus *MuirIELLA* FULLAWAY, 1919).

63 (72) Radial cell short, along metacarp its length shorter than pterostigma (Figs 13, 54, 89).

64 (65) Radial cell just longer along metacarp than pterostigma (Fig. 7 in PAPP 1984: 138). Further details see at key couplet 82 (81) **S. (M.) bucculus** PAPP, 1984

65 (64) Radial cell unambiguously shorter along metacarp than pterostigma (Figs 13, 54, 89).

66 (69) Temple in dorsal view (Fig. 52) rounded to strongly rounded, eye about one-third to one-fourth longer than (i.e. 1.5–1.6 times as long as) temple (Fig. 52).

67 (68) Discoidal cell relatively high, i.e. *n. bas.* and *cu1* less diverging posteriorly (Fig. 90). Hind femur broadest at about its middle (Fig. 88). Ovipositor sheath short, as long as hind tarsus. Antenna with 25–26 antennomeres. Carapace yellow; wing subhyaline, i.e. faintly brownish fumous. ♀♂: 3–3.1 mm. – Papua New Guinea, Fiji Islands **S. (M.) orangus** sp. n.

- 68 (67) Discoidal cell relatively less high, i.e. *n. bas.* and *cu1* more diverging posteriorly (Fig. 55). Hind femur broadest at its distal half (Fig. 53). Ovipositor sheath long, almost as long as mesosoma and carapace together. Antenna with 27 antennomeres. Carapace blackish; wings brownish fumous. ♀: 2.5–2.8 mm. – Fiji Islands
S. (M.) fijicus sp. n.
- 69 (66) Temple in dorsal view (Fig. 9) constricted, eye 1.75–2 times as long as temple (Fig. 9).
- 70 (71) Carapace in lateral view (Figs 16–18) convex and at most hardly downcurving, 2.7–3.1 times as long as high. Hind femur 3.3–3.6(–3.8) times as long as broad (Fig. 12). Pterostigma less wide, 3.4–3.7 times as long as wide (Fig. 13). Ovipositor sheath long, about as long as carapace. Head and mesosoma blackish brown to dark brown, carapace testaceous, legs yellow. ♀♂: 2.2–2.4 mm. – Fiji Islands
S. (M.) bicticus sp. n.
- 71 (70) Carapace in lateral view (Fig. 96) more convex and more downcurving, 2.1 times as long as high. Hind femur thick 2.85 times as long as broad (Fig. 94). Pterostigma wide, 2.4 times as long as wide (cf. Fig. 58). Ovipositor sheath short, 0.6 times as long as carapace. Head and mesosoma black, carapace brownish black, legs brownish yellow. ♀: 2.3 mm. – Papua New Guinea
S. (M.) pernegrus sp. n.
- 72 (63) Radial cell long, along metacarp its length greater than pterostigma (Figs 30, 82, 120).
- 73 (76) Temple in dorsal view rounded to strongly rounded, eye one-quarter to one-third longer than temple (Fig. 106). Rim of carapace behind weakly denticulate (Figs 43, 112).
- 74 (75) Carapace in lateral view (Fig. 110) more convex, twice as long as high medially and moderately downcurved. Apical rim of carapace moderately emarginate (Fig. 111). Hind femur thick, 3–3.1 times as long as broad at its middle (Fig. 108). Head in dorsal view distinctly twice as broad as long (Fig. 106). Wings hyaline. ♀: 3.8–4 mm. – Thailand
S. (M.) pinsapo sp. n.
- 75 (74) Carapace in lateral view (Fig. 41) less convex, 2.35 times as long as high behind and not downcurved. Apical rim of carapace deeply emarginate (Fig. 42). Hind femur less thick, 3.8 times as long as broad posteriorly (Fig. 39). Head in dorsal view 1.8 times as broad as long (cf. Fig. 1 in PAPP 1991: 76). Wings subhyaline. ♀: 3.7 mm. – Malaysia (Northern Borneo)
S. (M.) deversus sp. n.
- 76 (73) Temple in dorsal view constricted, eye about twice as long as temple (Figs 80, 119). Rim of carapace behind either weakly (Figs 85, 123) or distinctly denticulate (Figs 33, 37, 100).
- 77 (78) Face densely punctate, interspaces smaller than punctures, dull. Carapace globose, in lateral view (Fig. 85) twice as long as high; in dorsal view 1.36 times as long as broad medially, evenly areolated (Fig. 84). Antenna with 25 antennomeres. Temple in lateral view not broadening ventrally. Head in dorsal view (Fig. 80) distinctly transverse, 2.1 times as broad as long. Hind femur 3.3 times as long as broad at its middle. Ovipositor sheath as long as carapace. Body tricoloured: ground colour of body blackish, pro- and mesonotum as well as tegula testaceous, legs yellow. Wings hyaline. ♀: 3 mm. – Viet Nam
S. (M.) odrinus sp. n.
- 78 (77) Face smooth and shiny, at most with very fine and disperse subpunctation. Carapace less globose (Fig. 4 in PAPP 1984: 138; Figs 31–32).
- 79 (80) Carapace ventro-apically deeply incurved and its third tergite umbiliform (Fig. 121–122); rim of carapace behind less denticulate (Fig. 123). Carapace in lateral view

somewhat flattened, 2.8 times as long as high behind (Fig. 122). Antenna with 29 antennomeres. Temple in lateral view slightly broadening ventrally. Head in dorsal view (Fig. 119) transverse, 1.95 times as broad as long. Hind femur 3.5 times as long as broad distally. Body black, legs yellow. Wings subfumous. ♂: 2.9 mm. – Papua New Guinea
S. (M.) umbofer sp. n.

80 (79) Carapace ventro-apically at most hardly incurved and its third tergite not umbiliform (Figs 31–33, 100); rim of carapace behind denticulate (Figs 1 and 8 in PAPP 1984: 138; Figs 33, 37, 100).

81 (82) Carapace moderately globose, in lateral view about 2.3 times as long as high medially (Fig. 33). Temple in lateral view almost evenly broad behind eye, i.e. faintly broadening ventrally (Fig. 28). Carapace costate, intercostate surface rugo-rugulose (Figs 31–32). Ovipositor sheath relatively short, 0.7 times as long as carapace. In comparison to next species apical rim of carapace with large denticles (Fig. 1 in PAPP 1984: 138; Figs 33, 37). Body black to blackish, exceptionally rusty brown, legs yellow or brownish yellow. ♀: (2.3)–2.7–3 mm, ♂: 2.2–2.4 mm. – Indonesia (Larat), New Britain, New Guinea, Solomon Islands
S. (M.) concisa (FULLAWAY, 1919)

82 (81) Carapace not globose, in lateral view somewhat flattened, three times as long as high behind (Fig. 100). Temple in lateral view strongly broadening ventrally (Fig. 5 in PAPP 1984: 138). Carapace longitudinally strio-rugose (Fig. 99). Ovipositor sheath relatively long, as long as or one-fifth longer than carapace. In comparison to previous species apical rim of carapace with less large denticles (Fig. 8 in PAPP 1984: 138). Body black or rusty brown, legs blackish. ♀: 3–3.3 mm. – New Britain, Papua New Guinea
S. (M.) bucculus PAPP, 1984

CHECKLIST OF THE TRIASPIDINE SPECIES OF THE INDO-AUSTRALIAN AND PACIFIC REGION

Up to now fourty-eight triaspidine species are registered distributed in the region indicated in the chapter title. The species are representing three genera: *Schizoprymnus* FOERSTER, *Triaspis* HALIDAY and *Urosigalphus* ASHMEAD of which the *Urosigalphus* species were introduced in the Hawaii Islands (from the American continent). Numerically the triaspidine species are divided in the genera in the following figures: *Schizoprymnus* 35 species (subgenus *Muiriella* 10 and subgenus *Schizoprymnus* 25 species), *Triaspis* 11 species and *Urosigalphus* 2 species.

***Schizoprymnus* FOERSTER, 1862** (subgenera *Muiriella* FULLAWAY, 1919 = M. and *Schizoprymnus* FOERSTER, 1862 = S.)

- (S.) admirabilis PAPP, 1991 – Malaysia (Northern Borneo)
- (S.) aramus sp. n. – Malaysia (Northern Borneo)
- (S.) belairi PAPP, 1991 – Australia (South Australia)
- (M.) bicticus sp. n. – Fiji Islands
- (S.) bimus PAPP, 1991 – Philippines

- (M.) bucculus PAPP, 1984 – Indonesia (Irian), New Britain, Papua New Guinea
 (S.) calurus sp. n. – Laos, Viet Nam
 (M.) concisa (FULLAWAY, 1919) – Indonesia, New Britain, Papua New Guinea, Solomon Islands
 (S.) corniculiger PAPP, 1991 – Australia (Queensland)
 (S.) deres PAPP, 1991 – Laos
 (M.) deversus sp. n. – Malaysia (Northern Borneo)
 (S.) doryphorus PAPP, 1991 – Viet Nam
 (S.) eminens sp. n. – Indonesia (Irian), Papua New Guinea
 (M.) fijicus sp. n. – Fiji Islands
 (S.) granatus sp. n. – Malaysia (Northern Borneo)
 (S.) imitatus sp. n. – Taiwan
 (S.) irreptus PAPP, 1991 – Viet Nam
 (S.) maai sp. n. – Malaysia (Northern Borneo)
 (M.) odrinus sp. n. – Viet Nam
 (M.) orangus sp. n. – Fiji Islands, Papua New Guinea
 (M.) pernegrus sp. n. – Papua New Guinea
 (S.) phytattus sp. n. – Malaysia (Northern Borneo)
 (M.) pinsapo sp. n. – Thailand
 (S.) politus PAPP, 1984 – Papua New Guinea
 (S.) puellaris sp. n. – Philippines
 (S.) reflexus PAPP, 1991 – New Hebrides
 (S.) sedlacekorum PAPP, 1991 – New Hebrides
 (S.) subutus PAPP, 1991 – Philippines
 (S.) szelenyii PAPP, 1991 – Australia (South Australia)
 (S.) torreador PAPP, 1991 – Malaysia (Northern Borneo)
 (S.) tortilis PAPP, 1984 – Laos, Viet Nam
 (M.) umbofer sp. n. – Papua New Guinea
 (S.) urticus PAPP, 1991 – Philippines
 (S.) viisas PAPP, 1991 – Papua New Guinea
 (S.) vuptus sp. n. – Papua New Guinea

Triaspis HALIDAY, 1835

- bangelus PAPP, 1984 – Philippines
 coruscus PAPP, 1984 – New Hebrides, Papua New Guinea, Philippines
 fumosus PAPP, 1984 – Papua New Guinea
 nishidai PAPP, 1984 – Papua New Guinea
 pumilus PAPP, 1984 – New Britain
 scotospilus PAPP, 1984 – Malaysia (Northern Borneo)
 semiglaber (SZÉPLIGETI, 1902) – Laos, Malaysia (Northern Borneo), Papua New Guinea,
 Philippines, Thailand
 tadornus PAPP, 1984 – Malaysia (Northern Borneo)
 transitus PAPP, 1984 – Malaysia (Northern Borneo), New Caledonia, New Hebrides
 tripartitus (SZÉPLIGETI, 1905) – Australia (New South Wales), Philippines
 versatus PAPP, 1984 – Malaysia (Northern Borneo)

Urosigalpus ASHMEAD, 1889

- bruchi CRAWFORD, 1907 – USA (Hawaii, introduced)
 schwarzi CRAWFORD, 1907 – USA (Hawaii, introduced)

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Further references see in my first paper: PAPP 1984:158.

A REVISION OF THE PALAEARCTIC SPECIES OF GYMNONOMUS LOEW (DIPTERA, HELEOMYZIDAE)

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(Received 16 March 1992)

A revision of the genus is given with the new taxonomical status as genus and the generic characters are discussed. Six species new to the science are described: *G. czernyi* sp. n. (Czecho-Slovakia, Germany, Hungary, Poland), *G. gorodkovi* sp. n. (Mongolia), *G. europaeus* sp. n. (several European countries), *G. martineki* sp. n. (Austria, Switzerland), *G. mongolicus* sp. n. (Mongolia), *G. soosi* sp. n. (Bosnia). The lectotypes for *G. spectabilis* (LOEW, 1862) and *G. caesius* (MEIGEN, 1830) are designated. Description of male terminalia of all the twelve species (incl. those of the type-species, *Gymnomus troglodytes* LOEW, 1863) are presented. *G. caesius* (MEIGEN, 1830), *G. ceianui* (MARTINEK, 1985), *G. mariei* (SÉGUY, 1934), *G. sabroskyi* (GILL, 1962) and *G. spectabilis* (LOEW, 1862) are new combinations. *Gymnomus ceianui* (MARTINEK, 1985) was earlier mentioned as *Scoliocentra tatraica* MS name. The key to the hitherto known Palaearctic species is given. With 72 original drawings.

LOEW (1863) described a new genus *Gymnomus*, based on one species *G. troglodytes* from caves. This taxon was treated as a monotypical genus by some specific characters for decades. GORODKOV (1972a) proposed the synonymy of *Gymnomus* with *Scoliocentra* LOEW, 1862, reflecting a very broad generic concept of *Scoliocentra*.

PAPP (1981) noted the homology of the genitalia of the so-called *Scoliocentra caesia*-group and of the type-species *G. troglodytes*. In the Catalogue of Palaearctic Diptera GORODKOV (1984: 28) placed *Gymnomus* as a subgenus of *Scoliocentra* and included other four species in it but the reasoning of his procedure has not been presented yet. We are convinced that the synapomorphies found mainly in male genitalia are enough to prove the monophyly of the species included below. The rank of *Gymnomus* is elevated to the generic level though we know it would be necessary to group and to compare all of the species of the tribe Heleomyzini (not in the sense of MCALPINE 1985, who applied this name for the subfamily Heleomyzinae sensu GORODKOV, 1984). A subsequent paper is planned for studies on the Nearctic species of *Gymnomus* and for the cladistic analysis of all the known species.

Our revision is based mostly on the analysis of male terminalia, which show the best specific characteristics in the genus (see COLLART 1940, PAPP 1981). *Gymnomus troglodytes* differs from other species of the genus in some morphological characters only: humeral bristle absent, eye as high as cheek, arista much longer than head and longer pubescent than that of other species; all these can be treated only as an adaptation to the cave conditions. *Oecothea praecox* (a cave species) and some others species of *Oecothea* (*Oecotheini*) have reduced eyes as well; some specimens of *Gymnomus troglodytes* also possess a small praesutural dorsocentral; praesuturals are also absent in some *Suillia* (*Suillini*) species: *S. wittei* (COLLART), *S. immaculata* CZERNY (Afrotropical species) [see COGAN 1971], or contrarily, these bristles are present in some specimens of *Tephrochlamys rufiventris* (Heteromyzini), where usually absent [see STROBL 1906]. The humeral bristle is rather well developed in most of the genera (also in *Suillia atricornis* though it is absent in an overwhelming majority of the *Suillia* species). Thus all the above mentioned morphological characters of *Gymnomus troglodytes* must be treated only as a homoplasy in Heleomyzidae. The genitalia of *Gymnomus troglodytes* are very similar to those of other species in the genus possessing two symmetrical membranous projections at the basiphallus.

As for the nomenclature of male genital parts we follow GORODKOV's one in this paper; genital parts are drawn in different views but cerci are depicted mainly in caudal view, editum in a medial view at broadest extension of its lateral lobe, surstylus in a medial view at broadest extension and gonite in a lateral-sublateral view when its bristles are seen in the plane of drawing.

The materials were borrowed from various institutions (abbreviations are used in the text in parentheses, an asterisk indicates collections where type specimens are preserved or were borrowed from):

- *HNHM – Magyar Természettudományi Múzeum Állattára, (Zoological Department, Hungarian Natural History Museum), Budapest, Hungary
- *ISEA – Institute of Systematics and Evolution of Animals, PAS, Kraków, Poland
- MHNG – Muséum d'Histoire naturelle, Genève, Switzerland
- *MMB – Moravian Museum, Brno, Czechoslovakia
- *MNHN – Muséum National d'Histoire Naturelle, Paris, France
- *MHNN – Musée d'Histoire naturelle, Neuchâtel, Switzerland
- *NMW – Naturhistorisches Museum in Wien, Austria
- TC – Dr. M. Carles-Tolrá's collection (Barcelona, E)
- *USNM – National Museum of Natural History, Smithsonian Institution, Washington, USA
- *VM – Dr. V. Martinek's collection (Dobruška, CSFR)
- *WA – A. Woźnica's collection (Wrocław, PL)
- *ZMB – Zoologisches Museum der Humboldt Universität zu Berlin, Germany
- ZMZ – Zoologisches Museum, Univ. Zürich-Irchel, Switzerland

We would like to express our sincere thanks to the curators of the collections: DR. G. BÄCHLI (ZMZ), DR. D. BURCKHARDT (MHNG), DR. M. CARLES-TOLRÁ (Barcelona, E), DR. RUTH CONTRERAS-LICHENBERG (NMW), DR. J.-P. HAENNI (MHNN), DR. W. KRZEMINSKI (ISEA), DR. P. LAUTERER (MMB), DR. V. MARTINEK (CSFR), DR. W. N. MATHIS (USNM), DR. L. MATILE (MNHN), DR. H. SCHUMANN (ZMB) for the loan of materials important for this study.

Gymnomus LOEW, 1863

LOEW, 1863: Wien ent. Mschr. 7: 36. – Type-species: *Gymnomus troglodytes* LOEW, 1863: 1.c.: 37 (orig. des., mon.) (as genus). – Gender: masculine.

Diagnosis: in general as given for *Scoliocentra* LOEW, 1862 by GORODKOV (1962) and PAPP (1981) and specifically: 2 pairs of *ors*, anterior pair comparatively long (except in *troglodytes*), about a half of length of posterior *ors*, 1 pair of vibrissa, peristomal hairs comparatively short (longer but very thin in *mariei*), 1 pair of prosternals, only 1 pair of katepisternals (sternopleurals), anepisternum not covered by hairs; male genitalia with well-developed *edita* and *surstyli*, *editum* widely bilobed (e.g. Fig. 19), medial lobe with dense short black thornlets, basiphallus with two symmetrical membranous projections.

The genus can be characterized as follows: praefrons meets face area (postfrons) at a slightly obtuse angle, colour variable, mostly yellow orange and exceeds in two narrowed wedge-shaped lobes backwards on sides of the ocellar triangle; one strong oral vibrissa, 2 fronto-orbitals (*ors*), the anterior one about 0.3–0.75 length of the posterior one, bending nearly perpendicularly outside. Arista short pubescent. First two basal segments of arista seem swollen. Thoracic chaetotaxy: always 1 pair of prosternal bristles, exceptionally 2 pairs; 1 humeral, 2 notopleurals, posterior one without short hairs around it; 1 praescutellar, 2 scutellar pairs; (0)–1+3 dorsocentral bristles, 1 propleural; anterior corner of anepisternum (mesopleuron) (behind the propleuron) with several small hairs; katepisternum (sterno-pleuron) with 1 strong bristle, haired, propleuron and anepimeron (ptero-pleuron) without hairs. Scutellum bare. Thorax bluish-grey, brownish in some species. Legs with preapical bristles: preapicals on the fore and hind tibiae thinner than on the mid one. Apical tarsomere of all tarsi with long black hairs. Abdomen yellow to yellowish brown with microtomentum, postabdomen specifically formed by two projections.

Male terminalia: Epandrium and external genitalia form a double-shell over internal genitalia: outer shell: epandrium + cerci + edita; inner shell: large plates dorsal to surstyli + surstyli; the two shells join at two places: laterally to cercal bases and at the surstylus-editum conjunction. Hypandrium meet the outer shell at the dorsal 1/4 of epandrium (and

apices of plates approximate that conjointment). Cerci well developed, in the ventro-basal part connected or even fused on a section e.g. in *G. troglodytes*, editum in two lobes: medial lobe with a projecting process with black thorns (spines) grouped in its broad apex; its lateral lobe usually with some small thin setae and with black thornlets ventrally, surstylus usually longer than cerci and with dense black thornlets on both sides. Gonites with two well-developed black bristles. Phallus long and thin, not haired, basiphallus with two symmetrical membranous projections, apical part broadened. Hypandrium of an intricate structure largely of two U-shaped sclerite which usually bear well-developed bristles (e.g. Fig. 35); aedeagal apodeme partly fused with hypandrium; a well developed distinct but free ejaculatory apodeme always present.

Gymnomus caesius (MEIGEN, 1830)
(Figs 1–4, 13)

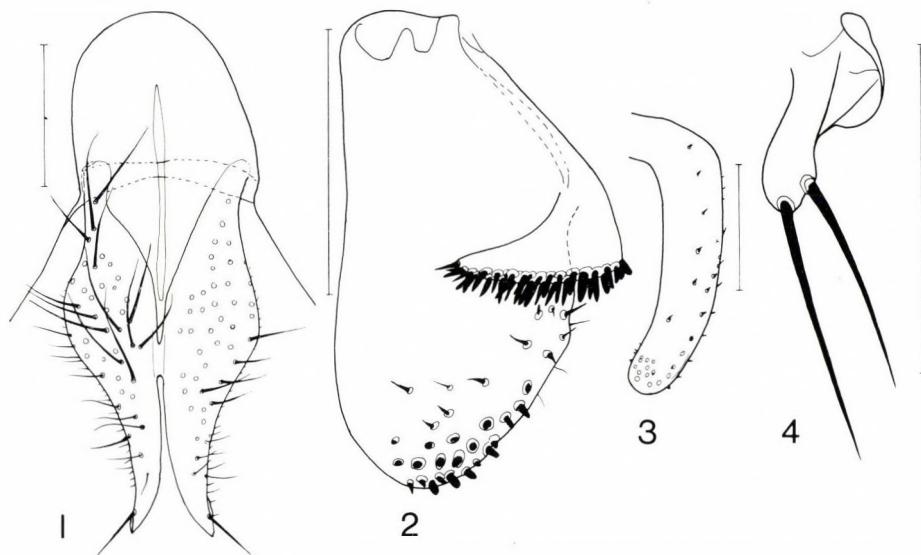
Helomyza caesia MEIGEN, 1830: Syst. Beschr. 6: 56. – *Blepharoptera caesia*: LOEW, 1862: 2. – *Amoebaleria caesia*: CZERNY, 1924: 134. – *Scoliocentra (Gymnomus) caesia*: GORODKOV, 1984: 29. – *Scoliocentra caesia*: MARTINEK, 1987: 241.

Total length of body (without antennae) 5.5–7.4 mm.

Head in lateral view about 1.15 times as high as long, anterior part of frons mostly yellow, posterior part behind anterior *ors* orange-brownish. Stripes near eyes with white pollinosity like parts of ocellar triangle and occiput. Ocellar triangle dark brown. Peristomal setae in 1 or 2 rows. 2 strong *ors*, anterior one about 0.66 length of the posterior one, bending nearly perpendicularly outside. Face yellow, palpi yellow-orange like scape and pedicel. Proboscis regularly brown. 2 strong *vt*, *pvt* relatively weaker. – Flagellomere relatively large, about 0.65 of cheek height, round, yellow-reddish and little darkened apically. Arista blackish-brown, very short pubescent, longer than height of head. Eyes round. Face below antennae more depressed, cheek-eye ratio about 0.58–0.60.

Thorax: mesonotum bluish grey, dorsal and pleural parts of thorax with white-grey pollinosity. Humerus grey, dorsal part densely covered by black thin and short setae. Scutellum greyish, brown marginally. Postscutellum in the same basic colour. Hind part of anepisternum and anterior part of anepimeron greyish-brown. Chaetotaxy: 1 + 3 dorsocentral bristles emerging from relatively large black spots, sometimes the dorsocentrals on a thin black stripe. Anterior corner of anepisternum with several small hairs, halteres pale yellow.

Wings: length 5.7 to 7.7 mm, width 2.5 to 2.9 mm. Membrane hyaline, crossveins not darkened. Costal spines strong and longer than width



Figs 1–4. *Gymnomus caesius* (MEIGEN), male genitalia: 1 = cerci, caudal view, 2 = editum, medial view, 3 = surstyli at its broadest (sublateral-medial view), 4 = gonite, lateral view. – Scales: 0.2 mm (all)

of the costa. Veins yellowish-brown. Medial vein ratio: lectotype 1.24, paralectotype 1.231, other specimens 1.139–1.390.

Legs yellowish orange, short haired. Mid and hind femora with dorsolateral bristles, hind femora with 3–4 black subapical dorsolateral bristles. Apical tarsomeres of fore and mid tarsi dark brown, other tarsomeres only darkened in their apical part. Two apical tarsomeres of hind tarsi brownish. Tibiae and tarsi short haired.

Abdomen: Tergites 1–4 dark bluish-grey, tergites 2–4 on the edges with small yellowish orange stripes. Tergite 4 in apical half yellowish orange as the caudal segments and epandrium. All tergites short haired with strong black marginal bristles.

Male terminalia: epandrium semiglobular, cerci (Figs 1, 13) much longer than wide, extended on the dorsal side and very much narrowed in the apical half, edita (Fig. 2) with very broad and rounded lateral lobe, medial surface apically with black thorns (spines), medial lobe broad apically with numerous rather long black thornlets; surstyli (Fig. 3) finger-like, curved distally with several black thornlets apically; gonites (Fig. 4) thin, shortly stalked with 2 strong and almost equally long bristles.

Type material – Lectotype by present designation: male (MNHN): “Meigen” – “caesia ♂” (handwriting, round); the lectotype is in a poor state of preservation: right half of its head was eaten by *Anthrenus* larvae, most parts of its legs lost; genitalia preserved in

a microvial with glycerin. – **Paratypes:** 1 female (MNHN): “Meigen” “caesia” [handwriting, round]; 1 male (NMW): only the male genitalia (dissected) in a plastic vial preserved in Vienna bearing a single red label: Lectotypus “♂ *Helomyza caesia* Meigen” (handwriting of K. B. Gorodkov).

Other specimens examined: 1 ♂ (NMW): Nordsh. Hoffm. 1 ♂ (NMW): Kraus 1880 II Wallor Loch. – Czecho-Slovakia: 26 ♂ (VM): Slovakia centr.: Vlciá cave (Slovensky Raj), 22. 07. 1989., V. KOSEL leg.; 8 ♂, 4 ♀ (VM): idem, 22. 07. 1976; 1 ♂ (VM): idem, 23. 09. 1976; 1 ♂ (VM): idem, 14. 08. 1976; 2 ♂ (VM): Slovakia, M. Karpaty, Zbojnická cave, 1. 07. 1989. 1 ♂ (MMB): Slovakia bor. 96/67, Vysoké Tatry, 1600 m., Trojhrané pleso, 12. 09. 67, P. LAUTERER. – Germany: 2 ♂ (ZMB): Pössneck, Riedel 2/7. 10. 07; 1 ♂ (ZMB): St. Wendel Rheinl. DUDA, 22. 05. 14; 1 ♀ (ZMB): 9. 11. 25 coll. M. P. RIEDEL. – Poland: 1 ♂, 1 ♀ (ZMB): Niemcza. DUDA, 2. 11. 08/8. 03. 07; 1 ♂ (ZMB): “caesia Mg”, Niemcza, Duda, 21. 05. 12; 3 ♂ (ISEA): Tatry, J. Lodowa, 4. 09. 51; 1 ♂ (ISEA): idem, 25. VII. 1952. – Switzerland: 1 ♀ (ZMZ): env. of Zürich., 25. III. 1919. – Hungary (HNHM): 10 ♂, 4 ♀: B. [ükk] N.[ational] P.[ark], Nagyvisnyó, Diabáz-barlang, 900 m, 24m, 1981. IX. 23., leg. ÁDÁM L.; 2 ♂: idem, Bánkúti víznyelő, 0–10 m; 1 ♂: Bükk N. P., Bánkút, Diabáz barl. bejárata [entrance of the cave] – 1982. VI. 2., leg. MISIKNÉ; 7 ♂: B.N.P., Nagyvisnyó, Bánkúti víznyelő barlang, 900 m, 1981. IX. 23., leg. ÁDÁM–PAPP L.; 16 ♂, 7 ♀: B.N.P., Nagyvisnyó, Diabáz-barlang, 1982. IX. 15., leg. ÁDÁM–PAPP; 2 ♀: idem, 0–10 m; 2 ♂, 3 ♀: B.N.P., Miskole, Vizes-barlang, 1984. VIII. 22., leg. MERKL O.; 1 ♂: B.N.P., Miskolc, Kecskelyuk, 1981. VIII. 23., leg. PAPP L.; 1 ♀: B.N.P.: Szilvásvárad, 1981. IX. 24., leg. ÁDÁM; 1 ♂: Bükk-hg., Istállós-kő – irtás – 1959. IX. 20., leg. TÓTH S.; 1 ♂: Pécs, THALHAMMER, “VII. 11.” – “*Blephariptera caesia* Mg.” coll. Thalhammer; 1 ♀: Mosonmagyaróvár, 1948. VI. 11., RUFF; 1 ♀: Budapest [test], 14. 6. [18]80.; 1 ♀: “Utcán” [on the street], 36 K.38. – Romania (HNHM): 1 ♀: Hu.Bihar, Melegszamos, Bokor, Becazár p.; 1 ♂: Hu. Bihar, Alun-völgy, BOKOR (on the reverse side: “Aluni-b.[arlang]”); 1 ♂, 1 ♀: Hu.Bihar, Ponor-völgy, BOKOR (on the reverse side: “Csiki b[arlang]”); 1 ♂, 1 ♀: Szászka [Sasca Romana], “21. II. 904., Kristen”. – “*H. caesia* Mg.” Det. CZERNY; 1 ♂, 2 ♀: Hu.Bihar, Bárssa, BOKOR; 3 ♂: “Fericse/Feritse” – “*H. caesia* Mg.” Det. CZERNY; 1 ♂, 1 ♀: Bedelői h., Csiki – Klára barlang, 1916. VII. 1. Austria: 1 ♂ (NMW): Austria – “caesia” Alte Sammlung; 1 ♂ (HNHM): Austria inf., Wien – “*H. caesia* Mg.” Det. CZERNY; 1 ♀ (HNHM): Tyrolis, Stilfser Loch – “*H. caesia* Mg.” Det. CZERNY. – France: 1 ♂ (HNHM): Isère: tran de Glaz, 19. VIII. 1974, leg. Crolle; 3 ♂ (MHNG): Grotte du Guier Mort, France (Isère), 1974, leg. lab. Biol. Sout.; 2 ♂, 2 ♀ (MHNG): Barre Froide Supérieur, Près de Faline, Hte Savoie, (F), Août 1973, leg. J. D. BOURNE; 2 ♂ (MHNG): Trou de Glatz, France (Isère), 1978, leg. lab. Biol. Sout, Lyon; 2 ♂, 7 ♀ (MHNG): Grotte Vers-chez le Brandt, NE 1, 27. 08. 1980, leg. B. HAUSER et al., L. PAPP det.; 3 ♂, 4 ♀ (MHNG): Gr. du Grand Bochat, NE 33, 17. 07. 1978, leg. STRINATI et AELLEN, L. PAPP det.; 2 ♂ (MHNG): Gr. du Prégure, NE 12, 28. 07. 1980, V. AELLEN leg.; 1 ♂, 1 ♀ (MHNG): Gr. aux Pards, NE 51, 23. 07. 1978, Leg. V. AELLEN, L. PAPP det.

Distribution: Austria, Czecho-Slovakia, France, Germany, Hungary, Poland, Romania, Switzerland, Sweden.

Remarks: *G. caesius* is closely related to *G. czernyi* sp. n. and is different from it in characters given in the key below, p. 208.

Gymnomus ceianui (MARTINEK, 1985)
 (Figs 5–9)

Scoliocentra ceianui MARTINEK, 1985: 1080. – *Scoliocentra tatraica* “GORODKOV, in litt.”: MARTINEK, 1977: 68; 1986: 140; 1987: 241.

Measurements in mm: total body length (without antennae) 5.5–6.0, length of wing 5.8 to 6.5, width of wing 1.8 to 2.0.

Head in lateral view about 1.2–1.3 times higher than long. Frons rather yellow orange. Stripes near eyes with white grey pollinosity like parts of ocellar triangle and occiput. Basic colour of these parts blue grey. 2 strong *ors*, anterior one shorter than half length of posterior one. Peristomal setae in two irregular rows. Cheek-eye ratio about 0.52–0.54. – Flagellomere relatively large and round, at most 0.66–0.67 of cheek height. Colour of scape and pedicel more intensive brown-yellow alike facial plate. Arista relatively long but its pubescence comparatively short.

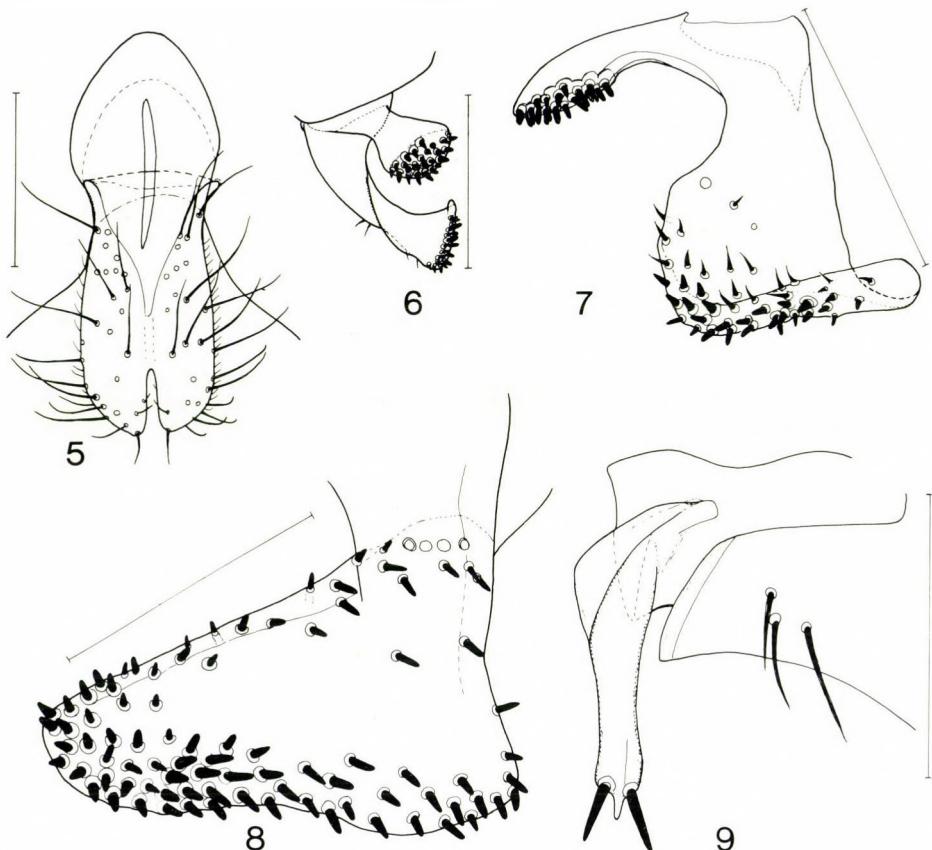
Thorax: dorsal and pleural parts bluish grey with white grey to brown pollinosity, other parts of body slightly brown. Mesonotum covered with black short setae. 1+3 dorsocentrals on relatively large brown spots (particularly so behind suture). 1 strong propleural bristle, anepisternum bare except some fine hairs near propleuron, anepimeron fully bare. One katepisternal, katepisternum with dense and short black hairs. Humeri of the same colour as thorax. Scutellum flat, reddish yellow between bristles and on adjacent borders, otherwise bluish grey like thorax, halteres brownish yellow.

Wings: entirely hyaline, crossveins not clouded. Costal spines longer than width of costa. Medial vein ratio about 1.150–1.333.

Legs: intensively reddish yellow, fore coxae and femora darkened. Hind femora with 2–3 strong dorsolateral bristles.

Abdomen: reddish yellow, tergites 3–5 with clear grey tinge and pollinosity.

Male terminalia: epandrium relatively large; cerci flat and short (Fig. 5), coalesced subbasally, laterally with fine and long hairs, apically with a pair of thicker hairs; editum (Figs 6, 7) with very long and caudally directed medial lobe bearing a disciform medial apex very densely blackly thorned, lateral lobe with a broad incurving apical part bearing dense thornlets not only in medial surface but on apex; surstyli (Fig. 8) extremely broad basally with strong (i.e. rather long) black thornlets, densely grouped apically and subapically giving a darker colour (or darker impression) of surstyli; gonites (Fig. 9) elongated (stalked) with a small apical process and with two small but thick bristles.



Figs 5–9. *Gymnomus ceianui* (MARTINEK), male genitalia: 5 = cerci in caudal view, 6–7 = editum; 6 = caudal view, 7 = medial (sublateral view, lateral lobe at its broadest), 8 = surstyli in widest extension (sublateral view), 9 = gonite with a part of hypandrium, lateral view. – Scales: 0.2 mm (all)

Type material – Paratype male (VM): Romania occ. mer.: Retezat Mts [1650 m] nr. Hunedoara, 18. 9. 1979., Ceianu lgt.

Other specimens examined: 1 ♂ (MMB), *Gymnomus ceianui* (= *tatrica*): Slovakia bor. 96/67, Vysoké Tatry 1600 m, Trojhrané Pleso, 12. 9. 67, P. LAUTERER, "Holotypus in litt." (red), Scoliocentra sp. n. GORODKOV det. 72, (genitalia with segments 4–5 dissected, in microvial; lost: flagellomere, second right ors, left first scutellar.) – Poland: 3 ♂ (ISEA): Tatry, J. Lodowa, 20. VII. 1951/7. VII. 1952. – France: 1 ♂ (NMW): Marseille, 217. Spain: coll. M. CARLES-TOLRÁ: Prov. Zaragoza, Monegros, Pina de Ebro, Retuerta de Pina, leg. J. BLASCO-ZUMETA: 19 ♂, 29 ♀: pitfall trap/coloured plate/Malaise trap/Moericke trap/trap with pig liver, 28. 11. 1990–31. 12. 1991 (Nos 2506, 2525, 2527, 2561, 2606, 2630, 2667, 2725, 2885, 3086, 4161, 4205, 4215, 4220, 4221, 4271, 4277, 4285); 1 ♀ (CT): 58.T2.; 1 ♀ (HNHM): Castell defels, 10. 12. 1983, 1 ♀: St. Marcal, 16. 02. 1989. – Hungary: 1 ♂ (HNHM): Simontornya, "K. abl." [in the garden, on window], V. 7. – 1924, Hung. occ. – "Blepharoptera spectabilis Lw." – coll. PILlich.

Distribution: Czechoslovakia, France, Hungary, Poland, Romania, Spain. This is a mountain species (Pyrénées, Carpathian Mts), known also from caves.

Remark: Specimens of *G. ceianui* are distinguished from congeners by the characters in the key below, p. 208; with *G. sabroskyi* it forms a special group within the genus. We cannot exclude now that this group would deserve a subgeneric rank (of course as a result of future studies on the Holarctic species).

Gymnomus czernyi sp. n.

(Figs 10–12, 14–17)

Scoliocentra scutellata: MARTINEK 1982: 77; 1986: 140; 1987: 241 (not *scutellata* GARRETT, 1921, misinterpretation).

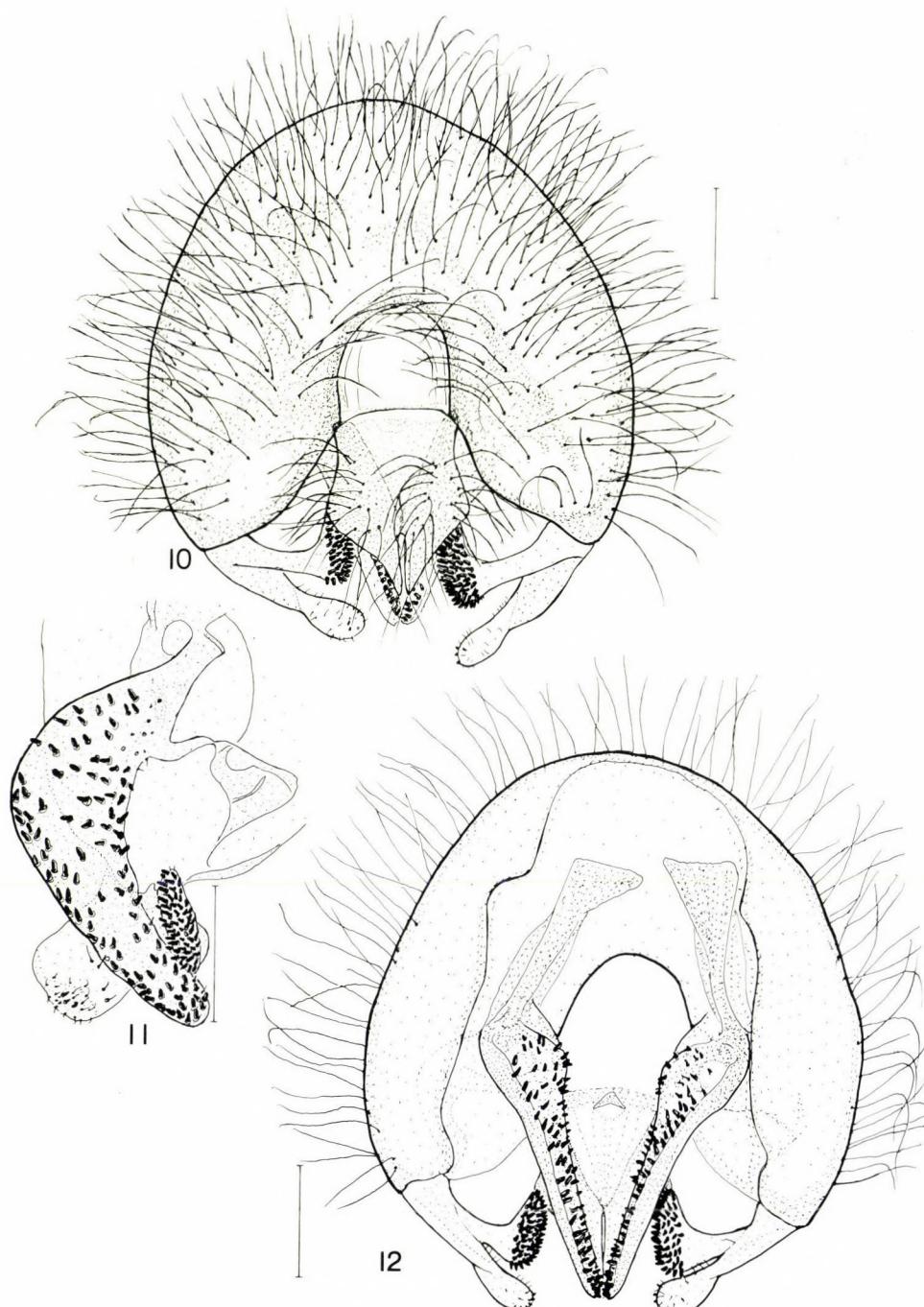
Measurements (in mm): total length of body (without antennae) 5.3–7.1, length of wing 5.7–7.6, width of wing 2.2–2.9.

Head in lateral view about 1.3 times higher than long. Frons meets with facial plate at a lightly obtuse angle. Anterior part mostly orange, posterior part reddish-brown. Stripes near eyes with white grey pollinosity like parts of ocellar triangle and occiput. Face brownish-yellow with silver pollinosity. Ocellar triangle dark brown. Basic colour of these parts blue grey. 2 strong *ors*, anterior one about 0.66 of the length of posterior one. 1 strong vibrissa, with 1–2 small black hairs above. Peristomal setae in 3–4 irregular rows. Palpi orange-brownish. Proboscis regularly dark brown. 2 strong *vt*, *pvt* relatively weaker. – Flagellomere smaller than in *caesius*, slightly elongated, at most 0.5 of cheek height, dark brown to blackish-brown. Scape and pedicel more intensive reddish orange. Arista considerably long but pubescence rather short, cheek-eye ratio about 0.64–0.65.

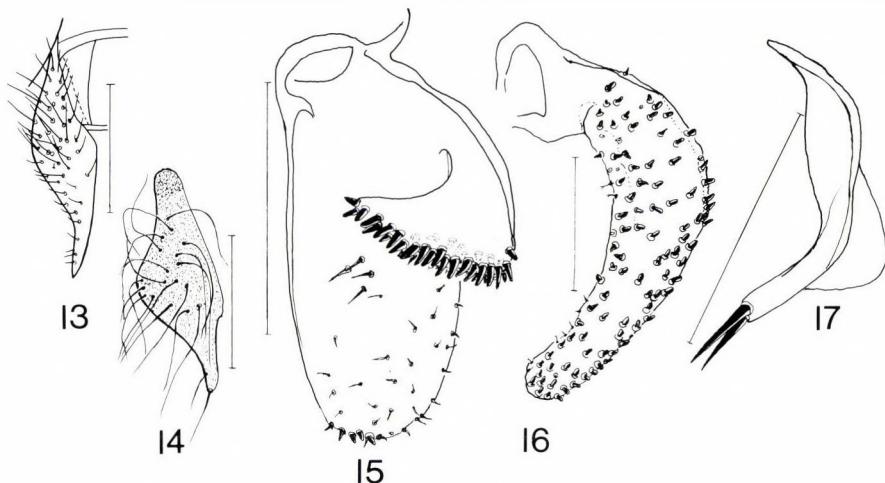
Thorax: dorsal and pleural parts bluish grey with grey pollinosity, other parts of body grey. Mesonotum covered with black short setae. Chaetotaxy: 1+3 dorsocentrals emerging from relatively large black spots (particularly so behind suture); usually a thin black stripe between dorsocentrals. Anepisternum bare except some fine hairs near propleuron, anepimeron fully bare. One katepisternal, katepisternum longer black haired than in *caesius*. Humeri of the same colour as thorax. Scutellum flat, brownish between bristles and on adjacent margin, otherwise blue-grey like thorax, halteres yellowish brown.

Wings: entirely hyaline, crossveins not clouded. Costal spines longer than width of costa. Medial vein ratio about 1.170–1.250.

Legs: intensively red-yellow. Mid and hind femora without bristles. Two apical tarsomeres of fore and mid tarsi dark brown, other tar-



Figs 10–12. *Gymnomus czernyi* sp. n., paratype, male genitalia: 10 = epandrium with cerci, edita and surstyli, caudal view, 11 = surstylus and editum in medial view, 12 = epandrium, edita and surstylus in cranial view. – Scales: 0.2 mm (all)



Figs 13–17. *Gymnomus* species, male genitalia: 13 = *G. caesius* (MEIGEN): cercus in caudal view; 14–17 = *G. czernyi* sp. n., paratype: 14 = cercus in caudal view, 15 = editum, medial view, 16 = surstylos, medial (sublateral) view, 17 = gonite laterally. – Scales: 0.2 mm (all)

someres only darkened apically. Two apical tarsomeres of hind tarsi darkened marginally and apically. Tarsomeres 2–3 darkened only apically. All tibiae and tarsi long haired. Fore coxae and femora more darker with bluish grey pollinosity. Hind femora with 4–6 strong dorsolateral bristles in two rows.

A b d o m e n: tergites 1–4 blackish-grey. Tergites 2–3 with clear grey pollinosity, tergite 4 in apical half reddish orange, 5th tergite and postabdomen of the same colour.

Male terminalia: epandrium (Figs 10, 12) large and round; cerci short, i.e. as long as wide, in medial part broadened, apically narrowed (Fig. 14), with relatively fine and long hairs; medial lobe of editum (Fig. 15) forms a projecting process with black thorns (spines) grouped on its medial apex, latter as wide as width of editum, lateral lobe with several black thorns and setae; surstylos curved (Figs 11, 16), distally narrowed, with some black thorns on both sides; gonites (Fig. 17) thin with two strong and long bristles, medial part with a membranous lobe.

Holotype male (HNHM): Slovakia e., Slov. Raj – Medvedia cave, V. Kosel lgt. – (on the reverse side) 30. 7. 89. (15–20).

Paratypes: 1 ♂ (ZMB): Amoebaleria caesia Mg. 5. 07. 22 (genitalia diss., ?from Germany); Germany: 1 ♂ (ZMB): Pössneck, RIEDEL, 15. 10. 07 W (genitalia diss.); 1 ♂ (ZMB): Pössneck, RIEDEL, 22. 10. 07; 1 ♂ (ZMB): Pössneck, RIEDEL, 7. 10. 07, (aus Steinen sichsonnend). – Poland: 1 ♂ (ZMB): Bad Reinerz [Miedzyrzecze], VII–VIII, M. P. RIEDEL leg.; 1 ♂ (ISEA): Tatry., J. Zimna (Poland), 11. 12. 1951; 1 ♂ (ZMB): Niemeza DUDA, 23. 06. 11; 1 ♂ (ISEA): Tatry, J. Lodowa, 20. VII. 1951 (diss.). – Czechoslovakia: 1

δ (VM): Bohemia centr. Praha Strahov, 5–11. 3. 1975, V. MARTINEK leg.; 1 δ (VM): Medvedia (cave), 8. 08. 90; 3 δ (VM): label same as for holotype; 1 δ (HNHM): Slovakia C., Slov. raj, Psie Dieri, 16. 08. 1976., V. KOSEL leg.; 1 δ , 4 φ (VM, HNHM): Slovakia Centr., Vlciá cave, slov. raj, 22. 07. 1976, V. KOSEL leg.; 1 δ (VM): idem, 22. 07. 1989; 1 δ (VM): CS: Sumava-Trojmezna, fly trap, 48.46N/13.50E 1350 m, PAVLICKO, 3. XI. 88. – Hungary: 1 δ (HNHM): Vác, Nagyszálesűs [Naszály], SZILÁDY, 1930. IX. 30. – Antrum.

Distribution: Czechoslovakia, Germany, Hungary, Poland.

G. czernyi sp. n. is dedicated to the late DR. LEANDER CZERNY, the excellent monographer of the heleomyzid species.

Gymnomus europaeus sp. n.
(Figs 18–27)

Amoebaleria ventricosa: CZERNY, 1924: 135; COLLART, 1940: 19, Fig. 4. – *Scoliocentra ventricosa*: PAPP, 1981: 64; MARTINEK, 1987: 241.

Total length of body (without antennae) 6.2–7.8 mm.

Head in lateral view about 1.1–1.15 times as high as long, anterior part of frons yellow orange, posterior part behind anterior *ors* orange-brownish. Stripes near eyes with grey pollinosity like parts of ocellar triangle and occiput. Ocellar triangle dark brown. Ocelli reddish-brown. One strong vibrissa with 1 small hair above. Peristomal setae in 2 irregular rows. 2 strong *ors*, the anterior one about 0.75 times as long as the posterior one. Palpi yellow. Proboscis regularly dark brown. 2 strong *vt*, *pvt* relatively weaker. – Scape and pedicel orange-brownish, flagellomere brownish, darkened apically, smaller than in *martineki*, about 0.47–0.49 of cheek height, slightly elongated. Arista longer than height of head, brownish-black with very short pubescence. Eyes round. Face little depressed below antennae, cheek-eye ratio about 0.61–0.615.

Thorax: mesonotum brownish-grey, densely covered with black and relatively long setae, dorsal and pleural parts of thorax with golden pollinosity. Humerus yellowish-orange to orange-brownish with grey pollinosity. Scutellum yellowish-brown, greyish-brown basally. Postscutellum in the same basic colour. Posterior part of anepisternum and anterior part of anepimeron orange-brownish. Chaetotaxy: 1+3 dorsocentral bristles emerge from relatively small dark brown spots, between dorsocentrals a thin and long greyish-brown stripe. Longest postpronotal acrostical bristles 0.225 mm, only 0.172 mm in *caesius* and 0.155 mm in *spectabilis*. Anterior corner of anepisternum with about 20 small hairs, katepisternum fine black haired with 1 katepisternal. Halteres yellowish-brown.

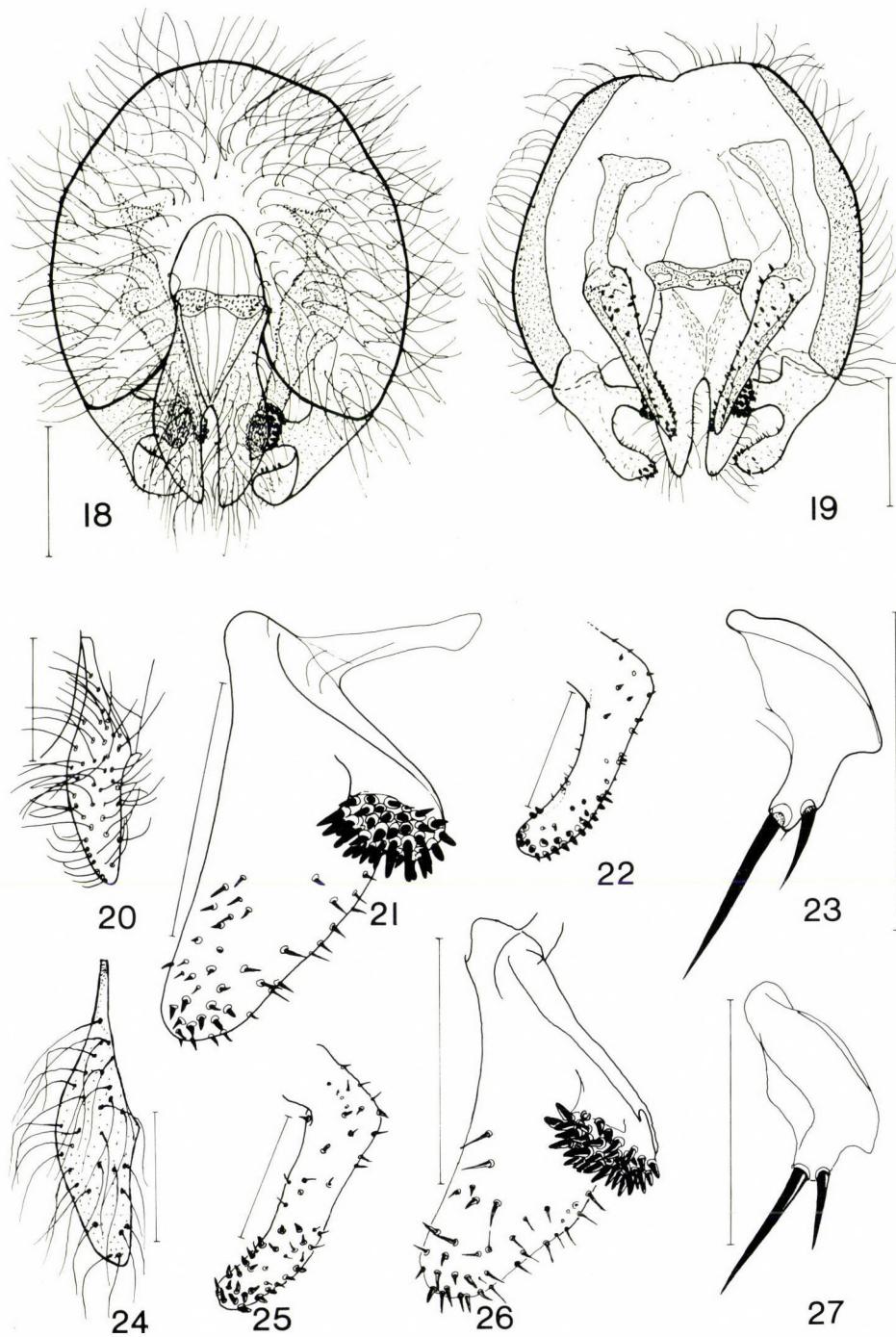
Wings: length 6.4–8.0 mm, width 2.6–2.9 mm. Membrane hyaline, crossveins not darkened. Costal spines strong and longer than width of costa; longest costal bristles 0.21 mm (i.e. approximately same as in *spectabilis* but only 0.15–0.16 mm in *caesius*). Veins brownish. Medial vein ratio 1.035–1.166.

Legs reddish-orange, longer haired than in *caesius*. Fore femora darkened with grey pollinosity, mid femora with some dorsolateral bristles, hind femora with 1–2 thin dorsolateral bristles. Fore tarsi dark brown except basitarsus (darkened only in the 1/3 apical part). Two apical tarsomeres of mid and hind tarsi dark brown marginally and apically, other tarsomeres only darkened apically. Hairs in mid tibiae as long as tibial width.

A b d o m e n: tergites 1–4 brownish-grey with grey pollinosity, marginally with thin brownish stripes. Tergite 5 and epandrium brownish-red. All tergites long haired with strong black marginal bristles.

M a l e t e r m i n a l i a: epandrium (Figs 18, 19) semiglobular; cerci (Figs 20, 24) extended dorsally and slightly narrowed apically, longer than wide; medial lobe of editum forms a process projecting with black thornlets (spines) grouped on its broad apex, lateral lobe extended with several setae and black thorns (Figs 21, 26), narrowed apically; surstyli (Figs 22, 25) curved distally and thinner than in *martineki*, distally and apically with several black thornlets (more thornlets apically); gonites (Figs 23, 27) similar to those of *martineki*, with two strong bristles, first one longer than half length of second one.

Type material: Holotype male (HNHM): Budakeszi, juhlegelő [sheep pasture], ürgelyukból [from burrows of souslik, *C. citellus*] – 1984. IV. 14., leg. PAPP, L. – Paratypes: Hungary (all in HNHM): 1 ♂: same as for holotype; 2 ♂: Solymár, Solymári barl. – 1960. VI. leg. BAJOMI D.; 1 ♂: idem, 1951. III. 2., leg. Kovács L.; 4 ♂: Simontornya, Hung. occ. 1912, VI. 6. “K.abl.” [on windows] – “Blepharoptera spectabilis Lw.” coll. THALHAMMER; 1 ♂: Százhalmabatta, 1979. IV. 5. – fehér színesapda [white colour plate], leg. Darvas B.; 1 ♂: Antr. Hárshegy, Buda, leg. BOKOR (reverse side) 1922. II. 28. – “Blepharoptera spectabilis Lw.” coll. THALHAMMER; 1 ♂: Vác, Nagyszálesűcs [Naszály], SZILÁDY, 1930. IX. 13. – Antrum; 3 ♂: Pécs, THALHAMMER, V. 26./VII. 12./19. – “Blepharoptera spectabilis Lw./caesia Mg.” coll. THALHAMMER; 1 ♂: Bükk hegys., Tard – 1957. IV. 4. leg. TÓTH S.; 1 ♂: Sz.-Fehérvár, Hungaria, THALHAMMER – “Blepharoptera spectabilis Lw.” coll. THALHAMMER; 1 ♂: B.N.P.: Miskolc, Vizes-barlang – 1984. VIII. 22., leg MERKL O.; 1 ♂: Eplény, Malomréti-v., 1974. VII. 12., Balla-Huszár. – Austria: 1 ♂ (NMW): Amoebaleria ventricosa BECK. L. CZERNY, Goldloch b. Türrnitz r.o. 14. 02. 1921, WETTSTEIN; 1 ♀ (NMW): Neusiedler See Bernhauer (Austria). – Czecho-Slovakia: 4 ♂ (VM): Kaniarova Cave, 24. 09. 1976, KOSEL leg.; 1 ♂ (VM): Slov. Cave Podbani, 5. 08. 88, KOSEL leg.; 2 ♂ (VM): Vlcie diery, 14. 8. 90. KOSEL; 1 ♂, 1 ♀ (WA): Slovensko, Vlcia, 3. 05. 1976 (WA); 1 ♂ (VM): CS: Medvedia jask., 22. 02. (15–30), KOSEL leg. – Poland: 1 ♀ (HNHM): Polonia, Pongrácz-Olkusz – “A. ventricosa Beck.” Det. CZERNY. – Romania: 1 ♂ (postabdomen missing) (VM): Romania or.bor. Valea Putnei nr. Gimpul. – Mold. lgt. I. CEIANU, I. 11. 61; 14 ♀♀ (HNHM): they probably belong to this species but are not designated as paratypes.



Figs 18–27. *Gymnomus europaeus* sp. n., paratypes, male genitalia: 18–19 = epandrium with external genitalia: 18 = caudal view, 19 = cranial view; 20, 24 = cercus, caudal view, 21, 26 = editum, medial view, 22, 25 = surstyli, medial (sublateral) view, 23, 27 = gonite laterally (upper line: a male from Hungary, lower line: a male from Slovakia). – Scales: 0.2 mm (all)

Distribution: Austria, Croatia, Czecho-Slovakia, Hungary, Poland, Romania.

Remark: *G. europaeus* sp. n. was mentioned by COLLART (1940) from Transsylvania (Romania) also from caves and a drawing on male genitalia was presented. Specimens of *G. europaeus* sp. n. are distinguished from congeners by the characters given in the key below, p. 208.

Gymnomus gorodkovi sp. n.
(Figs 28–33)

Measurements (in mm): body length 5.52, wing length ca. 5.93, width of wing 1.95, longest costal bristles 0.225.

Head in lateral view somewhat higher than long (ratio 1.05). Anterior part of frons back to posterior *ors* yellow orange, posterior part brownish. Face yellowish orange. Ocellar triangle dark brown. One strong oral vibrissa. Two *ors*, anterior one thinner than posterior one and about half length of the posterior bristle. Peristomal setae in one irregular row. Cheek-eye ratio 0.625. Arista dark brown, short pubescent. – Flagellomere dark brown, length about 0.63 of cheek height. Scape and pedicel reddish brown.

Thorax: pleural and dorsal parts of thorax brownish grey, humerus yellowish brown. Katepisternum finely long haired, scutellum greyish brown, brown marginally. Chaetotaxy: 1+3 dorsocentral bristles emerge from small brown spots. Anterior corner of anepisternum (mesopleuron) with less than 10 (about 7) hairs. Halteres yellowish.

Wings: veins yellowish brown, medial vein ratio 1.201.

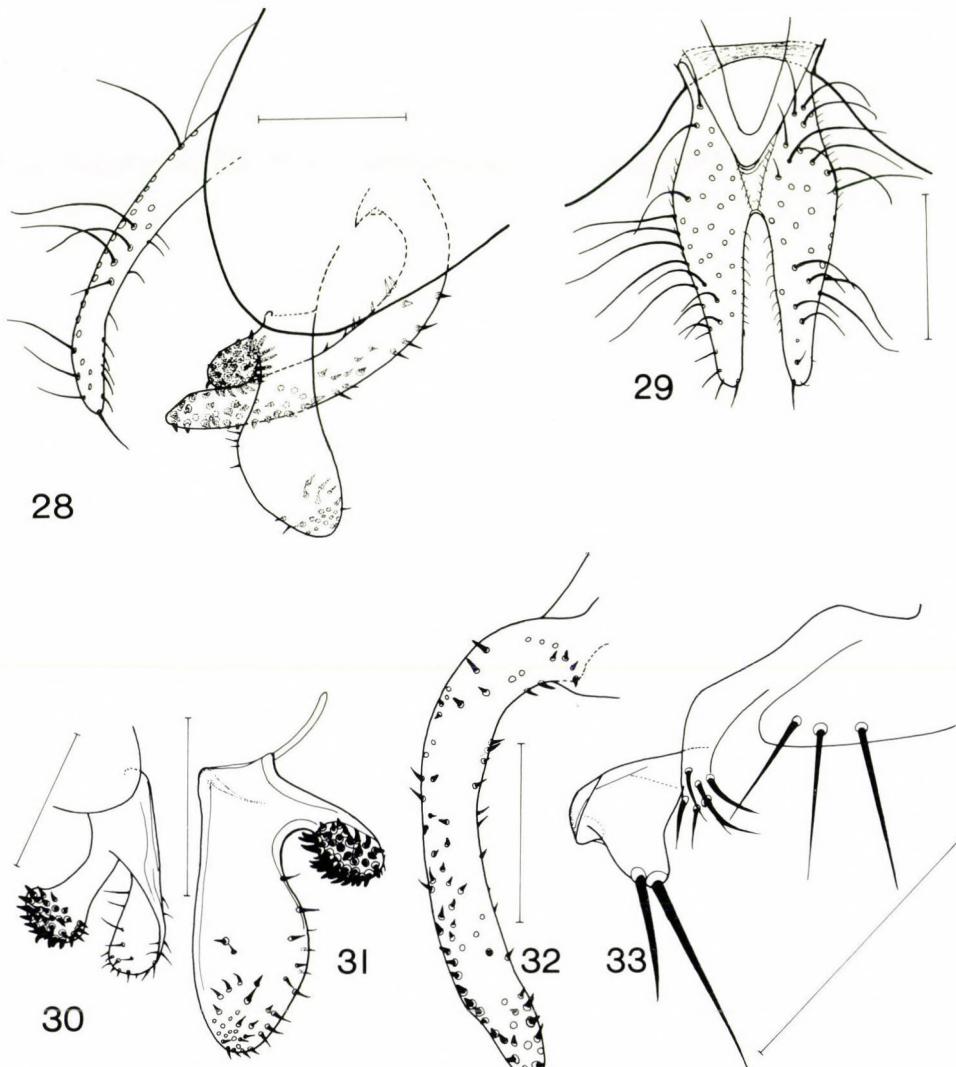
Legs: yellowish brown, as long as in *troglodytes*. Fore tarsi (except basitarsus) dark brown. Two basal tarsomeres of mid and hind tarsi yellow, only darkened apically, other parts dark brown. Only 2 bristles longer but not thicker than others on hind femur dorsally and subapically.

Abdomen: tergites 1–5 brownish, postabdomen reddish.

Male genitalia: cerci (Fig. 28) much shorter than in *mongolicus* sp. n., their free apical part not longer than half of total length, apex rounded, cercal bristles sparse and somewhat longer than in *mongolicus*, cerci in profile (Fig. 29) thin and apically curved; editum (Figs 30, 31) with lateral lobe narrow but spatulate, apex broadly rounded, apical part medially with several short thorns, in general with weak armature like in *mongolicus*, medial lobe as long but thinner than in *mongolicus*, apex similarly knob-like; surstyli (Fig. 32) extremely narrow and curved, its medial surface with not very numerous thornlets; gonite (Fig. 33) short (like in *mongolicus*), its anterior bristle more than half as long as posterior one.

Holotype male (HNHM): Mongolia: Chövsgöl aimak, 3 km SW von Somon Burenchaan, 1650 m, Exp. DR. Z. KASZAB, 1968 – No. 993, 21. VI.–16. VII. 1968.

This species is dedicated to Dr. K. B. GORODKOV (Zoological Institute, Academy of Sciences, Sankt-Petersburg, Russia) in recognition of all his contributions to the knowledge of Heleomyzidae.



Figs 28–33. *Gymnomus gorodkovi* sp. n., holotype, male genitalia: 28 = cercus, editum and surstyli in lateral view, 29 = cerci, caudal view, 30–31 = editum: 30 = in caudal view, 31 = in medial (sublateral) view; 32 = surstyli, widest extension (sublateral view), 33 = gonite with a part of hypandrium laterally. – Scales: 0.2 mm (all)

Gymnomus mariei (SÉGUY, 1934)
 (Figs 34–35, 37–41)

Amoebaleria Mariéi SÉGUY, 1934: Faune de France 28: 343. – *Scoliocentra (Gymnomus) mariei*: GORODKOV, 1984: 29.

Total length of body (without antennae) 8.8–9.0 mm.

Head in lateral view about 1.1 times higher than long, anterior part of frons rather yellow rust, posterior part behind anterior *ors* orange-brownish. Stripes near eyes with white-silvery pollinosity like parts of ocellar triangle and occiput. Ocellar triangle dark brown. One strong vibrissa with 1–2 small black hairs above. Peristomal setae in several rows. 2 strong *ors*, anterior one about 0.75 times as long as posterior one. Palpi orange-brownish like scape and pedicel. Proboscis regularly dark brown. 2 strong *vt*, *pvt* relatively weaker. – Flagellomere small, about 0.48 of cheek height, almost rounded (slightly elongated) and dark brown. Arista blackish-brown, very short pubescent, longer than height of head. Eyes nut-brown with metallic pollinosity. Face under antennae more depressed, cheek-eye ratio about 0.8–0.82.

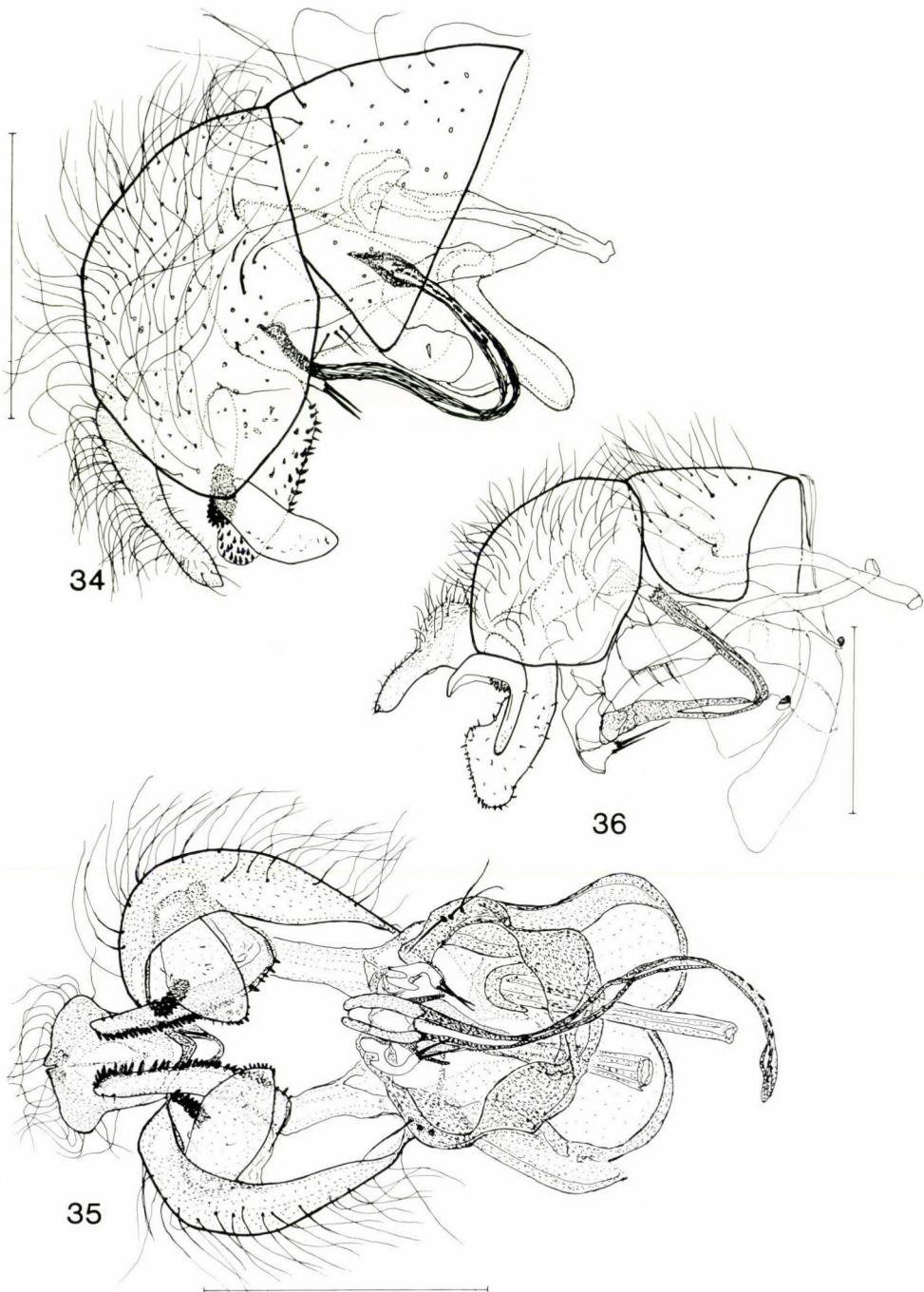
Thorax: mesonotum brownish-grey, dorsal and pleural parts of thorax with white-grey pollinosity. Humerus brownish-grey, densely covered with black, thin and long setae dorsally. Scutellum greyish-brown, brown marginally. Postscutellum in the same basic colour. Posterior part of anepisternum and anterior part of anepimeron brownish. Chaetotaxy: 1+3 dorsocentral bristles on relatively large black spots, anepisternum behind propleuron with more than 20 thin small hairs (24–28), katepisternum long black-haired with 1 katepisternal. Halteres yellowish brown.

Wings: length 9.1–9.3 mm, width 3.0–3.2 mm. Membrane hyaline, crossveins not darkened. Costal spines strong and longer than costal width. Basal parts of veins yellowish, remaining parts brownish. Medial vein ratio 1.145 (holotype), 1.160.

Legs: rust coloured, long-haired. Mid and hind femora without dorsolateral bristles. Two apical tarsomeres of fore and mid tarsi dark brown, other tarsomeres only darkened apically. Two apical tarsomeres of hind tarsi darkened marginally and apically, tarsomeres 2–3 darkened only apically. All tibiae and tarsi long-haired.

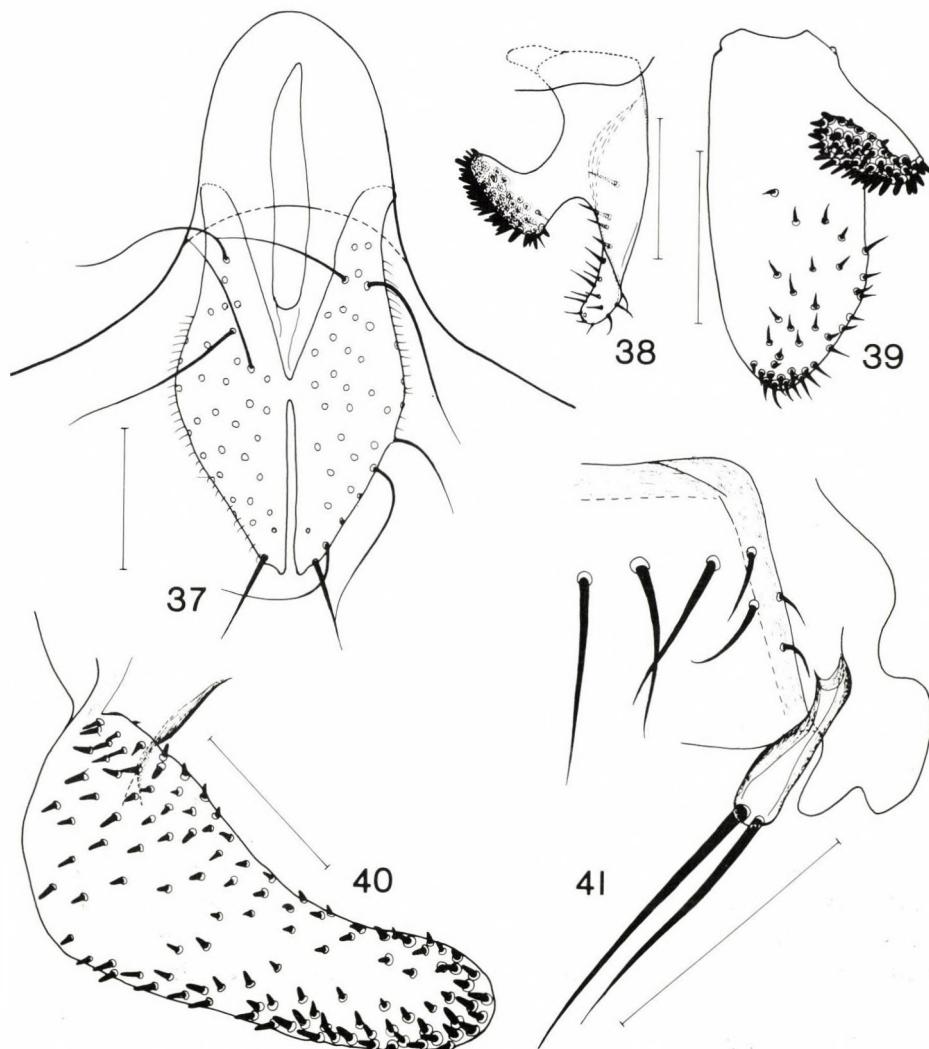
Abdomen: tergites 1–4 grey, tergites 2–3 on the edges with small rust coloured stripes. Tergite 4 in the apical half, tergite 5 and epandrium rust coloured. All tergites long-haired with strong black marginal bristles.

Redescription of the male terminalia: epandrium long-haired (Figs 34, 35), extended medially; cerci (Fig. 37) extended dorsally and narrowed apically, longer than wide; medial lobe of editum (Figs 38, 39)



Figs 34–36. 34–35 = *Gymnomus mariei* (SÉGUY), male: 34 = postabdomen seen from the right (laterally), 35 = male genitalia in ventral view; 36 = *Gymnomus sabroskyi* (GILL) holotype, male postabdomen seen from the right (laterally). – Scales: 0.5 mm (all)

forms a projecting process with black thornlets (spines) grouped on its broad apex, medial lobe shorter than width of editum, lateral lobe with several black thorns and setae; surstylus (Fig. 40) broad, distally curved, marginally and apically with several black thornlets; gonites (Fig. 41) thin with two strong and relatively long bristles, distally with a membranous lobe; ejaculatory apodeme with comparatively broad basal part, aedeagus of



Figs 37-41. *Gymnomus mariei* (SÉGUY), male genitalia: 37 = cerci, caudal view, 38-39 = editum: 38 = in caudal view, 39 = in medial (sublateral) view, 40 = surstylus, medial surface at widest, 41 = gonite with a part of hypandrium, sublateral view. — Scales: 0.2 mm (all)

medium length (as long as height of epandrium + editum), curved to the right apically.

Female: Unknown.

Type material: Holotype male (MHNN): Type (red label), Amoebaleria Mariéi. Type. SÉGUY (white) (wings a little destroyed, two flagellomeres missing).

Other specimen examined: 1 ♂ (MNHZ): Dischmatal Gr, (Suisse), 30. 05–24. 07. 1979, B. WARTMANN leg.

Distribution: France and Switzerland.

Remark: Specimens of *G. marieei* are distinguished from congeners by their mid and hind femora without dorsal subapical bristles.

***Gymnomus martineki* sp. n.**

(Figs 42–47)

Total length of body (without antennae) 5.6–5.9 mm.

Head at side view about 1.2–1.25 times higher than long, anterior part of frons mostly orange-yellow, posterior part behind anterior *ors* orange-brownish. Stripes near eyes with grey pollinosity like parts of ocellar triangle and occiput. Ocellar triangle dark brown. Ocelli reddish-brown. One strong vibrissa with 1 small hair above. Peristomal setae in a single, sometimes irregular row. 2 strong *ors*, anterior one about 0.66 length of posterior one. Palpi yellow orange. Proboscis regularly dark brown. 2 strong *vt*, *ptv* relatively weaker. – Flagellomere large, about 0.66 of cheek height, round and orange like scape and pedicel. Arista brownish-black, very short pubescent, longer than height of head. Eyes round. Facial plate under antennae a little depressed, cheek-eye ratio about 0.625–0.635.

Thorax: mesonotum bluish-grey, dorsal and pleural parts of thorax with white-grey pollinosity. Humerus brownish-grey, dorsal parts of mesonotum densely covered with black thin and short setae. Scutellum grey, dark brown marginally. Postscutellum in the same basic colour. Posterior part of anepisternum and anterior part of anepimeron brownish. Chaetotaxy: 1+3 dorsocentral bristles emerge from relatively small diffuse black spots, sometimes 1 small additional bristle. Anterior corner of anepisternum with about 10 small hairs, katepisternum black-haired. Halteres yellowish.

Wings: length 5.8–6.4 mm, width of wings 1.8–1.9 mm. Membrane hyaline, crossveins not darkened. Costal spines strong and longer than width of the costa. Basal parts of veins yellowish, remaining parts brownish. Medial vein ratio 1.135–1.160 (paratypes).

Legs: honey yellow, short haired. Fore femora darkened with grey pollinosity. Hind femora with 2–3 dorsolateral bristles (if 3, third one as thin as hairs). All fore tarsomeres dark brown except basitarsus (darkened only in the 1/3 apical part). Two apical tarsomeres of mid and hind tarsi dark brown marginally, other tarsomeres darkened only apically, mid tibia with hairs as long as width of tibia.

Abdomen: tergites 1–4 brownish red with grey pollinosity, marginally with small rust coloured stripes. Tergites 5 and epandrium brownish red. All tergites less densely haired than in *europaeus*, with strong black marginal bristles.

Male terminalia: epandrium (Figs 42, 43) elongated and extended medially; cerci (Fig. 44) like in *caesius* but not narrowed apically, longer than wide; medial lobe of editum (Fig. 45) forms a projecting process with black thornlets (spines) grouped distally on its broad apex, medial lobe shorter than width of editum, lateral lobe broad with several black thornlets and setae; surstylus (Fig. 46) distally gradually curved and wider than in *europaeus*, distally and apically with several black thornlets; gonites (Fig. 47) short and high, with two bristles, first one shorter than half length of second one.

Female: Unknown.

Type material: Holotype male (NMW): Badgastein (Austria), 1800 m., 14. 06. 1977., H. STOCKNER leg. – Paratypes: 1 ♂ (MHNN): Neuchâtel (Suisse), La Sclera, Nardetum, 2100 m., 14. 07. 1980.; 1 ♂ (WA): Badgastein (Austria), 1800 m., 17. 06. 1977., H. STOCKNER leg.; 1 ♂ (HNHM): Badgastein (Austria), 1800 m., 16. 06. 1977., H. STOCKNER Leg.; 1 ♂ (HNHM): Badgastein (Austria), 1800 m., 18. 06. 1977., H. STOCKNER leg. The specimens are in a poor state of preservation as a consequence of their storage in alcohol for a long time. The type-series was minutia-pinned during this study.

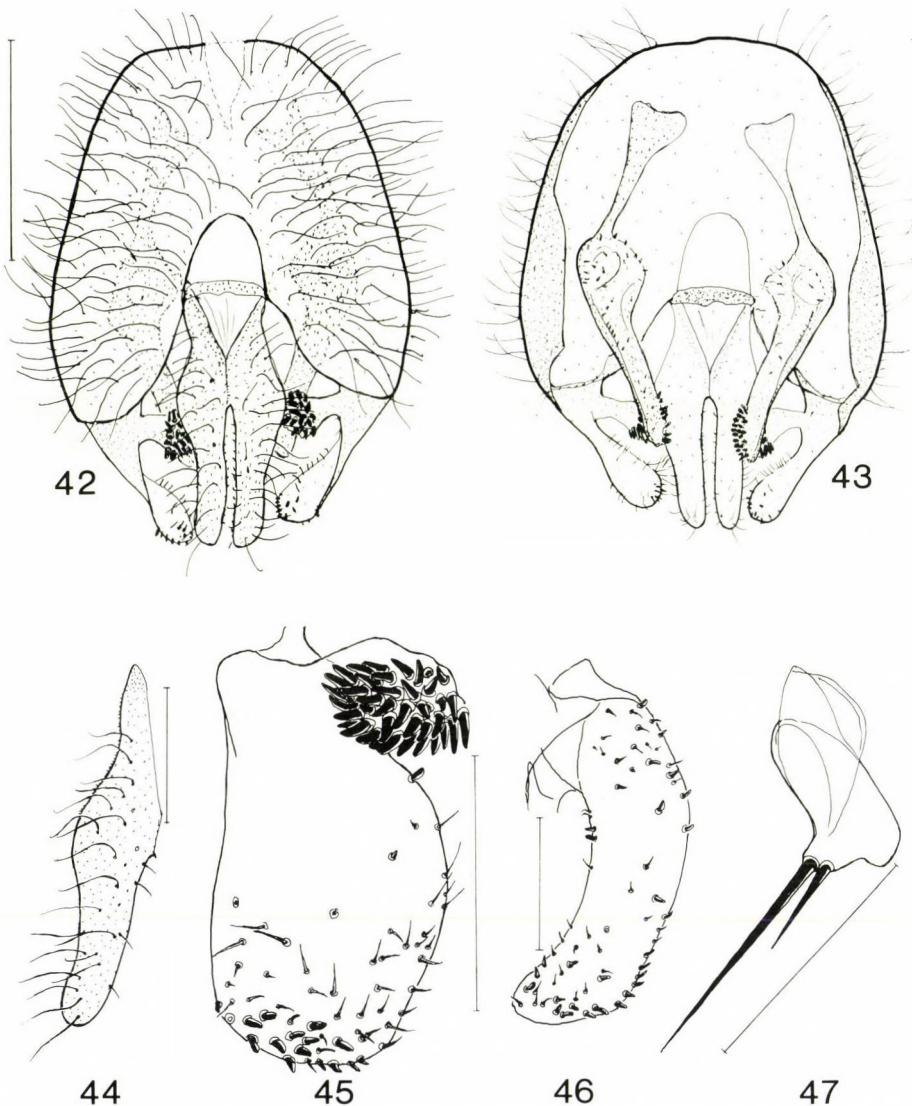
Distribution: Austria, Switzerland (Alps). This is a mountain species smaller than most other species in the genus.

Derivatio nominis: *G. martineki* sp. n. is named in honour of DR. ING. V. MARTINEK (Dobruška, Czechoslovakia), who also published excellent works on the heleomyzid species and who promoted our present work in various ways (by sending us all his invaluable specimens, etc.).

***Gymnomus mongolicus* sp. n. (Figs 48–52)**

Scoliocentra (Amoebaleria) ventricosa: GORODKOV (1969): 257; GORODKOV (1972): 896. – *Scoliocentra (Gymnomus) ventricosa*: GORODKOV (1974): 358.

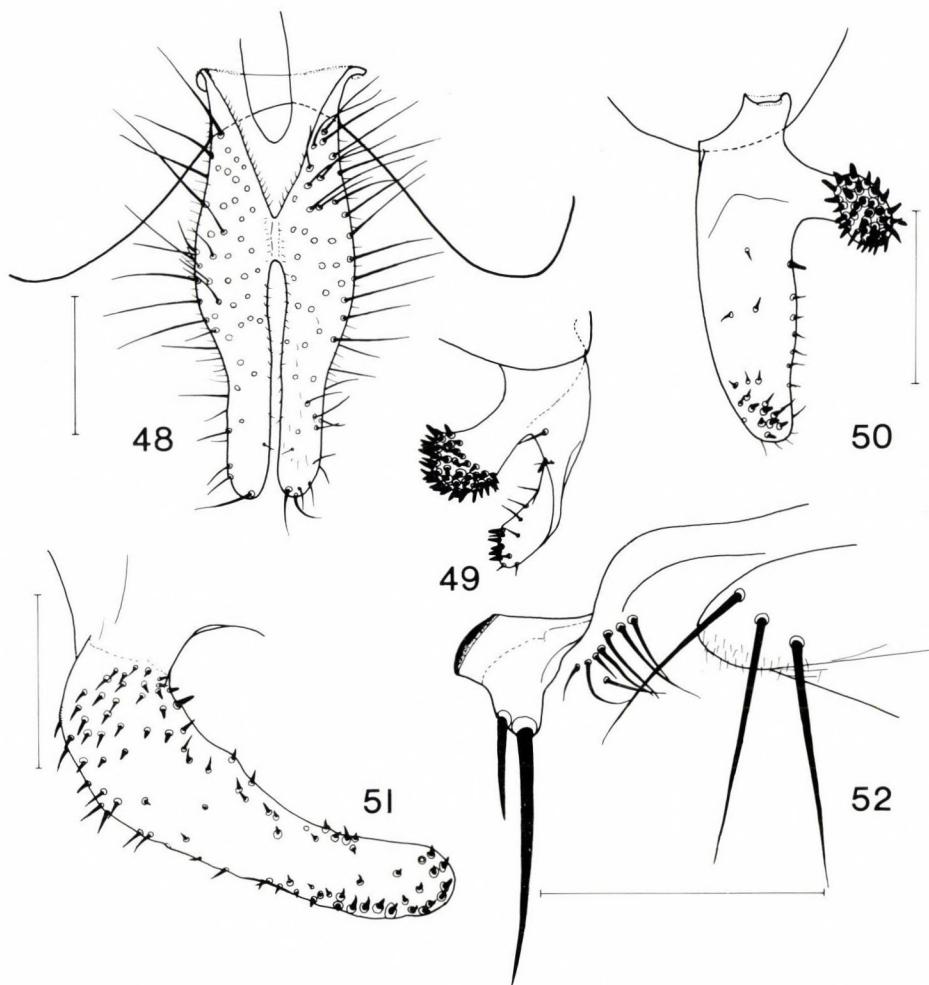
Measurements (in mm): body length ca. 6.90, 7.31 (paratype), length of wing 6.76, 7.66, width of wing 2.21, 2.58, longest costal bristles 0.258.



Figs 42–47. *Gymnomus martineki* sp. n., paratype, male genitalia: 42–43 = epandrium with external genitalia: 42 = in caudal view, 43 = in cranial view; 44 = cercus, caudal view, 45 = editum, medial (sublateral) view, 46 = surstylius, medial surface at widest, 47 = gonite laterally.

— Scales: 0.5 mm for Figs 42–43, 0.2 mm for Figs 44–47

Head in lateral view about 1.2 times higher than long. Anterior part of frons back to the anterior *ors* yellow, posterior part brown. Face yellow brownish. Stripes near eyes with silver pollinosity. 2 *ors*, the anterior one about half length of the posterior one. Peristomal setae in two rows.



Figs 48–52. *Gymnomus mongolicus* sp. n., holotype, male genitalia: 48 = cerci, caudal view, 49–50 = editum: 49 = in caudal view, 50 = in medial (sublateral) view, 51 = surstyli, widest extension (sublateral view), 52 = gonite with a part of hypandrium laterally. – Scales: 0.2 mm (all)

Cheek-eye ratio ca. 0.8. – Flagellomere orange, slightly elongated, length about 0.5 of cheek height, a little darkened apically. Arista as in *gorodkovi*.

Thorax: mesonotum brownish grey, humerus concolorous with disc of mesonotum. Propleuron and posterior part of anepisternum brownish. Anepisternum with 10–12 hairs near propleuron. Scutellum brownish with grey pollinosity. Chaetotaxy: 1 + 3 dorsocentrals emerge from brown spots. Halteres yellowish brown.

Wings: Medial vein ratio 1.250.

Legs: Hind femora with 1–2 thick dorsal (anterodorsal) subapical bristles; this dorsal subapical bristles in female stronger than in male.

Male genitalia: cerci (Fig. 48) comparatively long, free part longer than half of total length, apex narrowly rounded, cerci covered by medium long bristles; editum (Figs 49, 50) very characteristic: lateral lobe extremely narrow, its apex though blunt very narrow, medial surface apically with some distinct thornlets, lateral lobe otherwise with weak armature; medial lobe of editum rather long and robust apically knob-like with numerous, comparatively long thornlets; surstylus (Fig. 51) of medium length and width, apex rather broad and widely rounded, surstylus with comparatively few thornlets; gonite (Fig. 52) short, its anterior spine less than half length of the posterior one; hypandrium lateroventrally with 3 pairs of robust bristles.

Holotype male (HNHM): Mongolia: Chentej aimak, 7 km NO von Somon Mörön, 120 m, Exp. DR. Z. KASZAB, 1965 – Nr. 323., 28. VII.–21. VIII. 1965. – *Scoliocentra "ventricosa sensu Czerny"* GORODKOV det. 1967. – **Paratype female (HNHM):** same as for the holotype.

An additional female, in all probability a female of *mongolicus*: 1 ♀ (HNHM): Mongolia, Baruun-Urt ÉNy[NW] 120 km – 1972. VIII. 5–18., leg. MÉSZÁROS. Other specimen examined: Mongolei, 10. VI. 1926 Koslov, female (NMW).

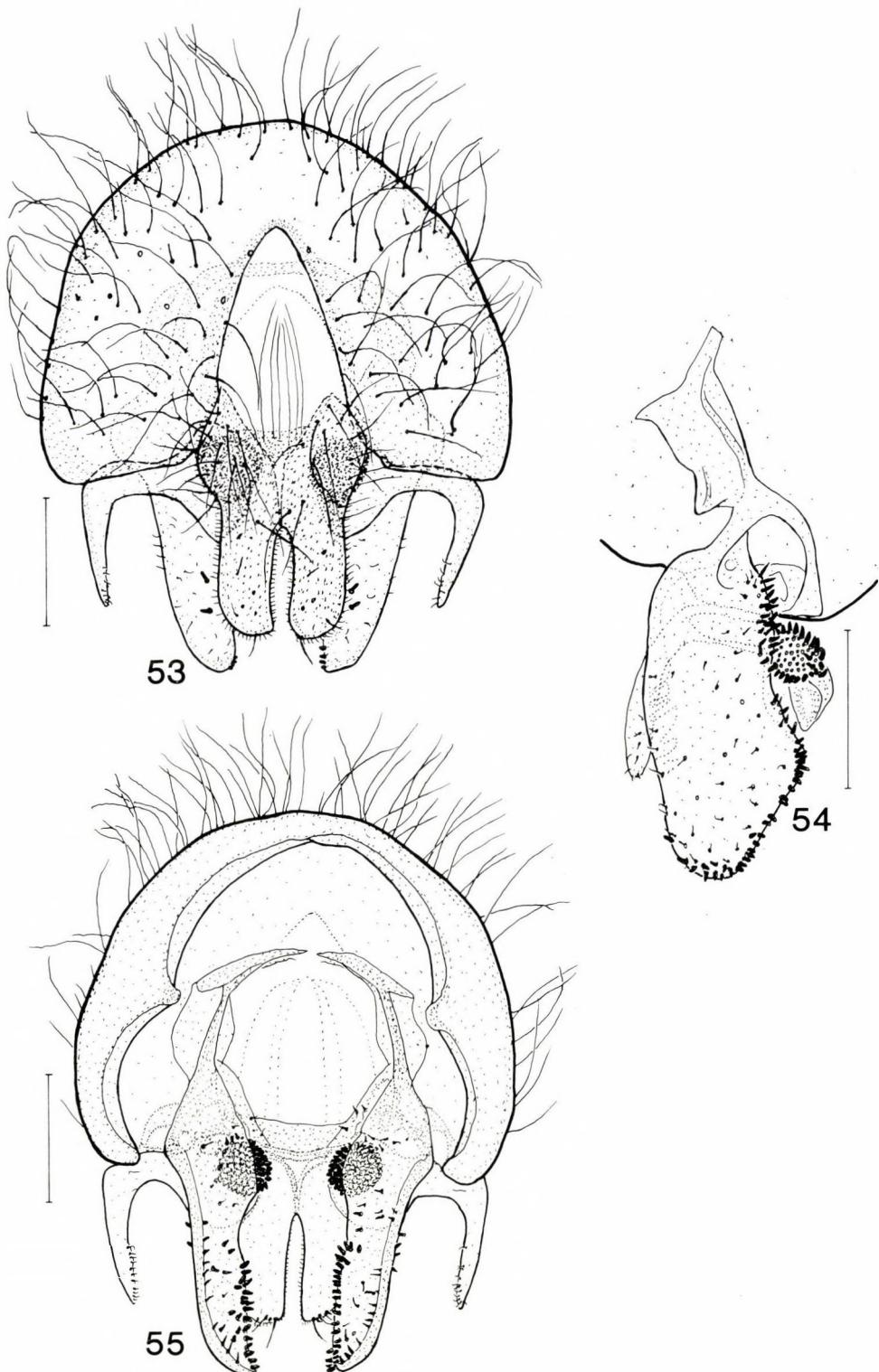
Gymnomus sabroskyi (GILL, 1962) (Figs 36, 53–55, 56–59)

Amoebaleria sabroskyi GILL, 1962: 587. – *Scoliocentra sabroskyi* (GILL): MARTINEK 1982: 77; 1986: 140; 1987: 241.

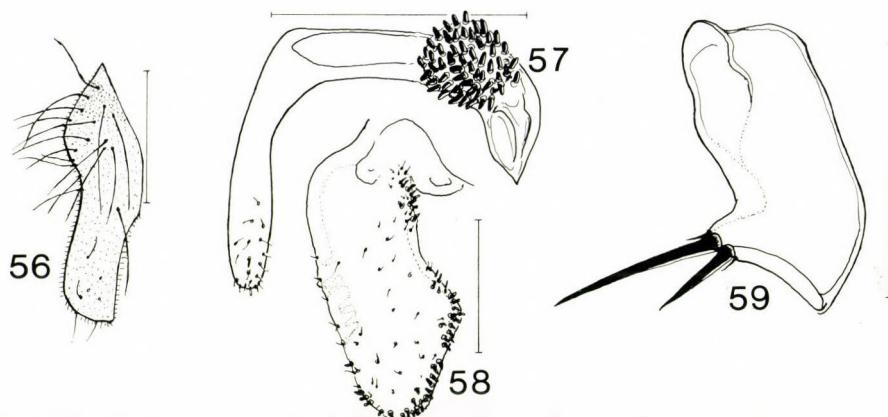
Total length of body (without antennae) 5.5–5.9 mm.

Head in lateral view about 1.15 times higher than long. Frons yellow anteriorly, posterior part orange. Stripes near eyes with greyish pollinosity like parts of ocellar triangle and occiput. Ocellar triangle dark brown. Ocelli reddish-brown. One strong vibrissa. Peristomal setae in a single sometimes irregular row. 2 strong *ors*, anterior fronto-orbital bristle as long as or shorter than one-half length of the posterior bristle. Palpi yellow. Proboscis regularly brown. 2 strong *vt*, *pvt* relatively weaker. – Flagellomere relatively large, about 0.66 of cheek height, round and reddish yellow. Arista brownish, very short pubescent, longer than height of head. Eyes round, facial plate under antennae slightly depressed, cheek-eye ratio about 0.58–0.59.

Thorax: mesonotum brownish grey to bluish grey, dorsal part densely covered with black short setae, dorsal and pleural parts of thorax



Figs 53–55. *Gymnomus sabroskyi* (GILL), male genitalia: 53 = epandrium with external genitalia, caudal view, 54 = editum and surstylius in lateral view, 55 = epandrium with external genitalia, cranial view. – Scales: 0.2 mm (all)



Figs 56–59. *Gymnomus sabroskyi* (GILL, male genitalia: 56 = cerci, caudal view, 57 = editum in medial (sublateral) view, 58 = sursty whole extension (medial and sublateral view), 59 = gonite laterally. – Scales: 0.2 mm (all)

whith grey pollinosity. Humerus yellowish brown. Scutellum yellowish brown, postscutellum in the same basic colour. Katepisternum, posterior part of anepisternum and anterior part of anepimeron brownish yellow. Chaetotaxy: 1+3 dorsocentral bristles on relatively small brownish black spots. Anterior corner of anepisternum with several small hairs. Halteres light yellow.

Wings: length 5.7–6.1 mm, width of wings 2.0–2.1 mm. Membrane hyaline, cross-veins not darkened. Costal spines strong and longer than width of costa. Veins yellowish brown. Medial vein ratio 1.07 (holotype), 1.06–1.145.

Legs: yellowish brown, short haired. Fore femora with greyish pollinosity. Hind femora with 2–3 dorsolateral bristles. Fore tarsi dark brown. Two apical tarsomeres of mid and hind tarsi dark brown marginally and apically. Tibiae darkened only apically.

Abdomen: tergites and epandrium reddish orange sometimes with grey pollinosity.

Redescription of the male terminalia: epandrium (Figs 36, 53, 55) relatively small; cerci (Fig. 56) flat, editum (Fig. 57) appears to be much narrowed and shape like an inverted J in lateral view; sursty whole extension (Fig. 58) much broader than editum and marginally with black thornlets; gonites (Fig. 59) shorter than high, apically sharpened, with two strong bristles and two small hairs above, first bristle shorter than double length of second one.

Type material: Holotype male (USNM, genitalia in microvial): Amoebaleria sabroskyi Gill Holotype (red), type No. 65447 USNM (red), White Pine Hollow, Dubuque Co. IOWA, July 4, 1949, JEAN LAFFOON (lost: left antenna, right mid tarsus, two katepisternals, 5th tarsomere of hind right tarsus).

Other specimens examined: 1 ♀ (USNM): Amoebaleria sp. near spectabilis Lw; det. SABROSKY, A. DE SAUSSURE A. 105, Northumberland Cave, NyeCo. Nev. 8. 18. 52. – Poland: 1 ♂ (ISEA, genitalia diss.); PL: Tatry, J. SZCZELINA, 2. [illegible] 1952. Czechoslovakia: 3 ♂, 4 ♀ (HNHM): CS: Vlečá j. [cave], 31. 10. 76., KOSEL leg.; 1 ♂ (HNHM): idem, 3. 2. 77; 2 ♂, 1 ♀ (HNHM, VM): idem, 4. 12. 1976; 3 ♂ (VM); idem, 16. 08. 1988; 2 ♂ (WA): Slow., Koniárova cave, 24. 09. 1976., KOSEL leg.

Distribution: Holarctic Region; Czechoslovakia, Romania, Poland (Carpathian Mts), North America: USA.

Gymnomus soosi sp. n.

(Figs 60–64)

Measurements (in mm): body length 8.07, ca. 7.5 (paratype), length of wing 7.79, ca. 7.0, width of wing 2.75, 2.54, longest costal bristles 0.258.

Head in lateral view about 1.4 times higher than long. Anterior part of frons reddish like scape and pedicel, posterior part brownish. Palpi orange, proboscis dark brown. Anterior *ors* about 0.66 length of posterior bristle. Paratype on its right with 3 *ors*. Peristomal setae in 2 irregular rows. Cheek-eye ratio 0.603. – Flagellomere length about 0.55 of cheek height.

Thorax: pleural and dorsal parts of mesonotum brownish with grey pollinosity. Humeri brownish grey. About 15 hairs behind the propleuron. Chaetotaxy: 1 + 3 dorsocentral bristles emerge from large brown spots. Scutellum brownish with grey pollinosity, brown marginally.

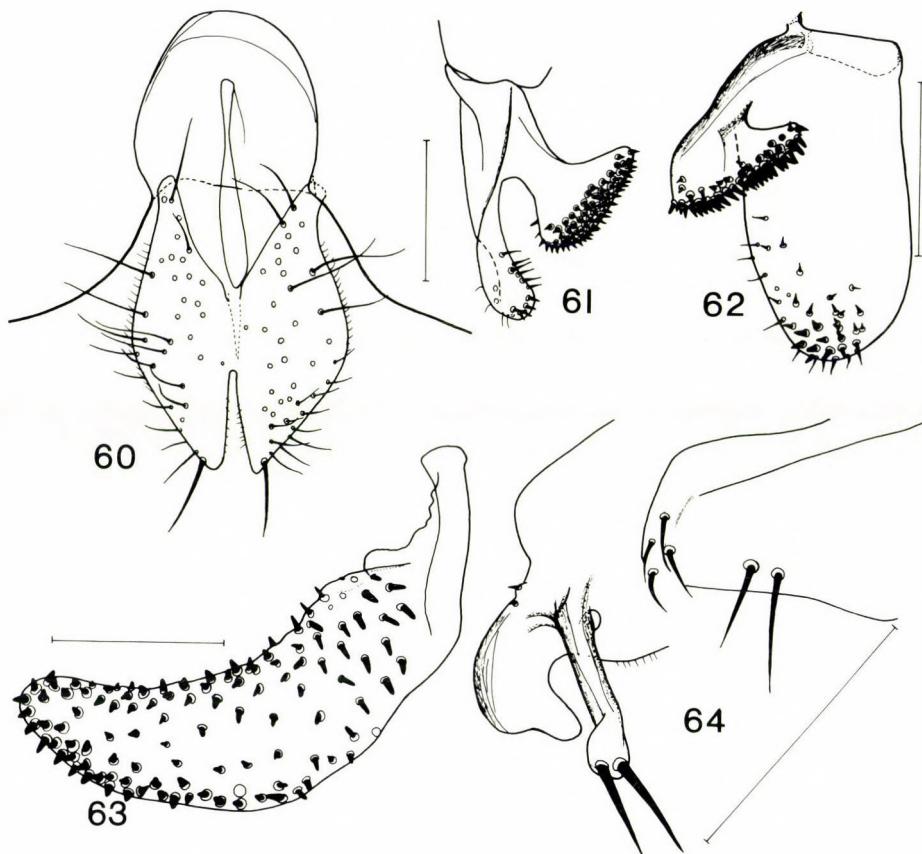
Wings: Medial vein ratio not precisely measurable, about 1.05.

Legs: not elongated, hind femora with 5–7 strong dorsal subapical bristles.

Male genitalia: cerci short and broad (Fig. 60), apex narrow and narrowly rounded but not sharp, cercal bristles comparatively sparse and only moderately long; editum (Fig. 62) with very wide medial lobe better seen in caudal view (Fig. 61), lateral lobe rather broad and widely rounded apically, its medial surface with 15–16 distinct short thornlets, medial lobe with rather flat medial apex and with numerous black thornlets; surstyli (Fig. 63) rather broad and curved with comparatively long but blunt black thornlets on its whole medial surface; gonite (Fig. 64) of a very characteristic and intricate shape: anteriorly with a large, ventrally directed process, gonite itself stalked (pedunculate) apically with two bristles of medium length; hypandrium laterally with only 2 long bristles.

Female unknown.

Holotype male (HNHM): “Trebević” [Bosnia] – “Blepharoptera caesia Mg.” coll. THALHAMMER. – **Paratype** male (HNHM, gen. prep.): same labels.



Figs 60–64. *Gymnomus soosi* sp. n., paratype, male genitalia: 60 = cerci, caudal view, 61–62 = editum: 61 = in caudal view, 62 = in medial (sublateral) view, 63 = surstyli, widest extension (sublateral view), 64 = gonite with a part of hypandrium laterally. – Scales: 0.2 mm (all)

Distribution: Bosnia.

Remark: *G. soosi* sp. n. is dedicated to the late DR. ÁRPÁD SOÓS, the greatest Hungarian dipterist, in order to commemorate all his invaluable activity for the dipterology and for the dipterists.

***Gymnomus spectabilis* (LOEW, 1862)**
(Figs 65–68)

Blepharoptera spectabilis LOEW, 1862: Z. ent., Breslau 13 (1859): 58, a second publication in Wien. ent Mschr. 6 (4): 128. – *Amoebaleria spectabilis*: CZERNY, 1924: 134. – *Scoliocentra (Gymnomus) spectabilis*: GORODKOV, 1984: 29. – *Scoliocentra spectabilis*: MARTINEK, 1987: 241; WOŹNICA, 1991: 209.

Length of body (without antennae) 6.0 to 8.5 mm.

Head in lateral view about 1.2 times higher than long. Frons yellow orange. Ocellar triangle dark brown. Ocelli reddish-brown. Peristomal setae in a single sometimes irregular row. 2 strong *ors*, anterior fronto-orbital bristle about 0.66–0.75 of the length of posterior bristle. Palpi yellow. Proboscis brown. 2 strong *vt*, *pvt* relatively weaker. — Antennae: scapus and pedicel yellow orange, flagellomere round, about 0.76–0.78 of cheek height and darkened (brown) near the arista. Arista black, pubescent, longer than height of head. Eyes round. Face under antennae more depressed, cheek-eye ratio about 0.55.

Thorax: mesonotum grey, dorsocentrals emerge on relatively large round black spots, humeri brownish-grey with grey pollinosity. Scutellum brownish grey, sometimes yellowish apically, postscutellum grey with a brown stripe marginally. Chaetotaxy: 1+3 dorsocentral bristles, sometimes a small thin black stripe between them. Anterior corner of anepisternum with several small hairs. Halteres light yellow.

Wings: length 6.3 to 8.8 mm, width of wings 2.2 to 2.6 mm. Membrane hyaline, crossveins not darkened. Costal spines strong and longer than width of the costa. Veins yellowish brown. Medial vein ratio 1.195 (lectotype), 1.175–1.183.

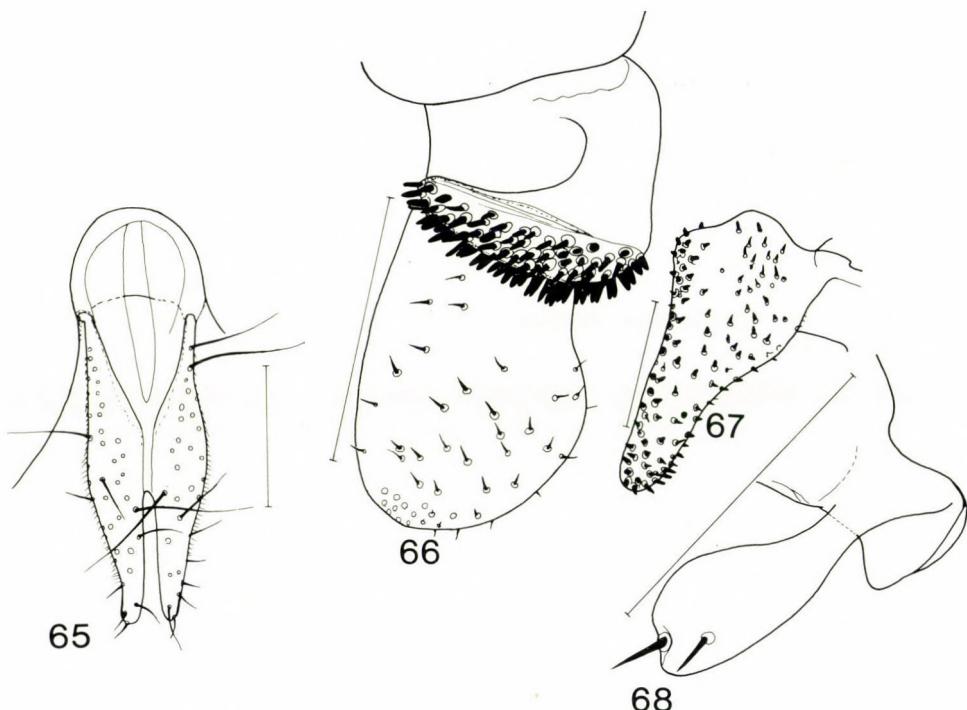
Legs: yellow, mid and hind femora with stronger bristles. Fore tarsi and two apical tarsomeres of mid tarsi dark brown, other tarsomeres darkened apically. Two apical tarsomeres of hind tarsi brown, tarsomeres 2–3 only darkened apically. Hind femora with 2–3 dorsolateral bristles.

Abdomen: yellow, tergites with fine black bristles (not longer than hairs).

Male terminalia: epandrium long-haired, cerci (Fig. 65) elongated but not sharply pointed apically, their free apical section less than half of the total length; edita (Fig. 66) wider than the distal portion of surstylus, medial lobe with black thornlets (spines) grouped on its broad apex, where as wide as lateral lobe, lateral lobe narrowed medially, widely rounded apically, with some small thin bristles and with some dense black thornlets on medial surface; surstylus (Fig. 67) trapezoidal, basal part much wider than apical part and covered by dense black thornlets; gonites (Fig. 68) thinner basally than apically, with two small and thin bristles shorter than width of gonites.

Type material: Lectotype female (by present designation) (ZMB): Lagosta Zeller (white label) – coll. H. LOEW (white label) – Type (red label) (hind right leg lost).

The junior author has studied the male of the Laybach types and he found that the specimen is a male of *caesioides*. However, we must regard the Laybach specimens as paratypes (cf. GORODKOV & SCHUMANN 1980).



Figs 65–68. *Gymnomus spectabilis* (LOEW), male genitalia: 65 = cerci, caudal view, 66 = edutum, medial view, 67 = surstylos at its broadest (sublateral-medial view), 68 = gonite, lateral view. – Scales: 0.2 mm (all)

Other material studied: Austria: 1 ♀ (HNHM): Tyrolis, Stilfser Joch – “H. spectabilis Lw.” Det. CZERNY. – Croatia: 1 ♀ (HNHM): Spilja Pustinja bei Delnice, (Croat). STILLER (on the reverse side) “VII. 1914”. – Hungary (all in HNHM): 1 ♂: Bükk-hg. [mountains], Középb[ére] – erdő [forest] – 1962. X. 4., leg. TÓTH S., 1 ♀: Mátra hg., Galyatető – 1970. X. 12., leg. PAPP L.; 1 ♂, 1 ♀: B.N.P.: Nagyvisnyó, Bánkúti víznyelő barlang 500 m, 1981. VIII. 26., leg. ÁDÁM-PAPP L., 4 ♂: B.N.P.: Nagyvisnyó, Diabáz-barlang, 1982. IX. 15., leg. ÁDÁM-PAPP. – Romania: 1 ♂ (HNHM): Hu.Bihar, Vidarét, E. BOKOR (on the reverse side) “Mihók b.[arlang]” – “H. spectabilis Lw.” Det. CZERNY; 2 ♂ (HNHM): Hu.Bihar, Vizevölgy, BOKOR – “A. spectabilis Lw.” Det. CZERNY; 2 ♂ (HNHM): “Feritse” [Fericese Cave] – “H. spectabilis Lw.” Det. CZERNY. – Switzerland: 1 ♂, 2 ♀ (ZMZ): Alp Flix GR (Suisse), 4.–8. 8. 1975, G. BÄCHLI coll.; 1 ♂, 2 ♀ (MHNG): Gr. de Vers-chez-le Brandt, Suisse, NE, 27. 08. 80, Scoliocentra spectabilis det. L. PAPP 1981.

Distribution: Czecho-Slovakia, Germany, Hungary, Italy, Poland, Romania, Switzerland.

Remark: Specimens of *G. spectabilis* are distinguished from congenera by their wholly yellow abdomen and the characters given in the key below, p. 208.

Gymnomus troglodytes LOEW, 1863
 (Figs 69–72)

Gymnomus troglodytes LOEW, 1863: Wien. ent. Zschr. 7: 37. – *Scoliocentra (Gymnomus) troglodytes* LOEW: Gorodkov, 1984: 29.

Total length of body (without antennae) 6.0–8.5 mm.

Head in lateral view about 1.15 times higher than long, anterior part of frons mostly yellow, posterior part behind anterior *ors* reddish-orange. Stripes near eyes with white-grey pollinosity like parts of ocellar triangle and occiput. Ocellar triangle dark brown. One strong vibrissa with 1–2 small black hairs above. Peristomal setae in two irregular rows. 2 *ors*, anterior one small, about 0.3 as long as posterior one. Palpi yellow. Proboscis regularly red-yellow. 2 strong *vt*, *pvt* relatively weaker. – Antennae: scapus and pedicel reddish-yellow, flagellomere round, less than half of cheek height (ratio 0.44) and dark brown. Arista black with white pollinosity, longer than height of head. Eyes round and small with metallic pollinosity. Face under antennae more depressed, cheek-eye ratio more than 1.0 (about 1.25).

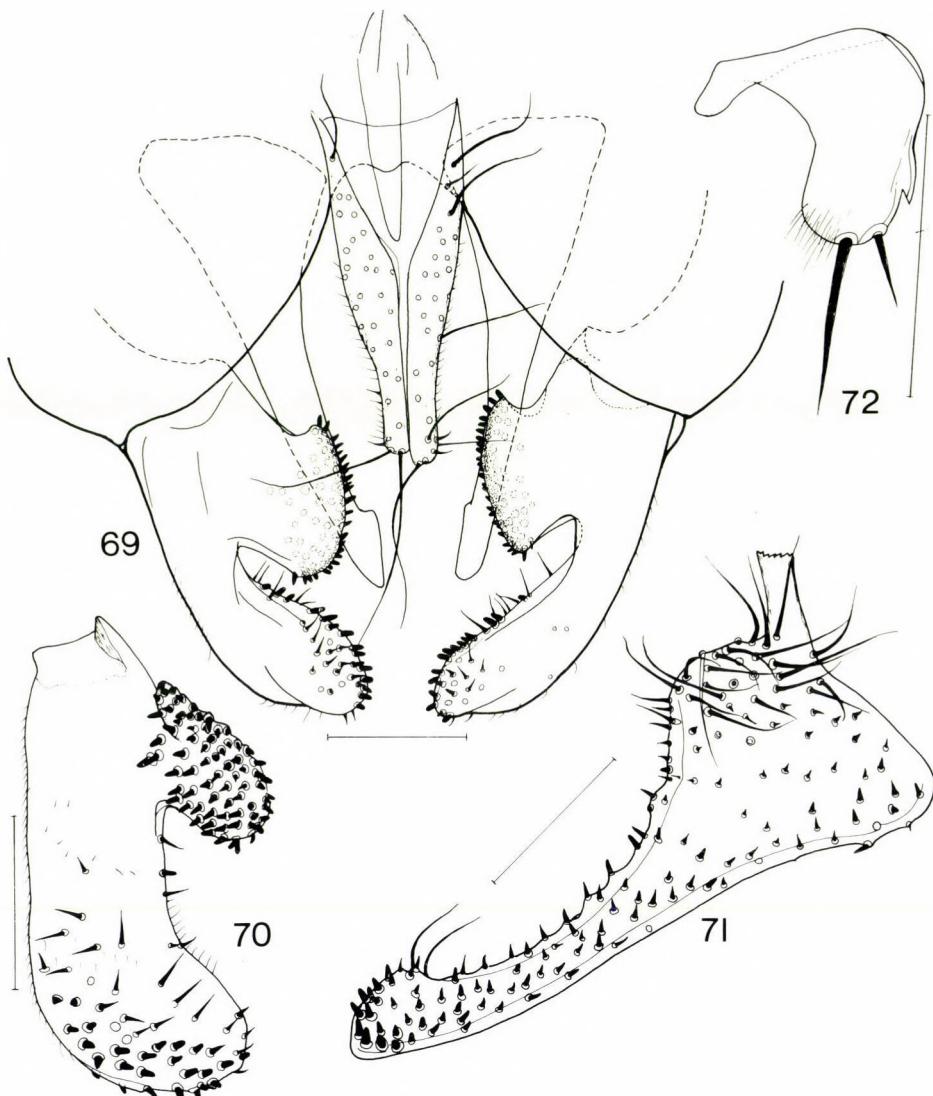
Thorax: mesonotum blackish-grey with white pollinosity and with 2–3 more or less clearly visible stripes, dorsal part densely covered with black short setae, dorsal and pleural parts of thorax with white-grey pollinosity. Humerus brick-red. Scutellum flat and grey, reddish-yellow marginally. Postscutellum in the same basic colour. Posterior part of anepisternum brick-red. Chaetotaxy: (0)–1+3 dorsocentral bristles, no humeral. Anterior corner of anepisternum with some small hairs, katepisternum black haired with 1 katepisternal. Halteres yellowish.

Wings: Membrane regularly light brown clouded, crossveins not darkened. Costal spines strong and longer than width of costa. Hind cross-vein curved. Medial vein ratio 1.107–1.128.

Legs: longer than in other species, yellow. Mid and hind femora with strong bristles. Two apical tarsomeres of fore and mid tarsi dark brown. Two apical tarsomeres of hind tarsi darkened marginally and apically, other tarsomeres darkened only apically. Hind femora with 2–3 dorsolateral bristles, in male reduced to hairs.

Abdomen: Tergites brick-red with grey pollinosity, with slightly yellow stripes on the borders. Tergite 5 and epandrium rust coloured. All tergites long and thick haired with strong black marginal bristles.

Redescription of the male terminalia: epandrium semiglobular covered by dense but thin bristles; cerci short and thin (Fig. 69), cercal bristles sparse but long; editum (Figs 69, 70) comparatively large and robust, both lobes thick, lateral lobe not broad and inclinate, all its apical



Figs 69–72. *Gymnomus troglodytes* (Loew), male genitalia: 69 = cerci, edita and surstyli in caudal view, 70 = editum, medial (sublateral) view, lateral lobe at its broadest, 71 = surstylus at its broadest (sublateral-medial view), 72 = gonite, lateral view. – Scales: 0.2 mm (all)

parts medially with dense but not wholly darkened thornlets, medial lobe extremely broad even at base, covered by dense and rather long thornlets not only apically; surstylus (Fig. 71) very characteristic: long and thin but with a spatulate apex, subapically with 2 thin bristles and basally with several thin bristles, ventral edges and medial surface with thornlets as

given in Fig. 71; gonites (Fig. 72) peculiar again: short and blunt, i.e. with a small subapical process but widely rounded apically, it bears not only one short and one medium long bristles but several thin trichia; aedeagus comparatively very short, i.e. not coiled.

Female: Dorsolateral subapical bristles on hind femora stronger than in male.

Type material: Holotype female (ZMB): *Gymnomus troglodytes* m. (handwriting), Type (red label), coll. H. LOEW (lost: right oral vibrissa, right ors, 2 posterior left dorsocentrals; 1 flagellomere glued on a white label); cf. GORODKOV & SCHUMANN 1980.

Other specimens examined: Croatia: 3 ♂, 1 ♀ (HNHM): second label on all: "G. troglodytes Lw." Det. CZERNY; 1 ♂: "Vel [illeg., ?Otu] Gr.[otte], Aug 9[?]3; 1 ♂: no locality label; 1 ♂: Radue. "(antra) 25. VII.;" 1 ♀: Pazariste, "12. VIII."

Distribution: Bosnia and Croatia.

Remark: *G. troglodytes* is a unique species in this genus: there is no close relative among the known species (see in the key below).

Gymnomus ventricosus (BECKER, 1907)

Blepharoptera ventricosa BECKER, 1907: Annu. Mus. zool. Acad. Sci. St.-Pétersb. 12(3): 258. – *Amoebaleria ventricosa*: CZERNY, 1924: 135. – *Scoliocentra ventricosa*: PAPP, 1981: 64; and other authors. – *Scoliocentra (Gymnomus) ventricosa*: GORODKOV, 1984: 29.

BECKER (1907) says in its original description: "ohne Streifung und ohne Fleckung an der Wurzelpunkten der Borsten . . . Mit der Leberöhre 8 mm lang." That is why we think none of the specimens from Mongolia belongs to this species described from East Tibet. No specimens of our above material would fit to BECKER's description. We are not sure whether this species does belong to this genus at all; this is why *ventricosus* was not included in the key below.

Type material: Holotype female preserved in the Zoological Department, Academy of Sciences, St. Petersburg (not studied).

Distribution: East Tibet (China).

Doubtful species / records

GORODKOV, 1977: 84: *sabroskyi*: (Kamchatka i Primorie); sp. n. (probably *ceianui* (Rila, Tatra Mts); sp. group *caesia* (distr. Krasnojarsk, left bank of Yenisey river.)

KEY TO THE IDENTIFICATION OF THE PALAEARCTIC SPECIES
OF *GYMNOMUS* LOEW, 1863

- 1 (2) Humeral bristle absent. Cheek-eye ratio more than 1.0, arista longer than head
troglodytes LOEW
- 2 (1) Humeral bristle present. Cheek-eye ratio less than 1.0, arista shorter than head.
- 3 (4) Hind femora without dorsal (anterodorsal) subapical bristles
mariei (SÉGUY)
- 4 (3) Hind femora with dorsal (anterodorsal) subapical bristles.
- 5 (10) Humeri yellow to yellowish-brown, in contrast to bluish grey disc of mesonotum.
- 6 (7) Peristomal setae in two or more rows
europaeus sp. n.
- 7 (6) Peristomal setae in a single row.
- 8 (9) Flagellomere brown, darker than scape and pedicel; scutellum greyish brown, legs lengthened
gorodkovi sp. n.
- 9 (8) Flagellomere orange and scutellum yellowish brown, legs as in *caesius*
sabroskyi (GILL)
- 10 (5) Humeri brownish to bluish grey, concolorous with the disc of mesonotum.
- 11 (14) Peristomal setae in a single row. Flagellomere round and orange.
- 12 (13) Humeri and scutellum are distinctly brownish yellow. Abdomen completely yellowish red, male editum not reduced (Fig. 66), wider than distal part of surstylus, surstylus (Fig. 67) trapezoidal
spectabilis (LOEW)
- 13 (12) Humeri bluish grey, concolorous with the disc of mesonotum. Abdominal tergites 1–3 darkened, editum apically rounded (Fig. 45), surstylus (Fig. 46) digitiform, curved gradually
martineki sp. n.
- 14 (11) Peristomal setae in 2 or more rows or irregularly placed so as not appearing in a single row. Flagellomere various.
- 15 (16) Abdomen completely orange. Editum (Figs 6, 7) with very long medial lobe bearing a round setose plot apically
ceianui (MARTINEK)
- 16 (15) Abdomen darkened (at least tergites 1–4 discally).
- 17 (18) Cheek-eye ratio 0.8. Male cerci not pointed apically. Only 1 or 2 dorsal subapical bristles on hind femora. Smaller, body length 6.9–7.31 mm. Cerci (Fig. 48) digitiform
mongolicus sp. n.
- 18 (17) Cheek-eye ratio 0.65 or less.
- 19 (20) Cerci (Fig. 60) widely triangular. 5 to 7 dorsal subapicals on hind femora. Bigger, body length 7.5–8.07 mm.
soosi sp. n.
- 20 (19) Male cerci pointed apically (e.g. Fig. 1). 2 to 5 dorsal subapicals on hind femora.
- 21 (22) Flagellomere round and yellow-orange. Male cerci (Figs 1, 13) much longer than wide
caesius (MEIGEN)
- 22 (21) Flagellomere brownish-black, slightly elongated. Male cerci (Fig. 14) only as long as wide
czernyi sp. n.

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TAXONOMIC STUDIES
ON THE GENERA PSEUDOHADENA ALPHERAKY, 1889
AND AUCHMIS HÜBNER, [1821]
(LEPIDOPTERA, NOCTUIDAE), PART IV.

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(Received 20 April 1992)

Discussion of some species groups of *Pseudohadena* with the descriptions of two new species, *P. orias* sp. n. (C Kopet-Dagh) and *P. clementissima* sp. n. (Mongolia) and a new subspecies, *P. arvicola korshunovi* ssp. n. (Kugitang-Tau Mts) are presented. “*P.*” *crasipuncta* PÜNGELER is transferred to *Scotocampa* STAUDINGER, “*P.*” *evanida* PÜNGELER is transferred to *Mervia* DARICHEVA and *P. banghaasi* BYTINSKY-SALZ et BRANDT is synonymized with *P. arvicola* CHRISTOPH. A new species of *Auchmis*, *A. imbi* sp. n. (Tibet, China) is described. “*A.*” *crassicornis* BOURSIN is removed from *Auchmis* and transferred to a new genus, *Nekrasovia* gen. n. and a further species, *N. pliuschi* sp. n. (Zailiskiy Alatau) is described, with phylogenetic considerations of the genera *Auchmis*, *Euxenistis* and *Nekrasovia*. In the Addenda et Corrigenda the lectotype designation of *Bryopolia chamaeleon* ALPHERAKY is given. With 49 figures and three photoplates.

1. INTRODUCTION

During the study of the peculiar species-group of *Pseudohadena* (the *laciniosa*-group, RONKAY & VARGA 1989), we had to face with numerous confusions concerning the other species and species groups of the genus. One of the principal difficulties was the taxonomic relegation of the type species of *Pseudohadena*, *armata* ALPHERAKY. This species is very poorly known and the morphology of the genitalia was never published and figured. The fixing of the type species by monotypy could involve the possibility to conserve the genus *Pseudohadena* as a monotypic one since all the other taxa mentioned previously as members of this genus should be transferred into some other genera. The examinations of the holotype (male) and an authentic female of *armata* have pointed out (see chapter 3 A) that *armata* displays closer affinity in some genital features with the members of the *laciniosa* group, consequently they are, in fact, congeneric taxa. Thus, the usual interpretation of *Pseudohadena* can be conserved respecting that it contains

several more or less differentiated species-groups based on some apomorphies of the external and genital features. This second part of the revisional work on *Pseudohadena* contains the revised checklist of the genus and its species groups, some of which are discussed in details.

The genus *Auchmis* was considered in one of the earlier papers dealing with the genus (RONKAY & VARGA 1990a) as one of the genera bearing some plesiomorphic features which are meaningful for the interpretation of the probable origin of one of the major evolutionary lineages in the trifine Noctuidae. Two important conclusions could be stated during the step by step investigations (e.g. PLANTE 1986, RONKAY & VARGA 1990a, b, HACKER & WEIGERT 1990). The first is that the genus is much richer in species than it was previously known, the second is that one, peculiar species, described and repeatedly mentioned as *Auchmis (crassicornis)* BOURSIN, in reality belongs to a distinct genus of the autumnal generic complex of "Cuculliinae" (sensu HAMPSON) and is closely related to *Euxenistis* WARREN.

2. SYSTEMATIC LIST OF THE PSEUDOHADENA SPECIES

commoda-group:

- sergia* PÜNGELER, 1901
 (Dt. ent. Z. Iris 14: 184 – Chinese Turkestan, Aksu)
commoda (STAUDINGER, 1889)
 (Rhiza c., Stett. ent. Z. 50: 44 – Issyk-Kul)

- idumaea* PÜNGELER, 1901
 (Dt. ent. Z. Iris 14: 331 – Israel) (possibly a race of *commoda*)

- schlumbergeri* PÜNGELER, 1905
 (Dt. ent. Z. Iris 17: 265 – Dzharkent)
stenoptera BOURSIN, 1970
 (Entomops 18: 65 – Emba)

laciniosa-group:

- laciniosa* (CHRISTOPH, 1887)
 (Chloantha 1., Mem. Lep. 3: 77 – Gernob)
laciniosa hethitica RONKAY et VARGA, 1989
 (Acta Zool. Hung. 35 (3–4): 346 – Turkey)
laciniosa odontographa RONKAY et VARGA, 1989
 (Acta Zool. Hung. 35 (3–4): 344 – Mongolia)
calligrapha RONKAY et VARGA, 1989
 (Acta Zool. Hung. 35 (3–4): 342 – Mongolia)

gnorima (PÜNGELER, 1906)

- (*Rhizogramma* g., Dt. ent. Z. Iris 19: 220 – Ashkhabad)

gnorima hololampra RONKAY et VARGA, 1989

- (Acta Zool. Hung. 35 (3–4): 349 – Armenia)

gnorima peregovitsi RONKAY et VARGA, 1989

- (Acta Zool. Hung. 35 (3–4): 350 – Mongolia)

armata-group:

armata (ALPHERAKY, 1887)

- (*Hadena* a., Stett. ent. Z. 48: 170 – Kara-Kum)

siri-group:

siri (ERSHOV, 1874)

- (*Mamestra* s., Reise in Turkestan 2 (5): 41 – Kizyl-Kum)

roseotinctoides POOLE, 1989

- (= *roseotineta* BRANDT, 1941, nec *Turati*, 1929). (Lep. Cat., N.S. Fasc. 118, Noctuidae, 2: 849. – Iran, Balouchistan)

orias sp. n.

- (Kopet-Dagh)

adscripta PÜNGELER, 1914 stat. rev.

- (Dt. ent. Z. Iris 28: 44 – Aksu, Chamil-Hami)

- pugnax* ALPHERAKY, 1892
 (Horae soc. ent. Ross. 26: 449 – Songaria)
- oxybela* BOURSIN, 1963
 (Z. wien. ent. Ges. 38 – Kuldja)
- coluteae-group:
- coluteae* (BIENERT, 1869)
 (*Luperina c.*, Lep. Ergebn. Reise in Persien: 35 – Persia)
- arvicola* (CHRISTOPH, 1887)
 (= banghaasi BYTINSKI-SALZ et BRANDT, 1937, syn. n.). (*Agrotis a.*, Stett. ent. Z. 48: 163 – Tekke)
- arvicola rhodostola* BOURSIN, 1962
 (Bull. mens. soc. linn. Lyon 31: 305 – Damaskus)
- arvicola korshunovi* ssp. n.
 (Kugitang-Tau Mts)
- presbytis-group:
- presbytis* HAMPSON, 1910
 (Cat. Lep. Phal. 9: 510 – Chamil-Hami)
- clementissima* sp. n.
 (Mongolia)
- xanthophanes-group:
- xanthophanes* BOURSIN, 1944
 (Rev. franc. Ent. 10: 82 – Armenia)
- xanthophanes rhodocyanea* BOURSIN, 1963
 (Bull. mens. soc. linn. Lyon 32: 261 – Altyn-Tagh)
- xanthophanes* ssp. or sp. div.
 (Pakistan, Mongolia)
- indigna-group:
- indigna* (CHRISTOPH, 1887)
 (*Agrotis i.*, Stett. ent. Z. 48: 163 – Tekke)
- minuta* PÜNGELER, 1900 (1899)
 (Dt. ent. Z. Iris 12: 293 – Ili)
- minuta pseudocommoda* BOURSIN, 1963
 (Bull. mens. soc. linn. Lyon 32: 260. – Iran)
- minuta sengana* BRANDT, 1941
 (Mitt. münchen. ent. Ges. 31 (3): 851 – Iran, Balouchistan)
- minuta* ssp.
 (Afghanistan)
- chenopodiphaga-group:
- chenopodiphaga* (RAMBUR, 1832)
 (*Mamestra?* c., Ann. soc. ent. Fr. 1832: 283 – Corsica)
- chenopodiphaga erubescens* STAUDINGER, 1901
 (Cat. Lep. Pal. 1901: 170 – Algeria)
- chenopodiphaga roseotincta* TURATI, 1929
 (Boll. lab. zool. gen. agr. 23: 108 – Libya)
- halimi* (MILLIÈRE, 1877)
 (*Mamestra immunda* var., Ann. soc. ent. belg. 20: 58 – France)
- immunda* (EVERSMANN, 1842)
 (*Agrotis i.*, Bull. Soc. nat. Mosc. 1842 (3): 544 – Kasan)
- roseonitens* (OBERTHÜR, 1887)
 (*Mamestra r.*, Bull. soc. ent. Fr. 1887. XLIX – Algeria)
- mariana* LAJONQUIÈRE, 1964
 (Bull. mens. soc. linn. Lyon, 33: 46 – Spain)
- pexa* (STAUDINGER, 1889)
 (*Luperina p.*, Stett. ent. Z. 50: 41 – Issyk-Kul)
- rjabovi-group:
- megaptera* BOURSIN, 1970
 (Entomops 18: 69 – Afghanistan)
- rjabovi* BOURSIN, 1970
 (Entomops 18: 66 – Iran)
- immanis-group:
- immunis* (STAUDINGER, 1889)
 (*Luperina i.*, Stett. ent. Z. 50: 40 – Issyk-Kul)
- immunis lesghica* BOURSIN, 1944
 (Rev. franc. Ent. 10: 82 – Daghestan)

Abbreviations

- HNHM = Hungarian Natural History Museum, Budapest
- NHMW = Naturhistorisches Museum, Vienna
- NRM = Naturhistoriska Riksmuseet, Stockholm
- VA = coll. Vartian, Vienna
- ZIN = Zoological Institute, Academy of Sciences, St. Petersburg
- ZMHU = Zoologisches Museum, Humboldt-Universität, Berlin
- ZSM = Zoologische Staatssammlung, Munich

3. SYSTEMATIC PART

A) The *armata*-group

The generotype of *Pseudohadena*, *P. armata* (ALPHERAKY, 1887) is a specialized eremic species, displaying rather close relationships with the *laciniosa*-group (see RONKAY & VARGA 1989, Figs 1–15) (and also with the genus *Diadochia* PÜNGELER, 1914 in some external features, e.g. the coloration, some details of the male genitalia) and the spining of the forelegs (an adaptive feature) is also similar. The species *armata* ALPHERAKY, 1887 is redescribed and the genitalia of both sexes are figured.

***Pseudohadena armata* (ALPHERAKY, 1887)**

Type locality: Kara-Kum. – Type material examined: holotype male, "Kara-Kumy" (in Russian), "25. VIII. 85", "Tura Gr.-Gr." (green), "Pseudohadena Armata Alph. ♂" (green), a small, quadrate red-brown label without text, "Kol. Vel. Kn. Nikolaia Mihailovicha" (in Russian), "Pseudohadena armata Alph. Type!, ♂ issl. Ryabov", "micr. pr. No. 8238 Zool. Inst." (underside of the previous label). Coll. ZIN St. Petersburg.

Additional material examined: female "VIII., fl. Honton, Original" (green), "Pseudohadena Armata Alph. ♀", "Kol. Vel. Kn. Nikolaia Mihailovicha" (in Russian). Further four specimens from the Kizyl-Kum, Ayakguzhumdi, leg. FALKOVICH, one of them is reared from larva, its foodplant was *Artemisia* (SUKHAREVA, pers. comm.). (Coll. ZIN St. Petersburg).

Redescription: The description of the external features (structure of the head and thorax and the forelegs, the coloration and the wing pattern) is given satisfactorily in the original description and the subsequent characterization was made also by ALPHERAKY (1889).

Male genitalia (Figs 28–29): uncus long and slender, tegumen wide with large penicular lobes. Fultura inferior a strong subtriangular plate with very long apical processus; vinculum sclerotized, wide V-shaped. Valvae elongated and narrow, costa with a small triangular lobe at apical third. Cucullus triangular with slightly pointed apex, corona absent. Sacculus narrow and long, harpe thick and large, medially curved, apical part tapering with pointed tip. Costal plate forms a fine and long, spiniform, pollex-like processus distally from harpe. Aedeagus cylindrical, vesica membranous, without cornuti.

Female genitalia (Fig. 41): Ovipositor relatively long, posterior papillae anales narrow and arcuate, gonapophyses long and strong. Ostium bursae sclerotized, calycular, ductus bursae long, tubular, membranous with fine granulation and longitudinal wrinkles and a large, lateral emergence at its caudal end. Bursa copulatrix large, elliptical, cervix bursae small, conical and weakly rugulose, with some stronger crests between cervix and ductus. Corpus bursae membranous, with four ribbon-like signa, two of them long, two others significantly shorter.

Distribution: An eremic species inhabiting the Kara-Kum and the Kizyl-Kum deserts (? "West China"). (Although the interpretation of the type locality as "Kizyl-Kum" is not correct, the species occurs in both two large desert areas of Turkmenia and Kazakhstan.) Its life history is poorly known but the larval foodplants are desert *Artemisia* species (SUKHAREVA, pers. comm.).

B) The *siri*-group (Plate I: 1–6)

A homogeneous, surely monophyletic group within the genus, containing six species (see below). The main common features of the species group are as follows:

- large species with strong body and elongated, narrow forewings, wing pattern relatively sharp and well-marked.
- male genitalia: valvae elongated with long and slender, arcuate harpe. Cucullus specialized, often flattened, bearing a corona consisting of few but strong setae. Aedeagus with carina bearing two slightly divergent, firm bars fixing the basal coiling of everted vesica. Vesica tubular, distally amplified, its basal part coiled with 360°, medial part covered densely with minute spicula, it bears lateral diverticula and slightly sclerotized crest, terminal part with a small, flattened terminal cornutus.
- female genitalia: ovipositor moderately long and rather weak, ostium large, membranous with sclerotized lamellae, ductus bursae variably long and rugulose, in some species with a long and strongly sclerotized, sinuous ribbon. Cervix bursae large, often rugulose and/or sclerotized, corpus bursae elliptical or ovoid, with four long, ribbon-like signa.

The species *oxybela* BOURSIN, 1963 is relatively distinct (the male genitalia is figured by BOURSIN, 1963) since the other five taxa are very close to each other. On the basis of the great similarity of the genital capsula of the males, BOURSIN considered *adscripta* as a form of *siri*. On the other hand, he separated correctly *roseotincta* BRANDT, 1941, described originally as the subspecies of *siri*, on specific level. Later POOLE (1990) stated the homonymy of *roseotincta* BRANDT with *roseotincta* TURATI, 1929 (subspecies of *chenopodiphaga* RAMBUR, 1832) and gave the replacement name *roseotinctoides* for the Iranian twin species of *siri*.

As the result of the more detailed studies of the genitalia of this group, it was pointed out, that *siri*, *adscripta* and *roseotinctoides* are distinct species, the configurations of the vesica and the female genitalia show essential differences between the three taxa. The species *adscripta* shows closer rela-

tionship with *pugnax* than with *siri*. Moreover, a fourth member of the group was discovered in the material of the recent Turkmenian expeditions.

The redescriptions of *siri*, *adscripta* and *roseotinctoides* and the description of the new species are given below.

Pseudohadena siri (ERSHOV, 1874)

Type locality: Kizyl-Kum (Turkestan). – Type material examined: holotype female, "Russkiy Turkestan", "coll. Erschov," (Coll. ZIN St. Petersburg).

Additional material examined: some three hundred specimens from Issyk-Kul (VA), Uzbekistan (HNHM, ZIN), Aksu (NHW), Ili (NHW), Kushk (NHW), various places of Turkmenia (coll. HNHM, NHW, FÁBIÁN, HERCZIG, HREBLAY, G. RONKAY).

Slide Nos 4188 RONKAY (male), 4006, 4016 RONKAY (females).

Redescription: The external morphology of the species is described and illustrated satisfactorily in numerous works (e.g. ERSOV 1874, CHRISTOPH 1892, HAMPSON 1908, WARREN in SEITZ 1911).

Male genitalia (Figs 1–2): uncus relatively long and slender, only slightly lanceolate. Tegumen low and wide, penicular lobes small. Fultura inferior a large, strong, shield-like plate with convergent apical processes; vinculum strong, V-shaped. Valvae elongated and narrow, apically tapering. Cucullus small, apex pointed, corona consists of few but strong setae. Sacculus short, clavus a less developed, triangular protuberance. Harpe very long, arcuate and medially finely dilated, its basis long and slender. Costal lobe ("digitus") small and rounded. Aedeagus thick, cylindrical, carina with two strong ventro-lateral bars. Vesica tubular, everted laterally and coiled ventrally with 360°. Basal part membranous, medial third amplified, with a big, membranous diverticulum laterad and a sclerotized crest on other side. Distal third tapering, with a very long and narrow and a small, rounded diverticulum, both situated ventrally. Terminal cornutus very small and weak, posterior half of vesica covered densely by minute spiculi.

Female genitalia (Fig. 43): ovipositor moderately long and less sclerotized, gonapophyses slender and moderately long. Ostium bursae large, cup-shaped, granulately sclerotized. Ductus bursae relatively short, anterior part broad and twisted, constricted posteriorly; membranous and rugulose, some parts incrustated gelatinously. Cervix bursae large, semi-globular, surface wrinkled, corpus bursae spacious, elliptical, with four long and narrow, ribbon-like signa.

The external appearance of *siri* – because of its always greyish coloration – is similar to a less-marked *adscripta* or a darker *pugnax*, but the genitalia of both sexes show its closer relationships with *roseotinctoides* and *orias* (see Figs 42, 46). The main differences in the genitalia of *siri* and *roseotinctoides* are as follows:

siri

- uncus slender, only slightly lanceolate
- fultura bigger, apical arms convergent
- harpe less regular in curving
- vesica medially less widened, lateral diverticulum of distal third very long
- terminal cornutus smaller
- ostium larger with stronger, more homogeneous sclerotization
- ductus bursae shorter, twisted and proximally dilated
- cervix bursae larger.

roseotinctoides

- uncus broader, strongly lanceolate
- fultura narrower with longer, parallel apical arms
- curve of harpe regular
- medial part of vesica spacious, lateral diverticulum of distal third significantly shorter
- terminal cornutus bigger
- ostium membranous with two sclerotized laminae
- ductus bursae long and narrow, dilated only at cervix bursae
- cervix bursae smaller.

Distribution: Turkmenia, "Soviet" and Chinese Turkestan.

Pseudohadena roseotinctoides Poole, 1989 (Plate I: 1–2)

Type locality: Iran, Balouchistan. – Type material examined: 1 male, 1 female paratypes, Iran, Balouchistan, Kouh-i-Taftan (Khach), coll. BRANDT (NRM Stockholm). Slide Nos 4004 RONKAY (male), 4005 RONKAY (female).

Redescription: the original description of the taxon is rather laconic, mentioning only the fine rosy-brown coloration as a differential feature as compared with the nominate *siri*. Wingspan 51–52 mm, length of forewing 23–24 mm. Head, thorax and forewing light sandbrown with some fine pinkish shine and irrorated with whitish-grey scales, especially along inner margin. Forewing narrow and long, transverse lines pale brown, double and sinuous, filled with ochreous-brown. Medial line a diffuse, brownish shadow, most conspicuous between stigmata in cell. Subterminal rather indistinct, defined by some dark brownish spots and patches at apex and tornus. Orbicular large, ± flattened and oblique, encircled partly with black and filled with light whitish-brownish. Reniform large, outline double, black and whitish, filling whitish-grey and brown. Claviform obsolescent, represented by a small, dark brown spot and some light ochreous-greyish scales. Terminal line whitish, marked with a row of darker triangles, cilia sandy brown with lighter medial line. Hindwing shiny ochreous-grey with brown suffusion, marginal area dark and wide. Discal spot bit but pale, transverse line obsolescent and sinuous. Terminal line brown, cilia milky-ochreous with pale brown medial line. Underside of wings light, shiny milky-ochreous, inner area of forewing suffused scarcely with brown. Discal spots and transverse lines well-discernible on both wings.

Male genitalia (Figs 3–5): uncus large, lanceolate, with finely rounded apex. Tegumen low and wide, penicular lobes small, fultura inferior shield-

like with long apical arms, vinculum strong, V-shaped. Valvae elongated and slender, apically tapering. Cucullus small, apically and ventrally rounded, corona consists of few strong setae. Sacculus short, clavus a slightly flattened and setose field. Harpe very long and regularly curved, its base short and weak. Aedeagus cylindrical, distally tapering. Vesica everted forward and coiled (twisted) ventro-medially with a 360° curve. Basal third tubular and membranous, medial and distal thirds dilated and covered densely by very small spiculi. Medial third with a weakly sclerotized crest and a long and narrow, digitiform diverticulum on one side, a larger, semiglobular diverticulum on other side. Terminal cornutus small, flattened and finely twisted. The genitalia is figured by BOURSIN (1963a) but mistaken as *P. banghaasi* BYTINSKY-SALZ et BRANDT, 1937.

Female genitalia (Fig. 42): ovipositor relatively short and weak, gonapophyses moderately long. Ostium bursae large, membranous, with two slightly sclerotized laminae: dorsal lamina halfmoon-shaped, ventral lamina reversed V-shaped. Ductus bursae tubular, long and ± straight, membranous and partly gelatinous, with fine wrinkles. Cervix bursae semi-globular, rugose, corpus bursae elliptical, with four long and narrow, ribbon-like signa.

Roseotinctoides is the allopatric twin species of *siri*, the specific differences are discussed in the preceding taxon. *Roseotinctoides* resembles externally to the newly discovered species, *orias* as well, the distinctive features are given in the diagnosis of *orias* sp. n.

Distribution: Iranian Balouchistan.

Pseudohadena orias sp. n. (Plate I: 3)

Holotype: female, Turkmenia, Kopet-Dagh Mts, 400–600 m, Firyuza, 58° 05' E, 37° 54' N, 12–16. V. 1991, leg. G. CSORBA, Gy. FÁBIÁN, B. HERCZIG, M. HREBLAY et G. RONKAY. Slide No. 3990 RONKAY.

Description: Wingspan 57 mm, length of forewing 27 mm. Head, thorax and forewing dark sandbrown with intensive rosy-pinkish irroration. Frons with a narrow blackish line, tegulae with pale darker marginal stripe. Forewing very long and narrow with pointed apex, wing pattern relatively pale, darker brown or blackish. Transverse lines wide and double, sinuous, filled with ochreous-brown, medial line a wide, diffuse brown shadow. Subterminal line sinuous, pinkish-ochreous, defined by brown patches. Orbicular spot big and rounded, encircled with black, reniform large with double – blackish and pinky-white – outline and ochreous-pinkish and dark brown-grey filling. Cell with darker brown patches be-

tween stigmata and behind reniform. Claviform small, incompletely outlined with brown. Terminal line whitish-ochreous with small blackish triangles, cilia brown with fine ochreous line. Hindwing shiny ochreous, suffused strongly with brown, marginal area wide and darker. Discal spot small, transverse line obsolescent, sinuous. Terminal line brown, cilia pinkish-ochreous. Underside of wings shiny ochreous with pinkish suffusion, especially at margins; inner area of forewing suffused with pale greyish. Discal spots and transverse lines well-discernible, former with lighter centres, latter rather diffuse and sinuous.

Female genitalia (Fig. 46): ovipositor moderately long, wide but weakly sclerotized, gonapophyses moderately long. Ostium bursae broad, calycular, membranous with two rather strongly sclerotized laminae and some teeth at anterior edge. Ductus bursae tubular, long and curved, posteriorly tapering. Its walls membranous and strongly rugose or cristated, some parts incrusted gelatinously. Cervix bursae large, apical part conical and wrinkled, medial and basal parts sclerotized and cristated. Corpus bursae sacculiform, with four long, ribbon-like signa.

The new species differs from the related taxa by its larger size (the largest member of the group) and narrower forewings and several details of the female genitalia. The wing pattern is similar to those of *siri* and *roseotinctoides* but the reniform is larger, its surroundings are darker and the subterminal is sharper and more sinuous. The rosy-brownish coloration of the forewings is darker and more brownish than in case of *roseotinctoides* (and differs strongly from the slate-greyish *siri* as well). The differences in the female genitalia of the related taxa are illustrated in Figs 42–46, the most striking features of the new species are the sclerotized cervix bursae, the long and twisted, strongly rugose-gelatinous ductus bursae, the shape and size of the sclerotized laminae of ostium bursae and the small but strong teeth at the anterior edge of the ostium. (The latter feature is typical for the two other species of the species-group, *adscripta* and *pugnax* but these species have a strongly sclerotized ribbon and a small lateral appendage in the ductus bursae.)

Distribution: Turkmenia, Central Kopet-Dagh Mts. The species is known only from the type locality, occurring sympatrically with *siri*. It seems rare since only a single specimen was found together with a large series (more than three hundred specimens) of *siri* and numerous other specimens of *chenopodiphaga* and *arvicola* in the wide range of the Central and the West Kopet-Dagh and the surrounding desert.

Pseudohadena adscripta PÜNGELER, 1914 stat. rev. (Plate I: 4)

Type locality: Aksu. – Type material examined: holotype and paratypes, Aksu (coll. PÜNGELER, ZMHU Berlin).

Additional material examined: Ili, Kushk (NHW); Aksu (HNHM), Mongolia (HNHM, ZIN, GYULAI, G. RONKAY, VARGA). Slide Nos 3843 RONKAY, 1708 VARGA (males), 3850, 4017 RONKAY (females).

Redescription: the external morphology of the species is characterized and illustrated by PÜNGELER (1914), later by DRAUDT (in SEITZ 1934).

Male genitalia (Figs 6–7): uncus lanceolate, valvae elongated with a long, slightly curved harpe, digitus only a small, rounded ventral emergence. Cucullus rather long, apically curved and acute, corona short consisting of about a dozen of strong setae. Fultura inferior wide, shield-like, with two strong, horn-like anterior processes. Aedeagus cylindrical, thick, medium-long, apically tapering, carina with two strong bars. Vesica tubular, recurved and distally amplified, with a broad subterminal diverticulum and a very short terminal cornutus.

Female genitalia (Fig. 44): ovipositor moderately long and less sclerotized, gonapophyses relatively strong. Ostium bursae large, funnel-like, membranous with a sclerotized, flattened and sinuous ribbon and some small, strong plates at anterior edge. Ductus bursae tubular and twisted, long and broad. Posterior part rugose and gelatinous, with an irregularly sinuous, strongly sclerotized ribbon, anterior part tapering, with a relatively large, membranous lateral appendage. Cervix bursae large, semiglobular, with rather fine wrinkles and a small sclerotized field. Corpus bursae elliptical, with four long and narrow, ribbon-like signa.

The species resembles externally to *siri* but is more ash-greyish and the wing pattern is significantly sharper and stronger. The female genitalia displays essential differences as compared with *siri* and shows the closer affinity to *pugnax*. It differs from the latter species by its stronger sclerotization of the ostium, longer and broader, more twisted ductus bursae with shorter and wider sclerotized ribbon and the presence of a sclerotized patch of cervix bursae.

Distribution: Chinese Turkestan and Mongolia. *P. adscripta* is sympatric with its closest relative, *pugnax* and also with *oxybela* and partly with *siri*; its area does not overlap with those of the other two allied species.

Pseudohadena pugnax ALPHERAKY, 1892 (Plate I: 5–6)

Type locality: Songaria. – Type material examined: 5 female syntypes, Songaria, (coll. ZIN St. Petersburg).

Additional material examined: Syr-Darya, Baigacum (ZIN St. Petersburg, NHMW), Mongolia (HNHM, G. RONKAY, SZABÓKY, VARGA, etc.). Slide Nos 5252 VARGA, 2966 RONKAY (males), 3838, 3839 RONKAY (females).

Description: the external morphology is characterized in details by ALPHERAKY (1892) and an excellent colour plate is also given in the same work. Later, HAMPSON (1908) gave a good diagnosis of the species (the colour plate of WARREN (1911) is not the best).

Male genitalia (Figs 8–10): uncus long, lanceolate, apically finely waved, apex claw-like. Tegumen rather low and wide, fultura inferior shield-like with two convergent apical processes. Valvae only moderately elongated, cucullus rounded with reduced corona, digitus hook-like, flattened and short. Harpe strong, arcuate, distally slightly flattened. Aedeagus with two dilated bars of carina, vesica tubular with one and a half coiling at its basal third. Medial part with a membranous, narrow diverticulum and a weakly sclerotized lateral crest, distal third with two broad diverticula and a rather short but strong, spine-like cornutus.

Female genitalia (Fig. 45): ovipositor relatively short and wide, less sclerotized, gonapophyses rather strong. Ostium bursae relatively narrow, membranous with a sclerotized, slender and sinuous ribbon and some strong plates at anterior edge. Ductus bursae narrow, flattened and twisted, relatively long. Posterior part rugose and gelatinous, with an irregularly sinuous, long and strongly sclerotized ribbon. Anterior part slightly tapering, with a small, membranous lateral appendage. Cervix bursae large, wrinkled, corpus bursae ovoid-elliptical, with four long and narrow, ribbon-like signa.

The species is related most closely to *adscripta*, although externally is rather distinct from the other members of the species-group. The configuration of the female genitalia of *pugnax* and *adscripta* is very similar, the specific differences are discussed at the preceding species.

Distribution: E Turcomania, "Soviet" and Chinese Turkestan, W and SW Mongolia and N China. Its area is rather wide, overlapping partly with three of its relatives (*siri*, *oxybela*, and *adscripta*).

C) The *coluteae*-group (Plate II: 9–12)

Small and homogeneous group containing only two species with partly overlapping distribution. The taxon *banghaasi* BYTINSKY-SALZ et BRANDT, 1937 is synonymous with *arvicola* CHRISTOPH, 1887 (syn. n.). *Coluteae* is

distributed from Iran to Chinese Turkestan and the Himalaya range, without subspecific segregation. The second species, *arvicola* displays stronger geographic splitting, the southwestern (ssp. *rhodostola* BOURSIN, 1962) and the eastern marginal populations (ssp. *korshunovi* ssp. n.) represent distinct geographic races. Both species are xeromontane-eremic, inhabiting (high) montane steppes and semideserts, occurring also in some deserts along the edges of the mountain chains.

Pseudohadena coluteae BIENERT, 1869 (Plate II: 9)

Type locality: Persia. – Material examined: Korla, Aksu, Altyn-Tagh (NHMW), Kirghisia (G. RONKAY), Chinese Turkestan (HNHM), Kashmir (PLANTE). Slide Nos 3841 RONKAY, 5679 VARGA (males).

Description: a very characteristic, practically unmistakable species with light silky-grey colouration of forewings and milky white underside. It was often figured well (HAMPSON 1908, WARREN 1911, etc.).

Male genitalia (Figs 15–16): uncus short and weak, tegumen wide with well-developed, ear-shaped penicular lobes. Fultura inferior large, more or less drop-shaped; vinculum strong and short. Valvae elongated, cucullus reduced, apex slightly rounded. Sacculus short and flattened, clavus a setose, weak protuberance. Harpe strong, acute, finely sinuous, costal processus ("digitus") narrow and arcuate with pointed apex. Aedeagus thick, cylindrical, ventral end with a sclerotized and curved, lip-like appendage. Vesica everted forward and curved ventrally, broad and membranous, with three large and rounded diverticula; terminal cornutus absent.

The two related species have relatively great differences in the male genitalia (e.g. shape of valva, clavus, cucullus, fultura and vesica, see Figs 11–16), the main synapomorphies are the same structure of the tegumen and its peniculi, the well-developed and horn- or beak-shaped costal processus, the coiling of the vesica and the reduction of the terminal cornutus.

Distribution: a xeromontane species with relatively wide but interrupted area from Iran to Chinese Turkestan and the NW Himalaya.

Pseudohadena arvicola CHRISTOPH, 1887 (Plate II: 10)

Type locality: Tekke: Germob. – (= banghaasi BYTINSKI-SALZ et BRANDT, 1937 *syn. n.*; type locality: Iran, Elburs, Keredj).

Type material examined: two male syntypes from the same locality: "Germob Ld.", "A. arvicola Chr." (grey label). The intact specimen is designated here as lectotype, the paralectotype was dissected by RYABOV, prep. No. 6241, the tube with such number was not

found. The types are deposited in coll. ZIN St. Petersburg. Two paratypes of *banghaasi* BYTINSKY-SALZ et BRANDT, Iran, Elburs, Keredj, 1200 m, 5. 5. 1936, leg. BRANDT.

Additional material examined: males and females from various places of the Turkmenian Kopet-Dagh (coll. FÁBIÁN, HERCZIG, HREBLAY, G. RONKAY, VARGA, HNHM, ZIN St. Petersburg); Iran, vic. Teheran (VA); vic. Isfahan (VA); Azerbaijan, Nahichevan, Buzgov (coll. NEKRASOV). Slide No. 5678 VARGA (male).

Redescription — Male genitalia (Figs 13–14): uncus long and narrow, tegumen wide and rather low, with big and apically pointed penicular lobes. Fultura inferior a strong, quadrangular plate with two short apical arms; Vinculum strong and V-shaped. Valvae elongated and narrow, cucullus more or less rounded, corona present and long. Sacculus strong, clavus very large, setose, pulvillus sclerotized and globular. Harpe long and slender, curved, apex slightly rounded, its basis a long and narrow bar. Costal processus ("digitus") heavily sclerotized, wide-based and flattened, beak-shaped with finely rounded apex. Aedeagus thick, cylindrical, vesica everted forward and recurved ventrally. Medial part strongly widened, bearing three large, membranous diverticula; terminal cornutus absent.

Female genitalia: ovipositor moderately long and weakly sclerotized, gonapophyses slender. Ostium bursae elliptical, both surfaces sclerotized, dorsal plate somewhat smaller and ± cordiform. Ductus bursae long and flattened, narrow, strongly rugose with some patches of granulose sclerotization. Cervix bursae large, more or less conical, membranous with relatively strong wrinkles and some weakly sclerotized crests, corpus bursae ovoid, with four long, ribbon-like signa.

Distribution: NW and N Iran, Azerbaijan and Turkmenia (Kopet-Dagh).

Pseudohadena arvicola rhodostola BOURSIN, 1962

Type locality: Syria, Damaskus. — Type material examined: Holotype, "16–28. v. 1961, Syria, Damaskus, KASY & VARTIAN" (coll. VARTIAN).

This western subspecies differs from the nominate *arvicola* by the fine reddish-ochreous colouration of its forewings.

Distribution: NW Syria.

Pseudohadena arvicola korshunovi ssp. n (Plate II: 11–12)

Holotype: male, Turkmenia, Kugitang-Tau Mts, 500–600 m, 6 km SW of Bazar-tepe, 66° 30' E, 37° 50' N, 16–19. V. 1991, leg. M. HREBLAY et RONKAY. — **Paratypes:** 28 specimens (males and females) from the same locality and data, (coll. HNHM, FÁBIÁN, HERCZIG, HREBLAY, G. RONKAY, PLANTE et VARGA). Slide Nos 4186 RONKAY (male), 4187 RONKAY (female).

Description: the new subspecies differs from *arvicola* in a series of external features which are as follows: smaller on average, the wings and the body are more gracile. The ground colour of the forewings is light, shiny ochreous-brown with a fine pinkish shade, the hindwings are lighter and more ochreous-greyish with less intensive marginal suffusion. The underside of wings are more ochreous-brownish, the darker irroration less strong.

The main differences between the male genitalia of the two races in the shape and size of the cucullus, the costal processus and the vesica. The eastern subspecies has narrower cucullus and more pointed apex, slightly asymmetric costal processes and less widened vesica (Figs 11–14).

Distribution: Known only from the Kugitang-Tau Mts. (SE Turkmenia).

D) The *presbytis*-group (Plate III: 13–14)

A poorly known group containing only two species, the second is described here. The basic configuration of the male genitalia resembles to those of some *Eremophysa* species; the females of the species are unknown. Both species have a very restricted Central Asian area (possible endemisms in the E Tien Shan and in C Mongolia).

Pseudohadena presbytis HAMPSON, 1910 (Plate III: 13)

Type locality: Chinese Turkestan, Chamil-Hami ("Chamil-Hanis"). – Type material examined: Holotype male, Asia centr., Turkestan, Chamil-Hami, leg. RÜCKBEIL; coll. PÜNGELER, ZMHU Berlin.

Additional material examined: one male, from the same locality. (This specimen was labelled by PÜNGELER as "Cotype" but it is not designated as paratype in the original description.) Slide No. 3788 RONKAY.

Description: The external features are described in details by HAMPSON and figured on a colour plate.

Male genitalia (Figs 17–18): fultura inferior a subtriangular shield without longer apical processi. Valvae elongated with nearby parallel borders, cucullus broad with well-developed corona consisting of 15–16 setae. Harpe strong, arcuate, apical part stout, costal processus ("digitus") short and spine-like. Aedeagus long, stout, vesica inflated and recurved ventrally, covered with small spinules. Inner curve with a small, flat diverticulum, terminal cornutus strong and long, slightly lanceolate.

Female unknown.

Distribution: the species is known only from the type locality (Chinese Turkestan).

Pseudohadena clementissima sp. n. (Plate III: 14)

Holotype: male, "Mongolia, Govi Altay aimak, Mts Hasagt Hayrhan, 2200 m, 25 km S of Dzargalant, 95° 44' E, 46° 48' N, 8–9. 08. 1988, leg. PEREGOVITS et VARGA", slide No. 3794 RONKAY.

Description: wingspan 41 mm, length of forewing 20 mm. Head and thorax dark ash-grey, abdomen a bit more brownish. Frons with a fine black line, tegulae mixed with some dark brown hair-scales. Forewing elongated and narrow, wing pattern sharp, blackish grey. Ground colour shiny (metallic) ash-grey, suffused with pinkish-ochreous in two narrow stripes below cell to tornus and from reniform to apex. Streak of submedian fold long and fine, transverse lines sinuous, double, medial line a narrow and pale brown shadow. Subterminal ochreous, defined with some blackish-brown arrowheads at apex. Orbicular large, rhomboidal, encircled sharply with black and filled with bluish-grey. Reniform big, arcuate, outlined with black and whitish, filled with light grey and a conspicuous, dark plumbeous-grey spot at lower third. Vein m_2 covered by a fine black line from reniform to subterminal, other veins dark greyish in marginal field. Terminal line sharp and fine, black; cilia dark grey mixed with ochreous-brown. Hindwing whitish, basal and marginal area suffused with brown. Discal spot very pale, transverse line well-discernible, sinuous, dark brown. Terminal line grey, cilia pinkish-white. Underside of wings shiny milk-white with some ochreous shade, inner area of forewing from base to subterminal suffused strongly with dark grey. Discal spot large and sharp, dark grey with whitish centre, transverse line pale and interrupted. Hindwing light with only scarce dark grey irroration on veins and in two disjunct patches in marginal area. Discal spot and transverse line relatively pale.

Male genitalia (Figs 19–20): uncus long, apically curved and acute. Fultura inferior subdeltoidal with two small apical processi. Valvae very long with broad cucullus and corona consisting of 24–25 setae. Costal margin with a lobated protuberance before cucullus, costal processus ("digitus") wide-based and ventrally dentated, apically triangular and acute. Harpe long and strong, apically partly recurved. Aedeagus thick, slightly curved, ventral part of carina finely dentate. Vesica broad, tubular, recurved ventrally. Inner curve with two large membranous diverticula, terminal cornutus strong and long, straight.

Female unknown.

The new species differs from *presbytis* by its larger size and more elongated forewings, characteristic metallic grey colouration and sharper pattern of the forewing. The stigmata are larger and fully encircled, the dark spots of subterminal line are black(ish), long and sharp; the marginal suf-

fusion and the transverse line of hindwing are considerably stronger and darker.

The differences in the male genitalia are less expressive but significant. In *clementissima* the cucullus is broader with longer corona, the costal margin is with a well-developed lobe, the costal processus is longer and acute and the vesica is with two large diverticula. In case of *presbytis* the cucullus is narrower with shorter corona, the costal margin is ± straight, the costal processus is short, spiniform and the vesica is with a single, small and flat diverticulum.

Distribution: *clementissima* is known only from the type locality (C Mongolia).

E) Species mentioned formerly as *Pseudohadena*
belonging to other genera:

Scotocampa crassipuncta (PÜNGELER, 1905) comb. n.

Type locality: Aksu. – Type material examined: holotype female, Aksu, slide No. 3836 RONKAY. Deposited in coll. PÜNGELER, ZMHU Berlin.

The external morphology and the configuration of the female genitalia (Fig. 47) undoubtedly show the close affinity of *crassipuncta* with *indigesta* STAUDINGER, 1888, the generotype of *Scotocampa* STAUDINGER, 1888. The two species occur sympatrically in Chinese Turkestan (Aksu).

Mervia evanida (PÜNGELER, 1914) comb. n.

Type locality: Syr-Darja, Baigacum.

The species is known only on the basis of the females, the external morphological characteristics and the features of the female genitalia suggest placing it into the formerly monotypic eremic genus, *Mervia* DARI-CHEVA, 1961.

Polymixis (s.l.) **seposita** (PÜNGELER, 1914)

Type locality: Syr-Darja, Baigacum (see also HACKER & RONKAY, 1992).

“Pseudohadena” *impedita* CHRISTOPH, 1887 (Germob)

The taxonomic relegation of this taxon is not clear: on the basis of the description and the material available from the vicinity of the type locality it seems as a possible synonym of *commoda* STAUDINGER, 1889. On the other hand, there is a specimen preserved in the collection of the Zoological Institute, St. Petersburg and named as “*impedita* CHRISTOPH” fits well with the description and the figure of CHRISTOPH. This specimen, in fact, is a special form of *Apamea platinea* TREITSCHKE occurring in the central Kopet-Dagh! This specimen is surely not the type of *impedita* (male, “Askhabad, 7.84. Komar”), but is was identified by CHRISTOPH as *impedita*, although in one of the labels it is mentioned that “DR. STAUDINGER gehält dass für 2 Arten”.

F) Taxonomic news in the genus *Auchmis* HÜBNER, [1821] 1816

***Auchmis imbi* sp. n. (Plate III: 15)**

Holotype: male, “Thibet, Fou-Lin, Chasseurs Indigenes, Printemps 1895” slide No. 3448 L. RONKAY. (coll. NHMW). – **Paratypes:** 1 male, (China), “Myn-dan-sha”, “Rh. indica Wkr.”, “Kol. Vel. Kn. Nikolaia Mihailovicha” (in Russian); 1 female, (China), “Shoengping, dolina reki Langza Lirva, 5. V. 1885”, “Indica Wkr.” “Kol. Vel. Kn. Nikolaia Mihailovicha” (in Russian). Both paratypes are in coll. ZIN St. Petersburg, female genitalia are mounted in a glycerine holder made by L. RONKAY.

Description: Wingspan 44–47 mm, length of forewing 20–21 mm. Head and thorax slate-grey, palpi laterally dark brown. Frons, tip of collar, edges of tegulae and metathorax with sharp black and dark brown stripes. Abdomen grey-brown, dorsal crest short. Forewing relatively short, broad, apex acute. Ground colour slate-grey with dark brown suffusion and irroration, especially in medial and marginal fields. Streak of submedian fold long, black with whitish and brown zones above and below it. Transverse lines double and sinuous, waved, medial line a wide and diffuse, brown ribbon. Subterminal strongly sinuous, pale grey, dividing marginal field to a light greyish inner and a dark brownish outer part. Arrowhead-spots long and narrow lines between veins. Stigmata incompletely encircled with black, orbicular small, conjoined with reniform by a long, black line at lower edge. Reniform large and arcuate, claviform a light patch with interrupted, blackish outline, continued in a double, grey line between ante- and post-medial lines. Terminal line fine, whitish, defined by grey at inner side; cilia grey-brown, spotted with white at ends of veins and with two fine, parallel darker lines. Hindwing shiny whitish, suffused intensely with brown, margi-

nal area broad and dark. Discal spot long and rather strong, transverse line diffuse, shadow-like. Terminal line brown, cilia white with brown medial line interrupted at veins. Underside shiny whitish-grey, forewing homogeneously suffused with brown, discal spot absent, transverse line a slightly visible shadow. Hindwing with weak brownish irroration on veins and at costal and marginal fields; discal spot strong and sharp, brown with whitish centre. Transverse line diffuse but well-visible, cilia white.

Male genitalia (Figs 36–37): uncus thick and moderately long, finely spatulated terminad. Tegumen narrow and high, peniculi long and narrow, hairy. Fultura inferior low and wide, calycular, vinculum strong, U-shaped. Valva large, medial third dilated, with a big, triangular lobe on ventral side at distal half of ampulla. Cucullus small with acute apex and weak, short corona, joined to medial third of valva with a narrow neck. Sacculus slender and long, clavus reduced. Harpe strong, slender and distally curved, apically tapering and pointed; basis flattened and wide, triangular with larger distal extension. Ampulla long and strong, straight; apex finely pointed and slightly exceeds ventral margin. Aedeagus cylindrical, distally strongly tapering. Ventral end of carina elongated, with a rounded plate bearing large cornuti, dorsal part with a weaker ribbon extending towards to vesica. Vesica everted forwards and reclinated dorsally, tubular and membranous with finely granulose medial part. Distal end with a big, semiglobular diverticulum covered densely with short spinules.

Female genitalia (Fig. 48): Ovipositor short and wide, gonapophyses relatively short. Ostium heavily sclerotized, large, rounded and more or less drop-shaped. Ductus bursae tubular and slightly rugulose. Cervix bursae small, conical, with fine wrinkles, corpus bursae large, elliptical, with four long, ribbon-like signa.

The new species belongs to a small group of species within the genus distributed in the Himalayan–Sino–Tibetan region. This group contains four species, *hannemanni* PLANTE, 1986, *ronkayi* HACKER et WEIGERT, 1990, *composita* PLANTE, 1986 and *imbi* sp. n. The imagines resemble somewhat to a dark and broad-winged *A. detersa* (ESPER, [1791]) but their pattern is usually sharper and the hindwings are always significantly darker (see PLANTE 1986, Figs 1–2, 4–5; HACKER & WEIGERT 1990, Plate D, Fig. 15). The species group consists of two twin species, concerning the configuration of the male genitalia, the new species is close to *composita* (the male genitalia are illustrated in PLANTE, 1986, Fig. 6), the specific differences are as follows: *imbi* is larger in size with broader forewings, the harpe is longer and more curved, its apical part is regularly tapering, the ampulla is stronger and straight. The aedeagus is significantly longer, the distal, dentated plate of carina is not eversible and placed ventrally.

Distribution: E Tibet, China. The ranges of the two sibling species are incompletely known but probably they are partly sympatric. The species *composita* was described from Nepal but was discovered also in NW China (Richthofen Mts, coll. ZSM, slide No. 3127 RONKAY; male), since the new species occurs in China, too (although the exact place of the two localities are unclear for us).

The new species is dedicated to the late MR. R. IMB (Naturhistorisches Museum Vienna). He was a respected person who never rejected anybody who was in need of entomological help. All colleagues liked him very much because of his readiness to help. Besides his entomological activity he was a collector of succulent plants and loved painting. We think to commemorate him with the dedication of this species the holotype of which was loaned by him for studies.

Interestingly, all the three specimens of *A. imbi* sp. n. were misidentified as *A. indica* (WALKER, 1858). *Indica*, in fact, is rather dissimilar to the species group discussed above and is related closely to *A. peterseni* (CHRISTOPH, 1887). The previously unpublished genitalia of both sexes of *indica* are given in Figs 26–27, 49.

G) The taxonomic position of “*Auchmis*” *crassicornis* BOURSIN, 1960

In the third part of his series on the Afghan Noctuidae (collected by KLAPPERICH) BOURSIN (1960) described a peculiar species resembling to the members of the genus *Auchmis* HÜBNER, [1821] 1816. On the basis of its external appearance and the well-developed complex of harpe and ampulla-costal plate, he placed it into *Auchmis*, although *crassicornis* is characterizable with several features unique in the genus (e.g. strongly bipectinated antennae, slender body, paired abdominal coremata on the first sternite, lack of corona and neck of cucullus, sinuous and less sclerotized, S-shaped harpe, presence of a terminal cornutus, and the autumnal flight period as well). As it was pointed out in one of the previous works of this series (RONKAY & VARGA 1990a), the harpe-ampulla complex – as a plesiomorphic feature – may often appear in very similar stages, in phylogenetically remote lineages. On the other hand, many of the unique characteristics of *crassicornis* suggest its removal from *Auchmis*. Interestingly, one of the main arguments for this decision is a plesiomorphic character, namely the presence of the coremata-pair in *crassicornis*. This fact also reflects to the danger of the mechanical usage of the apomorphic and plesiomorphic character states in the taxonomy and systematics. The abdominal coremata on the last sternite should be considered as a synapomorphy of the different species-groups of *Auchmis*, which is evidently not homologous with the

plesiomorphic basal coremata-pair of *crassicornis*. (The fact that the latter species has coremata-pair can serve as an argument for its phylogenetic distinctness, the lack of any coremata can not!)

The analysis of the morphological and phenological data has pointed out that *crassicornis* represents a distinct genus connected closely to *Euxenistis* WARREN, 1910. Our statement on the surprising similarity of some important morphological features of *Euxenistis* and *Auchmis* (RONKAY & VARGA 1990a) can be completed and given more precisely. The slender body, the strongly bipectinated antenna and some of the valval features (shape of valva, lack of corona and neck of cucullus, similar configuration of pulvillus and clavus) shows the true phylogenetic relationships between the monotypic *Euxenistis* and “*Auchmis*” *crassicornis* but not with any other *Auchmis* species. The differences between the configuration of the vesica, the harpe-ampulla complex and the colouration and wing pattern give the basis for the separation of the lineage represented by *crassicornis* on generic level (*Nekrasovia* gen. n.).

The more detailed study of “*crassicornis*” also revealed that *crassicornis* is a complex of some (very probably) allopatric species. *Crassicornis* itself is the species occurring in the Afghan (?and Tadzhik) Pamir since populations living in the south-western and central parts of the Tien Shan system represent one (or more) different species in the eastern and central parts of the Tien Shan system. As the available material is unfortunately small, the species-complex is only characterized but not revised here, but one of the taxa occurring in the C Tien Shan, being relatively far from the true *crassicornis* is described below as a distinct species.

Nekrasovia gen. n. (Plate III: 16–18)

Type species: *Auchmis crassicornis* (BOURSIN, 1960).

Diagnosis: Medium-sized or relatively large species (wingspan 38–42 mm) with slender body, antenna of males strongly bipectinate. Forewings broad and elongated, apex acute, outer margin straight and slightly sinuous. Head small, eyes large and rounded, with dark, overhanging cilia. Frons smooth and flattened, upper part of it and vertex bear 1–1 conical tufts. Proboscis with a pair of small, penicilliform, basal appendages. Collar very large, tegular rather distinct, pro- and metathorax with well-developed medial crest, metathorax with large tuft. Abdomen slender, dorsal crest present but reduced to one or two basal tufts.

Male genitalia (Figs 30–35, 38–39): uncus moderately long and flattened, tegumen wide with setose penicular lobes. Fultura inferior small,

subtriangular or subrectangular, vinculum strong, U- or V-shaped. Valvae elongated and slender, apically tapering. Apex rounded, corona reduced, cucullus finely hairy. Sacculus short, clavus less developed, usually a less strong, setose surface. Harpe moderately strong, characteristically S-shaped with sinuous distal part, ampulla large and strong, apically curved or angled and heavily sclerotized. Aedeagus relatively short and cylindrical, carina without stronger sclerotization. Vesica everted forward and partly or entirely reclinata, membranous with finely granulose parts. Distal third often with a large, conical diverticulum and a fine, long, spiniform terminal cornutus.

Female unknown.

The new genus belongs to the autumnal complex of *Xylenini*, related closely to *Euxenistis* WARREN, 1910.

Distribution: Pamir and Tien Shan mountain systems (Afghanistan, Tadjikistan, Kirghisia, Kazakhstan).

The new genus is dedicated to MR. A. V. NEKRASOV, one of the best explorers of the Central Asian Noctuidae, the excellent material of whom gave the opportunity to clarify numerous taxonomic problems of the autumnal noctuid complex (mentioned formerly as autumnal Cuculliinae).

Nekrasovia crassicornis (BOURSIN, 1960) comb. n. (Plate III: 16)

Bull. mens. soc. linn., Lyon 29: 148 – *Auchmis*.

Type material examined: holotype male, “J. KLAPPERICH, Ferusch Tagan 1900 m, Khinjantal 25. 9. 52., Lichtfg., O-Afghanist.” (coll. ZSM). Slide No. 4184 RONKAY.

Additional material examined: 5 males, Tadjikistan, Pamir, Khorog (coll. ZIN St. Petersburg; coll. NEKRASOV, Moscow); 1 male, Tadjikistan, Hissar, Anzob Pass, 24. 10. 1988, leg. LINDT (coll. Zoological Museum Helsinki). Slide Nos 4089, 4199 RONKAY.

The male genitalia are illustrated here for the first time (Figs 38–39). In our opinion, *crassicornis* is not a single species but a complex of closely related and allopatric taxa. The holotype of *crassicornis* differs from the specimens from the Tadjik Pamir (Plate III: 17) with its lighter ground colour, the somewhat paler outlines of stigmata and the rounded, short discal spot of the hindwing. The male genitalia also show some differences, as the holotype has shorter harpe and strongly recurved vesica. It is possible that these two populations represent two distinct taxa, but, as the available material is not satisfactorily enough to decide this problem, we desist from the separation of them. The case is similar with the Kirghisan population (we had an opportunity to study only a single male with the data: Kirghizskiy hrebet, Ala-Archa, 2050 m, VIII. 1986, A. NEKRASOV; slide No. 4079 RONKAY). The genitalia of this specimen have wider valvae with less strong costal protuberance, more rounded cucullus and shorter harpe (Figs 32–35).

Distribution: Hissaro-Pamir system (Afghanistan, ?Tadzhikistan), ?South-West Tien Shan (Kirghisia).

Moreover, *crassicornis* has a twin-species in the Central Tien Shan which is relatively far from the two other *Nekrasovia*. As the differences between them are considered as significant ones, this second species is described below as new for the science.

Nekrasovia pliuschi sp. n. (Plate III: 18)

Holotype: male, Kazakhstan, "Zailisk. Alatau, Pravyi Talgar, 1500 m, na svet, 21. IX. 1978, I. PLIUSCH" (in Russian) (= Zailiskiy Alatau, Right Talgar, on light). Slide No. 4073 RONKAY (coll. NEKRASOV, Moscow).

Description: wingspan 40 mm, length of forewing 18 mm. Head and thorax dark ash-grey mixed with whitish-grey and blackish hairs, tip of collar and edges of tegulae fumous grey or blackish. Antenna (of male) strongly bipectinate, dorsal surface of axis covered with whitish scales. Abdomen grey-brown with two small black-grey tufts of dorsal crest. Forewing elongated and broad, apex acute. Ground colour shiny plumbeous-grey mixed with some whitish-grey and brownish. Wing pattern more or less obsolescent, antemedial line double and sinuous, medial line relatively strong and diffuse, postmedial line reduced to some darker spots on veins. Orbicular and reniform stigmata present, encircled incompletely with blackish-grey. Orbicular oblique, flattened and more or less rounded, reniform narrow and falcate, filled with pale red-brown. Subterminal line very pale, defined with some darker spots at veins m_1-m_3 . Basal field of wing suffused with dark plumbeous-grey and some brownish (darkest part of wing), inner half of median area irrorated with whitish-grey scales. Veins covered with dark grey, especially in marginal zone. Terminal line sharp and sinuous, white, marked with some blackish arches at inner side. Cilia dark grey. Hindwing whitish, suffused intensively with brown, marginal area wide, only slightly darker than other parts of wing. Discal spot elongated, shadow-like, transverse line reduced. Terminal line dark brown, cilia white with brownish medial line. Underside of wings whitish-grey, forewing suffused entirely with somewhat darker brown-grey. Pattern reduced, only some small spots of transverse lines, ghost of reniform and a small, rounded discal spot of hindwing marked by dark brown scales.

Male genitalia (Figs 30–31): uncus narrow and more or less flattened, moderately long. Tegumen wide, penicular lobes small, densely setose. Fultura inferior a small, subrectangular plate, vinculum strong, U-shaped, valva elongated and slender with nearly parallel margins. Cucullus trian-

gular with finely rounded tip, corona absent, apical part of valva covered by long, fine hairs. Sacculus short, clavus a narrow, setose plate. Pulvillus small, harpe less sclerotized, S-shaped with long, slender basis and less regular, finely setose apical third. Ampulla very long and slender, weakly curved sword-like with acute apex. Aedeagus cylindrical, slightly arcuate, carina with weakly sclerotized bars extending towards to vesica. Vesica everted forwards but twisted laterally at its base, medial and distal thirds reclinated dorso-laterally. Vesica tubular with fine granulation and wrinkles, terminal cornutus slender, spiniform and relatively long.

The new species differs externally from the two other taxa of the genus by its less sharp outlines of stigmata, shorter and more rounded orbicular spot, darker suffusion of basal field and stronger medial line. The configuration of the male genitalia is also similar to those of the related taxa of the *crassicornis*-complex (see Figs 30–35, 38–39), the specific features are as follows:

- ampulla regularly tapering, apically only slightly arcuate but not wide based and strongly angled to ventral margin in its apical third;
- harpe short and weak, its distal half also sinuous;
- vesica longer, its distal, recline part nearly straight, without larger, membranous diverticulum;
- terminal cornutus finer and shorter.

Distribution: Central Tien Shan (Kazakhstan).

* * *

As a summary of the studies on the genus *Auchmis* the revised checklist is presented below:

subg. <i>Auchmis</i> HÜBNER, [1821] 1816	
<i>detersa</i> <i>detersa</i> (ESPER, [1791])	<i>detersina</i> (STAUDINGER, 1897)
<i>andalusica</i> (RIBBE, 1912)	<i>curva</i> (STAUDINGER, 1889)
<i>minoica</i> REISSER, 1958	<i>subdetersa</i> (STAUDINGER, 1896)
<i>demavendi</i> SCHAWERDA, 1955	<i>mongolica</i> <i>mongolica</i> (STAUDINGER, 1897)
<i>imbi</i> sp. n.	<i>pergrata</i> RONKAY et VARGA, 1990
<i>composita</i> PLANTE, 1986	<i>indica</i> (WALKER, 1865)
<i>ronkayi</i> HACKER et WEIGERT, 1990	<i>peterseni</i> (CHRISTOPH, 1887)
<i>hannemannii</i> PLANTE, 1986	subg. <i>Euscotia</i> BUTLER, 1889
<i>incognita</i> RONKAY et VARGA, 1990	<i>saga</i> (BUTLER, 1878)
<i>paucinotata</i> (HAMPSON, 1894)	<i>inextricata</i> (MOORE, 1881)

H) Addenda and corrigenda

1. Lectotype designation of *Bryopolia chamaeleon* ALPHERAKY, 1892

In the revision of the genus the taxon *B. chamaeleon* was stated by the genitalia figure sent by PROF. RYABOV to CH. BOURSIN who figured it as *B. chamaeleon*. But the type series, consisting of five specimens (3 males, 2 females), contains in fact three different species of *Bryopolia*. These are as follows:

- male, "Alai", prep. No. 7507 Ryabov (= *chamaeleon*);
- male, "Karateguin" (= *chamaeleon*);
- male, "Alai", "Original", without abdomen (= *tsvetaevi* VARGA et RONKAY, 1990);
- female, "Darwaz", "Chamaeleon Typus" (= *tsvetaevi*);
- female, "Karateguin" (= *virescens* HAMPSON, 1894).

In the original description of *chamaeleon* all the five specimens are mentioned and they can be undoubtedly recognized in the collection of N. M. ROMANOV, the diagnosis and the colour plates fit mostly to the two specimens belonging to *tsvetaevi*. (The name *chamaeleon* refers very probably to the big variation in the colour of the five specimens of the "species". This is not surprising, concerning the specific heterogeneity of the type series, otherwise both *chamaeleon* and *tsvetaevi* – sensu RONKAY, VARGA et HACKER, 1990 – are rather conform in their external features.

Although we suppose that the ALPHERAKY's description is based mainly on the two specimens of "*tsvetaevi*", a male specimen of "*chamaeleon*" is proposed to be designated here as lectotype. The synonymization of *tsvetaevi* with *chamaeleon* and the change of the sense of the species *chamaeleon* would result in a big confusion regarding the older and the recent literature as well. Moreover, since *chamaeleon* has no junior synonyms, the species named earlier as "*chamaeleon*" should be described as a new taxon.

Therefore, saving the previous statements and avoiding the radical changes in the nomenclature of the genus, the male specimen from the Alai Mts, dissected by Prof. Ryabov is here designated as lectotype.

2. Corrigenda

In the paper on the species of the *Mesapamea* subgenus *Resapamea* (RONKAY et VARGA 1992) the figures of the female genitalia of *M. (R.) megaleuca* and *M. (R.) vaskeni* had been changed. The correct numbers in the text (page 119) and in the explanation (page 120) are as follows:

Mesapamea (Resapamea) megaleuca: Fig. 37;
Mesapamea (Resapamea) vaskeni: Fig. 38.

* * *

Acknowledgement – The authors would like to express their thanks to Mrs. E. VARTIAN (Vienna) and Dr. I. L. SUKHAREVA (St. Petersburg), Dr. W. MEY (Berlin), Dr. W. DIERL and Mr. H. LEHMANN (Munich), Dr. M. R. HONEY (London), Dr. M. LÖDL and the late Mr. R. IMB (Vienna), Dr. B. GUSTAFSSON (Stockholm), Dr. V. I. KUZNETSOV and Dr. A. LVOVSKY (St. Petersburg), Mr. J. PLANTE, (Martigny), Mr. H. HACKER (Staffelstein), Mr. A. v. NEKRASOV (Moscow), Dr. V. M. KORSHUNOV (Ashkhabad), Dr. B. HERCZIG (Tata), Mr. M. HREBLAY, Mr. Gy. FÁBIÁN and Mr. G. RONKAY (Budapest) for their kind help.

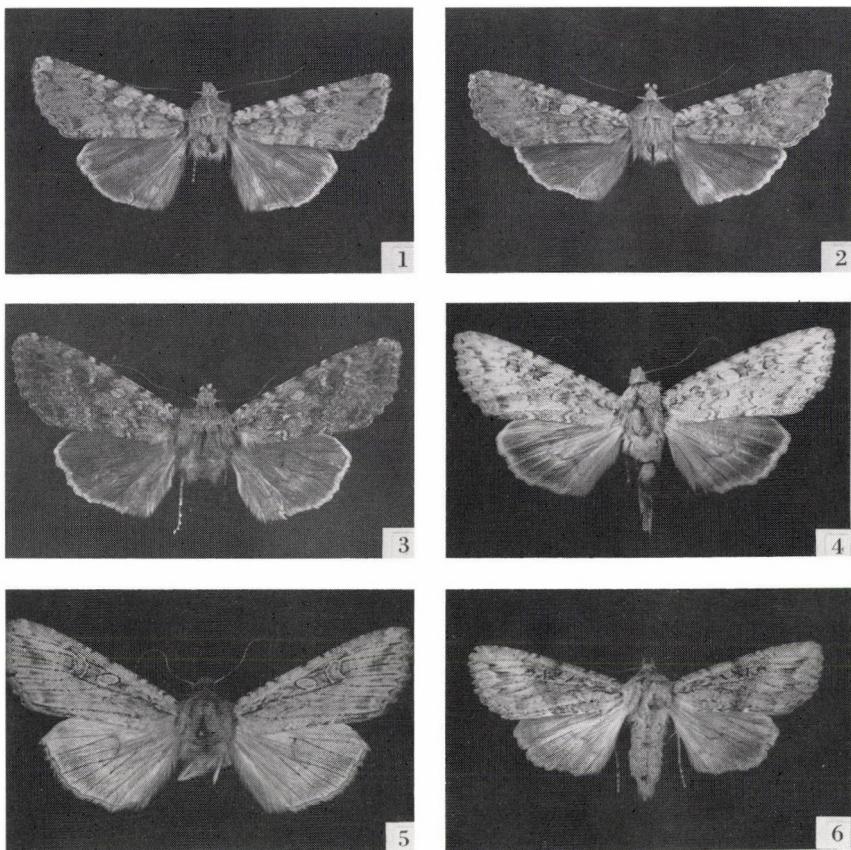
The research is supported by the OTKA Foundation, Hungarian National Science Foundation (No. 3181).

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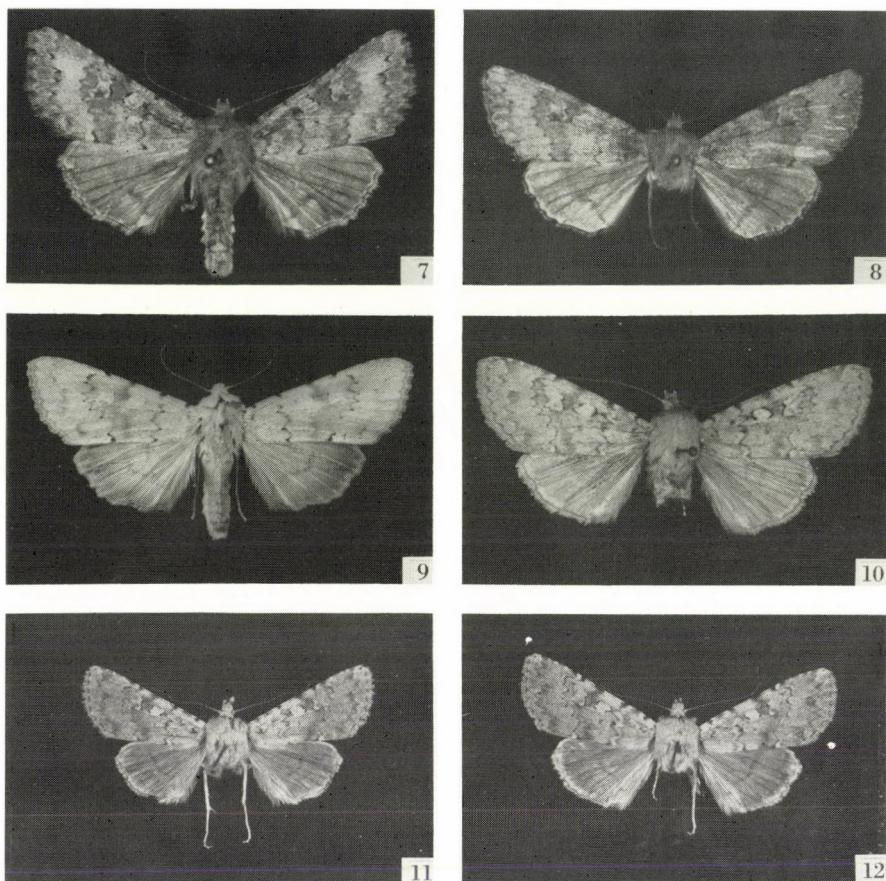
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Plate I



1 = *Pseudohadena roseotinctoides* POOLE, paratype male, Iran, Balouchistan. – 2 = *Pseudohadena roseotinctoides* POOLE, paratype female, Iran, Balouchistan. – 3 = *Pseudohadena oriata* sp. n., holotype female, Turkmenia, Kopet-Dagh. – 4 = *Pseudohadena adscripta* PÜNGELER, male, NW China, Turkestan, Aksu. – 5 = *Pseudohadena pugnax* ALPHERAKY, male, S Mongolia, Gurvantes. 6 = *Pseudohadena pugnax* ALPHERAKY, female, Songaria

Plate II

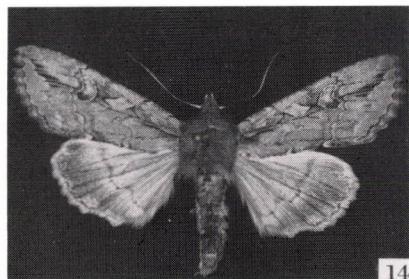


7 = *Pseudohadena xanthophanes* ssp., male, S Mongolia, Bayan Tsagaan. – 8 = *Pseudohadena xanthophanes* ssp., male, NW China, Turkestan, Altyn-Tagh. – 9 = *Pseudohadena coluteae* BIENERT, female, Iran. – 10 = *Pseudohadena arvicola* CHRISTOPH, paratype of *P. banghaasi* BYTINSKY-SALZ et BRANDT, Iran, Elburz. – 11 = *Pseudohadena arvicola korshunovi* ssp. n., paratype male, Turkmenia, Kugitang-Tau Mts. – 12 = *Pseudohadena arvicola korshunovi* ssp. n., paratype female, Turkmenia, Kugitang-Tau Mts

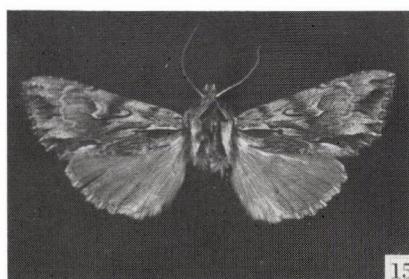
Plate III



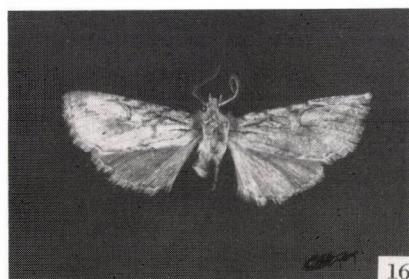
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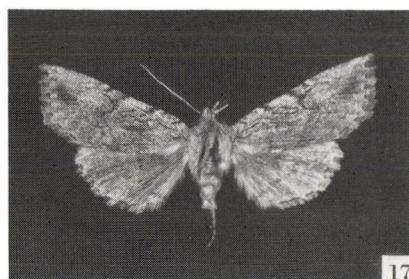
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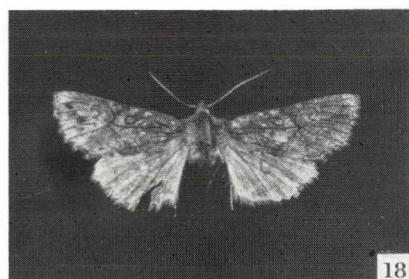
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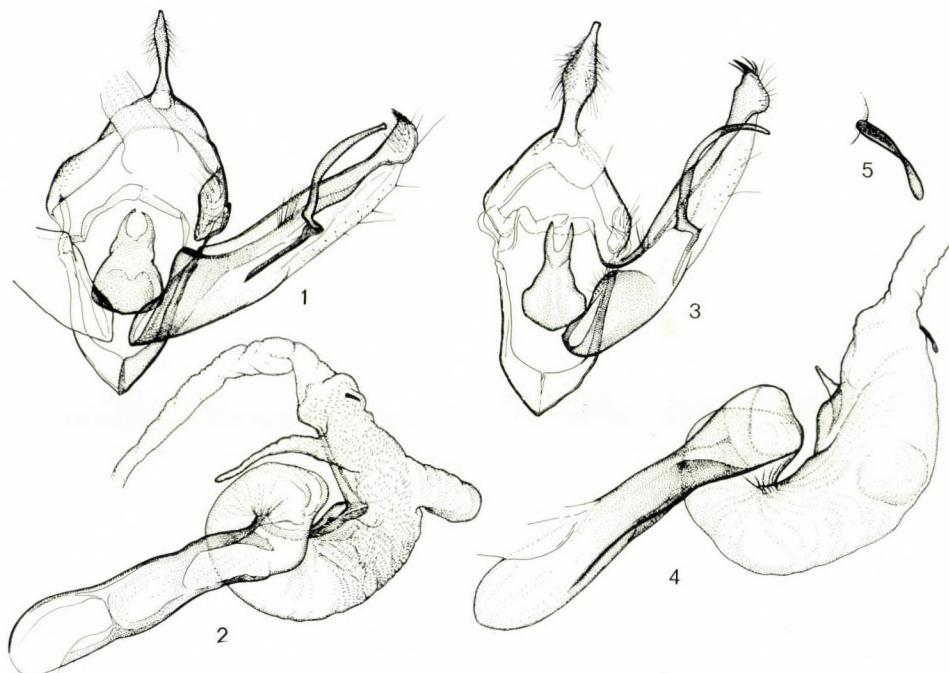


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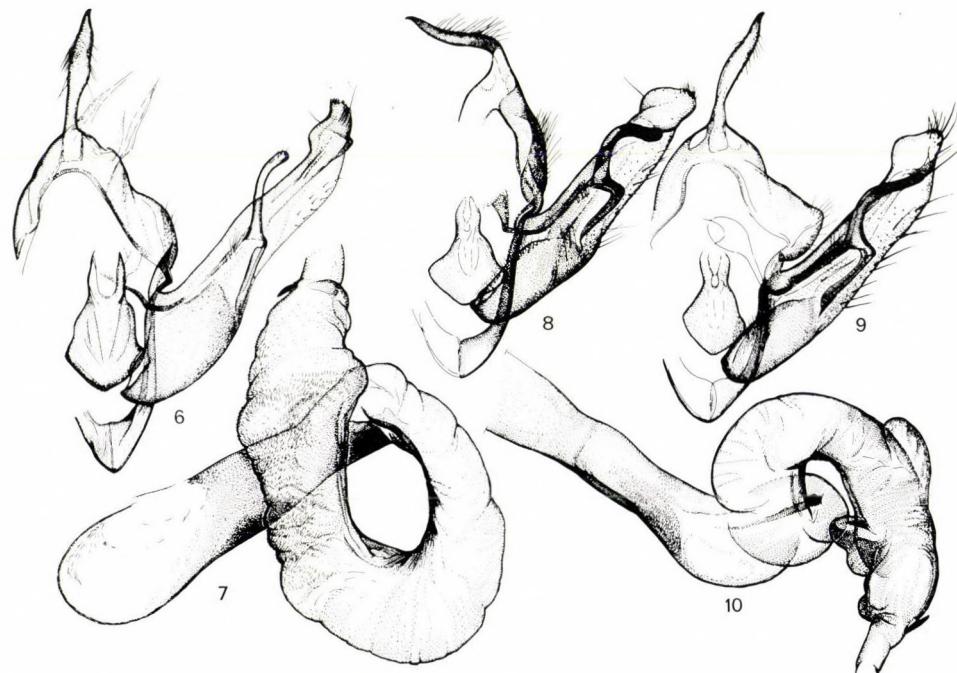


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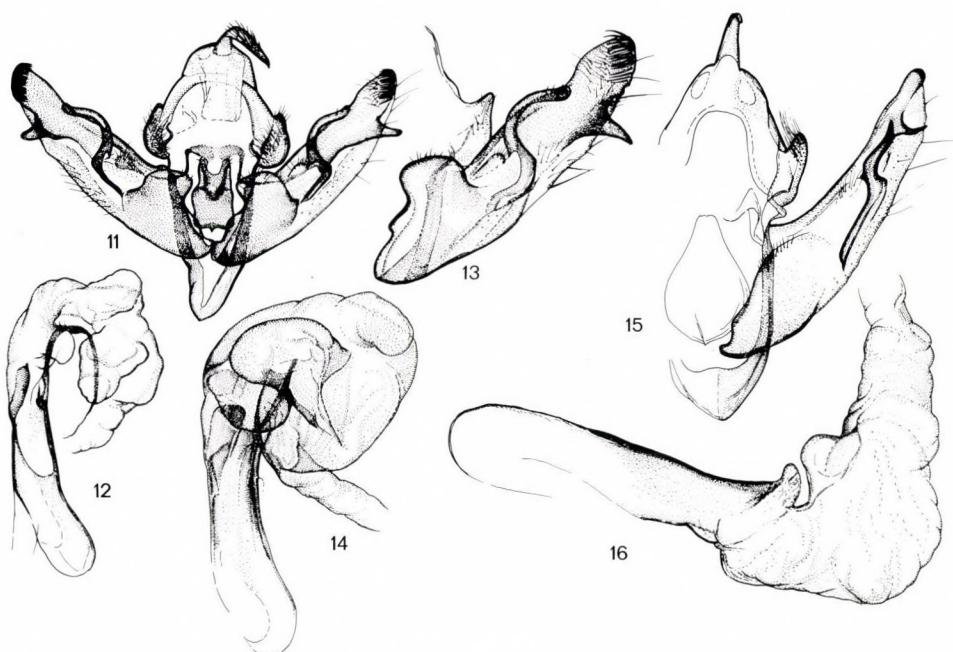
- 13 = *Pseudohadena presbytis* HAMPSION, holotype male, NW China, Turkestan, Chamil-Hami.
 - 14 = *Pseudohadena clementissima* sp. n., holotype male, Mongolia, Hasagt Hayrhan Mts. -
 15 = *Auchmis imbi* sp. n., holotype male, China, Tibet. - 16 = *Nekrasovia crassicornis* BOURSIN,
 holotype male, Afghanistan. - 17 = *Nekrasovia ?crassicornis*, male, Tadjikistan, Pamir,
 Khorog. - 18 = *Nekrasovia pliuschi* sp. n., holotype male, Kazakhstan, Zailiskiy Alatau



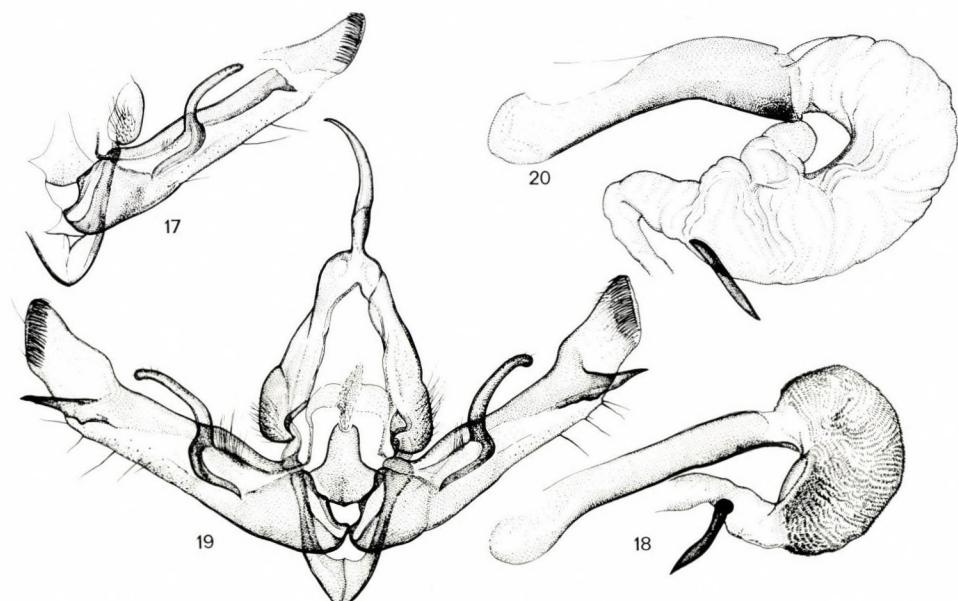
Figs 1–5. Male genitalia of *Pseudohadena* species: 1–2 = *P. siri* ERSHOV, Turkmenia, Repetek; 3–5 = *P. roseotinctoides* POOLE, paratype, Iran, Baluchistan



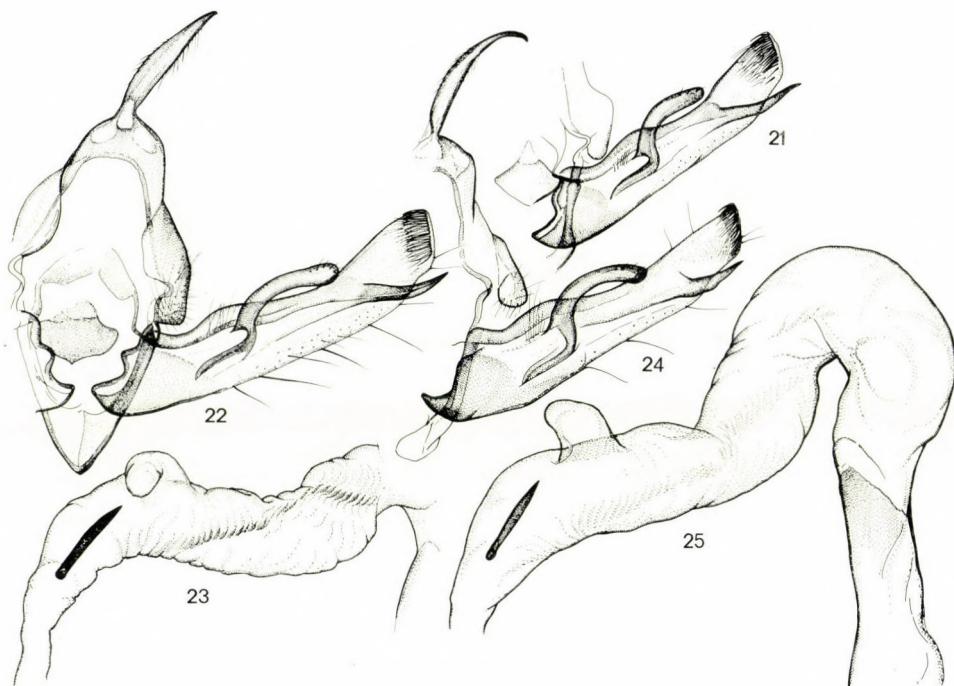
Figs 6–10. Male genitalia of *Pseudohadena* species: 6–7 = *P. adscripta* PÜNGELER, Mongolia; 8–10 = *P. pugnax* ALPHERAKY, 8 = Baigacum, 9–10 = Mongolia



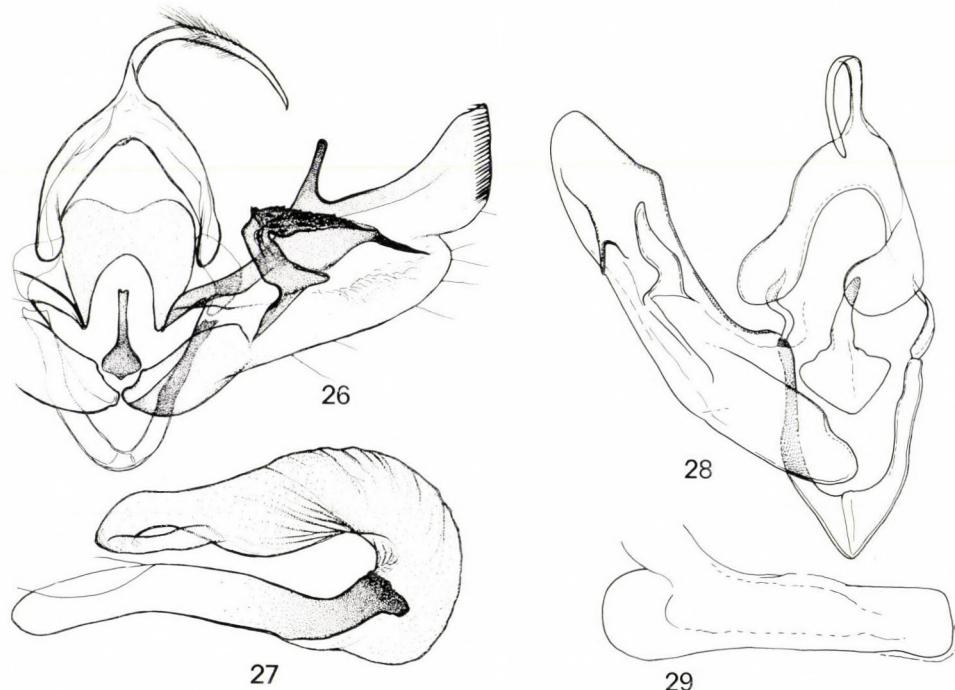
Figs 11–16. Male genitalia of *Pseudohadena* species: 11–12 = *P. arvicola korshunovi* ssp. n., paratype, Turkmenia, Kugitang-Tau Mts; 13–14 = *P. arvicola* CHRISTOPH, paratype of *P. banghaasi* BYTINSKY-SALZ et BRANDT, Iran, Elburz; 15–16 = *P. coluteae* BENERT, Iran



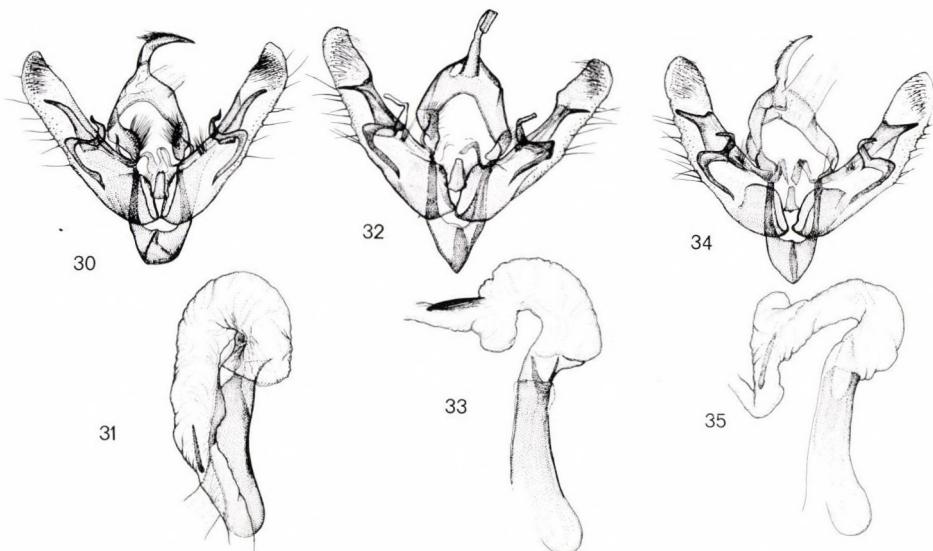
Figs 17–20. Male genitalia of *Pseudohadena* species: 17–18 = *P. presbytis* HAMPSION, China, Turkestan, Chamil-Hami; 19–20 = *P. clementissima* sp. n., holotype, Mongolia, Hasagt Hayrhan Mts



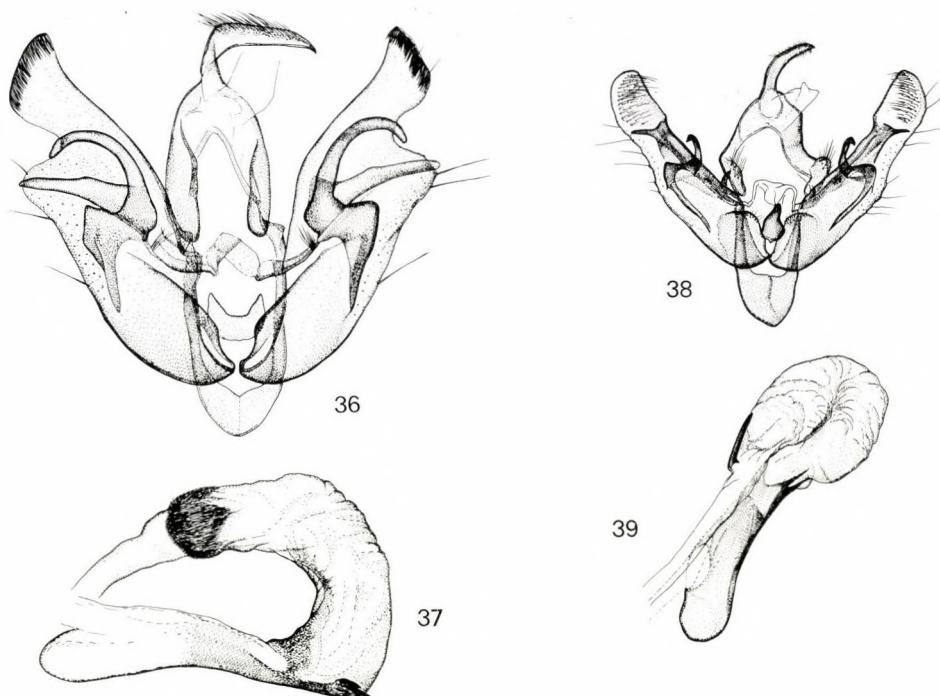
Figs 21–25. Male genitalia of *Pseudohadena xanthophanes* BOURSIN: 21 = holotype, Armenia;
22–23 = Mongolia; 24–25 = Pakistan



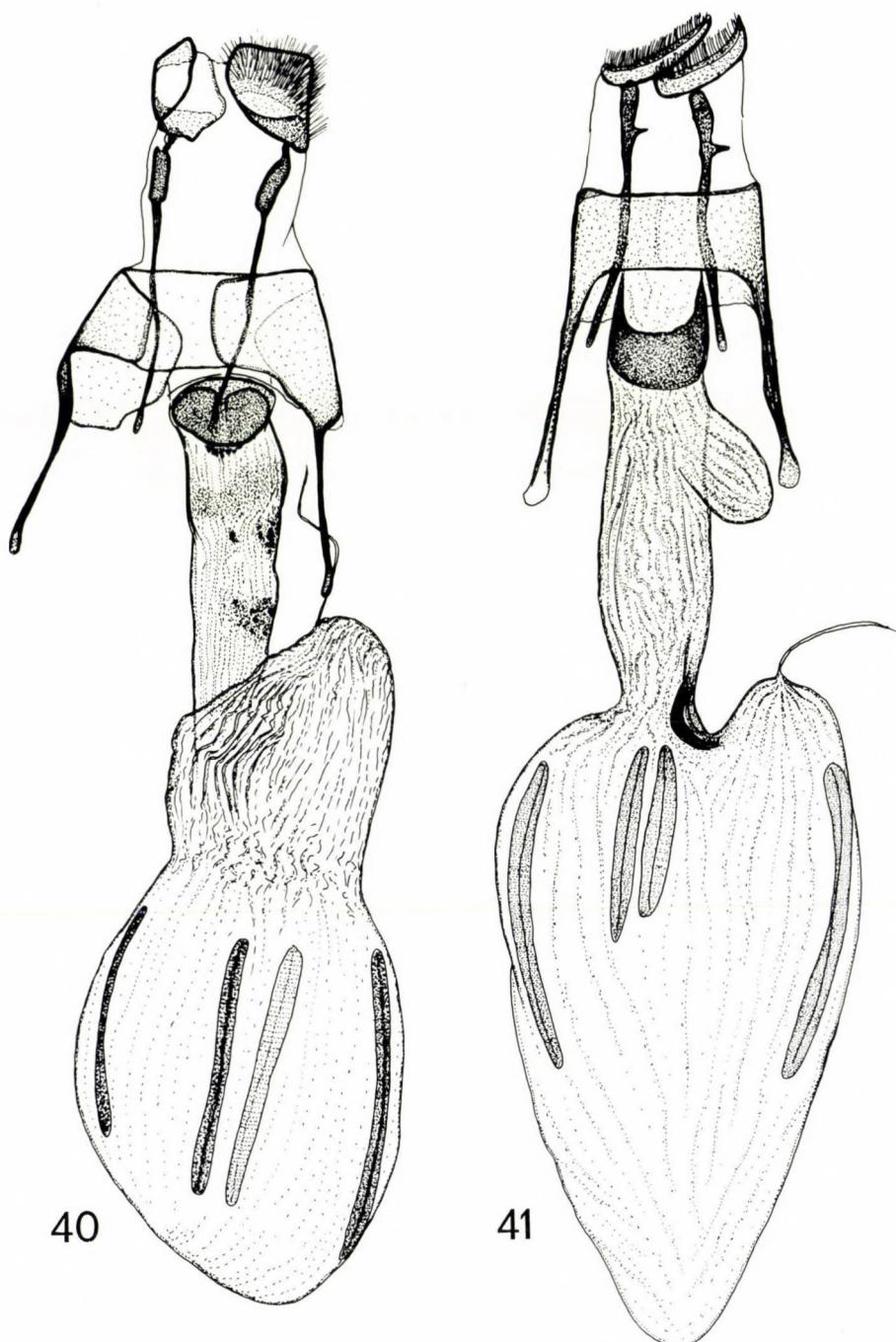
Figs 26–29. 26–27 = *Auchmis indica* WALKER, Pakistan, Nathia Gali; male genitalia. 28–
29 = *Pseudohadena armata* ALPHERAKY, holotype, Kara-Kum; male genitalia



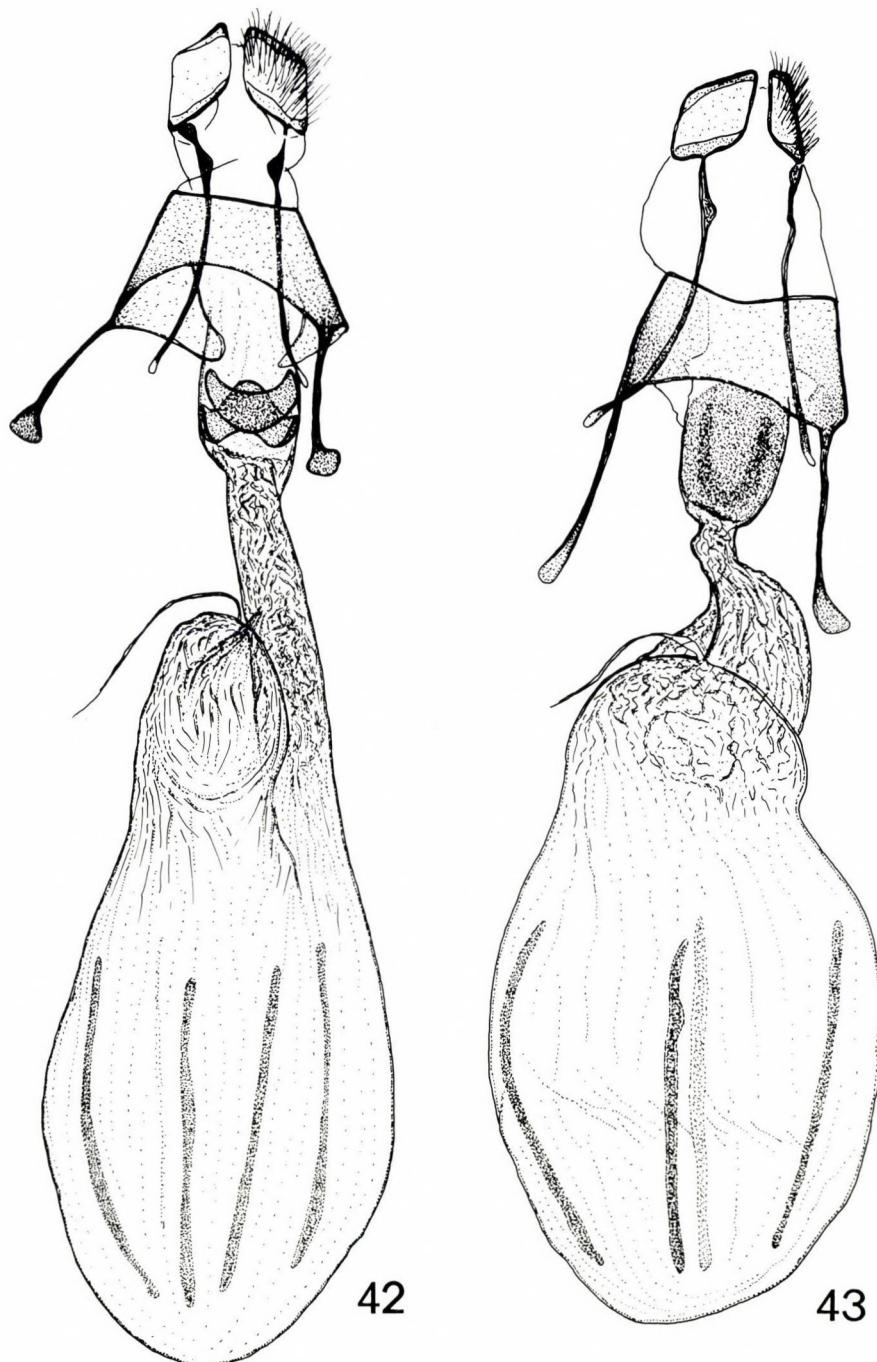
Figs 30–35. Male genitalia of *Nekrasovia* species: 30–31 = *N. pliuschi* sp. n., holotype, Zailiskiy Alatau; 32–33 = *N. 'crassicornis'*, Pamir, Khorog; 34–35 = *N. 'crassicornis'*, Kirghisia



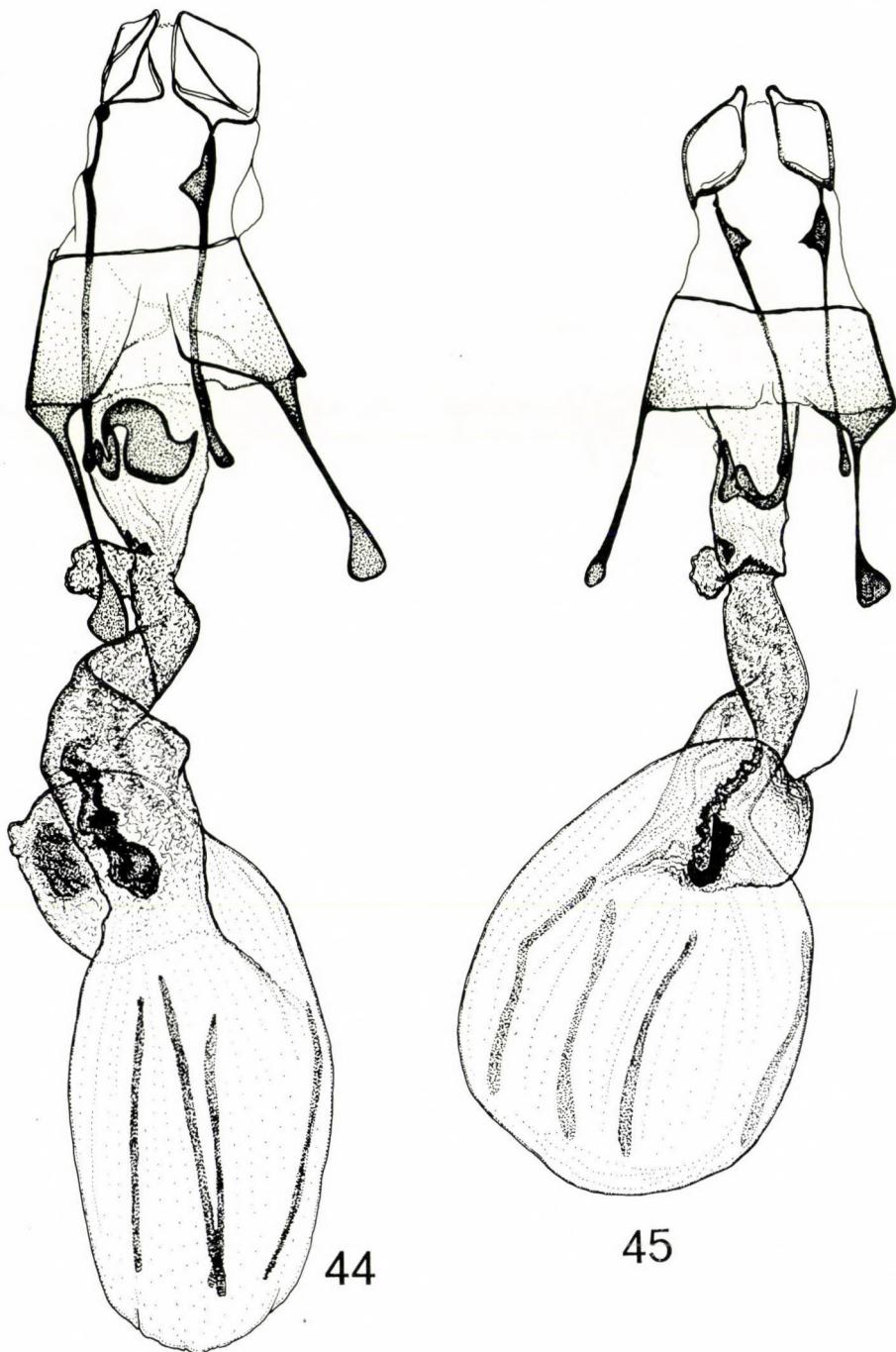
Figs 36–39. 36–37 = *Auchmis imbi* sp. n.: holotype, China, Tibet; male genitalia. 38–39 = *Nekrasovia crassicornis* Bourquin: holotype, Afghanistan, Khinjan; male genitalia



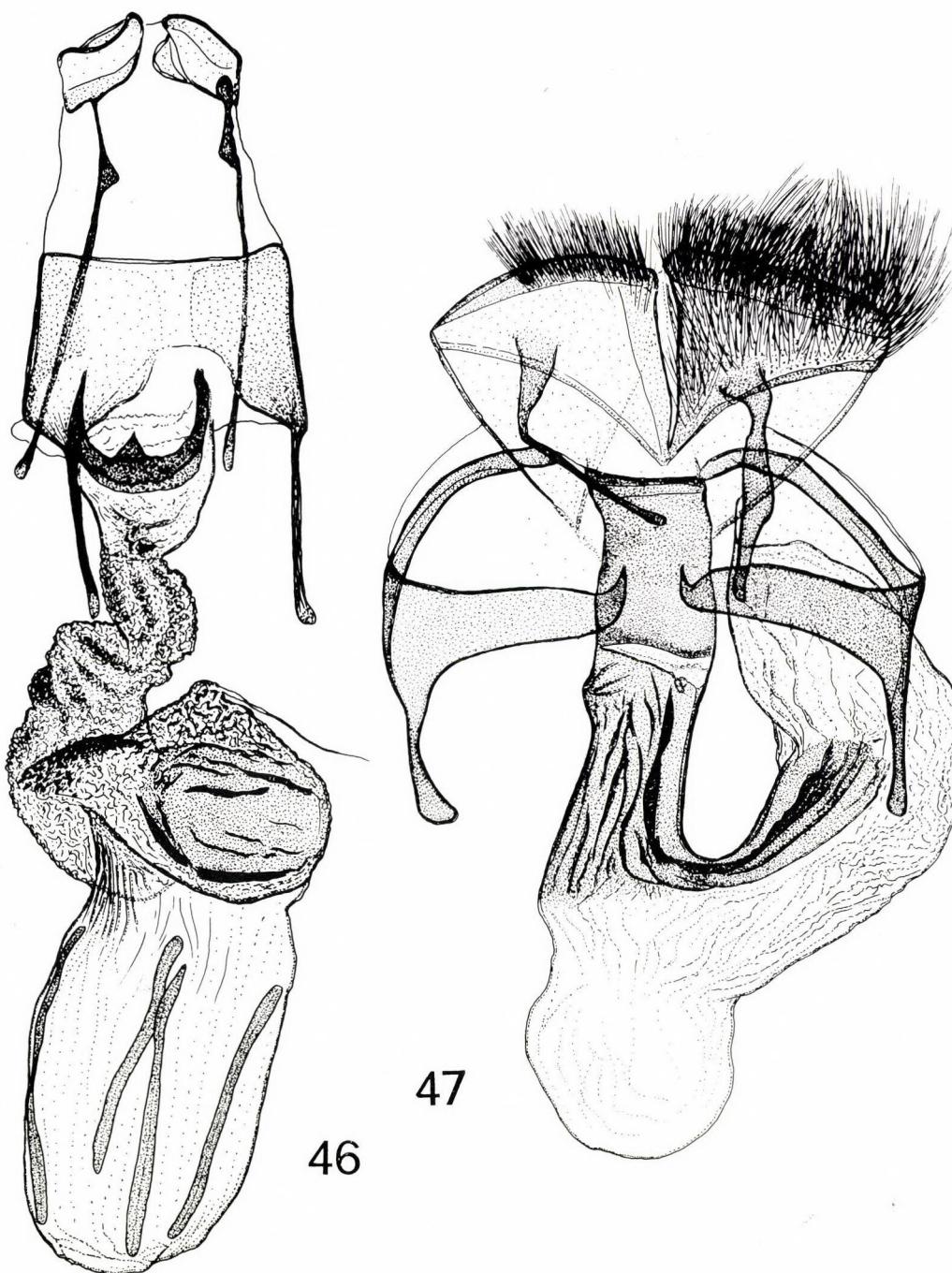
Figs 40–41. Female genitalia of *Pseudohadena* species: 40 = *P. arvicola korshunovi* ssp. n., paratype, Turkmenia, Kugitang-Tau Mts; 41 = *P. armata* ALPHERAKY, fl. Honton



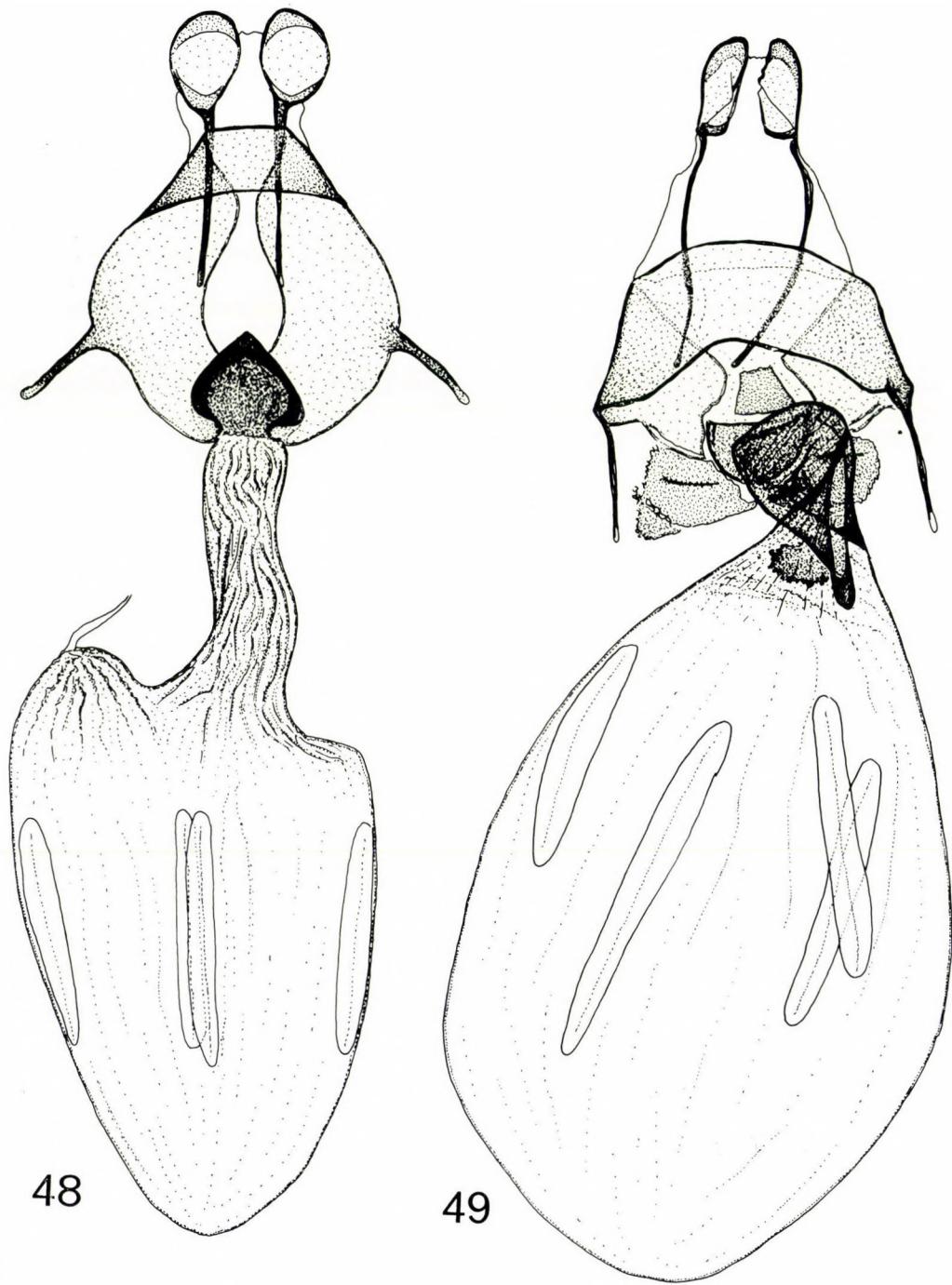
Figs 42–43. Female genitalia of *Pseudohadena* species: 42 = *P. roseotinctoides* POOLE, paratype, Iran, Baluchistan; 43 = *P. siri* ERSHOV, Turkmenia, Repetek



Figs 44–45. Female genitalia of *Pseudohadena* species: 44 = *P. adscripta* PÜNGELER, Mongolia;
45 = *P. pugnax* ALPHERAKY, Mongolia



Figs 46–47. Female genitalia: 46 = *Pseudohadena orias* sp. n., holotype, Turkmenia, Köpet-Dagh; 47 = *Scotocampa crassipuncta* PÜNGELER, holotype, Aksu



Figs 48–49. Female genitalia of *Auchmis* species: 48 = *A. imbi* sp. n., paratype, China; 49 = *A. indica* WALKER, Pakistan, Swat

DESCRIPTIONS OF SEVEN NEW SPECIES OF ENCHYTRAEIDAE (OLIGOCHAETA) FROM SPAIN

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(Received 6 May 1992)

Description of seven new species is presented: *Enchytronia oligosetosa* sp. n., *Fridericia miraflores* sp. n., *F. bubalus* sp. n., *F. terrassae* sp. n., *F. vixdiverticulata* sp. n., *Achaeta matritensis* sp. n. and *A. afolliculata* sp. n. The new species are distributed in several region of Spain. With 48 original figures.

Introduction. – By studying the Enchytraeidae populations of four localities in the central area of the Iberian Peninsula, we have found several species of this family belonging to the genera *Buchholzia* MICHAELSEN, 1887, *Enchytronia* NIELSEN et CHRISTENSEN, 1959, *Enchytraeus* HENLE, 1837, *Cognettia* NIELSEN et CHRISTENSEN, 1959, *Henlea* MICHAELSEN, 1889, *Fridericia* MICHAELSEN, 1889 and *Achaeta* VEJDOKSKY, 1877. In this paper four new *Fridericia*, two new *Achaeta* and one new *Enchytronia* species are described.

MATERIAL AND METHODS

The studied localities were:

1. Puerto de la Morcuera: about 55 km NNW of Madrid, UTM 30TVL301202, 1765 m above sea level. Soil: humic cambisol (Ranker), pH 4.4, humus acid mull, parent material gneis. Vegetation: association *Junipero nanae*–*Cytisellum purgantis* (RIVAS-GODAY, 1955) RIVAS-MARTÍNEZ, 1965; the dominant species is *Cytisus purgans* (L.) BOISS.

2. Miraflores de la Sierra: about 45 km NNW of Madrid, UTM 30TVL333178, 1220 m above sea level. Soil: humic cambisol (Brown forest soil), pH 6.1, humus acid mull, parent material gneis. Vegetation: association *Luzulo forsteri*–*Quercetum pyrenaicae* RIVAS-MARTÍNEZ, 1962; the dominant species are *Quercus pyrenaica* WILLD. and *Pteridium aquilinum* (L.) KUHN.

3. Pozo de Guadalajara: about 55 km E of Madrid, UTM 30TVK878829, 880 m above sea level. Soil: cromic luvisol (Terra rossa), pH 7.3, humus carbonated mull, parent material limestone. Vegetation: association *Cephalantero longifoliae*–*Quercetum fagineae* RIVAS-MARTÍNEZ et RIVAS-GODAY, 1959; the dominant species are *Q. rotundifolia* LAM. and *Q. faginea* LAM.

4. Arganda: about 28 km SE of Madrid, UTM 30TVK625595, 625 m above sea level. Soil: calcic leptosol (Rendsina), pH 7.8, humus carbonated mull, parent material limestone and loam. Vegetation: association *Bupleuro rigidii-Quercetum rotundifoliae* (RIVAS-GODAY, 1959) RIVAS-MARTÍNEZ, 1975; the dominant species are *Q. rotundifolia* LAM. and *Q. coccifera* L.

The central region of Spain has a Mediterranean Continental Climate, the maximum of temperature and the minimum of rainfall coinciding during the summer with a hard hydric deficit (the maximums of rainfall occur in autumn and spring). The temperature is elevated in summer, especially in the plain (localities 3 and 4). In winter the temperature falls below zero for several days, especially in the mountains (localities 1 and 2) and the soil becomes frozen for weeks in locality 1.

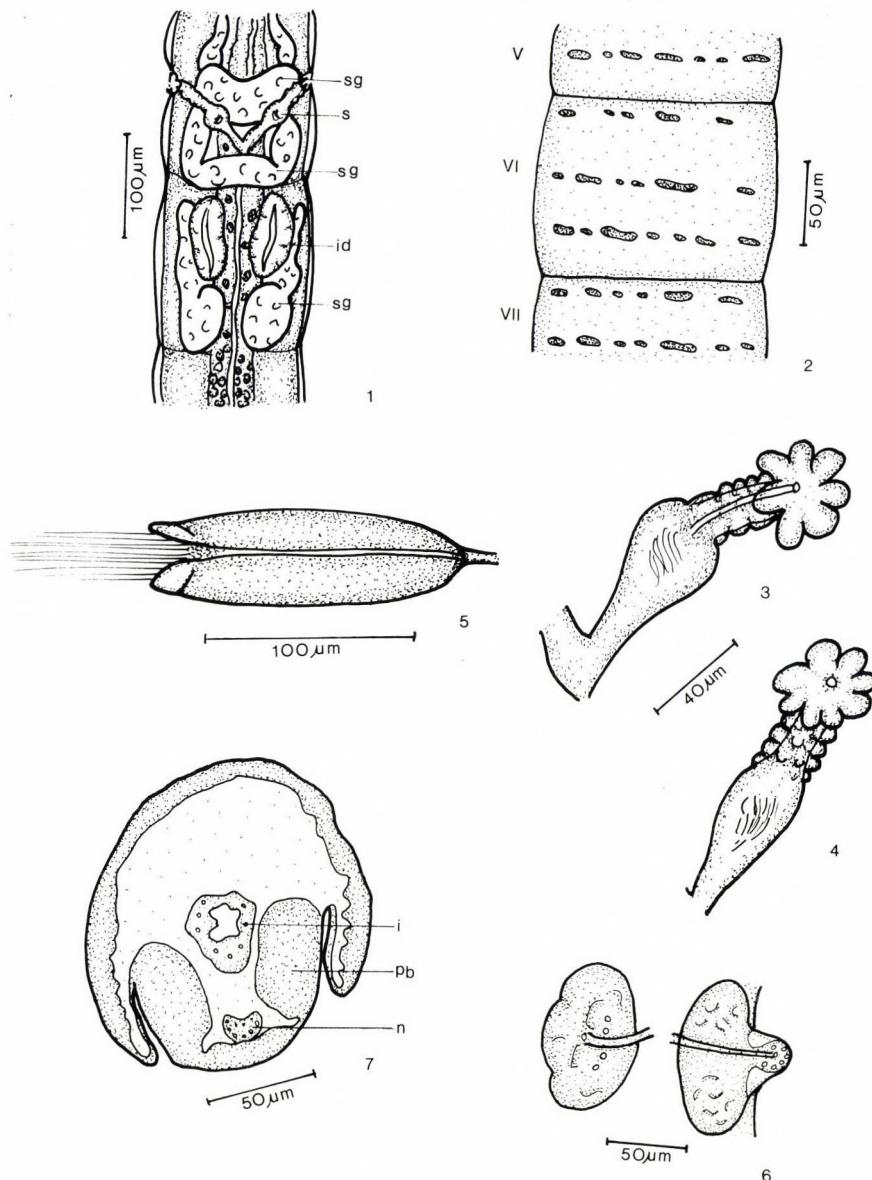
A lot of soil samples (12 cm depth, including the litter-layer) were taken from each locality between July 1987 and June 1988 and in November 1991. The enchytraeid worms were extracted from the samples by the O'Connor method. The descriptions are based on the examination of live material and of fixed, microtomized and stained ones too. Measurements were taken on alive or on microtomized worms (the latter is indicated). From the specimens of large-bodied species (*Fridericia bubalus* and *F. terrarossae*) fixed in Carnoy the spermathecas were prepared stained in orcein in acetic acid and partly in paracarmine too. Their permanent preparations are in cellosolve-Canada balsam.

Holotypes and paratypes (partly microtomized and mounted on slides, partly fixed in 70% ethanol) are deposited in the Instituto de Ciencias Medioambientales (C.S.I.C.), Madrid, and at the Department of Systematic Zoology and Ecology of the Eötvös Loránd University, Budapest, respectively.

Enchytronia oligosetosa sp. n. (Figs 1-7)

Number of segments 17-29. Length 2.5-4.4 mm. Width 140-177 µm on segment VIII, at the clitellum 157-190 µm. Cutaneous glands in 3 transverse rows of big cells, well visible in neutral red (Fig. 2). Clitellum slightly elevated in normal position; clitellar glands in transverse rows. Setae straight; all setal bundles contain 2 setae; dorsal bundles absent in VI-XII.

Peptonephridia absent. A pair of lateral intestinal diverticula in VI (Fig. 1 id). Chloragogen cells from V, from VI or VII continuing in a thick layer and not covering the diverticula; cell diameter 12-21 µm. 3 pairs of primary septal glands merging dorsally and with long ventral lobes, particularly the third pair (Fig. 1 sg); secondary septal glands absent. Dorsal vessel in XII.



Figs 1–7. *Enchytronia oligosetosa* sp. n.: 1 = IV–VI segments – dorsal view (sg = septal glands, s = spermatheca, id = intestinal diverticula), 2 = cutaneous glands, 3–4 = spermatheca, 5 = sperm funnel, 6 = penial bulb, 7 = clitellar zone – cross section (n = ventral nervous cord, i = intestine, pb = penial bulb)

Seminal vesicle medium-large, present in X. Penial bulb large and compact, 80–100 µm long (Figs 6 and 7). Sperm funnel (Fig. 5) 130–160 µm long and 36–40 µm wide; collar a little narrower, than the width of the funnel. Vas defferens long and narrow, 5 µm in diameter.

Spermatheca (Figs 3 and 4): ampulla large and with sperm in the lumen; ental ducts merging mid-dorsally over the oesophagus. Ectal duct stout, covered with a layer of glandular cells and with 7–8 rosette-formed ectal glands sorrounded the orifice. Number of examined specimens: 6 fixed and microtomized and 16 alive.

Type locality: Puerto de la Morcuera. – Holotype marked with RK2-1 (Madrid). – Paratypes 5 specimens: RK2-2, RK2-3, RK2-4, RK2-5, RK2-6 (Madrid) and P.25.1. (Budapest), 2 specimens.

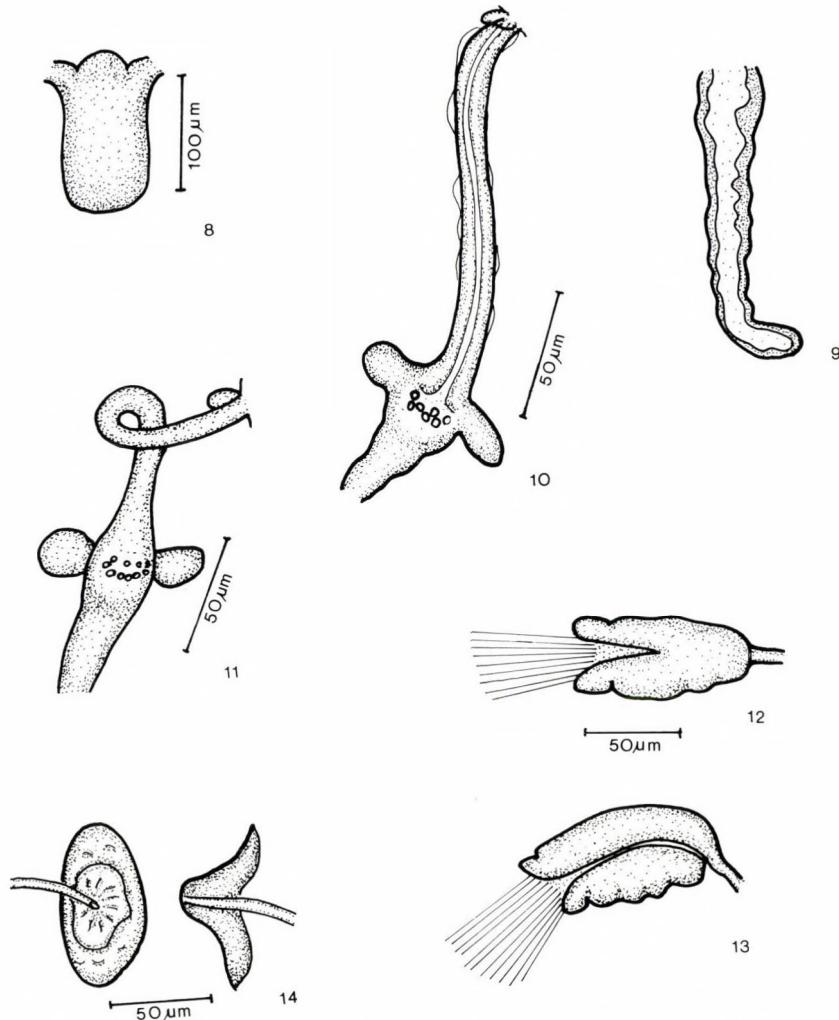
Discussion. – The chief characters of this species are: dorsal setal bundles absent in VI–XII and 7–8 rosette-shaped ectal glands. It is similar to *E. minor* MÖLLER, 1971 in the rosette-formed ectal glands of spermatheca (only this two species have such ectal glands), but differs from it in its size and in the form of intestinal diverticula; in *E. minor* the dorsal setae are also absent from VIII, the third pair of septal glands has small ventral lobes and the sperm funnel is shorter.

***Fridericia miraflores* sp. n.**

(Figs 8–14)

Number of segments 38–40. Length 7.0–9.5 mm. Width 0.23–0.30 mm on VIII, 0.28–0.34 mm at the clitellum. Whitish and very transparent. Head pore at 0/I. Dorsal pores from VII. Setae straight with ental hook, in typical *Fridericia* disposition: 2, 3, 4–2 : 3, 4–2; length of central setae 23–26 µm and of external setae 30–35 µm; length of postclitellar setae 28–30 µm and on the posterior segments 30–33 µm; only 2 setae par bundle beginning from XIII. Cutaneous glands arranged in 4–6 transverse rows, one of them consists of bigger cells. Clitellum not elevated and extends over XII and 1/2 XIII; the glands arranged irregularly.

Brain (Fig. 8) twice as long as wide. Peptonephridia (Fig. 9) short, unbranched or with 1–2 short terminal branches (*a*-type, according to NIELSEN & CHRISTENSEN 1959). Two kinds of lymphocytes, the nucleated ones are of type *a* (MÖLLER 1971). Chloragogen cells beginning in V. Septal glands: 3 pairs in normal position. Origin of dorsal vessel in XV–XVI. Nephridia with efferent duct arising posteroventrally.



Figs 8–14. *Fridericia miraflores* sp. n.: 8 = brain, 9 = peptonephridia, 10–11 = spermatheca, 12–13 = sperm funnel, 14 = penial bulb

Seminal vesicle present in XI, not brownish. Sperm funnel (Figs 12 and 13) 2–2.5 times as long as wide, length 1/3 of worm diameter. Penial bulb (Fig. 14) poorly developed.

Spermatheca (Figs 10 and 11): onion-shaped ampulla with 2 short and stalked diverticula, which are tending towards the two sides, neither forwards nor backwards. Ectal duct long with a sessile gland at the orifice. Ental duct long (50–70 μm) and opening separately into the oesophagus.

Number of examined specimens: 15 alive.

Type locality: Miraflores de la Sierra. – Holotype marked with F.11 (Budapest). – Paratypes P.26.1–P.26.4 (Budapest), 12 specimens.

Discussion. – Species near to this new one are *F. sylvatica* HEALY, 1979 but without seminal vesicle, origin of dorsal vessel in XIV and different ectal glands; *F. profundicola* DÓZSA-FARKAS, 1991 but with peptonephridia type b and different form of spermatheca. *F. conculcata* DÓZSA-FARKAS, 1986 is a larger species, has longer setae, the seminal vesicle is brownish and the diverticula of spermatheca are tending downwards.

***Fridericia bubalus* sp. n.**

(Figs 15–20)

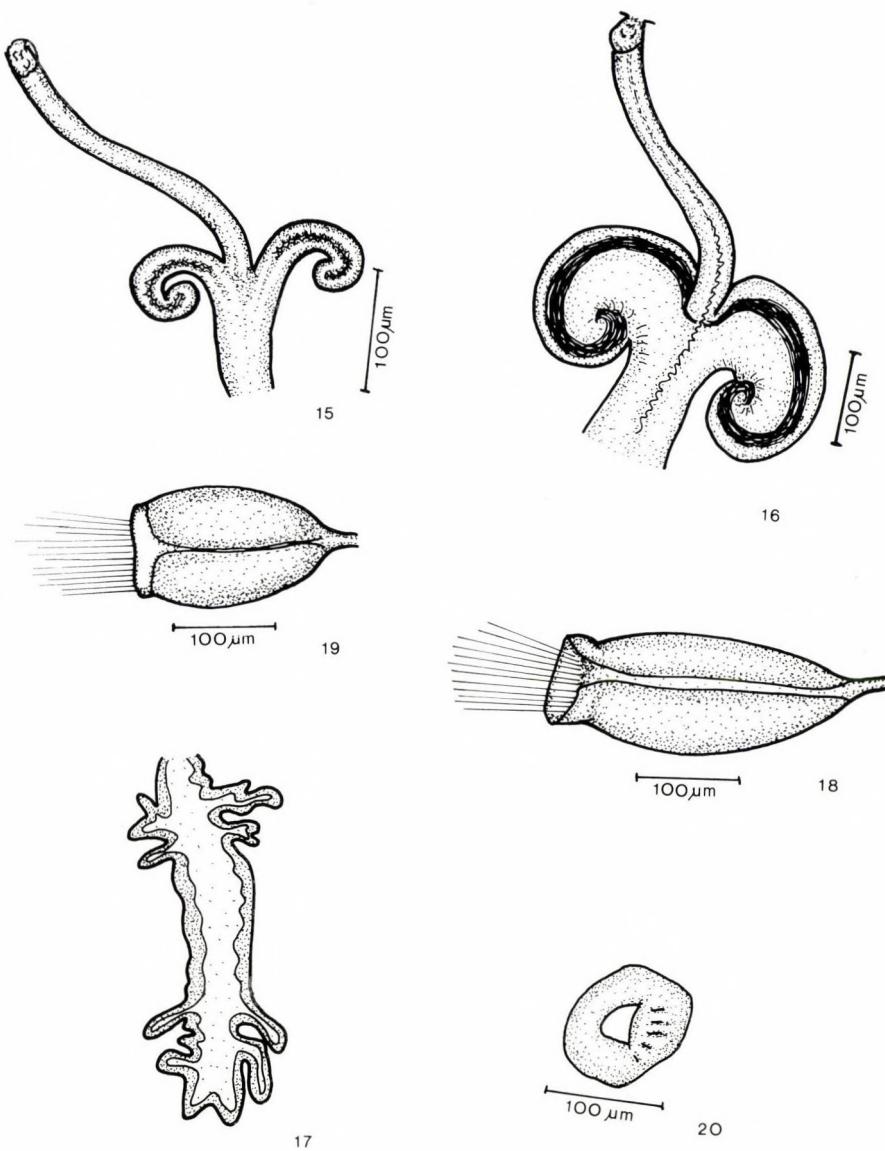
Number of segments 43–60. Length 11–19 mm. Width 0.44–0.66 mm on VIII, 0.66–0.70 mm at the clitellum. Whitish colour. Cutaneous glands arranged in 6–8 transverse rows, 3–4 of them consist of bigger glandcells. Clitellum weakly developed on XII–1/2 XIII; the small clitellar cells arranged irregularly. Setae straight with ental hook, in typical *Fridericia* disposition: 3, 4–3, 4, 2 : 4–4, 3, 2; length of ventral external setae 70–85 µm; length of ventral internal setae 50 µm. Dorsal pores present from VII.

Peptonephridia much branched (c-type) (Fig. 17). Chloragogen cells medium sized (length 20–30 µm in microtomized specimens), present from V and forming a dark (in transmitted light) but not very thick layer from VII. Two kinds of lymphocytes, the nucleated ones are of a-type (MÖLLER 1971), but they are granulated too. Origin of dorsal vessel in XV–XVI. Nephridia with efferent duct arising ventrally in praeclitellar region, terminally at the end of the worm.

Seminal vesicle well developed, brownish and extending over 1/2 X, XI and 1/2 XII. Sperm funnel (Figs 18 and 19) 1.5–2.5 times longer, than wide, its length is 1/3–1/4 of worm diameter. Penial bulb small, approx. 95 µm (Fig. 20).

Spermatheca (Fig. 15 at younger specimens; and Fig. 16 at more developed specimens): consists of an almost cylindrical ampulla with 2 long diverticula, curved towards the ental duct, therefore each spermatheca looks like the horns of a buffalo. The name of the species refers to this character. Ental duct communicates separately with the dorsolateral zone of the oesophagus, 90–120 µm in length and 40 µm in diameter (in microtomized worms). Ectal duct long (228–300 µm), and stout (20–25 µm wide). One small sessile ectal gland (19–20 µm).

Number of examined specimens: 14 fixed and microtomized and 26 alive.



Figs 15–20. *Fridericia bubalus* sp. n.: 15 = spermatheca of younger specimens, 16 = spermatheca of more developed specimens, 17 = peptonephridia, 18–19 = sperm funnel, 20 = penial bulb

Type locality: Puerto de la Morcuera and Miraflores de la Sierra. – Holotype marked with RK7-1 (Madrid) from Puerto de la Morcuera. – Paratypes 8 specimens: RK7-2, RK7-3, RK7-4, RK7-5, RK7-6, RK7-7, RK7-8, RK7-9 (Madrid); P. 27. 1. (Budapest), 10 specimens from Puerto de la Morcuera; P. 27. 2. (Budapest) 1 specimen from Miraflores de la Sierra; P. 27. 3.–P. 27. 6. spermathecas prepared of 4 paratypes.

Discussion. – The characteristic shape of the spermatheca distinguishes it clearly from the other *Fridericia* species.

***Fridericia terrarossae* sp. n.**
(Figs 21–29)

Number of segments 48–65. Large and wide worms, length 13–19 mm, width 0.44–0.49 mm in VIII, at the clitellum 0.50–0.65 mm. Colour yellow due to the chloragogen cells. Clitellum extends over XII–1/2 XIII and not elevated; the cells are small, irregularly arranged. Setae straight with ental hook in typical *Fridericia* disposition (Fig. 22): 4–4, 3, 2 : 4(5)–4, 3, 2; length: ventral external 70–90 µm, ventral central 50–60 µm, dorsal external 60–70 µm, dorsal central 40–55 µm (in microtomized specimens). Dorsal pores present from VII.

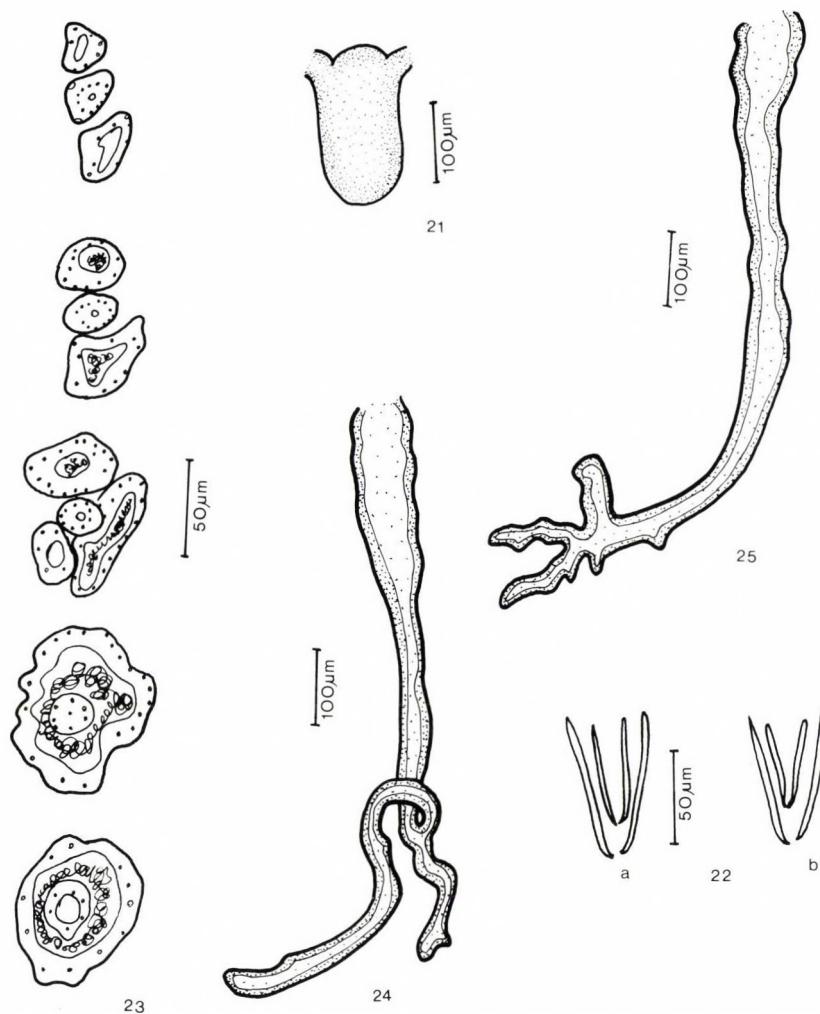
Peptonephridia (Figs 24 and 25) long with 2–4 terminal branches (*a*-type). Brain twice as long as wide. Chloragogen cells from V, forming a dense layer from VI, length 30–40 µm (in microtomized specimens). 3 pairs of septal glands connected dorsally. Origin of dorsal vessel in XIX–XXII.

Seminal vesicle brownish, large and compact in XI–XII. Sperm funnel (Fig. 29) wide, 1.5 times longer than wide, length 1/2 of worm diameter. Penial bulb large, approx. 200 µm.

Spermatheca (Figs 23, 26, 27, 28) consists of an almost spherical ampulla (diameter 100 µm) with 2 longer and 1–3 shorter diverticula; its length and width are different in every specimens; one of the diverticula is generally much greater than the others and it measures 1/2–1/3 of the ectal duct length; the longer diverticula are arranged parallelly with the ectal duct; ampulla and diverticula are full of spermatozoa. The two ental ducts merging in a wide duct connected with the oesophagus. Ental ducts measure in microtomized worms: length of the independent zone 45–75 µm, diameter of it 35–45 µm; length of common zone 40–80 µm and diameter of it 45–80 µm. Ectal ducts middle long (250–300 µm) and wide (diameter 20–25 µm) one ectal gland sessile and oviform (25–35 µm in diameter).

Number of examined specimens: 6 fixed and microtomized and 19 alive; spermatheca-preparates were made of 8 specimens.

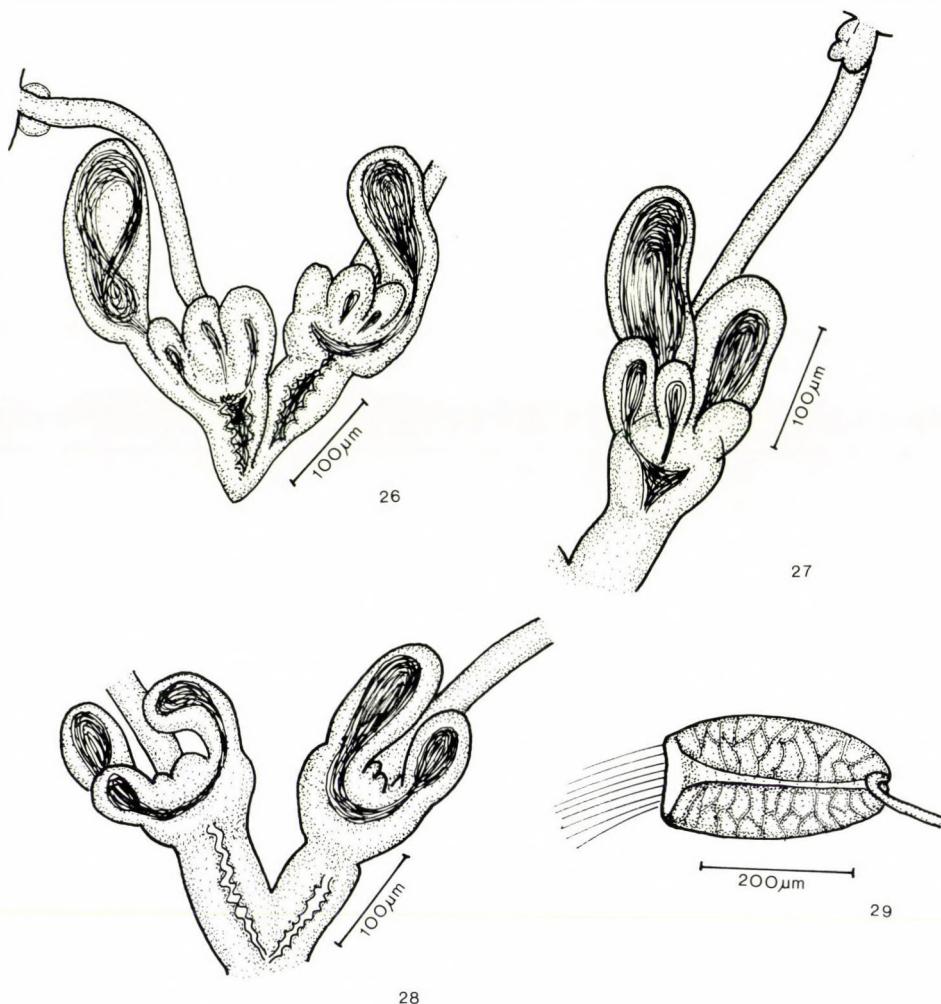
Type locality: Pozo de Guadalajara. – Holotype marked with SSRD3-1 (Madrid). – Paratypes 5 specimens: SSRD3-2, SSRD3-3, SSRD3-4, SSRD3-5,



Figs 21–25. *Fridericia terrarossae* sp. n.: 21 = brain, 22 = setae in XI segment (a—ventral, b—dorsal), 23 = 5 consecutive sections across the spermatheca (diverticula – ampulla zone), 24–25 = peptonephridia

SSRD3–6 (Madrid); P. 28. 1. (Budapest), 4 specimens, P. 28. 2.–P. 28. 9. (Budapest) 8 spermatheca-slides.

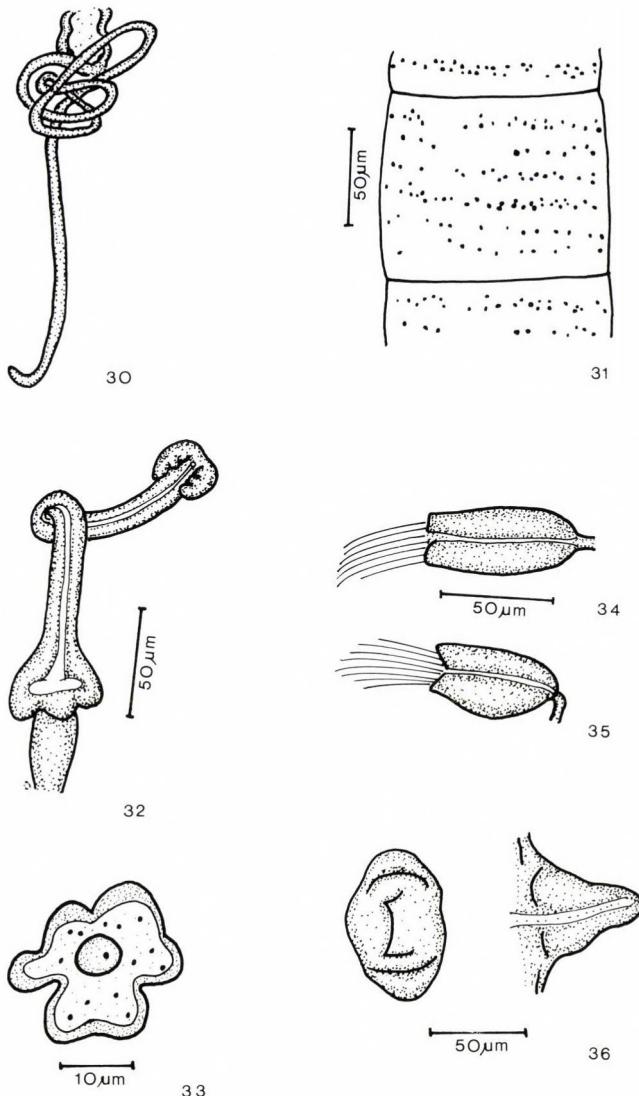
Discussion. — *F. terrarossae* sp. n. differs from any other *Fridericia* species in the form of the spermatheca.



Figs 26–29. *Fridericia terrarossae* sp. n.: 26–28 = spermatheca, 29 = sperm funnel

***Fridericia vixdiverticulata* sp. n.**
(Figs 30–36)

Number of segments 31–40. Length 5.2–7.4 mm. Width 0.21 mm on VIII, at the clitellum 0.24–0.25 mm. Colour whitish. Cutaneous glands are small cells, arranged in 4–6 transverse rows (Fig. 31). Clitellum over XII–1/2 XIII with large gland cells in transverse rows, but irregularly scattered. Setae straight with ental hook in typical *Fridericia* disposition: 2, 3, 4–2: (2, 3), 4–3, 2; length: external 34–36 µm, central 31 µm, at the body-end 41 µm.



Figs 30–36. *Fridericia vixdiverticulata* sp. n.: 30 = peptonephridia, 31 = cutaneous glands, 32 = spermatheca, 33 = section across the ampulla and the diverticula of the spermatheca, 34–35 = sperm funnel, 36 = penial bulb

Peptonephridia (Fig. 30) very characteristic: long, slender and unbranched (*b*-type), extending backwards to VII. Chloragogen cells from VI, dense layer from VII or VIII; cells 20 μm in length. The gut wall in IX is very stout and presents some cavities, therefore it looks spongy (in alive worms this is difficult to see, but it is conspicuous in sectioned specimens).

Septal glands: 3 pairs, the last one without an evident dorsal connection. Brain 1–1.5 times as long as wide. Two kinds of lymphocytes, the nucleated ones are of type *a* (MÖLLER 1971). Origin of dorsal vessel in XIV–XV.

Seminal vesicle absent or small in XI. Sperm funnel (Figs 34 and 35) small, 1.7–2 times as long as wide, length 1/3–1/4 worm diameter; collar indistinct. Penial bulb (Fig. 36) small, weakly developed (50–80 µm).

Spermatheca (Figs 32 and 33): consists of a spherical ampulla (diameter 25 µm) and generally of 3–6 not well visible and weakly developed sessile diverticula tending towards the ental duct (diameter 7–16 µm), without spermatozoa. The name of the species refers to this character (*vixdiverticulata* = not well visible and weakly developed). Ental ducts long, connected independently with the oesophagus (length 35–60 µm and diameter 25–35 µm in fixed and micromized material). The length of ectal duct 140–160 µm and its width 10–12 µm, with a sessile gland surrounding the ectal zone (diameter 20–25 µm in fixed and micromized material).

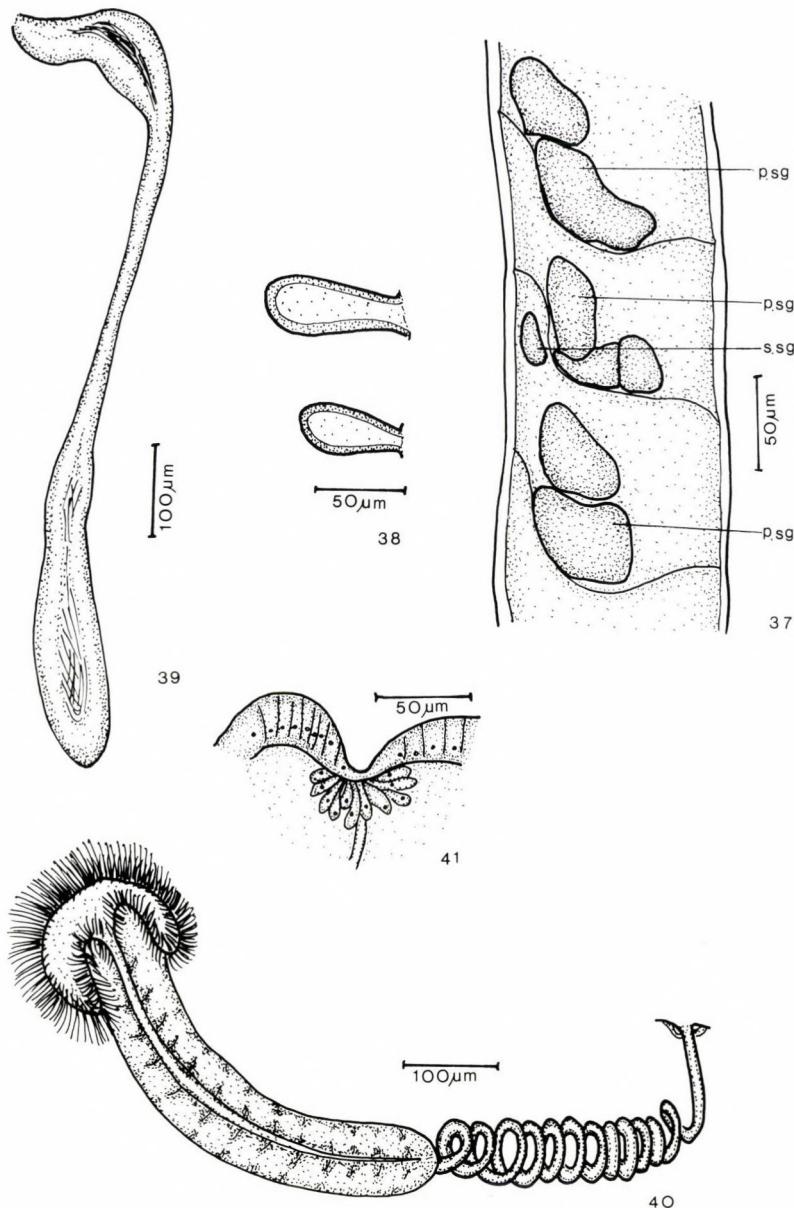
Number of examined specimens: 9 fixed and micromized and 16 alive.

Type locality: Pozo de Guadalajara. – Holotype marked with SSRD1–2 (Madrid). – Paratypes 4 specimens: SSRD1–1, SSRD1–3, SSRD1–4, SSRD1–5 (Madrid); P. 29. I. (Budapest), 6 specimens.

Discussion. – The chief characteristics of this new species are the form of the spermatheca and the peptonephridia type *b*. None of known *Fridericia* species with peptonephridia *b*-type have a similar spermatheca. *F. berninii* DÓZSA–FARKAS, 1988 is the most similar species (in the kind of peptonephridia, form of diverticula and ectal gland of spermatheca), but it is different from *F. vixdiverticulata* in that the two ental ducts merge before their connection with the oesophagus and that the penial bulb and the sperm funnel are bigger.

Achaeta matritensis sp. n. (Figs 37–41)

Number of segments 35. Length 9.1 mm. Width 0.14 mm on VIII, at the clitellum 0.35 mm. Setae absent; only dorsal setal follicles present (Fig. 38), large (length 70–90 µm, about 1/3 body diameter), at the end of the body are smaller (60–80 µm). Clitellum over XII–1/2 XIII; two kinds of glandular cells: small and granulated cells arranged in transverse rows, big and transparent cells present only on the dorsal zone, arranged between the little cell rows.



Figs 37–41. *Achaeta matritensis* sp. n.: 37 = septal glands, parasagittal section, lateral view (p.sg.—primary septal glands, s.sg.—secondary septal glands), 38 = setal follicles, 39 = spermatheca, 40 = sperm funnel, 41 = male pore

Peptonephridia absent. Oesophageal appendages in dorsolateral position in V. Chloragogen cells in dense layer from VII. Three pairs of primary septal glands in normal position with ventral lobes merging dorsally. One pair of secondary septal glands in VI (Fig. 37). Brain 1.5–2 times longer than wide. Origin of dorsal vessel in VII, with pulsating expansion in VI. First pair of nephridia on septum VI/VII. Lymphocytes in alive worms have drop form; several lymphocytes are often linked at the thin end.

Seminal vesicle in XI, large and compact. Sperm funnel (Fig. 40) 5 times longer than wide (length 443 µm, 1.3–1.8 times as long as the clitellar diameter); collar well developed, wide, reclinate and with a tuft of sperm; sperm duct winds into regular spiral. Male pores in XII. Penial bulb (Fig. 41) little and without muscular look, it is composed of several little cylindrical cells placed around the male pore.

Spermatheca (Fig. 39): Ectal duct short and stout, without ectal glands. Ectal part of the ampulla is small and pear-shaped, with the long axis nearly perpendicular to ectal duct; this part narrows gradually into a rather thin duct, which extends backwards and widens again into a big and egg-shaped part with stout wall; in some specimens the last wide part of the ampulla is divided into 2–3 egg-shaped portions connected by a rather wide duct with stout wall. The spermatheca can extend backwards to IX, X and is not connected with the oesophagus; total spermatheca length is 3–4 times the clitellum diameter, maximum diameter of ampulla is 1/2–1/3 worm diameter.

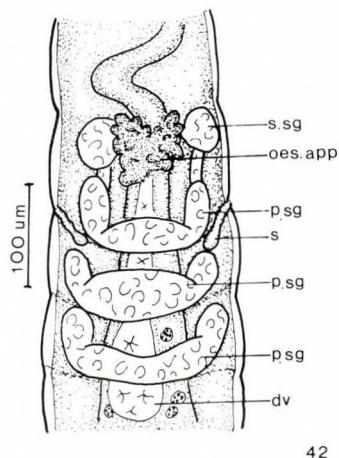
Number of examined specimens: 11 fixed and microtomized and 15 alive.

Type locality: Miraflores de la Sierra. – Holotype marked with TPA3–3 (Madrid). – Paratypes 5 specimens: TPA3–1, TPA3–2, TPA3–4, TPA3–5, TPA3–6 (Madrid); P. 30. 1. (Budapest), 1 specimen.

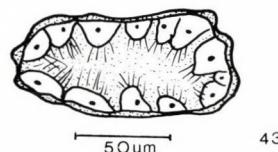
Discussion. – The main differences between the new species and the others which have dorsal setal follicles are only: *A. nielseni* PRABHOO, 1961 has spermatheca only in V; *A. incisa* FRIEND, 1914 has spermatheca connected with the oesophagus; *A. bohemica* NIELSEN et CHRISTENSEN, 1959 has not seminal vesicle, its sperm funnel is shorter and has a different form of collar; *A. bibulba* GRAEFE, 1989 is smaller and has a big ectal gland at the orifice of the spermatheca; *A. abulba* GRAEFE, 1989 is smaller and the sexual organs (except spermatheca) are placed one segment forward; *A. vesiculata* NIELSEN et CHRISTENSEN, 1959 has dorsal vessel in VI and the sperm funnel is shorter. The main characters of this new species are the collar form and the size of the sperm funnel.

Achaeta afolliculata sp. n.
(Figs 42–48)

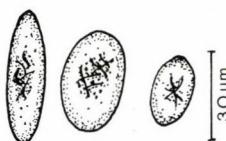
Number of segments 21–24. Length 3–4 mm. Width 0.19–0.21 mm on VIII, at the clitellum 0.20–0.26 mm. Setae, setal follicles and lentiform cutaneous glands absent. Clitellum over XII segment; clitellar glands weakly developed, ventrolaterally in transverse rows, dorsally irregularly scattered.



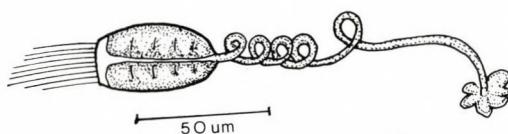
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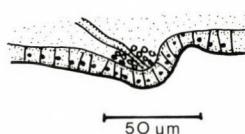
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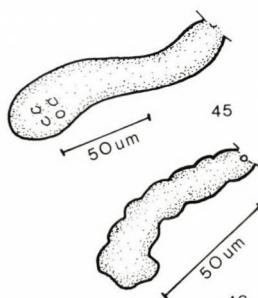
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46

Figs 42–48. *Achaeta afolliculata* sp. n.: 42 = III–VI segments, dorsal view (p.sg. = primary septal glands, s.sg. = secondary septal glands, s = spermatheca, oes. app. = oesophageal appendage, d.v. = origin of dorsal vessel), 43 = intestine, cross section in VIII segment, 44 = lymphocytes, 45–46 = spermatheca, 47 = sperm funnel, 48 = male pore

Peptonephridia absent. Oesophageal appendages in dorsolateral position in IV (Fig. 42, oes. app.). Chloragogen cells from VII. 3 pairs of primary septal glands (Fig. 42 p. sg.), all of them merge dorsally and have ventral lobes; one pair of secondary glands in segment VI on the ducts of primary glands (Fig. 42 s. sg.). Preserved and cross sectioned specimens show big ciliated cells with irregular outline attached to internal side of the gut wall (Fig. 43). Brain 1.5 times longer than wide. Origin of dorsal vessel in VII. Two pairs of praeclitellar nephridia on septa VI/VII and VII/VIII. Discoid lymphocytes (Fig. 44), their length 24–45 µm.

Seminal vesicle small in XI or absent. Sperm funnel (Fig. 47) small, pear-shaped or cylindrical, 1.2–1.8 times longer than wide and its length is 1/3–1/4 of worm diameter; the ducts are not very long, wound into loose loops in XII; at the male pores there are some small hyalin gland cells (Fig. 48).

Spermatheca (Figs 45, 46, 42 s.) small, confined in V; length 1/3–1/4 of worm diameter (in fixed specimens).

Number of examined specimens: 4 fixed and microtomized and 7 alive.

Type locality: Arganda. – Holotype marked with RZA4-4 (Madrid). – Paratypes 3 specimens: RZA4-1, RZA4-2, RZA4-5 (Madrid); P.31.1. (Budapest), 3 specimens.

Discussion. – There are 4 *Achaeta* species describe without setal follicles and the spermatheca confined in V segment. They differ from the new species in the following characters: *A. camerani* COGNETTI, 1899 has the origin of the dorsal vessel in VIII; *A. brevivasa* GRAEFE, 1980 has different shape of the clitellar and septal glands; *A. iberica* GRAEFE, 1989 has 3 pairs of preaclitellar nephridia; *A. pannonica* GRAEFE, 1989 has 3 pairs of praeclitellar nephridia and the male pore in the XI segment.

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TAXONOMIC STATUS OF *HIPPOSIDEROS LARVATUS ALONGENSIS* BOURRET, 1942
AND OCCURRENCE OF *H. TURPIS* BANGS, 1901
IN VIETNAM (MAMMALIA, CHIROPTERA)

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(Received 7 May 1992)

The taxonomic status of *Hipposideros larvatus alongensis* BOURRET, 1942 is discussed in connection with its recent findings in northern Vietnam. The Vietnamese samples are compared morphologically and statistically to samples of *Hipposideros turpis* BANGS, 1901 from Japan and Thailand. The Vietnamese animal is found to be conspecific with *Hipposideros turpis* and subspecifically intermediate between *H. turpis turpis* and *H. t. pendleburyi* (CHASEN, 1936), and should be referred to as *Hipposideros turpis alongensis* (BOURRET, 1942). With 9 figures.

Introduction. – After the description of *Hipposideros turpis* BANGS, 1901 from Ishigaki Island in the Ryukyu group (Japan), the species has been also found on Iriomote and Yonakuni Islands in the southern part of the same group of islands (YOSHIVUKI 1989) and then far away to the south-west in Thailand in the 1930s (Fig. 1). The latter form was described as *Hipposideros pendleburyi* by CHASEN in 1936. A few years later CHASEN (1940) still regarded the Thai form as a separate species. According to LEKAGUL et al. (1977) it has been known since, in that country only from two localities in the Krabi province and at Khao Ram, Nakhon si Thammarat province. TATE (1941) listed the diverse related forms previously described, as well as *H. turpis*, in the *H. armiger* group. ELLERMAN et al. (1951) dealt with it as a supposed subspecies of *Hipposideros armiger* HODGSON, 1835. HILL (1963) pointed out that it was a separate species, moreover, *H. pendleburyi* was actually a subspecies of *H. turpis*. The species thus seemed quite a rare one with a clearly disjunct distribution. YOSHIVUKI (1991) clarified the taxonomic status of *Hipposideros terasensis* KISHIDA, 1924 and the position of *H. t. turpis* within the *armiger* group.

During the present author's rather intensive bat collectings in North Vietnam in 1966, 1971 and 1987, a moderately large hippotiderid bat was also obtained in a good number. First it was thought to be *Hipposideros larvatus alongensis* BOURRET, 1942 as externally it clearly agreed with that

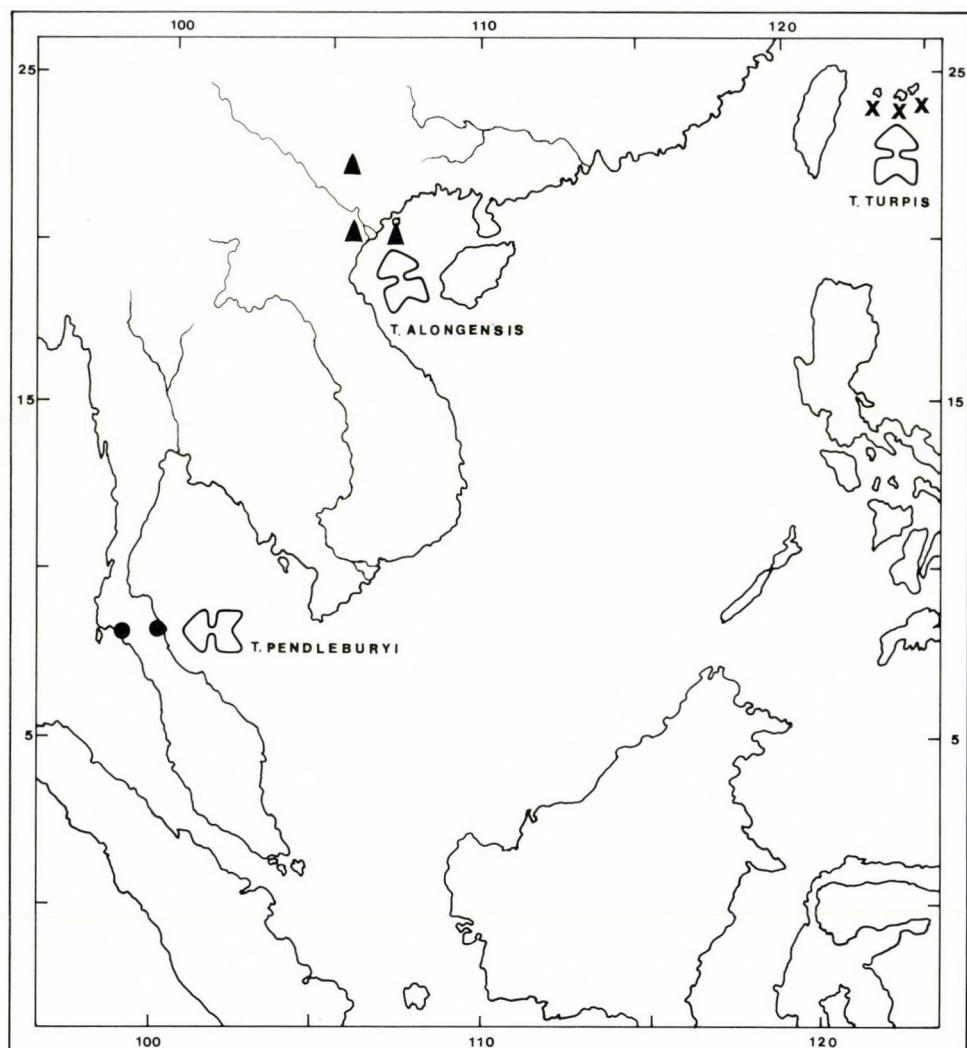


Fig. 1. Map of the distribution of *Hipposideros turpis* with the known collecting sites of the various subspecies

description in every respect. HILL (op.cit.) in his revision of the genus *Hipposideros* accepted BOURRET's animal as a subspecies of *H. larvatus*. TOPÁL (1975), however, regarded it as a separate species (*H. alongensis*) because it was found sympatrically with *H. larvatus* and because of the strong differences in their bacula. This view was further substantiated when, in 1987, on Cat Ba Island near Haiphong, in the Tonkin Bay, Vietnam in the very same cave both *H. larvatus*, and *H. "larvatus" alongensis* occurred

(along with populations of *H. armiger*, of *H. bicolor* and a specimen of *Aselliscus stoliczkanus*). It is worth noting that until very recently there was no new consideration of the Vietnamese "subspecies" of *H. larvatus* even by MR. J. E. HILL (HILL, in litt. and pers. com.).

MATERIAL AND METHODS

The following list of the studied specimens grouped under the name of the subspecies includes: deposition of the specimen (BMNH = The Natural History Museum, London; HNHM = Hungarian Natural History Museum, Budapest; NCSR = National Center for Scientific Research of Vietnam, Hanoi); register number (or collector's number); sex (m = male, f = female, ? = undetermined sex); collecting locality; collector's name.

Hipposideros turpis turpis – BMNH 5.11.3.16., m ad., S. Loo-choa, Ishigaki Isl., Japan, A. OWSTON; BMNH 5.11.3.17., m ad., S. Loo-choa, Ishigaki Isl., Japan, A. OWSTON; BMNH 5.11.3.18., m ad., S. Loo-choa, Ishigaki Isl., Japan, A. OWSTON; BMNH 5.11.3.19., m ad., S. Loo-choa, Ishigaki Isl., Japan, A. OWSTON; BMNH 25.9.3.7., m., Yonakuni Isl., Japan, N. KURODA; BMNH 25.9.3.8., f, Yonakuni Isl., Japan, N. KURODA; BMNH 25.9.3.9., m, Sonai, Iriomote Isl., Japan, N. KURODA; BMNH 25.9.3.10., f, Kasila, Ishigaki Isl., Japan, N. KURODA.

Hipposideros turpis pendleburyi – BMNH 78.2338., ?, Ban Thap Plick, Krabi Muang, Thailand, A. THONGLONGYA K.; BMNH 78.2339., ?, Ban Thap Plick, Krabi Muang, Thailand, A. THONGLONGYA K.

Hipposideros turpis alongensis – HNHM 88.39.1., f, netted in forest, Cuc Phuong National Park, 20° 20' N, 105° 35' E, prov. Ninh Binh, Vietnam, Gy. TOPÁL et CAO VAN SUNG; HNHM 88.40.1., m; HNHM 88.40.2., m; HNHM 88.40.3., m; HNHM 88.40.4., f; HNHM 88.40.5., m; HNHM 88.40.6., m; HNHM 88.40.7., m; HNHM 88.40.8., f; HNHM 88.40.9., f; HNHM 88.40.10., f; HNHM 88.40.11., m; HNHM 88.40.12., m; HNHM 88.41.1., m; HNHM 88.42.1., m; NCSR 280, m; NCSR 287, f; NCSR 289, m; NCSR 290, m; NCSR 298, m; NCSR 300, f; NCSR 302, m; NCSR 304, m; NCSR 306, m; NCSR 307, m; NCSR 320, m; NCSR 338, m; NCSR 339, m, all from the Bat Cave, Cuc Phuong Nat. Park, Vietnam, by Gy. TOPÁL et CAO VAN SUNG; HNHM 11294, ? and HNHM 11295, ? as subrecent fragments from Bat Cave, Cuc Phuong Nat. Park, Vietnam, Gy. TOPÁL; HNHM 11296, ? subrecent from Moon Cave, Cuc Phuong Nat. Park., Vietnam, Gy. TOPÁL; HNHM 11288, ?; HNHM 11289, ?; HNHM 11290, ?; HNHM 11291, ?; HNHM 11292, ?, all subrecent remains from a cave at Yu Do, Prov. Yen Bai, Vietnam, by Gy. TOPÁL et I. MATSKÁSI; HNHM 11297, f; HNHM 11298, m; HNHM 11299, f; HNHM 11300, f, all from Cave No. 1 at village Khé Sau, 20° 46' N, 107° 01' E, Cat Ba Island, Vietnam, I. MATSKÁSI et Gy. TOPÁL.

External measurements of the Vietnamese specimens were taken in the field by the author. A total of 38 cranial and dental characters were measured with help of a "Digimatic" caliper to an accuracy of 0.01 mm, except when the skull was fragmentary. A series of measurements, especially those of short distances and of the teeth, were taken with the caliper under a stereo-microscope. List of the cranial and mandibular characters, abbreviations of the measurements used in the paper along with explanations are as follows:

CCONDYLL	condylar length of skull (from front of canines to back of condyles)
TOTALLEN	total length of skull (from front of canines to occiput)
BASILLEN	basilar length of skull (from frontal edge of palate [without praemaxillae] to the foremost part of the ventral incision between condyles)
ZYGWIDTH	width of skull between zygomata
MASTWIDT	mastoid width of the skull (between mastoid knobs)
UCCWIDTH	width of rostrum between outer margins of crown of canines
M3M3WIDT	width of rostrum between outer crowns of M^3 s
UCM3LENG	crown length of upper $C-M^3$
PALBRIDG	length of palatal bridge (without the postpalatal spike)
COCHDIST	distance between cochleae
BRCASEWI	width of braincase (just above mastoid knob)
BRCASEHE	height of braincase (from base to top with sagittal crest)
LACRWIDT	width of rostrum between lachrymal foramina
UCP4LENG	crown length of upper $C-P^4$
UM1M3LEN	crown length of upper M^1-M^3 (from the anteriormost portion of parastyle of M^1 to the posteriormost edge of protocone of M^3)
UCBLENGT	basal cross-sectional length of upper C
UPCWIDTH	basal cross-sectional width of upper C
UM1LENGT	antero-posterior length of upper M^1 (between parastyle and metastyle)
UM1WIDTH	width of upper M^1 (between lingual base of protocone and labialmost edge of mesostyle)
UP2LENGT	antero-posterior crown length of upper P^2
UP2WIDTH	crown width of upper P^2
BULLALEN	greatest length of bulla tympani
MANDIBLE	length of mandible (between hindermost portion of articular process and anteriormost edge of I_1 alveolus)
LCM2LENG	crown length of lower $C-M_3$
LCP4LENG	crown length of lower $C-P_4$ row
LM1M3LEN	crown length of lower M_1-M_3 (between anterior edge of paraconid of M_1 and posterior margin of hypoconulid of M_3)
PROCCORH	height of coronoid process (between its top and the sinus on the mandibular body's ventral profile)
LP4LENGT	length of lower P_4 (between its paraconid and hypoconulid)
LP4WIDTH	greatest basal width of lower P_4
LP2LENGT	greatest basal length of lower P_2
LP2WIDTH	greatest basal width of lower P_2
LM1LENGT	length of lower M_1 (between its paraconid and hypoconulid)
LM1TALWI	talonid width of lower M_1
LM3LENGT	length of lower M_3 (between its paraconid and hypoconulid)
LM3TRIWI	trigonid width of lower M_3
INTEROWI	width of interorbital constriction

Statistical analyses of the available variables were carried out with help of the SYSTAT statistical computer programme (WILKINSON 1990).

RESULTS

Some of the specimens from Vietnam (Fig. 2) have been compared directly with the material in the Natural History Museum (London) probably from the type locality (purchased by the same collector as for the type

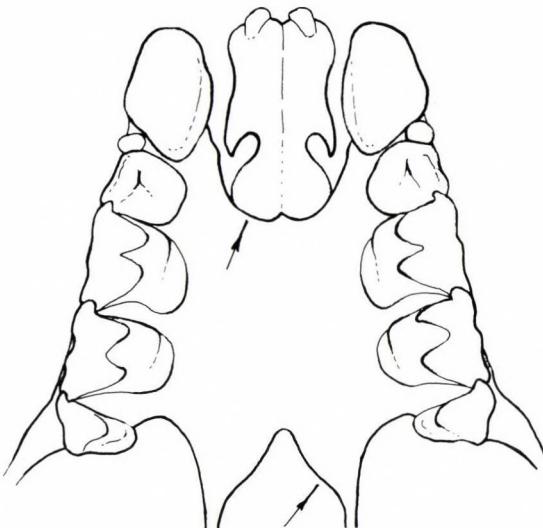


Fig. 2. Occlusal view of the rostral part of the skull in *Hipposideros t. alongensis* (HNHM 88.40.2.)

series, see also BANGS 1901), from some other Japanese localities, and from Thailand.

Conventional comparison of the Japanese and Vietnamese specimens

Comparison of the HNHM 88.41.1. Vietnamese *turpis* and the BMNH 5.11.3.19. Ishigaki *t. turpis* showed that the skull of the Japanese animal is decidedly smaller, with shorter and narrower nasofrontal region, and thinner and more elongated anteorbital bar, and greater anteorbital foramen. The anterior incision of the palate is very deep and reaches at least the level of the hypocone of M^1 . The postdental palate behind the toothrows is much narrower than that in the Vietnamese specimen, with evenly arched and pointed incision, not as in the Vietnamese skull where the palation is arched with two faint lobes (Fig. 2). The upper toothrows are very similar, however, C and P^4 in contact as P^2 fully extrudes out of the toothrow in the Japanese animal. In both specimens the basal surface of upper C has an impression of P^2 postero-labially. The lower P_2 of the northern specimen is somewhat greater, though both have the same length/width ratio in basal cross-section. On the contrary, the length/width ratio of the lower P_4 is quite different in the two compared animals, that of the Japanese specimen being decidedly shorter and wider. The lower molars of the northern animal were found to be somewhat greater. Another *t. turpis* specimen (BMNH 5.11.3.16., Ishigaki Island) was found to be different from the above Viet-

nameese animal in a similar way, in the size of the anteorbital foramen and bar, in the shape of the anterior palatal incision and in the postdental palate, as well as in the lower dentition. The Ishigaki specimen (BMNH 25.9.3.10.) has generally smaller nasofrontal region in dorsal view than that of the Vietnamese one. The upper C and P^4 are closer to each other than in the southern animal. The difference in the palation and postdental palate is as in the other Japanese specimens. The size of the bulla is equal, the lower C , P_2 and P_4 are smaller and shorter than in the Vietnamese specimen. Its molars are, however, slightly greater. The BMNH 25.9.3.9. specimen from the Iriomote Island has the same anteorbital bar and foramen as the other *H. t. turpis* specimens and a generally somewhat smaller skull with very similar, yet smaller nasofrontal region. The differences in the anterior palatal incision, and that of the postdental palate are the same as in other Japanese animals. The measurements of bulla tympani are equal in the present Japanese and in the above Vietnamese animal. It has C and P^4 in touch, upper dentition otherwise identical to that of the Vietnamese specimen. In the lower dentition P_4 is shorter and wider, the molars are somewhat greater than in the southern population, though C and P_2 are identical in both.

Comparison of the Thai and Vietnamese animals

Specimen HNHM 88.41.1. from Cuc Phuong, Vietnam, has been compared to a specimen of *H. t. pendleburyi* (BMNH 78.2329. from Ban Thap Plick, Korbi Muang, Thailand). In dorsal view their skulls are strikingly similar mostly because of equal size in general. At the same time the nasofrontal region of the Vietnamese specimen is longer and wider, thus with a greater dorsal surface. The anterior palatal incision in the Thai specimen reaches the level of the anteriormost part of the parastyle of M^1 and its interpterygoid fossa is narrower and the palation has rounded incision, not as in the Vietnamese animal where the interpterygoid fossa is wider and the posterior palate is sharply and pointedly incised (Fig. 2). The Vietnamese specimen has a more inflated bulla tympani with greater opening than the Thai one. The coronoid process of the mandible is somewhat higher in the Vietnamese specimen, while the projection of the dorsal crest on angular process is lower in the Thai animal. The upper and lower teeth of the Thai animal are wider than those of the Vietnamese one, although their antero-posterior lengths are more or less equal or just slightly longer in the southern specimen. The P_2 of the Thai specimen seems shorter anteroposteriorly. The second Thai specimen of *H. turpis pendleburyi* (BMNH 78.2338.) has the same measurements and rostrum as the Vietnamese HNHM 88.41.1. The anterior palatal incision proved to be deeper

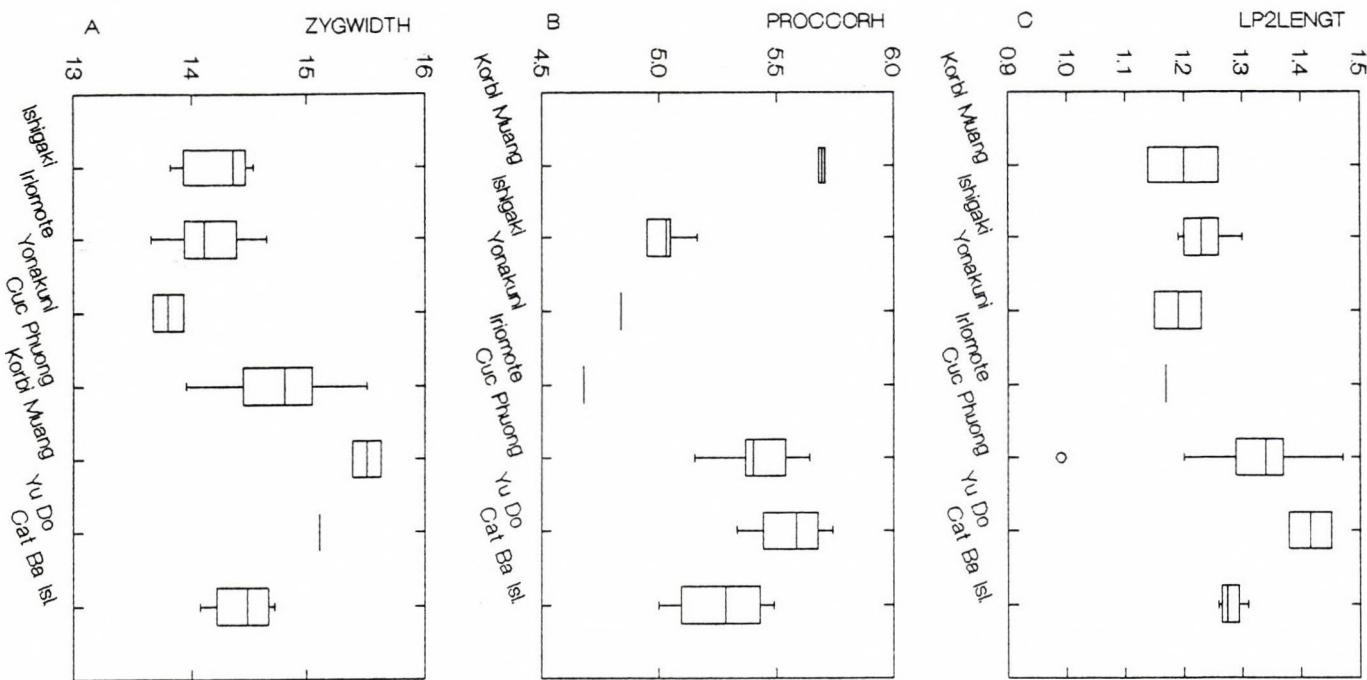


Fig. 3A, B, C. Boxplots of three variables. The horizontal lines represent the range of the sample, vertical mark in the box is the median, the right and left margins (hinges) of the boxes represent the interquartile range or midrange. Values outside the inner fences are plotted automatically with asterisks by the computer programme for some specimens slightly falling out of the sample, outside the outer fences with empty circles for strongly outstanding specimens. Grouped according to the collecting localities (see the list of study material)

and the posterior palate narrower with evenly rounded incision, not as in the Vietnamese animal. It has smaller bulla tympani with smaller opening. The upper C is basally shorter, but wider than in the northern specimen. Its upper molars are slightly, as well as the lower teeth are generally more robust, P_2 is longer and wider in cross-section, P_4 is relatively wider.

Cranial and dental characters

The dental and cranial measurements of Japanese specimens (taken from YOSHIYUKI 1989, with the exception of Nos NSMT-M 11446 and NSMT-M 11449), the few specimens in London, the Vietnamese populations, and the two Thai specimens have been analysed.

In general the Vietnamese population has slightly smaller cranial and dental measurements for the females in 22 characters measured. Among these the females are markedly smaller in LACRWIDT, BRACSEHE, PROCCORH, LP2LENGT, and LP2WIDTH. The males are smaller but in five characters: UCM3LENG, UCBLLENGT, LM1LENGT, LM1TALWI and especially in INTEROWI. The two sexes had apparently equal measurements in the following eight characters: UCM3LENG, UCP4LEGN, UM1WIDTH, UM1LENGT, UP2LENGT, LP4LENGT and BULLALEN.

The boxplots present rather different results, thus a truly mosaic picture.

The values of the small sample of *Hipposideros t. pendleburyi* are the highest in many cases, and outstandingly so in ZYGWIDTH, UCCWIDTH, M3M3WIDT, BRCASEHE, UPCWIDTH, MANDIBLE, LCM3LENG, LP2WIDTH and LM1TALWI (see Fig. 3A–B, Fig 4A). They are small, however, in UP2WIDTH and the smallest in BULLALEN. *H. t. pendleburyi* more or less equals the Japanese nominate form and is thus markedly greater in COCHDIST, UM1M3LEN, UM1LENGT, LP4WIDTH, LM1LENGT, LM3LENGT, and LM3TRIWI, (see Fig. 4A, B, C), or smaller than the Vietnamese population in CCONDYLL, LP2LENGT, PALBRIDG and PROCCORH, respectively, (see Fig. 3A, B, C). The Thai form and the Vietnamese material overlapped in TOTALLEN, BASILLEN, UCP4LENG and in UCM3LENG.

The Vietnamese and Japanese samples are generally equal in UCCWIDTH, UCM3LENG, PALBRIDG and LCM3LENG. Although it was difficult to compare the cranial and dental characters of the Japanese *H. t. turpis* due to the fragmentary state of the London specimens and the numerous missing characters in the material presented in YOSHIYUKI's book, they were markedly small e.g. in PROCCORH and LP2LENGT (Fig. 3A, C), however, large in UM1M3LEN, LP4WIDTH, LM3LENGT and LM3TRIWI (Fig. 4A, B, C).

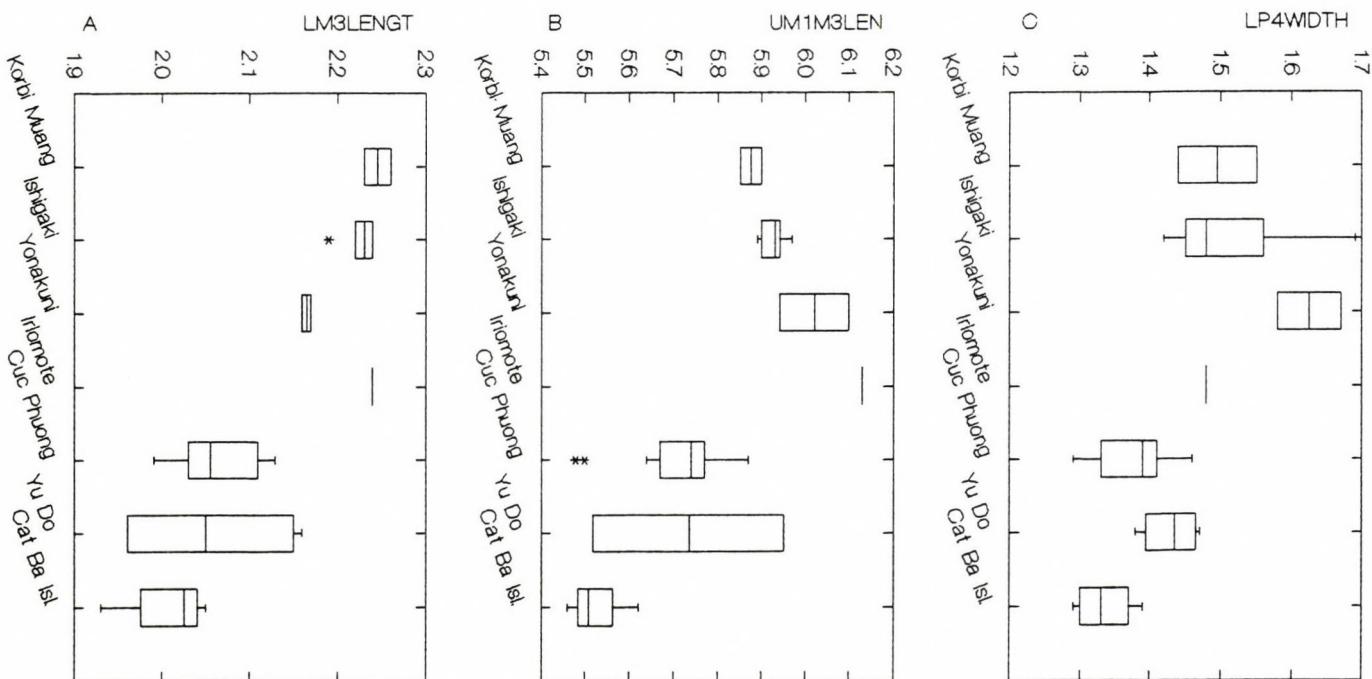


Fig. 4A, B, C. Boxplots of three variables. Legend as for Fig. 3

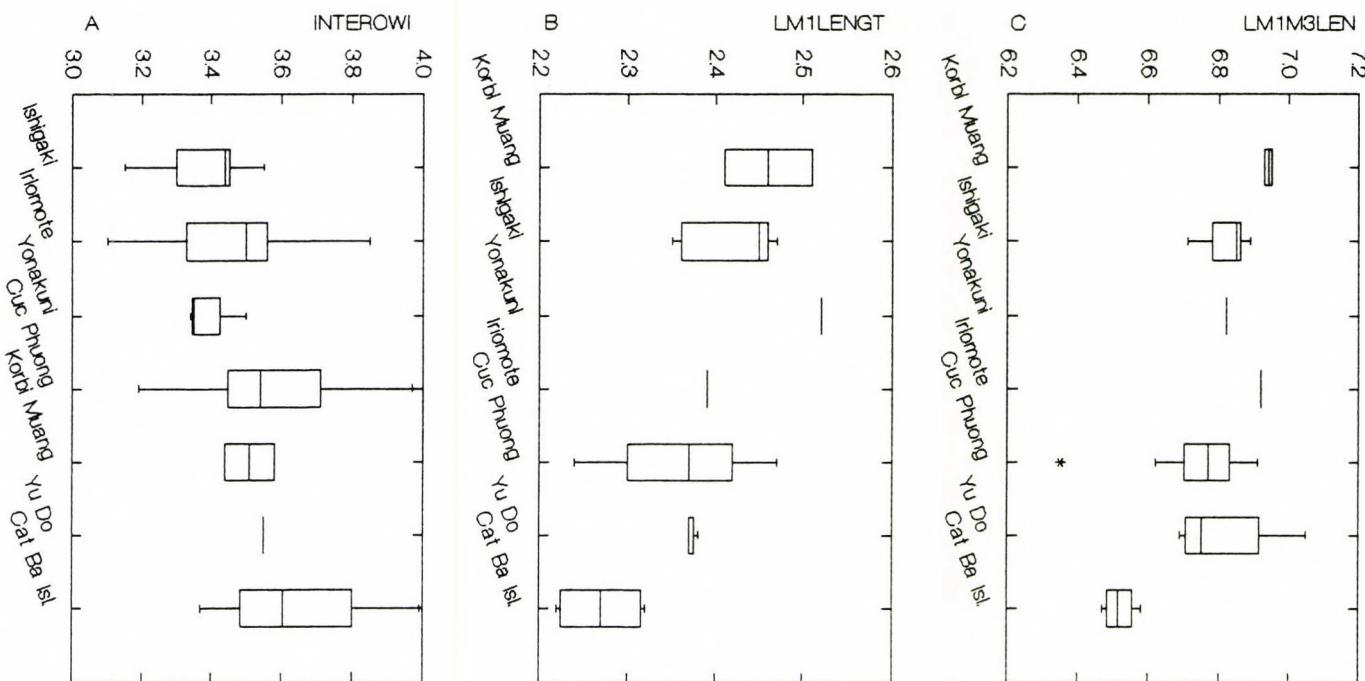


Fig. 5A, B, C. Boxplots of three variables. Legend as for Fig. 3

Within the Vietnamese material the unfortunately small series from the Cat Ba Island has smaller measurements than the other specimens in 21 cranial and dental characters. Among these they were certainly smaller in MASTWIDT, BRCASEWI, UM1M3LEN, LM1M3LEN, (see Fig. 5C) and especially in LACRWIDT, thus they were close and intermediate to the Japanese material in many cases. MANDIBLE and BRCASEHE in the Cat Ba specimens are practically equal to those of the Cuc Phuong sample, while INTEROWI of the Cat Ba specimens is greater (see Fig. 5A). The few fragments from Yu Do generally have greater values than the animals from Cuc Phuong, except in 12 characters where they are equal or smaller.

Otherwise, based on the present material, there were found no differences between the various populations in UCBLENGT, UPCWIDTH, UMI-LENGT, UP2LENGT, UP2WIDTH, and LCP4LENG.

Some of the dental and cranial measurements have been analysed with help of scatterplots (with regression lines and ellipses marking 50% probabilities of the density of the bivariate cloud of points). The scatterplots in which one of the variables was BRCASEHE had to be omitted for the Japanese material (published in YOSHIVUKI's book) because they were much lower and thus probably had been measured without sagittal crest (?).

Where there were data available in YOSHIVUKI's book, these and measurements of the specimens in the London collection, moreover the Cat Ba material agreed well in UCCWIDTH vs. ZYGWIDTH and BRCASEWI vs. CCONDYLL. However, the Cat Ba specimens more or less differed in having greater ZYGWIDTH vs. CCONDYLL, greater INTEROWI vs. CCONDYLL, smaller UCM3LENG vs. CCONDYLL, (see Fig. 6A), smaller BRCASEWI vs. ZYGWIDTH, and shorter UCM3LENG vs. ZYGWIDTH (see Fig. 7A). The Cat Ba material was practically mostly within the range of the Japanese sample in UCCWIDTH vs. CCONDYLL, UCCWIDTH vs. UCM3LENG, INTEROWI vs. ZYGWIDTH (see Fig. 7B), UCCWIDTH vs. ZYGWIDTH. The London deposited specimens of *H. t. turpis* were more or less outside the cloud of points of the original Japanese data (besides BRCASEHE mentioned above) in ZYGWIDTH vs. MANDIBLE, MANDIBLE vs. CCONDYLL (see Fig. 6B) and UCCWIDTH vs. BRCASEWI.

In scatterplots where there were no data from YOSHIVUKI's book the London specimens of *H. t. turpis* and the Cat Ba sample agreed in MANDIBLE vs. TOTALLEN, PALBRIDG vs. CCONDYLL and CCONDYLL vs. TOTALLEN. The Cat Ba material was greater than the specimens from Japan in the London collection in: LCP4LENG vs. LM1M3LEN (in LM1M3LEN), UCP4LENG vs. UM1M3LEN (in UM1M3LEN), UCCWIDTH vs. M3M3WIDT (in M3M3WIDT), UCP4LENG vs. UCM3LENG (in UCM3LENG), LCP4LENG vs. LCM3LENG (in LCM3LENG), UCP4LENG vs. MASTWIDT (in MASTWIDT). The Cat Ba sample has smaller MASTWIDT vs. ZYGWIDTH.

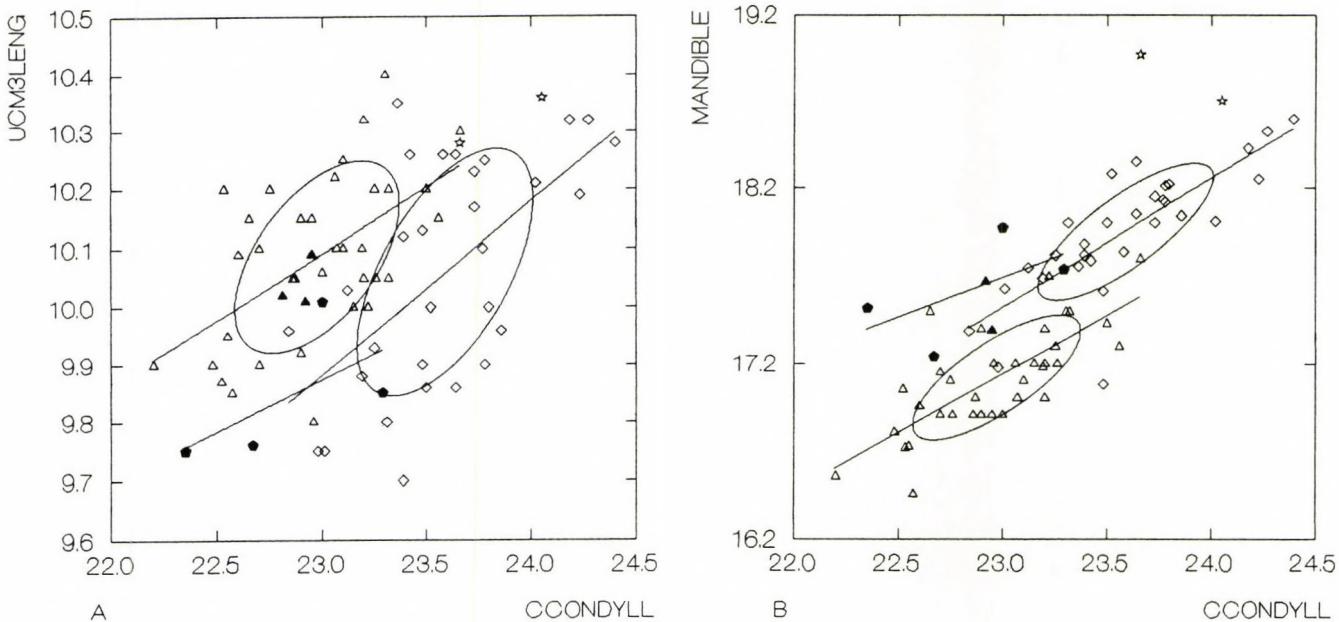


Fig. 6. Selected scatter diagrammes for three cranial and dental characters measured. Asterisks = *H. t. pendleburyi*; empty triangles = data of Japanese samples (YOSHIIKI 1989) of *H. t. turpis* (A: $y = 0.228 X + 4.843$; B: $y = 0.670 X + 1.741$); filled triangles = *H. t. turpis* measured in London; empty diamonds = data of the Cue Phuong and Yu Do, Vietnam samples (A: $y = 0.110 X + 8.423$, B: $y = 0.731 X + 0.701$); filled pentagons = *H. t. alongensis* from Cat Ba Isl. (A: $y = 0.180 X + 5.726$, B: $y = 0.450 X + 7.342$) with the corresponding regression lines (equations in brackets). Ellipses mark 50% probabilities of the density of the bivariate cloud of points

External characters

External measurements of the two sexes in the study material are similar but the females have very slightly longer ears and forearms (at least as regards the medians). Tibia length is smaller in the Vietnamese sample, however, medians are similar in the Japanese (YOSHIVUKI 1989) material. Comparison of the three external characters of the Japanese specimens (data taken from YOSHIVUKI's book, those of specimens NSMT 11146 and NSMT 15143 omitted), and the Vietnamese populations gave differences in the scatterplots tibia vs. forearm and also ear vs. forearm, with similar differences in the slopes of the regression lines. In these plots, the four specimens from the Cat Ba Island are somewhat closer to the Japanese group. The cloud of points in the latter is always more scattered (due to various populations or to several different collectors?). However, the forearm is smaller with longer tibia or ear (see Fig. 8A). One of the 3 dimensional plots also depicts (Fig. 8B) the above differences.

Comparison of forearm lengths, as revealed by boxplots also gave some differences, namely, the highest values were found in the Cuc Phuong sample, in this respect somewhat smaller was the small series from Cat Ba. The latter one fitted well to the Japanese samples (Fig. 9A), among these, however, the samples from Nakano and Otomi on Iriomote Island had as great maxima as the value of the median of the Cuc Phuong population.

Tibia length was practically the same in the Japanese and Vietnamese samples (Fig. 9B), with equal medians for the Cuc Phuong and Cat Ba samples. Within the Japanese material again the Iriomote specimens had the highest values.

As regards ear length, the Japanese and Vietnamese samples also do not differ, and even the Cuc Phuong animals are somewhat smaller (Fig. 9C) than those from Cat Ba.

Baculum

It is interesting to note the differences between the baculum of the Japanese *H. t. turpis* (YOSHIVUKI 1989) and that of the Vietnamese population (TOPÁL 1975). It should be noted first of all that the figures in YOSHIVUKI's (1989) book are upside down (see the general explanation on p. 13 as well as the description of the baculum of *H. turpis* on p. 78) thus, the forked distal portion of the bone is heading downwards (see also descriptions and figures for all *Rhinolophus*, *Pipistrellus*, *Nyctalus* and *Murina silvatica*). YOSHIVUKI's book (op. cit.) erroneously describes the opposite situation, that is e.g. for *H. turpis*: the body a "reverse Y-letter shape, ampulla small" and "the ampulla is at the distal end". As regards the measurements of the baculum in *H. turpis* the figures both in YOSHIVUKI's book and TOPÁL's

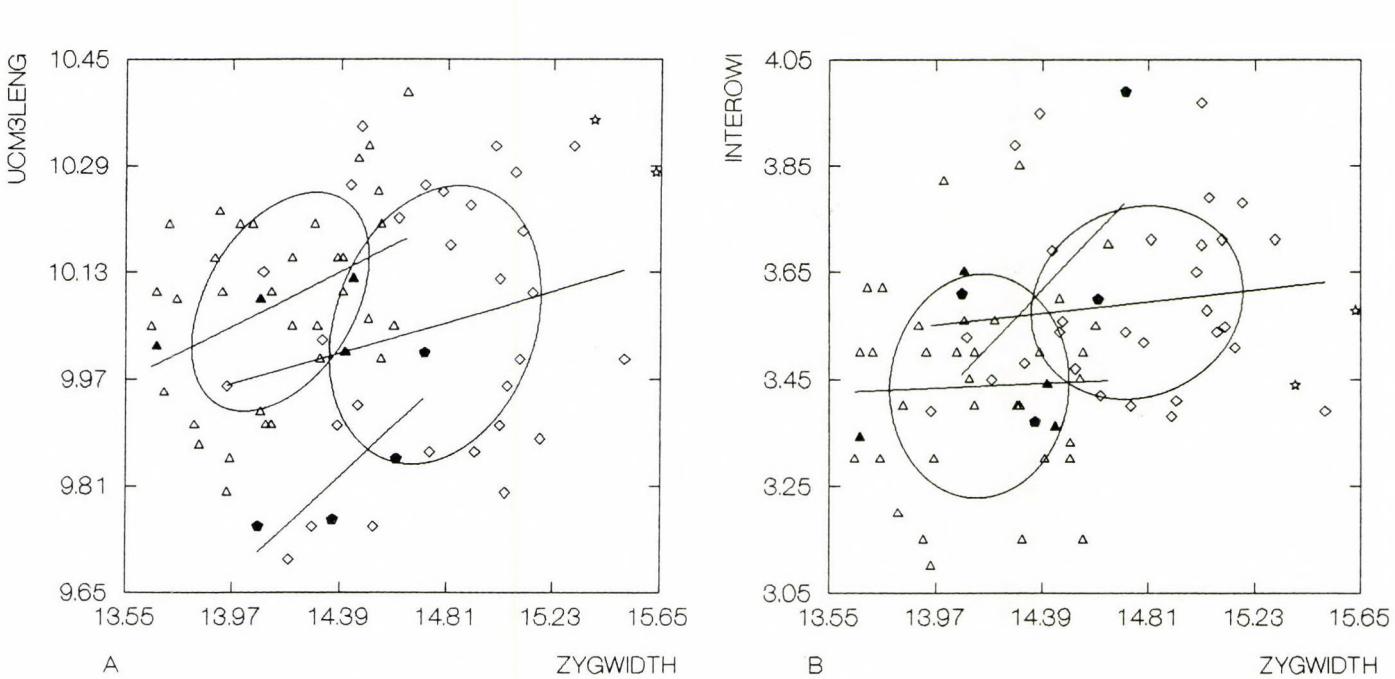


Fig. 7. Selected scatter diagrammes for three cranial and dental characters measured. Legend as for Fig. *H. t. turpis* (YOSHIYUKI 1989) (A: $y = 0.191 X + 7.386$; B: $y = 0.021 X + 3.146$); *H. t. alongensis*, Cuc Phuong (A: $y = 0.110 X + 8.423$; B: $y = 0.051 X + 2.846$); *H. t. alongensis*, Cat Ba Isl. (A: $y = 0.355 X + 4.174$, B: $y = 0.494 X - 3.497$)

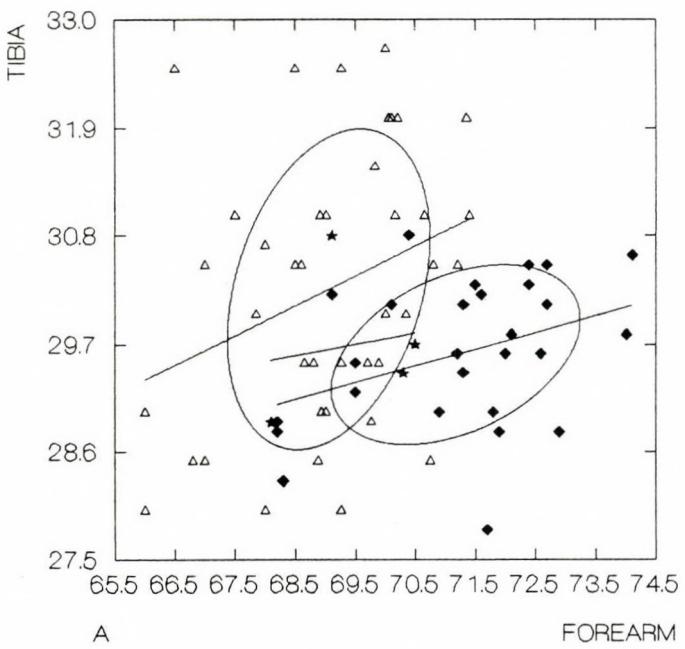
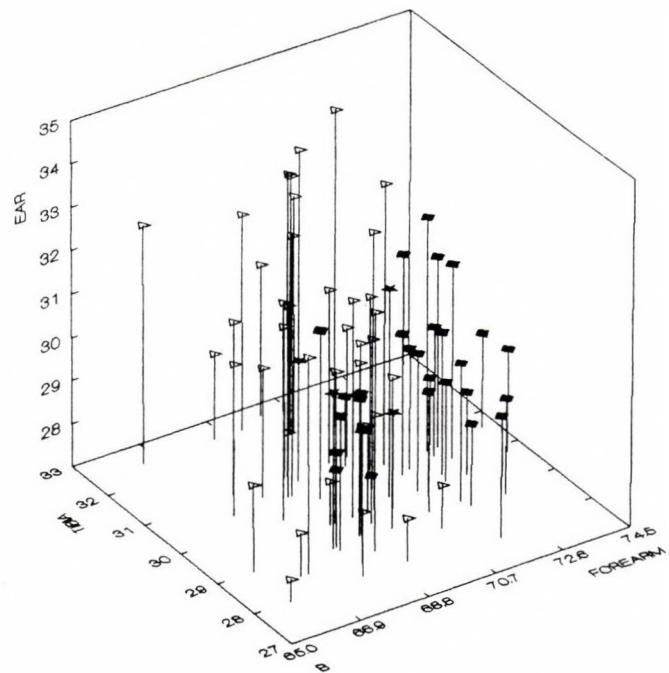


Fig. 8A. Scatter diagramme for tibia vs. forearm. Legend as for Fig. 6. except: filled asterisks = specimens *H. t. alongensis* from Cat Ba Island; filled diamonds = *H. t. alongensis* from Cuc Phuong; empty triangles = *H. t. turpis* (YOSHIIKI 1989). – Fig. 8B. Three-dimensional plot of the external measurements of the study material. Legend as for Fig. 8A



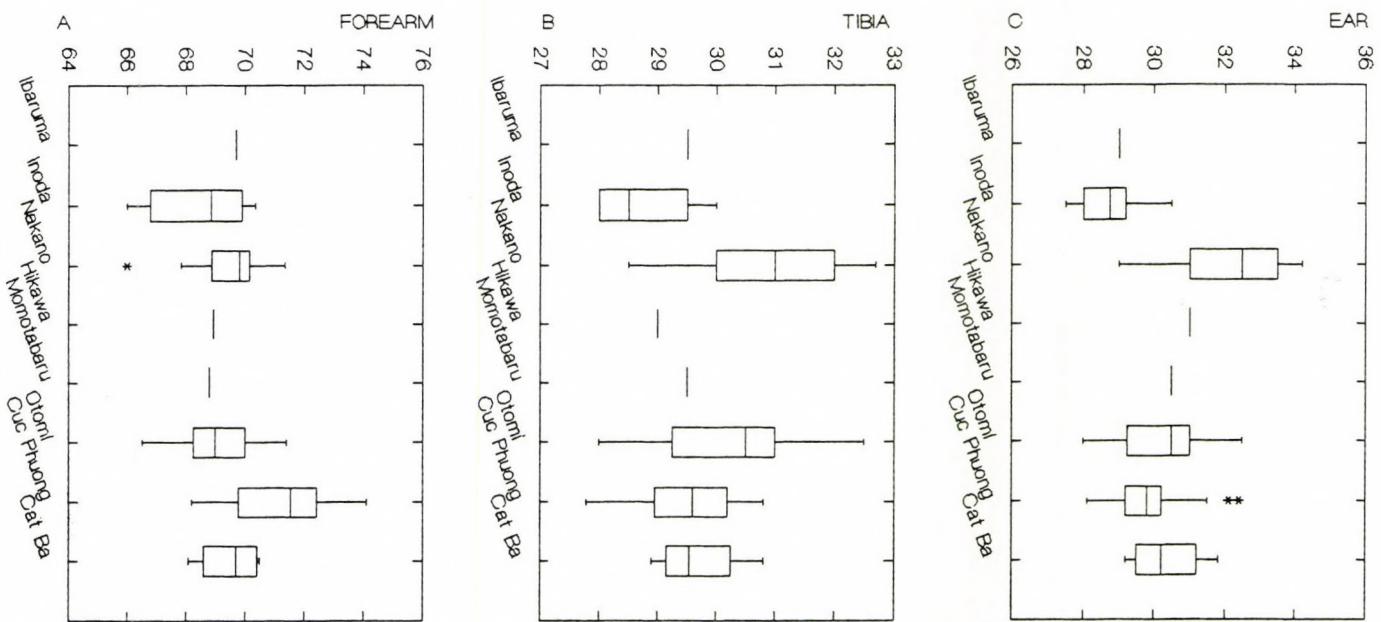


Fig. 9. Boxplots for the available external characters of *H. turpis* grouped according to collecting localities (Ibaruma and Inoda on Ishigaki Isl., Nakano and Otomi on Iriomote Isl., Hikawa and Momotabaru on Yonakuni Isl. see YOSHIYUKI 1989: 74.)

paper were made under the same magnification. Greatest length of the baculum in *H. t. turpis* is 1.40 ± 0.09 mm, in Vietnamese specimens $1.50\text{--}1.63$ mm, greatest width is 0.689 ± 0.04 mm and $0.55\text{--}0.57$ mm, respectively. Thus the Vietnamese form seems to have much more robust and somewhat longer bones with longer distal forks whose tips bend inwards, not as in the Japanese specimens where they clearly more diverge. The shaft of the bone between the basal cone and the terminal fork is broad and thick, and it seems more slender in the nominate form.

DISCUSSION

In light of the new findings it is evident that *Hipposideros larvatus alongensis* BOURRET, 1942 is a younger synonym of *Hipposideros turpis* BANGS, 1901.

The statistical investigations have proven in many respect that the Vietnamese population is an intermediate one between the northern *H. t. turpis* BANGS, 1901 and the southern *H. t. pendleburyi* (CHASEN, 1936), resembling the latter one.

The sporadic distribution of this still rarely collected species seems to be confined to easternmost continental Southeast-Asia and some close adjacent islands in the tropics and subtropics between 99° and 125° E and 8° and 25° N (see Fig. 1), with the northern and smallest nominate form, the southern and greatest *H. t. pendleburyi* and the transitional Vietnamese population whose name should stand as *Hipposideros turpis alongensis* (BOURRET, 1942) when one considers subspecific division. However, the complex picture of the various external, cranial and dental characters, although presenting a real mosaic, also indicates a northeast-southwest cline in the characters of this interesting bat, and insular effects cannot be excluded as well.

* * *

Acknowledgements. — Thanks are due to the staff and also MR. CAO VAN SUNG of the National Center for Scientific Research of Vietnam, Hanoi for their help in collecting this interesting bat, to the staff of the Mammal Collection, The Natural History Museum, London for making available for study the collection in London, and especially to DR. A. DEMETER for providing financial support for the visit to London, as well as for his critical revision of the manuscript.

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Table 1

Hipposideros turpis alongensis from Vietnam (except Cat Ba Isl.); basic statistical data, total observations: 37

N. OF CASES	CCONDYLL	TOTALLEN	BASILLEN	ZYGWIDTH	MASTWIDT
	30	30	29	29	30
MEAN	23.588	26.434	17.111	14.764	13.090
STD DEV.	0.388	0.423	0.380	0.392	0.226
MINIMUM	22.840	25.620	16.320	13.950	12.470
MAXIMUM	24.400	27.260	17.820	15.510	13.420
UCCWIDTH	M3M3WIDT	UCM3LENG	PALBRIDG	COCHDIST	BRCASEWI
29	29	32	29	17	17
6.651	9.586	10.063	4.896	2.470	10.059
0.198	0.240	0.219	0.214	0.098	0.186
6.220	9.000	9.700	4.500	2.310	9.730
6.950	10.000	10.570	5.370	2.690	10.510
UCP4LENG	UM1M3LEN	UCBLENGT	UPCWIDT	BRCASEHE	LACRWIDT
18	19	19	19	17	16
4.693	5.719	2.695	1.726	7.720	8.109
0.129	0.122	0.201	0.127	0.212	0.211
4.460	5.480	2.010	1.280	7.220	7.630
4.880	5.950	2.900	1.890	8.040	8.540
UM1LENGT	UM1WIDTH	UP2LENGT	UP2WIDTH	BULLALEN	MANDIBLE
19	19	18	18	15	33
2.288	2.596	0.648	0.616	3.651	17.962
0.077	0.092	0.063	0.051	0.080	0.356
2.140	2.450	0.530	0.550	3.430	17.080
2.450	2.750	0.770	0.720	3.750	18.600
LCM3LENG	LCP4LENG	LM1M3LEN	PROCCORH	LP4LENGT	LP4WIDTH
34	21	22	20	22	22
11.032	4.254	6.762	5.455	1.555	1.385
0.201	0.142	0.131	0.141	0.054	0.052
10.580	4.000	6.350	5.150	1.440	1.290
11.320	4.570	7.050	5.740	1.670	1.470
LP2LENGT	LP2WIDTH	LM1LENGT	LM1TALWI	LM3LENGT	LM3TRIWI
19	19	22	22	24	24
1.328	1.241	2.362	1.580	2.063	1.491
0.102	0.058	0.063	0.091	0.056	0.087
0.990	1.110	2.240	1.420	1.960	1.370
1.470	1.330	2.470	1.720	2.160	1.720
INTEROWI					
	30				
	3.580				
	0.182				
	3.190				
	3.970				

Table 2

Hipposideros turpis alongensis from Cat Ba Island, Vietnam; basic statistical data, total observations: 4

N. OF CASES	CCONDYLL 4	TOTALLEN 4	BASILLEN 4	ZYGWIDTH 4	MASTWIDT 4
MEAN	22.828	25.658	16.385	14.440	12.793
STD DEV.	0.407	0.240	0.427	0.289	0.111
MINIMUM	22.350	25.350	16.030	14.070	12.630
MAXIMUM	23.290	25.890	16.930	14.720	12.880
UCCWIDTH 4	M3M3WIDT 4	UCM3LENG 4	PALBRIDG 4	COCHDIST 4	BRCASEWI 4
6.540	9.373	9.843	4.573	2.315	9.755
0.112	0.169	0.120	0.149	0.054	0.203
6.420	9.210	9.750	4.400	2.250	9.500
6.650	9.600	10.010	4.720	2.360	9.980
BRCASEHE 4	LACRWIDT 4	UCP4LENG 4	UM1M3LEN 4	UCBLENGT 4	UPCWIDTH 4
7.688	7.723	4.588	5.525	2.743	1.665
0.107	0.203	0.113	0.068	0.076	0.040
7.570	7.560	4.490	5.460	2.640	1.630
7.830	8.010	4.750	5.620	2.820	1.720
UM1LENGT 4	UM1WIDTH 4	UP2LENGT 4	UP2WIDTH 4	BULLALEN 4	MANDIBLE 4
2.253	2.435	0.553	0.595	3.620	17.618
0.059	0.064	0.068	0.064	0.083	0.312
2.210	2.380	0.450	0.510	3.530	17.240
2.340	2.500	0.590	0.660	3.720	17.970
LCM3LENG 4	LCP4LENG 4	LM1M3LEN 4	PROCCORH 4	LP4LENGT 4	LP4WIDTH 4
10.785	4.153	6.520	5.263	1.473	1.335
0.110	0.070	0.047	0.214	0.042	0.044
10.680	4.060	6.470	5.000	1.430	1.290
10.940	4.220	6.580	5.490	1.530	1.390
LP2LENGT 4	LP2WIDTH 4	LM1LENGT 4	LM1TALWI 4	LM3LENGT 4	LM3TRIWI 4
1.280	1.228	2.270	1.530	2.008	1.405
0.022	0.028	0.052	0.042	0.053	0.024
1.260	1.200	2.220	1.500	1.930	1.380
1.310	1.260	2.320	1.590	2.050	1.430
INTEROWI 4					
3.643					
0.257					
3.370					
3.990					

Table 3

Hipposideros turpis turpis alongensis from Japan (combined measurement data of BNHM and NSMT specimens) basic statistical data, total observations: 46

N. OF CASES	CCONDYLL	TOTALLEN	BASILLEN	ZYGWIDTH	MASTWIDT
	41	3	3	42	3
MEAN	22.963	25.713	16.523	14.136	12.970
STD DEV.	0.322	0.129	0.595	0.298	0.087
MINIMUM	22.200	25.570	15.840	13.650	12.870
MAXIMUM	23.660	25.820	16.930	14.650	13.020
UCCWIDTH	M3M3WIDT	UCM3LENG	PALBRIDG	COCHDIST	BRCASEWI
	42	7	43	6	43
6.410	9.934	10.074	4.422	2.920	9.950
0.313	0.124	0.134	0.286	0.320	0.261
5.570	9.710	9.800	4.140	2.600	9.420
6.850	10.080	10.400	4.930	3.240	10.550
BRCASEHE	LACRWIDT	UCP4LENG	UM1M3LEN	UCBLENGT	UPCWIDTH
	37	8	8	8	8
6.739	7.560	4.564	5.975	2.771	1.765
0.280	0.104	0.122	0.090	0.135	0.071
6.300	7.420	4.390	5.890	2.600	1.670
7.680	7.710	4.710	6.130	2.980	1.870
UM1LENGT	UM1WIDTH	UP2LENGT	UP2WIDTH	BULLALEN	MANDIBLE
	8	8	8	4	45
2.435	2.535	0.596	0.601	3.705	17.198
0.108	0.208	0.040	0.066	0.042	0.340
2.350	2.300	0.550	0.490	3.650	16.450
2.680	2.800	0.660	0.690	3.750	17.850
LCM3LENG	LCP4LENG	LM1M3LEN	PROCCORH	LP4LENGT	LP4WIDTH
	7	8	7	8	8
10.956	4.135	6.833	4.938	1.471	1.541
0.143	0.108	0.071	0.149	0.089	0.101
10.750	4.010	6.710	4.680	1.340	1.420
11.150	4.320	6.920	5.160	1.580	1.690
LP2LENGT	LP2WIDTH	LM1LENGT	LM1TALWI	LM3LENGT	LM3TRIWI
	8	8	7	8	8
1.216	1.249	2.429	1.601	2.211	1.591
0.049	0.017	0.063	0.062	0.033	0.025
1.150	1.230	2.350	1.530	2.160	1.550
1.300	1.280	2.520	1.690	2.240	1.620
INTEROWI					
	43				
3.438					
0.168					
3.100					
3.850					

Table 4

Hipposideros turpis pendleburyi from Thailand; basic statistical data, total observations: 2

	CCONDYLL	TOTALLEN	BASILLEN	ZYGWIDTH	MASTWIDT
N. OF CASES	2	2	2	2	2
MINIMUM	23.660	27.010	17.090	15.390	12.700
MAXIMUM	24.050	27.280	17.380	15.630	13.160
UCCWIDTH	M3M3WIDT	UCM3LENG	PALBRIDG	COCHDIST	BRCASEWI
2	2	2	2	2	2
7.030	10.280	10.280	4.490	2.870	9.980
7.370	10.380	10.360	4.500	3.170	10.200
BRCASEHE	LACRWIDT	UCP4LENG	UM1M3LEN	UCBLENGT	UPCWIDTH
2	2	2	2	2	2
8.050	7.660	4.780	5.850	2.680	1.900
8.290	7.670	4.820	5.900	2.770	2.000
UM1LENGT	UM1WIDTH	UP2LENGT	UP2WIDTH	BULLALEN	MANDIBLE
2	2	2	2	2	2
2.410	2.590	0.540	0.530	3.330	18.710
2.470	2.740	0.600	0.540	3.440	18.980
LCM3LENG	LCP4LENG	LM1M3LEN	PROCCORH	LP4LENGT	LP4WIDTH
2	2	2	2	2	2
11.320	4.340	6.930	5.680	1.520	1.440
11.390	4.340	6.950	5.710	1.560	1.550
LP2LENGT	LP2WIDTH	LM1LENGT	LM1TALWI	LM3LENGT	LM3TRIWI
2	2	2	2	2	2
1.140	1.320	2.410	1.720	2.230	1.560
1.260	1.330	2.510	1.820	2.260	1.690
INTEROWI					
2					
3.440					
3.580					

BEITRÄGE ZUR KENNTNIS DER GATTUNG DICHAGYRIS LEDERER, 1857 (LEPIDOPTERA, NOCTUIDAE), I.

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(Eingegangen am 8. Mai 1992)

(Contributions to the genus *Dichagyris* Lederer, 1857, Lepidoptera: Noctuidae, I.) Description of a new species of the genus *Dichagyris* LEDERER, 1857: *D. cataleipa* sp. n. (Central and Eastern Turkey) related with *D. psammochroa* BOURSIN, 1940 (Iran) and *D. afghana* BOURSIN, 1963 (sp. bona, Afghanistan). Differences in the male genital structures are figured. A new subspecies of *Dichagyris verecunda* PÜNGELER, 1898: *D. verecunda psammodis* ssp. n. (W. Mongolia: Dzungarian Gobi) is described and figured, as well. With two photoplates and 38 original figures.

Einführung. – Die Gattung *Dichagyris* LEDERER, 1857 (Noctuinen Eur.: 45, 206) gehört zu den artenreichsten holarktischen Gattungen der Subfamilie Noctuinae (Tribus Agrotini). Ihr taxonomischer Umfang ist jedoch umstritten. Die Mehrzahl der hierher gehörigen Arten wurde früher – aufgrund einer unveröffentlichten Liste der paläarktischen Noctuiden von BOURSIN (mscr.) bzw. nach der Publikation von HARTIG & HEINICKE (1973) – als *Ochropleura* HÜBNER, [1821] 1816 (Verz. bekannt. Schmett.: 223, Generotypus: *Phalaena plecta* LINNAEUS, 1761) angeführt. Letzterwähnte Art gilt aber als Mitglied einer, hauptsächlich paläotropisch verbreiteter Gruppe und zeigt wenig Verwandtschaft mit jenen paläarktischen Arten, die – aufgrund einer täuschenden äußerer Ähnlichkeit – auch als *Ochropleura* eingereiht wurden. Es ist eine oft diskutierte Frage, welche z. Z. nicht mit vollständiger Sicherheit entschieden werden kann, ob jene Gattungen, die für die zahlreichen Mitglieder der früheren, falsch angedeuteten *Ochropleura* gebraucht bzw. aufgestellt wurden (vgl. HACKER & FIBIGER 1990, BECK 1991), alle als eigene Gattungen bestehen können oder nicht. Die Lage ist auch dadurch widerspruchsvoll geworden, weil für eine größere Anzahl nordamerikanischer Arten, die offensichtlich mit *Dichagyris* und verwandten paläarktischen Gattungen (und Subgenera) sehr nahe verwandt sind (z.B. *Protyggyia* McDONOUGH, 1928; *Richia* GROTE, 1887 usw.) eigene Gattungen aufgestellt wurden, die in einer Revision unbedingt mitberücksichtigt werden müssen. Deshalb möchte ich jetzt, provisorisch eine sehr weite Fassung der Gattung *Dichagyris* vorschlagen, um die Nomenklatur nicht

mit einer Vielzahl später zu revidierender Taxa zu belasten (wofür wir leider unlängst erschreckende Beispiele gesehen haben, vgl. BECK 1991). Dementsprechend betrachte ich hier *Yigoga* NYE, 1975 und *Protogygia* McDONOUGH, 1928 lediglich als Subgenera von *Dichagyris* LEDERER, 1857. Die Vielzahl der unbenannten (!) Subgenera, aufgestellt von HACKER & FIBIGER (1990), bleiben vorerst nur Artengruppen innerhalb von *Dichagyris*.

Hier muß noch vorausgeschickt werden, daß es sehr zweifelhaft ist, supraspezifische Taxa aufzustellen, wenn lediglich die "europäischen" Arten in Betracht gezogen werden (wie in der vorerwähnten Liste), welche oft nur als "Endzweige" solcher Evolutionsprozesse gelten, die sich größtenteils in zentral- und innerasiatischen Räumen abgespielt haben, und welche allein kein richtiges Bild über die wirklichen verwandtschaftlichen Beziehungen vermitteln können.

EINE NEUE ART AUS
DER *DICHAGYRIS PSAMMOCHROA*-GRUPPE

Dichagyris psammochroa – mit ihrer Form *dichroa* – wurde von BOURSIN (1940) aus dem Iran beschrieben (Typenfundort: N-Iran, Elburs, Pelur, leg. et coll. SCHWINGENSCHUSS, vgl. VARGA 1975: 7 + Taf. I). *D. afghana* BOURSIN, 1963 wurde – trotz der erheblichen äußereren Unterschiede (vgl. BOURSIN, Bull. Soc. Ent. Mulhouse, 1963/IX) – nur als Subspezies beschrieben. Ich habe – aufgrund einer Typenrevision beider Taxa – *afghana* BOURSIN als eigene Art validiert (Typenfundort: Afghanistan, Paghman Mts., Holotypus und Paratypen leg. et coll. VARTIAN, Wien; vgl. VARGA 1975: 7 + Tafel 1). Eine zur selben Artengruppe gehörige Art wurde in den Ausbeuten ungarischer lepidopterologischen Expeditionen bzw. in den Sammlungen von M. FIBIGER (Sorø, Denmark) und A. MOBERG (Enskede, Sweden) gefunden, welche offensichtlich synpatrisch mit der, äußerlich ähnlichen, aber zu einer anderen Artengruppe (*D. squalorum* EVERSMANN, *D. tyrannus* BANG-HAAS) gehörigen *Dichagyris terminicincta* CORTI et DRAUDT, 1931 im östlichen Teil der zentralen Türkei bzw. in O-Türkei vorkommt. Sie wird nachstehend beschrieben.

***Dichagyris cataleipa* sp. n.**

Derivatio nominis: kataleipa (gr.): relikartig, übrig geblieben.

Untersuchtes Material. – Holotypus: ♂, "Turkey, Prov. Sivas, Ziyaret geçidi, 1950–2050 m, 36° 45' E, 38° 42' N, 10. 8. 1988, leg. GYULAI, HREBLAY, RONKAY & RONKAY", coll. Ungarisches Naturwissenschaftliches Museum, Budapest (UNMB). – Paratypen: eine größere Anzahl beider Geschlechter vom oben erwähnten Fundort und Datum, in

coll. UNMB, GYLAI, HREBLAY, G. RONKAY & VARGA. Mehrere ♂♂ und ♀♀ "Turkey, Prov. Sivas, 5 km W Gürün, 1500 m, 37° 12' E, 38° 45' N, 9. 8. 1988, leg. GYLAI, HREBLAY, RONKAY & RONKAY" in den erwähnten Sammlungen, 1 ♂, "Kuşkunkiran, E. 7. 1990, leg. et coll. G. RONKAY". Ca 50 ♂♂ und ♀♀, "Turkey, Prov. Sivas, 20 km S Gürün, 1700 m, 07–08. 1987," leg. et coll. FIBIGER, HILLMANN et MOBERG, 4 ♂♂ ♀♀, "Turkey, Prov. Sivas, 10 km NW Darende, 100 km W Malatya, 1300 m, 19. 07. 1986 and 6. 07. 1987" leg. et coll. FIBIGER, 2 ♂♂, "Turkey, Prov. Malatya, 20 km N Elbistan, Nurhak dagh, 18. 07. 1986", leg. et coll. FIBIGER, 6 ♂♂ ♀♀, "Turkey, Prov. Sivas, 6 km W Gürün, 21. 07. 1986", leg. et coll. FIBIGER.

♂♂ und ♀♀ von ungefähr gleicher Größe (Vf. 14–15,5 mm, Spw. 34–36 mm). Kopf und Thorax fahl ockergelb ("sandfarbig"), mit einem leichten graubraunen Farbton (besonders bei den ♀♀). Abdomen etwas heller, weißlicher. Die Fühler der ♂♂ fein bewimpert, der ♀♀ dünn, fadenförmig. Die Grundfarbe der Vf. ca. mit dem Farbton der Körperbehaarung identisch. Die Makeln sind nur undeutlich braungrau angedeutet, die Linien einfach, unterbrochen und leicht gewellt, unterschiedlich stark angedeutet. Subterminalschatten ausgeprägt, braungrau, an der Außenseite gezackt. An der Basis der Fransen mit – unterschiedlich stark angedeuteten – dunklen Flecken. Hf. bei den ♂♂ weißlich mit einem undeutlichen, graubraunen Terminalband, bei den ♀♀ weißlich graubraun, in der Richtung der Basis heller, weißlicher, mit einem verloschenen Terminalband. Beine hell, weißlich, Tarsalglieder dunkell-hell geringelt.

Die neue Art wirkt etwas robuster als *D. psammochroa* BOURSIN, sie hat breitere Flügel und ihre Zeichnungen sind weniger kontrastreich (eine Parallelform mit f. *dichroa* konnte bis jetzt nicht festgestellt werden). *D. afghana* BOURSIN hat meistens eine mehr gestreckte Flügelform und ihre Vf.-Grundfarbe ist in der Regel mehr mit dunklen Schuppen überdeckt (vgl. Tafel 1, Fig. 6). *D. terminicincta* CORTI et DRAUDT ist eine sehr variable Art, mit mehreren beschriebenen Subspezies und Formen. Sie hat immer eine mehr gestreckte Flügelform, mit ausgezogenem Apex. Der unterschiedliche Ablauf der Subterminalzeichnung ist auf den Vf.-n stets recht auffallend. (Vgl. Taf. 1, Abb. 1–3, vs. Tafel 2, Abb. 1–2.)

Die ♂♂-Genitalien zeigen jene grundsätzliche Merkmale, welche bei den anderen Arten der *D. psammochroa*-Gruppe auch vorhanden sind. Harpe leicht gebogen und spitz, Clavus lang und ca. gleichmäßig breit, die Reste der reduzierten Ampulla vorhanden. Vesica mit einer typischen Torsion. Die Valven sind aber wesentlich breiter, die Reste der Ampulla mehr ausgeprägt, die Vesica breiter und mit einer anderen Richtung der Torsion, als bei den verwandten Arten (Abb. 1–6 vs. 7–14 und 15–22). Aus den Abbildungen (vgl. oben) geht hervor, daß die Vesica-Formen der drei allopatrischen Arten eindeutige spezifische Merkmale haben, bzw. daß die Genitalien der äußerlich ähnlich aussehenden Arten *D. terminicincta* CORTI et DRAUDT und *D. euteles* BOURSIN, 1963 noch in viel stärkerem Maß verschieden sind. Letztere Art steht mit der spezialisierten Form der Fultura inferior und mit der

Reduktion der Cucullus relativ isoliert innerhalb der großen, artenreichen Gattung *Dichagyris* (Abb. 23–24).

Die Genitalien der ♀♀ konnten, obwohl wir die notwendigen Präparate verfertigt haben, mangels entsprechenden Vergleichsmaterials mit den nächstverwandten Arten noch nicht verglichen werden (Präp.: ♂♂ 5489, 5523, 6163; ♀♀ 5878, 5995, 6069 – VARGA).

Über die Verbreitung der neuen Art ist sehr wenig bekannt geworden. Die Tatsache, daß sie in der Türkei in einem solchen Gebiet gesammelt wurde, welches zu den lepidopterologisch am besten erforschten Teilen dieses Landes gehört, spricht m.E. dafür, daß sie bis jetzt wohl übersehen wurde. Die überall sehr veränderliche *D. terminicincta* gilt auch in diesem Gebiet als recht polymorph, wo sie mit der neuen Art synpatrisch vorkommt. Die Mehrzahl der Exemplare – besonders bei Gürün – trägt die Merkmale der nominotypischen Subspezies (Tafel 2, Abb. 1), welche schwach gezeichnet und seidig ockergelb (mit leichtem rötlichen Farbton) ist. Es gibt aber manchmal olivbraun, stärker gezeichnete Exemplare (vor allem in den Hochlagen) bzw. Übergänge zur östlichen Subspezies *D. terminicincta phaeotaenia* BOURSIN, 1940 (vor allem in der östlichen Türkei: Kuşkunkiran, Tahir geçidi, Umgb. vom Van-See usw.). Deshalb bin ich sicher, daß bei einer Überprüfung größerer Ausbeuten aus dem östlichen Zentral-Anatolien bzw. aus Ost-Anatolien noch etliche Exemplare dieser neuen Art zum Vorschein kommen können. Das Einzelstück, gesammelt am Kuşkunkiran, spricht wohl dafür, daß *D. catalaipa* sp. n. relativ weit verbreitet sein muß.

EINE ÖSTLICHE SUBSPEZIES VON *DICHAGYRIS VERECUNDA* PÜNGELER

Dichagyris verecunda PÜNGELER, 1898 wurde vom “klassischen” (und nicht genau angegebenen) Fundort “Issyk-Kul” beschrieben und ist auch von den oft erwähnten Lokalitäten aus Chinesisch-Turkestan (Aksu, Korla) bekanntgeworden. EBERT & NAUMANN (1971) haben während ihrer sehr erfolgreichen Badakhshan-Expedition (NO-Afghanistan, Pamir-Gebiet) eine Serie beider Geschlechter an mehreren Stellen des Wakhan-Tals erbeutet. Von russischen Sammlern (BUNDEL, MURZIN, NEKRAZOV, TSVETAEV) stammen auch mehrere Exemplare aus den angrenzenden Gebieten von Tadzhikistan (frühere Tadzhik SSR). Deshalb schien es als ziemlich unerwartet daß P. GYULAI und ich, während unserer Mongolei-Expedition 1986 eine kleinere Serie dieser Art erbeuteten konnten, welche nachfolgend als eigene Subspezies beschrieben wird.

Dichagyris verecunda psammodis ssp. n.

Derivation nominis: sandfarbig (gr.).

Untersuchtes Material. – Holotypus: ♀, "Mongolia, Chovd aimak, Dzhungar Gobi, Bulgan sum, in the village, 31. 7. 1986," leg. et coll. VARGA, Zool. Inst. Univ. Debrecen (ZIUD). – Paratypen: 4 ♂♂ und 3 ♀♀ mit gleichen Angaben, leg. et coll. GYULAI und VARGA, 1 ♂ und 2 ♀♀, "Mongolia, Chovd aimak, Dzhungar Gobi, 15 km SW von Bulgan Sum, 3. 8. 1986", leg. et coll. GYULAI et VARGA (ZIUD), coll. UNMB.

Beschreibung der neuen Subspezies – Vfl. 17–18,5 mm, Spw. 38,5–41 mm. Die Geschlechter sind ca. gleich groß und auch sehr ähnlich gefärbt. Körperbehaarung bräunlich sandfarbig, Abdomen etwas heller. Vf. hell-bräunlich ockergelb, am Außenrand mit einem leichten grauen Anflug. Einige Exemplare (♀♀) können auch leicht rötlich gefärbt sein. Vf. fast zeichnungslos, nur Nierenmakel schwach angedeutet, mit dunkleren braun-grauen Schuppen. Fransen einfarbig, etwas bräunlicher als die Grundfarbe der Vf. Hf. seidig weiß (♂♂) oder mit einem leichten gelbbraunen Farbton am Flügelrand (♀♀).

Die neue Subspezies ist von der nominotypischen Rasse aus Issyk-Kul bzw. Chinesisch-Turkestan und von den noch größeren und mehr grauen Exemplaren aus dem Pamir-Gebiet so stark verschieden, daß man dazu neigt, sie als eigene Art aufzufassen. Nur die praktisch identischen Genitalien, die nachstehend beschrieben werden, beweisen, daß es sich hier nur um eine, äußerlich zu einem sandigen Wüstengebiet angepaßte Lokalrasse handelt. Sie gehört wohl zu den substratbedingten Formen, die aber infolge des Aussehens, der kleinen, aber wohl konstanten Genitalunterschiede bzw. ihrer vollständigen geographischen Isolation im dzhungarischen Gobi-Gebiet offensichtlich einen subspezifischen Status verdient.

Die ♂♂-Genitalien sind mit jenen der nominotypischen Subspezies praktisch identisch, aber die Fultura inferior ist breiter und ihr zungenförmiger Fortsatz länger. Die eigenartig rückwärts gebogene Vesica (Endophallus) scheint etwas länger zu sein als bei der nominotypischen Subspezies. In den ♀♀-Genitalien scheint die Cervix bursae etwas länger zu sein. Genitalpräparate: ♂♂ 4061, 4137; ♀♀ 5336 (VARGA).

Die Entdeckung der neuen Subspezies gilt zoogeographisch als recht bemerkenswert, weil sie ein östliches Isolat einer typisch zentralasiatischen Art im Dzhungarischen Gobi darstellt und gleichzeitig die engen zoogeographischen Beziehungen von Turkestan mit dem Dzhungarischen Becken beweist. Es ist bekannt, daß Dzungarien sehr reich an endemischen Pflanzentaxa ist, und daß hier auch andere merkwürdige Faunenelemente mit zentralasiatischen Beziehungen gefunden werden konnten (*Dichagyris clara* STAUDINGER, * *D. melanurooides* KOZHANTSCHIKOW, *D. elbursica* DRAUDT, *Parexarnis candida* STAUDINGER, * *Cucullia maracandica* STAUDINGER oder die

unlängst beschriebene *Aedophron eos* VARGA & RONKAY – die mit *bezeichneten Arten kommen auch im Transalai-Gobi vor).

Taxonomische Bemerkung.–Nach unseren Untersuchungen gehört *D. verecunda* PÜNGELER zur Verwandtschaft von *D. elbursica* DRAUDT, 1937 und *D. candelisequa* DENIS et SCHIFFERMÜLLER, 1775. Es muß aber vorerst noch offen bleiben, ob man für diese Arten ein eigenes Subgenus aufstellen soll.

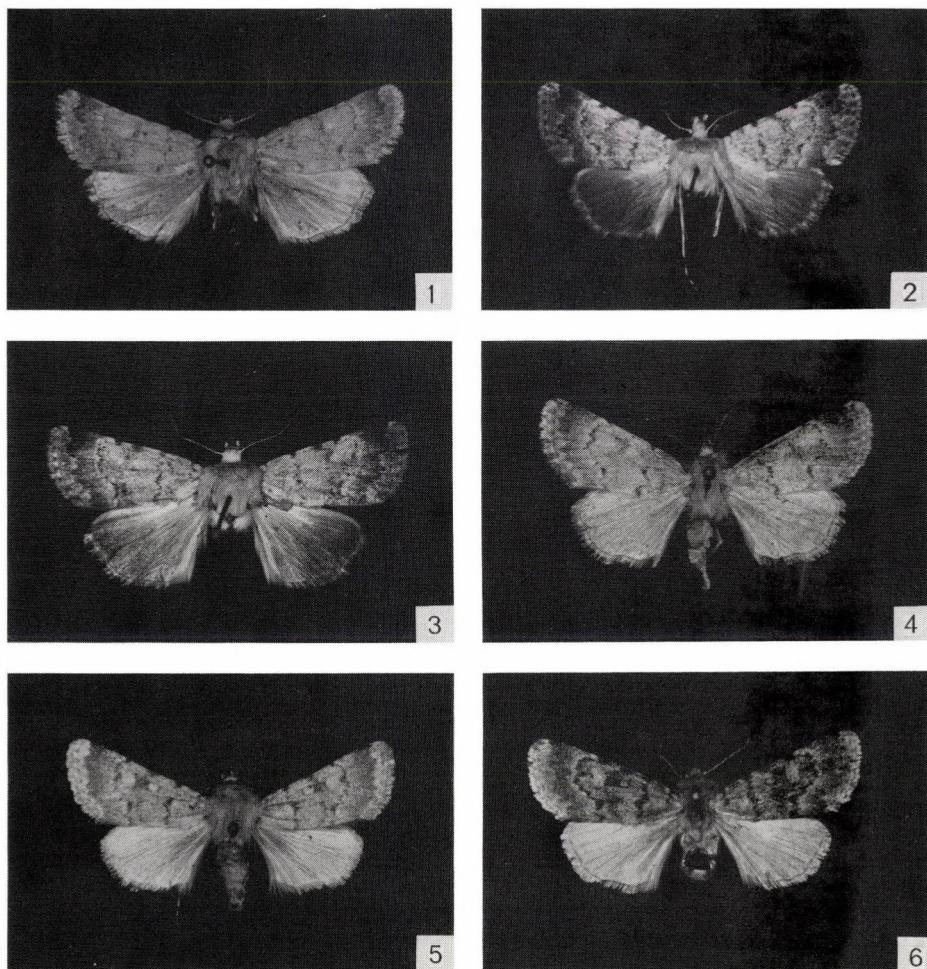
* * *

Danksagung. – Verfasser ist Frau EVA VARTIAN (Wien) und den Herren DR. P. GYULAI, M. HREBLAY, G. und DR. L. RONKAY für die Überlassung des Untersuchungsmaterials, Herrn G. EBERT (Landessammlungen f. Naturkunde, Karlsruhe) für die Möglichkeit der Untersuchung der Genitalpräparate von CH. BOURSIN, Herrn PROF. DR. C. NAUMANN (früher Universität Bielefeld, jetzt Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn) für die Unterstützung seiner Arbeiten in Bielefeld zu großem Dank verpflichtet. Herrn Dr. G. RONKAY verdanke ich wertvolle kritische Bemerkungen über die frühere Version der Arbeit, den Herren P. KOZMA und G. RONKAY danke ich für die technische Hilfe bei der Zusammenstellung des Bildmaterials. Ein Teil der Untersuchungen wurde 1989 mit einer Unterstützung der Alexander-von-Humboldt-Stiftung durchgeführt, wofür der Stiftung besonders gedankt sei.

SCHRIFTTUM

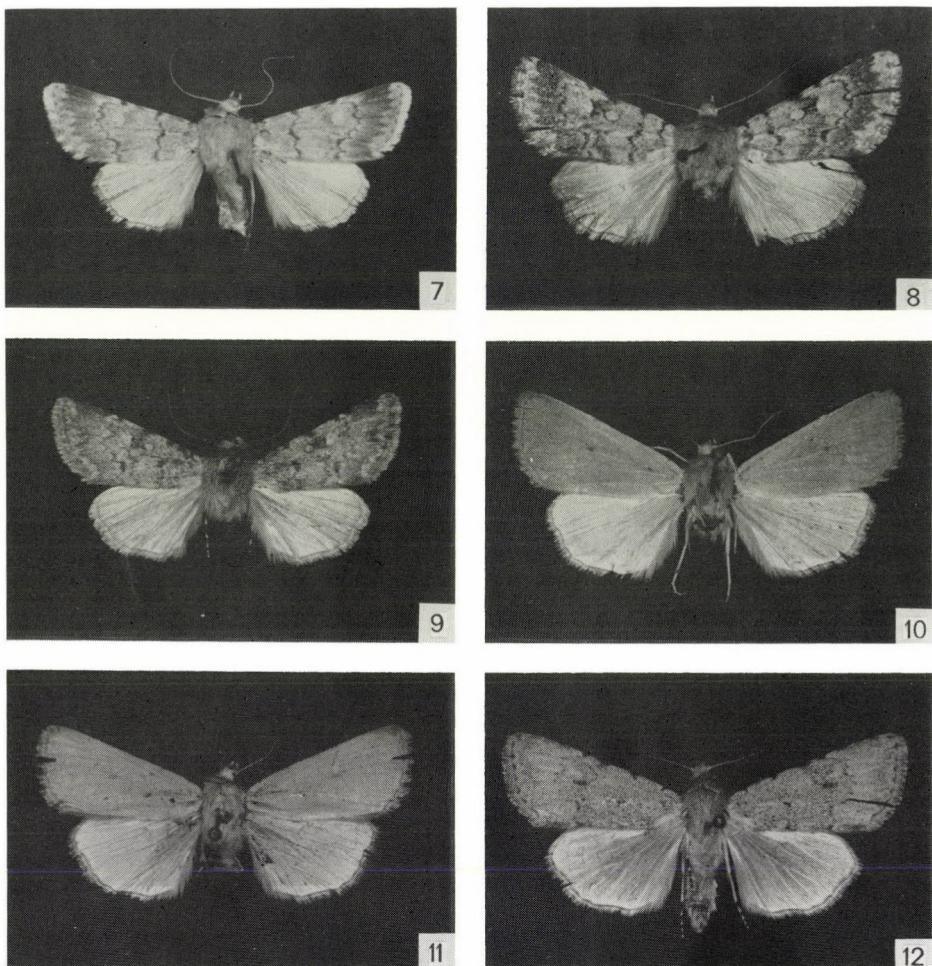
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Tafel 1



1 = *Dichagyris catalaipa* sp. n. ♂, Paratypus, Turkey, Ziyaret geçidi; 2 = *D. catalaipa* sp. n. ♀, Paratypus, W von Gürün; 3 = *D. catalaipa* sp. n. ♀, Paratypus, Ziyaret geçidi; 4 = *D. psammonchroa* BOURSIN, ♂, Iran, Elburs; 5 = *D. afghana* BOURSIN, ♂, Afghanistan, Koh-i-Baba mts.;
6 = *D. afghana* BOURSIN, ♂, Afghanistan, Salangpass

Tafel 2



7 = *Dichagyris terminicincta* CORTI et DRAUDT, ♂, Turkey, Gürün; 8 = *D. terminicincta phaeotaenia* BOURSIN, ♂, Afghanistan, Band-i-Amir; 9 = *D. euteles* BOURSIN, ♂, Afghanistan, Paghman; 10 = *D. verecunda psammodis* ssp. n. ♀, Holotypus, Mongolia, Dzhungar Gobi; 11 = *D. verecunda psammodis* ssp. n. ♂, Paratype, Mongolia, Dzhungar Gobi; 12 = *D. verecunda verecunda* PÜNGELER, ♂, Afghanistan, Badakhshan, Wakhan-Tal

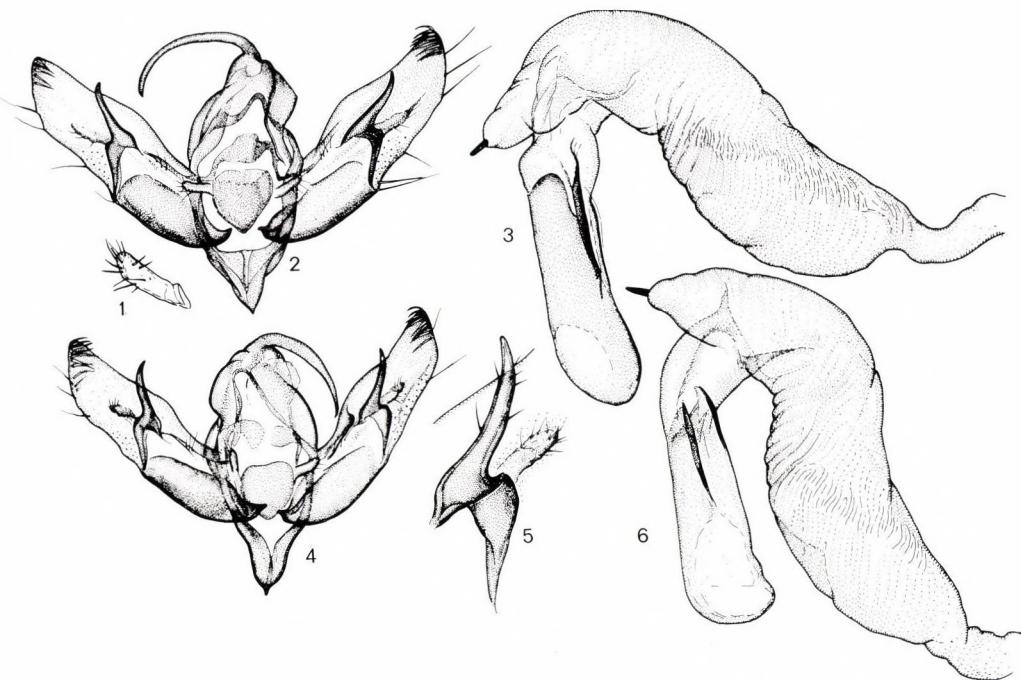


Abb. 1–6. Männliche Genitalstrukturen von *Dichagyris cataleipa* sp. n. 1–3: Paratypus, Turkey, Ziyaret geçidi (5489 VARGA), 4–6: wie 1–3 (5523 VARGA)

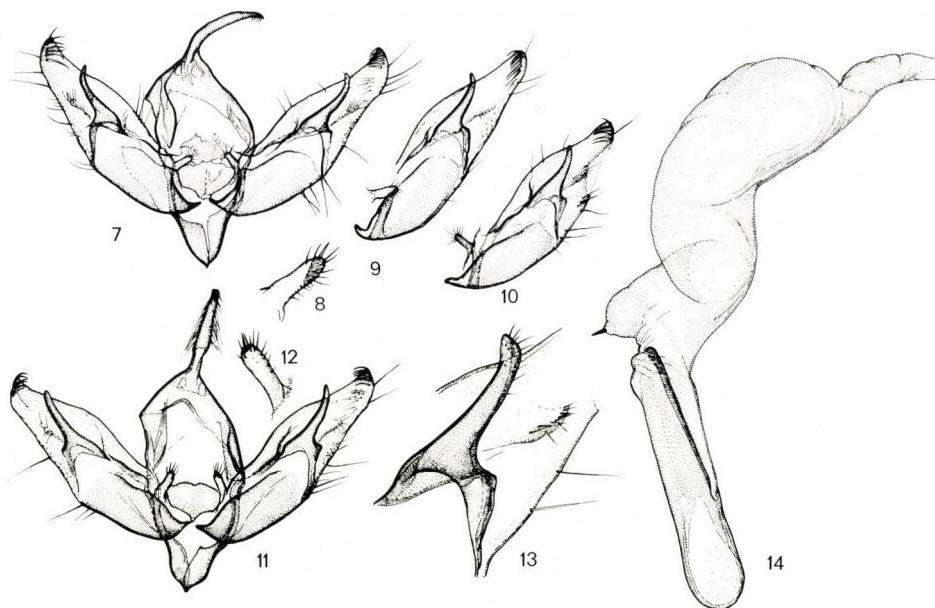


Abb. 7–14. Männliche Genitalstrukturen von *D. psammochroa* BOURSIN, 7–8: N-Iran, Elburs, Shemshak (V5 VARGA); 8–9 und 13–14: wie Vorige (5524 VARGA); 10: Paratypus, N-Iran, Elburs, Pelur (531 BOURSIN); 11–12: Iran, Fars, Paratypus der f. *dichroa* BOURSIN (593 BOURSIN)

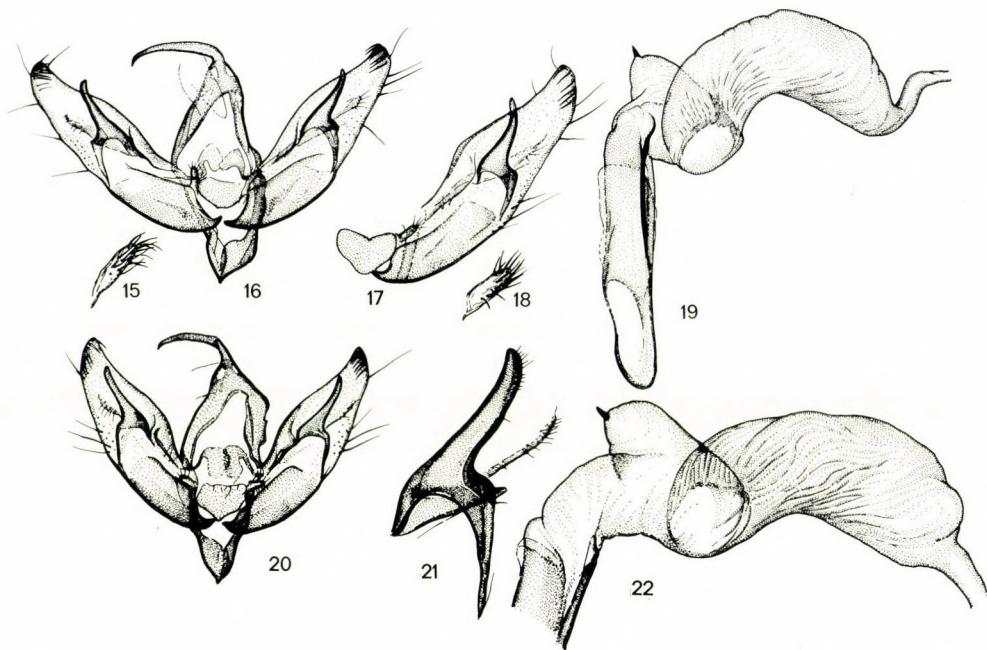


Abb. 15–22. Männliche Genitalstrukturen von *D. afghana* BOURSIN, 15–16, 19 und 21: Afghanistan, Koh-i-Baba, Panjao (5525 VARGA); 17–18 und 22: Afghanistan, Salangpaß (5530 VARGA); 20: Paratypus, Afghanistan, Paghman (V40 VARGA)

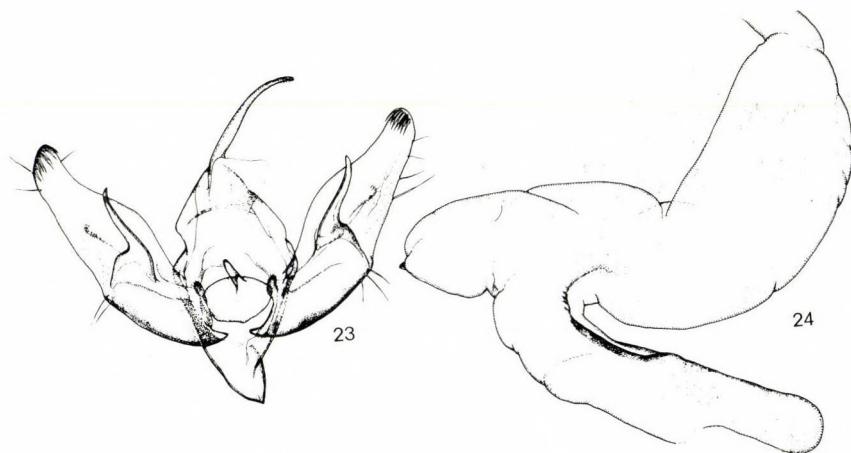


Abb. 23–24. Männliche Genitalstrukturen von *D. euteles* BOURSIN: Paratypus, Afghanistan, Paghman (4726 VARGA)

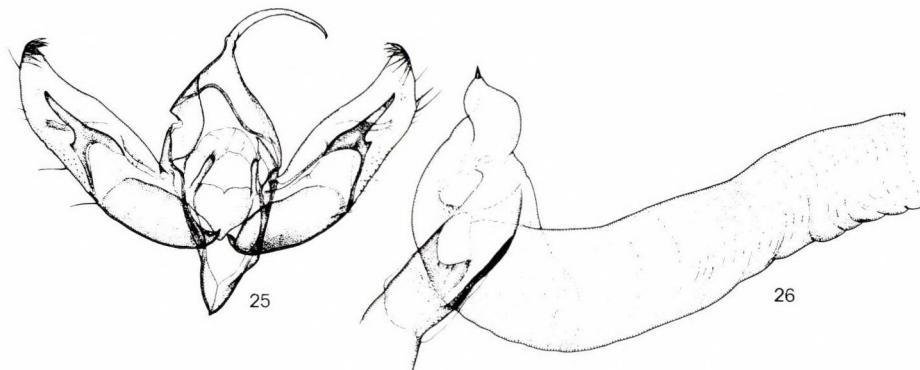


Abb. 25–26. Männliche Genitalstrukturen von *Dichagyris terminicincta* CORTI et DRAUDT, Holotypus, Libanon, Bcharré

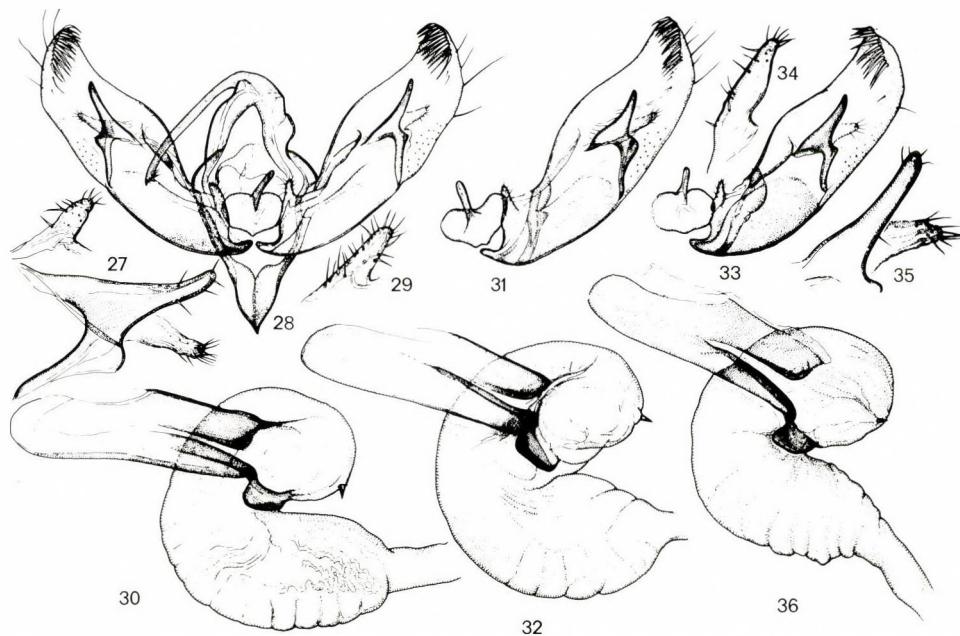
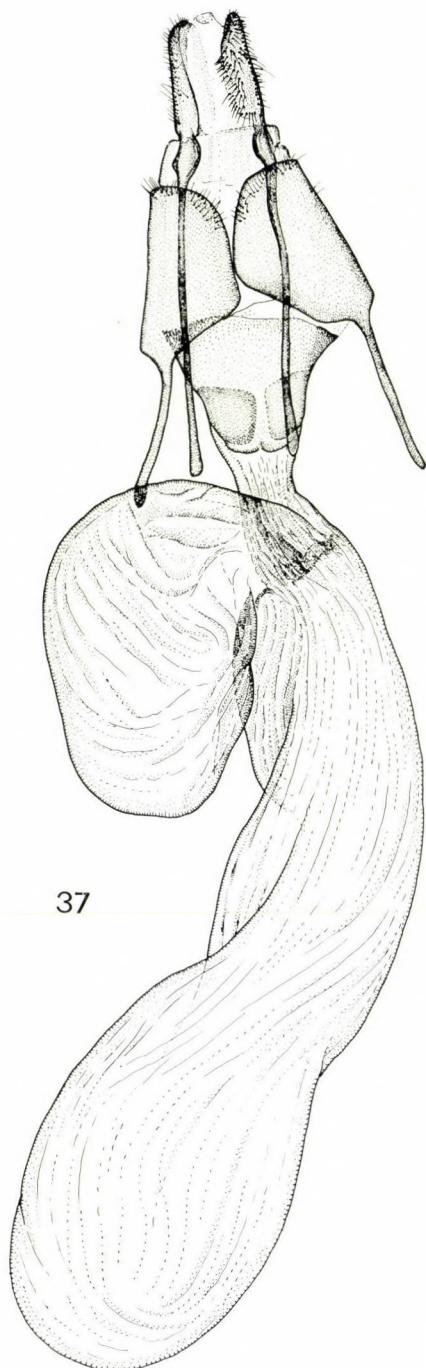
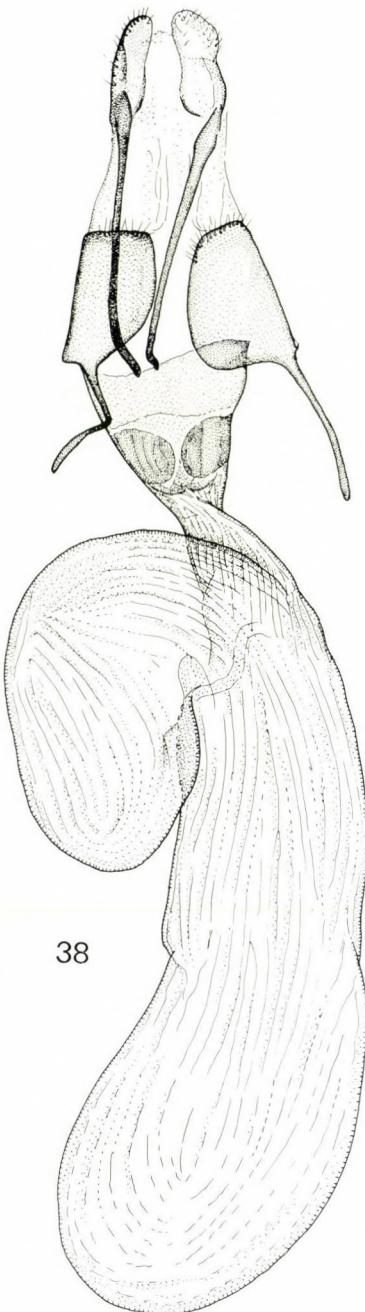


Abb. 27–36. Genitalstrukturen von *Dichagyris verecunda* PÜNGELER, 27–30: *D. verecunda psammodis* ssp. n. ♂, Paratypus, Mongolie, Dzhungar Gobi, Bulgan Sum (4061 VARGA); 31–32: wie Vorige (4137 VARGA); 33–36: *D. verecunda verecunda* PÜNGELER, ♂, Aksu (4509 VARGA);



37



38

37: *D. verecunda psammodis* ssp. n., ♀, Holotypus, Mongolia, Dzhungar Gobi, Bulgan Sum (5336 VARGA); 38: *D. verecunda verecunda* PÜNGELER, ♀, Afghanistan, Badakhshan, Wakhan-Tal (5535 VARGA)

ZWEI NEUE DENDROBAENA-ARTEN
AUS GRIECHENLAND
(OLIGOCHAETA, LUMBRICIDAE)

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(Eingegangen am 11. Mai 1992)

(Two new *Dendrobaena* species from Greece, Oligochaeta: Lumbricidae.) A list of earthworm (Lumbricidae) species collected in Greece by the authors is given. Two of the species, *Dendrobaena epirotica* sp. n. and *D. pindonensis* sp. n., are described as new to science. The genus *Bimastos* MOORE, 1893 is discussed in detail, and the genera *Spermophorodrilus* BOUCHÉ, 1975 and *Healyella* OMODEO et ROTA, 1989 are regarded as junior synonyms of that. With 12 original figures.

Einleitung. – Während eines Studienaufenthaltes des Zweitautors in Budapest 1989/90 wurde u. a. auch das 1979 und 1980 gesammelte, die Fauna Griechenlands erkundende Regenwurm-Material bearbeitet. Da in den letzten 10 Jahren die Fauna des Balkans sehr vielseitig erforscht und zahlreiche neue Arten aus verschiedenen Gattungen fortlaufend beschrieben wurden (vgl. Literatur in MRŠIĆ 1991, OMODEO & ROTA 1989), mußte vorerst eine Übersicht dieser neuen Taxa gewonnen werden. Nachdem von MRŠIĆ, 1991 nur neuerdings ein zusammenfassendes zweibändiges Werk über die Fauna des Balkans erschienen ist, wurde es ermöglicht die Bestimmungen der bereits vor Jahren gesammelten Tiere zu beginnen, ohne der Gefahr entgegen zu laufen, synonyme Arten zu beschreiben. Zur Bearbeitung liegt uns also ein Teil des vorausgehend von uns gemeinsam gesammelten Materials und ebenfalls ein sehr interessantes Material vor, welches von DR. G. OSSELLA, Italien uns zur Bestimmung überlassen wurde. Für die Überlassung des Materials sprechen wir Herrn DR. G. OSSELLA auch an dieser Stelle unseren besten dank aus.

Fundortliste

Sämtliche Regenwürmer der Fundorte 1–29 sind von K. MICHALIS und A. ZICSI gesammelt worden

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1. Meteora, 12. IV. 1980, 11. IV. 1979.
2. Kastraki, 12. IV. 1980.

3. Megali Kerassia, 13. IV. 1980.
 4. Orthovounion, 13. IV. 1980.
 5. Trygona, 13. IV. 1980.
- Prov. Metsovon
6. Korydallos, 13. IV. 1980.
 7. 127 km von Larissa nach Ioannina, 13. IV. 1980.
 8. 145 km von Larissa nach Ioannina, 13. IV. 1980.
 9. 147 km von Larissa nach Ioannina, vor Metsovon, 13. IV. 1980.
 10. 2 km hinter Metsovon, 14. IV. 1980.
 11. 5 km von Metsovon nach Ioannina, 14. IV. 1980.
 12. Votonossi, 14. IV. 1980.
 13. Peristeri, 14. IV. 1980.
 14. Balduma, 14. IV. 1980.
 15. 190 km von Larissa nach Ioannina, zwischen Mazia und Kryovryssl, 14. IV. 1980.
 16. Ktima Despoti, 130 km von Larissa nach Ioannina, 16. IV. 1980.
17. Ktima Despoti, 120 km von Larissa nach Ioannina, 16. IV. 1980.
- Prov. Ioannina
18. Lyggiades, 14. IV. 1980.
 19. Mantion, Dodoni, 16. IV. 1980.
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20. Karyes, 15. IV. 1980.
 21. Konitsa, 15. IV. 1980.
 22. Kalpaki, 15. IV. 1980.
 23. Voidomatis, zwischen Aristi und Papi-gon, 15. IV. 1980.
- Prov. Larissa
24. Tempi, 17. IV. 1980.
- Prov. Katerini
25. Litochoron, 17. IV. 1980.
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26. Nea Apollonia, 18. IV. 1980.
 27. Vassiloudion, 18. IV. 1980.
 28. Chortiatis, 24. XII. 1979.
 29. Korakolithos, 9. IV. 1979.

BESCHREIBUNG DER ARTEN

Die mit dem Buchstaben Z versehenen Inventarnummern beziehen sich auf die Sammlung des Tiersystematischen und Ökologischen Lehrstuhles der Universität, Budapest; die mit T bezeichneten auf die Sammlung des Institutes für Zoologie der Universität, Thessaloniki.

Gattung *Allolobophora* EISEN, 1874

Allolobophora caliginosa, (SAVIGNY, 1826) – Fundorte: Nr. 1. T/516 1 Ex.; Nr. 2. T/532 1 Ex.; Nr. 3 T/537 1 Ex.; Nr. 5. T/541 1 Ex. Z/9405 1 Ex.; Nr. 6. T/543 1 Ex.; Nr. 8. T/549 1 Ex.; Nr. 9 T/556 1 Ex., Z/9421 2 Ex.; Nr. 10. T/558 3 Ex., Z/9424 4 Ex.; Nr. 11. T/65 2 Ex., Z/9430 1 Ex.; Nr. 13. T/568 1 Ex.; Nr. 15. T/574 1 Ex.; Nr. 17. T/601 2 Ex., Z/9474 1 Ex., Nr. 18. T/578 5 Ex., Z/9442 3 Ex. Nr. 20. T/582 1 Ex.; Z/9446 2 Ex.; Nr. 22. T/595 3 Ex., Z/9458 3 Ex.; Nr. 23. T/588 2 Ex., Z/9454 3 Ex.; Nr. 24 T/609 3 Ex., Z/9480 4 Ex.; Nr. 26. T/621 9 Ex. Z/9484 6 Ex., Nr. 27. T/629 2 Ex., Z/9497 2 Ex.?

Allolobophora rosea (SAVIGNY, 1826) – Fundorte: Nr. 1. T/519 1 Ex.; Z/9394 3 Ex., T/526 2 Ex., T/530 1 Ex.; Nr. 2 Z/9401 1 Ex.; Nr. 5 T/540 3 Ex., Z/9403 3 Ex.; Nr. 7 T/547 5 Ex., Z/9410 8 Ex.; Nr. 8. T/553 2 Ex., Z/9417 3 Ex.; Nr. 11. T/564 2 Ex., Z/9428 2 Ex.; Nr. 13. T/567 10 Ex., Z/9434 7 Ex.; Nr. 14. T/569 1 Ex., Z/9436 2 Ex.; Nr. 15. T/573 1 Ex.; Nr. 16. T/608 2 Ex., Z/9463 1 Ex.; NR. 19. T/601 4 Ex., Z/9465 3 Ex.; Nr. 20. T/584 5 Ex., Z/9448 3 Ex.; Nr. 24. T/615 4 Ex.; Z/9481 6 Ex.; Nr. 25. T/619 2 Ex., Z/9486 2 Ex.; Nr. 26. T/622 2 Ex., Z/9490 3 Ex.; Nr. 27. T/628 3 Ex., Z/9496 4 Ex.; Nr. 28. T/633 3 Ex.

Allolobophora chlorotica (SAVIGNY, 1826) – Fundorte: Nr. 1. T/525 2 Ex., Z/9393 2 Ex.; Nr. 2. T/533 1 Ex., Z/9402 1 Ex.; Nr. 6. T/544 1 Ex.; Nr. 8. T/552 9 Ex., Z/9416 9 Ex.; Nr. 9. T/555 4 Ex., Z/9422 3 Ex.; Nr. 10. T/560 6 Ex., Z/9426 5 Ex.; Nr. 11. T/563 6 Ex., Z/9429 6 Ex.; Nr. 16. T/607 1 Ex., Z/9472 1 Ex.; Nr. 18. T/577 8 Ex., Z/9441 9 Ex.; Nr. 20.

T/580 3 Ex., Z/9444 3 Ex.; Nr. 21. T/590 1 Ex., Z/9455 1 Ex.; Nr. 22. T/517 8 Ex., Z/9461 7 Ex.; Nr. 23. T/587 10 Ex., Z/9453 10 Ex.; Nr. 26. T/623 2 Ex., Z/9491 1 Ex.

Allolobophora jassyensis jassyensis MICHAELSEN, 1891 – Fundorte: Nr. 5. T/542 1 Ex., Z/9409 2 Ex.; Nr. 16. T/610 11 Ex., Z/9476 5 Ex.; Nr. 17. Z/9475 5 Ex.; Nr. 24. T/613 4 Ex., Z/9479 7 Ex.

Allolobophora dofleini (UDE, 1922) – Fundorte: NR. 26 T/625 3 Ex., Z/9493 3 Ex.; Nr. 27. T/627 1 Ex., Z/9494 1 Ex.

Allolobophora georgii MICHAELSEN, 1890 – Fundorte: Nr. 3. T/535 2 Ex., Z/9404 1 Ex.; Nr. 3. T/359 1 Ex.; Nr. 19. Z/9467 1 Ex.

Allolobophora minuscula ROSA, 1905 – Fundort: Nr. 24. Z/9484 1 Ex.

Gattung **Proctodrilus** ZICSI, 1985

Proctodrilus antipai antipai (MICHAELSEN, 1891) – Fundort: Nr. 24. T/617 2 Ex., Z/9483 1 Ex.

Proctodrilus opisthoductus ZICSI, 1985 – Fundorte: Nr. 24. T/616 3 Ex., Z/9482 5 Ex.; Nr. 27. T/630/a 2 Ex., Z/1411 2 Ex.; Nr. 29. Z/8788 4 Ex. Paratypen. – Diese Art ist neu für die Fauna Griechenlands.

Gattung **Eisenia** MALM, 1877 emend. POP, 1941

Eisenia foetida (SAVIGNY, 1826) – Fundort: Nr. 22. T/593 1 Ex.

Eisenia eiseni (LEVINSEN, 1884) – Fundort: 1 T/520 1 Ex., Z/9390 1 Ex. – Die Art ist neu für die Fauna Griechenlands.

Gattung **Bimastos** MOORE, 1893 emend. ZICSI, 1981 (Abb. 1–3)

Syn. n. *Spermophorodrilus* BOUCHÉ, 1975. *Healyella* OMODEO et ROTA, 1989.

Wie bekannt, wurde auf Grund eines reichen Materials aus Griechenland und aus der Türkei sowie an Hand der Typusart der Gattung *Bimastos* MOORE, 1893; *B. palustris* eine Revision dieser Gattung durchgeführt, wobei eine einheitliche Gattungsdiagnose, mit Einbeziehung der Gattung *Spermophorodrilus* BOUCHÉ, 1975, aufgestellt wurde (ZICSI 1981). Wie bei der Erläuterung und Begründung der Bestimmungsmerkmale darauf hingewiesen wurde, zeigten sich in der Borstenanordnung und in der Form der Nephridialblasen gewisse Unterschiede bei den dieser Gattung eingereihten Arten. Da jedoch auch bei anderen Gattungen sich ähnliche Probleme ergeben (Dendrobaena; Formenkreis von *D. veneta veneta* [ROSA, 1896]), wurden gezwun- generweise Arten mit ungepaarten, weitläufig gepaarten und enger gepaarten Borsten dieser Gattung eingereiht. Ebenso wurde auch in der Beurteilung der Pigmentation verfahren, obwohl diesem Merkmal in der letzten Zeit kein generischer Wert mehr zugemessen wird (vgl. Gattung *Dendrobaena*, *Octodrilus*.)

Nach der Revision der Gattung *Bimastos* wurden dem Erstautor von Herrn DR. SCHWERT, Geology Depertment North Dakota University, USA zahlreiche Exemplare der *Bimastos palustris* MOORE, 1893, und *B. gieseleri hempeli* SMITH, 1915 zur Überprüfung zugesandt. Eine Bestimmung der Nephridialorgane, insbesondere die der Nephridialblasen erbrachte den Nachweis, daß selbst bei den Arten aus Nordamerika diese nicht einheitlich sind. Bei *B. palustris* fanden wir zwar die typische U-Form, doch waren die beiden Zweige nicht gleich lang und in vielen Fällen eng aneinander geschmiegt (Abb. 1). Bei *B. gieseleri hempeli* waren die Nephridialblasen stäbchenförmig, so wie bei den Arten aus Griechenland und aus der Türkei. Es ließen sich deutlich Verschmelzungen der beiden Zweige zu einem Stäbchen verfolgen (Abb. 2 und 3).

OMODEO und ROTA (1989) führen bei der Rückstellung der Gattung *Spermophorodrilus* BOUCHÉ, 1975 an, daß sich diese außer den von BOUCHÉ angeführten Unterschieden, noch in vielen anderen ausschlaggebenden Kennzeichen von *Bimastos* MOORE unterscheiden und verweisen auf die Arbeit von GATES (1969). In der erwähnten Arbeit von GATES wird in der Diagnose ein Divertikel der Kalkdrüsen im Segment 10 und U-förmige Nephridialblasen angegeben. In einer früheren Arbeit von GATES (1956) wird auch eine rötliche Pigmentation, die von außen rosarot erscheint, angeführt. Da die von GATES angeführten Unterschiede in der Beurteilung der beiden Gattungen – wie aus den vorausgehenden ersichtlich – keine bedeutenden Argumente zur Trennung der beiden Gattungen für OMODEO und ROTA (1989) liefern, halten wir uns auch im weiteren an die von ZICSI (1981) ausführlich bekanntgegebenen und jetzt teilweise ergänzten Merkmalkombinationen und betrachten die Gattung *Spermophorodrilus* auch im weiteren mit der Gattung *Bimastos* synonym.

Dieses Schicksal muß auch die von OMODEO und ROTA (1989) aufgestellte Gattung *Healyella* teilen, da außer der Borstenanordnung und der Lage der männlichen Poren zwischen der Borstenlinie *a* und *b*, keine weiteren Unterschiede bestehen. Bei der Borstenanordnung läßt sich ein kontinuierlicher Übergang von der Paarigkeit bis zur Unpaarigkeit der Borstenstellung bei den einzelnen Arten der Gattung *Spermophorodrilus*–*Bimastos*–*Healyella* verfolgen.

Bei der Lage der männlichen Poren sind von OMODEO und ROTA (1989) auch solche Arten beschrieben worden, wo die männlichen Poren oberhalb der Borstenlinie *b* liegen sollen (*H. mariae* und *H. naja*). Zu diesen zählt OMODEO und ROTA (1989) auch *Bimastos baloghi* ZICSI, 1981, obwohl in der Originalbeschreibung eindeutig die männlichen Poren zwischen der Borstenlinie *b* und *c* angegeben sind und dies auch als Trennungsmerkmal in der Differentialdiagnose angeführt wurde.

Wie aus den vorausgehenden eindeutig zu ersehen ist, lassen sich zwischen den drei Gattungen keine ausschlaggebenden, die Gattungen eindeutig von einander trennende Merkmale nachweisen, so daß wir auch weiter der Meinung bleiben, alle Arten mit den von ZICSI (1981) angeführten Merkmalkombinationen in der Gattung *Bimastos* MOORE zu vereinen.

Abschließend sei bemerkt, und dies muß ebenfalls als ein Argument der Gattungs-Zusammengehörigkeit betrachtet werden, daß wahrscheinlich sämtliche Arten dieser Gattung sich mit der Übertragung von Spermatophoren begatten. Obwohl in der Ausbildung der Spermatophoren, wie dies von BOUCHÉ (1975) angenommen wird, Unterschiede bestehen, haben sie funktionell dieselbe Bedeutung. Ob dies zur Aufstellung einer gesonderten Unterfamilie innerhalb der Familie Lumbricidae ausreicht, wie dies von OMODEO und ROTA (1989) durch hypothetische Beurteilungen bei anderen Arten dieser Familie angeführt wird, bleibt allenfalls fraglich. Unsere Kenntnisse über die Begattungsweise dieser Arten ist derzeit noch sehr spärlich und müßte in vielen Beziehungen noch erkannt und bewiesen werden.

Bimastos antiquus bouchei ZICSI et MICHALIS, 1981 – Fundort: Nr. 25. Z/9488 1 Ex.

Gattung **Lumbricus** LINNAEUS, 1758 emend. EISEN, 1874

Lumbricus rubellus HOFFMEISTER, 1843 – Fundorte: Nr. 10. T/559 4 Ex., Z/9425 4 Ex.; Nr. 25. T/628 1 Ex., Z/9485 2 Ex.; Nr. 27. T/630 5 Ex., Z/9498 3 Ex.; Nr. 28. T/634 5 Ex.

Gattung **Octodrilus** OMODEO, 1956

Octodrilus complanatus (ANT. DUGES, 1828) – Fundorte: Nr. 24. T/612 1 Ex., Z/9477 1 Ex.; Nr. 25. T/620 3 Ex., Z/9487 Ex.; Nr. 28. T/632 2 Ex., Z/9500 1 Ex.

Octodrilus croaticus (ROSA, 1895) – Fundorte: Nr. 1. T/515 6 Ex., T/524 9 Ex., T/529 1 Ex.; Z/9387 6 Ex.; Z/9392 7 Ex., Z/9398 1 Ex.; Nr. 3. T/536 1 Ex., Z/9405 1 Ex.; Nr. 7. T/548 5 Ex., Z/9412 6 Ex.; Nr. 12. T/566 5 Ex., Z/9432 4 Ex.; Nr. 13. Z/9433 1 Ex.; Nr. 14. T/570 1 Ex., Z/9437 1 Ex., Nr. 17. T/603 2 Ex., Z/9468 5 Ex.; Nr. 18. T/576 3 Ex., Z/9440 4 Ex.; Nr. 19. T/559 4 Ex., Z/9463 5 Ex.; Nr. 20. T/583 3 Ex., Z/9447 3 Ex.; Nr. 21. Z/9456 1 Ex.; Nr. 22. T/598 1 Ex., Z/9462 2 Ex.; Nr. 23. T/585 12. Ex., Z/9451 13 Ex.

Octodrilus transpadanus (ROSA, 1894) Fundorte: Nr. 22. T/591 7 Ex., Z/9457 9 Ex.; Nr. 24. T/611 1 Ex.

Gattung **Octolasion** ÖRLEY, 1885

Octolasion lacteum (ÖRLEY, 1881) – Fundorte: Nr. 1. T/517 5 Ex., Z/9388 3 Ex.; Nr. 9. T/554 1 Ex.; Z/9420 1 Ex.; Nr. 21. T/589 1 Ex.; Nr. 23. T/586 2 Ex., Z/9452 1 Ex.

Gattung **Dendrodrilus** OMODEO, 1956

Dendrodrilus rubidus tenuis (EISEN, 1874) – Fundort: Nr. 1. T/521 1 Ex.

Gattung **Dendrobaena** EISEN, 1874 emend POP, 1941

Dendrobaena cognetti (MICHAELSEN, 1903) – Fundorte: Nr. 1. T/523 3 Ex., T/527 2 Ex., T/531 2 Ex., Z/9391 3 Ex., Z/9395 2 Ex., Z/9399 2 Ex.; Nr. 19. T/602 2 Ex., Z/9466 3 Ex. – Bemerkung: Wie in der vorausgehenden Arbeit (ZICSI & MICHALIS 1981) erwähnt, liegt der Gürtel bei den Tieren aus Griechenland auf dem 32.–36. Segment. Auch bei den jetzt gesammelten Tieren konnte die Lage des Gürtels auf diesen Segmenten gelegen, nachgewiesen werden.

Dendrobaena mahnerti ZICSI, 1974

(Abb. 4–6)

Da es uns wieder gelungen ist, von dieser interessanten Art mehrere Exemplare zu erbeuten, wollen wir eine kurze Ergänzung der Originalbeschreibung anführen.

Nephridialporen regelmäßig alternierend in der Borstenlinie *b* und *d*. Eine Ausnahme bilden die Segmente 14–16, hier liegen sie in der Borstenlinie *b*. Weibliche Poren oberhalb der Borstenlinie *b*. Männliche Poren schlitzförmig hervorstehend zwischen der Borstenlinie *b* und *c*. Drüsennpapillen auf den Borsten *b* des 37.–40. Segmentes (Abb. 4). Spermatophoren in der Gürtelregion, oft auf Intersegmentalfurche 36/37. Samentaschenporen in der Borstenlinie *d* und nicht *b*.

Kalkdrüsen mit Ausbuchtungen im 11. und 12. Segment, im 10. und 13. Segment nur Kalkdrüsenstruktur in einem Teil des Segmentes vorhanden (Abb. 5). Drüsenstruktur nicht nur in der Umgebung des 14.–16. Segmentes, sondern auch im 9. Segment sowie im Inneren der Gürtelregion vom 37.–40. Segment oder in allen Gürtelsegmenten. Samentaschen rund mit langem Ausführungsgang (Abb. 6).

Fundorte: Nr. 18. T/579 7 Ex., Z/9443 13 Ex.

Auf Epirus begrenzt, scheinen Arten dieser Gattung mit weit nach hinten verlagertem Gürtelorgan verbreitet zu sein. Außer der vorausgehend angeführten *D. mahnerti* sind weitere zwei für die Wissenschaft neue Arten angetroffen worden.

Dendrobaena epirotica sp. n.

(Abb. 7–9)

Von dieser Art liegen 5 adulte und zwei juvenile Exemplare vor.

Länge des Holotypus 61 mm, Dicke 5 mm, Segmentzahl 147. Paratyphen Länge 30–45 mm, Dicke 3–4,5 mm, Segmentzahl 77–101.

Farbe dorsal rot pigmentiert. – Kopf epilobisch offen. Rückenporen fehlen. Segmente einfach geringelt. Borsten ungepaart. Borstendistanz hinter dem Gürtel aa : ab : bc : cd : dd = 7,5 : 5 : 7,5 : 6 : 13,5. Borsten *b* des 30.–36. Segmentes von Drüsennpapillen umgeben (Abb. 7).

Nephridialporen zwischen der Borstenlinie *b* und *d* regelmäßig alternierend. Ausnahme bilden die Segmente 14–16, hier liegen sie in der Borstenlinie *b*. Samentaschenporen in Intersegmentalfurche 9/10 und 10/11 in der Borstenlinie *d*. Weibliche Poren auf dem 14. Segment neben der Borstenlinie *b*. Männliche Poren große Schlitze, die seitlich hervorstehen zwischen der Borstenlinie *b* und *c* liegend, weiten die Segmente 14 und 16 aus, ohne auf diese überzugehen. Die Umgebung dieser Region auch außen von drüsiger Struktur.

Gürtel vom 31.–38. Segment sattelförmig, deutlich abgegrenzt. Pubertätsstreifen wellenförmig vom 33.–35. Segment, bei einigen Tieren auch auf 1/4 36 übergehend, neben der Borstenlinie *b*.

Innere Organisation. – Verdickte Dissepimente fehlen, Dissepimente dünn vorhanden. Kalkdrüsenträger im 1/2 10.–1/2 13. Segment, große Ausbuchtungen im 11. und 12. Segment (Abb. 8), Herzen im 7.–10. Segment. Perioesophageale Testikelblasen im 10. und 11. Segment schließen die Hoden und Samentrichter dieser Segmente ein. Auch die Samentaschen des 10. Segmentes werden von diesen umhüllt. Samensäcke im 9., 11. und 12. Segment. Traubige Ovarien im 13. Segment. Kropf im 15.–16. Segment. Muskelmagen im 17.–19. Segment. Innenwand des 14.–16. Segmentes wird von drüsigen Zellen ausgefüllt, die jedoch keine Kammer bilden. Typhlosolis einfach verzweigt. Nephridien stäbchenförmig, Kopf nach oben gebogen. Samentaschen länglich im 10. und 11. Segment (Abb. 9).

Dendrobaena epirotica gehört dem Artenkreis von *D. mahnerti* ZICSI an. Unterscheidet sich von dieser Art und der nachstehenden *D. pindonensis* sp. n. in der Lage des Gürtels und der Pubertätsstreifen, ferner in der Lage der Drüsennipillen.

Fundort – Holotypus: Griechenland Z/11300 Epirus Mte. Tymphi 1700–2500 m, Papingos Komitsa 1. 7. 1982 leg. G. OSSELLA. – Paratypen Z/11301 2 Ex.; 1 Ex. in der Sammlung von DR. G. OSSELLA 1 Ex. T/712. Fundort wie beim Holotypus.

***Dendrobaena pindonensis* sp. n. (Abb. 10–12)**

Es liegen von einem Fundort 3 adulte und 2 juvenile Exemplare vor.

Länge des Holotypus 60 mm, Dicke 6 mm, Segmentzahl 124. Paratypen. Länge 55–65 mm, Dicke 5,5–6 mm, Segmentzahl 120–128.

Farbe dorsal rot pigmentiert. – Kopf epilobisch, 1/3 offen. Rückenporen fehlen. Nephridialporen zwischen der Borstenlinie *b* und *d*, mit Ausnahme der 3 ersten Segmente und der Umgebung der männlichen Poren (14.–16.) regelmäßig alternierend. In der Umgebung der männlichen Poren liegen sie in der Borstenlinie *b*. Segmente einfach geringelt. Borsten ungepaart, Borstendistanz hinter dem Gürtel aa : ab : bc : cd : dd = 7,5 : 4,5 : 6,5 : 6 : 14.

Borsten *b* vom 32.–39. Segment von Drüsenpapillen umgeben, besonders die entlang des Pubertätsorganes auch von einem weißen Drüsenfeld umrandet (Abb. 10).

Samentaschenporen auf Intersegmentalfurche 9/10 und 10/11 in der Borstenlinie *d*. Weibliche Poren auf dem 14. Segment, neben der Borstenlinie *b*. Männliche Poren auf dem 15. Segment, längliche Schlitze zwischen der Borstenlinie *b* und *c*, sie weitern das Segment 14 und 16 etwas aus, ohne auf diese überzugehen. Sie stehen etwas seitlich hervor. Die ventrale Umgebung der männlichen Poren von drüsiger Struktur.

Gürtel sattelförmig, beim Holotypus vom 33.–40. Segment, bei den Paratypen auf dem 32. Segment angedeutet, deutlich vom 33.–40. Segment. Pubertätsstreifen wellenförmig vom 35.–37. Segment neben der Borstenlinie *b*.

Innere Organisation. – Verdickte Dissepimente fehlen, jedoch dünn vorhanden. Kalkdrüsenstruktur im 1/4 10.–1/2 13. Segment, mit großen Ausbuchtungen im 11. und 12. Segment (Abb. 11). Mächtige Drüsenzellen im 9. Segment. Herzen im 7.–10. Segment. Perioesophageale Testikelblasen im 10. und 11. Segment schließen Hoden und Samentrichter dieser Segmente ein. Die Testikelblasen sind aufgefrazt und verschwinden nach Öffnen der Tiere. Drei Paar Samensäcke im 9., 11. und 12. Segment. Die des 9. Segmentes seitlich nach vorne gerichtet. Ovarien im 13. Segment, fächerförmig. Innenwand des 14.–16. Segmentes von mächtigen Drüsenzellen ausgefüllt. Drüsenzellen auch in den Gürtelsegmenten. Kropf im 15.–16. Segment. Muskelmagen im 17.–19. Segment. Typhlosolis einfach. Nephridienblasen stäbchenförmig, Kopf nach oben gerichtet.

Samentaschen im 10. und 11. Segment, bei einigen Exemplaren auch mit einem Divertikel versehen (Abb. 12).

Dendrobaena pindonensis sp. n. steht der Art *D. mahneri* und *D. epirotica* sp. n. am nächsten. Unterscheidet sich von diesen durch die Lage des Gürtels und der Pubertätsstreifen sowie der Zahl der Drüsenpapillen.

Fundort – Holotypus: Griechenland, Z/10984 Prov. Metsovon Epirus Mte, Pinido Peristeri 1900–2100 m, 12. 7. 1981, leg. G. OSSELLA et BELLA. – Paratypen T/712 1 Ex., 1 Ex. in der Sammlung von DR. G. OSSELLA, Z/10985 1 Ex. + 2 juv., Fundort wie beim Holotypus.

Gattung *Eiseniella* MICHAELSEN, 1900

Eiseniella tetraedra tetraedra (SAVIGNY, 1826) – Fundorte: Nr. 1. T/545 1 Ex.; Nr. 8. T/550 2 Ex.; Z/9414 3 Ex.; Nr. 10. T/561 2 Ex., Z/9427 1 Ex.; Nr. 16. T/606 2 Ex.; Nr. 19. T/600 6 Ex., Z/9464 6 Ex.; Nr. 22. T/594 1 Ex.

Eiseniella tetraedra hercynia (MICHAELSEN, 1890) – Fundorte: Nr. 6. T/545 1 Ex.; Nr. 8. Z/9415 1 Ex.; Nr. 9. T/557 3 Ex., Z/9423 3 Ex.; Nr. 16. T/605 2 Ex., Z/9470 1 Ex.; Nr. 20. T/581 6 Ex., Z/9445 5 Ex.; Nr. 22. T/592 1 Ex.

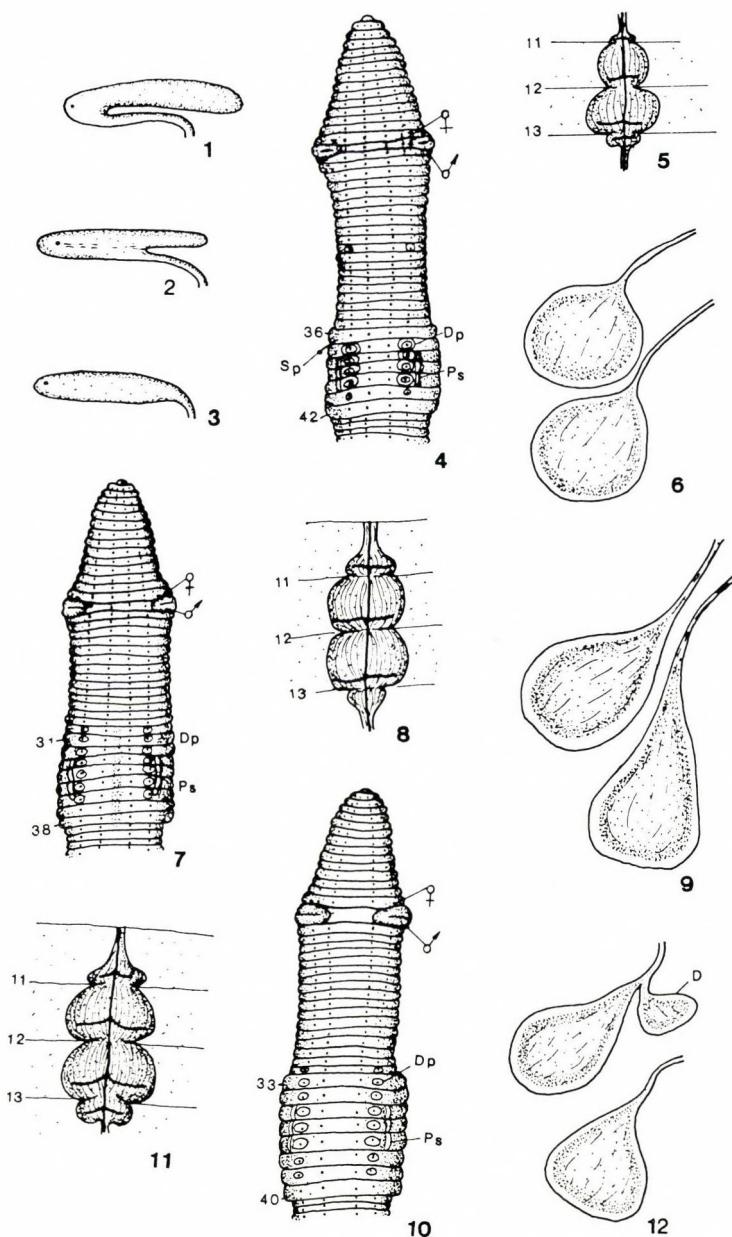


Abb. 1–12. – Abb. 1. *Bimastos palustris* MOORE 1893: Form der Nephridialblase. – Abb. 2–3. *B. gieseleri hempeli* SMITH, 1915: 2 = Verwachsene U-förmige Arme der Nephridialblase, 3 = Stäbchenförmige Nephridialblase. – Abb. 4–6. *Dendrobaena mahnerti* ZICSI, 1974: 4 = Ventralansicht, Sp = Spermatohoren, Dp = Drüsenpapillen, Ps = Pubertätsstreifen; 5 = Kalkdrüsen mit Ausbuchtungen im 12.–13. Segment, 6 = Form der Samentaschen. – Abb. 7–9. *Dendrobaena epirotica* sp. n.: 7 = Ventralansicht, Dp = Drüsenpapillen, Ps = Pubertätsstreifen; 8 = Kalkdrüsen mit Ausbuchtungen im 11. und 12. Segment, 9 = Form der Samentaschen. Abb. 10–12. *Dendrobaena pindonensis* sp. n.: 10 = Ventralansicht, Dp = Drüsenpapillen, Ps = Pubertätsstreifen; 11 = Kalkdrüsen mit Ausbuchtungen im 11. und 12. Segment, 12 = Form der Samentaschen, D = Divertikel

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REVISION DER GATTUNG ANDIODRILUS MICHAELSEN, 1900 (OLIGOCHAETA, GLOSSOSCOLECIDAE). REGENWÜRMER AUS SÜDAMERIKA 17

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(Eingegangen am 17. April 1992)

(Revision of the genus *Andiodrilus* Michaelsen, 1900, Oligochaeta: Glossoscolecidae. Earthworms from South America 17). Discussion of the morphological and anatomical characteristics of the genus *Andiodrilus* MICHAELSEN, 1900, and redefinition of the genus. On the basis of specimens preserved in different collections (Hamburg, Berlin, Torino, Budapest) and studied by the author fifteen species are characterized in details. Two of them, *A. michaelensi* sp. n. and *A. graffi* sp. n., are described as new to science. The genus *Bibri* RIGHI, 1984 is synonymized with *Andiodrilus*, and the species *A. paramensis* ZICSI, 1988 with *A. pachoensis* MICHAELSEN, 1900. A diagnostic key promotes to recognize the species. With 38 original figures.

Einleitung. – In zwei vorausgehenden Arbeiten sind aus verschiedenen Teilen Kolumbiens und Ekuadors mehrere für die Wissenschaft neue Arten der Gattung *Andiodrilus* MICHAELSEN, 1900, von mir beschrieben worden, ohne daß vorausgehend ermöglicht war, die bisher bekannt gewordenen Arten, deren Beschreibungen in vielen Beziehungen unzulänglich erschien, einer Nachuntersuchung unterziehen zu können (ZICSI 1988, 1989). Nachdem seither aus verschiedenen Teilen des Andengebietes weiteres Material erlangt und auch der größte Teil der Typen eingesehen werden konnte, kann an Hand der Überprüfungen der Typen und Bestimmungen des neuen und reichen Materials eine Revision dieser Gattung erfolgen.

Die Untersuchungen wurden einerseits auf Grund des Typenmaterials des Zoologischen Instituts und Museums von Hamburg, des Zoologischen Museums und Instituts für Spezielle Zoologie von Berlin und des Museo ed Istituto di Zoologia Sistematica della Università, Torino durchgeführt. Anderseits wurden weitere Aufsammlungen von PROF. DR. H. STURM, Hochschule Hildesheim, von DR. A. FEIJOO-MARTINEZ, Universidad Nacional de Colombia, Palmira und nicht zuletzt meine Aufsammlungen aus den Jahren 1989 und 1990 aus Ekuador bearbeitet.

Für die Überlassung eines Arbeitsplatzes im Museum von Hamburg, Torino sowie Genf, wo man mir u. a. auch in der Beschaffung der neuesten Literatur weitgehend behilflich war, spreche ich der Direktion der Museen sowie den Herren PROF. DR. M. DZWILLO, DR. A. ROLANDO und DR. CL. VAUCHER meinen besten Dank aus. Mein besonderer Dank gebührt auch

Herrn DR. G. HARTWICH, der mir das reiche Typenmaterial aus der Museumssammlung von Berlin freundlicherweise übersandte und so weitgehend meine Arbeit erleichterte. Für die Zusendung des neueren Materials wird den Herren PROF. DR. H. STURM und Dr. A. FEIJOO-MARTINEZ and dieser Stelle ebenfalls gedankt.

***Andiodrilus* MICHAELSEN, 1900 emend. ZICSI
(Abb. 1–2)**

Die bisherigen Fundorte der *Andiodrilus*-Arten zeigen mit Ausnahme von *Andiodrilus icomi* RIGHI, 1971 eine von Costa Rica über Venezuela bis Ekuador reichende einheitliche Verbreitung im Andengebiet (Abb. 1). Der Fundort von *A. icomi* im Osten von Brasilien erscheint mir besonders fraglich, und wenn es sich tatsächlich um eine *Andiodrilus*-Art handelt, so darf es sich nur um einen Verschleppungsort handeln, insbesondere da über 100 Exemplare nur in einem beschränkten Umkreis gesammelt wurden. Da mir diese Art und auch die anderen Arten von RIGHI (*Andiodrilus argous* RIGHI, 1984, *Andiodrilus venezuelanus* RIGHI, 1989 und *Bibri pipi* RIGHI 1984) nicht zugänglich waren, kann ich mich bei der Revision der Gattung nur auf die von mir eingesehenen Taxa stützen. Das Typenmaterial aller übrigen Arten hingegen konnte erlangt werden, und nach einer genauen Überprüfung ließen sich Ergänzungen an der Erstbeschreibung durchführen.

Im Rahmen der Bearbeitung des neueren Materials wurden zwei für die Wissenschaft neue Arten aufgestellt.

Wie bekannt, ist die Gattung *Andiodrilus* unter den meroandrischen Genera der Familie Glossoscolecidae eine der wenigen superspezifischen Taxa deren Geschlechtsapparat proandrisch (Hoden und Samentrichter im 10. Segment gelegen) ist. Sie schließt sich eng der holoandrischen Gattung *Andiorrhinus* COGNETTI, 1908 an, deren proandrische Form sie darstellt, da sie, wie MICHAELSEN (1918) betont, ebenfalls "über gestielte Lamellentaschen im 7.–9. Segment verfügt". In beiden Gattungen stößt man bei der Bestimmung der männlichen Geschlechtsorgane, so bei der Lage der Hoden und Samentrichter sowie Samensäcke auf Schwierigkeiten. In beiden Gattungsdiagnosen von MICHAELSEN (1918) werden die Samensäcke – wenn überhaupt vorhanden – als sehr kurz, nicht unter Durchbrechung der Dissepimente weit nach hinten reichend, angegeben.

Wie aus der Beschreibung verschiedener *Andiodrilus*-Arten hervorgeht, sind einerseits die Dissepimente stark nach hinten verschoben (*Andiodrilus biolleyi* COGNETTI, 1904, *A. orosiensis* MICHAELSEN 1912, *A. ruizanus* MICHAELSEN, 1913 und *A. argous* RIGHI, 1984), anderseits zeigen sich gewisse Verschmelzungen bzw. Verwachsungen der Dissepimente im Bereich des 9./10.–11./12. Segments. Eine genaue Feststellung der hier liegenden Organe stößt insbesondere bei Freihandpräparaten auf größte Schwierigkeiten.



Abb. 1. Verbreitung der *Andiodrilus*-Arten im Andengebiet

COGNETTI (1904) konnte trotz der verzerrten Lage der Dissepimente durch Schnittserien feststellen, daß die Hoden und Samenträger bei *A. bolleyi* im 10. Segment liegen und in Testikelblasen eingeschlossen sind. Noch im gleichen Segment sollen sich nach ihm auch die Samensäcke befinden. MICHAELSEN (1918) ist bei der Redeskription seiner Arten *Andiodrilus pachoenensis* und *A. affinis* der Meinung, daß Hoden und Samenträger sowie die Samensäcke im 10. Segment liegen, was für eine proandrische Art nicht

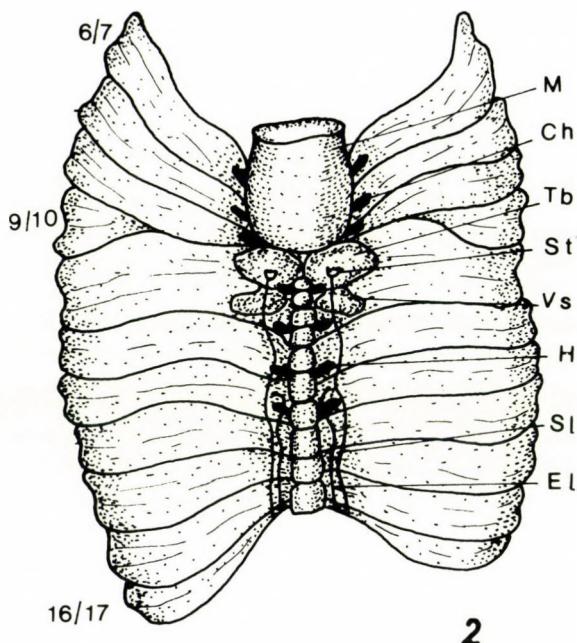


Abb. 2. Lage der männlichen Geschlechtsorgane bei den Arten der Gattung *Andiodrilus* MICHAELSEN, 1900: M = Muskelmagen, Ch = Chylustaschen, Tb = Testikelblasen, St = Samentrichter, Vs = Samensäcke, H = Herzen, Sl = Samenleiter, El = Eileiter

gebend. Die Verschiebung der weiblichen Poren vom 14. Segment um mehrere Segmente nach hinten (17., 18., 19. Segment) widerspricht dieser Tatsache nicht, da mit Sicherheit anzunehmen ist, daß die Verlagerung der weiblichen Poren mit der inneren Verschiebung der Organe in Korrelation steht. Da diese Organe bzw. die Öffnungen der weiblichen Poren bei den meisten früheren Beschreibungen nicht erkannt bzw. nicht erwähnt wurde, ließen sich auch die Zusammenhänge nicht eindeutig klären. Bei der Revision des vorliegenden Materials habe ich versucht – soweit der Zustand des Materials dies ermöglichte – die Lage dieser Organe genau herauszufinden und ergänzend der Beschreibungen anzuführen.

An und für sich sind die Begrenzungsmerkmale der Arten innerhalb dieser Gattung ziemlich eingeschränkt. Bei einigen Arten ist die Lage des Gürtels und der Pubertätsstreifen, d.h. die Streifen die das Pubertätsfeld einschließen sehr übereinstimmend. Das Variieren dieser Organe ist auf wenige Segmente beschränkt. Geschlechtsborsten tragende Segmente sind bei fast allen Arten auf das 7.–9. Segment oder auf die Gürtelorgane ausgedehnt. Die Geschlechtsborsten sind bei vielen Arten gleich groß und nahezu mit gleicher Zahl von Narben ornamentiert. Auch die Form der Chylusta-

typisch sein kann. Deswegen ist er sich unsicher, daß es sich bei diesen Arten um echte Samensäcke handeln kann. Bei der Beschreibung von *A. ruizianus* glaubt MICHAELSEN (1913) im Winkelraum zwischen Samensäcken und Testikelblasen ein sehr feines Häutchen erkannt zu haben, welches mutmaßlich das Dissepiment 10/11 darstellen kann. RIGHI (1984) findet bei seinen Arten aus Kolumbien die Dissepimente 8/9–12/13 dünn (*A. argous*), bei *Bibri pipi* die Dissepimente 10/11–12/13 fehlend. Bei der erstenen Art ist er der Meinung, daß die Hoden und Samentrichter im 10. Segment, die Samensäcke im 11. Segment, bei der letzteren die Hoden und Samentrichter im 11. Segment, die Samensäcke im 12. Segment liegen. Dieser Umstand veranlaßt ihn für die Art *pipi* eine neue Gattung: *Bibri* aufzustellen, da anzunehmen ist, daß es sich um einen metandrischen Geschlechtsapparat innerhalb der Meroandrie dieser Organe handelt. Da aber gerade die Dissepimente 10/11–11/12 als fehlend bezeichnet werden, erscheint es äußerst fraglich ob wir es nicht dennoch mit einem proandrischen Geschlechtsapparat zu tun haben, da die Verschmelzung des 9/10 Dissepimentes mit 10/11 nicht genau erkannt wurde.

Eben eine Nachuntersuchung an verschiedenen Arten und zahlreichen Exemplaren dieser Gattung (an Typen und an gut erhaltenem und konserviertem Material) konnten mich einwandfrei davon überzeugen, daß die Dissepimente 9/10 und 10/11 miteinander verwachsen sind (Abb. 2). Dies kann einerseits durch die Verdoppelung der Herzen im 11. Segment (zwei Paar Herzen) unterstützt werden, anderseits kann dadurch auch erklärt werden, warum Hoden und Samentrichter sowie Samensäcke im 11. Segment zu liegen scheinen. Die Samensäcke, die gesondert von den Testikelblasen an einem dünnen Häutchen hervorzutreten scheinen, repräsentieren das verwachsene 10/11 Dissepiment. Dies stimmt mit der Feststellung von RIGHI & GARCIA (1989) bei der Identifizierung ihrer *A. affinis* MICHAELSEN, 1990 insofern überein, daß dadurch tatsächlich 4 Paar Intestinalherzen vorhanden sind, die letzten im 13. Segment gelegen. Es ist anzunehmen, und dies konnte beim Typenmaterial von *A. affinis* und anderen Arten ebenfalls erkannt werden, daß die in Testikelblasen eingeschlossenen Herzen des verschmolzenen 10/11. Dissepimentes von Michaelsen übersehen, daß das 10. und 11. Segment als ein Segment betrachtet und so die Intestinalherzen in allen Beschreibungen im 10.–12. Segment gelegen, von ihm angegeben wurden. Die Angaben also, die die Herzen auch im 13. Segment erwähnen, können in der einschlägigen Literatur als stichhaltig betrachtet werden. Dies auch deswegen schon, da in diesem Segment bei fast allen von mir untersuchten Arten auch die Ovarien erkannt werden konnten. Da in beinahe allen Gattungen der Familie Glossoscolecidae diese Organe im 13. Segment liegen, ist auch eine Bestimmung und Zählung der Segmente von hinten durch die konstante Lage dieser Organe in meisten Fällen ausschlag-

schen sowie die Zahl der Lamellen zeigen bei vielen Arten eine Übereinstimmung.

Konstante Unterschiede konnten in der Zahl und Form sowie in der Lage der Samentaschen erkannt werden. Diesen wird bei der Begrenzung von Arten Priorität eingeräumt. Bei den Arten aus Ekuador, wo zahlreiche Tiere einer Population untersucht wurden, zeigten diese Merkmale große Stabilität.

Gattungsdiagnose

Borsten gepaart, in 8 Längsreihen angeordnet, höchstens in der Samentaschen- und Gürtelregion unregelmäßig gestellt. Männliche Poren im Bereich des Gürtels. Weibliche Poren hinter dem 14. Segment gelegen. Samentaschen vorhanden. Chylustaschen 3 Paar im 7.-9. Segment, gestielte Lamellentaschen. Geschlechtsapparat proandrisch und metagyn. Samensäcke vorhanden, auf ein Segment beschränkt.

Typus Art: *Andiodrilus schuetti* (MICHAELSEN, 1895); Syn. n. BIBI RIGHI 1984

Beschreibung der Arten

Andiodrilus schuetti (MICHAELSEN, 1895) (Abb. 3-6)

Unter Inv. Nr. V. 199 (*Andiodrilus Schütti* Bucaramanga Columbia leg. BAETCKE) lagen in der Sammlung des Museums Hamburg von den angeblich vorzüglich konservierten Exemplaren 2 Schwanzstücke und ein geöffnetes ganzes Tier vor. Bei diesem Exemplar fehlten leider sämtliche inneren Organe, so daß eine Nachbestimmung unmöglich war. Wahrscheinlich handelt es sich beim geöffneten Tier um das in der Originalbeschreibung als juvenil bezeichnete Exemplar, da auch die äußeren Organe, wie Gürtel und Pubertätsstreifen nicht deutlich zu erkennen sind. Die weiblichen Poren liegen auf dem 17. Segment vor der Borstenlinie b. Männliche Poren auf dem 20. Segment.

Obwohl die Originalbeschreibung im späteren des öfters ergänzt wurde (MICHAELSEN 1900, 1918), fehlen noch immer Merkmale die das Bestimmen von neuerem Material erschweren. Deswegen werden Tiere mit 3 Paar Samentaschen im 7., 8. u. 9. Segment, deren Samentaschenporen in der dorsalen Medianlinie ausmünden, als *A. schuetti* bestimmt (vgl. MICHAELSEN 1895 p. 27., MICHAELSEN 1900 p. 256 und nicht MICHAELSEN 1895 p. 26.) Die bisher unberücksichtigten Kennzeichen werden auf Grund des neu identifizierten Materials ergänzt.

Es stehen mir von verschiedenen Fundorten einige Exemplare zur Verfügung, die sich auch untereinander in einigen Merkmalen unterscheiden. Bei den aus der Umgebung von Tolima stammenden 3 Tieren, die leider sehr erweicht sind, erstreckt sich der Gürtel vom 17.–26. Segment, die Pubertätsstreifen vom 20.–24., 1/4 25. Segment. Bei dem vollkommen adulten Tier aus Sirena-Tenjo Palmira liegt der Gürtel auf dem 1/2 16.–26. Segment, die Pubertätsstreifen verlaufen vom 20.–24. Segment. Auch beim praeadulten Tier liegen die Pubertätsstreifen auf dem 20.–24. Segment. Äußerst gut konservierte und geschlechtsreife Tiere stehen mir aus einer Höhe von 3630 m Paramo de Las Dominguez-Cerrito zur Verfügung. Bei diesen erstreckt sich der Gürtel vom 1/2 16., 17.–26. Segment, die Pubertätsstreifen verlaufen vom 20.–24. Segment. Bei allen untersuchten Tieren sind auf Intersegmentalfurchen 20/21, 22/23 und auf dem 24. Segment Pubertätspölster zu erkennen (Abb. 3), die auch bei anderen Arten dieser Gattung in dieser Umgebung sehr kennzeichnend sein können. Aber auch die Segmente 18, 19 und 25 zeigen in der Umgebung der *ab*-Borsten Drüsenvelder in denen die Borsten ebenfalls zu Geschlechtsborsten umgewandelt sind. Da in der Originalbeschreibung die Lage des Gürtels vom 16.–24. Segment gelegen angegeben ist, doch mit folgender Bemerkung ergänzt wird "ist nicht ausgeschlossen, daß auch noch einige vorhergehende sowie nachfolgende Segmente zur Gürtelregion zu rechnen sind" (MICHAELSEN 1895 p. 26), kann mit Sicherheit angenommen werden, daß es nicht vollkommen adulte Tiere waren, von denen MICHAELSEN die Beschreibung gegeben hat. Ich glaube mit Sicherheit annehmen zu können, daß die von mir angeführten Angaben der Gürtel- und Pubertätsorgane für die Art charakteristisch sein dürfen, da nach vorne zu bei keiner bisher beschriebenen Art diese Organe zu liegen pflegen, nach hinten zu dagegen, sind größere Ausdehnungen des Gürtels bei anderen Arten beschrieben worden. Bei der Angabe der Pubertätswällen vermute ich eine Verzählung der Segmente, da eine ähnliche Verzählung in der Originalbeschreibung hinsichtlich der Samentaschenporen vorliegt. Diese werden einmal in Intersegmentalfurche 7/8, 8/9, 9/10 gelegen angegeben, später richtig in Intersegmentalfurche 6/7, 7/8 und 8/9. Bei allen von mir bestimmten Exemplaren liegen die Samentaschenporen in der dorsalen Medianlinie auf Intersegmentalfurche 6/7–8/9. Die Samentaschen besitzen eine längliche Ampulle und etwas dünneren Ausführungsgang in dem zahlreiche kugelige Samenkämmerchen liegen (Abb. 4). Die Segmentzahl ist bei meinen Exemplaren etwas kleiner als in der Originalbeschreibung und liegt zwischen 120–160. Die Tiere sind auch verschieden groß, 70–210 mm lang und 5–7 mm dick. Die meisten Exemplare sind auf der Dorsalseite rötlich pigmentiert. Borsten, wie in der Originalbeschreibung angegeben, eng gepaart. Geschlechtsborsten sind 1,15 mm lang und 0,025 mm dick, ungefähr mit 17 Kerben ornamentiert. Die Geschlechtsborsten der Gürtelregion sind

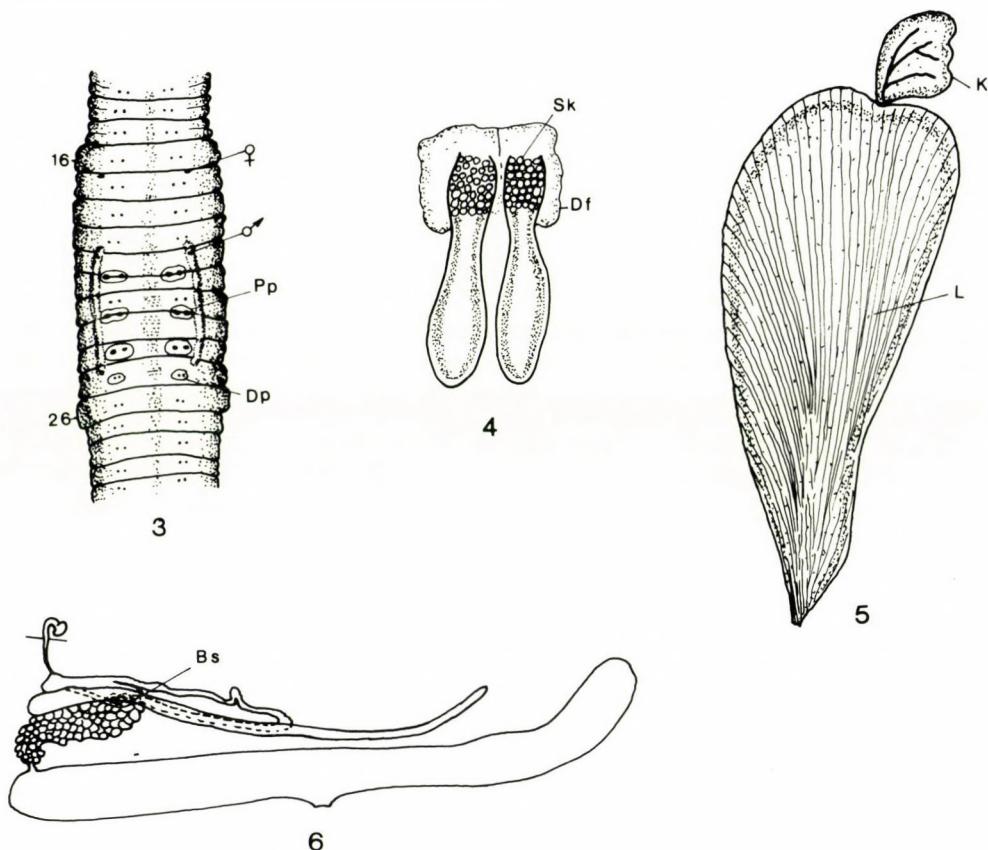


Abb. 3–6. *Andiodrilus schuetti* (MICHAELSEN, 1895): 3 = Ventralansicht Gürtel mit Pubertätsorganen: Pp = Pubertätspapillen, Dp = Drüsenpapillen; 4 = Form der Samentaschen: Sk = Samenkämmchen, Df = Drüsenfeld; 5 = Chylustasche: K = Abgeschnürter Kopf, L = Lamellen; 6 = Form der Nephridien: Bs = Blindsack

von Drüsenzellen umgeben (20.–25. Segment), die Borsten stecken in dünnten Borstenhüllen, die an der Innenwand befestigt sind. Die Geschlechtsborsten im 8. Segment sind von einem breiten sackförmigen Gebilde umgeben. Solche lassen sich auch bei anderen Arten erkennen. Nephridialporen in der Borstenlinie cd. Die Nephridien sind für die Gattung kennzeichnend und besitzen einen Blindsack (Abb. 6).

Innere Organisation. – Dissepimente 6/7–8/9 stark verdickt, 9/10–16/17 mäßig verdickt, nach hinten zu immer dünner werdend. Dissepimente 9/10 mit 10/11 dorsal verwachsen. Hoden und Samentrichter sowie Herzen des 10. Segmentes in Testikelblasen eingeschlossen und von dem verwachsenen Dissepiment umhüllt. Testikelblasen (vgl. Abb. 2) sind nach vorne gerichtet. Samensäcke hängen am rudimentären Häutchen des Disse-

pimentes 10/11 und sind nach hinten gerichtete herzförmige Gebilde im 11. Segment. Ovarien im 13. Segment. Ovarienleiter und Samenleiter durchbrechen die Dissepimente und treten in Höhe des 17. Segmentes hervor. Chylustaschen im 7.–9. Segment, schinkenförmige Gebilde, mit weniger deutlich abgeschnürtem Anhang. Es konnten 37–40 Lamellen der gestielten Lamellentaschen gezählt werden (Abb. 5). Mitteldarm mit Typhlosolis im 23. Segment beginnend. Ein deutlicher Blindsack ließ sich beiderseits in Höhe des 22. oder 23. Segmentes erkennen.

Fundorte: Kolumbien AF/2301 3 Ex. Tolima, zwischen El Silencio und El Rancho 2600–2700 m. Weide. 11. 9. 1989 leg. H. STURM. – AF/2325 2 Ex. La Sirena-Tenjo-Palmira, 2860 m, 14. 8. 1991 leg. A. FEJOO. – AF/2326. 2 Ex. La Sirena-Tenjo-Palmira, 2660 m, 17. 9. 1991. leg. A. FEJOO. – AF/2337–2338 8 Ex. Paramo de Los Dominguez-Cerrito 2630 m, 22. 10. 1991. leg. A. FEJOO.

Andiodrilus michaelseni sp. n.

(Abb. 7–10)

In der Sammlung von Hamburg sind unter Inv. Nr. V. 211 weitere 30 Exemplare aus Kolumbien mit der Beschriftung *Andiodrilus* SCHÜTTI leg. BAETCKE, Bucaramanga inventarisiert, ohne aber sie zum Typenmaterial gehörend betrachtet zu haben. Ob diese bei der Originalbeschreibung von MICHAELSEN mit Berücksichtigt wurden oder nicht, kann jetzt mit Sicherheit nicht festgestellt werden. Die Nähe der beiden Inventarnummern (V. 199 und V. 211) sowie der Umstand, daß die Samentaschenporen in der Originalbeschreibung auch auf Intersegmentalfurche 9/10 gelegen angegeben sind, lassen den Verdacht aufkommen, daß MICHAELSEN sich mit diesem Material befaßt hat. Es muß jedoch gleich betont werden, daß die Tiere in sehr erweichtem Zustand vorliegen. Länge und Zahl der Segmente läßt sich nicht genau feststellen, und auch die Borsten hängen an der Cuticula und sind zum Teil ausgefallen. Da hingegen die Zahl der Samentaschen und die Lage der Samentaschenporen bei allen Exemplaren eindeutig in Intersegmentalfurche 6/7–9/10 (4 Paar) in der dorsalen Medianlinie gelegen erkannt werden konnte, betrachte ich sie als eine für die Wissenschaft neue Art und gebe nachstehend eine Kurzdiagnose der Tiere.

Größe und Dicke ungefähr wie bei *A. schuetti*. Kopf rüsselförmig eingezogen, 1.–2. Segment verwachsen. Borsten gepaart, in 8 Längsreihen verlaufend. Borsten *ab* des 7., 8., 9. und 10. Segmentes zu Geschlechtsborsten umgewandelt, innen von breiten sackförmigen Drüsen umgeben. Borsten vom 19.–24. Segment ebenfalls von Drüsenpapillen umgeben, Borsten zu Geschlechtsborsten umgewandelt. Länge der Geschlechtsborsten 1,3 mm, Dicke 0,025 mm, mit ungefähr 14 Kerben ornamentiert (Abb. 9). Nephridialporen in der Borstenlinie *cd*.

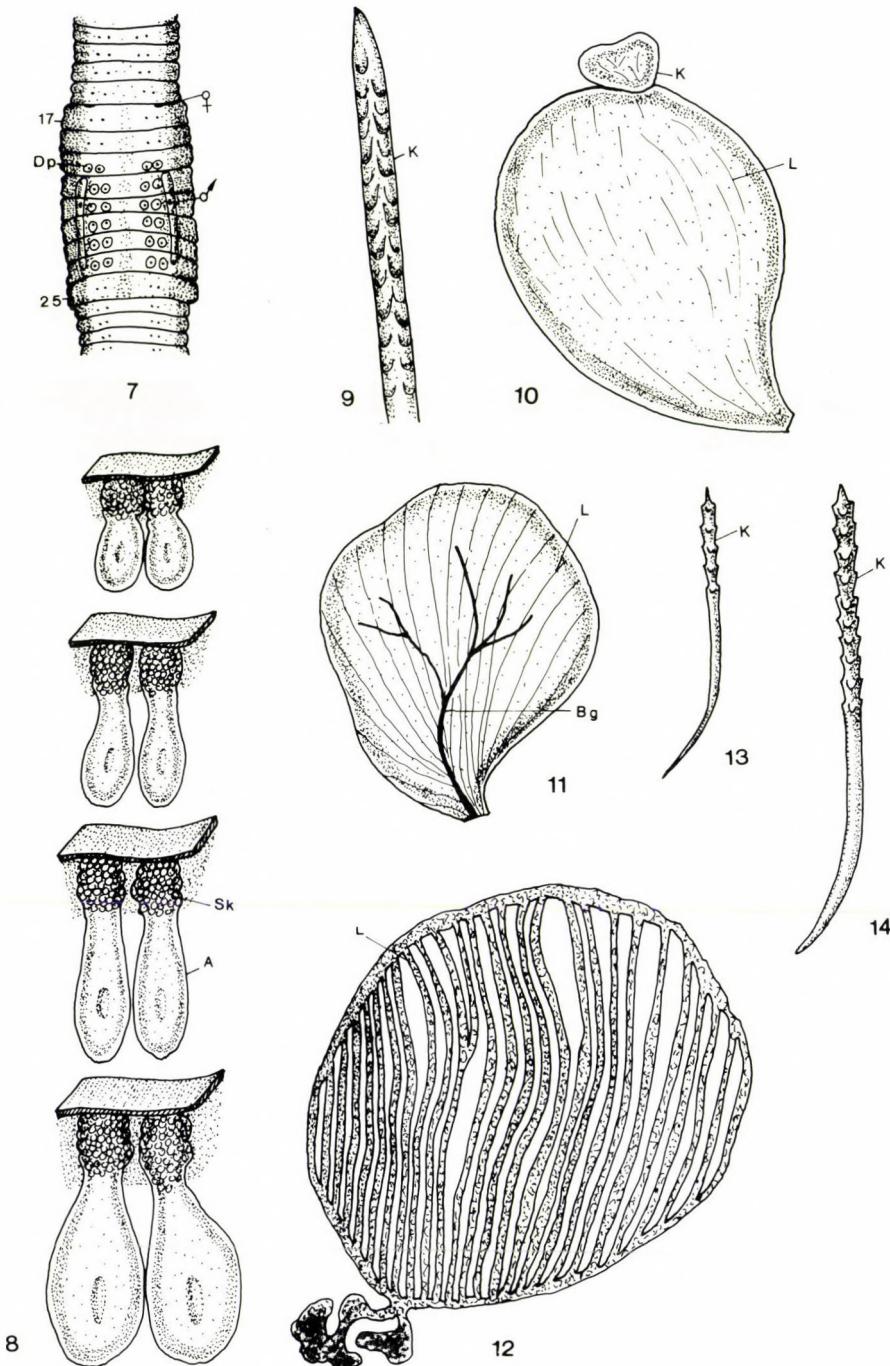


Abb. 7–10. *Andiodrilus michaelseni* sp. n.: 7 = Ventralansicht, Gürtel mit Pubertätsorganen: Dp = Drüsenpapillen; 8 = Form und Zahl der Samentaschen: Sk = Samenkämmerchen, A = Ampulle; 9 = Geschlechtsborste der Gürtelregion: K = Kerbe; 10 = Chylustasche: K = Abgeschnürter Kopf, L = Lamellen. – Abb. 11–14. *Andiodrilus vaucheri* ZICSI, 1988: 11 = Form der Chylustasche: L = Lamellen, Bg = Blutgefäß; 12 = Querschnitt durch eine Chylustasche; 13 = Geschlechtsborste der Samentaschenregion; 14 = Geschlechtsborste der Gürtelregion: K = Kerbe

Gürtel vom 17.–25. Segment, Pubertätsstreifen vom 20.–24. Segment (Abb. 7). – Weibliche Poren auf dem 17. Segment, männliche Poren auf dem 21. Segment, in Höhe der Pubertätsstreifen deutlich zu erkennen. – Samentaschenporen in Intersegmentalfurche 6/7–9/10, in der dorsalen Medianlinie gelegen.

Innere Organisation. – Verdickte Dissepimente 6/7–9/10. Dissepiment 9/10 mit 10/11 verwachsen, es lassen sich nur die Samensäcke im 11. Segment erkennen. Muskelmagen im 6. Segment. 3 Paar Chylustaschen im 7.–9. Segment, flache Gebilde (Abb. 10) mit deutlich abgeschnürtem Kopf. Die genaue Zahl der Lamellen ließ sich nicht feststellen. Lateralherzen im 7.–9. Segment. Intestinalherzen im 10–13. Segment. Ovarien im 13. Segment. Von den Nephridien waren nur die Blindsäcke zu erkennen. Typhlosolis vorhanden, Blindsack nicht erkannt. Samentaschen im 7.–10. Segment, sackförmige längliche Ampullen, nach hinten zu immer größer werdend. Im Ausführungsgang Samenkämmerchen mit Samenmassen (Abb. 8).

Die neue Art steht offensichtlich *A. schuetti* MICHAELSEN am nächsten, unterscheidet sich jedoch von dieser durch die Zahl der Samentaschen. Von *A. vaucheri* ZICSI, *A. argous* RIGHI und *A. pipi* (RIGHI) unterscheidet sie sich durch die Lage der Samentaschenporen und durch die Form der Samentaschen.

Fundorte: Kolumbien; Holotypus Inv. Nr. 211/a Bucaramara leg. BAETCKE. – Paratypen Inv. Nr. V. 211 30 Ex. AF/2239 2 Ex. Fundort wie beim Holotypus.

Die neue Art wird zu Ehren dem bekannten Oligochaeten Spezialisten nach DR W. MICHAELSEN benannt.

***Andiodrilus vaucheri* ZICSI 1988**

(Abb. 11–14)

Außer *A. argous* RIGHI und *A. pipi* (RIGHI), die mir zur Überprüfung nicht vorlagen, besitzt allein noch *A. vaucheri* 4 Paar Samentaschen, die in der Borstenlinie *c* auf Intersegmentalfurche 6/7–9/10 ausmünden.

Die Originalbeschreibung muß nachstehend mit einigen Angaben ergänzt bzw. revidiert werden.

Vor allem liegen die weiblichen Poren nicht auf dem 14. Segment, sondern auf dem 17. Segment, dicht neben der Borste *b*. Die männlichen Poren liegen auf dem 21. Segment auf den Pubertätsstreifen, vor der Borstenlinie *b*.

Innere Organisation. – Dissepimente 9/10 und 10/11 dorsal verschmolzen. Testikelblasen im 10. Segment nach vorne gerichtete lappenförmige Gebilde, die die Hoden Samenrichter und Herzen einschließen. Große Samensäcke gesondert von den Testikelblasen, an einem Häutchen

hängend nach hinten gerichtet im 11. Segment. Ovarien im 13. Segment. Eileiter und Samenleiter die Dissepimente durchbrechend, treten in Höhe des 17. Segmentes hervor. Samenleiter verläuft an der Innenwand entlang bis zum 21. Segment. – Chylustaschen flach, am Ende fächerförmig ausgebreitet, es können ungefähr 24 Lamellen gezählt werden (Abb. 12).

Die Geschlechtsborsten in Höhe der Samentaschen sind 0,70 mm lang, 0,030 mm dick, sie sind nur mit 4–5 Kerben ornamentiert (Abb. 13). Geschlechtsborsten der Gürtelregion 1,55–1,80 mm lang, 0,040–0,050 mm dick und mit 10–11 Kerben ornamentiert (Abb. 14).

Die übrigen aus Kolumbien und nördlich von Kolumbien beschriebenen *Andiodrilus*-Arten besitzen vorwiegend 3 Paar Samentaschen, deren Poren in verschiedenen Borstenlinien ganz bis zur dorsalen Medianlinie gelegen, ausmünden.

***Andiodrilus major* MICHAELSEN 1913**

Das in der Sammlung von Hamburg (Inv. Nr. V. 5452 Cordillere von Bogota, Westseite Fusagasuga, Dec. 96. leg. BERGER) vorliegende Exemplar war gänzlich ausgetrocknet und so nicht nachbestimmbar. Das zweite Exemplar lag in der Sammlung von Berlin vor (Inv. Nr. 7271 Fusagasuga leg. BERGER, Dec. 96). und ist zweifelohne das in der Originalbeschreibung erwähnte andere Tier. Es wird an dieser Stelle als Lectotypus designiert und soll durch einige Merkmale ergänzt werden, die in der Originalbeschreibung nicht angeführt wurden.

Die weiblichen Poren liegen im hinteren Teil des 17. Segmentes, innerhalb der Borstenlinie *a*. Die männlichen Poren liegen auf dem 20 Segment, auf den Pubertätsstreifen außerhalb der Borstenlinie *b*. Geschlechtsborsten auch im 6., 7. und 8. Segment vorhanden.

Innere Organisation. – Dissepimente 9/10 und 10/11 verwachsen. Testikelblasen im 10. Segment, schließen Hoden, Samentrichter und Herzen ein. Samensäcke im 11. Segment, hängen an einem deutlich erkennbaren Häutchen, am Dissepiment 10/11. Samensäcke sind auf das 11. Segment beschränkt. Intestinalherzen im 10.–13. Segment. Ovarien im 13. Segment. Eileiter und Samenleiter treten im 17. Segment nach Durchbrechung der vorausgehenden Dissepimente hervor. Eileiter mündet in diesem Segment aus, Samenleiter verläuft angeschmiegt an der Innenwand entlang bis zum 20. Segment und mündet hier aus. Form und Lage der Samentaschen erinnern an die von *A. schuetti* (vgl. Abb. 4).

Andiodrilus sturmi ZICSI 1988

(Abb. 15)

Eine Nachbestimmung des einzigen Originalstückes erbrachte den Nachweis, daß die weiblichen Poren auf dem 18. Segment außerhalb der Borstenlinie *b* liegen, die männlichen Poren befinden sich auf dem 20. Segment.

Innere Organisation. – Die Eileiter und Samenleiter treten nach Durchbrechung der vorausgehenden Dissepimente im 17. Segment hervor und verlaufen nebeneinander an der Innenwand entlang. Eileiter bis zum 18. Segment, Samenleiter bis zum 20. Segment, wo letzterer in die Borsten umgebenden Drüsen mündet. Auch hier sind die Dissepimente 9/10 und 10/11 gewissermaßen verwachsen, doch weit nicht so fest wie bei den anderen Arten. Testikelblasen sind eindeutig hypoösophageal, schließen Hoden und Samentrichter ein. Herzen des 10. Segmentes sind frei. Letzte Paar Herzen im 13. Segment.

Besonders hervorzuheben sind die kräftigen Borstensäcke der Geschlechtsborsten, die in der Umgebung der Gürtels und auf dem Gürtelorgan die Borsten umgeben und an der Innenwand befestigt sind. Chylustaschen sind einfach fächerförmig, ohne Abschnürungen (Abb. 15). Es konnten 72–80 Lamellen gezählt werden. Samentaschen erinnern an die Form der Samentaschen bei *A. affinis* MICHAELSEN. Samentaschenporen näher der Borstenlinie *cd*, etwas oberhalb der Nephridialporen. Nephridien wie bei den übrigen Arten mit Blindsack am Ende.

Andiodrilus bolleyi COGNETTI, 1904

(Abb. 16)

Unter Inv. Nr. OL 407 (Rancho Redonda 1700 m IX. 1902 leg. P. BOLLEY) liegen in der Sammlung von Torino 3 geschlechtsreife und ein juveniles Exemplar vor. Außerdem liegen auch Teile eines zerschnittenen Tieres vor, welches offensichtlich das Exemplar ist, welches bei den Präparatuntersuchungen in Teile zerlegt wurde. Eins von den adulten Tieren war geöffnet, dies wird unter Inv. Nr. OL 407/a als Lectotypus designiert.

Ohne die Beschreibung von COGNETTI in Frage zu stellen, die übrigens besonders genau und ausführlich ist, glaube ich kaum, daß der innere Bau der männlichen Geschlechtsorgane sich anders gestaltet als bei den Artgenossen dieser Gattung. Die geschwundenen Dissepimente im Vorderkörper und die stark nach hinten gerückten Organe ermöglichen es nicht, an Freihandpräparaten diese Frage zu klären. Es ist jedoch anzunehmen, daß auch hier die Hoden und Samentrichter in Testikelblasen eingeschlossen im 10. Segment liegen und im 11. Segment die Samensäcke. Es konnten ebenfalls 4 Paar Intestinalherzen erkannt werden. Die neueren Untersuchungen der Chylustaschen erbrachten den Nachweis von 13–16 Lamellen (Abb. 16).

Unter Inv. Nr. V. 7754 (Costa Rica, 1200 m, leg. C. PICADO Dez. 1910) lagen in der Sammlung von Hamburg einige juvenile Exemplare als *Andiodrilus bolleyi* COGNETTI var.? vor. Diese Tiere scheinen dem *bolleyi* nahe zu stehen, die Zahl der Lamellen in den Chylustaschen beträgt 23, also mehr als bei *bolleyi* und bedeutend weniger als bei *A. orosiensis* MICHAELSEN, wo auch bis 38–39 Lamellen gezählt werden konnten. Der Blindsack den ich bei diesen Tieren nachweisen konnte, scheint diese ebenfalls von *bolleyi* zu unterscheiden. Da jedoch keine adulten Tiere vorliegen, kann mit Sicherheit der Artzugehörigkeit gegenüber nicht Stellung eingenommen werden.

Andiodrilus orosiensis MICHAELSEN, 1912

In der Sammlung von Hamburg lagen unter Inv. Nr. V. 7713 (Costa Rica, Orosi, leg Picado Febr. 1912) 4 Exemplare dieser Art vor. Den drei geöffneten Tieren fehlten bis auf die Samentaschen und Borstendrüsen alle inneren Organe. Bei dem von mir geöffnetem Tier und auch bei den anderen Exemplaren lagen die weiblichen Poren auf dem 17. Segment neben der Borstenlinie *b*, die männlichen Poren auf dem 20. Segment, auf den Pubertätsstreifen. Die Lage der inneren Organe stimmen mit denen von *bolleyi* überein, es fehlen die vorderen Dissepimente, und alle Organe sind stark nach hinten verschoben. Die Chylustaschen besitzen ein fächerförmiges Aussehen, ohne Abschnürung am Ende. Lamellen wie erwähnt bis 39 in einer Chylustasche. Es besteht kein Zweifel, daß *orosiensis* dem *bolleyi* nahe steht, doch scheint er sich in der Lage des Gürtels, der weiblichen und männlichen Poren sowie in der Lamellenzahl der Chylustaschen deutlich zu unterscheiden.

Andiodrilus ruizanus MICHAELSEN, 1913

Unter Inv. Nr. V. 7751 (WSW von Honda, Zentral Cordillere, Paß des Ruiz, vom Massiv des Ruiz, 1515 m, leg. FUHRMANN, Columbia) lag in der Sammlung von Hamburg das einzige Exemplar dieser Art vor. An diesem Tier ließen sich die Angaben des Gürtels und der Pubertätsstreifen, gelegen vom 1/2 16.–1/2 26. und 1/4 20.–1/2. 24. Segment bestätigen. Von innen konnten die Borsten vom 7.–9. und vom 19.–24. Segment von Drüsenfeldern umgeben noch erkannt werden. Weibliche Poren liegen am 18. Segment, männliche Poren am 20. Segment auf den Pubertätsstreifen.

Im vorliegenden Material nehme ich an, ein Exemplar mit Sicherheit dieser Art einreihen zu können, obwohl mein Tier nicht ganz adult erscheint. Der Gürtel ist nicht kräftig entwickelt, liegt auf dem 17.–1/2 26. Segment. Die Pubertätsstreifen erstrecken sich vom 1/2 20.–1/2 24. Segment. Die

weiblichen Poren sind deutlich am 18. Segment neben der Borstenlinie *b* zu erkennen. Innen treten die Eileiter und Samenleiter, die vorausgehenden Dissepimente durchbrechend, im 17. Segment hervor und verlaufen der Innenwand angeschmiegt nach hinten. Der Eileiter tritt im 18. Segment, der Samenleiter im 20. Segment aus.

Die Dissepimente sind sehr zart, aber deutlich zu erkennen. Die inneren Organe, wie Muskelmagen, Chylustaschen usw. sind stark nach hinten gerückt. Chylustaschen 3 Paar, ohne deutliche Abschnürungen im 7.–9. Segment, es konnten zwischen 25–30 Lamellen in einer Tasche gezählt werden. Dissepimente 9/10 und 10/11 verwachsen, mächtige Testikelblasen im 10. Segment, sie sind nach vorne gerichtet und schließen Hoden und Samentrichter sowie die Herzen des 10. Segmentes ein. Ventral sind die Testikelblasen miteinander verschmolzen. Samensäcke im 11. Segment, kleine runde Gebilde, die an einem Häutchen, das die Testikelblasen vom 11. Segment trennt, hängen. Letzte Paar Herzen im 13. Segment. Blindsack beiderseits am 26. Segment, ventral am Mitteldarm entspringend und in die Leibeshöhle ragende längliche Gebilde.

Größe der Geschlechtsborsten in der Umgebung der Samentaschen auf dem 7., 8., und 9. Segment 1,5 mm, Dicke 0,030 mm. Es konnten 22 Kerben auf jeder Seite gezählt werden. Geschlechtsborsten der Gürtelregion 1,35 mm groß, 0,050 mm dick, es ließen sich ungefähr 23 Kerben zählen. Die Geschlechtsborsten der Samentaschenregion stecken in flachen großen Säckchen, die der Gürtelregion vom 19.–25. Segment, sind von drüsigen Zellen umgeben, die Borsten stecken in Borstensäcken und sind an die Innenwand befestigt.

Die Samentaschen liegen im 7.–9. Segment und münden in Intersegmentalfurche 6/7–8/9 oberhalb der Borstenlinie *cd*, der dorsalen Medianlinie genähert, aus. Samentaschen im letzten Segment am größten, Ampulle länglich sackförmig, Ausführungsgang mit Samenkämmerchen versehen.

*A. ruizanu*s ähnelt in vielen Merkmalen der vorausgehend angeführten *bolleyi* und *orosiensis*. Unterscheidet sich jedoch von diesen durch die vorderen angedeuteten Dissepimente und durch die Lage der Samentaschenporen, die der Medianlinie genähert sind. Die Geschlechtsborsten unterscheiden sich durch die bedeutend höhere Zahl der Kerben.

AF/2305 1 Ex. Oberhalb El Rancho, Tolima Bergwald, cca. 300 m ($75^{\circ} 20' W$, $4^{\circ} 38' N$). 13. 9. 1989 leg. H. STURM.

Andiodrilus bogotaensis MICHAELSEN, 1900

(Abb. 17–18)

In der Sammlung von Hamburg lagen vom Typenmaterial unter Inv. Nr. 5451 nur 3 Exemplare vor, die wegen Fehlen der inneren Organe nicht nachbestimmt werden konnten. In der Sammlung von Berlin gelang es von jedem in der Originalbeschreibung angeführten Fundort Tiere vorzufinden. Diese sind z. T. in gutem Zustand erhalten und konnten überprüft werden, so daß die Beschreibung MICHAELSEN's ergänzt werden kann.

Da das Syntypen-Material, wie erwähnt, von verschiedenen Fundorten stammt, sollen nachstehend die Tiere, von jeder Lokalität gesondert, überprüft werden.

Unter Inv. Nr. 7259 (Paramo Alto von Sibaté Fusagasuga 3. 2. 1897 leg. BÜRGER) lag ein adultes und ein praeadultes Tier vor. Das geschlechtsreife Tier ließ sich als *A. bogotaensis* bestimmen, das andere als *A. pachoensis*. Da am gleichen Fundort auch *A. pachoensis* vorkommt, kann es sich um eine Verwechslung handeln. Der Gürtel erstreckt sich bei *bogotaensis* vom 16.–26. Segment. die Pubertätsstreifen liegen am 20.–1/2 25. Segment. Pubertätspapillen lagen auf Intersegmentalfurche 20/21, 22/23 und 24/25. Weibliche Poren konnten am 17. Segment, die männlichen Poren am 20. Segment (Abb. 17) erkannt werden.

Unter Inv. Nr. 7366 (Lagune von Fuquene, Strand unter Steinen, 2. 3. 1897 leg. BÜRGER) war ein vollkommen adultes Tier vorhanden mit dem Gürtel vom 16.–1/4 27. Segment. Die Pubertätsstreifen erstreckten sich vom 1/2 20–1/2 25. Segment. Die weiblichen Poren konnten am vorderen Rand des 17. Segmentes oberhalb der Borstenlinie *b* erkannt werden. Männliche Poren liegen auf dem 20. Segment auf den Pubertätsstreifen. Bei dem unter Inv. Nr. 7283 (Boqueron bei Bogota, Dez. 1896–Jan. 1897 leg. BÜRGER) von mir geöffnetem einzigen adulten Tier erstreckte sich der Gürtel vom 16.–26. Segment Pubertätsstreifen, weibliche und männliche Poren wie bei dem vorher angeführten Exemplar gelegen. Mit Ausnahme der weiblichen Poren, die auf Intersegmentalfurche 17/18 lagen, waren bei dem unter Inv. Nr. 7267 (El Bergell bei Guaduas) von mir geöffnetem Exemplar die übrigen Kennzeichen wie bei den vorausgehend angeführten Syntypen gelegen. Bei dem unter Inv. Nr. 7266 (Bogota, Savanna in feuchter Erde, 7. 3. 1897 leg. BÜRGER) lag der Gürtel am 17.–26. Segment, die weiblichen Poren konnten am vorderen Rand des 18. Segmentes vor der Borste *b*, die männlichen Poren auf dem 20. Segment in Höhe der Pubertätsstreifen, erkannt werden. Die Tiere vom Fundort Ubaté, 20. 3. 1897 leg. BÜRGER (Inv. Nr. 7282) und Susa, Wiese, 23. 3. 1897 leg BÜRGER (Inv. Nr. 7269) waren juvenil, dennoch konnten die weiblichen Poren auf dem 17. Segment, die männlichen Poren auf dem 20. Segment erkannt werden.

Ebenfalls als Syntype von *bogotaensis* wurde ein besonders großes Exemplar aus Paramo von Bogota, Weg nach Coachi, 27. I. 1897 leg.

BÜRGER (Inv. Nr. 7284) bezeichnet. Bei diesem Tier lag der Gürtel vom 17.–26. Segment, die Pubertätsstreifen erstreckten sich vom 20.–24. Segment. Die weiblichen Poren liegen auf dem 19. Segment, die männlichen Poren auf dem 22. Segment. Die Samentaschenporen liegen zwischen der Borstenlinie *b* und *c*, ihre Form erinnert an die von *A. affinis*. Die angeführten Kennzeichen berücksichtigend, stelle ich dies Tier zu *A. affinis* MICHAELSEN.

Wie aus dieser kurzen Erörterung der äußeren Kennzeichen von Syntypen der Art *bogotaensis* hervorgeht, war mit Ausnahme des letzt angeführten Tieres, eine mehr oder weniger große Übereinstimmung in der Lage des Gürtels, der Pubertätsstreifen und Pubertätspapillen tragenden Segmente sowie die der männlichen und weiblichen Poren zu vermerken. MICHAELSEN (1913) stellt zwar in einer späteren Arbeit die konstante Lage der Pubertätspapillen tragenden Segmente auf Intersegmentalfurche 20/21, 22/23 und 24/25 an Hand von Untersuchungen an neuem Material (p. 245) in Abrede, weil seine Nachuntersuchungen am Typenmaterial ebenfalls erwiesen haben, daß solche auch am 20., 22. und 24. Segment vorkommen, die Pubertätsstreifen sich auf das 20.–24. Segment beschränken. Wie vorausstehend erwähnt, wurde dies von mir bei einem Exemplar (Inv. Nr. 7284) auch erkannt, nur bin ich der Meinung, daß es sich in diesem Fall, andere Merkmale ebenfalls berücksichtigend, um *A. affinis* handelt. In der Sammlung von Hamburg konnte von einem der angedeuteten Fundorte (Inv. Nr. V. 7752) SSW von Bogota Cafetal Argelia bei Viota, nahe dem Rio Bogota leg. FUHRMANN das Material überprüft werden. Bei allen Tieren lag der Gürtel am 16.–26. Segment, die Pubertätsstreifen erstreckten sich vom 20.–25. Segment, die weiblichen Poren am 17. Segment, die männlichen Poren am 20. Segment.

Die inneren Organe der untersuchten Syntypen zeigen bei allen geöffneten Exemplaren ein Verwachsen des 9/10 und 10/11. Dissepimentes. Die im 10. Segment liegenden Testikelblasen, die ventral miteinander verschmolzen sind, schließen Hoden und Samentrichter sowie die Herzen ein und werden vom verwachsenem Dissepiment umhüllt. Die Samensäcke hängen am rudimentären Dissepiment 10/11 und liegen im 11. Segment. Letzte Paar Herzen im 13. Segment, es sind also 4 Paar Intestinalherzen vorhanden. 3 Paar Samentaschen im 7.–9. Segment (Abb. 18).

In den neueren Aufsammlungen konnte nur ein geschlechtsreifes Exemplar als *bogotaensis* identifiziert werden. Ein weiteres juveniles Tier wird mit Vorbehalten ebenfalls dieser Art zugereiht.

Fundorte: AF/2296 1 Ex. Kolumbien, Paramo La Rusia, Bergwald, Epiphyten cca 1 m hoch, 3. 10. 1986 leg. H. STURM. – AF/2303 1 Ex. juv. Ostkordillere, Westhang, 1500 m La Vega, 10. 9. 1989, leg. H. STURM.

Andiodrilus affinis MICHAELSEN, 1900
 (Abb. 19–21)

Unter Inv. Nr. V. 5450 liegen in der Sammlung von Hamburg 2 zerschnittene Exemplare und ein ebenfalls zerschnittenes Tier ohne Kopf vor. Den Tieren fehlen allen die inneren Organe bis auf die Borstendrüsen und Borstensäcke. Da in der Sammlung von Berlin vom gleichen Fundort (Inv. Nr. 7289 Alto von Sibaté Cordillere von Bogota Westseite, 2800 m 3. 2. 1897 leg. BÜRGER) 3 adulte, ein praeadultes und 3 juvenile Tiere vorliegen, sollen die Untersuchungen an diesen erfolgen. Mit Sicherheit kann angenommen werden, daß die Originalbeschreibung auch von diesen erfolgte, da ein Tier bereits geöffnet war. Dies Tier wird unter Inv. Nr. 7289/a als Lectotypus designiert. Unter Inv. Nr. 7288 (Bogota Dez. 1896 leg. BÜRGER) liegen im Museum von Berlin weitere 2 Exemplare dieser Art vor, es sind die, die in der Originalbeschreibung als überhärtete Tiere erwähnt wurden und von dem eins geöffnet war. Außerdem waren im gleichen Glas noch weitere 3 Exemplare, diese gehören jedoch der Gattung *Martiodrilus* an und wurden als *M. savanicola* MICHAELSEN, 1900 bestimmt. Sie werden in einer späteren Arbeit näher besprochen.

Obwohl die Erhaltung des Materials vollkommen verschieden war, fällt sofort auf, daß das Pubertätsfeld verschieden ausgebildet ist. Bei den erweichten Tieren reicht der Gürtel vom 17.–26. Segment, die Pubertätsstreifen verlaufen vom 1/2 20.–1/2 24. Segment. Pubertätspapillen sind deutlich auf dem 20., 22. und 24. Segment zu erkennen (Abb. 19). Die weiblichen Poren liegen hier auf dem vorderen Rand des 18. Segmentes, die männlichen Poren auf den Pubertätsstreifen am 21. Segment. Bei den erhärteten Tieren liegt der Gürtel auf dem 17.–26. Segment, die Pubertätsstreifen verlaufen vom 20.–1/2 25. Segment, gespaltene Pubertätspapillen liegen auf Intersegmentalfurche 20/21, 22/23 und 24/25. Die Geschlechtsborsten stehen nebeneinander und sind von kleinen runden Höfen umgeben. Die weiblichen Poren sind am 17. Segment, die männlichen Poren auf den Pubertätsstreifen am 21. Segment erkannt worden (Abb. 20).

Abgesehen von diesen Unterschieden und dem beträchtlichen Größenunterschied zugunsten der erhärteten Tiere, zeigen die inneren Organe keine Unterschiede. Die Originalbeschreibung kann, wie bereits RIGHI & GARCIA (1898) darauf hingewiesen haben, durch das Vorhandensein von 4 Paar Intestinalherzen ergänzt werden. Wie bereits vorausgehend erwähnt und auf Abb. 2 veranschaulicht wurde, ist das Dissepiment 9/10 und 10/11 dorsal verschmolzen, und bildet mit den Testikelblasen auf der Dorsalseite ein geschlossenes Häutchen. Nur an der Ventralpartie sind die Dissepimente noch getrennt. In diesen Testikelblasen sind die Hoden und Samentrichter sowie die Herzen des 10. Segmentes eingeschlossen. Im 11. Segment liegt am rudimentären Häutchen ein länglichrunder Samensack. Ovarien im 13.

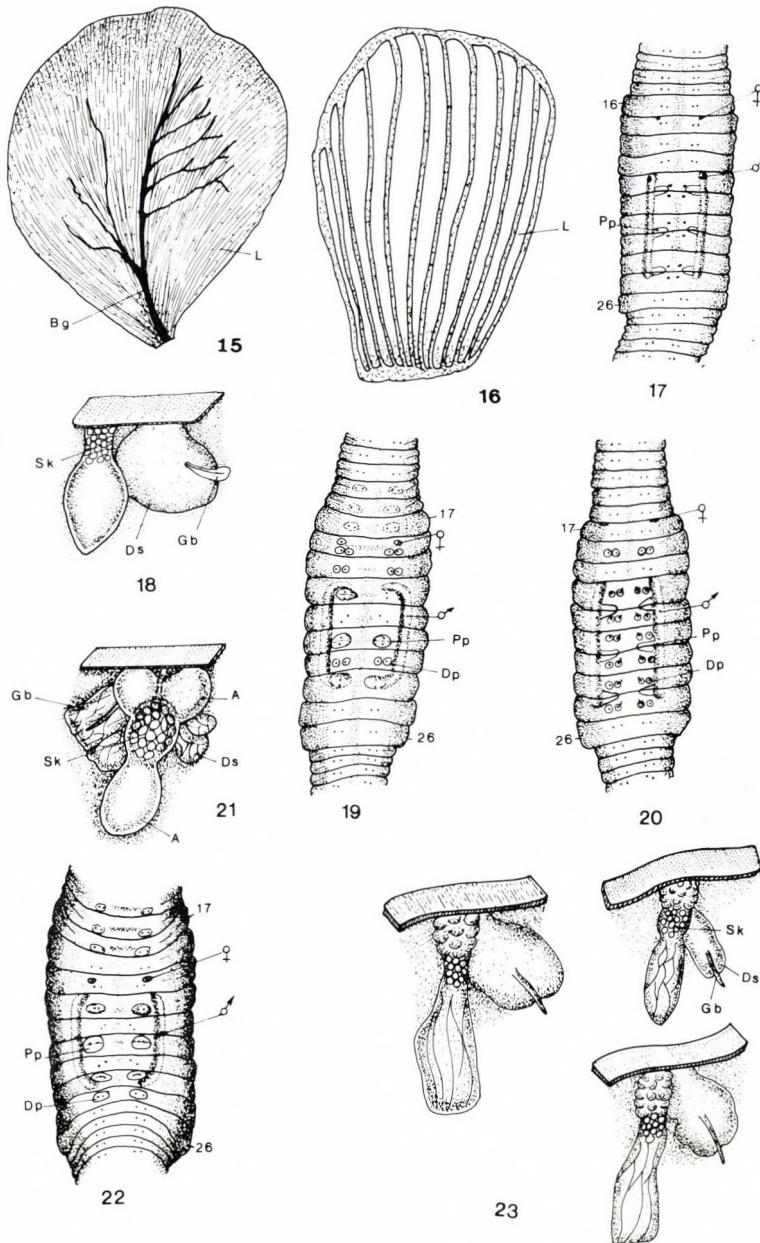


Abb. 15. *Andiodrilus sturmi* Zicsi, 1988: Chylustasche, L = Lamellen, Bg = Blutgefäß. – Abb. 16. *Andiodrilus bolleyi* COGNETTI, 1904: Längsschnitt durch eine Chylustasche, L = Lamellen. – Abb. 17–18. *Andiodrilus bogotaensis* MICHAELSEN, 1900: 17 = Ventralansicht mit Gürtel und Pubertätsstreifen, Pp = Pubertätspapillen, 18 = Form der Samentasche, Sk = Samenkämmerchen, Gb = Geschlechtsborste, Ds = Drüsensack der Geschlechtsborste. – Abb. 19–21. *Andiodrilus affinis* MICHAELSEN, 1900: 19–20 = Ventralansicht, verschiedene Lage der Gürtelorgane, Pp = Pubertätspapillen, Dp = Drüsenpapillen; 21 = Samentasche, A = Ampulle, Gb = Geschlechtsborste, Sk = Samenkämmerchen, Ds = Drüsensack der Geschlechtsborste. – Abb. 22–23. *Andiodrilus pachoensis* MICHAELSEN, 1900: 22 = Ventralansicht mit Gürtel und Pubertätsorgane, Pp = Pubertätspapille, Ds = Drüsenpapille; 23 = Form der Samentaschen, Sk = Samenkämmerchen, Gb = Geschlechtsborste, Ds = Drüsensack der Geschlechtsborste

Segment. Eileiter und Samenleiter treten in Höhe des 17. Segmentes, nach Durchbrechung der vorausgehenden Dissepimente, hervor und verlaufen nebeneinander. Chylustaschen rundliche Gebilde mit deutlich abgeschnürtem Kopf, es konten 42–45 Lamellen gezählt werden. Geschlechtsborsten der Samentaschenregion 1,80 mm lang, 0,03 mm dick mit ungefähr 32 Kerben. Geschlechtsborsten der Gürtelregion 1,80 mm lang, 0,035 mm dick mit 38 Kerben in einer Reihe.

Samentaschen von sehr eigenständlicher Form und sehr typisch für die Art. Ausführungsgang linsenförmig angeschwollen. Ampulle durch eine kleine Einschnürung in zwei Teile geteilt. Im distalen Teil dickwandig mit Samenkämmchen versehen, im proximalen Teil etwas gerundet und dünnwandig (Abb. 21).

Im vorliegenden Material ließen sich außer dem von mir früher veröffentlichten Fundort AF/518 Paramo de Monserrate 7 km NE von Bogota (ZICSI 1988) von der gleichen Stelle weitere 1 + 2 juv. Exemplare bestimmen (AF/2299), leg. H. STURM, 9. 10. 185.

Bemerkung. – Aus der gleichen Umgebung (AF/2300 2 Ex. Monserrate 3250 m 23. 9. 1989 leg. H. STURM) liegen mir noch zwei Exemplare vor, die der Art *A. affinis* sehr nahe stehen, sich allein in der Verdoppelung der Samentaschen im 7., 8. und 9. Segment von ihr unterscheiden. In meiner vorausgehenden Arbeit (ZICSI 1988) wurde bereits erwähnt, daß bei einem Exemplar (AF/518) die Samentaschen der linken Seite auf dem Segment 8 u. 9 verdoppelt sind. Dies wurde als eine Anomalie angesehen. Jetzt besitze ich ein Exemplar wo alle drei Paar Samentaschen verdoppelt sind und ein zweites Tier, wo nur die des 8. Segmentes verdoppelt sind. Nur die innere Reihe der Samentaschen besitzt einen linsenförmigen Ausführungsgang der in der Borstenlinie zwischen *b* und *c* ausmündet, die andere Reihe der Samentaschen ist einfach, tropfenförmig und mündet in der Borstenlinie *cd* aus. Die weiblichen Poren liegen auf dem 18. Segment, die männlichen Poren auf dem 21. Segment.

Obwohl die Zahl und Form der Samentaschen und die Lage der Samentaschenporen bei der Begrenzung von Arten dieser Gattung als konstantes Merkmal betrachtet wird, muß von diesen Tieren weiteres Material mit gleicher Samentaschenzahl vorliegen um die Verdoppelung als Artcharakter werten zu können. Die beiden Exemplare werden vorläufig als *A. affinis* inventarisiert.

Andiodrilus pachoensis MICHAELSEN, 1900
 (Abb. 22–23)

Syn. n. *Andiodrilus paramensis* ZICSI, 1988

Da in der Sammlung von Hamburg unter Inv. Nr. V. 5454 die 3 adulten und 1 praeadultes Tier bereits geöffnet waren und die inneren Organe bis auf die Samentaschen entbehrten, stütze ich mich bei der Revision auf die Tiere aus dem Museum von Berlin, da hier von jedem Fundort der Originalbeschreibung Exemplare vorliegen. Vom Fundort Inv. Nr. 7287 Alto von Sibaté Fusagasuga wird das geöffnete Tier unter Inv. Nr. 7287/a als Lectotypus designiert.

Von den vier Tieren die hier vorliegen sind nur drei Exemplare mit *A. pachoensis* identisch, ein Tier ließ sich als *M. savanicola* MICHAELSEN bestimmen.

Bei allen drei Exemplaren erstreckt sich der Gürtel vom 17.–26. Segment, die Pubertätsstreifen, beim Lectotypus bis zum 24. Segment, bei den Paralectotypen auch nur bis zum 1/2 24. Segment. Bei einem Exemplar sind die Pubertätsstreifen auf der rechten Seite um ein Segment nach hinten verschoben. Die weiblichen Poren beim Lectotypus auf dem 19. Segment vor der Borste *b*, männliche Poren auf Intersegmentalfurche 20/21 auf den Pubertätsstreifen, bei den übrigen auf dem 20. oder 21. Segment. Bei allen Tieren waren auf dem Pubertätsfeld, die Segmente 20, 22 und 24 von Pubertätspapillen umgeben (Abb. 22), aber auch die Borsten *ab* vom 25. Segment waren von kleineren Höfen umgeben. Die Samentaschenporen lagen bei allen Tieren auf Intersegmentalfurche 6/7–8/9 in der Borstenlinie *ab*.

Unter Inv. Nr. 7272 (Zwischen Pacho u. Tipaguira 2000–2200 m leg. BÜRGER 27. 3. 1897) liegen zwei Exemplare vor. Sie sind nicht geöffnet. Der Gürtel erstreckt sich bei beiden Tieren vom 17.–26. Segment, die Pubertätsstreifen vom 20.–1/2 24, 24. Segment, aber auch auf dem 25. Segment sind die Borsten von mächtigen Drüsen umgeben. Die weiblichen Poren liegen bei einem Exemplar auf dem 19., beim anderen auf dem 20. Segment, innerhalb der Borstenlinie *a*. Die männlichen Poren waren auf dem 21. Segment auf den Pubertätsstreifen zu erkennen. Die Samentaschenporen liegen bei beiden Tieren in der Borstenlinie *ab* auf Intersegmentalfurche 6/7–8/9.

Vom Fundort zwischen La Union und Chingasa 1500–2000 m 2. 1987 leg. BÜRGER (Inv. Nr. 7285) lag ein geöffnetes Tier vor. Gürtel und Pubertätsstreifen wie beim vorher angeführtem Fundort. Die weiblichen Poren lagen links auf dem 19., rechts auf dem 18. Segment. Die männlichen Poren liegen auf dem 21. Segment. Die inneren Organe fehlten. Ebenso fehlten die inneren Organe bei dem einzigen Exemplar vom Fundort zwischen Tierra Negra und Fusagasuga 2830–2300 leg. Bürger (Inv. Nr. 7279) Das Puber-

tätsfeld mit den Pubertätsstreifen war bei diesem stark erweiterten Tier seitlich verschoben, d.h. links lagen die Pubertätsstreifen von 21. beginnend, rechts vom 20. Segment. Weibliche Poren waren auf dem 18. Segment, Samentaschenporen in der Borstenlinie *ab* auf Intersegmentalfurche 6/7–8/9 gelegen.

Unter Inv. Nr. 7286 vom Fundort Pacho, 24. 3. 1897 leg. BÜRGER lagen 2 praeadulte und 2 juvenile Tiere der Art *A. pachoensis* vor. Ein weiteres adultes Tier gehört der Gattung *Martiodrilus* MICHAELSEN an, mit welchem ich mich in einer späteren Arbeit noch befassen werde. Bei den beiden praeadulten Tieren erstreckten sich die Pubertätsstreifen vom 20.–24. Segment, Pubertätspölster sind am 20., 22. und 24. Segment. Die weiblichen Poren waren am 18., die männlichen Poren am 20. Segment zu erkennen. Samentaschenporen in der Borstenlinie *ab* auf Intersegmentalfurche 6/7–8/9.

Wie auch aus der Abbildung hervorgeht ist die Lage der Pubertätsstreifen und die der Pubertätspapillen auf den Segmenten 20, 22, und 24 denen der einen Form von *affinis* sehr ähnlich (vergl. Abb. 19). Bei keinem Exemplar konnten die Pubertätsstreifen bis zum 25. Segment reichend betrachtet werden, da diese deutlich nur bis zum 24. Segment reichten. Am 25. Segment sind die Borsten öfters ebenfalls von großen Drüsen umgeben, so daß sie als Fortsetzung der Pubertätsstreifen angesehen werden könnten. Konstant erscheint mir allein die Lage der Samentaschenporen in der Borstenlinie *ab* zu sein. Die Form der Samentaschen ist ebenfalls anders als bei *A. affinis*, es sind längliche sackförmige Gebilde (Abb. 23) die im Ausführungsgang Samenkämmerchen besitzen. Sie ähneln denen von *A. schuetti*.

In der inneren Organisation konnte das verwachsene Dissepiment 9/10 und 10/11 erkannt werden, in den Testikelblasen des 10. Segmentes waren die Hoden und Samentrichter sowie die Herzen eingeschlossen. Samensäcke im 11. Segment, letzte Paar Herzen im 13. Segment. Chylustaschen sehr flach mit kleiner Abschnürung.

Im vorliegenden Material konnte ein Exemplar als *A. pachoensis* bestimmt werden. Bei diesem liegen die männlichen Poren auf dem 21. die weiblichen Poren auf dem 19. Segment. Eine Überprüfung meines Materials (ZICSI 1989) erbrachte einerseits den Nachweis, daß der unter Inv. Nr. AF/522 als *A. affinis* bestimmte Regenwurm zu *pachoensis* gestellt werden muß, da die Samentaschenporen in der Borstenlinie *ab* liegen, die weiblichen im 19., die männlichen Poren im 21. Segment. Anderseits, und dies wurde in der Originalbeschreibung bei *Andiodrilus paramensis* ZICSI, 1988, auch angedeutet, steht diese Art dem *pachoensis* bzw. *affinis* sehr nahe. Eine Nachuntersuchung des Typenmaterials und ein Vergleich mit den Typen von *pachoensis* hat mich davon überzeugt, daß *paramensis* mit *pachoensis* identisch ist und so eliminiert werden muß. Der Gürtel ist gewissermaßen auch schon am 17. Segment ausgebildet, die weiblichen und nicht die männ-

lichen Poren liegen am 19. Segment, die männlichen Poren liegen am 21. Segment auf den Pubertätsstreifen. Die Chylustaschen besitzen nach jetziger Bestimmung 24 Lamellen und stimmen so mit denen der von *pachoensis* (25–30 Lamellen) gut überein.

Fundort: AF/2308 1 Ex. Paramo de Monserrate, Serro el Rompedro 3250–3300 m 20. 9. 1968 leg. H. STURM.

Bemerkung. – Wie aus der ausführlichen Darstellung der äußeren und inneren Ergänzungsmerkmale der Syntypen beider Sammlungen hervorgeht, war früher das Auseinanderhalten von *schuetti*, *bogotaensis*, *affinis* und *pachoensis* nicht immer mit Sicherheit möglich. Selbst MICHAELSEN verwechselte bei der Erstbeschreibung seine Arten. Obwohl einige Ergänzungen dazugekommen sind, kann die große Ähnlichkeit der Arten nicht von der Hand gewiesen werden. Als sicherster Unterschied bleibt auch jetzt noch die Form der Samentaschen und Lage der Samentaschenporen, die Ergänzungen der Kennzeichen unterstützen nur diese Unterschiede.

Andiodrilus graffi sp. n.
(Abb. 24–29)

Obwohl von diesem Tier nur ein ganz geschlechtsreifes Tier vorliegt, sind die Samentaschen soweit nach hinten verschoben, daß es dadurch alleinstehen in der Gattung ist und kann so mit Sicherheit als neue Art für die Wissenschaft beschrieben werden.

Länge des Holotypus 85 mm, Dicke 6 mm, Segmentzahl 138. Farbe unpigmentiert.

Kopf rüsselförmig eingezogen, 1.–3. Segment verwachsen. Segmente doppelt geringelt. Borsten vor dem Gürtel *aa* sehr eng gepaart, *cd* tief in der Muskelwand, nicht zu erkennen. Borsten hinter dem Gürtel *ab* doppelt so groß wie *cd*, *aa* etwas kleiner als *bc*. Borstendistanz *aa* : *ab* : *bc* : *cd* : *dd* = 18 : 6 : 27 : 2,5 : 65 Borsten *a* vom 7., 8. und 9. Segment zu Geschlechtsborsten umgewandelt, von löcherförmigen Höfen umgeben. Borsten auf dem Gürtel vom 17.–21. Segment ebenfalls zu Geschlechtsborsten umgewandelt. Wegen der drüsenvörmigen Verschmelzung, Lage dieser nicht deutlich zu erkennen. Borsten *ab* des 16. Segmentes hintereinander stehend. Nephridialporen vor den *cd*-Borsten auf dem vorderen Teil des Segmentes erkenntlich.

Weibliche Poren auf dem 18. Segment, hinter der Borste *b*, männliche Poren auf dem Pubertätsfeld am 21. Segment.

Gürtel vom 17.–27. Segment, Pubertätsorgane von drüsiger Struktur vom 19.–21. Segment, vielleicht auch etwas auf das 22. Segment übergehend. Es sind nicht deutliche Streifen, es sind dies drüsige Verfärbungen (Abb. 24). Samentaschenporen auf dem 17. und 18. Segment.

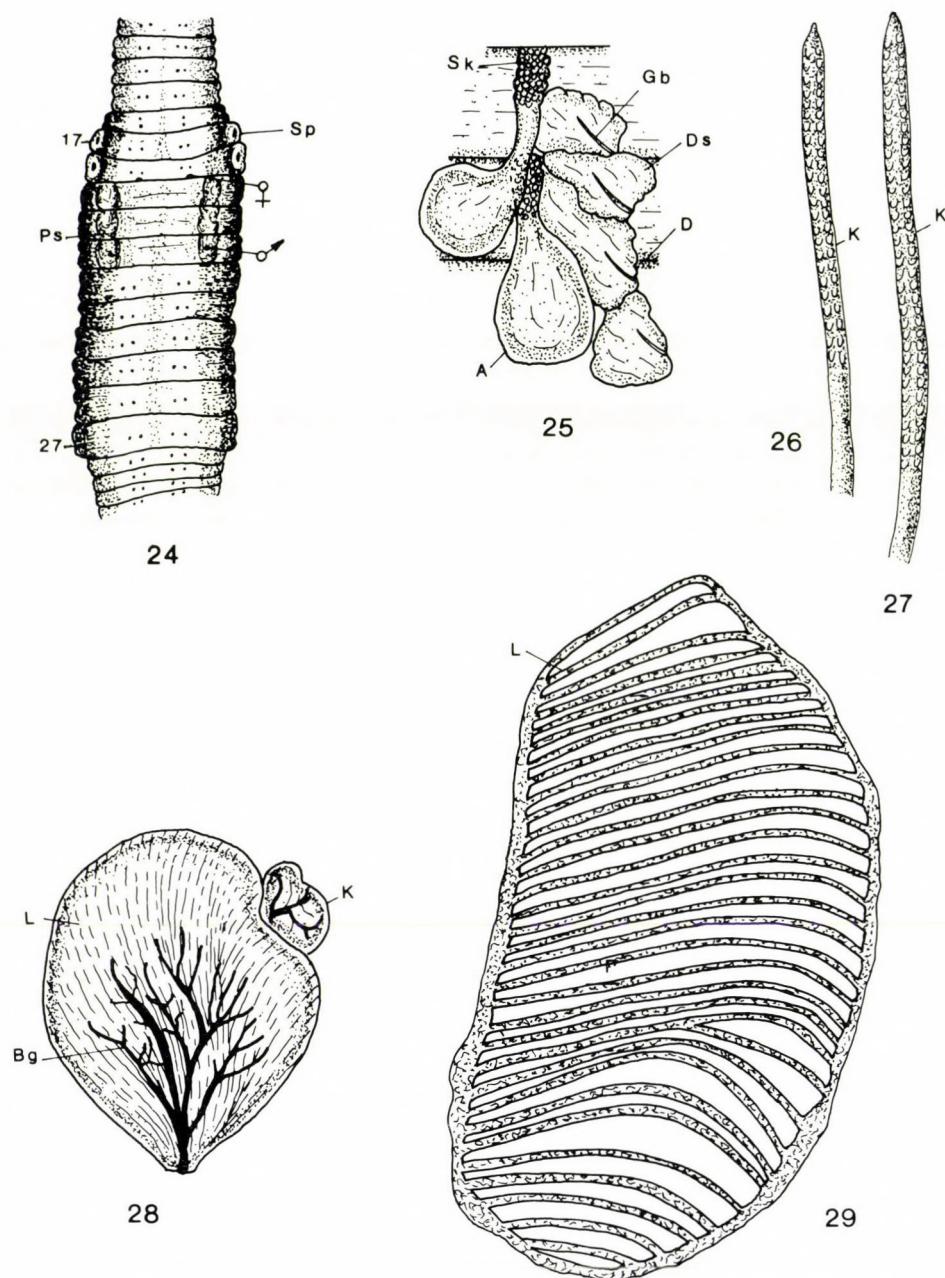


Abb. 24–29. *Andiodrilus graffi* sp. n.: 24 = Ventralansicht mit Gürtel und Pubertätsorganen, Sp = Samentaschenporen, Ps = Pubertätsstreifen; 25 = Form der Samentaschen, A = Ampulle, Sk = Samenkämmerchen, Gb = Geschlechtsborste, Gb = Drüsensack der Geschlechtsborste, D = Dissepiment; 26 = Geschlechtsborste der Samentaschenregion; 27 = Geschlechtsborste der Gürtelregion, K = Kerben; 28 = Form de Chylustasche, K = abgeschnürter Kopf, L = Lamellen, Bg = Blutgefäß; 29 = Querschnitt durch eine Chylustasche, L = Lamellen

Innere Organisation. — Verdickte Dissepimente sehr stark von 6/7–9/10, von 11/12–14/15 schwächer verdickt doch deutlich zu erkennen. Dissepiment 9/10 und 10/11 auf der Dorsalseite verwachsen, auf der Ventralseite noch deutlich zu erkennen. Großer Muskelmagen im 6. Segment. 3 Paar Chylustaschen, gestielte Lamellentaschen im 7., 8. und 9. Segment. Es sind flache Gebilde (Abb. 28) mit seitlich abgeschnürtem Kopf, es konnten 31–35 Lamellen gezählt werden (Abb. 29). Testikelblasen im verwachsenen 10. Segment, schließen Hoden und Samentrichter sowie die Herzen ein. An einem dünnen Häutchen zwischen den Testikelblasen hängen die Samensäcke im 11. Segment nach hinten gerichtet. 3 Paar Lateralherzen 7.–9. Segment, 4 Paar Interstinalherzen im 10.–13. Segment. Dorsalgefäß perlchnurartig bis ins 22. Segment reichend. Mitteldarm mit mächtiger Typhlosolis im 23. Segment beginnend.

Die Geschlechtsborsten im 18.–22. Segment sind von Drüsen umgeben, die Borsten stecken in Borstenhüllen, die an die Körperwand befestigt sind. Geschlechtsborsten der Gürtelregion 3 mm lang, und 0,06 mm dick, mit ungefähr 35 Kerben versehen (Abb. 26). Die Geschlechtsborsten des 7.–9. Segmentes sind 1,9 mm lang, 0,05 mm dick und mit ungefähr 25 Kerben versehen (Abb. 27). Samentaschen im 17. und 18. Segment, nahezu gleich groß, Ampulle und Stiel gleich lang, im Ausführungsgang Samenkämmerchen vorhanden (Abb. 25).

A. graffi sp. n. unterscheidet sich von allen bisher beschriebenen Arten der Gattung *Andiodrilus* durch die weit nach hinten verlagerten Samentaschen.

Die neue Art wird zu Ehren meines lieben Freundes und Kollegen nach Herrn PROF. DR. OTTO GRAFF, dem bekannten Oligochaeten-Fachmann, benannt.

Fundort: Kolumbien AF/2302 Holotypus. Paramo de San Cayetan 3400 m Sabaneque, 5. 9. 1989 leg. H. STURM.

Mit Ausnahme der vorausgehend beschriebenen *A. graffi* sp. n. besitzen sämtliche aus Kolumbien, Costa Rica und Venezuela bekanntgewordenen Arten 3 oder 4 Paar Samentaschen und in Korrelation mit diesen 5 Segmente einnehmende Pubertätstreifen mit 3 Pubertätspapillen, die nachstehend zur Erörterung gelangenden Arten aus Ekuador nur 2 Paar Samentaschen, wo die Pubertätsstreifen sich auf 2–3 Segmente erstrecken. In Ekuador konnten die Arten dieser Gattung nur in der Ostkordillere oder im Oriente erbeutet werden und auch hier nur in der Prov. Napo, (vgl. Abb. 1) obwohl an über 800 Stellen zwischen der Grenze von Kolumbien und Peru in allen Teilen des Landes gesammelt wurde.

***Andiodrilus reventadoriensis* ZICSI, 1989**
(Abb. 30)

Das vorliegende Material stammt aus zwei ganz verschiedenen Höhenlagen der Provinz Napo, u.zw. aus der Gegend des Vulkans Reventador 2000 m und aus dem Oriente, 16 km östlich von Lago Agrio 300 m hoch. Trotz dieser bedeutenden Höhenunterschiede konnten keine wesentlichen Abweichungen zwischen den Tieren beider Fundorte festgestellt werden. Die Originalbeschreibung muß mit folgenden Merkmalen ergänzt werden. Bei allen untersuchten adulten und praeadulten Tieren (18. Ex.) lagen die weiblichen Poren auf dem 17. Segment etwas seitlich von der Borstenlinie *b*.

Bei den gut konservierten Tieren ließ sich das Verwachsen des 9/10 und 10/11 Dissepimentes auf der Dorsalseite vorzüglich erkennen, ventral war das Dissepiment deutlich vorhanden. Dissepimente 11/12–16/17 dünn. Große Testikelblasen schließen die Hoden und Samentrichter sowie die Herzen des 10. Segmentes ein. Letzte Paar Intestinalherzen im 13. Segment. Chylustaschen flach mit deutlich abgeschnürtem Kopf, es konnten 30–35 Lamellen gezählt werden (Abb. 30). Geschlechtsborsten der Samentaschenregion 1,25 mm lang, 0,05 mm dick und mit 27 Kerben versehen. Geschlechtsborsten der Gürtelregion 1,45–1,65 lang, 0,05 mm dick und mit 30–31 Kerben versehen.

Fundort: Ekuador, Prov. Napo AF/2294 1 Ex. San Rafael Reventador 3. XII. 1988, leg. JIMENEZ.

***Andiodrilus szekelyi* ZICSI, 1989**
(Abb. 31–32)

Diese Art wurde wieder an mehreren Fundorten in der Prov. Napo, in der Ostkordillere und im Oriente südlich von den Fundorten dert Art *A. reventadoriensis* in Höhenlagen von 250–1200 m erbeutet. Eine Überprüfung des Typen Materials sowie des neueren Materials ermöglichen folgende Ergänzungen der Originalbeschreibung beizufügen.

Weibliche Poren liegen nicht auf dem 14. Segment, sondern bei allen untersuchten Tieren auf dem vorderen Rand des 17. Segmentes neben der Borste *b* (Abb. 31).

Innere Organisation. – Dissepimente 9/10 und 10/11 auf der Dorsalseite verwachsen. Perioesophageale Testikelblasen im 10. Segment, verhältnismäßig klein und reichen nicht wie bei *reventadoriensis* bis hinauf auf die Dorsalseite. Die Testikelblasen des 10. Segmentes schließen Hoden und Samentrichter sowie die Herzen des 10. Segmentes ein. Ein kleiner Samensack hängt beiderseits an einem Häutchen und liegt im 11. Segment.

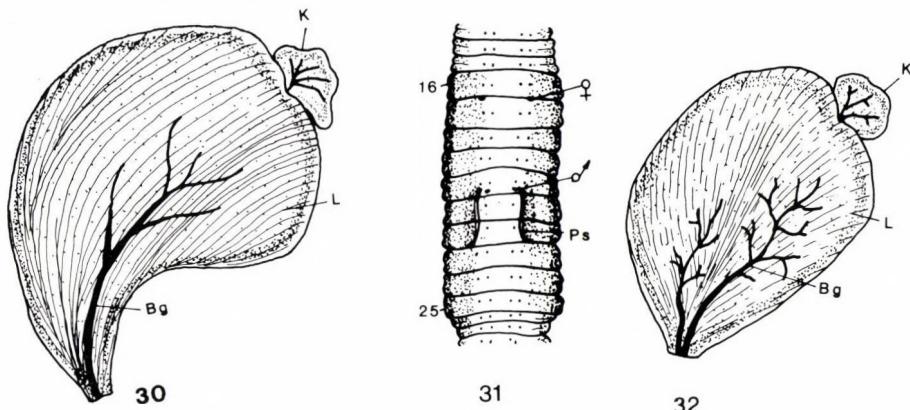


Abb. 30. *Andiodrilus reventadiriensis* ZICSI, 1989: Form der Chylustasche, K = abgeschnürter Kopf, L = Lamellen, Bg = Blutgefäß. – Abb. 31–32. *Andiodrilus szekelyi* ZICSI, 1989: 31 = Ventralansicht mit Gürtel und Pubertätsorganen, Ps = Pubertätsstreifen; 32 = Form der Chylustaschen, K = abgeschnürter Kopf, L = Lamellen, Bg = Blutgefäß

Letzte Paar Herzen im 13. Segment. Gestielte Chylustaschen im 7.–9. Segment, es konnten 35–39 Lamellen gezählt werden (Abb. 32).

Keine Geschlechtsborsten in der Samentaschenregion. Geschlechtsborsten in der Gürtelregion 1,50 mm lang, 0,45 mm dick mit 20–30 Kerben versehen.

Form der Samentaschen erinnern bei *A. szekelyi* an die von *A. bogotaensis*, bei *reventadioriensis* an die von *A. schuetti*.

Fundorte: Ekuador Prov. Napo. AF/2236 1+2 praead. Ex. Zwischen Puerto Napo und Ahuana, 19 km von Tena, Urwaldfleck 430 m. 2. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2272 4+4 praead. Ex. 32 km vor Loreto 950 m. 2. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2274 3+1 juv. Ex. 53 km von Baeza bei der Verzweigung nach Coca, 1250 m. 1. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2278 4 Ex. 55 km vor Loreto 1220 m. Urwald 2. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2279. 1+5 juv. Ex. 63 km von Baeza in Richtung Tena, 1. 5. 1990. leg. ZICSI, CSUZDI et PAREDES. – AF/2283 5 Ex. 26 km vor Tena, 930 m. 4. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2284 1 Ex. 2 km hinter der Verzweigung nach Coca in Richtung Baeza, 1200 m. 4. 5. 1990 leg. ZICSI, CSUZDI et PAREDES.

Andiodrilus lacteus ZICSI, 1989 (Abb. 33–38)

Die Originalbeschreibung erfolgte auf Grund mehrerer praeadulter Tiere und einem adulten Exemplar bei dem nur der hintere Teil des Gürtels mit den Pubertätsstreifen vorhanden war. Bei meinen neueren Sammlungen im Jahre 1990 besuchte ich den Locus typicus um weitere Tiere zu sammeln. Da auch an anderen Fundorten noch weitere Tiere dieser Art gesammelt

werden konnten, ergibt sich die Möglichkeit, einerseits die Originalbeschreibung zu ergänzen, andererseits das Variieren einiger artbegrenzender Merkmale wie die der Lage des Gürtels, der Pubertätsstreifen, Zahl und Form der Samentaschen sowie die Lage der Samentaschenporen zu verfolgen.

Der Neubeschreibung vorausgehend sei schon jetzt bemerkt, daß die aus verschiedenen Höhenlagen stammenden Tiere bedeutende Größenunterschiede aufweisen. Die aus dem Oriente stammenden Exemplare waren immer größer als die aus verschiedenen Höhenlagen der Ostkordillere erbeuteten Tiere. Auch andere kleine Unterschiede ließen sich zwischen den beiden Formen erkennen, doch langen diese nicht aus, diese als gesonderte Art zu betrachten.

Ebenfalls vorausgehend muß richtig gestellt werden, daß *A. lacteus* nicht nur über ein Paar Samentaschen verfügt, sondern über zwei Paare, die aber in verschiedenen Borstenlinien ausmünden. Dies ist ein so kennzeichnendes Merkmal, welches bei keiner bisher beschriebenen Art dieser Gattung beobachtet werden konnte. Eine Überprüfung des Typenmaterials erbrachte den Nachweis, daß die Samentaschen in der dorsalen Medianlinie bei den praeadulten Tieren ebenfalls vorliegen, doch waren diese so unentwickelt, daß sie übersehen wurden.

Nachstehend soll eine ausführliche Ergänzung der Originalbeschreibung erfolgen:

Länge der kleineren Form 45–60 mm, Dicke 3–3,2 mm, Segmentzahl 93–148, Länge der größeren Form 150–160 mm, Dicke 6,5–8,5 mm, Segmentzahl 125–170.

Wie aus den Angaben ersichtlich, handelt es sich um bedeutende Größenunterschiede denen jedoch die Segmentzahl nicht in jedem Fall folgt. Interessant ist bei vielen großen Tieren ein Schwanzregenerat, welches eventuell ein Wachstum der Tiere darstellen kann, es kann auch mehr als 50 Segmente betragen. Farbe kleine Formen weiß, unpigmentiert, große Formen grau, ebenfalls unpigmentiert.

Kopf, fingerförmiger Kopflappen eingezogen, 1.–2. Segment verwachsen. Borsten eng gepaart, Borsten *ab* bedeutend größer als *cd*, Borsten *aa* enger als *bc*. Borsten *ab* kräftig und stark gebogen, Borsten *cd* sehr zart.

Die Geschlechtsborsten der Samentaschen und Gürtelregion variieren bei den kleineren sowie größeren Formen aber auch innerhalb einer Population. Bei den kleinen Formen sind die *c*-Borsten des 8. und 9. Segmentes, bei den großen Formen die des 7., 8. und 9. Segmentes zu Geschlechtsborsten verwandelt. Ebenfalls sind auch die Geschlechtsborsten der Gürtelsegmente verschieden angeordnet. Bei den kleineren Formen sind manchmal die des 17.–23. Segments, oder nur die des 19.–23. Segments zu Geschlechtsborsten umgewandelt. Bei den großen Formen sind vorwiegend die am 18.–23.

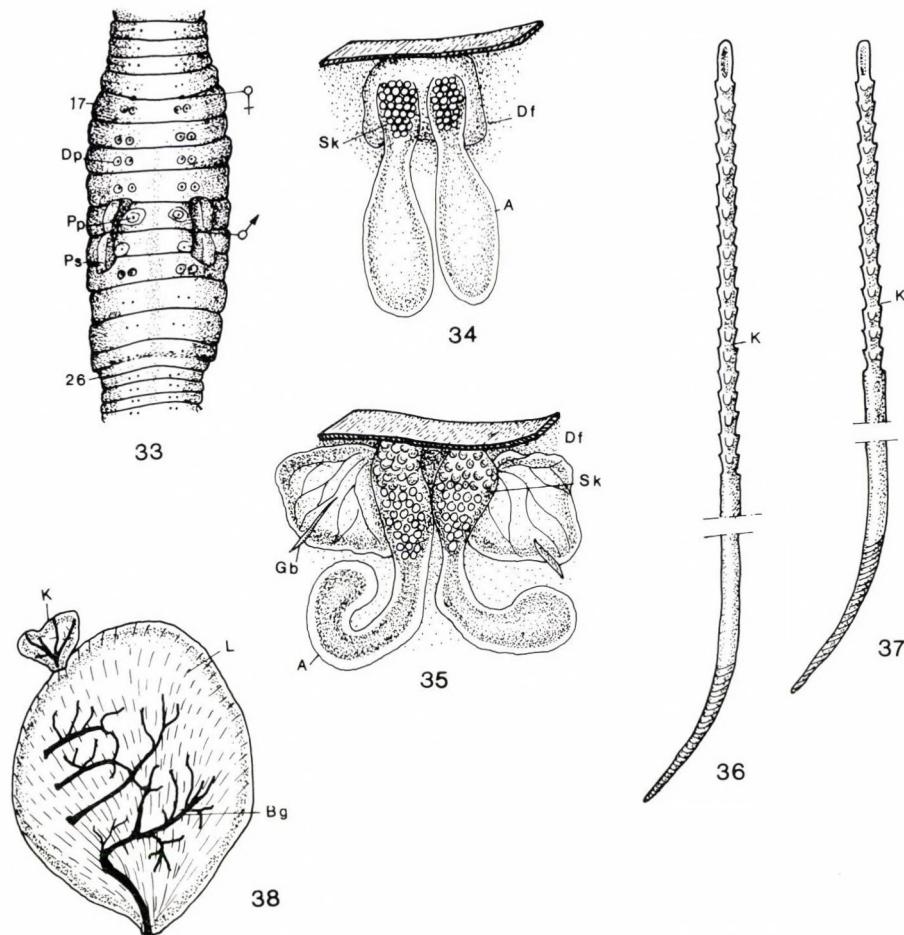


Abb. 33–38. *Andiodrilus lacteus* Zicsi, 1989: 33 = Ventralansicht mit Gürtel und Pubertätsorganen, Pp = Pubertätspapille, Dp = Drüsenpapille, Ps = Pubertätsstreifen; 34 = Samentasche aus der dorsalen Medianlinie, Sk = Samenkämmerchen, Df = Drüsenfeld, A = Ampulle. – 35 = Samentasche aus der ventralen Borstenlinie ab, Sk = Samenkämmerchen, Df = Drüsenfeld, Gb = Geschlechtsborste, A = Ampulle; 36 = Geschlechtsborste aus der Gürtelregion, 37 = Geschlechtsborste aus der Samentaschenregion, K = Kerben, 38 = Form der Chylustasche, K = abgeschnürter Kopf, L = Lamellen, Bg = Blutgefäß

Segment zu Geschlechtsborsten verwandelt. Die Länge der Geschlechtsborsten ist bei Tieren von verschiedener Größe bedeutend unterschiedlich. Bei Tieren vom *Locus typicus* sind die Borsten der Samentaschenregion 0,55–1,15 mm lang, 0,02–0,03 mm dick und mit 14–19 Kerben, die der Gürtelregion 1,30–1,35 mm lang 0,04–0,05 mm dick und mit 14–15 Kerben versehen. Bei den Tieren aus dem Oriente sind die Geschlechtsborsten der Samentaschenregion 1,70 mm lang, 0,06 mm dick und mit 25 Kerben

versehen, die der Gürtelregion sind 1,8 mm lang, 0,04 mm dick und besitzen 19 Kerben (Abb. 36–37).

Die weiblichen Poren liegen bei allen untersuchten Tieren vorne auf dem 17. Segment, in der Intersegmentalfurche oder dieser genähert. Die männlichen Poren liegen auf Intersegmentalfurche 21/22, in Höhe der Pubertätsstreifen.

Gürtel vom 17.–25., 1/2 26, 26. Segment. Pubertätsstreifen vom 21.–22. Segment, konserviert ohrenförmig hervortretend und die benachbarten Segmente 20 und 23 ausdehnend (Abb. 33).

Samentaschenporen bei den kleineren Exemplaren vom Locus typicus ein Paar auf Intersegmentalfurche 7/8 in der dorsalen Medianlinie, das andere Paar auf Intersegmentalfurche 8/9 in der Borstenlinie *ab*. Bei den größeren Formen aus dem Oriente liegen ein Paar Samentaschen auf Intersegmentalfurche 7/8 der dorsalen Medianlinie genähert, das andere Paar auf Intersegmentalfurche 8/9 zwischen der Borstenlinie *b* und *c*. Diese kleine Verschiebung der Samentaschenporen kann vielleicht auch mit der verschiedenen Größe der Tiere zusammenhängen, kann jedoch nicht als Artenunterschied betrachtet werden.

Wie bei den vorausgehenden Arten, so ließ sich auch hier das Verwachsen der Dissepimente 9/10 und 10/11 verfolgen. In diesen liegen die oesophagalen Testikelblasen des 10. Segmentes und schließen Hoden und Samentrichter sowie die Herzen ein. An dem rudimentären Häutchen des 10/11 Dissepintes hängen mehr oder weniger große Samensäcke ins 11. Segment hinein. Letzte Paar Herzen im 13. Segment. Chylustaschen im 7.–9. Segment, flache Gebilde mit abgeschnürtem Kopf, es konnten 28–30 bzw. 29–32 Lamellen gezählt werden (Abb. 38).

Samentaschen des 8. Segmentes von sackförmigem Drüsenveld umgeben. Ampulle länglich sackförmig mit langem Ausführungsgang (Abb. 34) in dem Samenkämmerchen erkannt wurden. Samentaschen des 9. Segmentes mit großer verschiedenförmiger, plattgedrückter Ampulle und langem Stiel, der Ausführungsgang prall mit Samenkämmerchen und Samenmassen gefüllt (Abb. 35).

Fundorte: Ekuador, Prov. Napo. AF/2265 15+3 juv. Ex. vom Locus Typicus von der Brücke des Rio Victoria, 2200 m. 1. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2268 1 Ex. 3 km Hinter Cuyuja in Richtung Baeza, 2420 m. 1. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2269 4 Ex. 8 km hinter Cuyuja am Ufer des Rio Jatuntinahua 1. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2237 3 Ex. 2 km vor Cosanga aus Richtung Tena 2000 m. 4. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/1757 1 Ex. Zwischen Cosanga und Aliso 2250 m. 10. 4. 1987 leg. ZICSI et LOKSA. – AF/1777 1 Ex. Cosanga 2. 1986 leg. ZICSI et LOKSA. – AF/1248 1 Ex. Archidona 2. 5. 1987. leg. D. ORTIZ. – AF/2273 1 Ex. 32 km vor Loreto aus Richtung Tena 950 m. 2. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2275 2+2 juv. Ex. 53 km hinter Baeza in Richtung Tena bei der Abzweigung nach Coca, 1250 m 1. 5. 1990. leg. ZICSI, CSUZDI et PAREDES. – AF/2280 18 Ex. 37 km von Tena, 4 km hinter der Abzweigung Coca in Richtung



Loreto 1200 m 4. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2282 4 Ex. 26 km vor Tena aus Richtung Baeza 930 m. 4. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2287 3 Ex. 82 km vor Loreto 1250 m 2. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2291 3+4 juv. Ex. 35 km vor Loreto 1000 m 2. 5. 1990 leg. ZICSI, CSUZDI et PAREDES. – AF/2292 1+1 Ex. 44 km vor Loreto 2. 5. 1990. leg. ZICSI, CSUZDI et PAREDES. – AF/2295 1 Ex. Archidona 1. 5. 1990 leg. CARNENA. – AF/2271 1 Ex. Vor Cosanga aus Richtung Baeza 1. V. 1990 leg. ZICSI, CSUZDI et PAREDES.

BESTIMMUNGSSCHLÜSSEL FÜR DIE ARTEN DER GATTUNG
ANDIODRILUS MICHAELSEN, 1900

1	Zwei Paar Samentaschen vorhanden	2
	Mehr als zwei Paar Samentaschen vorhanden	5
2	Samentaschen auf dem Gürtel	<i>graffi</i> sp. n.
	Samentaschen vor dem Gürtel	3
3	Samentaschenporen in der gleichen Borstenlinie gelegen	4
	Samentaschenporen in verschiedenen Borstenlinien gelegen	<i>lacteus</i> , ZICSI, 1989
4	Samentaschenporen zwischen der Borstenlinie <i>cd</i> und der dorsalen Medianlinie gelegen	<i>szekelyi</i> ZICSI, 1989
	Samentaschenporen in der dorsalen Medianlinie gelegen	<i>reventadoriensis</i> ZICSI, 1989
5	Drei Paar Samentaschen vorhanden	6
	Mehr als drei Paar Samentaschen vorhanden	14
6	Pubertätsstreifen auf drei Segmente beschränkt	7
	Pubertätsstreifen auf mehr als drei Segmente sich erstreckend	8
7	Samentaschenporen in der Borstenlinie <i>b</i> gelegen	<i>venezuelanus</i> RIGHI, 1989
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	Samensäcke fehlen	<i>icomii</i> RIGHI, 1971
11	Gürtel bis zum 26. Segment reichend	<i>biolleyi</i> COGNETTI, 1904
	Gürtel bis zum 25. Segment reichend	<i>orosiensis</i> MICHAELSEN, 1912
12	Samentaschenporen in der Borstenlinie <i>ab</i>	<i>pachoensis</i> MICHAELSEN, 1900
	Samentaschenporen in der Borstenlinie <i>bc</i>	<i>affinis</i> MICHAELSEN, 1900
	Samentaschenporen in der Borstenlinie <i>cd</i>	<i>bogotaensis</i> MICHAELSEN 1900
	Samentaschenporen in der dorsalen Medianlinie gelegen	13
13	Gürtel bis zum 29. Segment reichend	<i>major</i> MICHAELSEN, 1913
	Gürtel bis zum 26. Segment reichend	<i>schuetti</i> (MICHAELSEN, 1895)
14	Samentaschenporen in der dorsalen Medianlinie gelegen	<i>michaelseni</i> sp. n.
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PRINTED IN HUNGARY

Akadémiai Kiadó és Nyomda Vállalat, Budapest

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